



March 1, 2021

RE: 21-0223-NM - Application of Inn by the River for a certificate of public good for a 34.22 kW solar net-metered electric power system in Hardwick, Vermont. (the Project).

To Whom it May Concern,

Green Mountain Solar ("GMS") filed a CPG, 21-0223-NM on behalf of Inn by the River in Hardwick. We have been working with Karin McNeill at the Agency of Natural Resources to draft up site plans for the proposed array location that would comply with Criteria 1E and 1F. After reviewing the proposed site plan Ms. McNeill asked that a few items be clarified, and a revised draft be sent to the Public Utility Commission.

The revisions are as follows:

- We continued the red dashed line labeling the riparian zone boundary to the east parcel boundary as on the original plan it incorrectly turned into a blue solid line.
- We color filled the site plan area marking and labeling for the Proposed Restoration area so that it is visible and easy distinguished between all the other markings.
- We added a label to indicate the permanent demarcation that is planned to be installed outside of the Proposed Restoration area.

While working on this with Ms. McNeill, GMS, also, became made aware of concerns with the Right of Way between Hay's Service Station and Inn by the River. Once these concerns were brought to our attention, we shifted the arrays approximately +/- 35' out of the right of way and further out of the riparian zone limit. By adjusting the array location, it minimizes the amount of riparian zone we are disturbing and lessens the trench length +/- 10'.

Attached you will find a copy of the revised site plans. Please let us know if you have any questions or concerns by calling us at 802.369.9149.

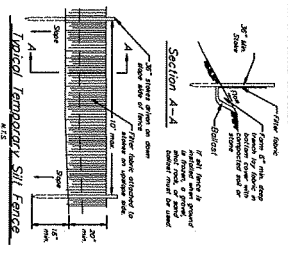
Sincerely,

Tara Huestis

Tara J Huestis
Office Manager
Green Mountain Solar
96 Commerce Street
Williston, VT 05495
Ph. 802.369.9149

Green Mountain Solar, LLC 96 Commerce Street, Williston, VT 05495 802.369.9149

- NOTES:**
1. Associate EPSC member shall provide design and specifications for Concrete Retention and Sediment Storage.
 2. The proposed design shall be submitted to the Permit Administrator for Review and Approval.
 3. The Permit Administrator will review the design and specifications and will issue a permit decision within 60 days of receipt of a complete application.
 4. Any design changes must be approved prior to any work beginning including which requires a change order.
 5. The contractor shall be responsible for all construction details.



Typical Temporary Silt Fence

Silt Fence Spacing (feet)	Minimum Slope	Minimum Length (feet)
50	3:1	15
100	3:1	30
150	3:1	45
200	3:1	60

CONSTRUCTION SPECIFICATIONS FOR SILT FENCE

1. The silt fence shall be constructed in accordance with the specifications and drawings.
2. The silt fence shall be constructed in accordance with the specifications and drawings.
3. The silt fence shall be constructed in accordance with the specifications and drawings.
4. The silt fence shall be constructed in accordance with the specifications and drawings.
5. The silt fence shall be constructed in accordance with the specifications and drawings.

CONSTRUCTION SPECIFICATIONS FOR SILT FENCE

1. The silt fence shall be constructed in accordance with the specifications and drawings.
2. The silt fence shall be constructed in accordance with the specifications and drawings.
3. The silt fence shall be constructed in accordance with the specifications and drawings.
4. The silt fence shall be constructed in accordance with the specifications and drawings.
5. The silt fence shall be constructed in accordance with the specifications and drawings.

CONSTRUCTION SPECIFICATIONS FOR SILT FENCE

1. The silt fence shall be constructed in accordance with the specifications and drawings.
2. The silt fence shall be constructed in accordance with the specifications and drawings.
3. The silt fence shall be constructed in accordance with the specifications and drawings.
4. The silt fence shall be constructed in accordance with the specifications and drawings.
5. The silt fence shall be constructed in accordance with the specifications and drawings.

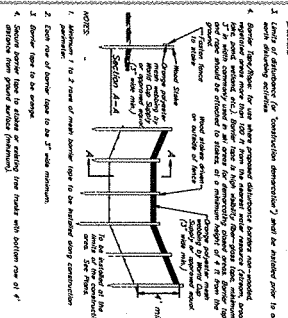
CONSTRUCTION SPECIFICATIONS FOR SILT FENCE

1. The silt fence shall be constructed in accordance with the specifications and drawings.
2. The silt fence shall be constructed in accordance with the specifications and drawings.
3. The silt fence shall be constructed in accordance with the specifications and drawings.
4. The silt fence shall be constructed in accordance with the specifications and drawings.
5. The silt fence shall be constructed in accordance with the specifications and drawings.

CONSTRUCTION SPECIFICATIONS FOR SILT FENCE

1. The silt fence shall be constructed in accordance with the specifications and drawings.
2. The silt fence shall be constructed in accordance with the specifications and drawings.
3. The silt fence shall be constructed in accordance with the specifications and drawings.
4. The silt fence shall be constructed in accordance with the specifications and drawings.
5. The silt fence shall be constructed in accordance with the specifications and drawings.

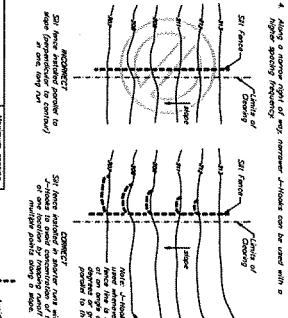
- NOTES:**
1. Associate EPSC member shall provide design and specifications for Concrete Retention and Sediment Storage.
 2. The proposed design shall be submitted to the Permit Administrator for Review and Approval.
 3. The Permit Administrator will review the design and specifications and will issue a permit decision within 60 days of receipt of a complete application.
 4. Any design changes must be approved prior to any work beginning including which requires a change order.
 5. The contractor shall be responsible for all construction details.



