RESOLUTION NO. R-15-20

A RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH HOMOLY SOLAR, INCORPORATED, IN THE TOTAL AMOUNT NOT TO EXCEED $83,370.00 FOR THE WATER TREATMENT PLANT 25kW SOLAR GRID-TIED PROJECT

WHEREAS, four proposals were received for the Water Treatment Plant 25kW Solar Grid-Tied Project WP1588, and the proposal of Homoly Solar, Incorporated, in the amount of $83,370.00 has been determined by the Director of Public Works and City Engineer to be the lowest and best proposal; and

WHEREAS, the City of Gladstone is eligible for a rebate from Kansas City Power and Light in the amount of $37,500.00 if the project is completed prior to June 30, 2015.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF GLADSTONE, MISSOURI, AS FOLLOWS:

THAT, the City Manager of the City of Gladstone, Missouri, is hereby authorized to execute a contract with Homoly Solar, Incorporated, for work as outlined in the contract for a total amount not to exceed $83,370.00.

FURTHER, THAT funds for such purpose are authorized from the Combined Waterworks and Sewerage System Funds.

INTRODUCED, READ, PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF GLADSTONE, MISSOURI, THIS 13th DAY OF APRIL 2015.

J. Brian Hill

J. Brian Hill, Mayor

ATTEST:

Ruth E Bocchino

Ruth E. Bocchino, City Clerk

PART D - CONTRACT

State of Missouri

} ss:

County of Clay

THIS AGREEMENT AND INDENTURE made and entered into this, the 24th day of April, 2015 by and between

The City of Gladstone

party of the first part, termed in this agreement and the specifications as the **"OWNER"**, and

Homoly Solar, Inc. party of the second part, termed in this agreement and the specifications as the **"CONTRACTOR"**.

WITNESSETH;

THAT, WHEREAS, The Owner has heretofore caused to be prepared certain Contract Documents comprising the Notice to Bidders, Instructions to Bidders, Proposal Form, Bond Forms, Contract Form, Regulations of the Contract and the Specifications and Plans for furnishing material and constructing improvements therein fully described, and the Contractor did, on the 7th day of April, 2015, file with the Owner a Proposal to furnish said materials and construct said improvements at the terms thereto fully stated and set forth; and

WHEREAS, the said Contract Documents and Proposal accurately and fully describe the terms and conditions upon which the Contractor is willing to furnish the material, construct the improvements, and pay not less than the "Prevailing Wages" called for by the said specifications and in the manner and time of furnishing and constructing same.

IT IS THEREFORE AGREED:

FIRST--That a copy of said Contract Documents and Proposal filed as aforesaid are a part hereof and that the same do in all particulars become the agreement and Contract between the parties hereto in all matters and things set forth therein and described; that both parties hereby accept and agree to the terms and conditions of said Contract Documents and Proposal so filed; and further that the part or parts of the Proposal accepted and the compensation therefore are as follows:

For the unit prices as set forth in the attached Proposal, having an estimated total price of: $ 83,370.00.

SECOND--The Contract Documents and Proposal hereto annexed are made a part of this Agreement and Contract as fully and absolutely as if herein set out in haec verba.

THIRD--This Contract is executed in quintuplicate, with distribution as specified in the Regulations of the Contract.

IN FAITH WHEREOF, Witness the hands and seals of both parties on the day and year in this agreement first above written.

ATTEST:

By: Ruth Bocchino 8/11/15

Ruth Bocchino

Title: City Clerk

Owner City of Gladstone

By

Kirk L. Davis

Title: City Manager

Approved as to form:

Randall Thompson

ATTEST:

By:

Title: Secretary

Contractor Homoly Solar Inc.

By

Andrew Homoly

President

Approved as to form:

By: _____
Attorney for the Contractor

CORPORATE SEAL:

If Contractor is not an individual, authority for signing Contract must be shown or attached.

