



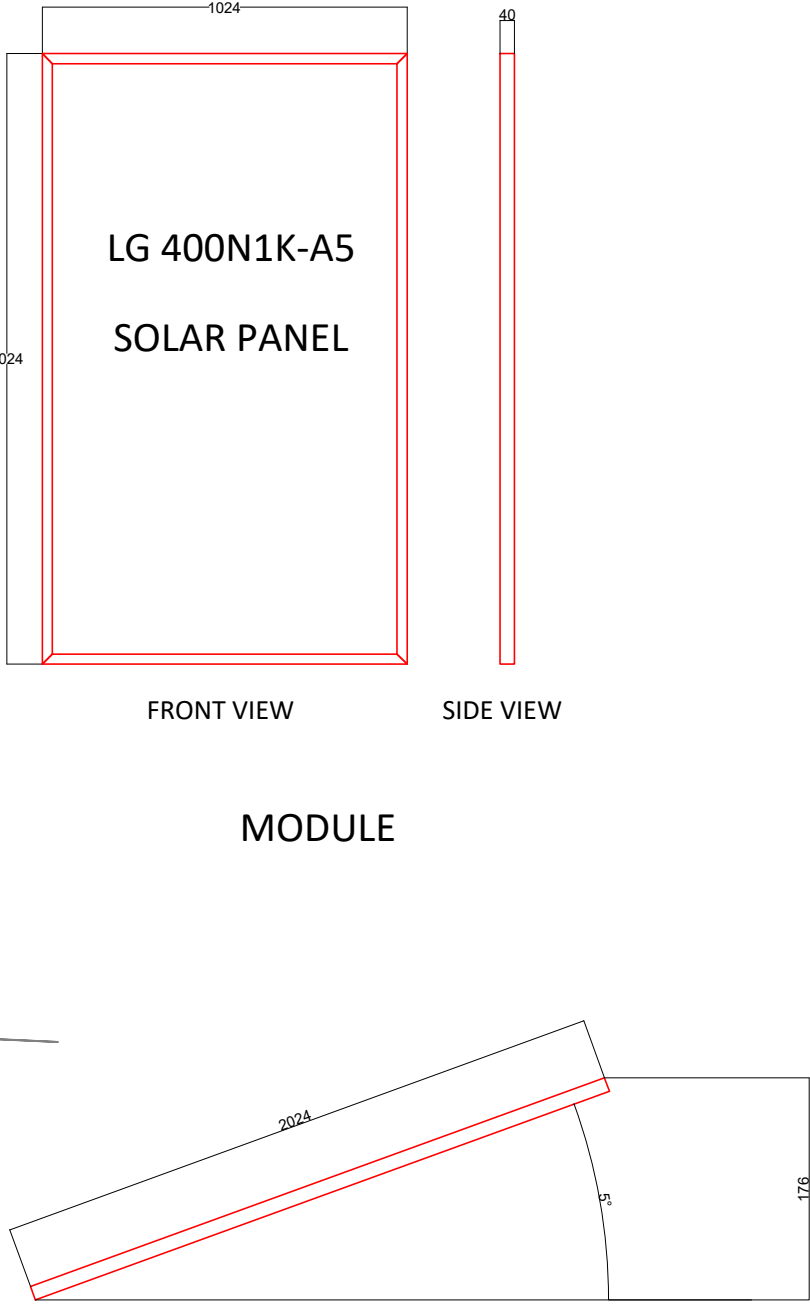
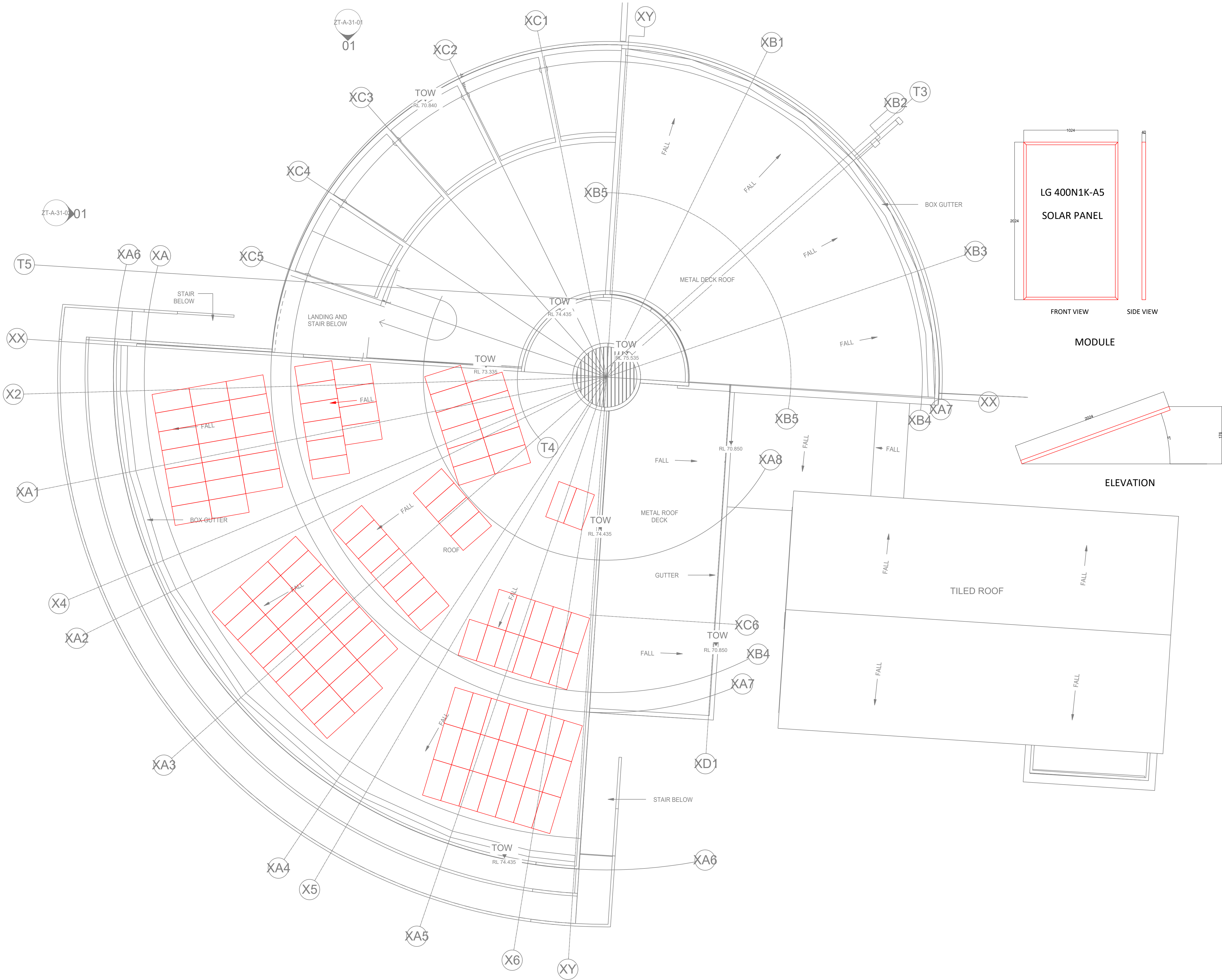
GENELEC Power Solutions