Typical Temporary Silt Fence

Silt Fence Spacing (feet)	Minimum Slope	Minimum Length (feet)
50	3:1	15
100	3:1	30
150	3:1	45
200	3:1	60

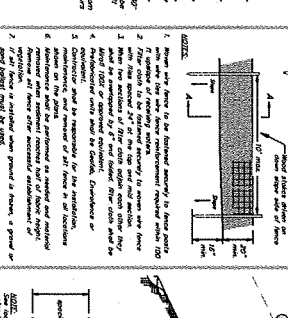
- NOTES:**
1. Associate EPSC member shall provide design and specifications for Concrete Retention and Sediment Storage.
 2. The proposed design shall be submitted to the Permit Administrator for Review and Approval.
 3. The Permit Administrator will review the design and specifications and will issue a permit decision within 60 days of receipt of a complete application.
 4. Any design changes must be approved prior to any work beginning including which requires a change order.
 5. The contractor shall be responsible for all construction details.



Typical Temporary Silt Fence

Silt Fence Spacing (feet)	Minimum Slope	Minimum Length (feet)
50	3:1	15
100	3:1	30
150	3:1	45
200	3:1	60

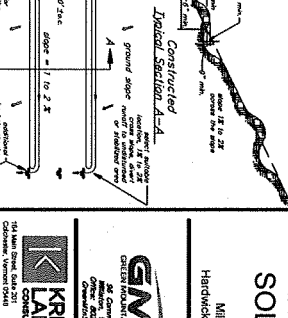
- NOTES:**
1. Associate EPSC member shall provide design and specifications for Concrete Retention and Sediment Storage.
 2. The proposed design shall be submitted to the Permit Administrator for Review and Approval.
 3. The Permit Administrator will review the design and specifications and will issue a permit decision within 60 days of receipt of a complete application.
 4. Any design changes must be approved prior to any work beginning including which requires a change order.
 5. The contractor shall be responsible for all construction details.



Typical Temporary Silt Fence

Silt Fence Spacing (feet)	Minimum Slope	Minimum Length (feet)
50	3:1	15
100	3:1	30
150	3:1	45
200	3:1	60

- NOTES:**
1. Associate EPSC member shall provide design and specifications for Concrete Retention and Sediment Storage.
 2. The proposed design shall be submitted to the Permit Administrator for Review and Approval.
 3. The Permit Administrator will review the design and specifications and will issue a permit decision within 60 days of receipt of a complete application.
 4. Any design changes must be approved prior to any work beginning including which requires a change order.
 5. The contractor shall be responsible for all construction details.



Typical Temporary Silt Fence

Silt Fence Spacing (feet)	Minimum Slope	Minimum Length (feet)
50	3:1	15
100	3:1	30
150	3:1	45
200	3:1	60

EPSC GENERAL NOTES

1. The contractor shall be responsible for all construction details.
2. The contractor shall be responsible for all construction details.
3. The contractor shall be responsible for all construction details.
4. The contractor shall be responsible for all construction details.
5. The contractor shall be responsible for all construction details.

EPSC CONSTRUCTION NOTES

1. The contractor shall be responsible for all construction details.
2. The contractor shall be responsible for all construction details.
3. The contractor shall be responsible for all construction details.
4. The contractor shall be responsible for all construction details.
5. The contractor shall be responsible for all construction details.

EPSC CONSTRUCTION NOTES

1. The contractor shall be responsible for all construction details.
2. The contractor shall be responsible for all construction details.
3. The contractor shall be responsible for all construction details.
4. The contractor shall be responsible for all construction details.
5. The contractor shall be responsible for all construction details.

SEEDING SPECIFICATIONS

1. The contractor shall be responsible for all construction details.
2. The contractor shall be responsible for all construction details.
3. The contractor shall be responsible for all construction details.
4. The contractor shall be responsible for all construction details.
5. The contractor shall be responsible for all construction details.

SEEDING SPECIFICATIONS

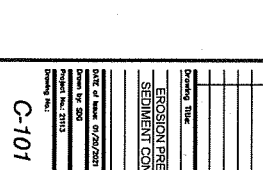
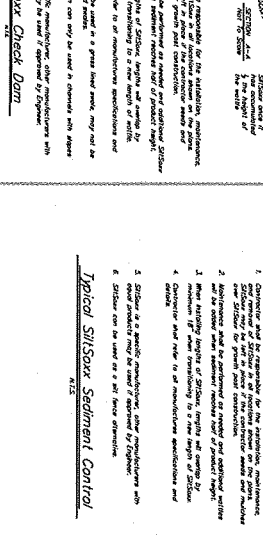
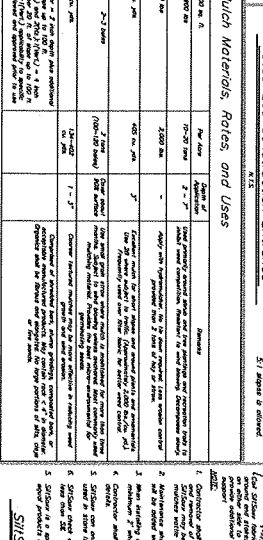
1. The contractor shall be responsible for all construction details.
2. The contractor shall be responsible for all construction details.
3. The contractor shall be responsible for all construction details.
4. The contractor shall be responsible for all construction details.
5. The contractor shall be responsible for all construction details.

SEEDING SPECIFICATIONS

1. The contractor shall be responsible for all construction details.
2. The contractor shall be responsible for all construction details.
3. The contractor shall be responsible for all construction details.
4. The contractor shall be responsible for all construction details.
5. The contractor shall be responsible for all construction details.

Guide to Match Materials, Rates, and Uses

Material	Rate	Use
Concrete	300-500 yds	Temporary construction
Gravel	100-200 yds	Drainage
Geotextile	100-200 sq ft	Retention
Silt Fence	100-200 yds	Erosion control
Seeding	100-200 sq ft	Stabilization
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control
Silt Fence	100-200 yds	Erosion control



REVISION/COMMENTS

NO.	REVISION/COMMENTS	DATE

PROPOSED
Solar Array

ROSION PREVENTION AND
SEDIMENT CONTROL DETAILS

DATE OF ISSUE: 08/16/2020
DRAWING NO: 101
PROJECT NO: 2020-101
SCALE: 1/8" = 1'-0"

KREBS & LANSING
CONSULTING ENGINEERS
400 W. 10th Street, Suite 100
Decorah, IA 52001
PHONE: 562-7266
WWW.KREBS-AND-LANSING.COM

