

Haneolnuri

Solar Power Streetlamp

Electric Construction Business
Information and Communication Construction Business
Fire Protection System Installation Business
New Renewable Energy (Solar Power) Installation Specialized Company
Manufacture Solar Power Generation Equipment
Manufacture and Install Energy Storage System (ESS)
Manufacture Solar Energy Streetlamp





GREEN ENERGY SOLUTION

Solar Energy & Energy Storage System

We provide higher technology and better service to fulfill your expectations.



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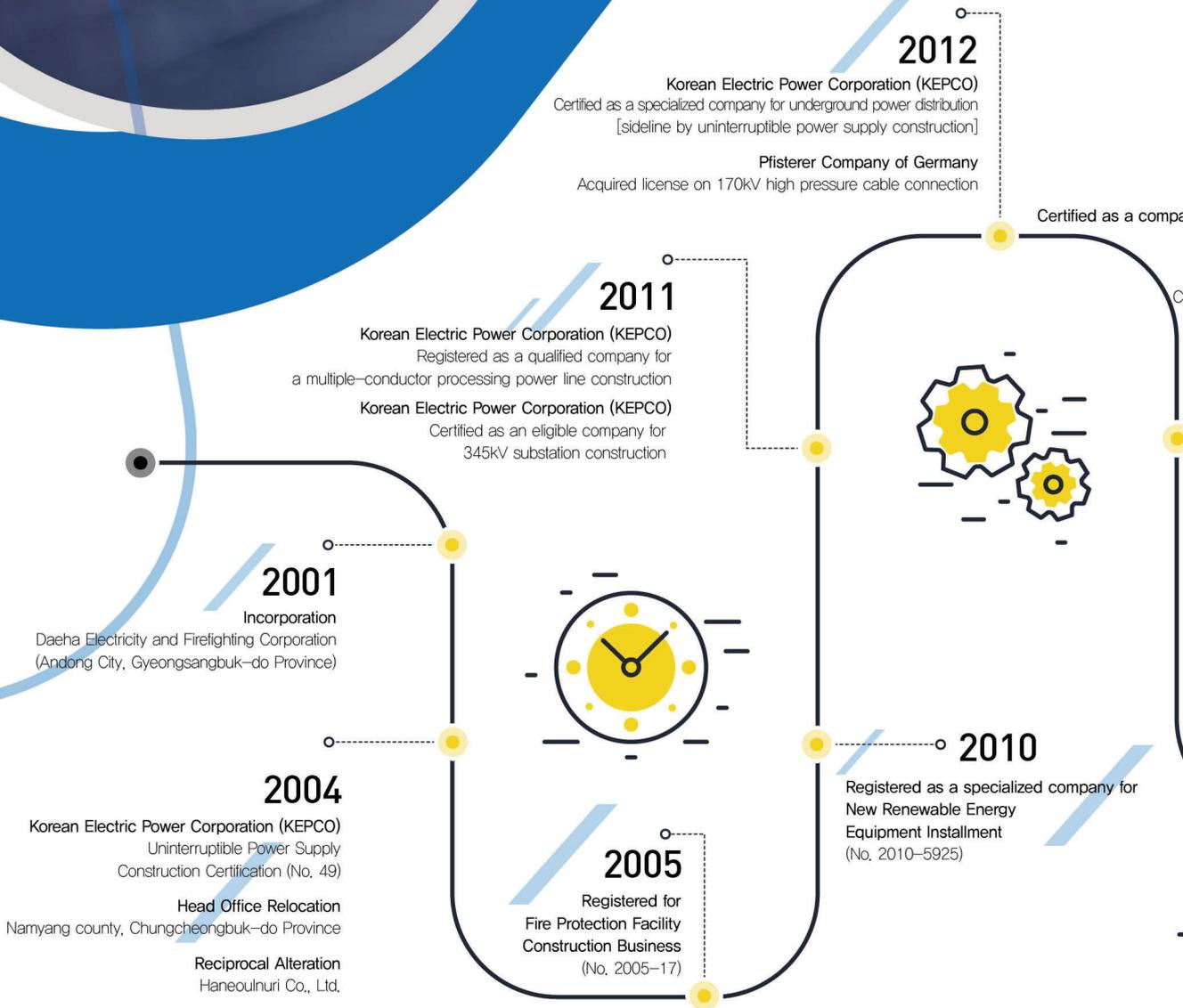
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About HANEOLNURI