TOTAL SYSTEM SPECIFICATION

ITEM	SPECIFICATION	QTY
PANEL	LG 400N2W-A5	112
INVERTER	HUAWEI SUN2000-50KTL	1
TOTAL		44.80kWp

GENERAL NOTES

- THIS DRAWING IS THE COPYRIGHT OF GENELEC POWER SOLUTIONS PTY LTD AND MUST BE RETAINED, COPIED OR USED WITHOUT THE EXPRESS PERMISSION OF GENELEC POWER SOLUTION PTY LTD
- DO NOT SCALE FROM THE DRAWINGS
- ALL DIMENSION ARE IN MILLIMETERS AND LEVELS IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL DIMENSION TO BE VERIFIED ON SITE
- PV MODULES TO USE TEMPERED GLASS, BE SELF CLEANING AND ANTI-REFLECTIVE PV SERIES CONNECTIONS SHALL BE SECTIONALISED AT EACH PANEL. SO VDC AT STC IS WITHIN ELV RANGE. IP67 SEGMENT CONNECTORS TO BE USED.
- DOUBLE INSULATED PV1-F CABLES INSTALLED IN UV RESISTANT CABLE TRAY /CONDUIT SHALL BE USED IN ARRAY AREA.
- THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
  - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
  - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
  - AS3000: ELECTRICAL WIRING RULES
  - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
- INSTALLATION TO BE LABELLED IN ACCORDANCE WITH RELEVANT SERVICE AND INSTALLATION RULES AS WELL AS AS 5033.
- ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
- EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
- ACCORDING TO SECTION 5.5.2 OF AS/NZS 5033:2014, WHERE THE MULTIPLE DC DISCONNECTION DEVICES ARE USED THAT ARE NOT GANGED THE FOLLOWING SIGN SHALL BE PLACE ADJACENT TO INVERTER:  
"WARNING: MULTIPLE DC SOURCES TURN OFF ALL DC ISOLATORS TO ISOLATE THE EQUIPMENT"
- IN CASE THE INTERNAL ISOLATOR OF THE INVERTER IS BEING USED, THE INSTALLER NEEDS TO VERIFY THE CORRECT RATINGS FOR VOLTAGE & CURRENT AND COMPLIANCE WITH AS/NZS 5033:2014.



