



#2023-177

**Ridgefield Road Solar Farm
Project Review for Planning and Zoning Commission**

Meeting Date: September 6, 2023

Request: Conceptual Planned Unit Development for a solar farm.

Location: Ridgefield Road

Acreage: Approximately 46 acres

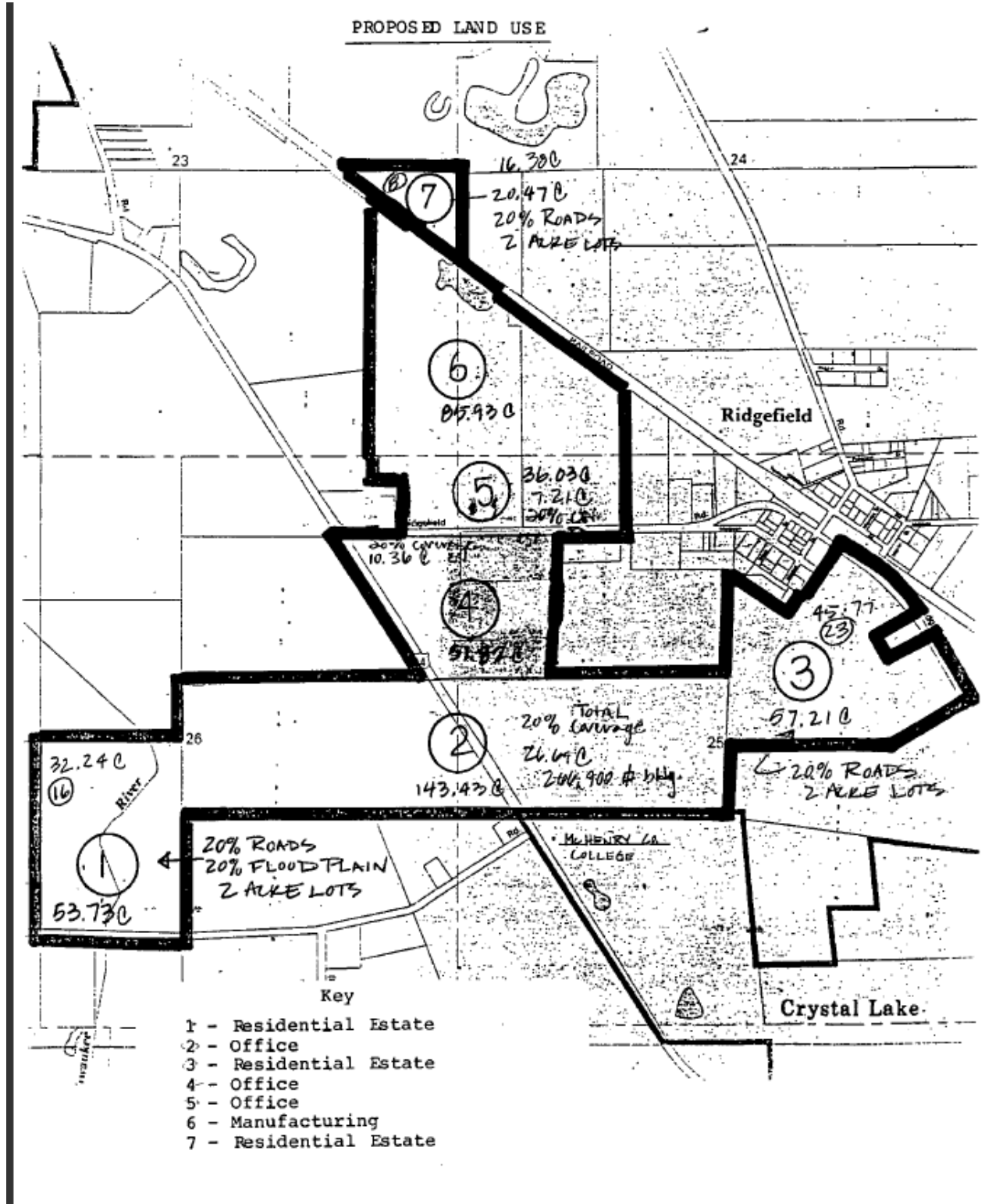
Zoning: M PUD Manufacturing

Surrounding Properties: North: F Farming
South: O PUD Office
East: M PUD Manufacturing (The MAC soccer fields)
West: A-1 Agriculture (McHenry County)

Staff Contact: Elizabeth Maxwell (815.356.3615)

