hotspot energy

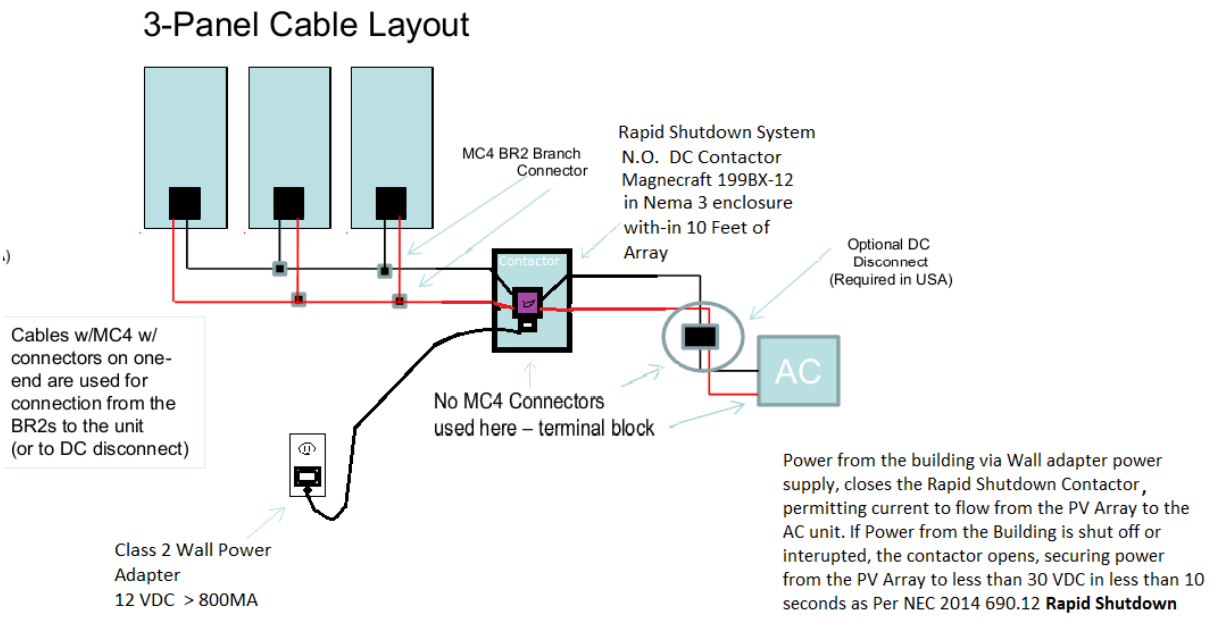
Rev 9/2/2015

ACDC12

Solar Air Conditioner

Rapid Shutdown

Per 2014 NEC 690.12



2014 NEC

690.12 Rapid Shutdown Of PV Systems On Buildings.

PV system circuits installed on or in buildings shall include a rapid shutdown function that controls specific conductors in accordance with 690.12 (1–5) as follows:

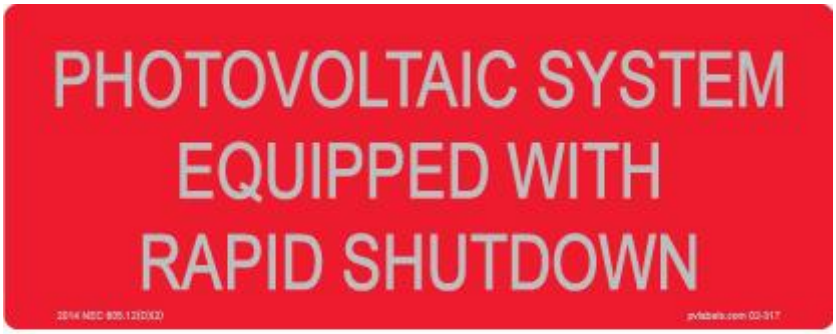
1.) Requirements for controlled conductors shall apply only to PV system conductors of more than 1.5 m (5 ft.) in length inside a building, or more than 3 m (10 ft.) from a PV array.

2.) Controlled conductors shall be limited to not more than 30 volts and 240 volt-amperes within 10 seconds of rapid shutdown initiation.

3.) Voltage and power shall be measured between any two conductors and between any conductor and ground.

4.) The rapid shutdown initiation methods shall be labeled in accordance with 690.56(C).

5.) Equipment that performs the rapid shutdown shall be listed and identified.



5 ¾" x 2 ¼"

The PV system with rapid shutdown ability shall be properly labeled according to NEC 690.56 (C).The sign/label should be right at the service entrance and match the sample above (text and color scheme)

System operation

Power from the building energizes a class 2 wall power adapter. This produces 12 vdc at a current lever sufficient to operate the coil on the Rapid Shutdown contactor. With the coil energized, the contactor closes (switches on) providing a path for current flow between the Photovoltaic Array and the Air Conditioning unit. In the event of a fire or other emergency, Emergency Responders shut down power to the building. When this occurs, power is lost to the wall power adapter and contactor coil. With the contactor opens (switches off), PV power is disconnect from the Air Conditioning unit. In order to be in compliance with NEC 2014 Art 960.12 (1) *Requirements for controlled conductors shall apply only to PV system conductors of more than 1.5 m (5 ft.) in length inside a building, or more than 3 m (10 ft.) from a PV array.* So the Rapid Shutdown unit must be no more than 10 ft from the array if installed on the roof of the building.

Once power is restored to the building, the system continues as before.

