ARPOS

RENEWABLE STREET LIGHTING

BRING LIGHT TO DARK AREAS
IN A SUSTAINABLE WAY

ARPOS BASIC & SMART

WIND **SOLAR**

RPOS
RENEWABLE STREET LIGHTING

PRODUCT LINE
STREETLIGHT APPLICATIONS

BRING LIGHT WHERE IS NEEDED THE MOST.

ARPOS pole can be used for both street light and home lighting purposes.

CITY WIDE IMPLEMENTATION

ARPOS line is suitable for deployment invarious urban environments, from crowded streets to highways.

RURAL ELECTRIFICATION

It can be connected to a cluster of houses and in this way the excess electricity can be used to supply homes.

AN AFFORDABLE HIGH TECH SOLUTION

ARPOS is the one of the first hybrid standalone streetlighting pole, providing light, security, connectivity and safety. ARPOS has been built and configured to harvest maximum energy from renewable sources available on site and also allows integration into larger systems for remote management and monitoring.

Fitted with a high power LED system, the ARPOS pole offers an efficient way to assure the light quality required for a safer automotive and pedestrian traffic.

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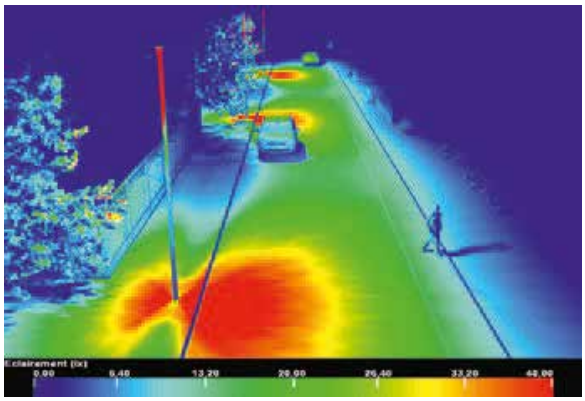
PRODUCT LINE STREETLIGHT APPLICATIONS

PRODUCT LINE	BASIC	SMART
Description	The basic pole has a revolutionary design that is provides reliable light using solar and wind.	Smart accesories are added to the pole, so there will be additional benefits to the users
Road class	S, CE, ME	S, CE, ME
LED lamp size	30W - 65W	30W - 65W
Number of lamps	1 or 2	1 or 2
Number of arms	1 or 2	1 or 2
Pole distribution	Single, double or central	Single, double or central
Renewables	Solar, Wind	Solar, Wind
Consumption *	360-780 Wh	360-780 Wh
IP Camera	N/A	180o 1.2MP IP camera
Charger	N/A	USB Charger
WiFi (optional)	N/A	Access point
On-grid connection (optional)	N/A	Grid energy used
Grid feeed (optional)	N/A	Micro on-grid inverter
Weather sensor (optional)	N/A	Temperature, time and humidity
RFID (optional)	N/A	RFID reader

* Consumption is calculated based on the number of lamps installed, considering 12 hours of light per night.

