NEC2008

RESIDENTIAL GRID STRING INVERTER W/O BATTERIES SOLAR ELECTRIC INSPECTION CHECKLIST

Contact Name _____ **Address** _____ **Contact #** _____

Code sections that are often considered in installation

Workmanship	**110.12**	**Unused Openings**	**110.2(A)**
Working Spaces-Depth	**110.23(1), T110.26(A)(1)**		
Working Spaces-Width	**110.26(2)**		
Working Spaces-Height	**110.26(3)**		

DC

A. Array

		Code Section NEC 2008		
1	*Structural*			
	Ground			
	Attachment			
	Roof			
	Attachment			
	Flashing			
2	*Grounding of Array and Metal Parts "Likely to be Energized"*			
	Module	690.43		
	Rack	250.134	250.136(A)	
	Likely to be energized, including metal roof	250.110		
3	*PV -DC Equipment Grounding Conductor Sizing*			
	EGC sized for physical environment	690.45(A) not smaller than #14		690.46, 250.120(C)
	EGC sized for overcurrent protection ahead	250.122		
4	*PV - DC Conductor Marking*			
	Identification and Grouping			
	Color coding	310.12 [by inference, ungrounded any other color]		690.4(B)
5	*PV -DC Source and Output Circuit Volt/Amp Design Values*			
	Maximum Design Current Calculations	690.8(A)(1), (2)(3)(4)		
	Maximum Design Voltage Calculations/Listings	690.7(A)		
	Common-Return Conductor Sizing	690.8(C)		
6	*PV -DC Conductor protection -PHYSICAL*	110.27		
	Conductors protected	690.31(E)		
	Conductors supported	Conductor specific 3XX		
7	*PV -DC Conduit protection -PHYSICAL*			
	Conduit Secured	Conduit specific 3XX	352.30 PVC	
	Conduit Expansion Considered	Conduit specific 3XX	352.40 PVC	
	Physical Impact			
8	*PV - DC Conductor and Conduit protection -ELECTRICAL*			
	PV Source&Output Circuits not with other conductors unless separated by a partition	690.4(B)		
	Conductor Ampacity Calculation - Greater Of:	690.8(A)(1)(2)	310.15(B)	310.16
	DC overcurrent protection listing	690.9(D)		
	DC overcurrent protection Sizing	690.9(A)		
	EGC required to run with dc source conductors	690.43		
	EGC sized for overcurrent protection	690.45(B) w/o GFP	690.45(A)	250.122
	Conduit properly grounded			
9	*PV -DC Disconnection Requirements*			
	Required	690.13		
	Location	690.14(C)(1)		
	Grouping with other disconnection means	690.14(C)(5)		
	Type	690.14(C)(3)		

		Code Section NEC 2008			
10	*PV - DC Conduit Signage/Marking*				
	Conduit				
	Material				
	Conductors				
	Identification and Grouping	310.12	690.4(B)		
	Disconnection Means	690.14(C)(2)			
11	*PV - DC Electrode Grounding System*				
	Grounding Electrode Conductor Sizing	690.47(B)	690.47(C)	250.166 for grounded	250.169 for ungrounded
	Grounding Electrode Installation/Configuration	690.47(C)91)-(8)	690.47(D)	250.52	
	Grounding Electrode Conductor-Ungrounded Systems				
12	*Ground Fault Requirements*				
	Grounded Systems	690.5			
	Requirement				
	Ungrounded Systems	690.35			
	Requirement				
13	*Arc Fault Requirements*				
	Arc fault detection, interruption,	210.12			
	and annunciation required over 80Vdc				
14	*Other*				