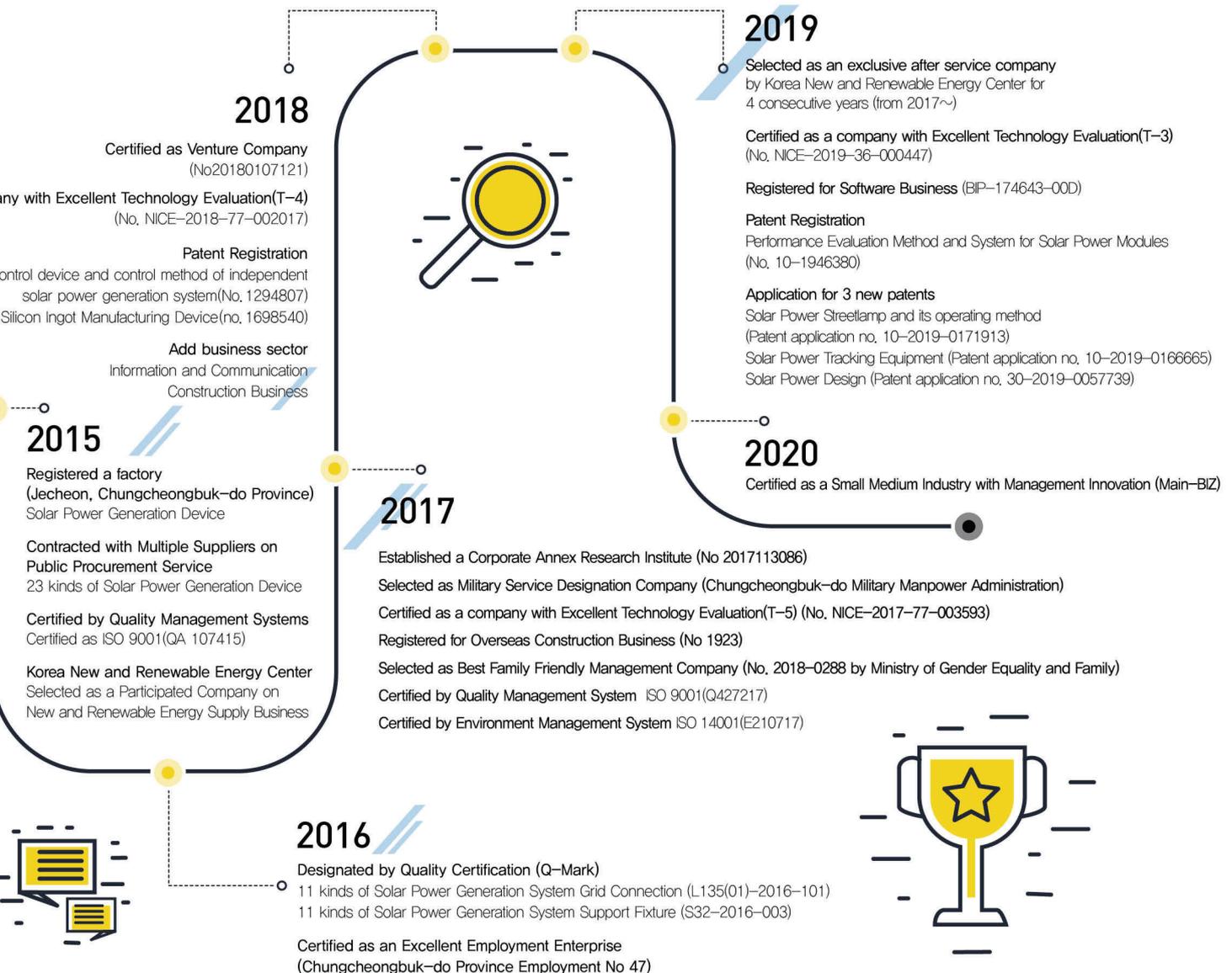
Haneoulnri is a company that leads the future society where humans and nature harmonize with eco-friendly renewable energy technology!

Haneoulnuri Co., Ltd is a manufacturer of Solar Power Streetlamps, and a manufacturer and construction specialist of New Renewable Energy and Solar Power Generators. It also operates Electric Construction Business, Information and Communication Construction Business, and Fire Protection System Installment Business. Based on its numerous experiences, remarkable technical skills, and restless research and development, Haneoulnuri pursues only the best quality and service.



History

• Cooperative firm



Quality Management Policy

Secured quality through zero-defect safe construction and achieved customer satisfaction

In order to achieve the above goals, the following managerial objectives are set. Each department should devise detailed plans and concentrate on establishing quality management system and accomplishing goals



 **Haneoulnuri Co.,Ltd**
will try its best to live up all customers' expectations

Business field

Solar Power

- * Solar Power Generation Facility Construction combined by the clean energy solar power with technology of Haneounuri Co., Ltd.



Electricity

- * Current maintenance related electricity facility installation construction for general constructions and power plants
- * Battery interior and lighting equipment installation



Communication

- * Communication electric power supply construction business (DC, AC, storage batteries, generators, and ground connection constructions)
- * high ground relay station maintenance and construction business
- * high-speed internet and electric vehicle charging business(EV)



Firefighting

- Installation construction of firefighting equipment on general constructions and apartment complexes



ESS

- * Power Management System
- * Power Conditioning System
- * Energy Management System
- * Battery Management System

Solar Power Generation Business with



Minimize the investment and Maximize the power output!