PROJECT

**TARONGA ZOO**  
BRADLEYS HEAD ROAD, MOSMAN NSW 2088

**GENELEC POWER  
SOLUTIONS PTY LTD**  
www.genelecps.com.au

**DRAWING TITLE**  
**TARONGA ZOO**  
**WESTERN QUADRANT**  
**PV SYSTEM LAYOUT**  
**w/400W**  
**44.80kWp**

SCALE	DRAWN	CHECKED	SIZE
NTS	D.MCVERNON	D.MCVERNON	
	DATE	DATE	
	07/09/2018	07/09/2018	

**DRAWING No.**  
**GPS/western\_quadrant**

Rev  
**002**





GENELEC Power Solutions

TOTAL SYSTEM SPECIFICATION

ITEM	SPECIFICATION	QTY
PANEL	LG 400N2W-A5	97
INVERTER	HUAWEI SUN2000-33KTL	1
TOTAL		38.80kWp

GENERAL NOTES

- THIS DRAWING IS THE COPYRIGHT OF GENELEC POWER SOLUTIONS PTY LTD AND MUST BE RETAINED, COPIED OR USED WITHOUT THE EXPRESS PERMISSION OF GENELEC POWER SOLUTION PTY LTD
- DO NOT SCALE FROM THE DRAWINGS
- ALL DIMENSION ARE IN MILLIMETERS AND LEVELS IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL DIMENSION TO BE VERIFIED ON SITE
- PV MODULES TO USE TEMPERED GLASS, BE SELF CLEANING AND ANTI-REFLECTIVE PV SERIES CONNECTIONS SHALL BE SECTIONALISED AT EACH PANEL SO VOC AT STC IS WITHIN ELV RANGE. IP67 SEGMENT CONNECTORS TO BE USED.
- DOUBLE INSULATED PV1-F CABLES INSTALLED IN UV RESISTANT CABLE TRAY /CONDUIT SHALL BE USED IN ARRAY AREA.
- THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
  - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
  - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
  - AS3000: ELECTRICAL WIRING RULES
  - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
- INSTALLATION TO BE LABELLED IN ACCORDANCE WITH RELEVANT SERVICE AND INSTALLATION RULES AS WELL AS AS 5033.
- ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
- EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
- ACCORDING TO SECTION 5.5.2 OF AS/NZS 5033:2014, WHERE THE MULTIPLE DC DISCONNECTION DEVICES ARE USED THAT ARE NOT GANGED THE FOLLOWING SIGN SHALL BE PLACE ADJACENT TO INVERTER - "WARNING: MULTIPLE DC SOURCES TURN OFF ALL DC ISOLATORS TO ISOLATE THE EQUIPMENT"
- IN CASE THE INTERNAL ISOLATOR OF THE INVERTER IS BEING USED, THE INSTALLER NEEDS TO VERIFY THE CORRECT RATINGS FOR VOLTAGE & CURRENT AND COMPLIANCE WITH AS/NZS 5033:2014.

Rev	Description	Date	Checked
2	Module-Elevation	07/09/2018	E.B.
1	Pv Array Layout	03/09/2018	E.B.
0	Pv Array Layout	15/07/2018	E.B.