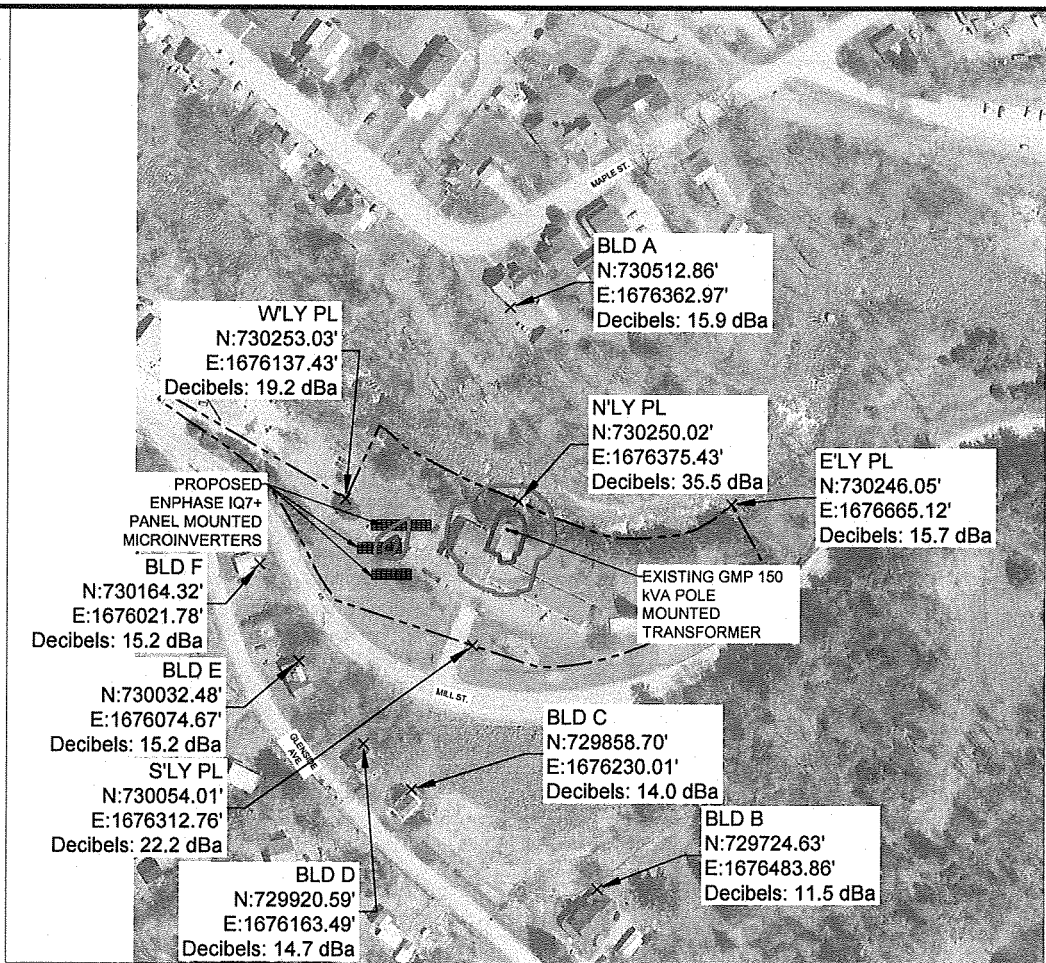
GMS
GEOLOGICAL MATERIALS SERVICE
1704 E. 1st Street
Decorah, IA 52001
PHONE: 562-7266
WWW.GMS-ENGINEERS.COM

INN BY THE RIVER SOLAR
Mtn St.
Decorah, Vermont

ISSUED FOR PERMIT REVIEW
NOT FOR CONSTRUCTION

SURVEY, ANALYSIS, DESIGN AND CONSTRUCTION
MOUNTAIN HILLS CONSULTING ENGINEERS
100 West Main Street, Suite 100
Decorah, IA 52001
PHONE: 562-7266
WWW.MOUNTAINHILLS-ENGINEERS.COM

C-101

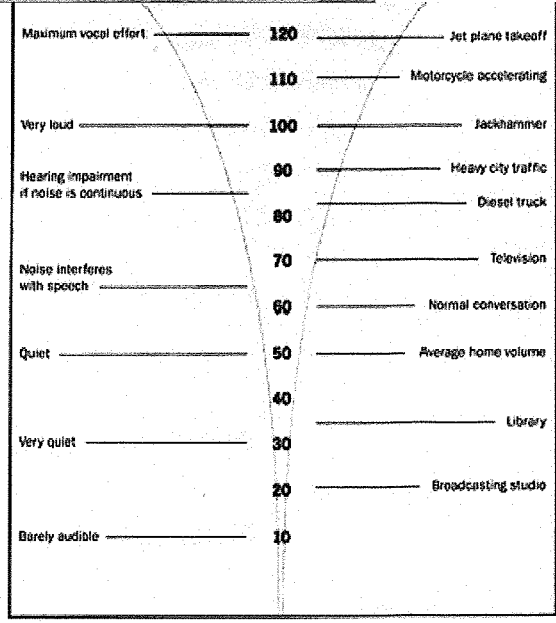
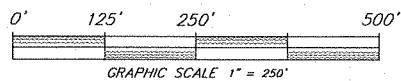


NOTES:

1. Sound from the Enphase microinverters is purported to be negligible due to a lack of moving parts within the microinverters. Conservatively all inverters were modeled to be producing the minimum audible noise level of 10.0 dBa's with them all running simultaneously. The sound level for the pole mounted 150kVA transformers is a maximum of 55 dBa [measured at 0.3 meter, as per NEMA TR1 (ANSI/IEEE Std. C57.12-90-1993, sec. 13.3.4)] Assuming the measurement was taken at 1 meter to be conservative, the calculated sound level at 3 meters is 45.5 dBa.
2. Other decibel ranges were derived using the following distance damping equation $[L2 = L1 - 20 \text{ Log}(d1/d2)]$. This damping equation was the only factor considered in decibel range attenuation estimates. Elevation, ambient noise, vegetation, proposed solar array and other structures which would further effect the attenuation of sound levels were not considered in this study. Sound levels depicted are for all (1165) Enphase inverters and the pole mounted Cooper 150 kVA Single-Phase Transformer operating simultaneously at maximum noise level. See additional calculation information on Sound 2, Sound 3 and Sound 4.
3. Plans Sound 3 & Sound 4 run the calculations for nighttime operation. Site inverters make negligible noise when not loaded with power. For this calculation we assume they will make no noise. The site transformers do still make noise at night, to be conservative the nighttime calculation models the transformers running at maximum noise.
4. Sound levels reported do not account for any background noise. Local background noise may exceed sound created by project equipment.