With over 10 years of experience and technology, Haneoulnuri offers customers maximum output with a reasonable price



Thorough Monitoring & Meticulous Maintenance

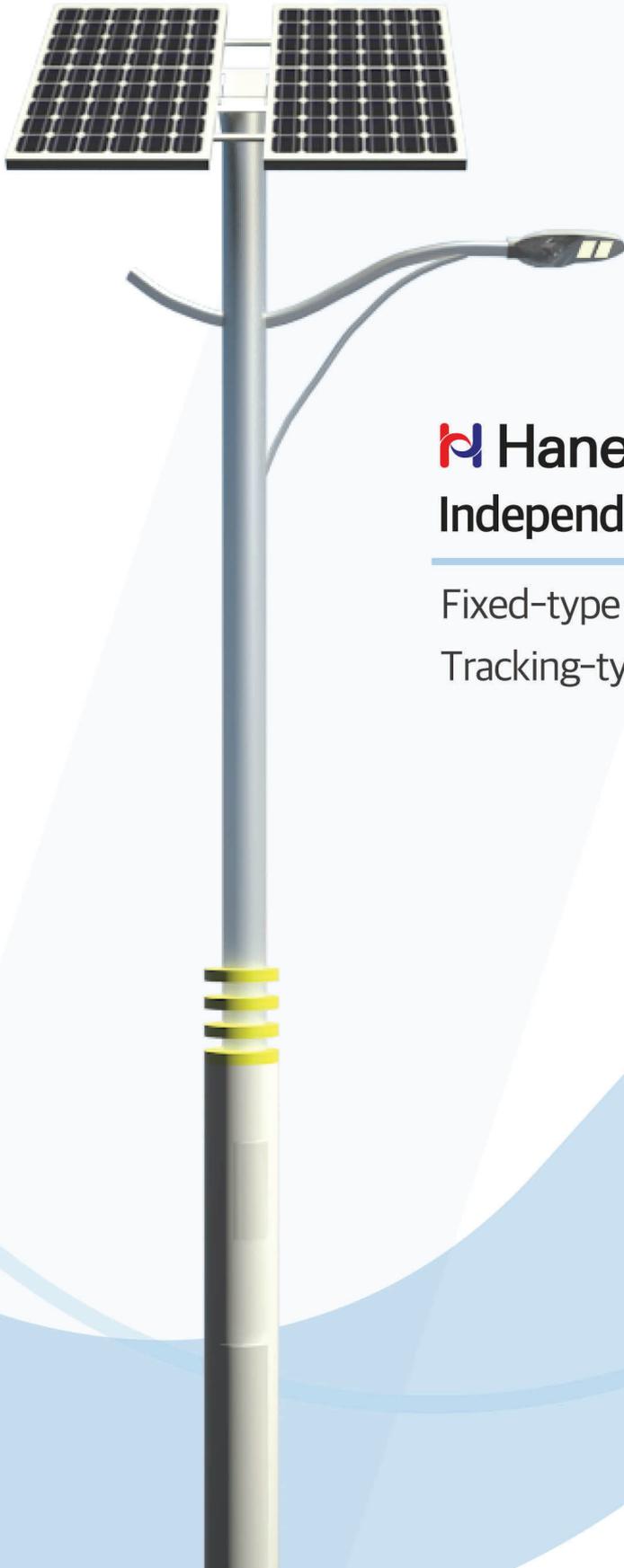
By closely monitoring quantity of generation, the system senses abnormality in advance that allows to minimize the damage and extend its maintenance period.



Increase Profitability by Analyzing the Market

To improve customer's profit, Haneoulnuri approaches strategically by analyzing factors which may influence on price such as past data of electricity market, its trend, and global market trend.





 **Haneoulnuri** Co.,Ltd

Independent Solar Power Streetlamp

Fixed-type Streetlamp

Tracking-type Streetlamp

Power Control Management Patent Technology Only with Haneounuri!!

Lighting problem solved! Streetlamp lifespan expended!



- Patent (No 10-1294807) Control Device and Control method of Independent Generation System
- Patent (No. 10-1946380) Performance Evaluation Method and its system for Solar Power Modules
- Patent (No1698540) Silicon Ingot Manufacturing Device



4 Key Points of Solar Power Streetlamp



Power Control Patent Technology Applied

By Haneounuri's unique patent technology on power control, the batteries are prevented from being overcharged or fully discharged which allows the streetlamps' life expectancy to expend and it also solves lighting problems.



Power Management via Display

Unlike preexisting solar power streetlamps, the details of power management can be checked via display and optimize them.



