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EMERGENCY POWER VAULT

EMPV - Pro Series Wiring Diagrams

105. AC Connections

CAUTION:

A) All EMPV Pro inverter system units contain hazardous AC and DC voltages. Because of these voltages, a qualified electrician must install the Pro inverter system, AC line service, and batteries. The electrician must install the AC line service according to local, state and NEC codes and must be familiar with batteries and battery installation.

B) Before installing, maintaining, or servicing the unit, always remove or shut off all sources of AC and DC power to the EMPV Pro inverter system. Turn off the AC line input circuit breaker at the service panel and place the Pro Battery Switch S2 in the OFF position to make sure the unit will not supply output voltage.

C) Whenever AC and/or DC voltage is applied, there will be AC voltage inside the Pro inverter system unit; the unit can supply power from AC line or from its batteries. To avoid equipment damage or personal injury, always assume that there may be voltage inside the Pro inverter system.

D) Remove rings, watches, and other jewelry before installing the AC wiring. Always wear protective clothing and eye protection and use insulated tools when working near batteries. Whenever servicing an energized unit with the inside panel open, electric shock is possible; follow all local safety codes. **TEST BEFORE TOUCHING!**

E) To reduce the risk of fire or electric shock, install the Pro inverter system and the batteries in a temperature-controlled and humidity-controlled indoor area free of conductive contaminants. See Section 103 for operating environment specifications.

105.1 AC Wiring Preparations

1. Remove the system's front cover. Make sure the Pro Battery Switch S2 is in the OFF position.
2. Make sure the Pro inverter system input and output voltages are correct for the particular application. Remember that the Pro system provides single-phase power only.
3. The input circuit breaker in the input service panel provides the means for disconnecting AC to the Pro inverter system. Only authorized persons shall be able to disconnect AC to the unit. (See NEC 700-20 and 700-21.)

CAUTION: **To prevent electrical shock or equipment damage, for all units, the EMPV Pro Battery Switch S2 and the AC input circuit breaker at the service panel are all OFF before making AC connections to the Pro inverter system.**

4. If not previously done, remove cabinet knockouts for AC Input and AC Output as described in Sections 104-4, 104.5 or 104.6 depending on mounting method

CAUTION: Do not drill the cabinet; drill filings may damage the unit and prevent it from operating. If larger knockouts are needed, use a chassis punch to enlarge the appropriate knockout. Do not add additional or unnecessary knockouts.

5. Install the input and output conduits.
6. Run the AC Input service conductors and AC Output conductors through separate conduits. Pro inverter system emergency output circuits shall be installed in dedicated conduit systems and not shared with other electrical circuits as described in NEC 700-9(b).

105.2 AC Input and AC Output Connections

CAUTION: Prior to making any wiring connections to unit make sure branch AC input circuit breaker feeding the Pro unit is turned off at the service panel!

The EMPV Pro models can be configured for various modes of operation and are described in this section. Refer to the appropriate wiring diagrams to properly connect the utility AC power, fixtures and external switching device (where applicable). Perform all wiring procedures in accordance with applicable codes.

Normally-On Operation - Fixtures remain illuminated in AC and emergency operating modes.
See "A" in Wiring Diagram 1 for 120V wiring or "F" in Wiring Diagram 2 for 277V wiring.

Normally-Off Operation- Fixtures illuminate only upon loss of utility AC power.
See "B" in Wiring Diagram 1 for120V wiring or "G" in Wiring Diagram 2 for 277V wiring.

Normally-On and Normally-Off Operation - A combination ofthe operating modes described above.
See "C" in Wiring Diagram 1for 120V wiring or"H" in Wiring Diagram 2 for 277V wiring.

Switched Load Operation - Single Circuit- Fixtures can be externally switched and will illuminate upon loss of utility AC power regardless of external switch position. See "D" in Wiring Diagram1 for 120V wiring or "I" in Wiring Diagram2 for 277V wiring.

Switched Load Operation - Four Circuit(-4C Option) - Functionally identical to the Switched Load Operation above but provides for the operation of up to four individually switched output circuits. See "E" in Wiring Diagram 1 for 120V wiring or "J" in Wiring Diagram 2 for 277V wiring.

