UTL SOLAR

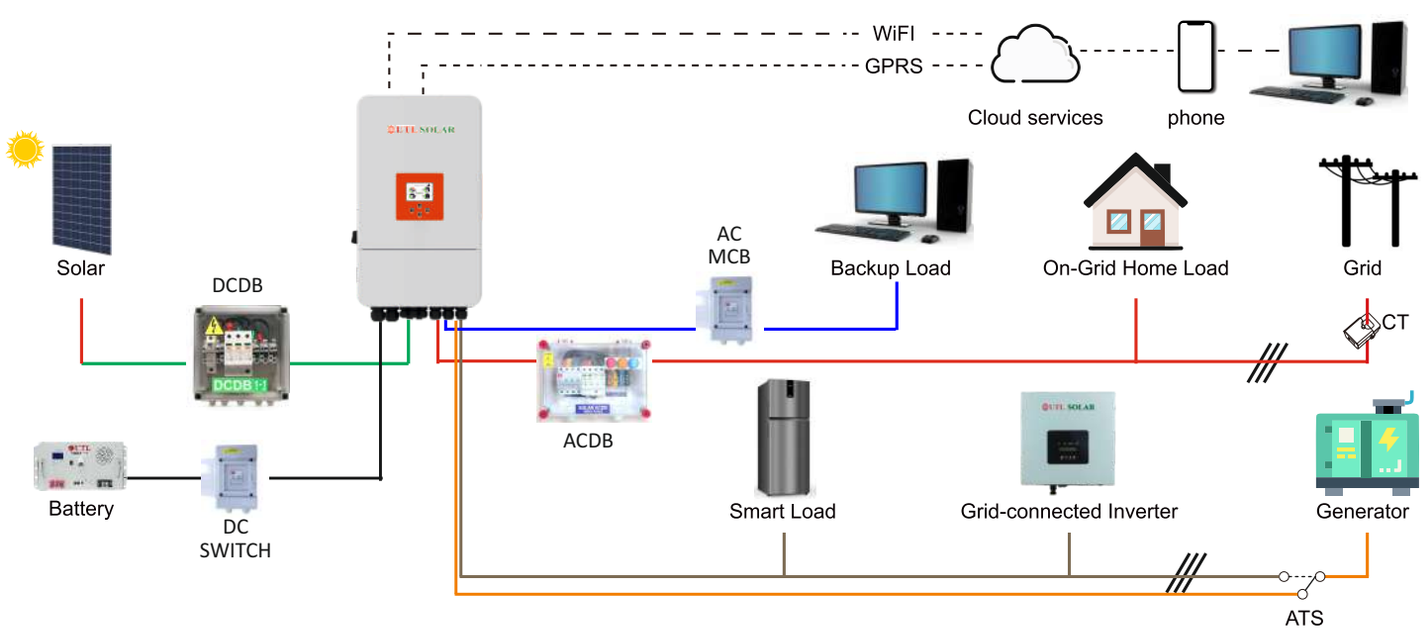
TRUST
SINCE - 1996

Single Phase & Three Phase

HYBRID INVERTER

SMART FEATURES

- Smart Load function
- Overload/over temperature/ short circuit protection
- Smart battery charger design for optimized battery performance
- Programmable multiple operation modes: On grid, Off grid and UPS.
- Programmable supply priority for battery or grid.
- Smart settable three stages MPPT charging for optimized battery performance.
- With built-in export limitation function.
- The system is AC-coupled to retrofit existing solar installations.
- Up to a max. of 10 units can be connected in parallel for On-Grid installations and upgrades.
- It supports the parallel operation of multiple batteries.
- The system is capable of a max. charging and discharging current of 70A-240AA.
- High voltage batteries offer enhanced efficiency.