B. Inverter

AC

1	*Physical Installation*				
	Structural				
	Accessibility				
	Clearances				
2	*Inverter Input Circuit Amperage Design Values*				
	Grid Interconnected, Non Battery	Maximum PV Output Circuit			
3	*Inverter Input Circuit Voltage Design Values*				
	Grid Interconnected, Non Battery	Maximum PV Output Circuit			
4	*Inverter Maximum Output Circuit Amperage Design Values*				
	Grid Interconnected Non Battery	690.8(A)(3)			
5	*Inverter Maximum Output Voltage*				
	AC Maximum Output Voltage is from Manufacturer's Specification				
6	*AC Disconnecting Requirements*				
	Required	690.15			
	Inverters Not Readily Accessible	690.14(D)			
	Multiple Inverters	690.4(D)			
	Signage	690.54			
7	*AC Grounding Electrode System and Conductor*				
	AC Grounding Electrode Conductor	690.47(A); 250.50-250.60			
	Continuous	250.64(C) (1)(2)			
8	*AC Conductor Signage/Marking*				
	Conductors Idenfication and Grouping	690.4(B)			
9	*Other*				

		Code Section NEC 2008		
C. Utility Interconnection				
1	*Load Side*			
a	*Main Panel or SubPanel or Inverter "Combiner" Panel*			
	Required busbar rating	690.64(B)(1)(2)		
	Sum of Supply Breakers<=100% Busbar Rating		705.12(D)(7)	
	100% Busbar Rating<Sum of Supply Breakers<=120% Busbar Rating		690.64(B)(7)	
	Sum of All Load and Supply Breakers <= 100% of Busbar Rating excluding main breaker		*[inverter Combiner Panel may not be allowed by AHJ]*	
	Breaker suitable for backfeeding	690.64(B)(5)		
	Secured breaker for battery backed up panel	690.64(B)(6)		
b	*Feeder* Inverter between Main and Subpanel w/o breaker			
c	*Tap* Inverter between Main and Subpanel w breaker			
2	*Line Side or Supply Side*			
	Allowed	690.64(A)	230.82(6)	705.12(A)
	Rating of Disconnect Switch	230.79(D)		
	Overcurrent Protection	690.8(A)(3)	690.8(B)(1)	690.9
	Minimum Conductor Sizing	230.42(B)	690.8(A)(3)	
3	*Other*			
E. NEC Required Signage Summary				
AC *1*	*PV System Directory*	690.56	705.10	
a	Utility Interconnected Systems	690.56(B)		
b	Rapid Shut Down Required Systems	NA		
2	*DC Disconnect Switch Identification*	690.14(C)(2)		
DC *3*	*DC System Characteristics*	690.53		
4	*DC Conduit and Enclosures*	NA		
5	*DC Disconnect Switch WARNING LABEL when all terminals may be energized*	NA	690.17(4)	
6	*DC Disconnnect Switch WARNING LABEL for Ungrounded Systems*	690.35(F)		
7	*Supply or Line Side Utility Interconnection*			
AC a	AC Disconnect Switch Identification	690.54		
b	AC System Charactreristics	690.54		
c	AC Disconnect Switch WARNING LABEL when all terminals may be energized	690.17		
8	*Load Side Utility Interconnection*		690.64(B)(1) - (7)	
9	*Interconnected w breaker into subpanel or mainpanel*			
a	Sum of Supply Breakers<=100% Busbar Rating	690.54	705.12(D)(7)	
b	100% Busbar Rating<Sum of Supply Breakers<=120% Busbar Rating	690.54	690.64(B)(7)	705.12(D)(7)
c	Sum of All Load and Supply Breakers Excluding Main Breaker <= 100% of Busbar Rating	Not Recognized		
10	*Other*			

Recommended Action Items

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NEC2008

RESIDENTIAL GRID STRING INVERTER W/ BATTERIES SOLAR ELECTRIC INSPECTION CHECKLIST

Contact Name _____ **Address** _____ **Contact #** _____

Code sections that are often considered in installation

Workmanship	**110.12**	**Unused Openings**	**110.12(A)**
Working Spaces-Depth	**110.23(1), T110.26(A)(1)**		
Working Spaces-Width	**110.26(2)**		
Working Spaces-Height	**110.26(3)**		