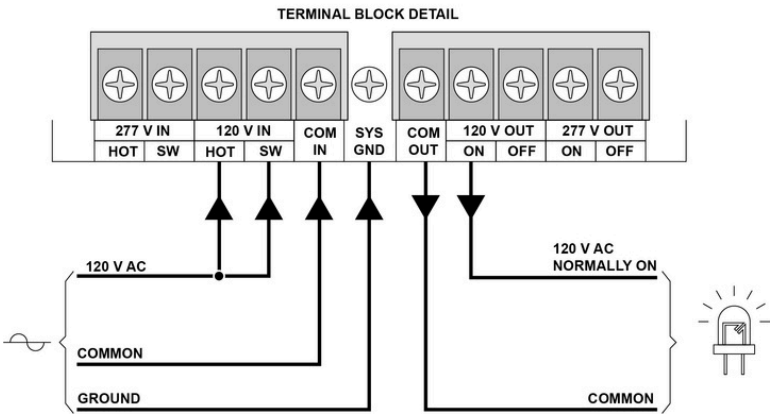
Dimmable (2.5, 5.0, 7.5 or 10.0 volts) Load Operation Dual Output (-FLEXDIM2 option) – Functionally identical to the Switch Load Operation above, but provides four (4) independent settings for each of the two dimmable loads. See "G" in Wiring Diagram 1 for 120V wiring or "N" in Wiring Diagram 2 for 277V wiring.

****Caution: Dimming switches must be programmed such that the loads DO NOT EXCEED UNIT RATING in Emergency Mode. (See Wiring Diagram "O" for details on dimming switch field programming).**

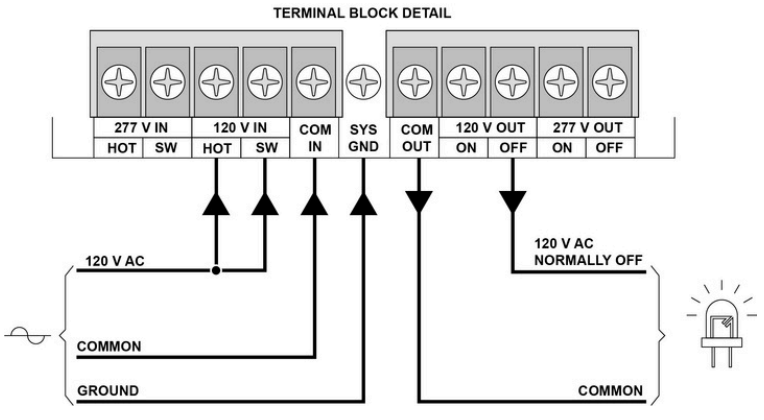
Diagram "O" in Wiring Diagram 3 can be used for both 120V or 277V wiring and setting of the desires load requirement in the Emergency Mode for the 0-10V Dimmer.

