Power Optimizer Efficiency: S-Series and P-Series

The power optimizer efficiency (or DC/DC conversion efficiency) is the ratio between the output power and the input power of the power optimizer. It is defined using the following values:

- Maximum (Peak) efficiency – The highest DC/DC conversion efficiency of the power optimizer.
- Weighted efficiency - This value is the weighted average DC/DC conversion efficiency. This efficiency provides a more accurate representation of the power optimizers’ operating profile. The weighting formula takes into account the changing environmental conditions to which the power optimizer is exposed throughout the day and over the year and is calculated by measuring the efficiency at various power loads, input voltages and string conditions. The weighted efficiency of power optimizers is calculated using the same equation used for inverters.

The efficiency specifications of the S-Series and P Series Power Optimizers

- Maximum Efficiency 99.5%
- Weighted Efficiency 98.8%

The graphs below show the Efficiency under typical operating conditions for the different Power Optimizers:
Power Optimizer Efficiency: S-Series and P-Series

**S-Series and P-Series Efficiency**

- **P400/P500**
  - $V_{mpp} = 25V$: Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
  - $V_{mpp} = 35V$: Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
  - $V_{mpp} = 45V$: Peak Efficiency = 99.5%  Weighted efficiency = 99.2%

- **P300/P320/P350/P370/P385/P401**
  - $V_{mpp} = 25V$: Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
  - $V_{mpp} = 35V$: Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
  - $V_{mpp} = 40V$: Peak Efficiency = 99.5%  Weighted efficiency = 99.2%

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**P400/P500 Efficiency**

- $V_{mpp} = 25V$: Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
- $V_{mpp} = 35V$: Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
- $V_{mpp} = 45V$: Peak Efficiency = 99.5%  Weighted efficiency = 99.2%

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Power Optimizer Efficiency: S-Series and P-Series
Power Optimizer Efficiency: S-Series and P-Series

**P404**

![Graph of P404 efficiency showing peak efficiency at different voltages and weighted efficiency.]

**P405/P485**

![Graph of P405/P485 efficiency showing peak efficiency at different voltages and weighted efficiency.]

- **P404**:
  - $V_{mpp} = 25V$  Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
  - $V_{mpp} = 35V$  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%

- **P405/P485**:
  - $V_{mpp} = 59.85V$  Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
  - $V_{mpp} = 85.5V$  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
  - $V_{mpp} = 102.6V$  Peak Efficiency = 99.5%  Weighted efficiency = 99.2%
Power Optimizer Efficiency: S-Series and P-Series

**P505/P601/P605**

- Vmpp = 28.7V  Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
- Vmpp = 41V  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%

**P600/P650**

- Vmpp = 40V  Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
- Vmpp = 60V  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
- Vmpp = 75V  Peak Efficiency = 99.5%  Weighted efficiency = 99.3%
Power Optimizer Efficiency: S-Series and P-Series

**P700/P701/P730**

- Vmpp = 50V  Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
- Vmpp = 100V  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%

**P800s/P801/P850/950/P1100**

- Vmpp = 27.6V  Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
- Vmpp = 39.5V  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
- Vmpp = 47.4V  Peak Efficiency = 99.5%  Weighted efficiency = 99.2%
Power Optimizer Efficiency: S-Series and P-Series

P800p/P860/P960

Efficiency

Power (W)

Vmpp = 38.5V Peak Efficiency = 99.3%  Weighted efficiency = 98.6%
Vmpp = 55V  Peak Efficiency = 99.5%  Weighted efficiency = 99.1%
Vmpp = 66V  Peak Efficiency = 99.5%  Weighted efficiency = 99.2%