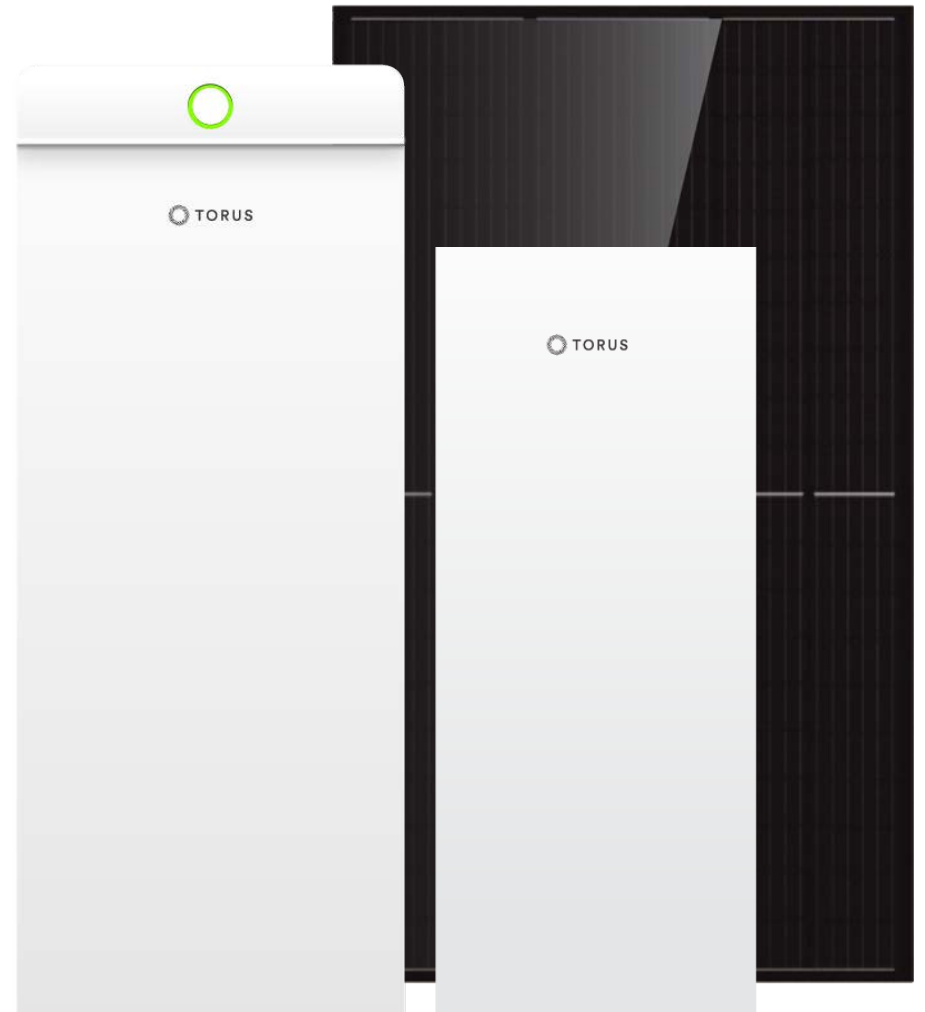
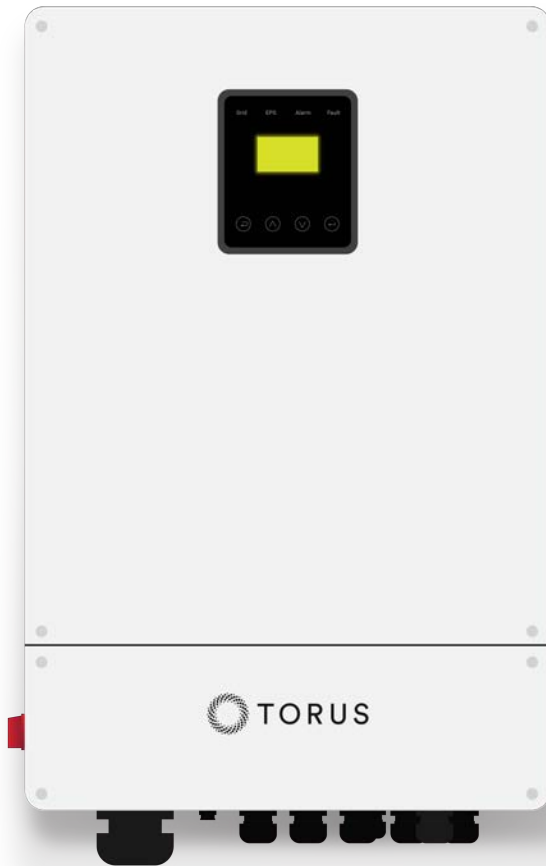


Torus Station Core TSC-R



Torus Inverter

LVI-R



Summary

The Torus LVI-R supports multi-inverter connections, accommodating up to three devices simultaneously, and allowing them to interface with the Torus battery system.

Each inverter boasts a load capacity of 33.3A per inverter for up to 100A of total capacity (with 3 inverters), and the system utilizes parallel SOC equalization control and parallel current sharing control for optimal performance.