Wiring Diagram 1 - 120VAC Connections

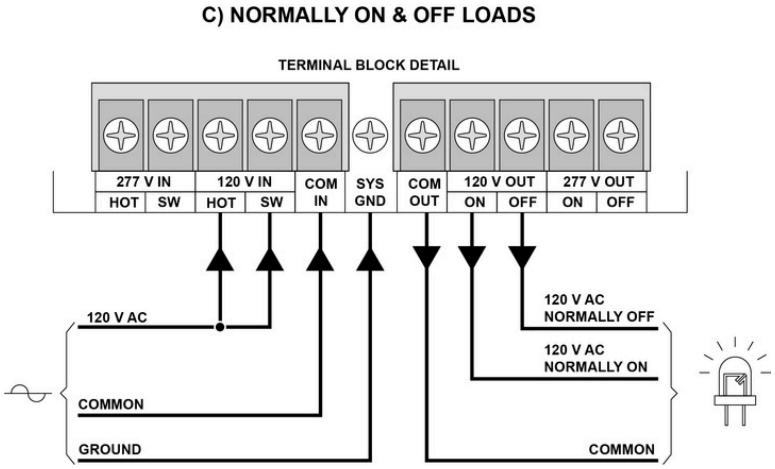
A) NORMALLY ON LOADS



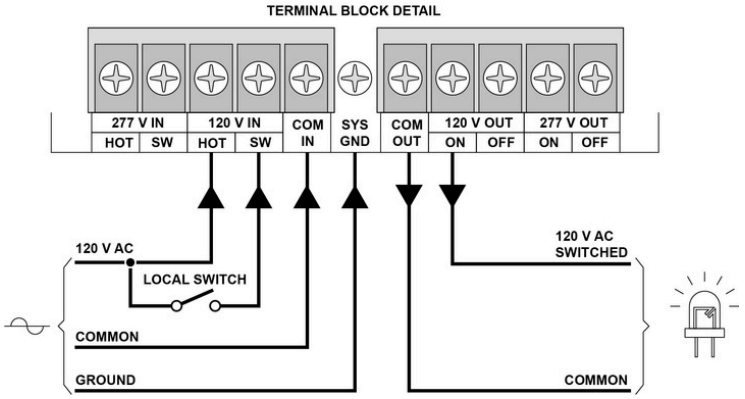
B) NORMALLY OFF LOADS



C) NORMALLY ON & OFF LOADS



D) SWITCHED LOADS



WIRING

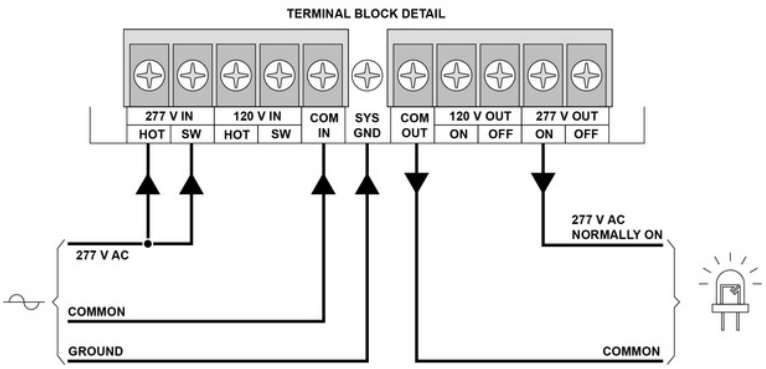
Connection to an unswitched AC circuit is required by the NEC. Wiring access is provided for by conduit knockouts in the unit housing. EMPV Pro Series models also provide knockouts in the back of the housing for rear wiring from standard electricalboxes when surface mounting.

LOAD COMPATIBILITY

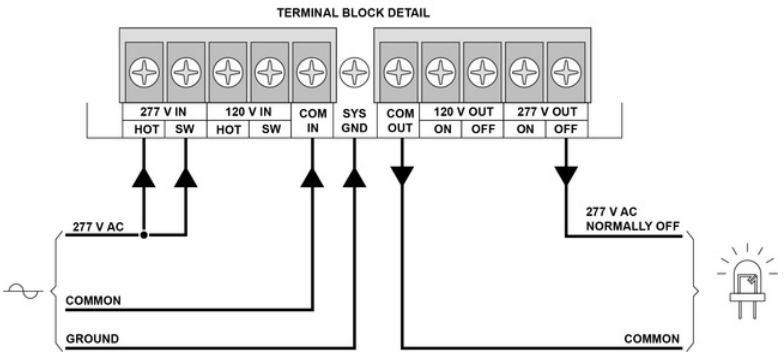
EMPV Pro Series model's clean, sinusoidal AC output will operate incandescent lamps as well as all common fluorescent and LED lamp types. Consult factory for compatibility with all other lamp types. Lighting loads are driven at 100% output for the entire emergency power cycle. This outstanding feature translates into greater occupant egress vision and safety.