APPLICATIONS FOR ROADS AND PARKING AREAS

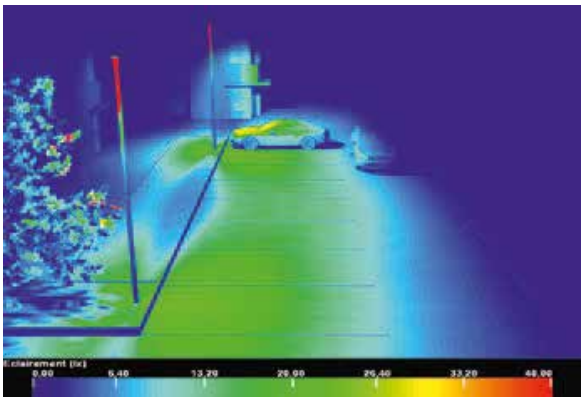
Residential roads - Class ME4b



Class ME4b
L = 0.75 cd/m2 (on average)
U0>0.4; UI>0.5

Road width: 5m
Mounting height: 6m
Spacing: 24m

Parking areas - Class CE4

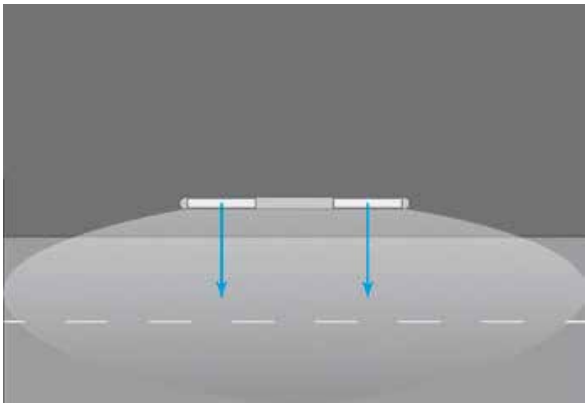


Class CE4
10 lux on average
Uniformity of 0.4

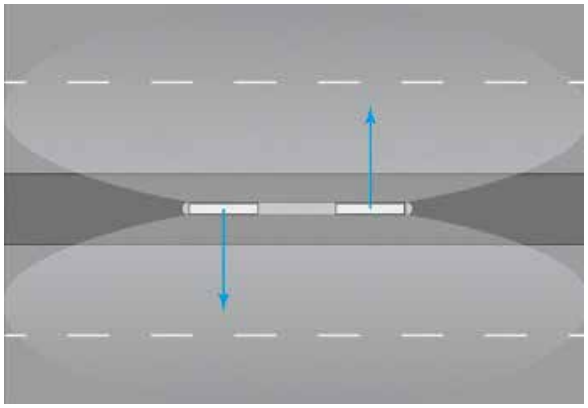
Road width: 3.5m
Parking width: 5m
Mounting height: 6m
Spacing: 16m

INSTALLATION OPTIONS

When required, ARPOS poles can be installed parallel with the road.
Using special tilting lamps, the angle can vary from -5o to +5o



Asymmetrical light distribution



Symmetrical light distribution

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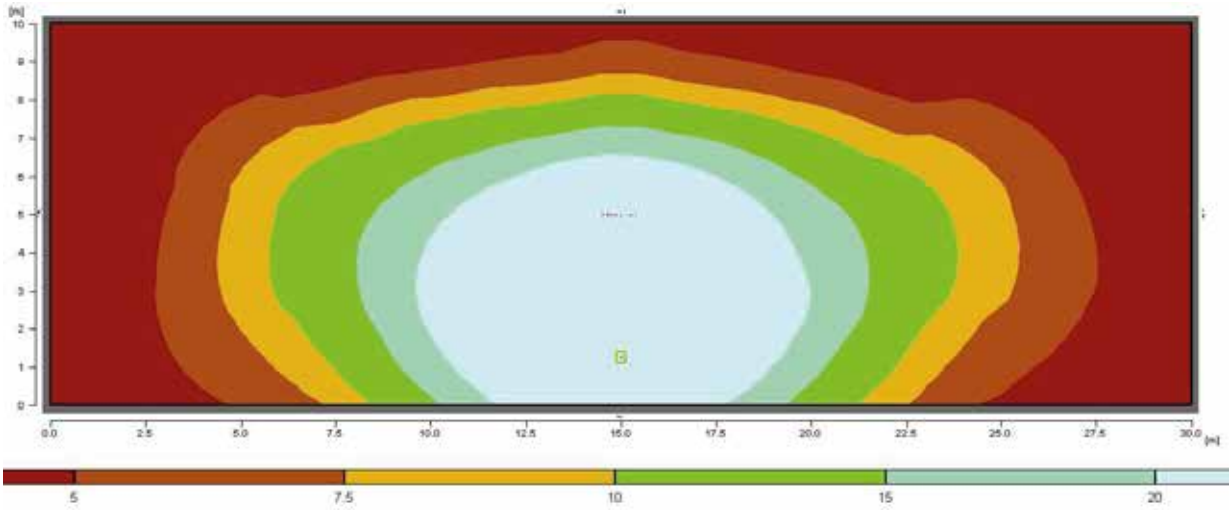
LIGHTING CHARACTERISTICS

Power consumption	36W standard. Other sizes available on request.
IP	IP 65
Globe	Tempered glass
LED packages	Edison
Light temperature	4000 oK as standard
Luminosity (Lm/W)	140
Life expentancy	up to 80.000 hrs
Warranty	5 years