A. Array

	Code Section 2008			
1 Structural				
Ground				
Attachment				
Roof				
Attachment				
Flashing				
2 Grounding of Array and Metal Parts "Likely to be Energized"				
Module	690.43			
Rack	250.134	250.136(A)		
Likely to be energized, including metal roof	250.110			
3 PV - DC Equipment Grounding Conductor Sizing				
EGC sized for physical environment	690.45(A) [not smaller than #14]	690.46, 250.120(C) [if smaller than #6]		
EGC sized for overcurrent protection ahead	250.122			
4 PV - DC Conductor Marking				
Identification and Grouping	690.4(B)			
Color Coding	310.12	by inference, ungrounded any other color		
5 PV - DC Source and Output Circuit Volt/Amp Design Values				
Maximum Design Current Calculations	690.8 (A)(1)(2)			
Maximum Design Voltage Calculations/Listings	690.7(A)			
Common-Return Conductor Sizing	690.8(C)			
6 PV - DC Conductor protection -PHYSICAL	110.27			
Conductors protected	690.31(E)			
Conductors supported	Conductor Specific 3XX			
7 PV - DC Conduit protection -PHYSICAL				
Conduit Secured	Conduit Specific 3XX	352.30	PVC	
Conduit Expansion Considered	Conduit Specific 3XX	352.44	PVC	
Physical Impact				
8 PV - DC Conductor and Conduit protection -ELECTRICAL				
PV Source&Output Circuits not with other conductors unless separated by a partition	690.4(B)			
Conductor Ampacity Calculation - Greater Of:	690.8(A)(1)(2)	310.15(B)		Applications of Conditions of Use
DC overcurrent protection listing	690.9(D)			Table 310.15(B)(3)(a) > 3 Current Carrying Conductors
DC overcurrent protection Sizing	690.9(A)	690.8(A)		Tables T310.15(B)(2)(a); T310.15(B)(3)(c)
EGC required to run with dc source conductors	690.43			Temperature Adjustment Including Proximity to Roof
EGC sized for overcurrent protection	690.45 w/o GFP	250.122 w/ GFP		
Conduit properly grounded	Conduit Specific 3XX			
9 PV - DC Disconnection Requirements				
Required	690.13			
Location	690.14(C)(1)			
Signage/Marking	690.14(C)(2)	Identification	690.53	System Characteristics
Grouping with other disconnection means	690.14(C)(5)			
Type	690.14(C)(3)			

		Code Section 2008	
10	*PV - DC Conduit Signage/Marking*		
	Conduit		
	Material		
	Conductors		
	Identification and Grouping	310.12	690.4(B)
	Disconnection Means	690.13	690.14(C)(2)
11	*PV-DC Electrode Grounding System*		
	Grounding Electrode Conductor Sizing	690.47(B)(C)(1)(3)	250.166 for grounded, 250.169 for ungrounded
	Grounding Electrode Installation/Configuration	690.47(C)(2)	690.47(D)
	Grounding Electrode Conductor-Ungrounded Systems		
12	*Ground Fault Requirements*		
	Grounding Systems	690.5	
	Requirement	690.5(A)(B)	
	Ungrounded Systems		
	Requirement	690.35(C)	
13	*Arc Fault Requirements*		
	Arc fault detection, interruption	250.12	
	and annunciation required over 80Vdc		
14	*Other*		

Code Section 2008

B. Inverter

AC

1 *Physical Installation*		
Structural		
Accessibility		
Clearances		
2 *Inverter Input Circuit Amperage Design Values*		
Stand Alone, Battery	Maximum PV Output Circuit	
3 *Inverter Input Circuit Voltage Design Values*		
Stand Alone, Battery	Maximum PV Output Circuit	
4 *Inverter Maximum Output Circuit Amperage Design Values*		
Grid Interconnected	690.8(A)(3)	
Stand Alone, Battery	690.8(A)(4)	
Stand Alone, Maximum Load	690.10 (A)	
Stand Alone, Inverter Feeder Conductor Sizing	690.10 (B)	
5 *Inverter Maximum Output Voltage*		
AC Maximum Output Voltage is from Manufacturer's Specification		
6 *AC Disconnecting Requirements*		
Required		690.15
Inverters not Readily Accessible	690.14(D)(1)(2)(3)(4)	
Multiple Inverters	690.4(D)	
Sinage		690.54
7 *AC Grounding Electrode System and Conductor*		
AC Grounding Electrode Conductor	690.47(A);250.50-250.60	
Continuous	250.64(C)	
8 *AC Conductor Signage/Marking*		
Conductors Idenfication and Grouping	690.4(B)	
9 *Other*		