Wiring Diagram 2 - 277VAC Connections

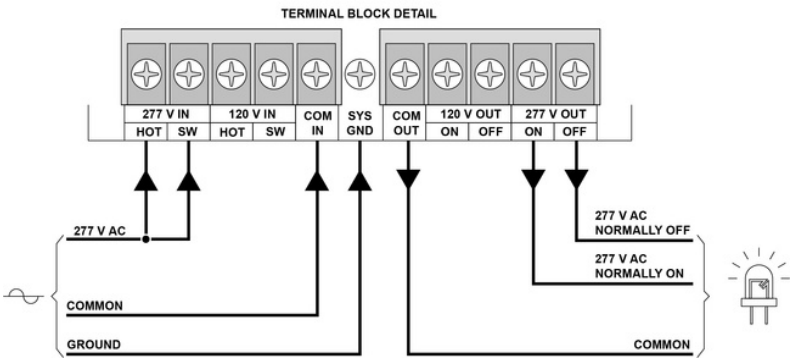
H) NORMALLY ON LOADS



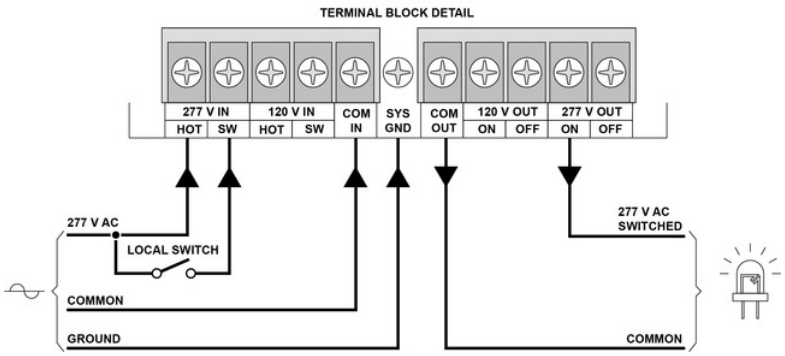
I) NORMALLY OFF LOADS



J) NORMALLY ON & OFF LOADS



K) SWITCHED LOADS



WIRING

Connection to an unswitched AC circuit is required by the NEC. Wiring access is provided for by conduit knockouts in the unit housing. EMPV Pro Series models also provide knockouts in the back of the housing for rear wiring from standard electricalboxes when surface mounting.

LOAD COMPATIBILITY

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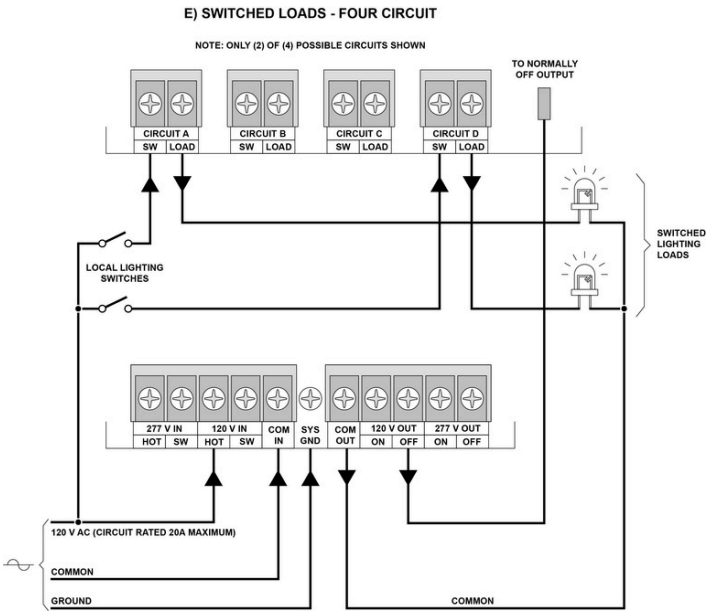
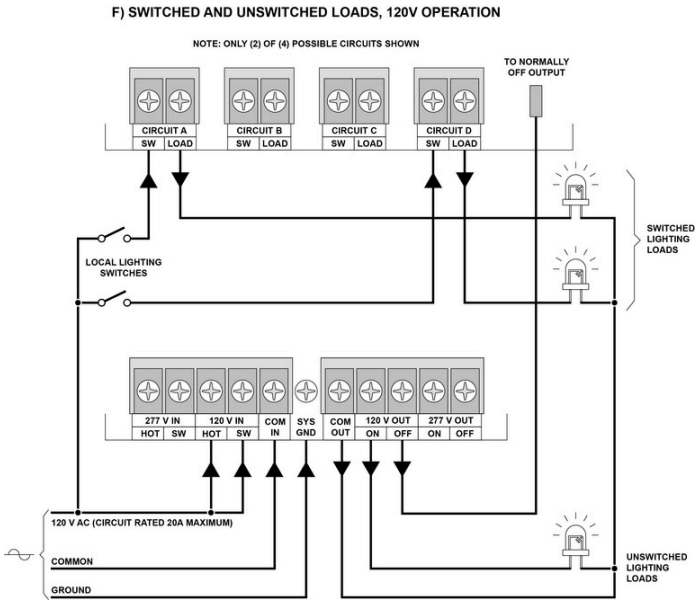
4 Circuit Output Option Wiring Diagrams