UTL SOLAR

HYBRID INVERTER - SINGLE PHASE

TECHNICAL SPECIFICATION

Model	HYB-3K-GXLS1	HYB-3.6K-GXLS2	HYB-5K-GXLS2	HYB-6K-CXLS2
Battery Input Data				
Battery Type	Lead-acid or Lithium-ion			
Battery Voltage Range(V)	40-60			
Max. Charging Current(A)	70	90	120	135
Max. Discharging Current(A)	70	90	120	135
Charging Strategy for Li-ion Battery	Self-adaption to BMS			
Number of Battery Input	1			
PV String Input Data				
Max. PV Input Power(W)	4800	5760	8000	9600
Max. PV Input Voltage(V)	500			
Start-up Voltage(V)	125			
PV Input Voltage Range(V)	125-500			
MPPT Voltage Range(V)	150-425			
Full Load MPPT Voltage Range(V)	300-425			
Rated PV Input Voltage(V)	370			
Max. Operating PV Input Current(A)	18	18+18		
Max. Input Short-Circuit Current(A)	27	27+27		
No. of MPP Trackers/No. of Strings MPP Tracker	1/1	2/1+1		
Max. Inverter Backfeed Current to The Array	0			
AC Input/Output Data				
Rated AC Input/Output Active Power(W)	3000	3600	5000	6000
Max. AC Input/Output Apparent Power(VA)	3300	3960	5500	6600
Peak Power (off-grid)(W)	2 times of rated power, 10s			
Rated AC Input/Output Current(A)	13.7/13.1	16.4/15.7	22.8/21.8	27.3/26.1
Max. AC Input/Output Current(A)	15/14.4	18/17.3	25/24	30/28.7
Max. Continuous AC Passthrough (grid to load)(A)	35			40
Rated Input/Output Voltage/Range(V)	220V/230V 0.85Un-1.1Un			
Grid Connection Form	L+N+PE			
Rated Input/Output Grid Frequency/Range	50Hz/45Hz-55Hz 60Hz/55Hz-65Hz			
Power Factor Adjustment Range	0.8 leading-0.8 lagging			
Total Current Harmonic Distortion THDi	<3% (of nominal power)			
DC Injection Current	<0.5%In			
Efficiency				
Max. Efficiency	97.60%			
Euro Efficiency	96.50%			
MPPT Efficiency	>99%			
Equipment Protection				
DC Polarity Reverse Connection Protection	Yes			
AC Output Overcurrent Protection	Yes			
AC Output Overvoltage Protection	Yes			
AC Output Short Circuit Protection	Yes			
Thermal Protection	Yes			
DC Terminal Insulation Impedance Monitoring	Yes			
DC Component Monitoring	Yes			
Ground Fault Current Monitoring	Yes			
Arc fault circuit interrupter (AFCI)	Optional			
Power Network Monitoring	Yes			
Island Protection Monitoring	Yes			
Earth Fault Detection	Yes			
DC Input Switch	Yes			
Overvoltage Load Drop Protection	Yes			
Residual Current (RCD) Detection	Yes			
Surge Protection Level	TYPE II(DC), TYPE II(AC)			
Interface				
Display	LCD+LED			
Communication Interface	RS232, RS485, CAN			
Monitor Mode	GPRS/WIFI/Bluetooth/4G/LAN(optional)			
General Data				
Operating Temperature Range	-40 to +60℃, >45℃ Derating			
Permissible Ambient Humidity	0-100%			
Noise	<30 dB			
Ingress Protection(IP) Rating	IP 65			
Inverter Topology	Non-Isolated			
Over Voltage Category	OVC II(DC), OVC III(AC)			
Cabinet size(W*H*D) [mm]	330W×433H×229D (Excluding connectors and brackets)			
Weight(kg)	17			
Warranty	Standard 5 years, extended warranty			
Type of Cooling	Intelligent Cooling	Intelligent Air Cooling		
Grid Regulation	IEC 61727,IEC 62116,CEI 0-21,EN 50549,NRS 097,RD 140, UNE 217002,OVE-Richtlinie R25,G99,VDE-AR-N 4105			
Safety EMC/Standard	IEC/EN 61000-6-1/2/3/4, IS 16221/IEC 62109 , IS 16169/ IEC 62116			