MEMORANDUM

TO: Kirk L. Davis; City Manager

THROUGH: Tim Nebergall; City Engineer; Director of Public Works

FROM: Glen Whitten; Construction Contracts Administrator

DATE: April 8, 2015

RE: Project WP1588
Water Treatment Plant 25kW Solar Grid-Tied Project

Staff received the following bids for the referenced project:

	Bid Amount	KCP&L Rebate	Net Cost
KCP&L Solar, Inc.	$81,486.42	($37,500.00)	$43,986.42
Solar Energy, LLC	$69,942.00	($25,000.00)	$44,942.00
Homoly Solar, Inc.	$83,370.00	($37,500.00)	$45,870.00
Herner Construction, Inc.	$85,000.00	($25,000.00)	$60,000.00

The Engineer's estimate, prepared by staff, was $50,000.00.

This project consists of the design, delivery, and installation of a complete and operational 25kW solar grid-tied system and associated equipment to be located at 913 NW 44th Terrace.

The City required that all contractors supply solar panels from a Tier 1 manufacturer as defined by Bloomberg New Energy Finance. Tier 1 manufacturers invest heavily in research and development, demonstrate advanced manufacturing techniques, and have been engaged in the solar business for a minimum of 5-years. Products submitted by Solar Energy, LLC and Herner Construction, Inc did not meet the Tier 1 requirement. KCP&L Solar submitted a non-conforming bid that requested exceptions to the City's standard contract including a proposed reduction in the contractor's warranty on materials and workmanship from 2-years to 1-year.

Based on all available information, staff is recommending that this project be awarded to Homoly Solar, Inc., at the bid price of $83,370.00 at the next regularly scheduled City Council meeting. Homoly Construction is a company based in Kansas City, Missouri that has been in business since 1997. Homoly Solar, Inc., a subsidiary of Homoly Construction, has been in business for 4 years and completed over 60 solar installations. Staff conducted a reference check of previous work Homoly Solar has performed and found all respondents to be satisfied with the work they completed.

The proposed 25.2 kW system consists of solar panels manufactured by Trina, inverters manufactured by Fronious to convert direct current (DC) from the solar panels to

alternating current (AC) that can be used by KCP&L, and software to allow real-time monitoring of the system.

The estimated payback period of the system is 13.4 years based upon an annual utility rate increase of 4%, an annual system degradation rate of 0.5%, and average sunlight of 4.5-hours per day. KCP&L recently requested a rate increase of 15.8% from the Missouri Public Service Commission. The proposed solar panels include a manufacturer's linear power warranty that guarantees that the system will perform at 90% of its rated output at 10-years, and 80% of its rated output at 25-years. The proposed system will be fully expandable in the future should additional grants or rebate programs become available.

Funds for this project are provided for from the CWSS Fund and a rebate from KCP&L in the amount of $37,500 if the project is completed by June 30, 2015. An initial project application was submitted in December 2014 and approved by KCP&L. Projects completed after this date are eligible for a maximum rebate of $25,000.

If you have any questions or require additional information, please contact me at your convenience.

Cc: Scott Wingerson; Assistant City Manager

Nathan Clausen
Homoly Solar
1-816-891-2444

Solar Electric Investment, Incentive and Energy Savings Analysis

Proposal for:
Steve Querry
Gladstone Water Department
Site Location:
913 NW 44th Ter
Gladstone, MO 64116

April 3, 2015

Utility: KCP&L
Current Rate Schedule: DirectUD -- Flat Annual Rate

Historical Usage: 1,084,160 kWh/yr

System Information		Cost Information	
Proposed System DC Size	26.2 kW STC DC	Proposed System Cost per rated Watt	$3.31 per STC DC Watt
		Estimated Federal Tax Bracket	0.0%
84 Trina Solar TSM-300PA14 modules and 2 Fronius USA IG Plus 11.4-3 Delta-200 inverters		Current Utility Rate are as high as	8.6 ¢/kWh
Location's Avg Sun Hours	4.5 Sun Hours		
Estimated Annual Production	34,115 kWh/yr	Estimated First Year Utility Savings	$2,934 per year