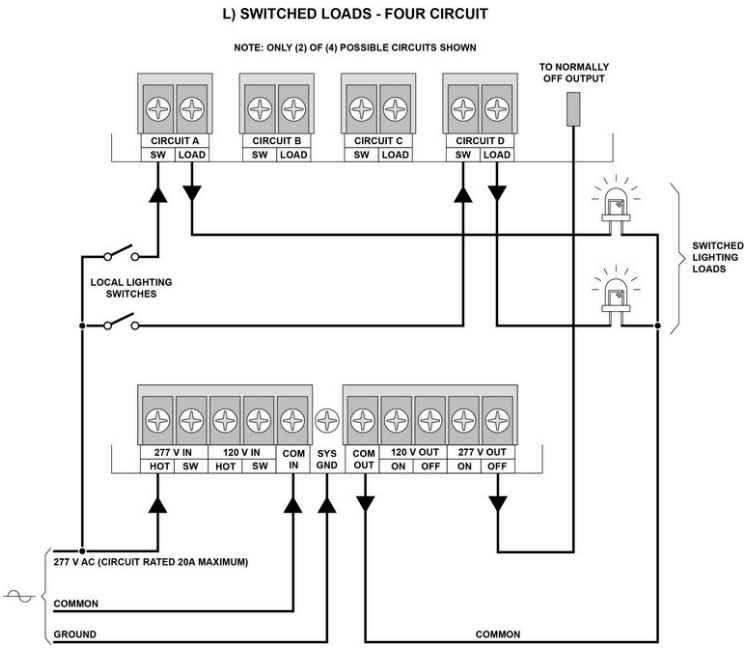
Switched Load Operation - Four Circuit
120VAC or 277VAC Connections