ARPOS

ARPOS: 36W, S-type Lens , Luminarie height= 6m, Angle of inclination =0°



ELECTRICAL CHARACTERISTICS

PV Modules *	Total of 6 polycrystalline modules per pole 20w per module, total of 120W per hole Warranty of 2 years. 25 years with 80% efficiency
Wind turbine	300W Max
LED	Standard LED - 36 Watt, 20 lux ground based on 7.5m pole LED Power range 30-65W
Energy storage **	750 Wh (25 Volt x 30 Ah) li-polymer battery, 2000 cycles Full electronic circuit protection in battery pack
System autonomy	12 - 72h (Optional upgrade)
Dimming	Standard
Energy management	Balance consumption between light and accesories
Grid feed	Max 330 W micro inverter
On-grid connection	6.2 amp @ 30VDC battery charger

Additional accesories would require extra storage capacity

* Solar panels capacity is determined considering number of lamps installed, when the system allows multiple light points installation

** Capacity for Energy Storage is determined by the required system autonomy and the number of lamps installed. Standard poles are coming with a 12 hours automonomy. On request, it can be extended up to 72 hours using additional battery packs.

PHYSICAL CHARACTERISTICS

Body material	Housing: aluminium or galvanized steel Optical cover: tempered glass	
Pole	**Aluminum** 4mm thickness, 300mm radius Base Plate: 700m radius, 10mm thickness Anchorage: m22x8x1000	**Galvanized Steel** Minimum 70-80 micron hot dip galvanize (S235 steel) 4mm thickness, 300mm radius Base Plate: 700m radius, 10mm thickness Anchorage: m22x8x1000
Body colour	Silver Grey standard (Other RAL colours available)	
Pole height	Standard height 7.5m (6m pole, 1.2m wind turbine, 0.3m disk and tray) 6-14m available	
IP	65	
Tray	Holds 6 solar panels and LED Heigth: 9cm on the front (LED side), 7cm on the back side. Length: 342cm. Width: 36cm	

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ENERGY PRODUCTION

Solar	PV - 6 solar panels	Total production is 120 Watt. Polycristalline panels. 20-year guarantee with 80% efficiency.
Wind turbine	Custom-design, neodymium magnet, direct-drive, brushless alternator that does not need maintenance service	Start-up Speed 3 m/s (no energy production), @ 4.5 m/s - 25 Watt, @ 6 m/s - 50 Watt, 7.5 m/s - 75 Watt, @ 8.5 m/s - 100 Watt, @12.5 m/s 125 Watt, @17 m/s - 200 Watt, 22m/s - Wind Turbine Stops
	magnetic break system which stops the wind turbine from turning when the battery is full.	3-step smart charge system that is directed by a processor.
	Automatic fuse system	Halogen-free cable system

ENERGY CONSUMPTION

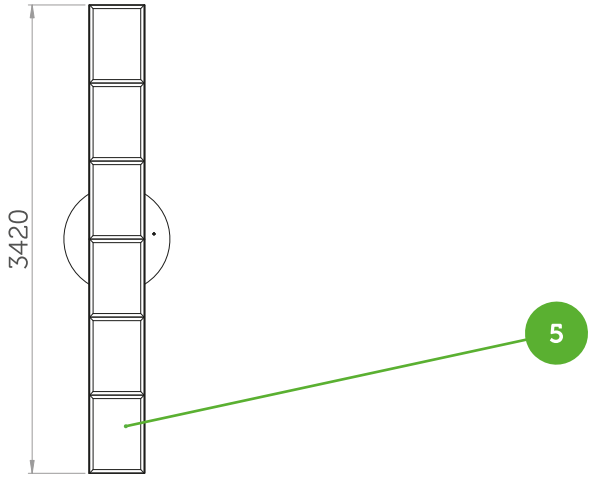
LED	36 Watt
IP Wi-Fi Camera	6 Watt, 15-meter range with night vision. 1.3 MP
USB	4.2 Watt (Max output 500 ma 5V)
Access Point (Optional)	4 Watt (12 db output)
Weather sensor (Optional)	6 Watt