 # Specification Are Subject To Change Without Prior Notice Due To Constant Improvements In Design & Technology.

UTL SOLAR

HYBRID INVERTER - THREE PHASE

TECHNICAL SPECIFICATION

Model	HYB-5K-GXT2	HYB-6K-GXT2	HYB-8K-GXT2	HYB-10K-GXT2	HYB-12K-GXT2
Battery Input Data					
Battery Type	Lead-acid or Lithium-ion				
Battery Voltage Range(V)	40-60				
Max. Charging Current(A)	120	135	190	210	240
Max. Discharging Current(A)	120	135	190	210	240
Charging Strategy for Li-ion Battery	Self-adaption to BMS				
Number of Battery Input	1				
PV String Input Data					
Max. PV Input Power(W)	7500	9000	12000	15000	18000
Max. PV Input Voltage(V)	800				
Start-up Voltage(V)	160				
PV Input Voltage Range(V)	160-800				
MPPT Voltage Range(V)	200-650				
Full Load MPPT Voltage Range(V)	250-650				350-650
Rated PV Input Voltage(V)	550				
Max. Operating PV Input Current(A)	20+20				
Max. Input Short-Circuit Current(A)	30+30				
No. of MPP Trackers/No. of Strings MPP Tracker	2/1+1				
Max. Inverter Backfeed Current to The Array	0				
AC Input/Output Data					
Rated AC Input/Output Active Power(W)	5000	6000	8000	10000	12000
Max. AC Input/Output Apparent Power(VA)	5500	6600	8800	11000	13200
Peak Power (off-grid)(W)	2 times of rated power, 10s				
Rated AC Input/Output Current(A)	7.6/7.3	9.1/8.7	12.2/11.6	15.2/14.5	18.2/17.4
Max. AC Input/Output Current(A)	8.4/8	10/9.6	13.4/12.8	16.7/16	20/19.2
Max. Continuous AC Passthrough (grid to load)(A)	45				
Rated Input/Output Voltage/Range(V)	220/380V, 230/400V 0.85Un-1.1Un				
Grid Connection Form	3L+N+PE				
Rated Input/Output Grid Frequency/Range	50Hz/45Hz-55Hz 60Hz/55Hz-65Hz				
Power Factor Adjustment Range	0.8 leading-0.8 lagging				
Total Current Harmonic Distortion THDi	<3% (of nominal power)				
DC Injection Current	<0.5%In				
Efficiency					
Max. Efficiency	97.60%				
Euro Efficiency	97.00%				
MPPT Efficiency	>99%				
Equipment Protection					
DC Polarity Reverse Connection Protection	Yes				
AC Output Overcurrent Protection	Yes				
AC Output Overvoltage Protection	Yes				
AC Output Short Circuit Protection	Yes				
Thermal Protection	Yes				
DC Terminal Insulation Impedance Monitoring	Yes				
DC Component Monitoring	Yes				
Ground Fault Current Monitoring	Yes				
Arc fault circuit interrupter (AFCI)	Optional				
Power Network Monitoring	Yes				
Island Protection Monitoring	Yes				
Earth Fault Detection	Yes				
DC Input Switch	Yes				
Overvoltage Load Drop Protection	Yes				
Residual Current (RCD) Detection	Yes				
Surge Protection Level	TYPE II(DC), TYPE II(AC)				
Interface					
Display	LCD+LED				
Communication Interface	RS232, RS485, CAN				
Monitor Mode	GPRS/WIFI/Bluetooth/4G/LAN(optional)				
General Data					
Operating Temperature Range	-40 to +60℃, >45℃ Derating				
Permissible Ambient Humidity	0-100%				
Noise	≤ 55 dB				
Ingress Protection(IP) Rating	IP 65				
Inverter Topology	Non-Isolated				
Over Voltage Category	OVC II(DC), OVC III(AC)				
Cabinet size(W*H*D) [mm]	386W×660H×250D (Excluding connectors and brackets)				
Weight(kg)	35.2				
Warranty	Standard 5 years, extended warranty				
Type of Cooling	Intelligent Air Cooling				
Grid Regulation	IEC 61727,IEC 62116,CEI 0-21,EN 50549,NRS 097,RD 140, UNE 217002,OVE-Richtlinie R25,G99,VDE-AR-N 4105				
Safety EMC/Standard	IEC/EN 61000-6-1/2/3/4, IS 16221/IEC 62109 , IS 16169/ IEC 62116				

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The Power.....

As and when you need it.

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UTL SOLAR

SIGMA PRO Grid Export Solar PCU

A SMART PCU
Which Stores as well as Exports Electricity

rMPPT Hybrid Solar PCU
(1Ph in 1Ph out)

Model Available
1kVA-15KVA

FEATURES

- DSPIC based Pure Sine Wave Design.
- Inbuilt in rMPPT charge controller (upto 30% more efficient).
- Grid Interactive.
- Maximum Preference to Solar Power.
- Wi-Fi based remote monitoring (GSM Optional).
- Certified by IEC 61683, 61727, 60529, 60068-2 (1,2,14,30) & 62116 standards.
- Robust Design-20 years product life, 5 yrs of warranty.
- User Friendly & Easily accessible LCD Display with all AC and DC Parameter Configurable by Display Switches & Digital LCD (20X4).
- User Friendly Control :- Output Voltage, Chg. Voltage - SPV/Grid, Chg. Current - SPV/Grid, Grid Reconnect, Batt. Low.
- Reverse AC Voltage Protection.
- Priority based working modes - Smart/PCU/Hybrid (for saving energy & money).
- Grid Export Mode, Grid Charging & IT Load - Enable/Disable by Display Switch.