By employing split-phase topology and eliminating transformers, the system achieves higher efficiency overall.

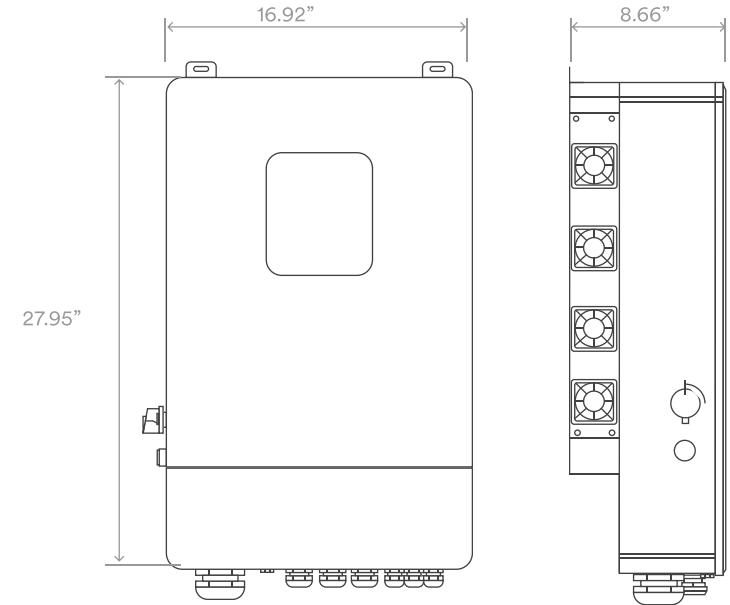
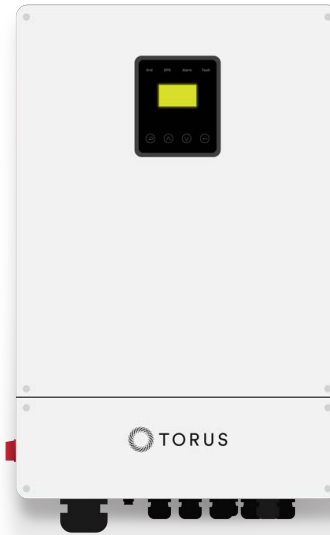
Additionally, it supports simultaneous renewable energy, grid power, and optional diesel generator while facilitating peak load shifting. The Torus LVI-R ensures the continuous operation of critical loads, enhancing overall reliability and performance.

Key Features

- Certification: UL 9540
- Multi-Inverter Modes (Peak Shaving, Battery Priority, Self Consume)
- 12kW Max DC input, 8kW AC output
- IEEE 1547, IEEE 2030.5, Hawaii Rule 14H, Rule 21 Phase I, II, III
- 33.3A (up to 100A with 3 inverters) load capacity, up to four MPPTs

Torus Inverter

LVI-R



PV INPUT DATA

Max DC Input Power	12 kW
MPPTs	4
MPPT Range	120 - 500V
Max DC Input Voltage	500V
Max Input Current	12A
Max MPPT Power	3.6 kW

BATTERY INPUT DATA

Nominal voltage (VDC)	48V
Max Charging/Discharging Current	190A/190A
Battery Voltage Range	40-60V
Battery Type	Flywheel Energy Storage, Lithium
Charging Strategy for Li-Ion Battery	Self-adaption to BMS

AC OUTPUT DATA (ON-GRID)

Nominal output power Output to Grid	8KVA
MAX. Apparent Power Output to Grid	8.8KVA
Output Voltage Range	110-120/220-240V split phase, 1Ø, 230 1 phase
Output Frequency	50/60Hz (45 to 54.9Hz / 55 to 65Hz)
Nominal AC Current Output to Grid	33.3A
Max AC Current Output to Grid	36.7A
Output Power Factor	-0.8 to +0.8
OutPut THDI	< 2%

AC OUTPUT DATA (BACK-UP)

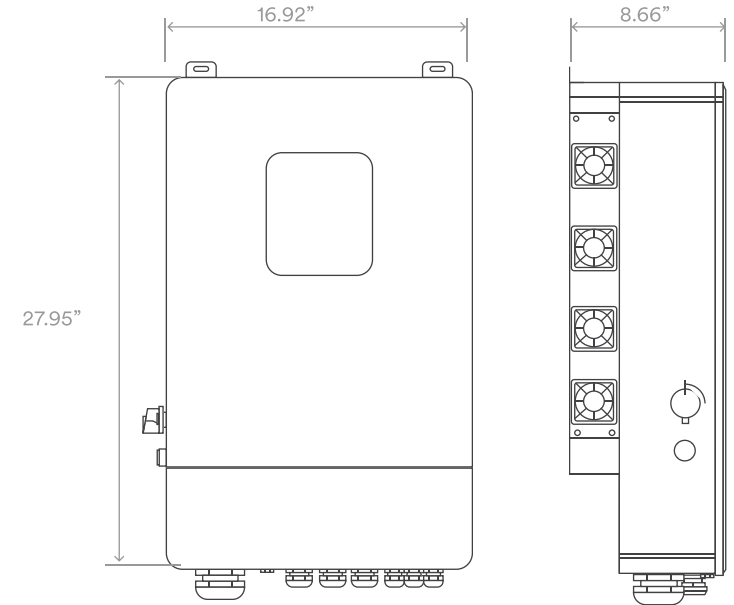
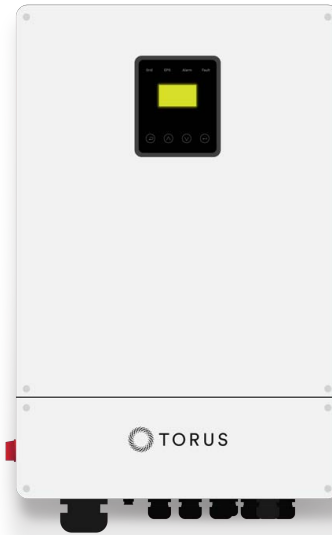
Nominal. Apparent Power Output	8KVA
Max. Apparent Power Output	8.8KVA
Nominal Output Voltage L-N/L1-L2	120/240V
Nominal Output Frequency	60Hz
Output THDU	< 2%