SAMPLE YEARLY ENERGY BALANCE FOR ARPOS BASIC

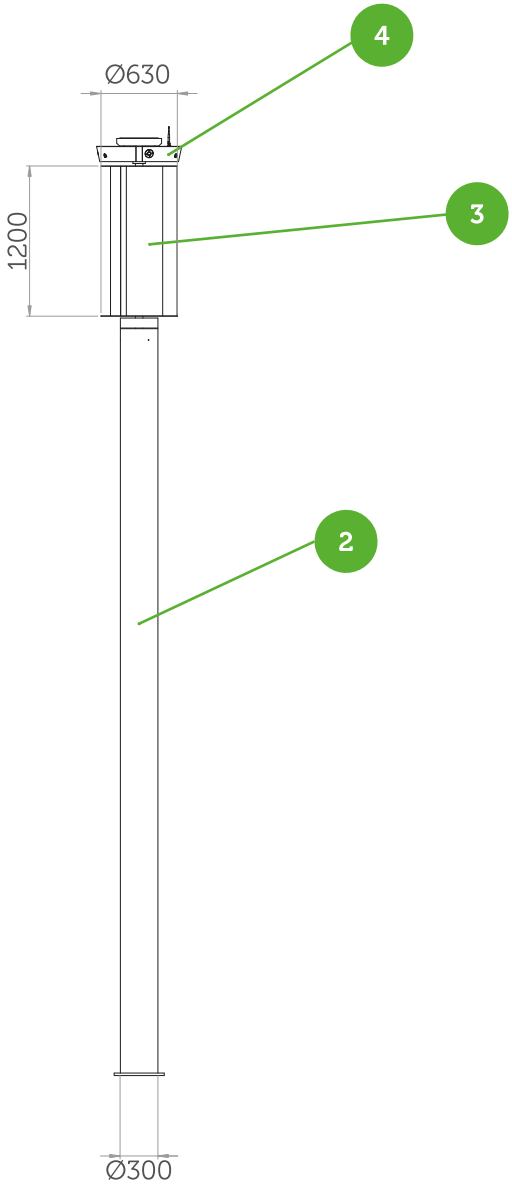
Generation	Low	M. low	Medium	M. high	High
Wind speed (m/s)	4.5	6	8	10	12
Solar radiation (kWh/m2/year)	1000	1500	2000	2500	3000
Wind production (kWh/year)	77	149	292	365	448
Solar production (kWh/year)	105	140	185	235	305
Total production (kWh/year)	182	289	477	600	753
Excess generation (kWh/year) *	**25**	**132**	**320**	**443**	**596**

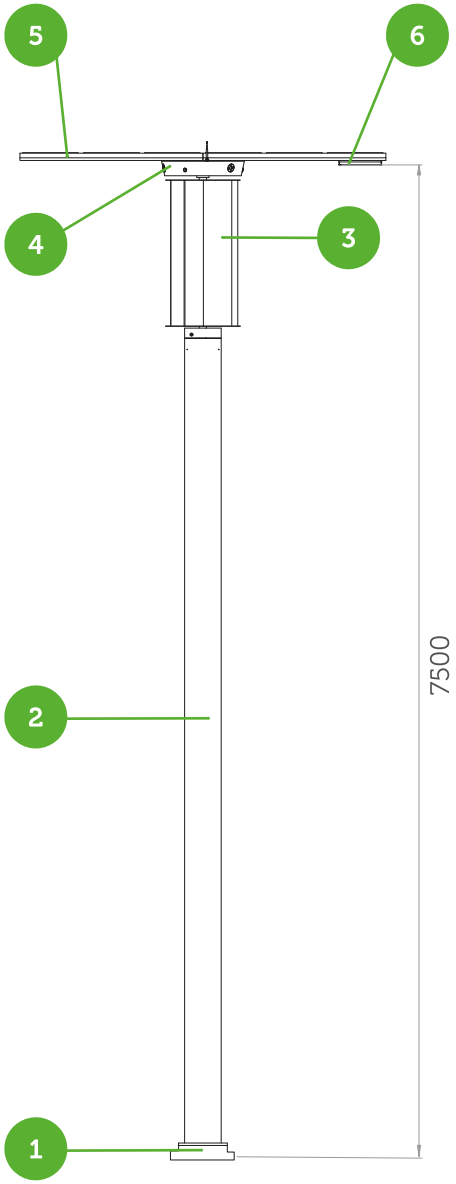
*) Calculated for a 30W LED lamp used 12 hours per night.