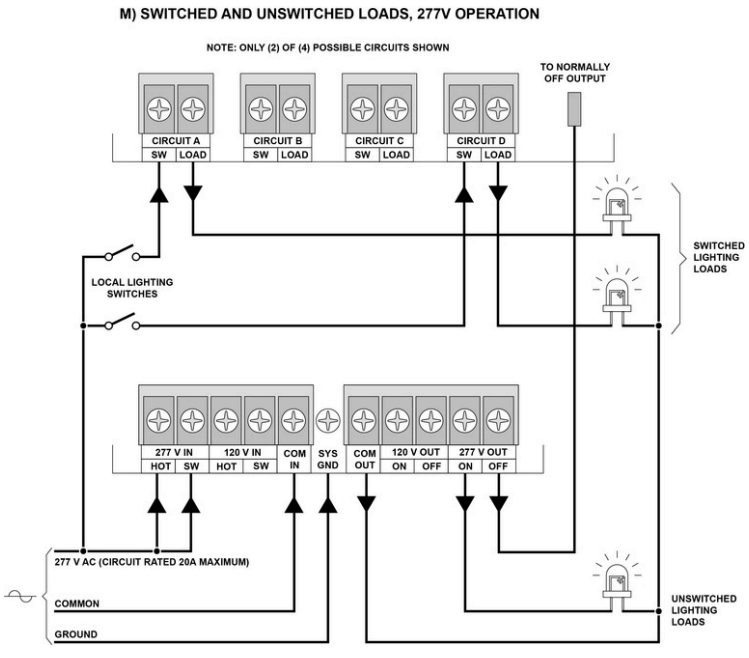
120V





220V



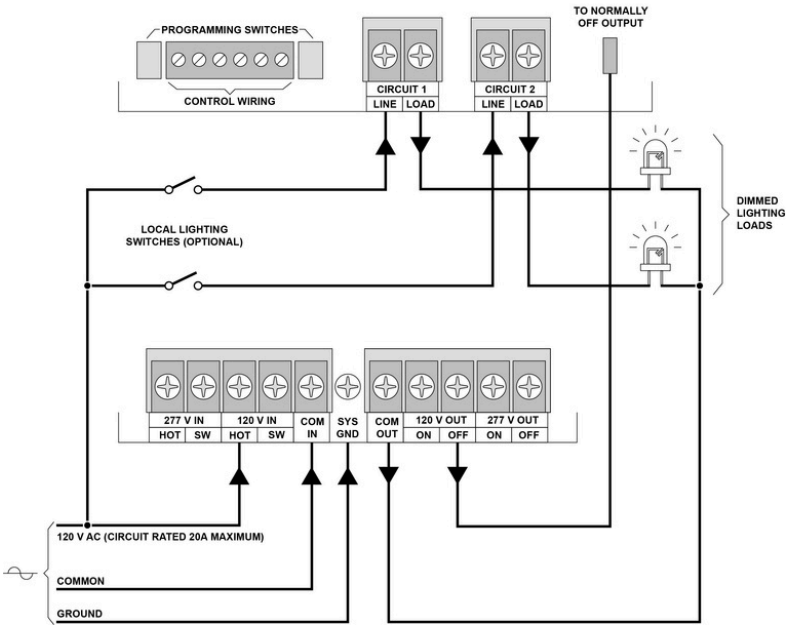


FlexDim Wiring Diagrams

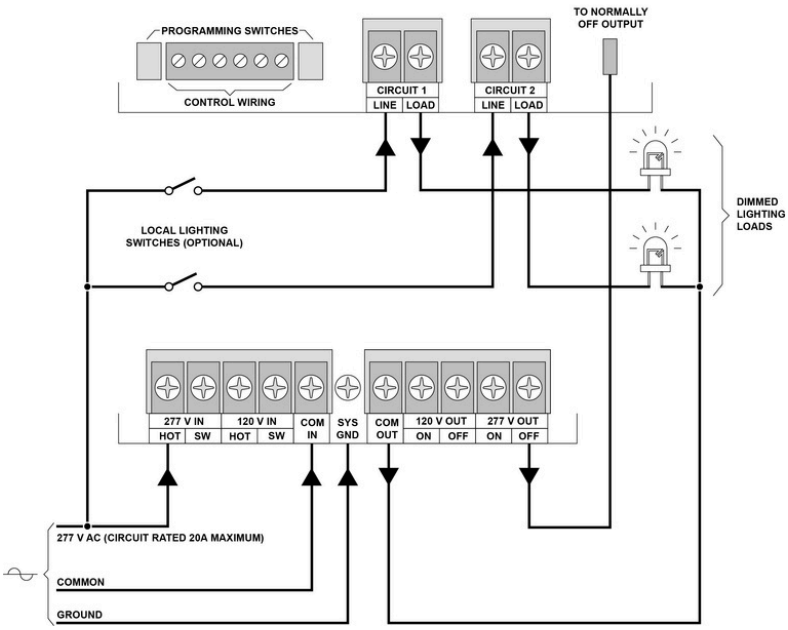
120VAC or 277VAC Connections

Diagram 3

G) DIMMING OPTIONS, 120V OPERATION



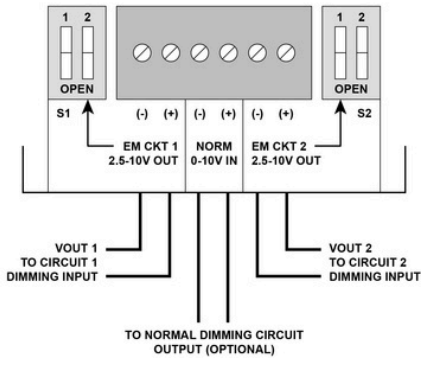
N) DIMMING OPTION, 277V OPERATION



O) DIMMING OPTION PROGRAMMING TABLE

S-1, 2-1	S-1, 2-2	VOUT1, VOUT 2
OPEN (OFF)	OPEN (OFF)	10.0V
OPEN (OFF)	CLOSED (ON)	7.50V
CLOSED (ON)	OPEN (OFF)	5.00V
CLOSED (ON)	CLOSED (ON)	2.50V

DIMMING OPTION CONTROL WIRING



NOTE: Dimming switches S1 and S2 are designed for independent setting to allow different emergency voltages for Output Circuits 1 and 2 if required.

CAUTION: Dimming switches must be programmed such that loads do not exceed unit rating in emergency mode

CAUTION: The sum of loads connected to Output Circuits 1 and 2 must not exceed unit rating in emergency mode.