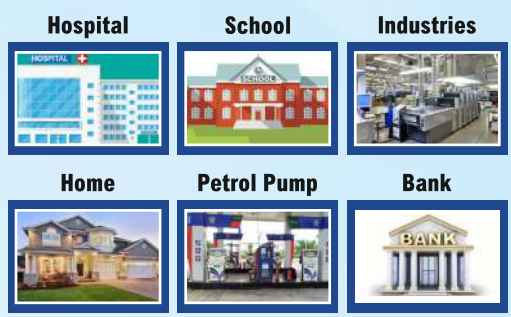
PCU Mode Priority
Solar/Battery/Grid

Hybrid Mode Priority
For Load - Grid/Solar/Battery
For Charging - Solar/Grid

Smart Mode Priority
For Day Time - Solar/Battery/Grid
For Night Time - Grid/Battery

Grid Export Mode
Solar/Grid/Battery

Application



UTL SOLAR

TECHNICAL SPECIFICATION

SIGMA PRO Grid Export SOLAR PCU (1Ph in 1Ph out)

Parameters		Units	Rating				
Model (UGE)			1024	1524	2024	2524	3024
System Rating		KVA	1	1.5	2	2.5	3
Operating DC Voltage		V	24				
Photovoltaic Input							
Input Voltage range(Min.-Max.)		V_{OC}	40-90				
Maximum PV power recommended		kW	1	1.5	2	2.5	3
Solar Charge Controller Rating		A	30	45	60	75	90
MPPT Based Charge Controller							
Switching Element			MOSFET				
Controller			DSP				
Type of Charger			MPPT				
Peak Efficiency		%	95				
Parameters			**Configurable**			**Default Value (Li-Ion)**	**Default Value (LED ACID)**
Battery Low Buzzer		V	Batt. Low Cut +0.2			23.8	22.4
Battery Low cut		V	20-23.4			23.4	22
Battery High cut (INV.)		V	SPV Present-SPV CHG. REF +1.3V for 15Sec, SPV CHG. REF +1.8V for 2Sec			29.6	31
			SPV Absent-SPV CHG. REF +0.5V for 15Sec, SPV CHG. REF +1.2V for 2Sec			29	30
Battery Charging Voltage with SPV		V	25.6-32			28.4	29
Battery Charging Current with SPV		A	12-60			18	
Battery Charging Voltage with Grid		V	25-31			28	
Battery Charging Current with Grid		A	6-15			10	
Grid low cut volt. (IT Mode Enb/Dis)	GRID EXPORT	V	NA/120-200			175/120	
Grid high cut volt. (IT Mode Enb/Dis)	MODE DISABLE	V	NA/245-280			260/280	
Grid Charging		V	Enable/Disable			Enable	
IT Mode			Enable/Disable			Disable	
Operating mode			Smart/PCU/Hybrid/Grid Export			Smart Mode	
Input Source			Grid/Genset(for Genset, Grid Export Mode must be Disable)			Grid	
Output voltage low		V	170-190			185	
Output voltage high		V	250-260			255	
Grid Export Mode Enable							
Grid Low/recover		V	185/195				
Grid High/recover		V	280/275				
Synchronization voltage range		V	185-280V				
Synchronization frequency range		HZ	47 to 53				
Maximum Charging Current from Grid (Import)		A	6-15				10
Battery							
Grid Disconnect (Solar Available) PCU/SMART			Either Battery chg voltage ref meet. Or battery chg current ref meet for the 2 minutes				
Grid Reconnect (PCU Mode / Smart Mode), Import ON (Grid Export mode)		V	11-12.8				11.5
Inverter							
Switching Element			MOSFET				
Control			PWM				
Nominal Output voltage			230V ±10%. , 1Phase, 3 Wire, Pure Sine Wave				
Nominal frequency		Hz	50				
Load Current		A	3.6	5.4	7.2	8	10.45
Voltage regulation		%	1				
Output voltage distortion with 100% linear load		%	<3				
Overload capacity		%	Fold back logic working And maintain 100% load By reducing the output voltage			**Grid Tie ON** Over Load Indication @>200% >200 - 300% : 10min >300 - 400% : 1min >400% : 250ms	
Peak efficiency		%	>85				
Noise @ 1 meter		dB	50				
Cooling			Either Load Based (On ≥ 60, Off ≤ 50) or Temperature Based (On ≥ 55°C ±3°C, Off ≤ 42°C ±3°C)				
Protections			Overload, Battery Low, Battery High, Output Low, Output High, Input Low, Input High, SPV Low, SPV High, Output Short Ckt., Input Short Ckt., Over Temp., Under Frequency, Over Frequency, Solar Panel Reverse, Anti-islanding, Surge Protection, Grid/Solar Charger Open Circuit, NTC Open.				
Display Parameters			Battery Voltage, Charging Current, Discharging Current, charging KWH and discharging KWH				
			Solar Voltage, Solar Current, Instantaneous Power, Cummulative Energy				
			Grid Voltage, Grid Current, Frequency, Import Power, Import Energy ,				
			Export Power , Export Energy				
			Output Voltage, Output Current, Frequency, Instantaneous Power & Commutative Energy				
			Grid, Inverter & SPV Charger Status				
			System Info : Grid CHG-EN, IT Load-EN, Input Source-Grid, Operation Mode-Smart				
Switches			Reset for System ON/OFF, UP , DOWN, BACK, ENTER (for LCD Configuration)				
Indications			System ON, Inv. ON, SPV Charging, Grid Charging, Grid Tie ON, Battery Low/High, Overload / Overheat, Mains Low / Mains High, Under frequency/Over frequency, Operating modes (smart, Hybrid, PCU and Gridexport), Fault, HOE				
Environment							
Operating temperature		ºC	0-45				
Max. Relative Humidity @ 25 C (non condensing)		%	95				
Degree of Protection			IP-21				
Data Logging			30 Days Data Storage				
Dimension (LxWxH)		Inch	11.7 x 11.2 x 23.2				