Single-Axis Solar Power Tracking System

This system compares and analyzes Haneounuri's data with real-time solar power data and tracks the solar power to secure the maximum power on the same condition.

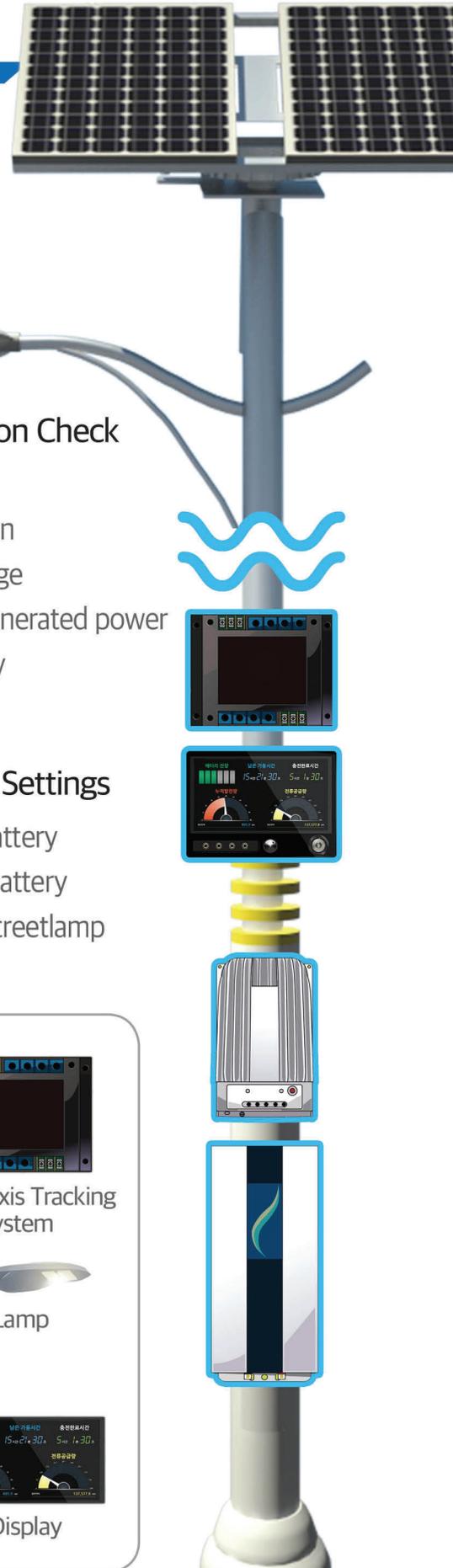


Optimized Battery

Different from the batteries of preexisting streetlamps, it is safe from heating or exploding and its discharge capacity decrease rate is low that it's effective on extending lifespans of streetlamps. It's a perfect battery for streetlamp since it's easy to handle and provides proper amount of energy regardless of season.

About Solar Power Streetlamp

Power Management System via Display,
Country's One and Only System by Haneoulnuri!!



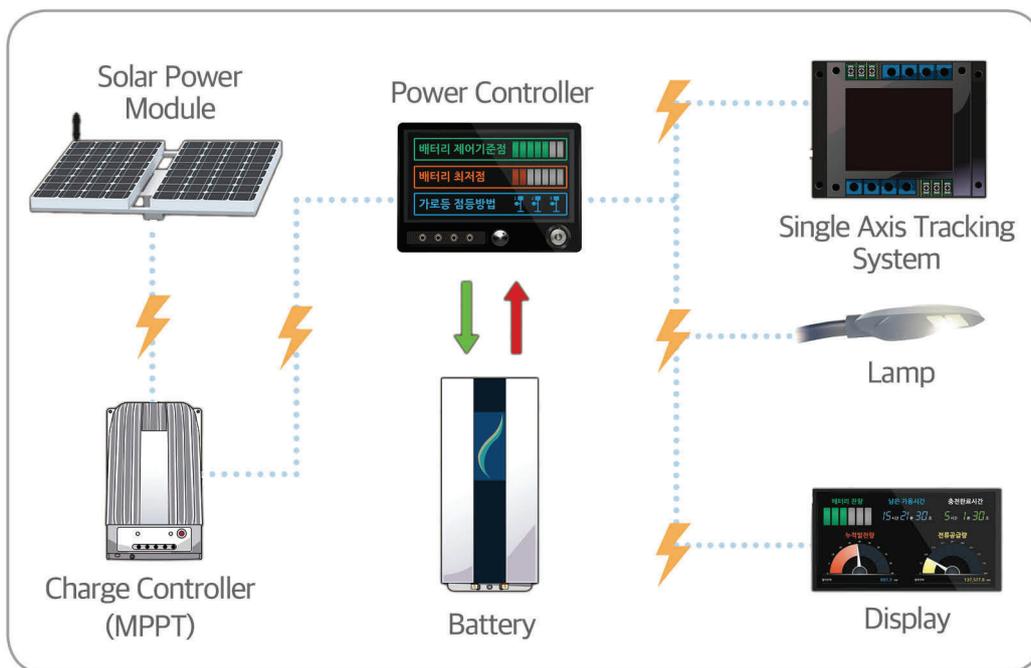
List for Power Operation Check

- ✓ Battery residual value
- ✓ Remain hours of operation
- ✓ Remain hours of full charge
- ✓ Amount of cumulative generated power
- ✓ Amount of current supply