Legend:

- 70 dBa range
- 60 dBa range
- 50 dBa range
- 40 dBa range
- 30 dBa range "Very Quiet"



Decibel Breakdown Compared to Everyday Noises

KREBS & LANSING
 CONSULTING ENGINEERS
 164 Main Street, Suite 201 P. (802) 878-0375
 Colchester, Vermont 05446 www.krebsandlansing.com

GMS
 GREEN MOUNTAIN SOLAR
 96 Commerce St., Williston, VT 05495
 Office: 802.393.9149 GreenMtnSolar.com

**DAYTIME FULL OPERATION
 SOUND LEVEL PLAN**

**Basic Sound Level Estimates for
 Noise Produced by Transformers
 and Inverters**

DRAWN BY: EJM CHECKED BY: SDG

Project: Inn By The River Solar

Location: Mill St., Hardwick, VT

Source Data:

Revision Date:

Plan ID:

Sound 1

Scale:
 1" = 250'

Date:
 01/20/21

Inn by the River Solar Project, Hardwick, Vermont - DAYTIME - EQUIPMENT

Sound Source #	Easting (feet)	Northing (feet)	Noise Level (dBA @ 3 Meters)
Proposed Enphase IQ7+ 295W Microinverters (135)	See Plan	See Plan	10.0
Proposed 150 kVA Cooper Pole Mounted Transformer	See Plan	See Plan	45.5

Formulas used for Calculations

Adding of Noise Levels

$$L_T = 10 \times \log_{10} (10^{L_{1/10}} + 10^{L_{2/10}} + \dots + 10^{L_{N/10}})$$

Where:

L_T = Total noise level of all equipment

L_n = Noise level for each piece of equipment

Noise Level Changes with Distance

$$L_b = L_a - 20 \times \log_{10} (D_b/D_a)$$

Where:

L_b = Noise level at new distance

L_a = Noise level at original distance

D_b = New distance from source of noise

D_a = Original distance from source of noise

Enphase Inverters:
Enphase specifies that the sound created by their microinverters is negligible. A 10.0 dBA sound level at 3.0 meters was used to be conservative.

Cooper Power Systems 150 kVA Single-Phase Overhead Transformer specifies the units peak noise level as <45.5 dBA measured at 3 meters. (Manufacturer specification is a maximum of 55 dBA measured at 0.3 meters, as per NEMA TR1 (ANSI/IEEE Std. C57.12-90-1993, sec. 13.3.4). Assuming this measurement to be at 1 meter, to be conservative, the calculated sound level at 3 meters is 45.5 dBA.

	1 meter	3 meters
Proposed Enphase IQ7+ 295W Microinverters	-	10.0
Existing 150 kVA Cooper Pole Mounted Transformer	55.0	45.5

Points of Interest	Northing (feet)	Easting (feet)	Estimated Noise Level Based on Project Components (Sound Pressure, dBA)
N'LY PL	730,250.02	1,676,375.43	35.5
W'LY PL	730,253.03	1,676,137.43	19.2
S'LY PL	730,054.01	1,676,312.76	22.2
E'LY PL	730,246.05	1,676,665.12	15.7
BLD A	730,512.86	1,676,362.97	15.9
BLD B	729,724.63	1,676,483.86	11.5
BLD C	729,858.70	1,676,230.01	14.0
BLD D	729,920.59	1,676,163.49	14.7
BLD E	730,032.48	1,676,074.67	15.2
BLD F (NEAREST OFFSITE RESIDENCE)	730,164.32	1,676,021.78	15.2



DAYTIME FULL OPERATION SOUND LEVEL PLAN

Project: Inn By The River Solar

Location: Mill St., Hardwick, VT

Source Data:

Plan ID:

Sound 2

Scale:
N/A

Date:
01/20/21

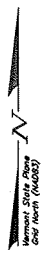
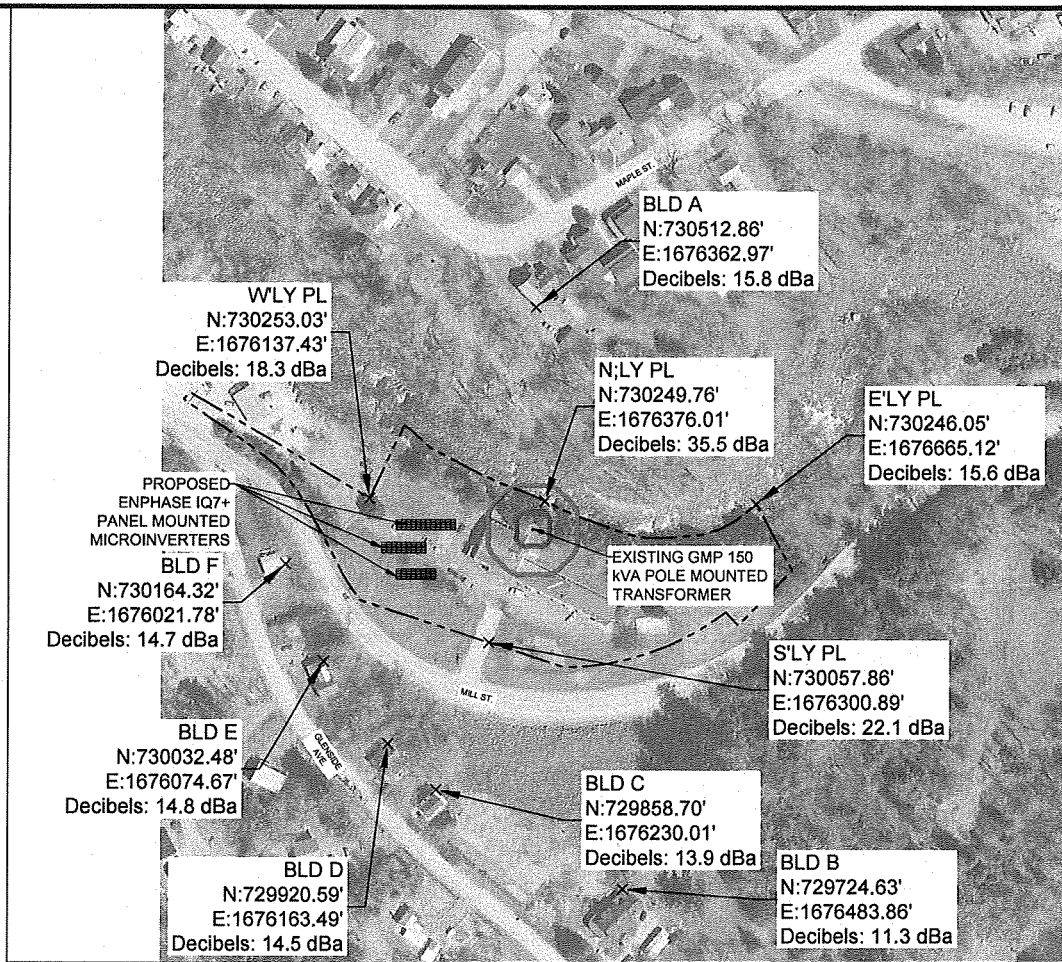
Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

