

## VHDC-Series

### DC/DC Converters

The Rajant VHDC-series consists of passive Power-over-Ethernet (PoE) compatible DC/DC converters designed for high reliability military and industrial applications. The VHDC-24V-50W-GbE and VHDC-48V-50W-GbE models support Ethernet data speeds up to 1000 Mbps, offering excellent throughput for Ethernet traffic such as mesh-to-wired network communications as well as BCIC Commander® and Automatic Protocol Tunneling (APT) control traffic. The other models in the VHDC series support 10/100 Mbps Ethernet data speeds. The VHDC-24V-50W-GbE, VHDC-48V-50W-GbE, VHDC-24V-50W, and VHDC-48V-50W models offer sealed enclosures making them ideal for outdoor installations. The VHDC-24V-50W-LC model is the most-affordable, non-sealed version aimed at indoor installations.



### VHDC-Series Features & Benefits

- Designed for high reliability military and industrial applications – featuring ruggedized enclosures, over-temperature, over-voltage, over-current, and short-circuit protection.
- VHDC-24V-50W and VHDC-48V-50W are designed to meet the IP67 (6: Dust-tight, 7: Waterproof) ingress protection specifications making them ideal for outdoor applications and extreme environmental conditions. VHDC-24V-50W-GbE and VHDC-48V-50W-GbE are designed for IP66 (6: Dust-tight, 6: Water-resistant) and can be operated outdoors year-round.
- The user-replaceable input and self-resetting output fuses on the VHDC-24V-50W-GbE and VHDC-48V-50W-GbE, manufacturer-replaceable input and user-replaceable output fuses on VHDC-24V-50W and VHDC-48V-50W, and user-replaceable input and output fuses on the VHDC-24V-50W-LC are designed to protect the devices from over-current conditions.
- Wide 10–36 V (VHDC-24V-50W, VHDC-48V-50W, and VHDC-24V-50W-LC) and 10-32 V (VHDC-24V-50W-GbE and VHDC-48V-50W-GbE) input range versions are useful for stabilizing the power from input sources such as vehicle batteries, which can exhibit varying characteristics due to the sharing of power with other systems, and battery charge and discharge states.
- High power 24 V or 48 V, 50 W isolated and regulated output.
- High efficiency (83% typical).

VHDC-24V-50W



VHDC-48V-50W



VHDC-24V-50W-LC



VHDC-24V-50W-GbE

VHDC-48V-50W-GbE



| Model                   | Rajant Part # | Output Voltage (V) | Max. Output Current (A) | Environmental                                  |
|-------------------------|---------------|--------------------|-------------------------|------------------------------------------------|
| <b>VHDC-24V-50WGbE</b>  | 01-000037-002 | 24                 | 2.08                    | Sealed (IP66: 6-Dust-tight, 6-Water-resistant) |
| <b>VHDC-48V-50W-GbE</b> | 01-000037-004 | 48                 | 1.04                    | Sealed (IP66: 6-Dust-tight, 6-Water-resistant) |
| <b>VHDC-24V-50W</b>     | 01-000029-001 | 24                 | 2.08                    | Sealed (IP67: 6-Dust-tight, 7-Waterproof)      |
| <b>VHDC-24V-50W-LC</b>  | 01-000033-001 | 24                 | 2.08                    | Non-sealed                                     |
| <b>VHDC-48V-50W</b>     | 01-000029-048 | 48                 | 1.04                    | Sealed (IP67: 6-Dust-tight, 7-Waterproof)      |

### General

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Data Speed</b>   | VHDC-24V-50W-GbE and VHDC-48V-50W-GbE: 10/100/1000 Mbps<br>VHDC-24V-50W, VHDC-48V-50W, and VHDC-24V-50W-LC: 10/100 Mbps                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Efficiency</b>             | 83% (typical)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Switching Frequency</b>    | 300 kHz (nominal)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Thermal Shutdown Temp.</b> | 100 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Isolation Voltage</b>      | 1500 VDC (minimum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Isolation Resistance</b>   | 100 MΩ (minimum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Fuse</b>                   | <p>VHDC-24V-50W-GbE and VHDC-48V-50W-GbE: Input - User replaceable 10 A, 32 VDC, Blade type; Output - Self-resetting (does not need replacement)</p> <p>VHDC-24V-50W: Input - Manufacturer replaceable 10 A; Output - User replaceable, 2.5 A, cylindrical, 3AG fast-acting, ¼" x 1¼" (6mm x 32mm)</p> <p>VHDC-24V-50W-LC: Input - User replaceable, 7.5 A, ATO style; Output - User replaceable, 2 A, ATO style.</p> <p>VHDC-48V-50W: Input - Manufacturer replaceable 10 A; Output - User replaceable, 1.25 A, cylindrical, 3AG fast-acting, ¼" x 1¼" (6mm x 32mm)</p> |
| <b>Connector</b>              | VHDC-24V-50W and VHDC-48V-50W require 13/16"–28UN thread mating cable glands for their Input/Output ports. Rajant recommends the Amphenol LTW LTWRJ-00BMMA-SL7005 cable gland.                                                                                                                                                                                                                                                                                                                                                                                           |

### Input

|                            |                                                                                                               |
|----------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Input Voltage Range</b> | HDC-24V-50W-GbE and VHDC-48V-50W-GbE: 10-32 VDC<br>VHDC-24V-50W, VHDC-48V-50W, and VHDC-24V-50W-LC: 10-36 VDC |
|----------------------------|---------------------------------------------------------------------------------------------------------------|