Background:

- The site is a vacant lot used for agriculture.
- The proposed solar company would be acquiring the back half of the property to install solar panels, battery storage and a fabric-wrapped fence.
- The site was annexed and zoned in 1989. At the time, this property was a planned Office-Industrial District. The map illustrates Office and Manufacturing uses for the site. Specific permitted uses were office, administrative headquarters, personnel training center, radio or television stations, hotel, banks, indoor facilities for court games, research and professional laboratories, accessory uses to serve the office and manufacturing uses of food service, and light manufacturing,
- This PUD was never established as no development occurred. The site is zoned M PUD which will require the petitioner to seek Planned Unit Development approvals.



Development Analysis:

Land Use/Zoning

- The site is currently zoned M PUD Manufacturing.
- The current land use is Agriculture/Rural Residential. A Comprehensive Land Use Plan Amendment would be required to request Industry.

Site Layout

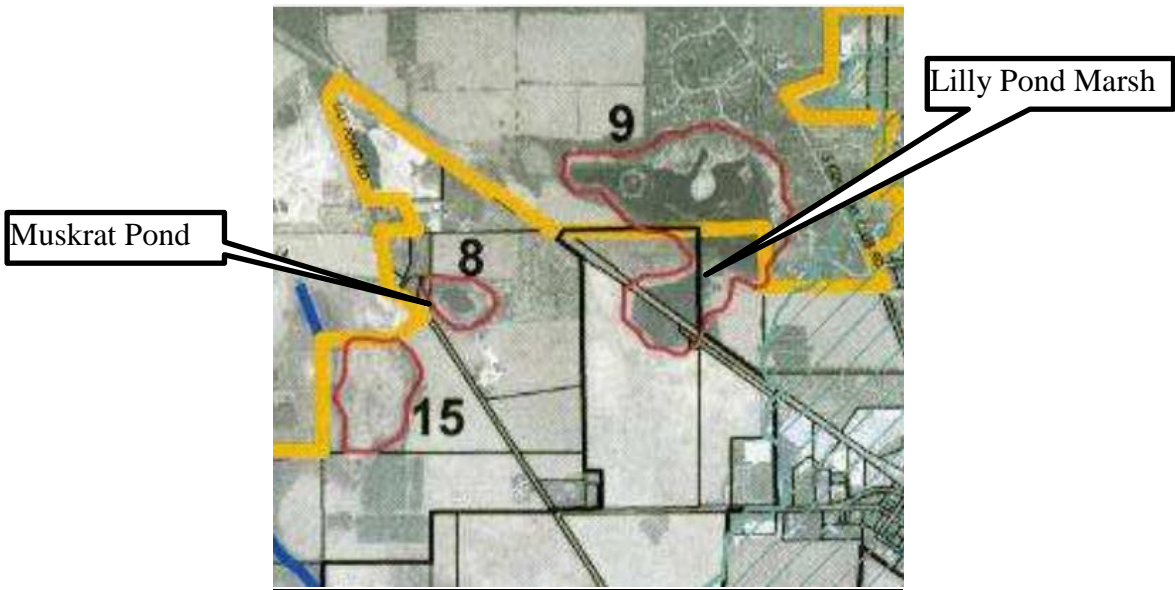
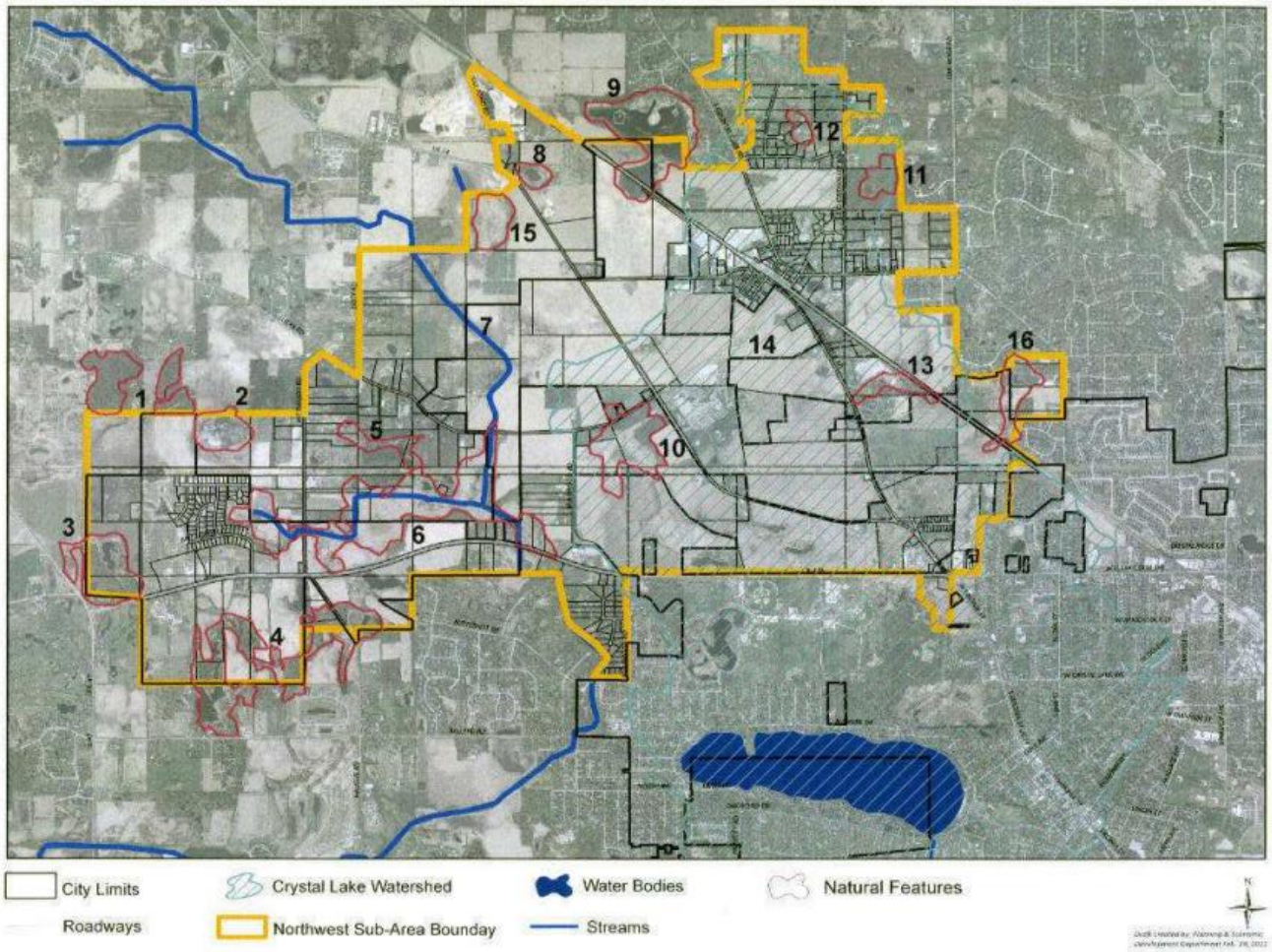
- The site would be accessed from Ridgefield Road, just west of the MAC and the soccer fields.
- The solar farm is approximately 1,000 feet from Ridgefield Road.
- A 10-foot paved path would run throughout the site. This is to comply with the UDO requirement for solar farms.
- A green fabric-wrapped fence is proposed around the entire site. This is to comply with the UDO requirement to screen the solar farm from roadways.
- The UDO requires that the grounds in and around the panels shall be repurposed for wildflowers or agriculture. A landscape plan would be required with the Planned Unit Development submittal.