C. Utility Interconnection

	Code Section 2008		
1 Load Side			
a Main Panel or SubPanel or Inverter "Combiner" Panel			
Required busbar rating	690.64(B)(1)(2) Inverter Panel may not be allowed by AHJ		
1 Sum of Supply Breakers<=100% Busbar Rating			
2 100% Busbar Rating<Sum of Supply Breakers<=120% Busbar Rating			
3 Sum of All Load and Supply Breakers <= 100% of Busbar Rating excluding main breaker			
Breaker suitable for backfeeding	690.64(B)(5)	705.12(D)(4)	
Secured breaker for battery backed up panel	690.64(B)(6)	705.12(D)(5)	
b Feeder Inverter between Main and Subpanel w/o breaker			
c Tap Inverter between Main and Subpanel w breaker			
2 Line Side or Supply Side			
Allowed	690.64(A)	705.12(A)	230.82(6)
Rating of Disconnect Switch	230.79(D)		690.8(B)(1)
Overcurrent Protection	690.8(A)(3)		
Minimum Conductor Sizing	230.42(B)		690.8(A)(3)
3 Other			

			Code Section 2008		
	D. Batteries				
	1	*Installation*	690.71		
	2	*Dwellings, Guarding of Live Parts*	690.71(B)(2)		
	3	*Current Limiting Device*	690.71(C)		
	4	*Signage*	690.55		
	5	*Other*			
AC	**E. NEC Required Signage Summary**				
	1	*PV System Directory*	690.56	705.10	
	a	Stand Alone Systems	690.56(A)		
	b	Utility Interconnected Systems	690.56(B)		
	c	Rapid Shut Down Required Systems	NA		
DC	2	*DC Disconnect Switch Identification*	690.14(C)(2)		
	3	*DC System Characteristics*	690.53		
	4	*DC Conduit and Enclosures*	NA		
	5	*DC Disconnect Switch WARNING LABEL when all terminals may be energized*	690.17		
	6	*DC Disconnnect Switch WARNING LABEL for Ungrounded Systems*	690.35(F)		
AC	7	*Supply or Line Side Utility Interconnection*			
		AC Disconnect Switch Identification	690.64(B)(2)		
		AC System Charactreristics	690.64(B)(2)		
		AC Disconnect Switch WARNING LABEL when all terminals may be energized	690.6	690.15	690.17
	8	*Load Side Utility Interconnection*	690.64(B)(1)-(7)		
	9	*Interconnected w breaker into subpanel or mainpanel*			
	a	Sum of Supply Breakers<=100% Busbar Rating			
	b	100% Busbar Rating<Sum of Supply Breakers<=120% Busbar Rating	690.64(B)(7)		
	c	Sum of All Load and Supply Breakers Excluding Main Breaker <= 100% of Busbar Rating			
DC	10	*Battery Storage System Characteristics*	690.6	690.55	
	11	*Other*			

Recommended Action Items

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NEC2008

MICROINVERTER SOLAR ELECTRIC INSPECTION CHECKLIST

Contact Name _____ **Address** _____ **Contact #** _____

Code sections that are often considered in installation

Workmanship	**110.12**	**Unused Openings**	**110.12(A)**
Working Spaces-Depth	**110.23(1), T110.26(A)(1)**		
Working Spaces-Width	**110.26(2)**		
Working Spaces-Height	**110.26(3)**		

DC

A. Array

		Code Section NEC 2008	
1 Structural			
	Ground		
	Attachment		
	Roof		
	Attachment		
	Flashing		
2 Grounding of Array and Metal Parts "Likely to be Energized"			
	Module	690.43	
	Rack	250.134	250.136(A)
	Likely to be energized, including metal roof	250.110	
3 PV -DC Equipment Grounding Conductor Sizing			
	EGC sized for physical environment	690.45 *(not smaller than #14)*	690.46, 250.120(C) *(if smaller than #6)*
	EGC sized for overcurrent protection ahead	250.122	
4 PV - DC Conductor Marking			
	Identification and Grouping	NA	
	Color coding	310.12	*[by inference, ungrounded any other color]*
5 PV -DC Source and Output Circuit Volt/Amp Design Values			
	Maximum Design Current Calculations	690.8(A)(1), (2)	
	Maximum Design Voltage Calculations/Listings	690.7(A)	
	Common-Return Conductor Sizing	690.8(C)	
6 PV -DC Conductor protection -PHYSICAL		110.27	
	Conductors protected	690.31 (E)	
	Conductors supported	Conductor specific 3XX	
7 PV -DC Conduit protection -PHYSICAL			
	Conduit Secured	Conduit specific 3XX	352.30
	Conduit Expansion Considered	Conduit specific 3XX	352.40
	Physical Impact		
8 Other			