PROJECT

TARONGA ZOO

BRADLEYS HEAD ROAD, MOSMAN NSW 2088

GENELEC POWER SOLUTIONS PTY LTD

www.genelepcs.com.au

DRAWING TITLE

TARONGA ZOO RESTAURANT PV SYSTEM LAYOUT w/400W 38.80kWp

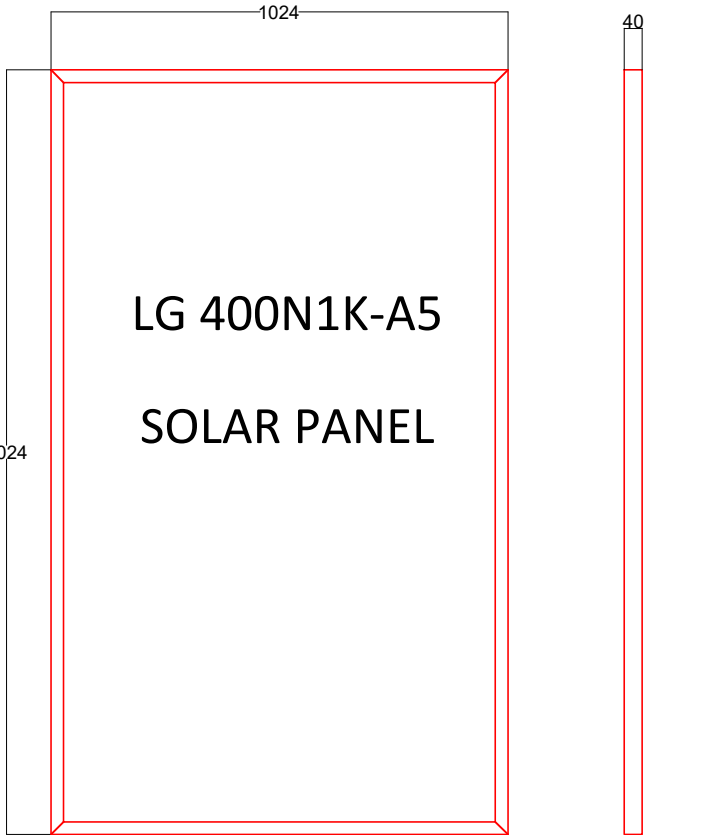
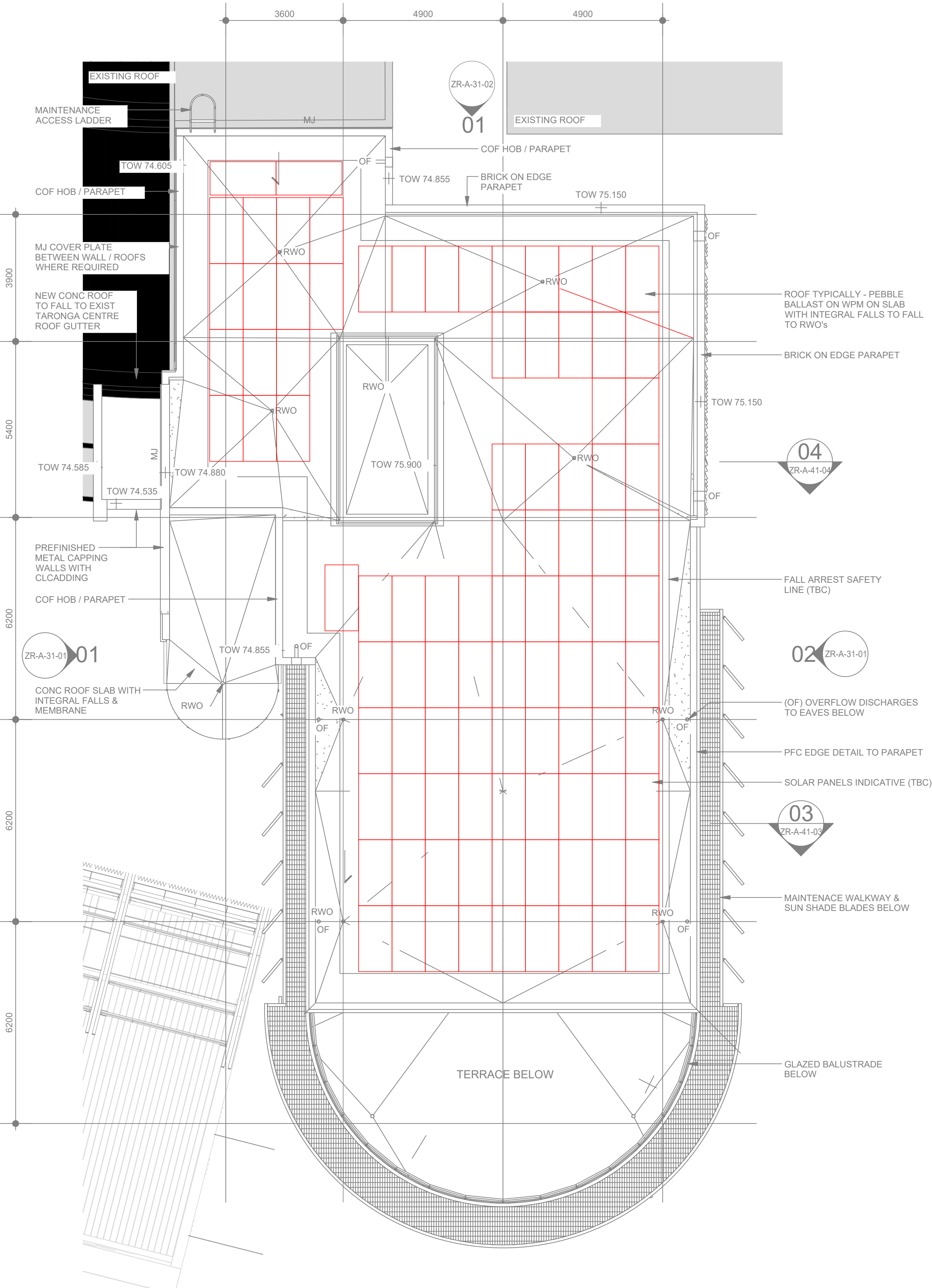
SCALE	DRAWN	CHECKED	D.MCVERNON	SIZE
NTS	DATE	DATE	DATE	
	07/09/2018	07/09/2018	07/09/2018	

