



**AC Solar disconnecting means will be adjacent to the utility meter**

**We Do not place any CT's or Taps inside of the meter base.**

MODULES														
REF.	QTY.	MAKE AND MODEL	P <sub>MAX</sub>	PTC	ISC	IMP	VOC	VMP	TEMP. COEFF. OF VOC	FUSE RATING				
PM1-20	20	CANADIAN SOLAR CS1U-410MS	410W	383W	9.70A	9.23A	53.6V	44.5V	-0.155V/°C (-0.29%/°C)	20A				
INVERTERS														
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	WEIGHTED EFFICIENCY					
I1	1	SOLAR EDGE SE7600H-US [240V]	240V	NOT SOLIDLY GROUNDED	7,600w	25.0A	16.5A	480V	99.0%					
OPTIMIZERS														
REF.	QTY.	MODEL	RATED INPUT POWER	MAX OUTPUT CURRENT	MAX INPUT ISC	MAX DC VOLTAGE	WEIGHTED EFFICIENCY							
PO1-20	20	SOLAR EDGE P505	505W	15A	11.0A	83V	98.8%							
DISCONNECTS														
REF.	QTY.	MAKE AND MODEL	RATED CURRENT	MAX RATED VOLTAGE										
SW1	1	SQUARE D D223NRB OR EQUIV.	100A	240VAC										
OCPDS														
REF.	QTY.	RATED CURRENT	MAX VOLTAGE											
F1-2	2	35A	0VAC											
SYSTEM SUMMARY														
	STRING 1	STRING 2												
DC SOURCE CIRCUIT CURRENT	15A	15A												
NUMBER OF OPTIMIZERS	7	7												
NOMINAL STRING VOLTAGE	380V	380V												
ARRAY OPERATING CURRENT	7.6A	7.6A												
ARRAY STC POWER	5,740W													
ARRAY PTC POWER	5,361W													
MAX AC CURRENT	25A													
MAX AC POWER OUTPUT	6,000W													
DERATED AC POWER OUTPUT	5,243W													
CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS														
ID	TYPICAL	CONDUCTOR	CONDUIT / CABLE	CURRENT-CARRYING CONDUCTORS IN CONDUIT / CABLE	OCPD	EGC	TEMP. CORR. FACTOR	FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	AMP. @ TERM. TEMP. RATING
1	2	10 AWG PV WIRE, COPPER	FREE AIR	N/A	N/A	6 AWG BARE, COPPER	0.76 (55°C)	1.0	15A	18.75A	55A	41.8A	75°C	50A
2	1	10 AWG THWN-2, COPPER	0.75" DIA. EMT	4	N/A	10 AWG THWN-2, COPPER	0.96 (33°C)	0.8	15A	18.75A	40A	30.72A	90°C	40A
3	1	6 AWG THWN-2, COPPER	0.75" DIA. EMT	2	35A	10 AWG THWN-2, COPPER	0.96 (33°C)	1.0	25A	31.25A	55A	52.8A	75°C	50A
4	1	6 AWG THWN-2, COPPER	0.75" DIA. EMT	2	35A	10 AWG THWN-2, COPPER	0.96 (33°C)	1.0	25A	31.25A	75A	72A	75°C	65A

