



Solar Plant M&O

CSDS units are designed to run automatically with minimum human interact. Power plant is operated through a central controlled SCADA system which Solarversal provided with. Current state of technologies call for maintenance service include a) Periodically mirror washes with water; b) Parts service when preventive maintenance schedule occurs, current operation data suggests a 4600 hrs MTBF with CSDS units. Estimate of M&O cost is around \$0.015~0.02/kWh depend on location of plant. Units offered are covered by industrial certificates and standard product warranty.



Fig4. Solar plant with SCADA

2. Dish Stirling Solar Power Generation

Dish Stirling power generation spec

CSDS is designed to use parabolic shaped mirrors (dish) to concentrate solar energy to provide hi density solar flux to drive solar Stirling engine producing mechanical energy, and then through induction generator, AC electricity is generated to connected grid. System has designed with following power spec:

Table 2. CSDS Power Spec

CSDS system function design spec:	
Heat supplied peak	75~80 kWt
Electric power (peak)	28.5 kWe
Heat supplied (normal)	75 kWt
Electric power (normal)	25 kWe
Efficiency Engine	37.3 %
Efficiency Power (solar to electric)	31.25 %
Total system weight	7.2 ton
Annual energy*	70,200 kWh

* CSDS system is design to run at DNI range at 650~1100kW/m²/day annually.

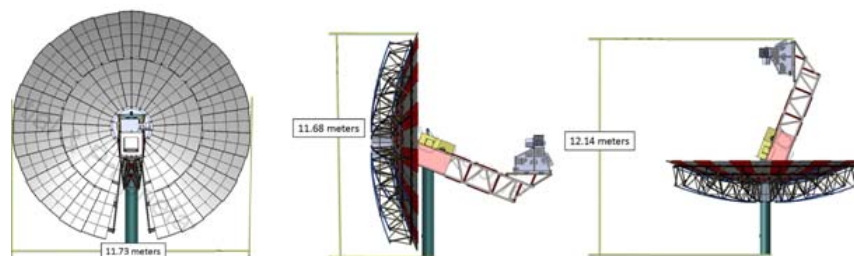


Fig 5. CSDS Operation sizes

Dish Stirling power generating data

Dish Stirling has demonstrated its power generating curve, at a proper DNI level, from 200 to 1100kW/m², a dish system starts to produce power to grid. When DNI reaches 850 kW/m², system reaches its peak output. When the operation ends system goes back to its "home" position for next day run. Following chart shows a