List for Power Control Settings

- ✓ Reference point of the battery
- ✓ The lowest point of the battery
- ✓ Lighting method of the streetlamp



Fixed-type Streetlamp



General Model Specifications

■ Fixed-type Streetlamp_General

Model Name	HSS-B40W5M	Solar Power Tracker	-
Solar Module	100Wp x 2EA	Charge Controller	DC12V 20A / PWM
LED lamp	40W	integrated controller	-
Battery Capacity	144Ah / DC 12V	Control Box Type	BUILT IN
Battery Type	Lithium-ION	Product Size (material)	About 5M(STS304)
Solar Power Tracking Sensor	-	Certified Technology	-
Model Name	HSS-B50W5M	Solar Power Tracker	-
Solar Module	120Wp x 2EA	Charge Controller	DC12V 20A / PWM
LED lamp	50W	integrated controller	-
Battery Capacity	176Ah / DC 12V	Control Box Type	BUILT IN
Battery Type	Lithium-ION	Product Size (material)	About 5M(STS304)
Solar Power Tracking Sensor	-	Certified Technology	-
Model Name	HSS-B60W6M	Solar Power Tracker	-
Solar Module	150Wp x 2EA	Charge Controller	DC12V 20A / PWM
LED lamp	60W	integrated controller	-
Battery Capacity	176Ah / DC 12V	Control Box Type	BUILT IN
Battery Type	Lithium-ION	Product Size (material)	About 6M(STS304)
Solar Power Tracking Sensor	-	Certified Technology	-

Fixed-type Streetlamp

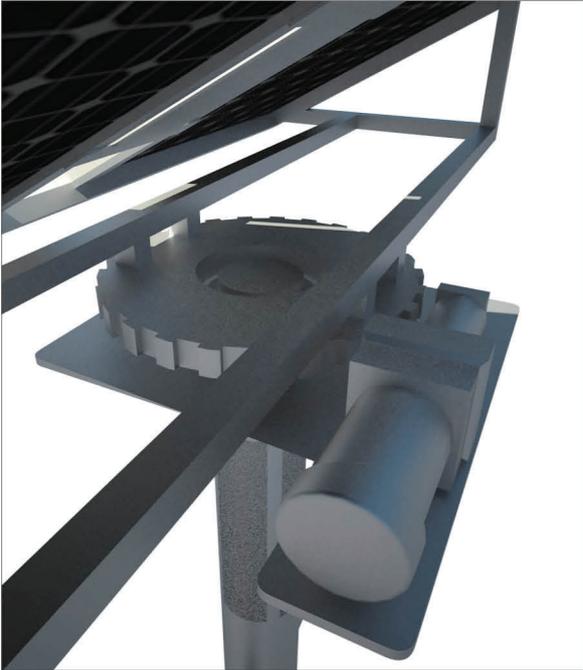


premium Model Specifications

■ Fixed-type Streetlamp_premium

Model Name	HSS-P40W5M	Charge Controller	DC12V 20A / MPPT
Solar Module	100Wp x 2EA	integrated controller	12V / 60W
LED lamp	40W	Control Box Type	BUILT IN
Battery Capacity	110Ah / DC 12V	Product Size (material)	About 5M(STS304)
Battery Type	Lithium Phosphate Iron	Certified Technology	* Patent Technology Applied (No 10-1294807) * Certified by KC (electromagnetic compatibility registration)
Solar Power Tracking Sensor	-		
Solar Power Tracker	-		
Model Name	HSS-P50W5M	Charge Controller	DC12V 20A / MPPT
Solar Module	100Wp x 2EA	integrated controller	12V / 60W
LED lamp	50W	Control Box Type	BUILT IN
Battery Capacity	110Ah / DC 12V	Product Size (material)	About 5M(STS304)
Battery Type	Lithium Phosphate Iron	Certified Technology	* Patent Technology Applied (No 10-1294807) * Certified by KC (electromagnetic compatibility registration)
Solar Power Tracking Sensor	-		
Solar Power Tracker	-		
Model Name	HSS-P60W6M	Charge Controller	DC12V 20A / MPPT
Solar Module	120Wp x 2EA	integrated controller	12V / 60W
LED lamp	60W	Control Box Type	BUILT IN
Battery Capacity	160Ah / DC 12V	Product Size (material)	About 6M(STS304)
Battery Type	Lithium Phosphate Iron	Certified Technology	* Patent Technology Applied (No 10-1294807) * Certified by KC (electromagnetic compatibility registration)
Solar Power Tracking Sensor	-		
Solar Power Tracker	-		