Wetland

- The wetland is Lilly Pond Marsh and per the Comprehensive Land Use Plan, a 100-foot buffer is required.
- There is an opportunity to provide a green path along the railroad right-of-way to start a connection over to Muskrat Pond to the west.
- A wetland delineation would be required for development.
- Comprehensive Land Use Plan recommendations:

- 8) Muskrat Pond, identified by MCCD, is a small pond surrounded by undisturbed bushes and grasses. A 100-foot buffer should be established from the outer limits of the grass area surrounding the pond.
- 9) Site 9 is Lily Pond Marsh, identified by MCCD. This feature straddles the rail line and a portion of this feature is located within the sub-area. This site has very little undisturbed surrounding area because it has been farmed. A 100-foot buffer should be established to protect the water quality of this feature. Opportunity exists to provide a green space connection between this site and site 8.

Northwest Sub-Area Natural Features

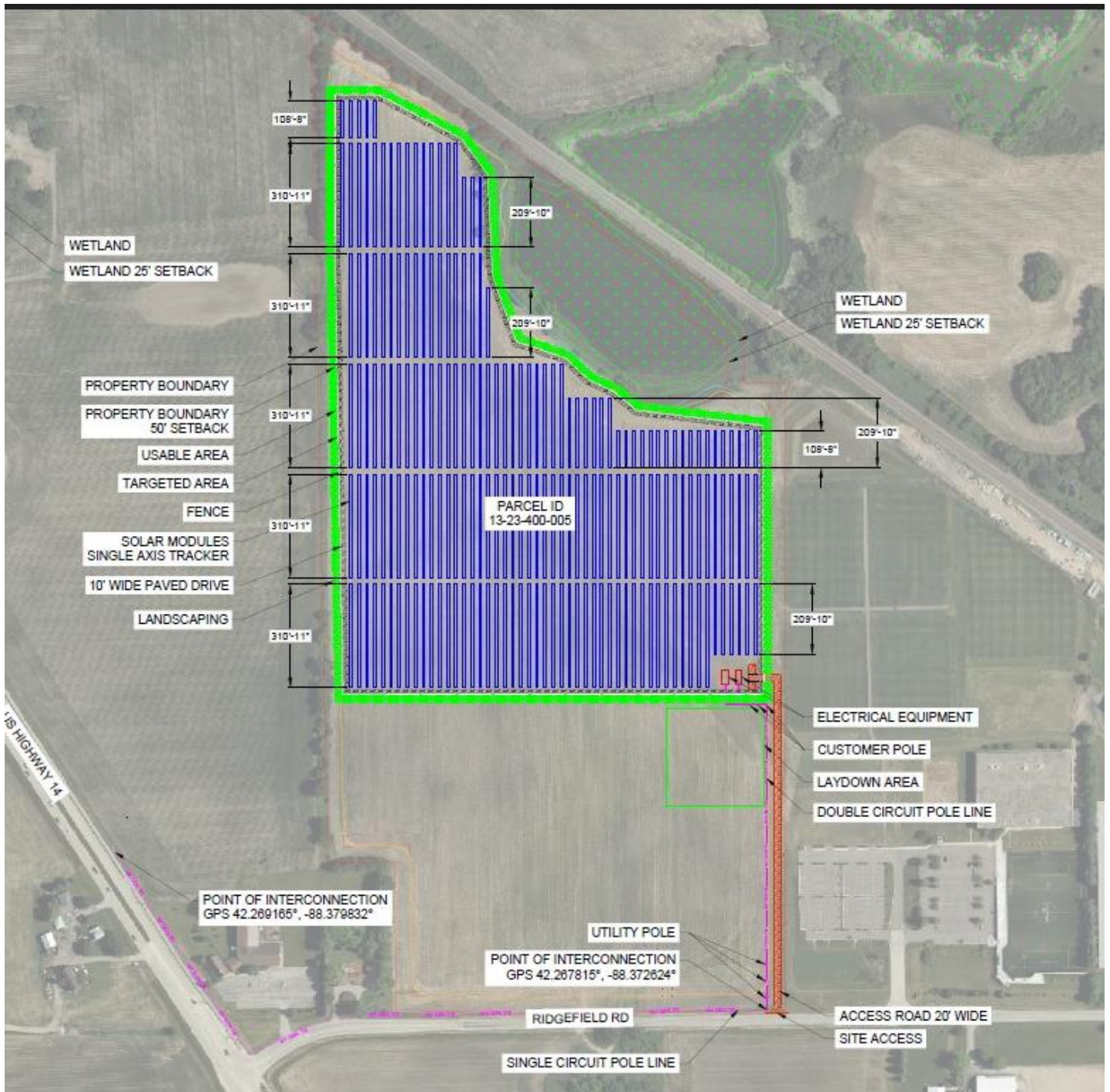


Discussion Topics:

1. How does the proposed use of a solar farm fit within the character of the area?
2. While the subject property is not located in the Crystal Lake Watershed, the 2030 Comprehensive Plan encourages development, which minimizes its impact to the Northwest Sub-Area. Development that minimizes grading is encouraged, does this proposed land use complement this goal?
3. The request may require a plat of subdivision. What would be compatible land uses for the property along Ridgefield Road if the request moves forward?