DRAWINGS FOR ARPOS SMART



QTY	ITEM NO	DESCRIPTION
1	1	Pipe foot
1	2	Main pipe
1	3	Turbine
1	4	Generator
6	5	Solar frame
1	6	LED lamp





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ARPOS OPTIONAL ACCESORIES

	**IP CAM:** With 180° coverage, data can be stored locally or streamed to a central control room
	**CHARGER:** Allows local charging of USB devices or portable lighting systems (2 USB outlets)
	**WIRELESS ACCESS POINT:** Creates a wireless network that will cover the surround- ing area and can have public or private access
	**WEATHER SENSOR:** This feature allows reading of several weather parameters
	**RFID:** Can read active or passive RFID tags.
	**ON-GRID OPTION:** When the battery capacity gets as low as 5%, within 10 milliseconds the grid begins to feed the pole and will fully charge the battery within 3 hours Grid voltage tolerance required is 100-280 VAC at 50 or 60 Hz. up to 80.000 hrs
	**GRID FEED:** After the battery reaches 100% capacity with the energy produced by the sun and wind, the excess energy is fed into the grid by a micro on-grid inverter
	**CUSTOMISABLE ADD-ONS:** The platform supports development of additional features and integrating them in the ARMACON Platform

IP CAMERA

Sensor	1.2 MP
Lens	Wide angle
Covered area	90 - 180 dgr
Imaging device	1/3-in. progressive-scan CMOS sensor with wide dynamic range
Minimum illumination	Color mode: F1.4 @ 0.65 lux Black and white mode: F1.4 @ 0 lux night shot
Signal to noise ratio (SNR)	> 48 dB
Video compression	H.264, MPEG-4, MJPEG
Protocols	Dynamic Host Control Protocol (DHCP), File Transfer Protocol (FTP), Hypertext Transfer Protocol (HTTP), Se- cure HTTP (HTTPS), Network Time Protocol (NTP), Real- Time Transport Protocol (RTP), Real-Time Streaming Protocol (RTSP), Simple Mail Transfer Protocol (SMTP), Secure Sockets Layer/Transport Layer Security (SSL/ TLS), Transmission Control Protocol/Internet Protocol (TCP/IP)

WIRELESS ACCESS POINT

Standards
IEEE 802.11b, IEEE 802.11g, IEEE 802.11n

LEDS
Power, LAN, 4 Signal Strength LEDs

Interfaces
1 * 10/100Mbps Auto-Sensing RJ45 Port (Auto MD/MDIX) Passive PoE supported Frequency Range 2.4-2.4835GHz

Security
WEP, WPA/WPA2,
WPA-P5K/WpA2-PSK encryptions,
MAC Filtering

Wireless Data Rates
Up to 150Mbps

Operating Temp.
-30°C-70˚C (-22°F-158°F)

Antenna Type
Dual-Polarized 12dBi
antenna, external RP-SMA connector

Advanced Features
Long Distance Adjustment, Antenna Alignment, Wireless Speed Test, Ping Watchdog

Operating Mode
AP, AP Router/AP Client,
WISP Client Router/Bridge/
Repeater mode

Operating Humidity
10%-90%RH, Non-condensing

Dimensions
(H x W x D) 10.4 x 4.7 x 3.2 inch
(265 x120 x 83 mm)

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WHY IS RENEWABLE ENERGY IMPORTANT?

Environmental Benefits

Renewable energy technologies are clean sources of energy that have a much lower environmental impact than conventional energy technologies.

Energy for our children's children's children

Renewable energy will not run out. Ever. Other sources of energy are finite and will some day be depleted.

Jobs and the Economy

Most renewable energy investments are spent on materials and workmanship to build and maintain the facilities, rather than on costly energy imports. Renewable energy investments are usually spent within the United States, frequently in the same state, and often in the same town. This means your energy dollars stay home to create jobs and fuel local economies, rather than going overseas. Meanwhile, renewable energy technologies developed and built in the United States are being sold overseas, providing a boost to the U.S. trade deficit.

Energy Security

After the oil supply disruptions of the early 1970s, our nation has increased its dependence on foreign oil supplies instead of decreasing it. This increased dependence impacts more than just our national energy policy.

*Content for this section provided in part by the National Renewable Energy Laboratory and the Department of Energy.


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