Power Relays

199 Power Relays

GENERAL SPECIFICATIONS


DPDT


SPDT


SPST-DM

Schneider Electric
www.serelays.com

PART NUMBERS		199AX, 199X, 199AMX[1], 199MX[1], 199ABX[2], 199BX[2]	199ADX, 199DX, 199ADYX, 199DYX, 199ADBX[2], 199DBX[2]	199P[3,4], 199AP[3,4]	199ADE, 199DE, 199ADBE[2], 199DBE[2]
CONTACT CHARACTERISTICS					
Number and type of contacts		SPST, SPDT, DPST, DPDT	SPST-DM, SPST-DB	DPDT, SPDT	SPST-DM
Contact material		AgSnO			
Thermal (carrying) current rating		40 A		50 A	
Maximum switching voltage		600 V(rms)			
Rated Switching current at voltage	Resistive	40 A at 300 VAC; 5 A at 480 VAC; 5 A at 600 VAC; 40 A at 28 VDC	40 A at 300 VAC; 12 A at 480 VAC; 10 A at 600 VAC; 40 A at 28 VDC	50 A at 300 VAC; 5 A at 480 VAC; 5 A at 600 VAC; 50 A at 28 VDC	50 A at 300 VAC; 12 A at 480 VAC; 10 A at 600 VAC; 50 A at 28 VDC
	Motor	2 HP at 120 to 600 VAC			
	Tungsten	15 A at 120 VAC			
	Pilot duty	A600			
Minimum switching requirement		1 A at 5 VAC/VDC			
COIL CHARACTERISTICS					
Voltage range		6 to 600 VAC; 6 to 250 VDC			
Operating range (% of Nominal)		85% to 110% (AC); 80% to 110% (DC)[5]			
Average power consumption (Maximum)		10 VA; 4 W			
Drop-out voltage threshold		10% (AC/DC)			
PERFORMANCE CHARACTERISTICS					
Electrical life (IEC 60947-1)	Rated resistive load	Please refer to Table 3			
Operating time (response time)		30 ms			
Dielectric strength	Between coil and contact	2200 V	2200 V	2200 V	2200 V
	Between poles	2200 V	N/A	2200 V	N/A
	Between open contacts	1600 V	2200 V	1600 V	2200 V
ENVIRONMENT					
Product certifications		UL, CSA, CE, RoHS			
Ambient temperature range (around the device)		-55 to +100 °C (Storage)			
		-55 to +55 °C (Operation)			
Termination[3]		10 (5.3) AWG (mm²)			
Terminal tightening torque		11 to 15 in-lb (1.2 to 1.7 Nm)			
Weight		227 to 312 g (8 to 11 oz)			

[1] For auxiliary switch ratings, please refer to Table 1.
[2] For ratings with blowout magnet, please refer to Table 2.
[3] For UL listed installations, proper wire rating and terminations required.
[4] Recommended ring, fork, or box wire termination.
[5] Recommended mounting positions: horizontal or vertical (not upside down).

Power Relays

Schneider Electric
www.serelays.com

Table 1: Auxiliary Switch Ratings

AUXILIARY SWITCH RATINGS	
Resistive Load 120/250 VAC (50/60 Hz)	10 A
Motor Load 125/250 VAC (50/60 Hz)	0.25 HP
Tungsten Load 125 VAC (50/60 Hz)	3 A

Table 2: Additional DC Ratings with Blowout Magnets

RELAY VOLTAGE	RATING W/BLOWOUT MAGNET
110 VDC	20 A
220 VDC	8 A
325 VDC	4 A
500 VDC	2 A

Table 3: Contact Ratings & Electrical Endurance (per IEC 60947-1, 60947-4-1)

CURRENT/HORSEPOWER RATINGS	LOAD VOLTAGE	FREQUENCY	LOAD TYPE	ESTIMATED ELECTRICAL ENDURANCE	SEE NOTE(S)
AC LOAD					
50 A	300 V	50/60 Hz	Resistive	25,000 cycles	1, 4
40 A				50,000 cycles	2, 4
2 HP	120 to 600 V		Motor	50,000 cycles	3, 4
15 A	120 V		Tungsten	20,000 cycles	4, 5
A600	---	---	Pilot Duty	100,000 cycles	4
DC LOAD					
40 A	28 V	DC	Resistive	100,000 cycles	4
20 A	110 V				
8 A	220 V				
4 A	325 V				
2 A	500 V				

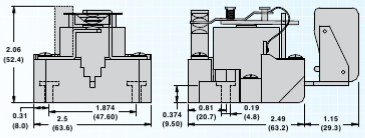
Notes:

1. *50 A rating refer to models with pressure wire connectors only.*
2. *Resistive AC load ratings are based on a power factor of 0.85 to 1.0.*
3. *Motor horsepower ratings are based on a power factor of 0.4 to 0.5, and an initial inrush current not in excess of six times the full load current.*
4. *All ratings are based on applying the rated nominal power to the relay coil in such a manner as to provide a "clean" make and break, and does not result in any contact chatter or multiple actuation of the contacts.*
5. *The tungsten rating is based on cold filament inrush current not exceeding 15 times the rated steady state lamp current.*

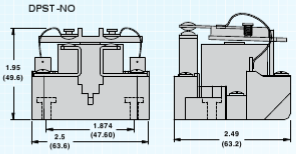
RELAY DIMENSIONS

shown in inches (millimeters)

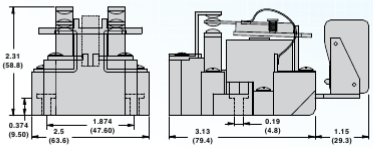
SPDT – Short base w/Auxiliary Switch



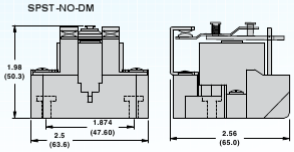
DPST-NO



DPDT – Long base w/Auxiliary Switch



SPST-NO-DM



RELAY WIRING DIAGRAMS