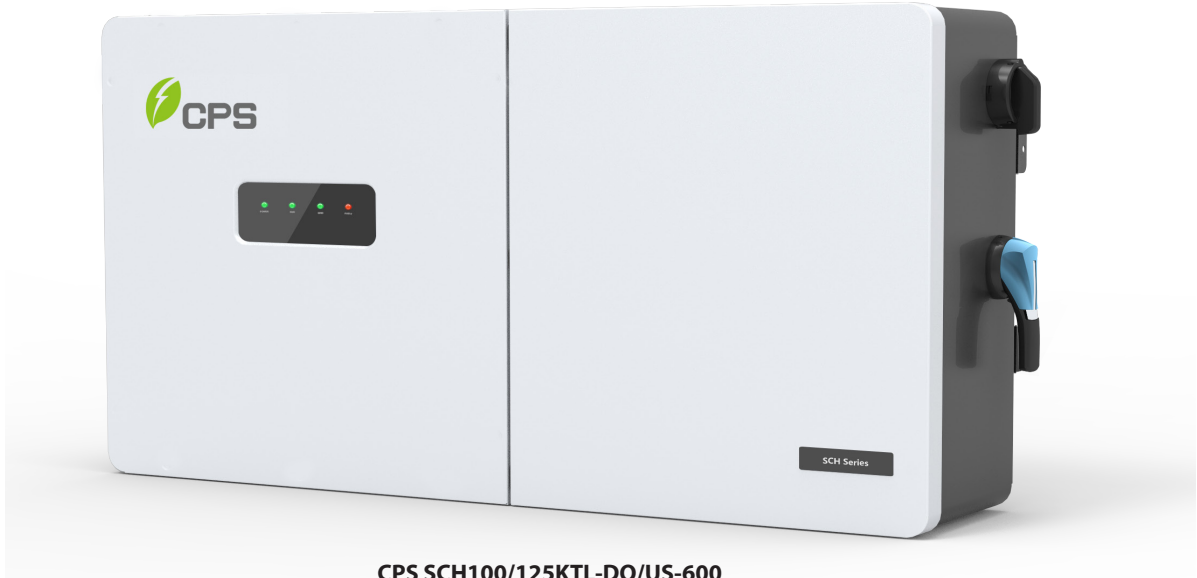
PIQ Map
Ridgefield Road







100/125 kW, 1500 Vdc String Inverters for North America



CPS SCH100/125KTL-DO/US-600

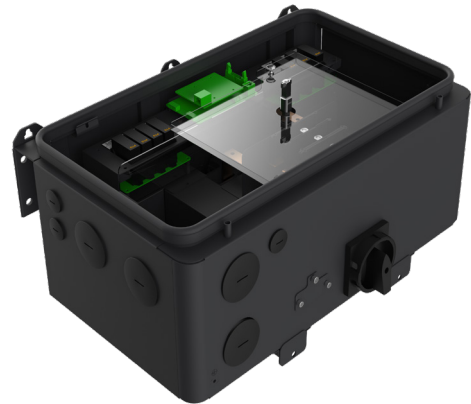
The 100 and 125 kW high power CPS three-phase string inverters are designed for ground mount applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 99.1% peak and 98.5% CEC, wide operating voltages, broad temperature ranges and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 100/125 kW products ship with the Standard or Centralized Wire-box, each fully integrated and separable with AC and DC disconnect switches. The Standard Wire-box includes touch-safe fusing for up to 20 strings. The CPS FlexOM Gateway enables communication, controls and remote product upgrades.

Key Features

- NFPA 70 and NEC compliant
- Touch-safe DC Fuse holders add convenience and safety
- CPS FlexOM Gateway enables remote firmware upgrades
- Integrated AC and DC disconnect switches
- 1 MPPT with 20 fused inputs for maximum flexibility
- Copper- and Aluminum-compatible AC connections
- NEMA Type 4X outdoor rated enclosure
- Advanced Smart-Grid features (CA Rule 21 certified)
- kVA headroom yields 100 kW @ 0.9 PF and 125 kW @ 0.95 PF
- Generous 1.87 (100 kW) and 1.5 (125 kW) DC/AC inverter load ratios
- Separable wire-box design for fast service
- Standard 5-year warranty with extensions to 20 years



