

# PS 9k/15k/21k

## Solar-operated Submersible Pump Systems

### Characteristics

- flow rate up to 130 m<sup>3</sup>/h
- max. total dynamic head (TDH): 160 m
- fast, failure-free installation
- excellent serviceability
- high reliability and life expectancy
- short Return of Investment (ROI) cycle
- lower Total Cost of Ownership (TCO)

### Application

- drinking water supply
- livestock watering
- pond management
- irrigation
- etc.

### Components

#### Motor

- 3-phase AC motor
- corrosion-resistant construction
- stainless steel splined shaft
- NEMA mounting dimensions
- hermetically-sealed windings
- water lubrication
- pressure equalizing diaphragm
- max. submerged depth: 700 m/2,300 ft
- max. water temperature: 30 °C/86 °F
- PH value: 6–9
- IP 68

#### Pump End (PE)

- centrifugal multistage direct-coupled pump end
- non-return valve
- material: stainless steel (AISI 304), rubber
- dry running protection (optional)
- max. sand content: 50 g/m<sup>3</sup>, a higher content will wear the pump and reduce its life span considerably
- max. salt content: 300–500 ppm at max. 30 °C/85 °F, higher salt contents require lower water temperatures
- pH value: 6–9
- high life expectancy

### Performance

pump system		PS 9k	PS 15k	PS 21k
max. total dynamic head (TDH)	[m   ft]	160   520	140   460	120   400
max. flow rate	[m <sup>3</sup> /h   1,000 US gal./h]	130   34.3	130   34.3	43   11.4
max. power voltage (Vmp)*	[VDC]	> 500	> 500	> 500
open circuit voltage (Voc)	[VDC]	max. 750	max. 750	max. 750

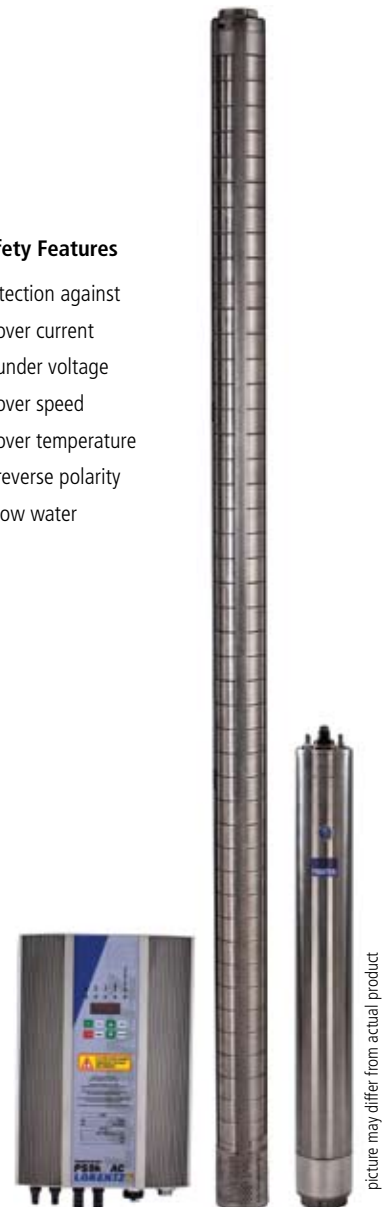
\*) PV modules at standard test condition: AM = 1.5, E = 1,000W/m<sup>2</sup>, cell temperature: 25 °C

#### Controller PSkAC

- controlling of the pump system and monitoring of the operating states
- mounted at surface (no electronic parts submerged)
- two control inputs for well probe (dry running protection), float or pressure switches, remote control etc.
- automatic reset 20 minutes after well probe turns pump off
- data logger for historical dates: running time, starting/shut down time of day, max. power/voltage of day, accumulated energy of day etc.
- display of current running data such as: input/output current/power/voltage, pump speed, temperature
- speed control selectable, max. and min. speed
- integrated MPPT (Maximum Power Point Tracking)
- input: Voc max. 750VDC, Vmp min. 500VDC
- output: 400VAC 3-phase, 30–60 Hz
- max. efficiency 97 %, advanced IGBT
- enclosure: IP 41 (sealed, weatherproof)
- ambient temperature: –10 to +45 °C