Tracking-type Streetlamp



Product specifications

■ Tracking-type Streetlamp

Model Name	HSS-T40W5M	integrated controller	12V / 60W
Solar Module	80Wp x 2EA	Control Box Type	BUILT IN
LED lamp	40W	Product Size (material)	About 5M(STS304)
Battery Capacity	110Ah / DC 12V	Solar Power Tracker	Solar Power Tracking Controller DC 12 / 4A V3(Programmable)
Battery Type	Lithium Phosphate Iron	Certified Technology	* Patent Technology Applied (No 10-1294807) * Certified by KC(electromagnetic compatibility registration)
Solar Power Tracking Sensor	Dual Axis Sensor (Azimuth Angle)		
Charge Controller	DC12V 20A / MPPT		

Model Name	HSS-T50W5M	integrated controller	12V / 60W
Solar Module	80Wp x 2EA	Control Box Type	BUILT IN
LED lamp	50W	Product Size (material)	About 5M(STS304)
Battery Capacity	135Ah / DC 12V	Solar Power Tracker	Solar Power Tracking Controller DC 12 / 4A V3(Programmable)
Battery Type	Lithium Phosphate Iron	Certified Technology	* Patent Technology Applied (No 10-1294807) * Certified by KC(electromagnetic compatibility registration)
Solar Power Tracking Sensor	Dual Axis Sensor (Azimuth Angle)		
Charge Controller	DC12V 20A / MPPT		

Model Name	HSS-T60W6M	integrated controller	12V / 60W
Solar Module	100Wp x 2EA	Control Box Type	BUILT IN
LED lamp	60W	Product Size (material)	About 6M(STS304)
Battery Capacity	160Ah / DC 12V	Solar Power Tracker	Solar Power Tracking Controller DC 12 / 4A V3(Programmable)
Battery Type	Lithium Phosphate Iron	Certified Technology	* Patent Technology Applied (No 10-1294807) * Certified by KC(electromagnetic compatibility registration)
Solar Power Tracking Sensor	Dual Axis Sensor (Azimuth Angle)		
Charge Controller	DC12V 20A / MPPT		

LED light fixture

■ Model name : HE40 (LED 40W)



Standard	Figure	Measur
Lighting Fixture Efficiency	102	lm/w
Initial Luminous Flux	4130 (109% of Rated Light Speed)	lm
Color Rendering	75.2	Ra
Luminous Flux Retention Rate	99	%
Input Voltage	DC 12V	V
Input Electrical Power	40	W
input current	0.19	A
Color Temperature	5,747	K
Degree of Protection	65	IP
Power Factor	0.98	
Rated Light Speed	3,800	lm
Source of Light and Package	LG Innoteck Co., Ltd	

■ Model name : HE50 (LED 50W)



Standard	Figure	Measur
Lighting Fixture Efficiency	122	lm/w
Initial Luminous Flux	5970 (108% of Rated Light Speed)	lm
Color Rendering	77	Ra
Luminous Flux Retention Rate	96.8	%
Input Voltage	DC 12V	V
Input Electrical Power	50	W
input current	0.23	A
Color Temperature	5,395	K
Degree of Protection	65	IP
Power Factor	0.96	
Rated Light Speed	5,500	lm
Source of Light and Package	LG Innoteck Co., Ltd	

■ Model name : HE60 (LED 60W)

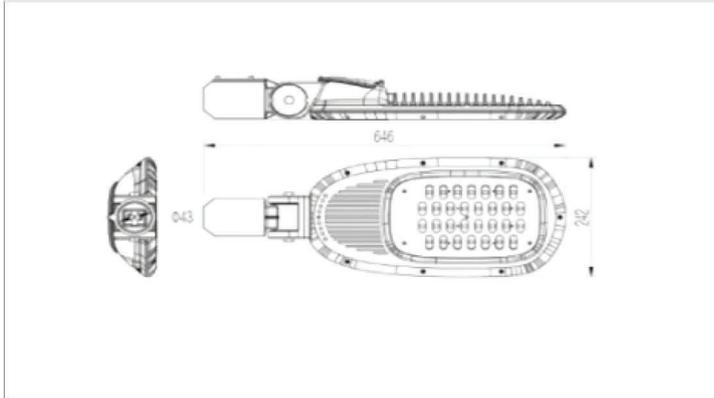


Standard	Figure	Measur
Lighting Fixture Efficiency	110	lm/w
Initial Luminous Flux	6839 (120% of Rated Light Speed)	lm
Color Rendering	76	Ra
Luminous Flux Retention Rate	96.5	%
Input Voltage	DC 12V	V
Input Electrical Power	60	W
input current	0.28	A
Color Temperature	5,825	K
Degree of Protection	65	IP
Power Factor	0.99	
Rated Light Speed	5,700	lm
Source of Light and Package	LG Innoteck Co., Ltd	

