



## Annexure – 1

### Technical Specification for Sol Clean (Robotic Cleaners)

Model : GIPL-4M-002			
S/N	Item	Parameters	Remarks
1	Mode of Working	Automated control through PCB	
2	Installation & Walking	Runs on the module frames	We can propose solution on running on robo purlin rails having additional structure cost.
3	Running speed	12-15 meters per minute	
4	Weight	55 Kgs	
5	Running Voltage (Battery Output)	24 VDC	
6	Dimension	4680 x 485 x 196 mm	Standard dimensions considered
7	Charging Mode	Self-powered	No external power supply
8	Driving Mode	DC motor	
9	Cleaning device	Nylon brush	
10	Microcomputer controller	Equipped with PCB for automatic operation	
11	Operating Noise	Under 70 dB	
12	Working temperature range	10 degree to 60 degree	
13	Levels of protection	IP65	
14	Environmental effect in operation	Non-toxic and no emissions	



#### Top/End cover:

Aluminium material, lightweight, strong anti-aging ability, five-year outdoors using no color fading, no pulverization. With a streamlined design, wind resistance is greatly reduced.

#### Front side driving wheels:

Outer diameter 125mm, thickness 32mm, enhanced Polyurethane + Rubber materials.

#### By side driving wheels:

Outer diameter 125mm, thickness 32mm, enhanced Polyurethane + Rubber materials.

#### Driving tube:

Material 304 stainless steel, high corrosion resistance ability.

#### Body cover:

Aluminium material, lightweight, strong anti-aging ability, five-year outdoors using no color fading, no pulverization. With a streamlined design, wind resistance can be greatly reduced.

#### Drop/Wind resistance hook:

Zin-coat (thickness 80 $\mu$ ) steel. Prevent robot from dropping in gust wind.

#### Guide wheels:

Outer diameter 125mm, thickness 32mm, enhanced Polyurethane materials.

#### Brush:

1. Material – Nylon-6, length – 2000 mm, rotate speed - 200 r/min.
2. Diameter of bristle 0.3 mm, length is – 60 mm.
3. Elongation at break – 25% to 41%.
4. Breaking strength – 7.4 cN/dtex.

Life time more than 1.5 years, subject to using environment. Frequency of usage and heavy dust will shorten the life time faster.

#### Brush driving motor:

1. Working range DC - 24V.
2. Rated power - 100W.
3. Reduction gearbox, reduction rate -1:9, rated rotating speed without loading - 1556RPM, Output speed – 172 RPM.
4. Efficiency -  $\geq$ 80%.
5. Current without loading -  $<$  0.7A.
6. IP65.
7. Noise  $<$  70 dB.
8. Lifespan  $>$  3-5 years depending on working conditions, electric brush can be replaced externally.



## Wheels driving motor:

1. Voltage -, working range DC - 24V.
2. Rated power - 25W.
3. Reduction gearbox, reduction rate -1.50, rated rotating speed without loading - 1556RPM, Output speed - 172 RPM.
4. Efficiency -  $\geq 80\%$ .
5. Current without loading -  $< 0.7A$ .
6. IP65.
7. Noise  $< 70$  dB.
8. Lifespan  $> 3-5$  years depending on working conditions, electric brush can be replaced externally.

## Battery :

Particulars	Description
Type	Lithium Ion (LFP)
Capacity/AH	25 Ah
Voltage/V	25.6 V
Current Max./A	10 A
Charging current Max./A	10 A
Charging voltage Max./V	29.2V $\pm$ 0.05V
Weight/KG	6.0 Kg
Short current/A	$\leq 20 \mu A$
Lifespan (cycle)	2000 cycles

## Self-charging module :

Description	Description
Peak power (Wp)	35 Wp
Short current (Isc)	1.25 A
Open circuit voltage (Voc)	37.2 V
Maximum Power voltage (Vmp)	30 V
Maximum Power current (Imp)	1.13 A



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## Control system :

1. Input voltage (V) : 26V
2. Max working current (I) : 6A
3. Protect current (I) : 6A (continuously changeable)
4. Min adjust of protect current : 3A
5. Min settling of starting voltage : 22V
6. Control mode : Software
7. Regular startup set point : 26V
8. Reverse connection protection : Yes
9. Charging protect : 26V $\pm$ 0.2V
10. Timer : External & RTC available

## Consumable component lifetime and replacement job:

S. No.	Name	Lifetime (year)	Remarks
1	Brush	1.5	Considering usage once a day
2	Wheel	5	Considering usage once a day
3	Battery	5	Considering 50% DoD
4	Motor	5	Considering usage once a day
5	Limit switch	3	
6	Communication module	5	
7	Communication Gateway	5	
8	Communication antenna	5	
9	Bearing	5	

Note: Above specifications are for standard models and can be modified and changed based on customer requirements, subject to approval from GIPL engineering and Design team.