EFFICIENCY DATA

Europe Efficiency	>=97.8%
Max. Battery to Load Efficiency	>=97.2%

Torus Inverter

LVI-R



PROTECTION DATA

Grounding detection	Yes
Arc fault protection	Yes
Island protection	Yes
Battery reverse polarity	Yes
Insulation resistor detection	Yes
Residual current monitoring unit	Yes
Output over current protection	Yes
Back-up output short protection	Yes
Terminal temperature detection	Yes
Output over voltage protection	Yes
Output under voltage protection	Yes

GENERAL DATA

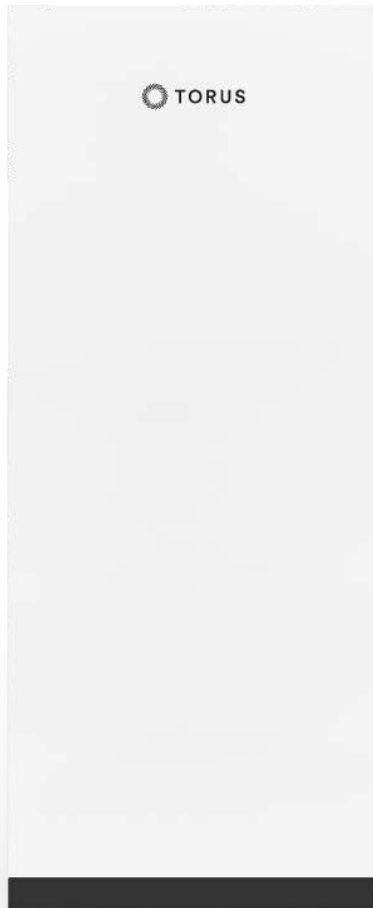
Output Conduit	25.4mm (1 in.)
PV Input Conduit	25.4mm (1 in.)
BAT Input Conduit	38.1mm (1.5 in.)
Operating Temperature Range	-.25 ~ +60°C (-13°F to 140°F)
Relative Humidity	0-95%
Operating Altitude	0~4000m (0 to 13,123 ft)
Ingress Protection	IP65/NEMA 3R
Weight	32kg (70.5 lbs)
Size (W X H X D)	430mm x 710mm x 220mm (17" x 28" x 8.7")
Cooling	Forced air and natural convection
Noise emission	38 – 70 dB
Display	LCD
Communication With BMS/ Meter/EMS	RS485, CAN
Supported communication interface	RS485, WLAN, 4G (optional)
Self-consumption at night	< 2.5 W (with battery enabling < 5 W)

SAFETY DATA

Certifications	UL 9540, UL1741SA all options, UL1699B, CSA 22.2
EMC	FCC Part 15 Class
Grid connection standards	IEEE 1547, IEEE 2030.5, Hawaii Rule 14H, Rule 21 Phase I,II,III

Torus Smart Battery

LIF-R



Summary

The Torus LIF-R uses a rechargeable high performance lithium iron phosphate (LFP) battery pack that is compact and easy to install. It seamlessly integrates with the Torus Station as a time-based control battery backup that will help stabilize the grid and help provide power at peak times.

The LIF-R interface connects easily with any home or building. It is designed to store energy from solar panels or the grid, allowing customers to use stored power in case of a power outage, acting like a generator but without the need for fuel, thereby reducing reliance on the grid.

Multiple LIF-R batteries can work in parallel giving flexibility and scale based on the needs of the home. It's safe and certified.

