Horizon Educational

H-3000-DCDCC-48V

DCDC converter 48V to H-3000

User Guide

Version History

Ver.	Date	Description	Author
1	2023-02-09	First release	J. Holemář, J. Seidl

Disclaimer

Proprietary Note

Table of Contents

Glossary of terms and abbreviations

Tab. 1: Table of Terms and abbreviations

Term	Explanation
DC	Direct current
DCDC	DC / DC converter
H2FC	Hydrogen Fuel Cell

1. Technical description

2.1 Technical parameters

The H-3000-DCDCC-48V is an output DC/DC converter designed mainly for hydrogen fuel cell stacks. It provides constant output voltage in full range H2FC stack operational voltage.

H-3000-DCDCC-48V Device - front and rear view

1. Technical description

2.1 Technical parameters

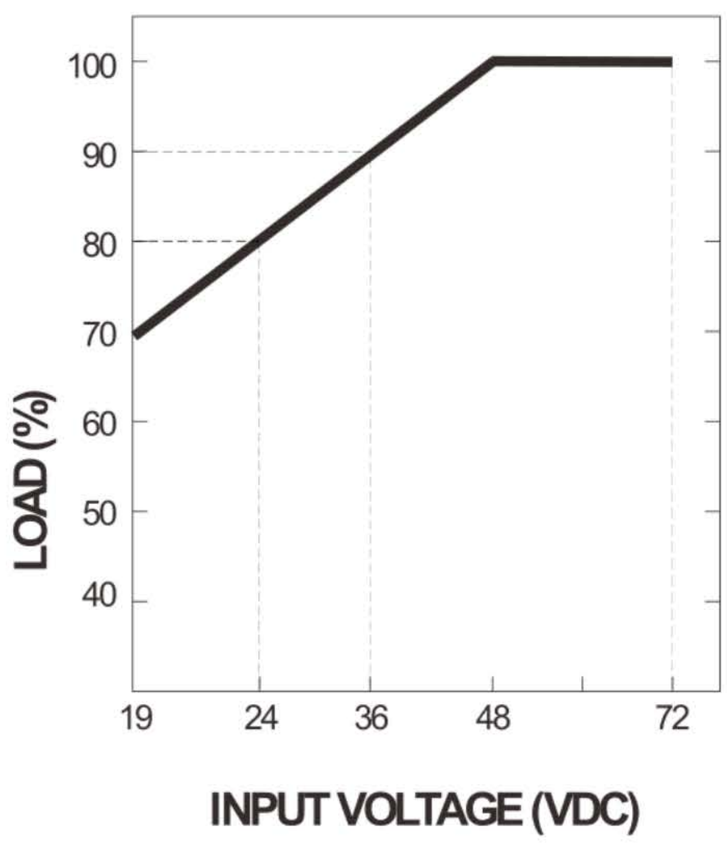
Tab. 2: Technical specification

Product name		H-3000-DCDCC-48V
INPUT	**Voltage range**	19 ~ 72 V DC (note 1)
	DC Current	94 A / 48 V DC typ
OUTPUT	**DC Voltage**	48 V
	Rated Current	75 A
	Current Range	0 ~ 75 A
	Rated Power	3600 W
	Ripple & Noise	150 mV p-p
	Setup, Rise Time	500 ms, 50 ms at full load
PROTECTION	**Output Overload**	105 ~ 125 % rated output power Protection type: Constant current limiting, unit will shut down output voltage after about 5 s. Re-power on to recover.
	Output Fuse	120 A fuse cannot be replaced by customer, sent to the manufacturer to repair
	Output Over Voltage	62 ~ 68 V Protection type: Shut down output voltage, re-power on to recover
	Over Temperature	Shut down output voltage, recovers automatically after temperature goes down
Efficiency		90 % typically
Isolation Resistance		Input – Output, Input - Frame Ground, Output – Frame Ground: 100 MΩ / 500 V DC / 25°C / 70% RH
IP Rating		IP20
Operating temperature		-20 ~ +60 ℃ (note 2)
MTBF		17.6 K hrs min. MIL-HDBK-217F (25℃)
Dimensions		354 x 438 x 161 mm
Weight		20 kg