#### Safety Features

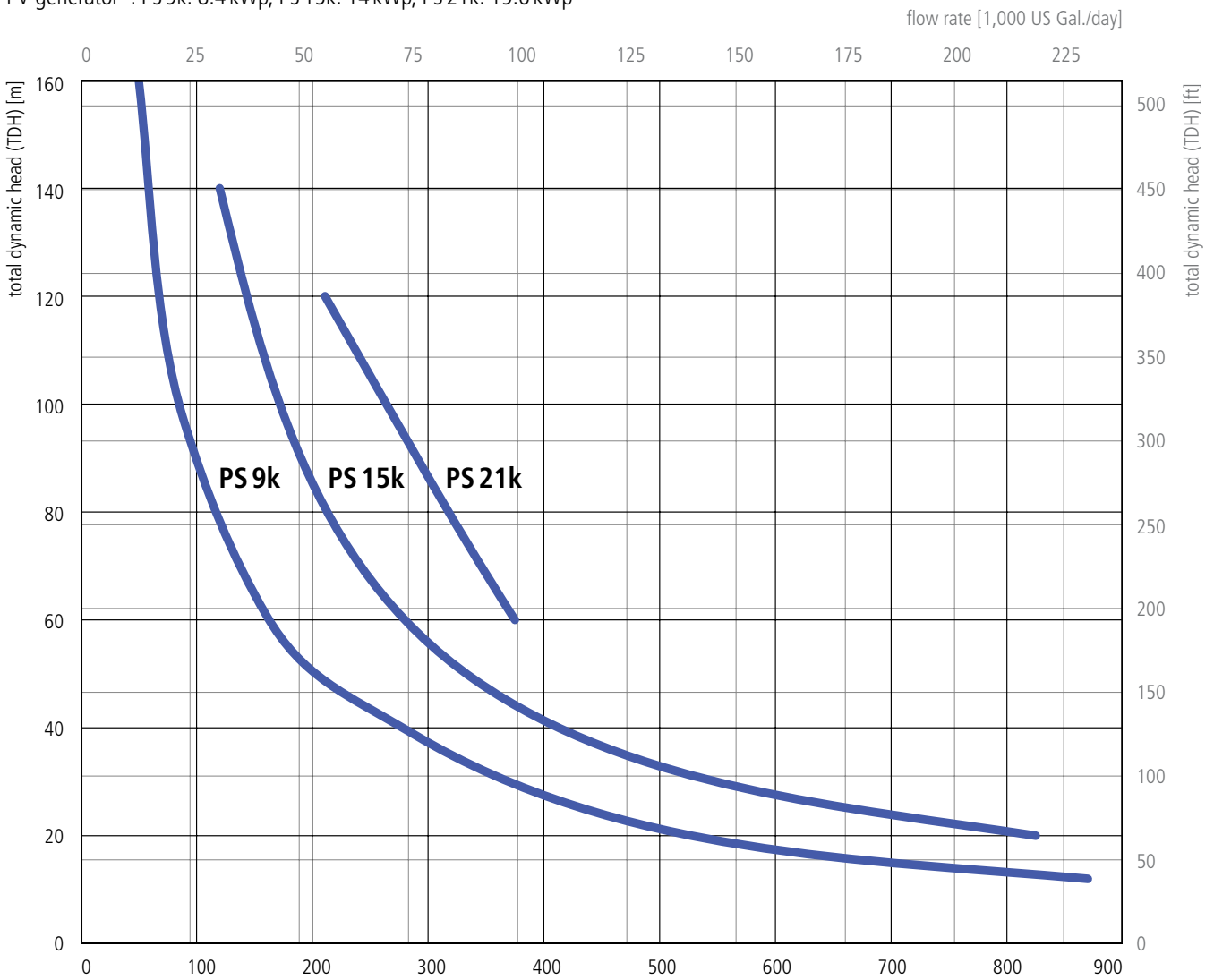
- protection against
  - over current
  - under voltage
  - over speed
  - over temperature
  - reverse polarity
  - low water



**Daily Flow Rate**

irradiation: 6 kWh/m<sup>2</sup>/day, 8 peak flow hours per day

PV generator\*: PS 9k: 8.4 kWp, PS 15k: 14 kWp, PS 21k: 19.6 kWp



\*) 16 PV modules of 175Wp, Vmp 35VDC, in series, i.e. per string: 2.8kWp, Vmp 560VDC, each string installed on a single-axis tracking system  
 3, 5 respectively 7 strings parallel for PS9k, PS15k and PS21k  
 technical data of PV modules at standard test conditions: AM = 1.5, E = 1,000W/m<sup>2</sup>, cell temperature: 25 °C  
 20% for degradation (ageing, dust, temperature influences etc.), cable losses, tolerances included

**Pump Layout Service**

For each PSk pump system a choice of different pump ends is available to guarantee best performance for specific flow rates and lift. The above diagrams represents the consolidated optimum of all the available pump ends for the whole performance range.

LORENTZ provides the service of a individual pump system layout for its customers.

For further details visit [www.lorentz.de](http://www.lorentz.de)