DRAWING No.

GPS/ZR-A-21-03(B)

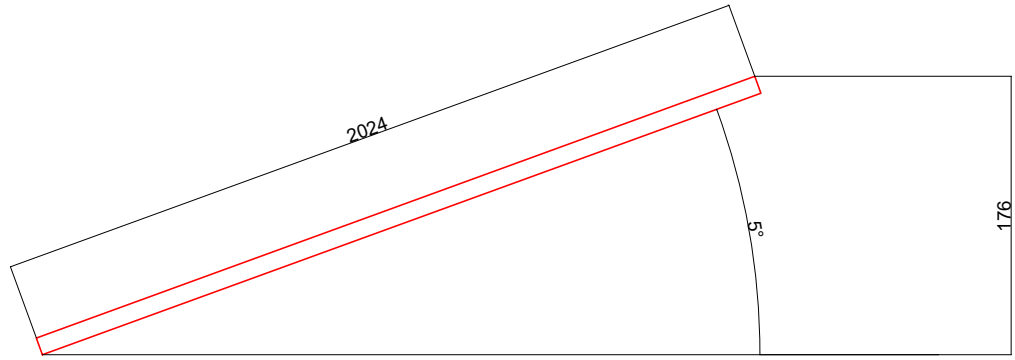
Rev

002



FRONT VIEW SIDE VIEW

MODULE



ELEVATION



# LG NeON<sup>®</sup> 2

LG400/405N2W-A5

**THE 72 CELL POWER HOUSE**

**UP TO 19.5% MODULE EFFICIENCY**



## THE NeON<sup>®</sup> 2 72 CELL - THE PANEL OF THE FUTURE AVAILABLE TODAY

The new LG NeON<sup>®</sup> 2 72 cell has seen many improvements, from longer warranties and higher efficiency to more busbars. This panel is ideal for commercial systems or solar farms seeking an efficient use of space and a high quality panel with great output efficiency.

The new NeON<sup>®</sup> 2 with 72 cells adopts the award winning CELLO Technology replacing 3 busbars in each cell with 12 thin wires to enhance power output. This technology sets a new standard for innovation and was recognised with the 2015 Photovoltaic Innovation Award at the Intersolar Industry Event in Germany.



### More Power per Square Metre

LG NeON<sup>®</sup> 2's 405W are a similar physical size to many conventional 320W 72 cell panels. This means with the LG NeON<sup>®</sup> 2 405W you get 26% more electricity per square metre than a 320W panel. So you can install more kW of solar on your roof with the LG NeON<sup>®</sup> 2.



### 25 Years Product Warranty (Parts & Labour)

LG has extended the product warranty of the LG NeON<sup>®</sup> 2 by an additional 15 years from industry average 10 to 25 years. This includes coverage for labour and transport.



### Improved High Temperature Performance

Solar panels slowly lose ability to generate power as they get hotter. LG NeON<sup>®</sup> 2, has an improved temperature co-efficient of -0.36%/°C to our previous model and to the majority of competitor models which means in high temperatures LG NeON<sup>®</sup> 2 panels will deliver higher output.



### Improved 25 Year Performance Warranty

The initial degradation of cells has been improved from -3% to -2%, in the 1st year and the annual rate of degradation has fallen from -0.7%/year to -0.5%/ year thereafter. This brings an 86% warranted output at 25 years, compared to 80.2% for many standard panels.