*Specification are subject to change without prior notice due to constant improvement in design & technology.

*If battery is not fully charged, battery low cut voltage is 11.5V/batt. If battery is fully charged, battery low cut voltage is equal to set Voltage.

UTL SOLAR

TECHNICAL SPECIFICATION

SIGMA PRO Grid Export SOLAR PCU (1Ph in 1Ph out)

Parameters	Units	Rating											
Model (UGE)		1048	2048	3048	4048	5048	5096	7596	8120	10120	10180	15180	15240
System Rating	KVA	1	2	3	4	5		7.5		10		15	
Operating DC Voltage	V	48					96		120		180		240
Photovoltaic Input													
Input Voltage range(Min.-Max.)	V_{OC}	80-160	80-195				180-360		200-400	220-400	300-540		400-650
Maximum PV power recommended	kW	1	2	3	4	5		7.5		10		15	
Solar Charge Controller Rating	A	20	40	60	80	100	50	75		60	80	55	60
MPPT Based Charge Controller													
Switching Element		IGBT											
Controller		DSP											
Type of Charger		MPPT											
Peak Efficiency	%	95											
Parameters		**Configurable**											**Default Value**
Battery Low Buzzer	V	Batt. Low Cut +0.2											11.2
Battery Low cut	V	10-11.7											11
Battery High cut (INV.)	V	SPV Present-SPV CHG. REF +1.3V for 15Sec, SPV CHG. REF +1.8V for 2Sec											15.5
		SPV Absent-SPV CHG. REF +0.5V for 15Sec, SPV CHG. REF +1.2V for 2Sec											15
Battery Charging Voltage with SPV	V	12.8-16											14.5
Battery Charging Current with SPV	A	12-60											18
Battery Charging Voltage with Grid	V	12.5-15.5											14
Battery Charging Current with Grid	A	6-15											10
Grid low cut volt. (IT Mode Enb/Dis) GRID EXPORT	V	NA/120-200											175/120
Grid high cut volt. (IT Mode Enb/Dis) MODE DISABLE	V	NA/245-280											260/280
Grid Charging	V	Enable/Disable											Enable
IT Mode		Enable/Disable											Disable
Operating mode		Smart/PCU/Hybrid/Grid Export											Smart Mode
Input Source		Grid/Genset(for Genset, Grid Export Mode must be Disable)											Grid
Output voltage low	V	170-190											185
Output voltage high	V	250-260											255
Li Ion Parameter		**100AH**											
No. of Cells		15					30		38		56		75
Battery Low Buzzer	V	45.75					91.5		115.9		170.8		228.75
Battery Low Cut**	V	44.25					88.5		112.1		165.2		221.25
Battery Charging Voltage by SPV	V	53.25					106.5		134.9		198.8		266.25
Battery Charging Current by SPV	A	20					20		20		20		20
Battery Charging Voltage by Grid	V	52.5					105		133		196		262.5
Battery Charging Current by Grid	A	10					10		10		10		10
Grid Export Mode Enable													
Grid Low/recover	V	185/195											
Grid High/recover	V	280/275											
Synchronization voltage range	V	185-280V											
Synchronization frequency range	HZ	47 to 53											
Maximum Charging Current from Grid (Import)	A	6-15											10
Battery													