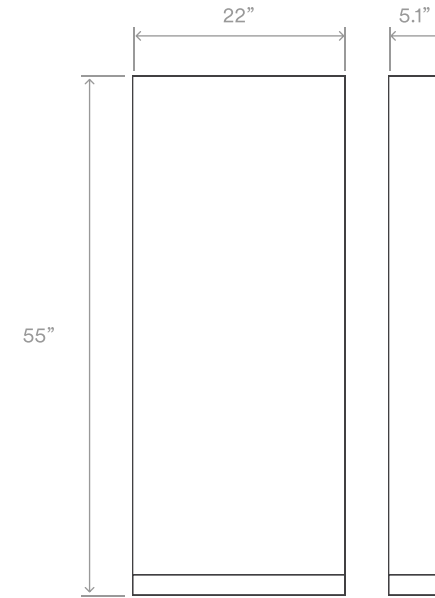
Key Features

- Lithium Iron Phosphate (LFP) chemistry
 - Certifications include UL9540, UL9540A, UL1973, UN38.3
 - Cycle life of over 7500 cycles@0.5C, 90% DOD, 77°F
 - Calendar life of over 10 years with Torus Station
 - Communication protocol: RS232, RS485, CAN
-



Torus Smart Battery

LIF-R



TECHNICAL DATA

Chemistry	Lithium Ion Phosphate (LFP)
Nominal Voltage	51.2V
Voltage Range	47.5V - 57.6V
Nominal Capacity	200Ah
Nominal Energy	10.24kWh
Unit Dimensions (L x W x H)	1400 mm x 560mm x 130mm (55.1" x 22" x 5.1")
Unit Weight	102kg (225 lbs)
Charge/Discharge Current	100A
Peak Current	204A for 15s
Round-Trip Efficiency	95%
Communication Protocol	RS232, RS485, CAN

OPERATING DATA

Operating Temperature	<ul style="list-style-type: none">• Charge: 32°F - 113°F• Discharge: 14°F - 122°F
Cycle Life	≥7000 cycles@0.5C, 90% DOD, 77°F
Calendar Life	≥10 years
Certifications	UL9540; UL9540A; UL1973; UN38.3

Torus Control™ CNS

CNS-R



Summary

The Torus CNS is designed to report, regulate, and monitor renewable energy generation, storage, and consumption empowering the user to make smarter decisions in their energy consumption.

The Torus CNS contains the command and control interface between the hardware and our cloud architecture. The firmware architecture of the CNS allows it to be configured to communicate with different hardware components, such as inverters, batteries, and appliances in the home.

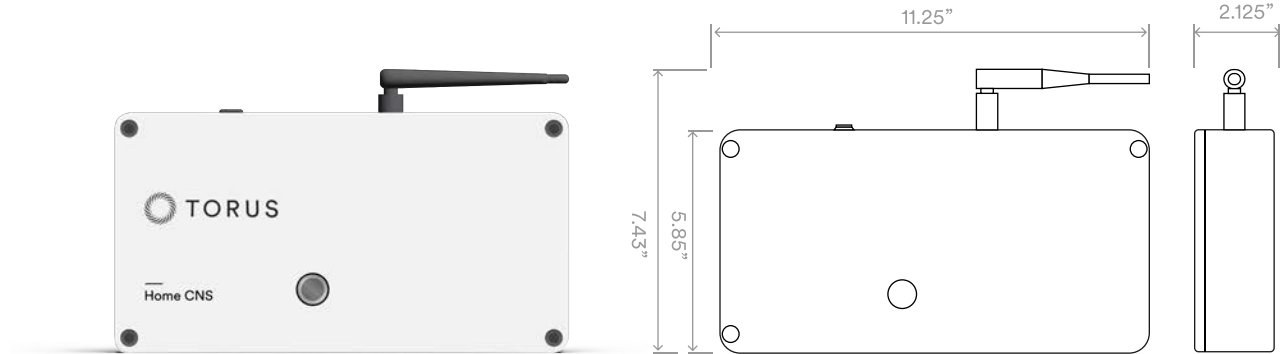
The Torus CNS can support multiple inverters and restructure MQTT messages to support aggregated reporting of real-time values to the cloud. It also supports multiple hardware modes – self-consume, battery priority, off-grid, and peak shift.

Key Features

- Command and control interface between hardware and cloud
- Multiple inverter support, aggregated real-time reporting
- Over-the-air firmware updates
- SSH support for troubleshooting
- Configurability for multiple hardware support – inverters, batteries, home appliances, smart panels