# LG NeON<sup>®</sup> 2 - 72 Cell

## ABOUT LG SOLAR

LG Electronics embarked on a solar energy research programme in 1985, using our vast experience in semi-conductors, chemistry and electronics. LG Solar modules are now available in 32 countries. In 2013, 2015 and 2016 the LG NeON<sup>®</sup> range won the acclaimed Intersolar Award in Germany, which demonstrates LG Solar's lead in innovation and commitment to the renewable energy industry.

With over 200 lesser known brand panels selling in Australia, LG solar panels offer a peace of mind solution, as they are backed by an established global brand.

## KEY FEATURES



### Proven Field Performance

LG has been involved in a number of comparison tests of the LG panels against many other brand panels. LG NeON<sup>®</sup> models are consistently among the best performing in these tests.



### Additional Certification

LG NeON<sup>®</sup> 2 panels have received additional certification including for, Salt Mist Corrosion to maximum severity 6. Ammonia Resistance certification and PID Resistance Tests.



### Strict Quality Control Reliable for the Future

The quality control of LG world-class production processes is monitored and improved to Six Sigma quality control standards, which includes 500+ monitoring points to effectively maintain and improve our uncompromising standards.



### Multi Anti-reflective Coatings Increase Output

LG is using an anti-reflective coating on the panels glass as well as on the cell surface to ensure more light is absorbed in the panel and not reflected. More absorbed light means more electricity generation.



### Installation Time Savings

This NeON<sup>®</sup> 2 - 72 cell panel can reduce installation time for commercial systems, as there are less panels required eg. to install a 3.2 MW system one would need 8,000 LG400W and 10,000 of a 320W - 72 cell panel. There will also be significant savings in design, transport, labor, rails and cabling and 20% less space required.



### "CELLO" Technology Increases Power

"CELLO" Multi wire busbar cell technology lowers electrical resistance and increases panel efficiency, giving more power per panel and provides a more uniform look to the panel.



### Low LID

The N-type doping of the NeON<sup>®</sup> cells results in extremely low Light Induced Degradation (LID) when compared with the standard P-type cells. This means more electricity generation over the life of the panel.



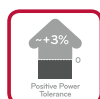
### Extensive Testing Programme

LG solar panels are tested between 2 to 3 times the International Standards at our in-house testing laboratories, ensuring a very robust and longer lasting solar module.



### Double-Sided Cell Structure

In conventional panels the cells produce energy from the front only. The NeON<sup>®</sup> Cell produces energy from both the front as well as the back of the cell. This innovative technology allows the absorption of light from behind the panel which raises the panel's efficiency and electricity output.



### Positive Tolerance (0/+3%)

If we sell you a 400 Watt panel then the flash test of this panel will show somewhere between 400W and 412.1W. Some competitor panels have -/+ tolerance, so you could get a flash test result below the rated Watt, meaning you pay for Watts you never get.



### Excellent low light performance

LG NeON 2 panels will give better performance under low light, such as early morning or late afternoon compared to standard panels. At 200W/m<sup>2</sup> LG Neon 2 panel efficiency drop is -2% while many conventional panels reduce by -4%.



### Automated Production in South Korea

All LG solar panels are manufactured in a custom designed and fully automated production line by LG in Gumi, South Korea ensuring extremely low tolerances. This means great consistency between panels.



## LG NeON<sup>®</sup> 2 72 cell– INNOVATIVE, CLEVER, HIGH EFFICIENT

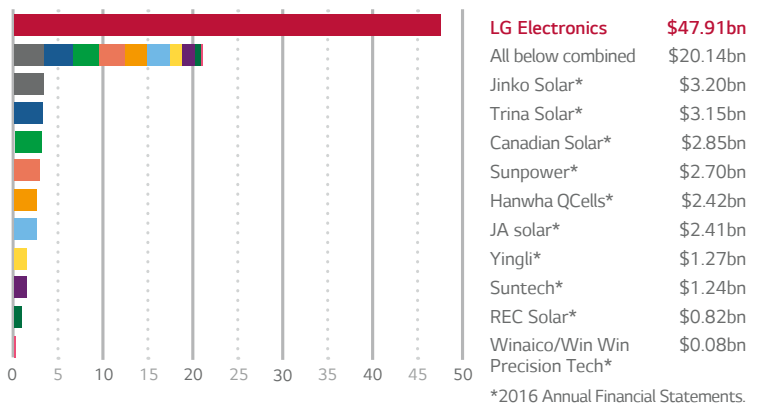
LG NeON<sup>®</sup> 2 72 cell solar modules now offer even more performance. Featuring LG's 12 wire busbar CELLO Technology for improved performance and reliability, it can also withstand a front load of 5,400 pascals. LG has extended its product warranty from 10 to 25 years and improved its linear performance guarantee to at least 84.8 % of nominal output after 25 years.