Gross System Cost with Sales Tax		$83,370
Rebate	Rebate: $1.49 per STC DC Watt	-$37,500
		$0
		$0
		$0
		$0
		$0
PBI Incentive		$1
Net System Cost with Tax Benefits & Incentives		$45,870

Payback / Return on Investment

13.4 Years

Year	Average Utility Rate ¢/kWh	Utility Savings $/year	Net Utility Savings, sRECs, PBIs, etc, after tax & maintenance	Tax & Rebate Incentives	Cost / Payback Schedule (Cumulative Cash Position)
0				$37,500	($45,870)
1	8.6	$2,934	$2,934		($42,936)
2	8.9	$3,007	$3,007		($39,929)
3	9.1	$3,082	$3,082		($36,846)
4	9.4	$3,160	$3,160		($33,687)
5	9.7	$3,239	$3,239		($30,448)
6	10.0	$3,319	$3,319		($27,129)
7	10.3	$3,402	$3,402		($23,726)
8	10.6	$3,488	$3,488		($20,239)
9	10.9	$3,575	$3,575		($16,664)
10	11.2	$3,664	$3,664		($13,000)
11	11.5	$3,756	$3,756		($9,244)
12	11.9	$3,850	$3,850		($5,395)
13	12.3	$3,946	$3,946		($1,449)
14	12.6	$4,044	$4,044		$2,596
15	13.0	$4,146	$4,146		$6,741
16	13.4	$4,249	$4,249		$10,990
17	13.8	$4,355	$4,355		$15,346
18	14.2	$4,464	$4,464		$19,810
19	14.6	$4,576	$4,576		$24,386
20	15.1	$4,690	-$7,910		$16,476
21	15.5	$4,808	$4,808		$21,284
22	16.0	$4,928	$4,928		$26,212
23	16.5	$5,051	$5,051		$31,263
24	17.0	$5,177	$5,177		$36,440
25	17.5	$5,307	$5,307		$41,746

MACRS Depreciation Schedule

Fed Depr Basis (Fed ITC Basis minus 1/2 Fed ITC)	$0
Federal Depreciation	$0
State Net Depreciation (factoring state rebate)	$0

Year	State Net Depreciation	Federal Depreciation
1	$0	$0
2	$0	$0
3	$0	$0
4	$0	$0
5	$0	$0
6	$0	$0
7	$0	$0
8	$0	$0
9	$0	$0
10	$0	$0
11	$0	$0
12	$0	$0
TOTALS	$0	$0

Results

Old Monthly Electric Bill	$7,770
Estimated New Electric Bill	$7,526
% Bill Offset	3.1%