DRAWN BY: EJM

CHECKED BY: SDG

Revision Date:



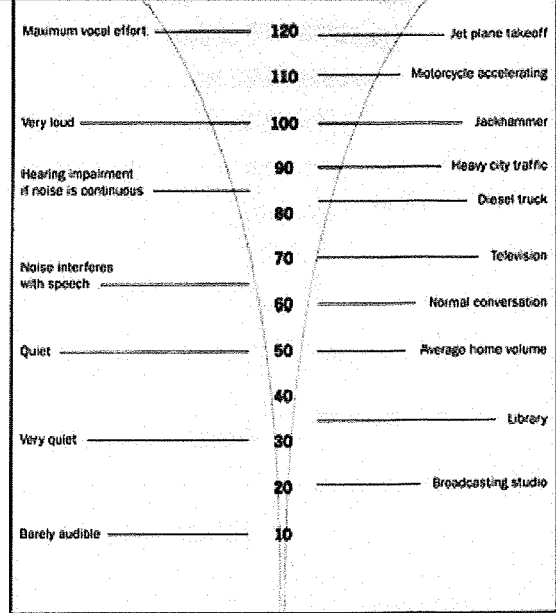
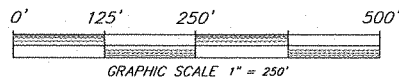


NOTES:

1. Sound levels for pole mounted transformer are a maximum of 55.0 dBA [measured at 0.3 meter, as per NEMA TR1 (ANSI/IEEE Std. C57.12-90-1993, sec. 13.3.4)]. Assuming 1 meter to be conservative calculated sound level at 3 meters is 45.5 dBA.
2. Other decibel ranges were derived using the following distance damping equation $[L_2 = L_1 - 20 \text{ Log}(d_1/d_2)]$. This damping equation was the only factor considered in decibel range attenuation estimates. Elevation, ambient noise, vegetation, proposed solar array and other structures which would further effect the attenuation of sound levels were not considered in this study. Sound levels depicted are for the 150 kVA pole mounted transformers operating at maximum noise level.
3. Sound levels reported do not account for any background noise. Local background noise may exceed sound created by project equipment.

Legend:

- 70 dBA range
- 60 dBA range
- 50 dBA range
- 40 dBA range
- 30 dBA range "Very Quiet"



Decibel Breakdown Compared to Everyday Noises

KREBS & LANSING
CONSULTING ENGINEERS
164 Main Street, Suite 201 P: (802) 878-0375
Colchester, Vermont 05446 www.krebsandlansing.com

**NIGHTTIME OPERATION
SOUND LEVEL PLAN**

Project: Inn By The River Solar
Location: Mill St., Hardwick, VT
Source Data:

Plan ID:
Sound 3

**Basic Sound Level Estimates for
Noise Produced by Transformers**

Scale:
1" = 250'

DRAWN BY: EJM

CHECKED BY: SDG

Revision Date:

Date:
01/20/21

GMS
GREEN MOUNTAIN SOLAR
96 Commerce St., Williston, VT 05495
Office: 802.369.9149 GreenMtnSolar.com

Inn by the River Solar Project, Hardwick, Vermont - NIGHTTIME - EQUIPMENT

Sound Source #	Easting (feet)	Northing (feet)	Noise Level (dBA @ 3 Meters)
Proposed 150 kVA Cooper Pole Mounted Transformer	See Plan	See Plan	45.5
<p>Formulas used for Calculations</p> <p>Adding of Noise Levels</p> $L_T = 10 \times \text{Log}_{10} (10^{L_1/10} + 10^{L_2/10} + \dots + 10^{L_n/10})$ <p>Where:</p> <p>L_T = Total noise level of all equipment L_n = Noise level for each piece of equipment</p> <p>Noise Level Changes with Distance</p> $L_b = L_a - 20 \times \text{Log}_{10} (D_b/D_a)$ <p>Where:</p> <p>L_b = Noise level at new distance L_a = Noise level at original distance D_b = New distance from source of noise D_a = Original distance from source of noise</p>			
	1 meter	3 meters	
Existing 150 kVA Cooper Pole Mounted Transformer	55.0	45.5	



Cooper Power Systems 150 kVA Single-Phase Overhead Transformer specifies the units peak noise level as <45.5 dBA measured at 3 meters. (Manufacturer specification is a maximum of 55 dBA measured at 0.3 meters, as per NEMA TR1 (ANSI/IEEE Std. C57.12-90-1993, sec. 13.3.4). Assuming this measurement to be at 1 meter, to be conservative, the calculated sound level at 3 meters is 45.5 dBA.

Points of interest were picked based on close proximity to the proposed project.