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Battery Installation & Connection

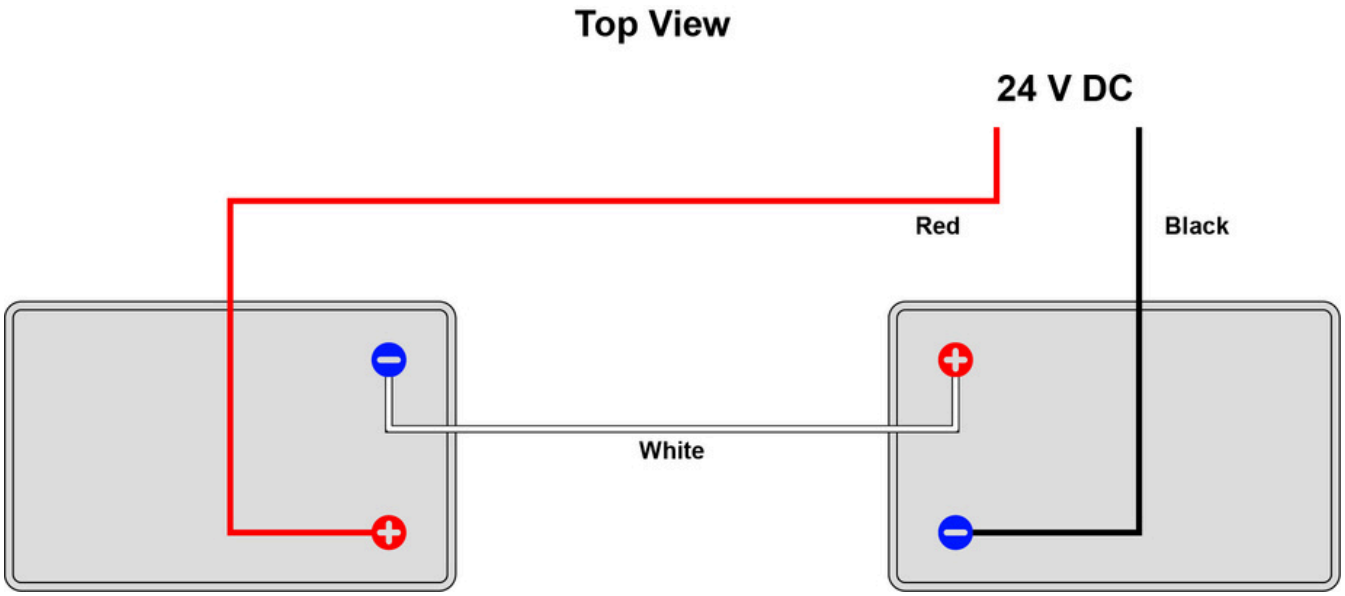
CAUTION: Prior to connection of battery string to the inverter/charger assembly make sure the Pro Battery Switch S2 is in the OFF (down) position.

*__EMPV Pro-110/125 Models__ are supplied with two (2) batteries installed (24VDC string voltage) with the positive (+) battery lead disconnected. This connection will need to be completed prior to system startup. See **Wiring Diagrams 1 and 2** for verification of proper battery connections.

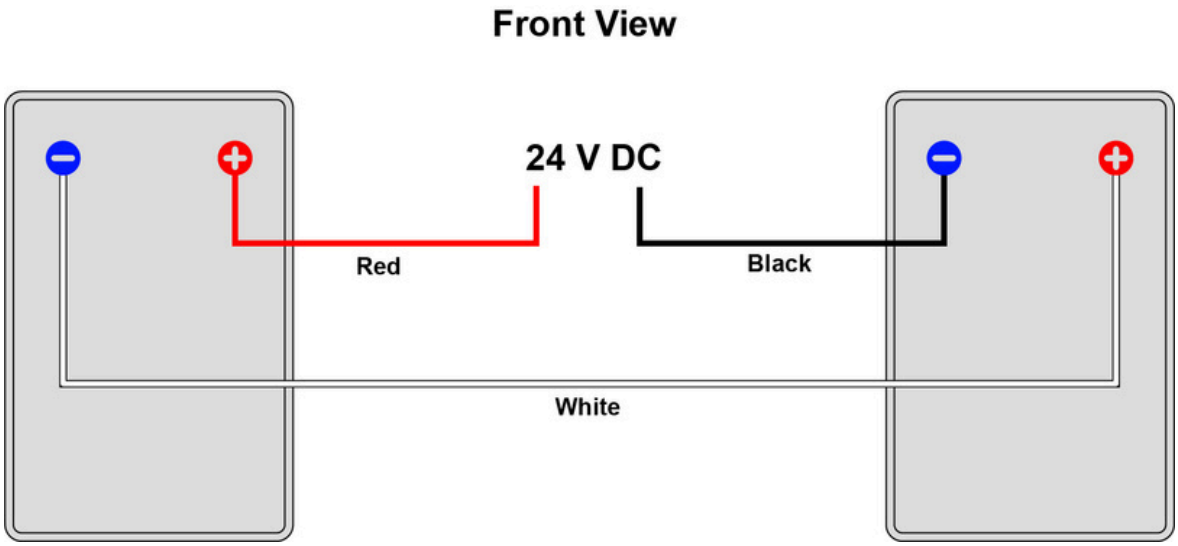
__EMPV Pro-220/250 Models__ are supplied with four (4) batteries shipped separately (48VDC string voltage). See **Wiring Diagram 3 for battery connections. Install batteries with terminals facing outwards. Connect batteries using wiring conductors supplied with the system.