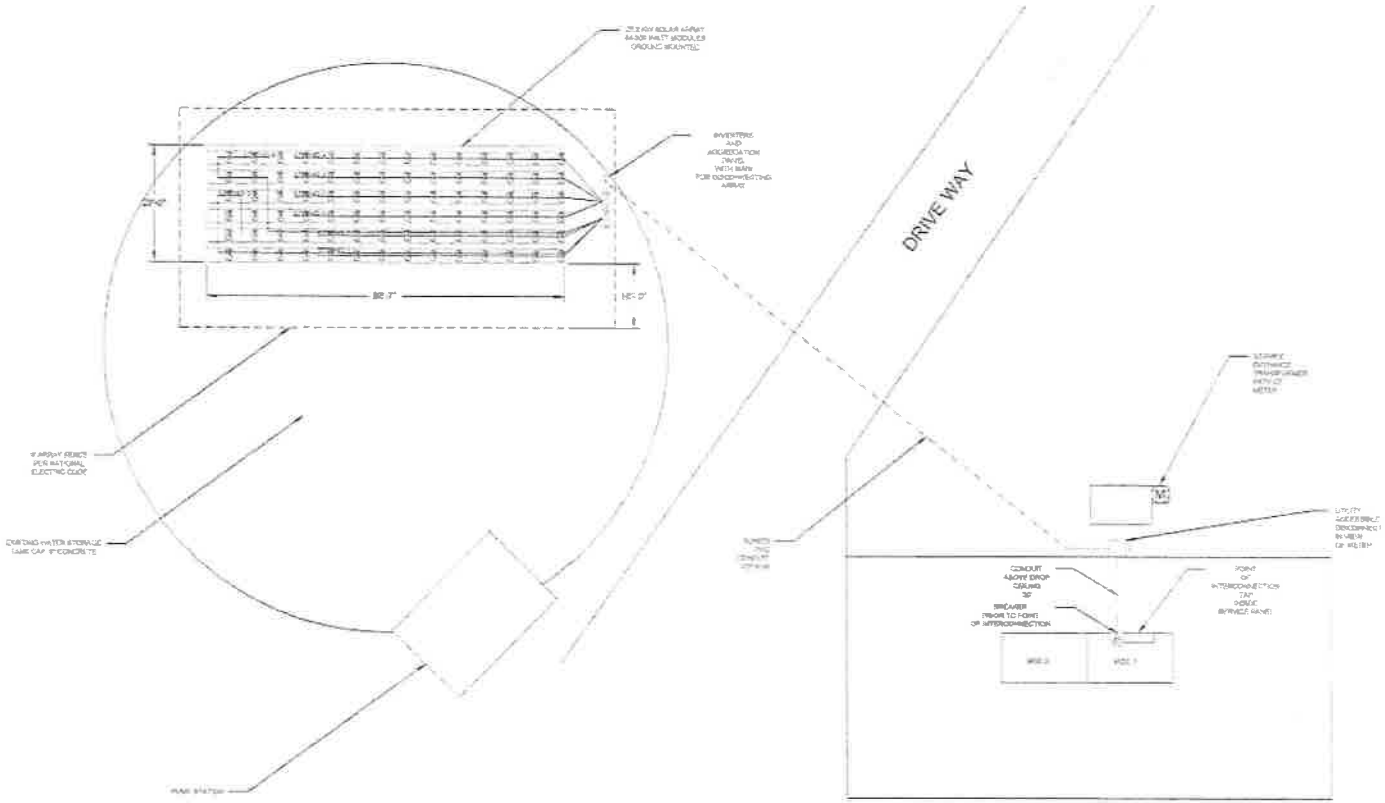
$41,746 Net Present Value with 0% Discount Rate
The IRR over 25 years is 5.5%
Over 25 years it will provide total savings of: $87,616
Including bill savings, sRECs, maintenance, & inverter replacement (net after-tax values)
It will pay for itself in 13 years
With a Cap Rate of 6%, the building's value will increase by: $0

Carbon Dioxide and Environmental Benefits

Based on estimated production, this system will reduce emissions by:
669 tons of CO2 over 25 years
It's the environmental equivalent of:
2,176,933 miles not driven
or 11.6 acres of trees planted

Incentives and energy savings depend upon several factors that may not be represented in this analysis.
A trusted tax professional should verify the figures provided.
Homoly Solar provides assistance with applications for incentives and rebates.
Homoly Solar does not take responsibility for any future changes in tax law or other incentives.

OnGrid Tool v5.48



General Notes

NEW EQUIPMENT

EXISTING EQUIPMENT

METER

MODULE DISCONNECT

JUNCTION BOX

No	Revisions/Issue	Date

HOMOLY
SOLAR
215 Delaware Street
Kansas City, MO 64105
816.881.3444
www.homolysolar.com

Solar
8320 Broadmoor Plaza, Suite 295
Kansas City, MO 64113
913.221.8053
www.solarstudio.com

City of Gladstone Water Plant
913 NW 64TH Terrace
Kansas City, MO 64118

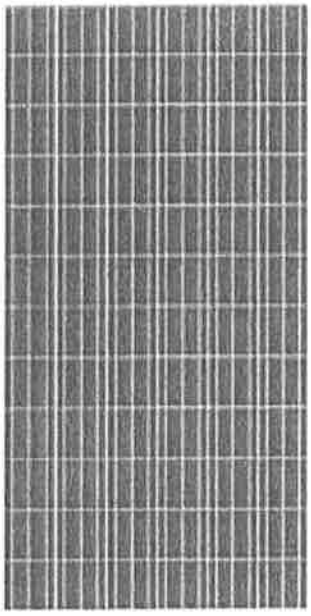
Water Plant Solar PV

11 / 30 / 2016

3/8" = 1'-0"