Grid Disconnect (Solar Available) PCU/SMART		Either Battery chg voltage ref meet. Or battery chg current ref meet for the 2 minutes											
Grid Reconnect (PCU Mode / Smart Mode), Import ON (Grid Export mode)	V	11-12.8											11.5
Inverter													
Switching Element		MOSFET							IGBT				
Control		PWM											
Nominal Output voltage		220, 1Phase, 3 Wire, Pure Sine Wave											
Nominal frequency	Hz	50											
Load Current	A	4.5	9	13.5	14.2	18		27		36		54	
Voltage regulation	%	1											
Output voltage distortion with 100% linear load	%	<3											
Overload capacity	%	**IT Load Disable** 100-120(2Time auto Reset) : 60sec; 120-150(2Time auto Reset) : 30sec				**IT Load Enable** 100 - 110%:10min; 110 - 120%: 2min;				**Grid Tie ON** Over Load Indication @>200% >200 - 300% : 10min >300 - 400% : 1min >400% : 250ms			
Peak efficiency	%	>85											
Noise @ 1 meter	dB	50											
Cooling		Either Load Based (On ≥ 60, Off ≤ 50) or Temperature Based (On ≥ 55°C ±3°C, Off ≤ 42°C ±3°C)											
Protections		Overload, Battery Low, Battery High, Output Low, Output High, Input Low, Input High, SPV Low, SPV High, Output Short Ckt., Input Short Ckt., Over Temp., Under Frequency, Over Frequency, Solar Panel Reverse, Anti-islanding, Surge Protection, Grid/Solar Charger Open Circuit, NTC Open.											
Display Parameters		Battery Voltage, Charging Current, Discharging Current, charging KWH and discharging KWH											
		Solar Voltage, Solar Current, Instantaneous Power, Cummulative Energy											
		Grid Voltage, Grid Current, Frequency, Import Power, Import Energy ,											
		Export Power , Export Energy											
		Output Voltage, Output Current, Frequency, Instantaneous Power & Commutative Energy											
		Grid, Inverter & SPV Charger Status											
		System Info : Grid CHG-EN, IT Load-EN, Input Source-Grid, Operation Mode-Smart											
Switches		Reset for System ON/OFF, UP , DOWN, BACK, ENTER (for LCD Configuration)											
Indications		System ON, Inv. ON, SPV Charging, Grid Charging, Grid Tie ON, Battery Low/High, Overload / Overheat, Mains Low / Mains High, Under frequency/Over frequency, Operating modes (smart, Hybrid, PCU and Gridexport), Fault, HOE											
Environment													
Operating temperature	°C	0-45											
Max. Relative Humidity @ 25 C (non condensing)	%	95											
Degree of Protection		IP-21									IP-20		IP-21
BIS Certification		Yes					No						
Data Logging		30 Days Data Storage											
Dimension (LxWxH)	Inch	18 x 10 x 20				23 x 13 x 26				26 x 13 x 26	30 x 16 x 27		26 x 13 x 26
Weight (Approx)	kg	35	43	50	52	60	70	78		103	160		120

*Specification are subject to change without prior notice due to constant improvement in design & technology.

*If battery is not fully charged, battery low cut voltage is 11.5V/batt. If battery is fully charged, battery low cut voltage is equal to set Voltage.