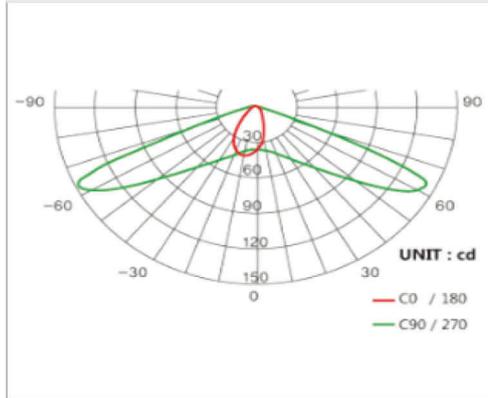
LED light fixture

■ Size and Light Distribution Curve of HE40

Exterior Size (mm) 646 x 242 x 87 (Internal Diameter ϕ 43)

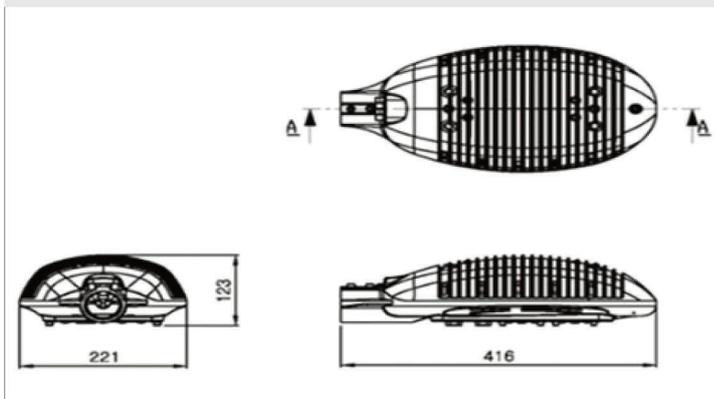


Beam Angle

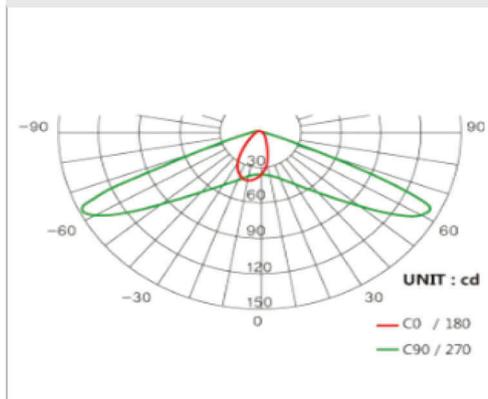


■ Size and Light Distribution Curve of HE50

Exterior Size (mm) 416 x 221 x 123

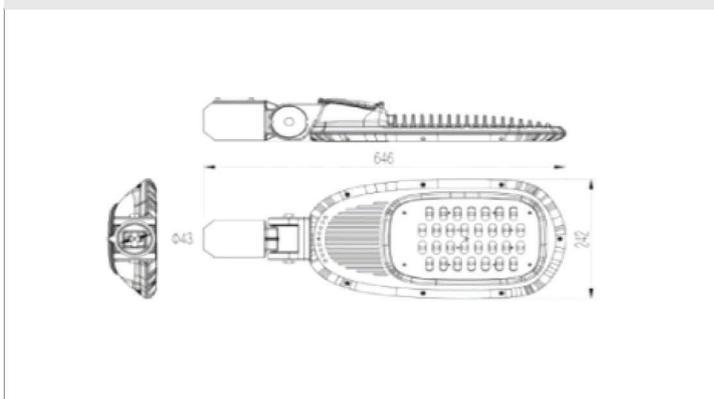


Beam Angle

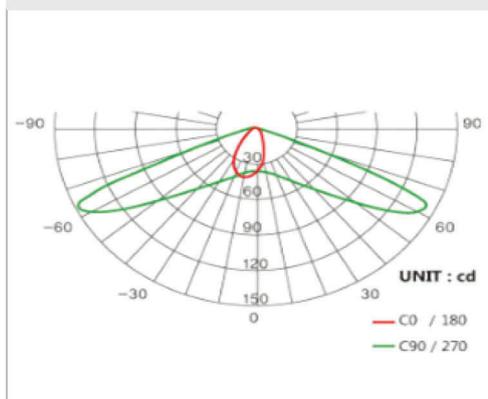


■ Size and Light Distribution Curve of HE60

Exterior Size (mm) 646 x 242 x 87 (Internal Diameter ϕ 43)



Beam Angle



SPC-solar Power Controller

Unique Power Control Patent Technology Only with Haneoulnuri!!