### LOCAL WARRANTY, GLOBAL STRENGTH

LG Solar is part of LG Electronics Inc., a global and financially strong company, with over 50 years of experience in technology.

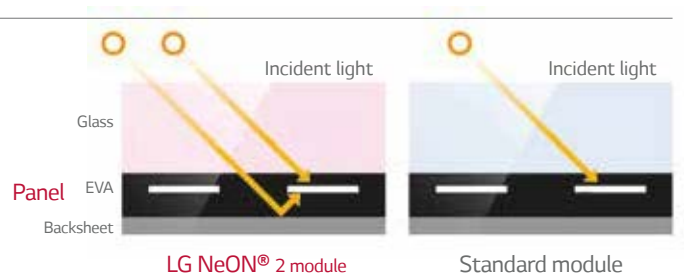
Good to know: LG Electronics Australia Pty Ltd is the warrantor in Australia and NZ for your solar modules. So LG support, via offices in every Australian mainland state and NZ and through our 70 strong, Australia wide dealer network, is only a phone call away.

The warrantor's 2016 sales in billions of US dollars



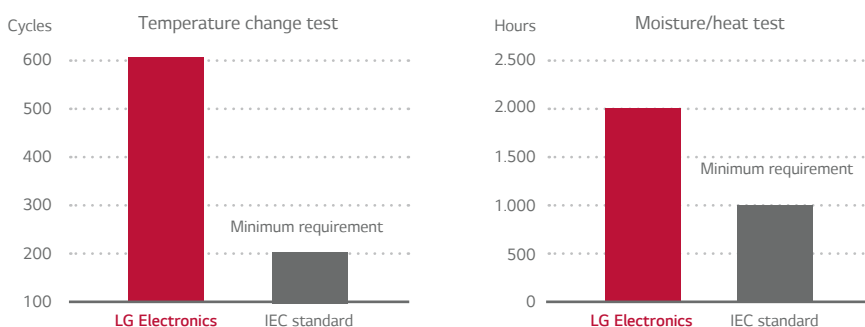
### HIGHER OUTPUT, HIGHER YIELD

The NeON<sup>®</sup> Cell produces energy from both the front and the back of the cell. This innovative approach allows the absorption of light from the back of the cell which raises the panel's efficiency and power output. Standard panels only absorb light from the front.



### EXCELLENT QUALITY, THOROUGHLY TESTED

You can rely on LG. We test our products with at least double the intensity specified in the IEC standard. (International Quality Solar Standard).



Our panel range have won a string of International Awards.

### POWERFUL OUTPUT, GREAT WARRANTY

If you buy an LG panel and should there be a warranty issue you will deal with LG Electronics Australia/NZ. You will not have to worry if the importer is still in operation or the manufacturer is located overseas. We are only one phone call away. LG Electronics Australia/NZ backs your product. That's peace of mind. Contact us on [solar.sales@lge.com.au](mailto:solar.sales@lge.com.au) or ph 61-2-88054038.

**Extended Product Warranty**  
**10yrs + 15yrs**

LG offers a fifteen year longer product warranty for parts and labour than many competitors 10 years to an impressive 25 years.

## Mechanical Properties

Cells	6 x 12
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	161.7 x 161.7 mm
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	2024 x 1024 x 40 mm
Front Load	5400 Pa
Rear Load	4300 Pa
Weight	21.7 kg
Connector Type	Genuine MC4, IP68 (Male: PV-KST4) (Female: PV-KBT4)
Junction Box	IP68 with 3 bypass diodes
Length of Cables	2 x 1200 mm
Front cover	High transmission tempered glass
Frame	Anodised aluminum