PV 1
Array
Plan

Mono Multi Solutions



TSM-PA14

THE UTILITY SOLUTION

15.7%
MAX EFFICIENCY

305W
MAX POWER OUTPUT

10 YEAR
PRODUCT WARRANTY

25 YEAR
LINEAR POWER WARRANTY

Module can bear snow loads up to **5400Pa** and wind loads up to **2400Pa**

Guaranteed power output
0~+3%

High performance under low light conditions
Cloudy days, mornings and evenings

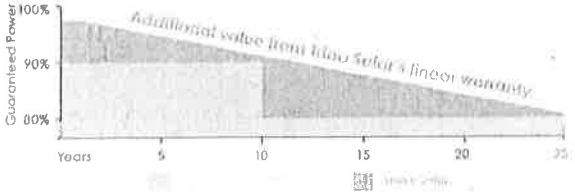
Enhanced module durability with **4.0mm** thick tempered glass

Manufactured according to International Quality and Environment Management System Standards
ISO9001, ISO14001

MC4 photovoltaic connectors increase system reliability

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty

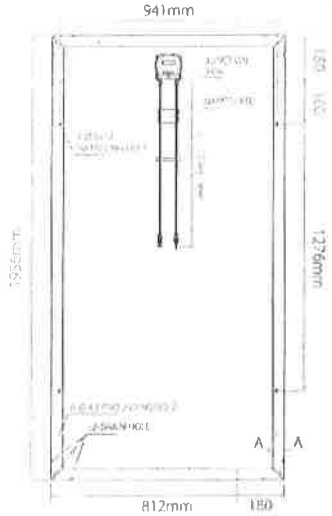


Trina Solar Limited

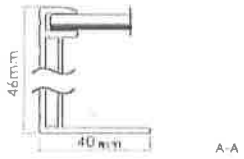
Trinasolar
Smart Energy Together

TSM-PA14 Utility Scale Solar Module

DIMENSIONS OF PV MODULE TSM-PA14

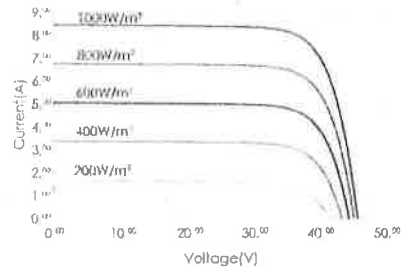


Back View



A-A

I-V CURVES OF PV MODULE TSM-290 PA14



Average efficiency reduction of 4.5% at 200W/m² according to EN 60904-1.

CERTIFICATION

ELECTRICAL DATA @ STC	TSM-285 PA14	TSM-290 PA14	TSM-295 PA14	TSM-300 PA14	TSM-305 PA14
Peak Power Watts-P_{MAX} (Wp)	285	290	295	300	305
Power Output Tolerance-P_{MAX} (%)	0/+3	0/+3	0/+3	0/+3	0/+3
Maximum Power Voltage-V_{MP} (V)	35.6	36.1	36.6	36.9	37.0
Maximum Power Current-I_{MPP} (A)	8.02	8.04	8.07	8.13	8.25
Open Circuit Voltage-V_{OC} (V)	44.7	44.9	45.2	45.3	45.4
Short Circuit Current-Isc (A)	8.50	8.53	8.55	8.60	8.75
Module Efficiency η_m (%)	14.7	14.9	15.2	15.5	15.7

Values at Standard Test Conditions STC (Air Mass AM1.5, Irradiance 1000W/m², Cell Temperature 25°C)
Power measurement tolerance: ±3%