Torus Control™ CNS

CNS-R



TECHNICAL DATA

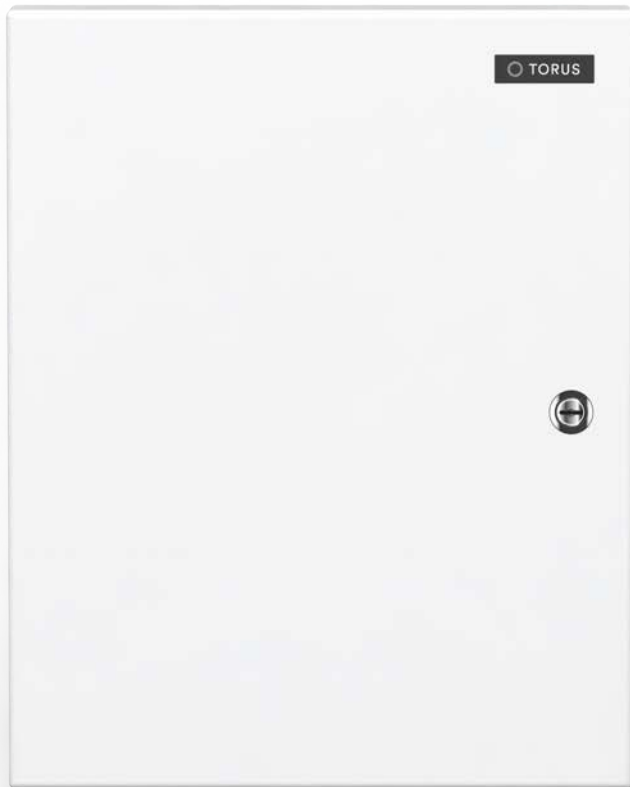
CPU	i.MX 8M Mini family ARM Cortex-A53 Core 1.8GHz
CPU Clock Speed	1600MHz
Memory	DDR4, 2048MB
Flash	eMMC 8GB
Networking	<ul style="list-style-type: none"> • 10/100/1000 Mbit/s Ethernet Interface • Certified dual band Wi-Fi 802.11 ac/a/b/g/n • Bluetooth: 4.2/BLE
Operating Temperature Range	-40 to 85°C (-40°F to 185°F)
USB	<ul style="list-style-type: none"> • USB3.0/2.0 OTG Type C • USB2.0 Host Type A
CAN Bus	CAN Transceiver with CAN FD support via RJ45
RS-485	50Mbps Half-Duplex RS-485/RS-422 Transceiver via RJ45

TECHNICAL DATA (CONTINUED)

Power Supply	<ul style="list-style-type: none"> • Input: 100Vac - 240Vac 50Hz / 60Hz • Output Voltage: 12V • Output Current: 0 – 2 A • Maximum Power: 24W • Operation Temperature: -10C to 40C • Model Number: Chanzon 2ABL024F
Dimensions (L x W x H)	286 x 147 x 54 mm
Certifications	<ul style="list-style-type: none"> • Power Supply - FCC (USA), UL E161451 ITE Power Supply, RoHS R43016 • Carrier Board - UL94V-0, Wi-Fi/BT antennas FCC (USA), IC (Canada), ETSI (EU), RoHS I/II/III

Torus Off-Grid

SITTM-R



Summary

The power transfer switch assembly allows for off-grid power without limiting full electrical service capability, all without any major re-wiring of house circuits.

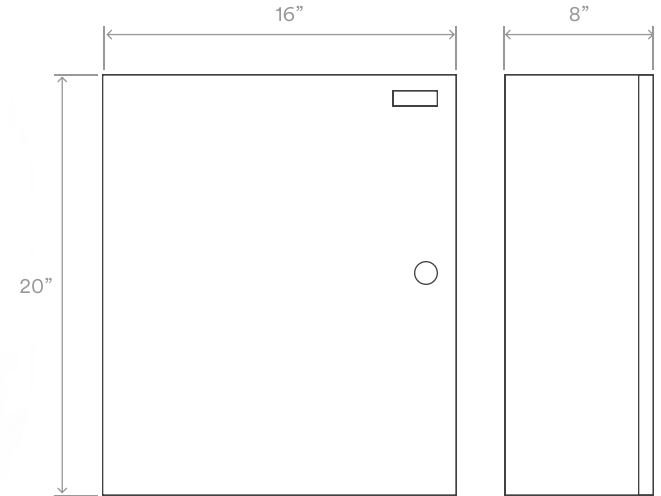
During a power outage, this assembly disconnects from the electric grid in 1/60th of a second, allowing the home to operate seamlessly off-grid as long as renewables and backup power are available.

If the home owner chooses to go off-grid they can do so seamlessly by pushing Off-Grid button via the Torus App. The Torus Off-Grid box comes in a wall mounted (or pole mounted) outdoor-rated enclosure.

Key Features

- Seamless disconnection from grid to self-powered
- Improve energy independence and security with Off-Grid
- Automatic transfer switch when the power goes out
- User-controlled off-grid capability

Torus Off-Grid SITTM-R



GENERAL DATA

Material	Metal
Dimensions	508mm x 406mm x 203 mm (20" x 16" x 8")
Weight	15kg (33 lbs.)
Temperature Range	-20°C to 60°C (-4°F to 140°F)
Humidity	Humidity ≤ 90% RH
Inside Mounting Attachments	<ul style="list-style-type: none"> • Electrical Junction box with Mounting Plate • DIN Rail(s) • Mounting brackets
Penetrations	<ul style="list-style-type: none"> • Knockouts for 3/4", 1", 2" and 3" conduit • Knockout for CNS WiFi antenna (on both left and right sides) • Mounting Screw holes
Options	<ul style="list-style-type: none"> • Single Inverter • Dual Inverter • Tri Inverter

GENERAL DATA (CONTINUED)

Mounting	Wall or Poll mount
NEMA Rating	IP66 Waterproof and dustproof.
Certifications & Standards	<p>CNS shall have the following certifications and Standards:</p> <ul style="list-style-type: none"> • FCC -Class B • ANSI UL 9540 • CEC (California Energy Commission) • RoHS Certification • ESD Immunity • IEC/TC 120 • NFPA 855 • ISO 9001/ ISO 27001/ ISO 30001 • Third party penetration testing

Torus EV Charger

AC-II-R



Summary

The Torus EV charging station, a Level II charger, provides versatile charging options for any electric vehicle (EV) with its adjustable amperage, up to 40 amps with a 22" NEMA 14-50P and up to 48 amps with hardwiring. Its watertight NEMA Type 4 enclosure makes it suitable for both indoor and outdoor installation.