**PV Notes**

- 1) SOLAR EDGE SYSTEM MEETS REQUIREMENTS FOR PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS), AS PER NEC 690.12(B).
- 2) MATING CONNECTORS SHALL COMPLY WITH NEC 690.33.
- 3) THE SPECIFIED OPTIMIZER CAN BE SUBSTITUTED WITH A P505, P401, OR P485. THESE OPTIMIZERS HAVE AN INPUT VOLTAGE WINDOW WIDE ENOUGH TO ACCOMMODATE THE OUTPUT VOLTAGE RANGE OF THE MODULE AT THE DESIGN TEMPERATURES, HAVE A MAX INPUT CURRENT RATING THAT IS ABOVE THE MAX OUTPUT CURRENT OF THE MODULE, AND A MAX POWER INPUT THAT IS ABOVE THE RATED POWER OUTPUT OF THE MODULE.
- 4) DC PV CONDUCTORS ARE NOT SOLIDLY GROUNDED. NO DC PV CONDUCTOR SHALL BE WHITE- OR GRAY-COLORED.
- 5) ALL METAL ENCLOSURES, RACEWAYS, CABLES AND EXPOSED NONCURRENT-CARRYING METAL PARTS OF EQUIPMENT SHALL BE GROUNDED TO EARTH AS REQUIRED BY NEC 250.4(A) AND PART III OF ARTICLE 250 AND EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45. THE GROUNDING ELECTRODE SYSTEM SHALL ADHERE TO NEC 690.47(A) AND NEC 250.169. THE DC GROUNDING ELECTRODE SHALL BE SIZED ACCORDING TO NEC 250.166 AND INSTALLED IN COMPLIANCE WITH NEC 250.64.
- 6) MAX DC VOLTAGE OF ARRAY FIXED BY THE INVERTER AT 350V REGARDLESS OF TEMPERATURE. THE MAX DC VOLTAGE OF THE MODULE AT 0° C IS 51.2V (0°C - 25°C) X -0.143V/C + 47.6V = 51.2V).
- 7) POINT-OF-CONNECTION IS ON THE SUPPLY SIDE OF SERVICE DISCONNECT, AT METER BASE TERMINALS THAT ARE SUITABLE FOR DOUBLE LUGGING OR USING ANOTHER LOCALLY APPROVED METHOD, IN COMPLIANCE WITH NEC 705.12(A).
- 8) PV SYSTEM DISCONNECT SHALL BE A VISIBLE KNIFE-BLADE TYPE DISCONNECT THAT IS ACCESSIBLE AND LOCKABLE BY THE UTILITY. THE DISCONNECT SHALL BE LOCATED WITHIN 10 FT OF UTILITY METER. DISCONNECT SHALL BE GROUNDED IN ACCORDANCE WITH NEC 230.72. GROUNDED CONDUCTOR SHALL BONDED INSIDE DISCONNECT PER NEC 250.24(B) AND NEC 250.24(C)

**GENERAL ELECTRICAL NOTES**

- 1 UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
- 2 CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).
- 3 CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).

**GROUNDING NOTES**

- 1 ALL EQUIPMENT SHALL BE PROPERLY GROUNDED PER THE REQUIREMENTS OF NEC ARTICLES 250 & 690
- 2 PV MODULES SHALL BE GROUNDED TO MOUNTING RAILS USING MODULE LUGS OR RACKING INTEGRATED GROUNDING CLAMPS AS ALLOWED BY LOCAL JURISDICTION. ALL OTHER EXPOSED METAL PARTS SHALL BE GROUNDED USING UL-LISTED LAY-IN LUGS.
- 3 INSTALLER SHALL CONFIRM THAT MOUNTING SYSTEM HAS BEEN EVALUATED FOR COMPLIANCE WITH UL 2703 "GROUNDING AND BONDING" WHEN USED WITH PROPOSED PV MODULE.
- 4 IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE A VERIFIABLE GROUNDING ELECTRODE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
- 5 AC SYSTEM GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE A MINIMUM SIZE #8AWG WHEN INSULATED, #6AWG IF BARE WIRE.
- 6 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC ARTICLE 690.45, AND BE A MINIMUM OF #10AWG WHEN NOT EXPOSED TO DAMAGE, AND #6AWG SHALL BE USED WHEN EXPOSED TO DAMAGE
- 7 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN, OR MARKED GREEN IF #4AWG OR LARGER

1 SINGLE-LINE DIAGRAM  
PV-3 SCALE: NTS



**GRID-TIED SOLAR POWER SYSTEM**

**8.30 SE  
CANADIAN SOLAR  
415**

**SINGLE-LINE DIAGRAM**

PROJECT ID: 164609  
DATE: 11/30/21  
CREATED BY: W.K.  
CHECKED BY:

**REVISIONS**


**PV-3**

DC RACEWAYS  
2

SW1 - DISCONNECT  
(SQUARE D D223NRB)  
3 5 6

I1 - INVERTER  
(SOLAR EDGE SE7600H-US000BXX4)  
3 4

MSP - MAIN SERVICE PANEL  
(HOMELINE)  
1 7

1 SEE NOTE NO. 4 (MSP)

**PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN SWITCH TO THE 'OFF' POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY.