ELECTRICAL DATA @ NOCT	TSM-285 PA14	TSM-290 PA14	TSM-295 PA14	TSM-300 PA14	TSM-305 PA14
Maximum Power-P_{MAX} (Wp)	207	211	214	218	221
Maximum Power Voltage-V_{MP} (V)	32.1	32.6	33.0	33.3	33.4
Maximum Power Current-I_{MPP} (A)	6.46	6.47	6.48	6.55	6.62
Open Circuit Voltage (V)-Voc (V)	40.7	40.9	41.2	41.3	41.4
Short Circuit Current (A)-Isc (A)	6.93	6.97	7.00	7.04	7.17

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s
Power measurement tolerance: ±3%

MECHANICAL DATA	
Solar cells	Multicrystalline 156 × 156mm (6 inches)
Cell orientation	72 cells (6 × 12)
Module dimensions	1956 × 992 × 46mm (77 × 39.05 × 1.81 inches)
Weight	27.6kg (60.8 lb)
Glass	High transparency solar glass 4.0mm (0.16 inches)
Frame	Anodized aluminium alloy
J-Box	IP 67 rated
Cables	Photovoltaic Technology cable 4.0mm² (0.006 inches²), 1250mm (49.2 inches)
Connector	Original MC4

TEMPERATURE RATINGS	
Nominal Operating Cell Temperature (NOCT)	45°C (±2°C)
Temperature Coefficient of P_{MAX}	-0.44%/°C
Temperature Coefficient of V_{OC}	-0.33%/°C
Temperature Coefficient of Isc	0.046%/°C

MAXIMUM RATINGS	
Operational Temperature	-40~+85°C
Maximum System Voltage	1000V DC(IEC)/ 600V DC(UL)
Max Series Fuse Rating	15A

WARRANTY

10 year Product Workmanship Warranty

25 year Linear Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 24 pieces

Modules per 40' container: 528 pieces

TSM_US_Feb_2013

Trinasolar
Solar Energy Together

Fronius **IG Plus** PV Inverter

The first complete solution. Reliable. Proven. Smart.

An outstanding addition to the family: The next generation Fronius IG Plus inverter builds on a successful model with multiple enhancements, including maximum power harvest, a built-in six circuit string combiner, integrated, lockable DC Disconnect, significantly improved efficiency, and unbeatable reliability. New, larger power stages expand the proven Fronius IG family from 2 to 12 kW in a single inverter.

Fronius

INPUT DATA Fronius IG Plus V	3.0-1 UNI	3.8-1 UNI	5.0-1 UNI	6.0-1 UNI	7.5-1 UNI	10.0-1 UNI	11.4-1 UNI	10.0-3 Delta	11.4-3 Delta	12.0-3 WYE277
Recommended PV-Power (kWp)	2.60 - 3.45	3.20 - 4.40	4.25 - 5.75	5.10 - 6.90	6.35 - 8.60	8.50 - 11.50	9.70 - 13.10	8.50 - 11.50	9.70 - 13.10	10.20 - 13.80
PPT-voltage range	230 ... 500 V									
DC startup voltage	245 V									
Max. input voltage (at 1000 W/m² / 14 °F (-10 °C) in open circuit operation)	600 V									
Nominal input current	8.3 A	10.5 A	13.8 A	16.5 A	20.7 A	27.6 A	31.4 A	27.6 A	31.4 A	33.1 A
Max. usable input current	14.0 A	17.8 A	23.4 A	28.1 A	35.1 A	46.7 A	53.3 A	46.7 A	53.3 A	56.1 A
Admissible conductor size (DC)	No. 14 - 6 AWG									
Number of DC input terminals	6									
Max. current per DC input terminal	20 A; Bus bar available for higher input currents									