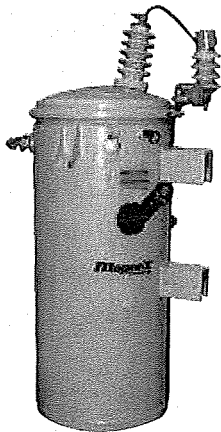
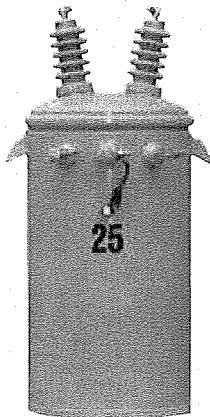
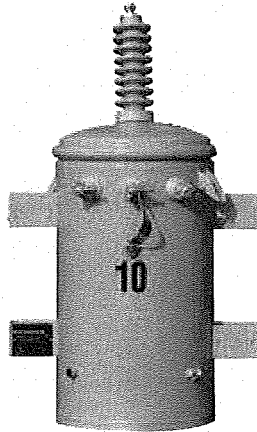
Points of Interest	Northing (feet)	Easting (feet)	Estimated Noise Level Based on Project Components (Sound Pressure, dBA)
N'LY PL	730,249.76	1,676,376.01	35.5
W'LY PL	730,253.03	1,676,137.43	18.3
S'LY PL	730,057.86	1,676,300.89	22.1
E'LY PL	730,246.05	1,676,665.12	15.6
BLD A	730,512.86	1,676,362.97	15.8
BLD B	729,724.63	1,676,483.86	11.3
BLD C	729,858.70	1,676,230.01	13.9
BLD D	729,920.59	1,676,163.49	14.5
BLD E	730,032.48	1,676,074.67	14.8
BLD F (NEAREST OFFSITE RESIDENCE)	730,164.32	1,676,021.78	14.7

NOTE:

Site inverters make negligible noise when not loaded with power. For this calculation we assume they will make no noise.

 <p>184 Main Street, Suite 201 P: (802) 878-0375 Colchester, Vermont 05446 www.krebsandlansing.com</p>	NIGHTTIME OPERATION SOUND LEVEL PLAN		Project: Inn By The River Solar	Plan ID: Sound 4
			Location: Mill St., Hardwick, VT	
 <p>96 Commerce St., Williston, VT 05495 Office: 802.369.9149 GreenMtnSolar.com</p>	Basic Sound Level Estimates for Noise Produced by Transformers		Source Data:	Scale: N/A
	DRAWN BY: EJM	CHECKED BY: SDG	Revision Date:	Date: 01/20/21

Single-phase overhead transformers



General

Eaton's Cooper Power Systems manufactures a complete line of single-phase overhead-type distribution transformers. Single-phase transformers are available as conventional (5-167kVA), completely self-protected (CSP 5-75kVA), or MagneX™ interrupter-protected (5-167kVA) in a variety of ratings to meet or exceed the requirements of applicable ANSI® and NEMA® standards. Units designed per Rural Utilities Service (RUS) standards are also available.

CSP transformers have direct connected primary arresters, secondary circuit breakers, and internal primary voltage fuses. This eliminates the need for separately mounted protective devices and provides reduced installation costs.

The MagneX interrupter is an overcurrent protective device that protects distribution transformers from damaging overloads and secondary faults, and is also used for switching the transformer "on" or "off."

Transformers shown include, first and second, single-phase overhead conventional transformers, and third, MagneX interrupter-protected transformer.

**Cooper
Power Systems**
by **EAT•N**

Standard features

- Meet or exceeds ANSI® and NEMA® standards
- Meets DOE Energy Efficiency Standard 10 CFR Part 431 for distribution transformers
- EPRI recommended interlaced core-type design (5-75 kVA)
- Tank coating exceeds IEEE Std C57.12.31™-2010 standard
- Cover with a minimum dielectric strength of 8 kV
- Tin-plated high and low-voltage bushing terminals to accommodate aluminum or copper conductors
- Laser-engraved nameplate
- Wet process porcelain high-voltage bushings resistant to high-voltage corona
- Tank grounding provisions
- Envirotemp™ FR3™ fluid or electrical grade mineral oil
- Heavy-duty lifting lugs and hanger brackets per ANSI® requirements¹
- Visible cover ground on units with cover-mounted bushings
- Recessed tank bottom that offers protection when sliding over rough surfaces
- Automatic pressure relief device
- Polymer low-voltage bushings (5-75 kVA)
- Arrester mounting and grounding provisions
- Internal mark indicating the proper oil level
- Permanently stamped secondary leads to ensure proper identification
- Corrosion-resistant cover band
- Quality System ISO 9001 certified

Optional accessories

- Taps either two 2.5 % above and below; four 2.5% below; NEMA® taps or special taps
- Externally-operable tap changer switches for safe operation
- Multiple voltage primaries (5-75kVA)
- Externally-operable multiple voltage switches for safe operation
- High corrosion area protection with 304 or 409 stainless steel hardware and tanks
- MagneX™ interrupter
- Birdguards
- Envirotemp™ FR3™ fluid where less-flammable fluid is required and superior environmental characteristics are desired
- Cover with a minimum dielectric strength of 15 kV
- Extra creep high voltage bushings (up to 150 kV BIL)
- Porcelain low-voltage bushings
- Canadian Standards Association (CSA) conforming design
- Special designs conforming to international specifications
- Drain/sampling valve
- Pressure vacuum gauge (tank size limitations apply)
- Filter press connections
- Temperature gauge (tank size limitations apply)
- Liquid level gauge (tank size limitations apply)
- High efficiency transformers at 0.05% or higher above DOE efficiency

¹Lugs and brackets per ANSI requirements up to 4500 lbs.