System Model Number	System DC Voltage	Number of Batteries	Battery Part Number	Wiring Diagram
PRO-110/125-S	24	2	03-001	1
PRO-220/250-S	48	4	03-001	3
PRO-110/125-R	24	2	03-001	1
PRO-110/125-T	24	2	03-001	2

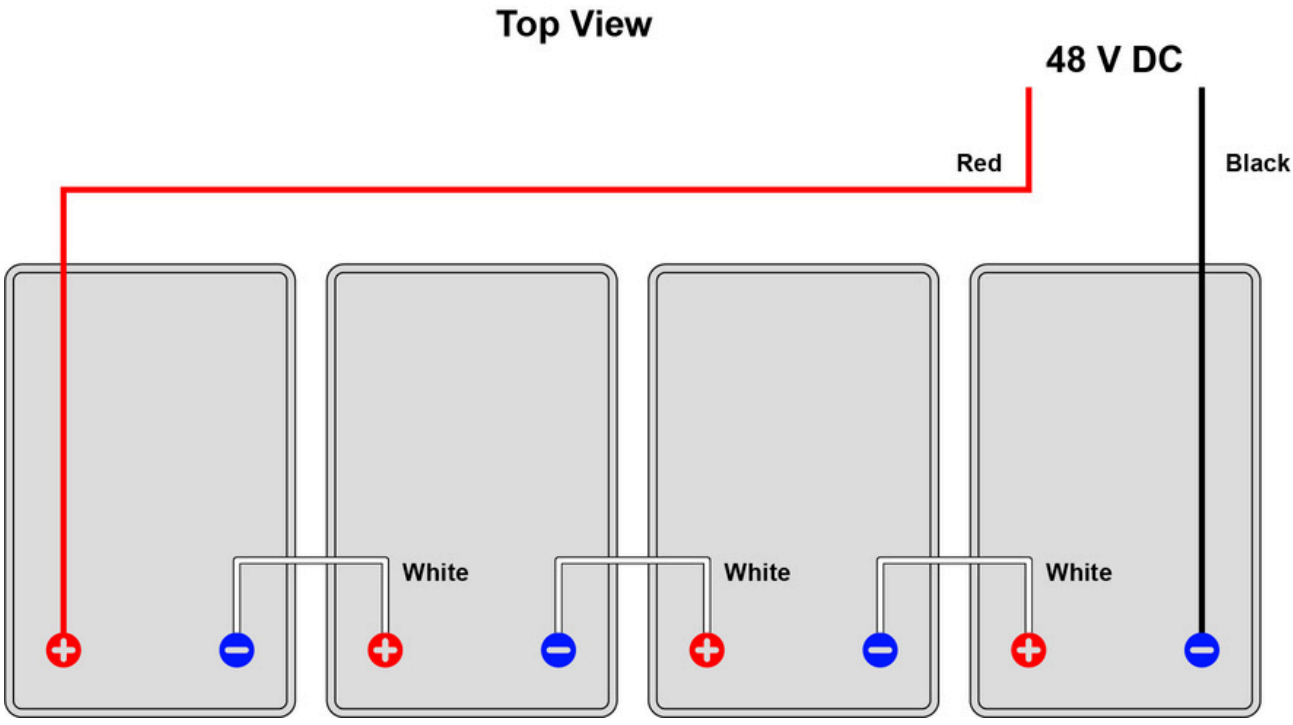
Wiring Diagram 1



Wiring Diagram 2



Wiring Diagram 3



106.3 Battery Connection Voltage Check

Using a digital volt-ohm meter, check for correct nominal battery voltage between DC Input NEG and POS wires. Refer to table in Section 106.2 for proper system DC voltage. Voltage reading should be ±10% of system DC voltage.