It is a UL and ENERGY STAR certified product, the charger meets various safety standards including NEC 625, SAE J1772, UL 817, UL 991, UL 2231, UL 2251, and UL 2594. The charger comes with a SAE J1772 connector and a 24' cable to ensure compatibility with any EV.

With its WiFi connectivity, it syncs with the Torus Station mobile app for intelligent charging during low-demand periods or using surplus solar power. The device also supports real-time energy data monitoring, facilitating efficient energy management of variable utility rate charges.

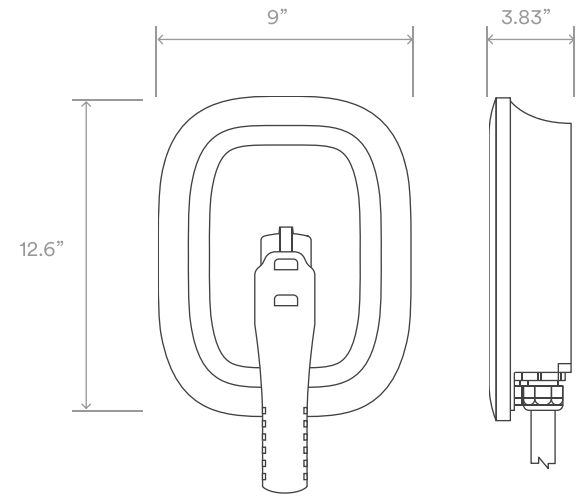
Key Features

- Indoor and outdoor installation
- Certifications: NEC 625, SAE J1772, UL 817, UL 991, UL 2231, UL 2251, and UL 2594
- 11.5kW (240V/48A) / 9.6kW (240V/40A) / 10kW (208V/48A) / 8.3kW (208V/40A) (up to 48A hardwired or up to 40A NEMA Type 14-50P with 24" cable compliant with 2017 NEC Section 625.17(A)(3))
- Compatible with any EV with SAE J1772 connector (adapter required for Tesla EVs)



Torus EV Charger

AC-II-R



GENERAL DATA

Charger Type	Level 2 / 48A
Input Voltage	208/240VAC @ 50/60Hz
Power Charge	11.5kW (240V/48A) / 9.6kW (240V/40A) / 10kW (208V/48A) / 8.3kW (208V/40A)
Power Wiring	NEMA Type 14-50P (up to 40A) / Hardwired (up to 48A)
Dedicated Breaker / Max Charge	15A (2.9kW / 12A max charge) 20A (3.8kW / 16A max charge) 25A (4.8kW / 20A max charge) 30A (5.8kW / 24A max charge) 35A (6.7kW / 28A max charge) 40A (7.7kW / 32A max charge) 45A (8.6kW / 36A max charge) 50A (9.6kW / 40A max charge) 60A (11.5kW / 48A max charge) Hardwired Only 70A (11.5kW / 48A max charge) Hardwired Only 80A (11.5kW / 48A max charge) Hardwired Only
Connector	7.4m (24 ft) cable SAE J1772 connector - Compatible with any EV (adapter required for Tesla)

GENERAL DATA (CONTINUED)

Dimensions	Charging Station: 12.6" x 9" x 3.4" (320mm x 230mm x 86mm) Charging Gun: 5.3" x 2.2" (135mm x 56mm)
Enclosure	Watertight NEMA Type 4 indoor/outdoor
Temperature Range	-22°F to 122°F (-30°C to 50°C)
Certifications	FCC Parts 15b & c UL Listed E528156 Energy Star Certified 2397026
WiFi	2.4 GHz 802.11b/g/n
FCC ID	2AS6P-EMEVSE1

ELECTRICAL DATA

Maximum Charging Power	11.52 kW (1 Phase)
Rated Current	Configurable from 6 A to 48A (up to 11,520 watts at 240 VAC)
Configurable Current	6 A to 48A (1440 watts up to 11,520 watts at 240 VAC)

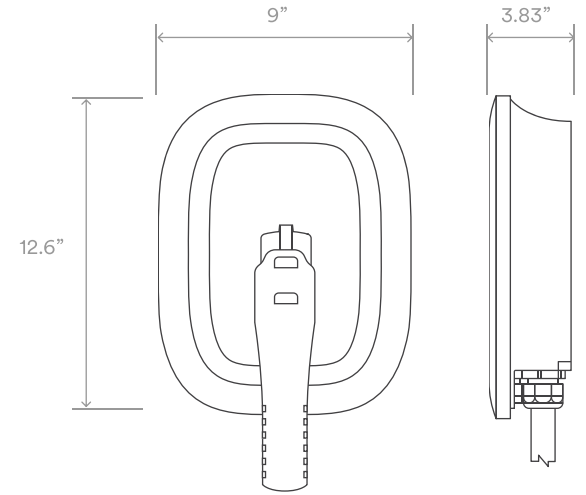
CONNECTIVITY & INTERACTION DESIGN

Charger Status	Wi-Fi / Ethernet / Bluetooth / RS-485
User Identification	Torus App / RFID Card / Face Recognition
User Interface	Torus App (iOS and Android) / Gesture Control
Reach	Torus Station app status is accessible and controllable from anywhere in the world.
Charger Status Information	Color Screen / RGB LED
Communication Protocol	Torus Electron GraphQL Protocol MQTT