B. Inverter

	Code Section NEC 2008	
1 Physical Installation		
Structural		
Accessibility		
Clearances		
2 Inverter Input Circuit Amperage Design Values		
Grid Interconnected, Non Battery	Maximum PV Output Circuit Current	
3 Inverter Input Circuit Voltage Design Values		
Grid Interconnected, Non Battery	Maximum PV Output Circuit Voltage	
4 Inverter Maximum Output Circuit Amperage Design Values		
Grid Interconnected Non Battery	690.8(A) (1),(2),(3), (4)	
5 Inverter Maximum Output Voltage		
AC Maximum Output Voltage is from Manufacturer's Specification		
6 AC Disconnecting Requirements		
Required	690.15	
Inverters Not Readily Accessible	690.14(D)(1), (2), (3), (4)	
Multiple Inverters	NA	
Signage	690.54	
7 AC Grounding Electrode System and Conductor		
AC Grounding Electrode Conductor	690.47(A)	250.50 - 250.60
Continuous	250.64(C)	
8 AC Conductor Signage/Marking		
Conductors Idenfication and Grouping	690.31(B)(2),(3),(4)	
9 Other		

C. Utility Interconnection

1 Load Side		
a *Main Panel or SubPanel or Inverter "Combiner" Panel*		
Required busbar rating	690.64(B)(1)(2)	*[inverter Combiner Panel may not be allowed by AHJ]*
Sum of Supply Breakers<=100% Busbar Rating		
100% Busbar Rating<Sum of Supply Breakers<=120% Busbar Rating		
Sum of All Load and Supply Breakers <= 100% of Busbar Rating excluding main breaker		
Breaker suitable for backfeeding	690.64(B)(5)	
Secured breaker for battery backed up panel	690.64(B)(6)	
b *Feeder* Inverter between Main and Subpanel w/o breaker		
c *Tap* Inverter between Main and Subpanel w breaker		
2 Line Side or Supply Side		
Allowed	690.64(A)	230.82(6)
Rating of Disconnect Switch	230.79(D)	
Overcurrent Protection	690.8(A)(3)	690.8(B)(1)
Minimum Conductor Sizing	230.42(B)	
3 Other		

		Code Section NEC 2008
	D. EC Required Signage Summary	
AC	1 *PV System Directory*	
	Stand Alone Systems	690.56(A)
	Utility Interconnected Systems	690.56(B)
	Rapid Shut Down Required Systems	NA
DC	2 *DC Disconnect Switch Identification*	690.14(C)(2)
	3 *DC System Characteristics*	690.53
	4 *DC Conduit and Enclosures*	NA
	5 *DC Disconnect Switch WARNING LABEL when all terminals may be energized*	NA
	6 *DC Disconnnect Switch WARNING LABEL for Ungrounded Systems*	690.35(F)
AC	7 *Supply or Line Side Utility Interconnection*	
	AC Disconnect Switch Identification	690.64(B)(2)
	AC System Characteristics	690.64(B)(2)
	AC Disconnect Switch WARNING LABEL when all terminals may be energized	690.55
	8 *Interconnected w breaker into subpanel or mainpanel*	
	a Sum of Supply Breakers<=100% Busbar Rating	
	b 100% Busbar Rating<Sum of Supply Breakers<=120% Busbar Rating	690.64(B)(7)
	c Sum of All Load and Supply Breakers Excluding Main Breaker <= 100% of Busbar Rating	
	9 *Other*	

Recommended Action Items

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