## Certifications and Warranty

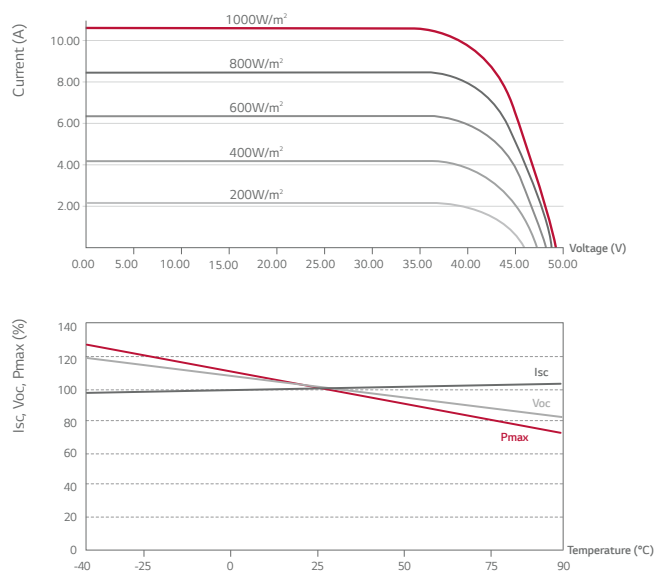
Certifications	ISO 9001
	IEC 61215, IEC 61730-1/-2
	IEC 62716 (Ammonia Test)
	IEC 61701 (Salt Mist Corrosion Test)
Module Fire Rating	Class C
Product Warranty	25 Years (Manufactured after 1/3/2018)
Output Warranty of Pmax (Measurement Tolerance $\pm 3\%$ )	Linear Warranty <sup>1</sup>

<sup>1</sup> 1) 1st year: 98%, 2) After 1st year: 0.5%p annual degradation, 3) 86% for 25 years

## Temperature Characteristics

NOCT	45 ± 3 °C
Pmax	-0.36 %/°C
Voc	-0.26 %/°C
Isc	0.02 %/°C

## Characteristic Curves



### Electrical Properties (STC<sup>2</sup>)

Module Type	400 W	405 W
Maximum Power Pmax (W)	400	405
MPP Voltage Vmpp (V)	40.6	41.0
MPP Current Impp (A)	9.86	9.89
Open Circuit Voltage Voc (V)	49.3	49.4
Short Circuit Current Isc (A)	10.47	10.51
Module Efficiency (%)	19.3	19.4
Operating Temperature (°C)	-40 ~ +90	
Maximum System Voltage (V)	1000 (IEC) / 1500 (UL)	
Maximum Series Fuse Rating (A)	20	
Power Tolerance (%)	0 ~ +3	

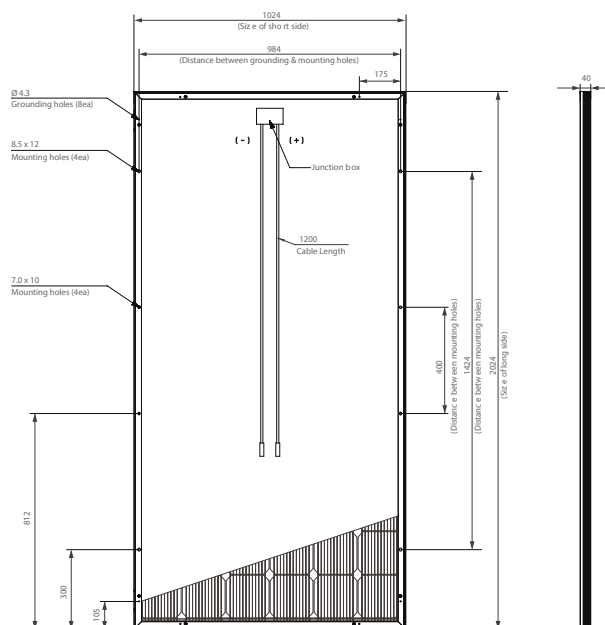
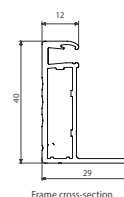
<sup>2</sup> STC (Standard Test Condition): Irradiance 1000 W/m<sup>2</sup>, Module Temperature 25 °C, AM 1.5.  
The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.

### Electrical Properties (NOCT<sup>3</sup>)

Module Type	400 W	405 W
Maximum Power Pmax (W)	296	300
MPP Voltage Vmpp (V)	37.6	38.0
MPP Current Impp (A)	7.88	7.91
Open Circuit Voltage Voc (V)	46.1	46.2
Short Circuit Current Isc (A)	8.41	8.44

<sup>3</sup> NOCT (Nominal Operating Cell Temperature): Irradiance 800 W/m<sup>2</sup>, ambient temperature 20 °C, wind speed 1 m/s

### Dimensions (mm)



\* The distance between the center of the mounting/grounding holes.