Torus EV Charger

AC-II-R



CHARGING THROTTLING MODES

Auto-throttle charging current to match excess solar energy Yes

Auto-throttle to limit current drawn from the electric grid Yes

Auto-throttle to limit current provided by the inverter (during off-grid or peak shift modes) Yes

Auto-throttle charging current based on availability of renewable energy (on the grid or at home) Yes

Disable auto-throttling (let the EV charge at full power) Yes

DISPATCH MODES

If multiple charging stations are in use at a residence, auto-throttle is split among the charging stations according to sharing mode selected:

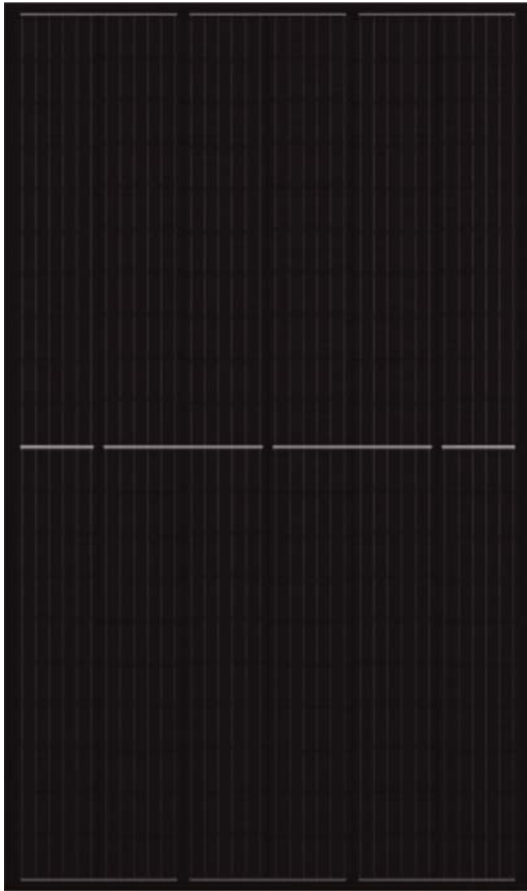
Split available energy evenly across each charging station Yes

Prioritize one station above another Yes

Schedule one vehicle to finish (or reach a certain state of charge) and then start the next charging station Yes

Solar Panel

Solar-R



Summary

Torus' Solar Panel is a superb and cost-effective solar panel that can meet your energy needs. This panel features 120 half-cut monocrystalline PERC cells that deliver up to 370 to 410 watts of power and 20.3% efficiency. The black frame and back-sheet give the panel a sleek and elegant look that blends in with any roof.

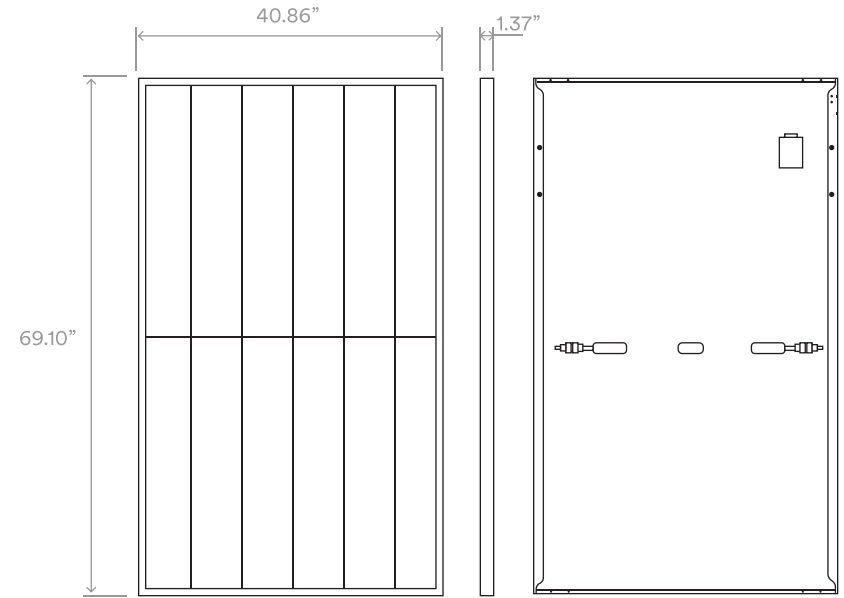
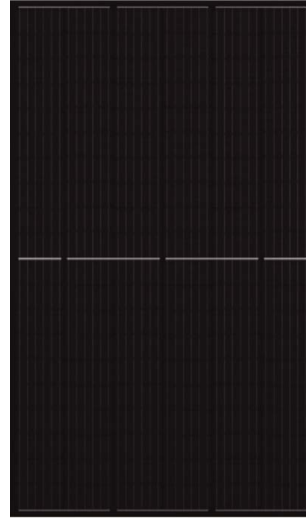
The panel also comes with a 25-year performance warranty, which ensure its quality and durability. The Torus solar panel is compatible with most inverters and mounting systems, and has a high tolerance to extreme weather conditions.