NEC690.56(C)(1) AND IFC1204.5.1,1204.5.1

6 AC DISCONNECT (SW1)

MAXIMUM AC OPERATING CURRENT: 25.0A  
MAXIMUM AC OPERATING VOLTAGE: 240V

NEC690.54

2 SEE NOTE NO. 5 (DC RACEWAYS)

**WARNING PHOTOVOLTAIC POWER SOURCE**

NEC690.31(G)(3)

4 DC DISCONNECT (I1)

DIRECT-CURRENT PV POWER SOURCE  
MAXIMUM VOLTAGE: 380V  
MAX CIRCUIT-CURRENT: 37.5A  
DC-TO-DC CONVERTER RATED CURRENT: 15.0A

NEC690.53

7 ANY AC ELECTRICAL PANEL THAT IS FED BY BOTH THE UTILITY AND THE PHOTOVOLTAIC SYSTEM (MSP)

**! WARNING !**  
DUAL POWER SOURCE. SECOND SOURCE IS PHOTOVOLTAIC SYSTEM.

NEC705.12(B)(3)

3 EACH DISCONNECTING MEANS FOR PHOTOVOLTAIC EQUIPMENT (SW1, I1)

**! WARNING !**  
ELECTRIC SHOCK HAZARD. TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

NEC690.13(B)

5 AC SOLAR DISCONNECT (SW1)

**PV SYSTEM DISCONNECT**

NEC690.13(B)

LABELING NOTES	
1	ALL PLAQUES AND SIGNAGE REQUIRED BY 2017 NEC AND 2018 IFC WILL BE INSTALLED AS REQUIRED.
2	LABELS, WARNING(S) AND MARKING SHALL COMPLY WITH ANSI Z535.4, WHICH REQUIRES THAT DANGER, WARNING, AND CAUTION SIGNS USED THE STANDARD HEADER COLORS, HEADER TEXT, AND SAFETY ALERT SYMBOL ON EACH LABEL. THE ANSI STANDARD REQUIRES A HEADING THAT IS AT LEAST 50% TALLER THAN THE BODY TEXT, IN ACCORDANCE WITH NEC 110.21(B).
3	A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION IN ACCORDANCE WITH NEC 690.56(B).
4	LABEL(S) WITH MARKING, "TURN RAPID SHUTDOWN SWITCH TO THE 'OFF' POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY," SHALL BE LOCATED WITHIN 3 FT OF SERVICE DISCONNECTING MEANS. THE TITLE SHALL UTILIZE CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8" IN BLACK ON A YELLOW BACKGROUND, AND REMAINING TEXT SHALL BE CAPITALIZED WITH A MINIMUM HEIGHT OF 3/16" IN BLACK ON WHITE BACKGROUND
5	LABEL(S) WITH MARKING, "WARNING PHOTOVOLTAIC POWER SOURCE," SHALL BE LOCATED AT EVERY 10 FEET OF EACH DC RACEWAY AND WITHIN ONE FOOT OF EVERY TURN OR BEND AND WITHIN ONE FOOT ABOVE AND BELOW ALL PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS AND BARRIERS. THE LABEL SHALL HAVE 3/8" TALL LETTERS AND BE REFLECTIVE WITH WHITE TEXT ON A RED BACKGROUND



GRID-TIED SOLAR POWER SYSTEM

**SAFETY LABELS**

DOC ID: 164609-202812-1  
DATE: 11/30/21  
CREATOR: W.K.  
REVIEWER:

**REVISIONS**


**PV-4**