100/125KTL Standard Wire-box



100/125KTL Centralized Wire-box



Model Name	CPS SCH100KTL-DO/US-600	CPS SCH125KTL-DO/US-600
DC Input		
Max. PV power	187.5 kW	
Max. DC input voltage	1500 V	
Operating DC input voltage range	860-1450 Vdc	
Start-up DC input voltage / power	900 V / 250 W	
Number of MPP trackers	1	
MPPT voltage range ¹	870-1300 Vdc	
Max. PV input current (Isc x 1.25)	275 A	
Number of DC inputs	Standard Wire-box: 20 PV source circuits, pos. and neg. fused Centralized Wire-box: 1 input circuit, 1-2 terminations per pole, non-fused	
DC disconnection type	Load-rated DC switch	
DC surge protection	Type II MOV (with indicator/remote signaling)	
AC Output		
Rated AC output power	100 kW	125 kW
Max. AC output power ²	100 kVA (111 kVA @ PF>0.9)	125 kVA (132 kVA @ PF>0.95)
Rated output voltage	600 Vac	
Output voltage range ³	528-660 Vac	
Grid connection type ⁴	3Φ / PE / N (neutral optional)	
Max. AC output current @ 600 Vac	96.2 / 106.8 A	120.3 / 127.0 A
Rated output frequency	60 Hz	
Output frequency range ³	57-63 Hz	
Power factor	>0.99 (±0.8 adjustable)	>0.99 (±0.8 adjustable)
Current THD	<3%	
Max. fault current contribution (1-cycle RMS)	41.47 A	
Max. OCPD rating	200 A	
AC disconnection type	Load-rated AC switch	
AC surge protection	Type II MOV (with indicator/remote signaling)	
System		
Topology	Transformerless	
Max. efficiency	99.1%	
CEC efficiency	98.5%	
Stand-by / night consumption	<4 W	
Environment		
Enclosure protection degree	NEMA Type 4X	
Cooling method	Variable speed cooling fans	
Operating temperature range	-22°F to +140°F / -30°C to +60°C (derating from +108°F / +42°C)	
Non-operating temperature range ⁵	-40°F to +158°F / -40°C to +70°C maximum	
Operating humidity	0-100%	
Operating altitude	8202 ft / 2500 m (no derating)	
Audible noise	<65 dBA @ 1 m and 25°C	
Display and Communication		
User interface and display	LED indicators, WiFi + APP	
Inverter monitoring	Modbus RS485	
Site-level monitoring	CPS FlexOM Gateway (1 per 32 inverters)	
Modbus data mapping	SunSpec / CPS	
Remote diagnostics / firmware upgrade functions	Standard / (with FlexOM Gateway)	
Mechanical		
Dimensions (W x H x D)	Standard Wire-box: 45.28 x 24.25 x 9.84 in (1150 x 616 x 250 mm) Centralized Wire-box: 39.37 x 24.25 x 9.84 in (1000 x 616 x 250 mm)	
Weight	Inverter: 121 lbs (55 kg) Standard Wire-box: 55 lbs (25 kg) Centralized Wire-box: 33 lbs (15 kg)	
Mounting / installation angle	15 - 90 degrees from horizontal (vertical or angled)	
AC termination	M10 stud type terminal [3Φ] (wire range: 1/0 AWG - 500 kcmil CU/AL; lugs not supplied) Screw clamp terminal block [N] (#12 - 1/0 AWG CU/AL)	
DC termination	Standard Wire-box: Screw clamp fuse holder (wire range: #12 - #6 AWG CU) Centralized Wire-box: Busbar, M10 bolts (wire range: #1AWG - 500kcmil CU/AL [1 termination per pole], #1 AWG - 300 kcmil CU/AL [2 terminations per pole]; lugs not supplied)	
Fused string inputs	20 A fuses provided (fuse values up to 30 A acceptable)	
Safety		
Certifications and standards	UL 1741-SA/SB Ed. 3, CSA-C22.2 NO.107.1-01, IEEE 1547-2018, FCC PART15	
Selectable grid standard	IEEE 1547a-2014, IEEE 1547-2018 ⁶ , CA Rule 21, ISO-NE	
Smart-grid features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAR, Freq-Watt, Volt-Watt	
Warranty		
Standard ⁷	5 years	
Extended terms	10, 15 and 20 years	

1) See user manual for further information regarding MPPT voltage range when operating at non-unity PF.

2) "Max AC apparent power" rating valid within MPPT voltage range and temperature range of -30°C to +40°C (-22°F to +104°F) for 100 kW PF≥0.9, and 125 kW PF≥0.95.

3) The "output voltage range" and "output frequency range" may differ according to the specific grid standard.

4) Wye neutral-grounded; delta may not be corner-grounded.

5) See user manual for further requirements regarding non-operating conditions.

6) Firmware version 12.0 or later required.

7) 5-year warranty effective for units purchased after October 1, 2019.