Key Features

- Certifications: IEC 61215 / IEC 61730 / UL 61730
 - Monocrystalline cell type design
 - 3.2mm AR Coating Tempered Glass
 - Operating temperature: -40°C ~ +85°C
-

Solar Panel

Solar-R



GENERAL DATA

Cell Type	Monocrystalline
Cell Dimensions	166 x 166mm (6.5" x 6.5")
Cell Arrangement	120 (6*20)
Dimensions (L x W)	1770mm x 1038mm (69.1" x 40.86")
Weight	21kg (46.3lbs)
Front Glass	3.2mm (0.13inches) AR Coating Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68

ELECTRICAL DATA

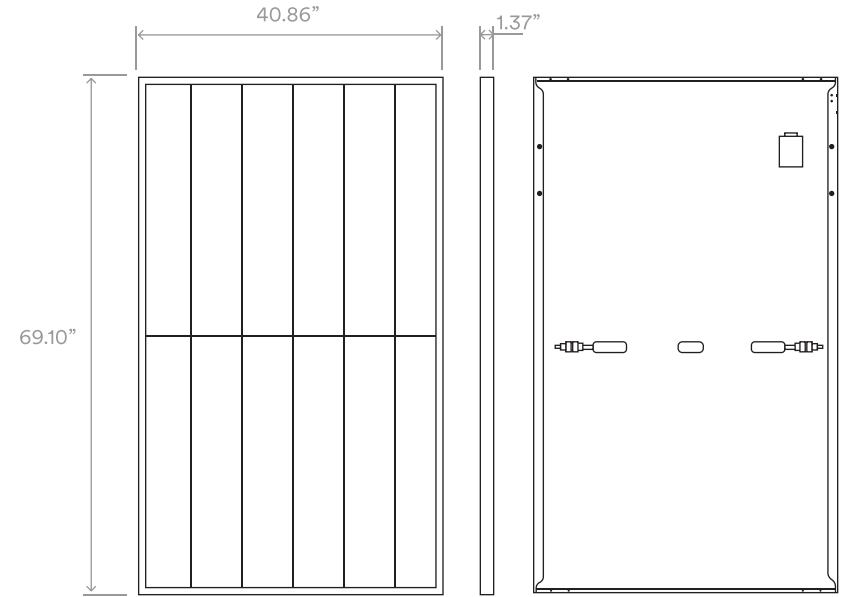
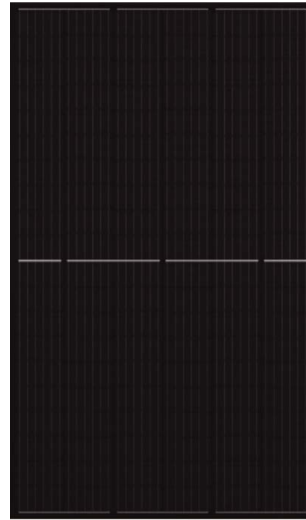
Performance at STC	Power Tolerance 0 ~ +3%
STC	Irradiance at 1000 W/m ² while at 25°C (77°F)
Cell Temperature	25°C (77°F)
Air Mass	AM1.5
Maximum Power (Pmax/W)	370
Operating Voltage (Vmpp/V)	34.9
Operating Current (Impp/A)	10.61
Open-Circuit Voltage (Voc/V)	41.1
Short-Circuit Current (Isc/A)	11.26

ELECTRICAL DATA (CONTINUED)

Performance at NMOT	
NMOT	Irradiance at 800W/m ²
Ambient Temperature	20°C
Air Mass	AM1.5
Wind Speed	1m/s
Maximum Power (Pmax/W)	274
Operating Voltage (Vmpp/V)	32.1
Operating Current (Impp/A)	8.55
Open-Circuit Voltage (Voc/V)	38.2
Short-Circuit Current (Isc/A)	9.09

Solar Panel

Solar-R



OPERATING CONDITIONS

Maximum System Voltage	1000V/1500V/DC(IEC)
Operating Temperature	-40°C ~ +85°C
Maximum Series Fuse	20A
Static Loading	<ul style="list-style-type: none"> • Snow Loading: 5400Pa • Wind Loading: 2400Pa
Conductivity at Ground	<0.1 Ohm
Safety Class	II
Resistance	>100M Ohm
Connector	T01/LJQ-3-CSY/MC4/MC4-EVO2

TEMPERATURE DATA

Temperature Coefficient Pmax	-0.36%/°C
Temperature Coefficient Voc	-0.26%/°C
Temperature Coefficient Isc	+0.043%/°C
NMOT	43±2°C

COMPLIANCE

Certifications	IEC 61215 / IEC 61730 / UL61730
----------------	---------------------------------

Torus System Diagram