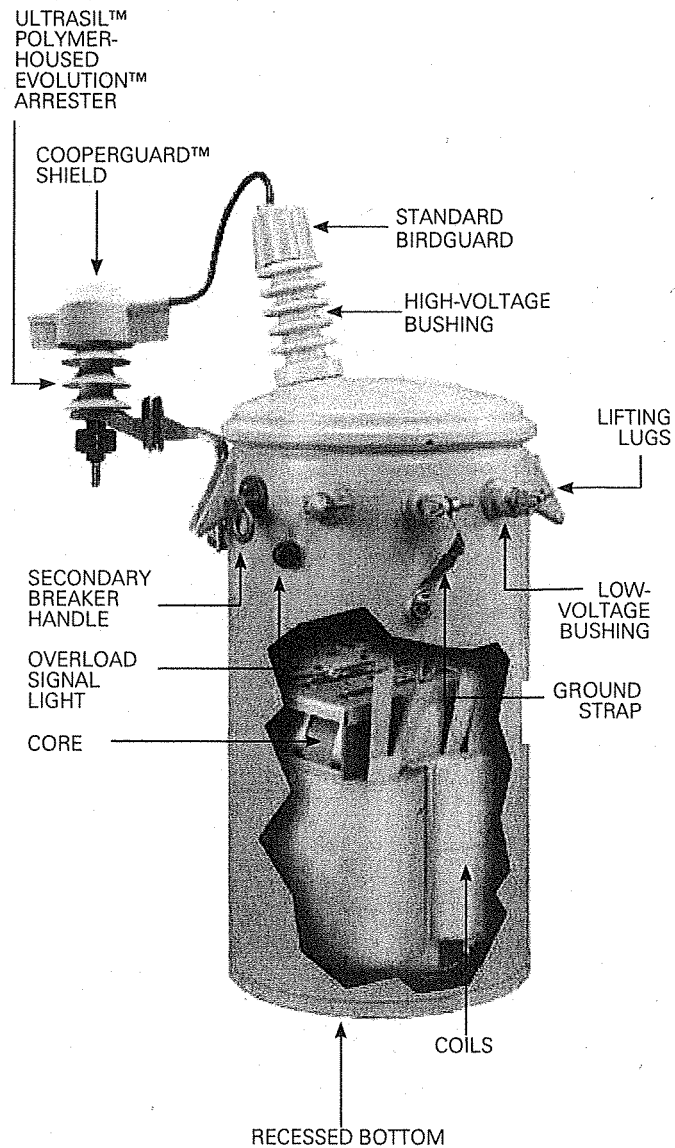


Figure 1. Single-phase overhead CSP transformer.

Single-phase overhead conventional

Product Scope:

kVA: 5-167

Primary Voltage: 2400-19,920 V

Secondary Voltage: 120-600 V

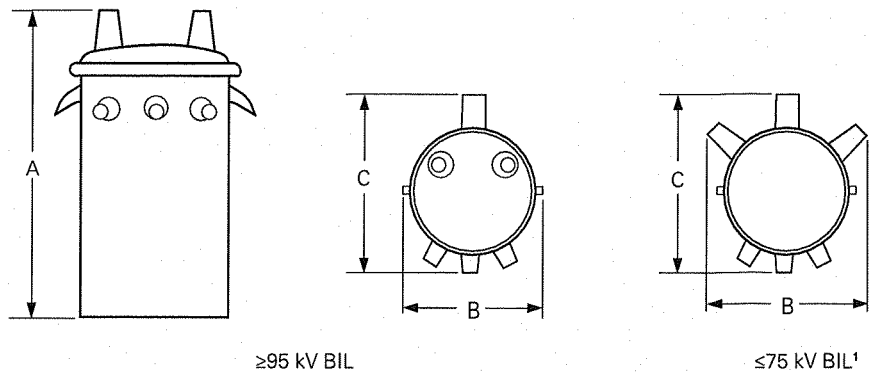


Table 1. Typical dimensions and Weights^{2,3}

kVA	Dimensions (in.)				"B"		"C" ¹	Approx. Weight (lbs.)
	"A"				≤75 kV BIL	≥95 kV BIL		
5	26	32	42	45	28 ¹	17	20	220
10	26	32	42	45	28 ¹	17	20	220
15	30	35	46	49	28 ¹	17	20	280
25	31	38	48	51	30 ¹	20	22	350
37.5	33	40	52	55	31 ¹	20	24	450
50	36	44	52	55	33 ¹	22	25	600
75	39	51	54	57	33 ¹	24	28	820
100	40	55	58	61	33 ¹	27	31	1100
167	47	55	58	61	35 ¹	35	37	1400

¹ Includes sidewall mount H.V. bushings.

² Includes radiators.

³ Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Eaton's Cooper Power Systems for exact dimensions.

Single-phase overhead completely self protected (CSP)

Product Scope:

kVA: 5-75

Primary Voltage: 2400-19,920 V

Secondary Voltage: 120-600V

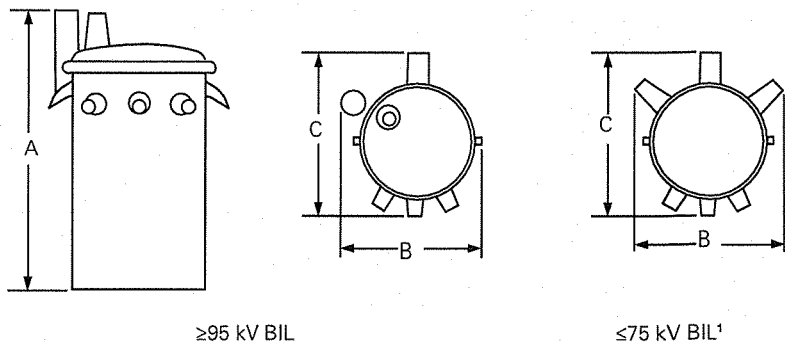


Table 2. Typical Dimensions and Weights^{2,3}

kVA	Dimensions (in.)				"B"		"C" ¹	Approx. Weight (lbs.)
	"A"				≤75 kV BIL	≥95 kV BIL		
5	26	36	42	45	28 ¹	17	20	240
10	26	36	42	45	28 ¹	17	20	240
15	30	42	46	49	28 ¹	17	20	300
25	31	44	48	51	30 ¹	20	22	400
37.5	33	46	52	55	31 ¹	20	25	500
50	36	46	52	55	33 ¹	22	26	600
75	39	51	54	57	33 ¹	24	30	900
100 ⁴	40	55	58	61	33 ¹	27	34	1100
167 ⁴	47	55	58	61	35 ¹	35	40	1600

¹ Includes sidewall mount H.V. bushings.

² Includes Radiators

³ Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Eaton's Cooper Power Systems for exact dimensions.

⁴ MagneX interrupter Only

Protection options

- High fire point Envirotemp™ FR3™ fluid for increased fire safety
- Secondary breaker with weak link for secondary fault and overload protection (5-75 kVA)
- Primary weak link fuse
- Current-limiting fuse for high interrupting ratings and limiting fault currents
- Low-voltage distribution class MOV arrester – internally or externally mounted
- MagneX interrupter (Primary Breaker) with isolation link
- MagneX interrupter (Primary Breaker) with partial range current-limiting fuse
- Lightning arresters for primary over-voltage protection: direct connected, normal or heavy duty metal oxide varistor (MOV) either internal (VariSTAR™), or external UltraSIL Polymer-Housed Evolution or UltraSIL™ Polymer-Housed VariSTAR arrester with polymer housing.