Battery's lifespan extended by preventing overcharge and full discharge!
It also prevents lighting problems!



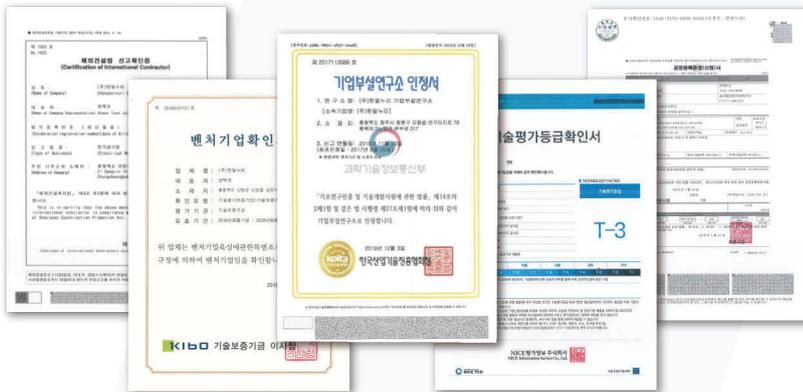
Key Technical Details

Specification	Contents	
Voltage for Monitoring Battery Charge is up to 36v, 15A (30A)	<ul style="list-style-type: none"> ■ Checking remained battery by monitoring Charged or Discharged status 	<ul style="list-style-type: none"> ■ Setting time for lamp lighting mode ■ Built in MICOM to control battery charging voltage and current
Streetlight 12V, 60W Control	<ul style="list-style-type: none"> ■ Remaining battery display ■ Remaining hours of operation display ■ Built-in monthly sunset and sunrise time data on MICOM 	<ul style="list-style-type: none"> ■ The amount of accumulated power generation ■ The amount of current supply display ■ Controlling lighting method per lamp status
Various Lighting Options and Battery Shutdown Mode Using Fixed RTC	<ul style="list-style-type: none"> ■ Remaining battery display by only using battery voltage ■ Remaining charging hours display 	<ul style="list-style-type: none"> ■ The amount of accumulated power generation display ■ The lamp's accumulated consumption rate display
Control of Light and Tracker	<ul style="list-style-type: none"> ■ LED light control according to remain battery ■ Controlling control reference point of the highest battery point (reference point) 	<ul style="list-style-type: none"> ■ Controlling reference point of the lowest battery point (the lowest point) ■ The tracker's accumulated consumption rate display
Functions to set levels for voltage or current monitoring of charge/discharge and power shutdown setting using GLCD	<ul style="list-style-type: none"> ■ Provides solutions on maximizing system's stability and efficiency by using controller of independent solar power generation system and algorithm of optimized program. ■ By using power controller to manage battery's charge/discharge and use minimum electricity load, the high-priced battery's lifespan extends, and expense reduces. ■ The display of the power management system gives users information on setting, confirmation, power usage to efficiently save power and prevent problems caused by region, weather, and more. ■ Maximize efficiency of the solar power generated energy by comparing and analyzing solar power and seasonal data and utilizing single axis control motor tracker ■ Through MICOM(MCU) control, it maintains high performance under lighting problems due to lack of sunlight, shortage issues of battery lifespan, and endures low/high temperature (contributes on increasing days without sunlight) 	

Certificate and retention license



- ▶ Management Innovation Medium Business (MAIN-BIZ)
- ▶ Registration Certificate for Electrical Industry
- ▶ Registration Certificate for Fire Protection Facility Business
- ▶ Certificate on Excellent Employment Enterprise
- ▶ Certificate on Best Family Friendly Management Company



- ▶ Venture Business Confirmation
- ▶ Certificate on Corporate Annex Research Institute
- ▶ Technology Credit Evaluation Confirmation
- ▶ Overseas Construction Industry Registration
- ▶ Factory Registration Certificate



- ▶ Patent
 - Control device and control method on independent solar power generation system
 - Silicon ingot control device
 - Performance evaluation method and its system for solar power modules
- ▶ Patent Application
 - Solar Power Streetlamp and its operating method (Patent application no. 10-2019-0171913)
 - Solar Power Tracking Equipment (Patent application no. 10-2019-0166665)
 - Solar Power Design (Patent application no. 30-2019-0057739)



- ▶ Quality Management System Certification (ISO-9001)
- ▶ Environmental Management System Certification (ISO-14001)
- ▶ Quality Certification Specification





Haneolnuri

Prepare for Tomorrow

With the best design and high-tech construction method,
Haneoulnuri leaps beyond spatial limit and challenges boldly for a
better tomorrow and an eco-friendly future



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