OUTPUT DATA Fronius IG Plus V		3.0-1 UNI	3.8-1 UNI	5.0-1 UNI	6.0-1 UNI	7.5-1 UNI	10.0-1 UNI	11.4-1 UNI	10.0-3 Delta	11.4-3 Delta	12.0-3 WYE277
Nominal output power ($P_{AC,nom}$)		3000 W	3800 W	5000 W	6000 W	7500 W	9995 W	11400 W	9995 W	11400 W	12000 W
Max. continuous output power 104 °F (40 °C) 208 V / 240 V / 277 V		3000 W	3800 W	5000 W	6000 W	7500 W	9995 W	11400 W	9995 W	11400 W	12000 W
Nominal AC output voltage		208 V / 240 V / 277 V							208 V / 240 V		277 V
Operating AC voltage range (default)	208 V	183 - 229 V (-12 / +10 %)									
	240 V	211 - 264 V (-12 / +10 %)									
	277 V	244 - 305 V (-12 / +10 %)									
Max. continuous output current	208 V	14.4 A	18.3 A	24.0 A	28.8 A	36.1 A	48.1 A	54.8 A	27.7 A*	31.6 A*	n.a.
	240 V	12.5 A	15.8 A	20.8 A	25.0 A	31.3 A	41.6 A	47.5 A	24.0 A*	27.4 A*	n.a.
	277 V	10.8 A	13.7 A	18.1 A	21.7 A	27.1 A	36.1 A	41.2 A	n.a.	n.a.	14.4 A*
Number of phases		1							3		
Admissible conductor size (AC)		No. 14 - 4 AWG									
Max. continuous utility back feed current		0 A									
Nominal output frequency		60 Hz									
Operating frequency range		59.3 - 60.5 Hz									
Total harmonic distortion		< 3 %									
Power factor		1 (at nominal output power)									

GENERAL DATA Fronius IG Plus V		3.0-1 UNI	3.8-1 UNI	5.0-1 UNI	6.0-1 UNI	7.5-1 UNI	10.0-1 UNI	11.4-1 UNI	10.0-3 Delta	11.4-3 Delta	12.0-3 WYE277
Max. efficiency		96.2 %									
CEC efficiency	208 V	95.0 %	95.0 %	95.5 %	95.5 %	95.0 %	95.0 %	95.0 %	95.0 % **	95.0 %	n.a.
	240 V	95.5 %	95.5 %	95.5 %	96.0 %	95.5 %	95.5 %	95.5 %	96.0 % **	96.0 %	n.a.
	277 V	96.0 %	96.0 %	96.0 %	96.0 %	96.0 %	96.0 %	96.0 %	n.a.	n.a.	96.0 %
Consumption in standby (night)		< 1.5 W									
Consumption during operation		8 W		14 W			20 W				
Cooling		Controlled forced ventilation, variable speed fan									
Enclosure type		NEMA 3R									
Unit dimensions (W x H x D)		17.1 x 26.5 x 9.9 in.		17.1 x 38.1 x 9.9 in.			17.1 x 49.7 x 9.9 in.				
Power stack weight		31 lbs. (14 kg)		57 lbs. (26 kg)			84 lbs. (38 kg)				
Wiring compartment weight		24 lbs. (11 kg)		24 lbs. (11 kg)			26 lbs. (12 kg)				
Admissible ambient operating temperature		-13 °F ... +131 °F (-25 °C ... +55 °C)									
Compliance		UL 1741-2010, IEEE 1547-2003, IEEE 1547.1, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690, C22. 2 No. 107.1-01 (Sept. 2001), California Solar Initiative - Program Handbook - Appendix C: Inverter Integral 5 % Meter Performance Specification									

PROTECTION DEVICES Fronius IG Plus V	3.0-1 UNI	3.8-1 UNI	5.0-1 UNI	6.0-1 UNI	7.5-1 UNI	10.0-1 UNI	11.4-1 UNI	10.0-3 Delta	11.4-3 Delta	12.0-3 WYE277
Ground fault protection	Internal GFDI (Ground Fault Detector/Interrupter); in accordance with UL 1741-2010 and NEC Art. 690									
DC reverse polarity protection	Internal diode									
Islanding protection	Internal; in accordance with UL 1741-2010, IEEE 1547-2003 and NEC									
Over temperature	Output power derating / active cooling									

* per Phase
** preliminary

Fronius USA, LLC
10421 Citation Drive, Suite 1100
Brighton, MI 48116
E-Mail: pv-us@fronius.com
www.fronius-usa.com

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