Quality control

Single-phase overhead-type transformers manufactured by Cooper Power Systems provide outstanding performance. All transformers from Cooper Power Systems pass tests as prescribed by ANSI® prior to shipment. Cores and coils are designed for high reliability and low field failure rates. The domed cover design in conjunction with the formed cover band provides increased pressure withstand capability, eliminates bushing overhang and improves cover retention. The high-voltage bushing design improves gasket protection and seal. The low-voltage polymer bushing virtually eliminates ultraviolet deterioration with its captured gasket, compression-limiting design. Transformers are designed and manufactured to be corrosion-resistant. Special attention is given to all welded external parts, to avoid moisture entrapment that can lead to corrosion problems. The recessed bottom design, as well as the stainless steel cover band ends, provide corrosion protection in areas that are more susceptible to coating damage during handling. All coating systems exceed IEEE Std C57.12.31™-2010 standard.

The Quality System at Eaton's Cooper Power Systems Transformer Products is ISO 9001 certified.

Fluid options

Transformers can be filled with standard electrical grade mineral insulating oil, Envirotemp™ FR3™ fluid, or other dielectric coolants.

For fire-sensitive locations, Envirotemp™ FR3™ fluid, a fire resistant natural ester-based fluid is recommended. Envirotemp™ FR3™ fluid also offers the benefits of a soy oil-based dielectric coolant that is sustainable and has unique environmental and material properties in addition to increased fire safety over conventional mineral oil.

Check with Eaton's Cooper Power Systems for the availability of other dielectric coolants in single-phase, pad-mounted transformers.

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

Eaton's Cooper Power Systems Business
2300 Badger Drive
Waukesha, WI 53188
United States
Cooperpower.com

© 2014 Eaton
All Rights Reserved
Printed in USA
Publication No. 201-10

Eaton, Cooper Power Systems, MagneX, VariSTAR, UltraSIL, Evolution, and CooperGuard are trademarks of Eaton in the U.S. and other countries. You are not permitted to use these trademarks without the prior written consent of Eaton. IEEE Std. C57.12.31™-2010 standard is a trademark of the Institute of Electrical and Electronics Engineers, Inc., (IEEE). This product is not endorsed or approved by the IEEE. Envirotemp™ and FR3™ are licensed trademarks of Cargill, Incorporated. NEMA® is a registered trademark of the National Electrical Manufacturers Association. ANSI® is a registered trademark of the American National Standards Institute.

For Eaton's Cooper Power Systems single-phase overhead transformer product information call 1-877-277-4636 or visit: www.cooperpower.com.



Krebs and Lansing <email@krebsandlansing.com>

Single Phase Pole Audible Sound Rating

1 message

DustinRScaife@eaton.com <DustinRScaife@eaton.com>
To: gregdixson@krebsandlansing.com

Fri, Jul 25, 2014 at 1:21 PM

Greg –

This email is to confirm our phone conversation about the 167 kVA single phase pole type transformer. The sound level will be limited to 55 decibels based on the NEMA TR1 sound levels. Let me know if you have any questions.

Thanks,

Dustin Scaife
Product Application Engineer

Power Delivery Division

Eaton's Cooper Power Systems Business
1900 E. North St.

Waukesha, WI 53188

Office: (262) 524-4336

Mobile: (262) 422-9256

Fax: (770) 268-7510

DustinRScaife@eaton.com

www.CooperPower.com

www.eaton.com



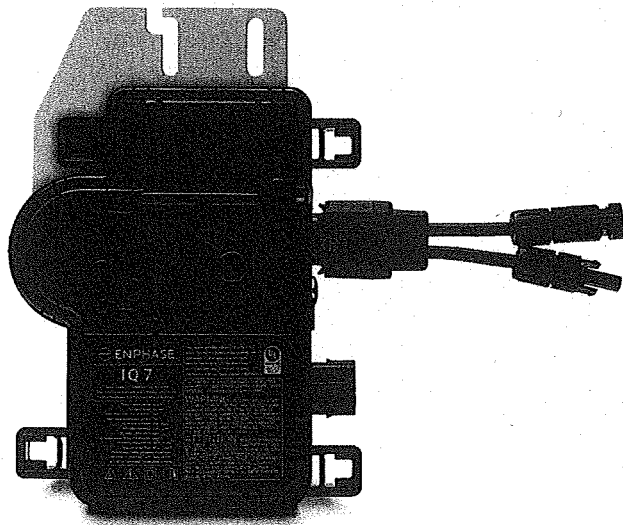
Powering Business Worldwide

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell/120 half-cell and 72-cell/144 half-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell/144 half-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)		IQ7-60-2-US		IQ7PLUS-72-2-US	
Commonly used module pairings ¹		235 W - 350 W +		235 W - 440 W +	
Module compatibility		60-cell/120 half-cell PV modules only		60-cell/120 half-cell and 72-cell/144 half-cell PV modules	
Maximum input DC voltage		48 V		60 V	
Peak power tracking voltage		27 V - 37 V		27 V - 45 V	
Operating range		16 V - 48 V		16 V - 60 V	
Min/Max start voltage		22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)		15 A		15 A	
Overvoltage class DC port		II		II	
DC port backfeed current		0 A		0 A	
PV array configuration		1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
OUTPUT DATA (AC)		IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power		250 VA		295 VA	
Maximum continuous output power		240 VA		290 VA	
Nominal (L-L) voltage/range ²		240 V /	208 V /	240 V /	208 V /
		211-264 V	183-229 V	211-264 V	183-229 V
Maximum continuous output current		1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency		60 Hz		60 Hz	
Extended frequency range		47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles		5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit ³		16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port		III		III	
AC port backfeed current		18 mA		18 mA	
Power factor setting		1.0		1.0	
Power factor (adjustable)		0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY		@240 V	@208 V	@240 V	@208 V
Peak efficiency		97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency		97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA					
Ambient temperature range		-40°C to +65°C			
Relative humidity range		4% to 100% (condensing)			
Connector type		MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)			
Dimensions (HxWxD)		212 mm x 175 mm x 30.2 mm (without bracket)			
Weight		1.08 kg (2.38 lbs)			
Cooling		Natural convection - No fans			
Approved for wet locations		Yes			
Pollution degree		PD3			
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure			
Environmental category / UV exposure rating		NEMA Type 6 / outdoor			
FEATURES					
Communication		Power Line Communication (PLC)			
Monitoring		Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.			
Disconnecting means		The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Compliance		CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.			

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.

2. Nominal voltage range can be extended beyond nominal if required by the utility.

3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com

