

## 600Vdc Input, 500W, IP66-Rated, Encapsulated Industrial DC-DC Converter HVI 500P-D3 Series (IP66)

- High input voltage
- Wide DC-input voltage range
- Packaged in waterproof IP66 enclosure
- Internal module fully encapsulated
- Rugged field-proven design
- Wide temperature range
- Full electronic protection
- N+1 redundancy available



This series of rugged, industrial quality, high input voltage DC/DC converters utilize KHR 301 topology to generate the required output power. This technology enables a significantly more compact construction than previous high input voltage designs at this output power level. The converters accept a nominal input voltage of 600Vdc, with a 400V to 800V input range. To ensure high reliability and long operating life, all critical components on the primary side are designed and tested for corona inception levels, which are significantly higher than the operating voltages. The units are packaged in waterproof, rugged, die cast aluminum IP66 enclosures. The input and output are via sealed cable glands, circular connectors or custom connections. The internal converter unit is entirely potted with a thermally conductive MIL-grade silicon rubber compound for immunity to high levels of shock and vibration. Cooling is by conduction and convection via the walls of the IP66 enclosure. If installed on a heat-sinking surface, cooling is further enhanced and the converters achieve higher output power. An optional built-in redundancy diode allows for a number of units to be connected in parallel to achieve higher output power or N+1 redundancy. The output separation diode also makes the unit suitable for battery charging applications. Full electronic protection, low component count, large design headroom, and the use of components with established reliability result in a high MTBF. The series is manufactured at our plant under strict quality control.

### SPECIFICATIONS

#### Input Voltage

600Vdc nominal  
400 - 800Vdc operating range  
Other input ranges on request

#### Input Protection

Inrush current limiting  
Varistor  
Reverse polarity protection  
Internal safety fuse  
Lower voltage than specified  
minimum input will not damage  
unit

#### Isolation

3000VDC input to chassis  
4300VDC input to output,  
5600 type test  
1000VDC output to chassis

#### Standards

Designed to meet EN 60950-1  
and related standards

#### EMI

EN55022 Class A with margins

#### Switching Frequency

55kHz  $\pm$ 3kHz

#### Output Voltage

24V, 36V, 48V or 110Vdc  
Output is floating; either  
terminal can be grounded  
Other outputs on request

#### Redundancy diode

Not installed  
Available as option

#### Line/Load Regulation

Better than  $\pm$ 1% combined  
from zero load to full load

#### Dynamic Response

Max 5% voltage deviation for 10%  
to 50% load step, with better than  
1msec recovery time

#### Output Ripple / Noise

Better than 0.2% rms or 1%  
pp of the output voltage  
(20MHz BW)

#### Output Overload Protection

Rectangular current limiting with  
short-circuit protection (no hiccup)  
Thermal shutdown in case of  
insufficient airflow (self-resetting)

#### Output Overvoltage Protection

Second regulator loop, completely  
stable and independent of main  
regulator loop

#### Efficiency

80 - 90% at full load depending  
on input/output configuration

#### Operating Temperature

-40 to +70°C cold-plate temperature  
for full specification

#### Temperature Drift

0.03% per °C over operating  
temperature range

#### Cooling

Cooling is by conduction and  
convection via the walls of  
the IP66 enclosure.

#### Environmental Protection

IP66 enclosure  
The internal module is fully  
encapsulated with a thermally  
conductive silicon potting  
compound with UL94V-0  
flammability rating.

#### Shock/Vibration

IEC 61373 Cat 1 A&B

#### Humidity

5-100% condensing

#### MTBF

150,000 hours @45°C  
Demonstrated MTBF is  
significantly higher.

#### Indicators

None

#### Control Input

None on standard version  
Available as option

#### Alarm Outputs

None.  
Available as option

#### Package/Dimensions (W x H x L)

D3: 360 x 160 x 90 mm  
(14.2" x 6.3" x 3.5")  
D3 with baseplate:  
406 x 160 x 94 mm  
(16" x 6.3" x 3.7")

#### Weight

Approx. 5.8 kg (12.8 lb)

#### Connections

Internal barrier-type terminal block  
accessible via sealed cable glands.  
Optional connectors instead of  
cable glands

#### RoHS Compliance

Fully compliant

#### Warranty

Two years subject to application  
within good engineering practice



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