**Output**

|                                                         |                                                                                                                          |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Output Voltage</b>                                   | VHDC-24V-50W-GbE, VHDC-24V-50W, and VHDC-24V-50W-LC: 24 V (nominal)<br>VHDC-48V-50W and VHDC-48V-50W-GbE: 48 V (nominal) |
| <b>Max. Output Current</b>                              | VHDC-24V-50W-GbE, VHDC-24V-50W, and VHDC-24V-50W-LC: 2.08 A<br>VHDC-48V-50W and VHDC-48V-50W-GbE: 1.04 A                 |
| <b>Output Ripple</b>                                    | ± 1% (maximum)                                                                                                           |
| <b>Line Regulation</b>                                  | ± 0.2% (maximum)                                                                                                         |
| <b>Load Regulation</b>                                  | ± 0.2% (maximum)                                                                                                         |
| <b>Short Circuit Protection</b>                         | Continuous                                                                                                               |
| <b>Over-Voltage Protection Trip Range (%Vo Nominal)</b> | 115% (minimum), 140% (maximum)                                                                                           |
| <b>Over-Current Protection (%Io Nominal)</b>            | 10% (minimum), 160% (maximum)                                                                                            |

### BreadCrumb® Model and Cable Length Dependencies for VHDC-Series Devices

It is important to choose the correct VHDC-series device to support the power requirements of a given BreadCrumb model and Data + Power output cable length combination. Please refer to the table below for the appropriate VHDC-series model(s) for your application.



| BreadCrumb Model | Output Cable Length (24 AWG)               | Recommended VHDC-Series Model(s)                                                                    |
|------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>JR3</b>       | 0–100 m (0–328 ft)                         | VHDC-24V-50W, VHDC-24V-50W-LC                                                                       |
| <b>ME4</b>       | 0–60 m (0–200 ft)<br>60–100 m (200–328 ft) | VHDC-24V-50W-GbE, VHDC-24V-50W, VHDC-24V-50W-LC,<br>VHDC-48V-50W;<br>VHDC-24V-50W-GbE, VHDC-48V-50W |
| <b>LX4</b>       | 0–30 m (0–100 ft)                          | VHDC-24V-50W, VHDC-24V-50W-LC, VHDC-48V-50W                                                         |
| <b>LX5</b>       | 0–30 m (0–100 ft)<br>30–100 m (100–328 ft) | VHDC-24V-50W-GbE, VHDC-24V-50W, VHDC-24V-50W-LC,<br>VHDC-48V-50W;<br>VHDC-24V-50W-GbE, VHDC-48V-50W |
| <b>FE1</b>       | 0–100 m (0–328 ft)                         | VHDC-48V-50W-GbE                                                                                    |

| Physical             |                                                                                                                                                                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions</b>    | VHDC-24V-50W-GbE and VHDC-48V-50W-GbE: 150 mm x 87 mm x 40 mm (5.90" x 3.40" x 1.56")<br>VHDC-24V-50W and VHDC-48V-50W: 156 mm x 83 mm x 42 mm (6.125" x 3.250" x 1.650")<br>VHDC-24V-50W-LC: 141 mm x 76 mm x 29 mm (5.531" x 3.006" x 1.120")  |
| <b>Weight</b>        | VHDC-24V-50W-GbE and VHDC-48V-50W-GbE: 709 g (1.56 lb)<br>VHDC-24V-50W and VHDC-48V-50W: 635 g (1.40 lb)<br>VHDC-24V-50W-LC: 391 g (0.86 lb)                                                                                                     |
| <b>Temperature</b>   | Operating: -40 °C to 100 °C (-40 °F to 212 °F)<br>Storage: -55 °C to 105 °C (-67 °F to 221 °F)                                                                                                                                                   |
| <b>Enclosure</b>     | VHDC-24V-50W-GbE and VHDC-48V-50W-GbE: Anodized aluminum, IP66 (6: Dust-tight, 6: Water-resistant).<br>VHDC-24V-50W and VHDC-48V-50W: Anodized aluminum, IP67 (6: Dust-tight, 7: Waterproof).<br>VHDC-24V-50W-LC: Anodized aluminum, non-sealed. |
| <b>Humidity</b>      | 95% (non-condensing)                                                                                                                                                                                                                             |
| <b>Certification</b> | FCC Part 15 Subpart B Class A (USA), ICES-003 Class A (Canada)                                                                                                                                                                                   |
| <b>Warranty</b>      | 90 Days                                                                                                                                                                                                                                          |

### Warning on VHDC-24V-50W-GbE, VHDC-48V-50W-GbE, and BreadCrumb Ethernet Port Compatibility

This warning relates to the VHDC-24V-50W-GbE and VHDC-48V-50W-GbE models only. VHDC-24V-50W-GbE and VHDC-48V-50W-GbE applies DC power to all four Ethernet wire pairs at its output. This powering scheme is only compatible with BreadCrumb Ethernet ports that are capable of 1000 Mbps (Gigabit) operation. This is limited to both eth0 and eth1 on the LX5, eth0 on the ME4, and eth0 and eth1 on the FE1.

### Note on Waterproofing

Please refer to Rajant's technical service bulletin TSB 03-100136-001 for waterproofing the cable glands at the Input/Output ports of the VHDC-24V-50W and VHDC-48V-50W.