STS SOLAR

Project Datesheet

Roof-mounted solar power plant

Features of the plant:

The power plant is divided in two sections and it is build on the southern slope of the rooftop of the agricultural equipment warehouse.

The first power plant section is composed of 312 SPV 180M-24 modules. The modules form a plate of 8 rows with 40 modules per row and feed the generated electricity to 6 inverters and to each inverter are connected 4 strings, consisting of 13 serially-connected modules.

The second section consists of 126 modules, of which 156 SSM-170/24M and 70 EQ Solar with the same power – 170 Wp. The modules form a plate of 3 rows and feed the generated electricity to 3 inverters, and to each inverter are connected 3 strings, consisting of 14 serially-connected modules.

SMA Technologies inverters were used for this project, as for the given installed capacity correspond Sunny Mini Central SMC 8000TL and 7000TL models. These are single-phase inverters without transformers with inputs for 4 strings. They have IP65 level of protection against external weather conditions and in this case they are located on the outside of the wall below the southern roof slope. From each inverter exits a CBT-c 2x16.0 mm^2 cable and goes to a properly sized circuit breaker into a main switchboard.

The grounding of the PV module frames is guaranteed by their electrical connection with the supporting aluminum profiles. The connection between the supporting aluminum profiles is completed with galvanized 40/4mm bar. On both ends of the roof – east and west, vertical galvanized 40/4 mm bars descend to the earth, ending with earthing devices, consisting of 2 galvanized pipes 2" with 2 m in length. All earthing devices are connected with each other in a closed loop of galvanized 40/4 mm bar, laid at a depth of 0.4m underground.

Inverter and main switchboard grounding is performed with earthing devices, consisting of 2 galvanized 2" pipes with 2 m in length. The inverter and switchboard grounding bolts are connected with the zero bar.

All metal non-current-carrying parts are welded to the grounding circuit.

The lightning protection system consists of early streamer emission lightning conductor E.S.E.S-A1p, with advance time of 60 μs and lightning shaft height of 2.0 m above the highest point on the roof.

The central monitoring and control device is Sunny Web Box. It has RS485 interface for connection with inverters and with Sunny Sensor Box, that has sensor interface for measuring the ambient temperature, the temperature of the modules in the power plant and the wind power.

The monitoring and control devices are mounted in low voltage switchboard. Their power supply is done through UPS, located in the main switchboard.

Power Plant Specification

Size:	77.6 DC
Commissioned:	May 2011
Type:	Roof-mounted
Site Area:	1700 $м^2$
Output:	69 kW
CO_2 Displacement:	~67.9 metric tons per year
Module Surface Area:	559 m^2
Modules Used:	Type: SPV 180M-24, SSM-170/24M, EQ Solar
	Quantity: 438
Angles:	Mounting Tilt: 11,14°
	Azimuth: -11°

Supported by:

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