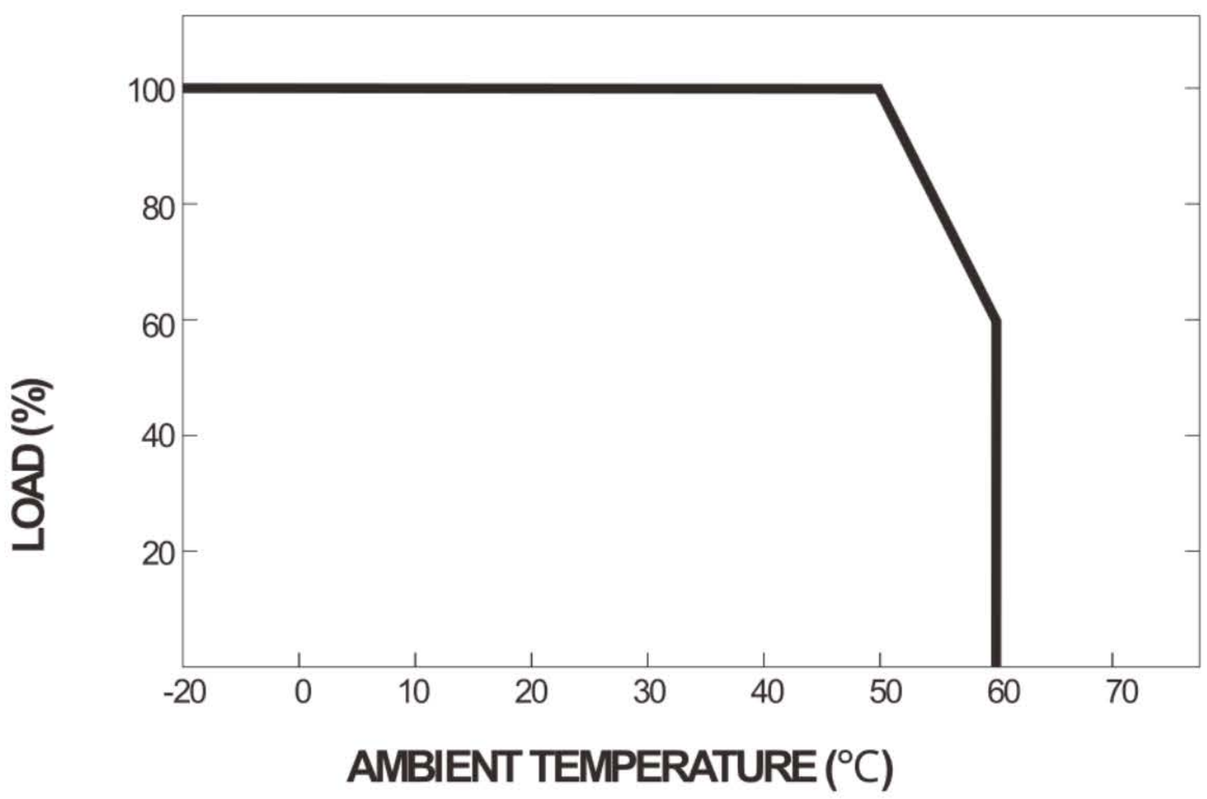
Note 1: The DCDC converter output power is dependant on the input voltage - see the Static Characteristics chart below

Note 2: The DCDC converter output power is dependant on the ambient temperature - see the Derating Curve chart below

■ Static Characteristics



■ Derating Curve



2.2 Interfaces

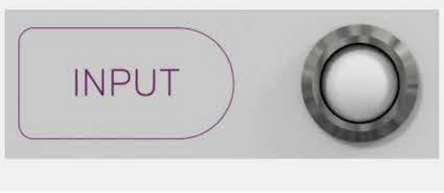
Device interfaces

Tab. 3: Interfaces

IN +	DC input from H2FC stack
IN -	DC input from H2FC stack
OUT +	DC output
OUT -	DC output
⏚	Protective earth

2.3 Indicators

Tab. 4: Indicators on the device

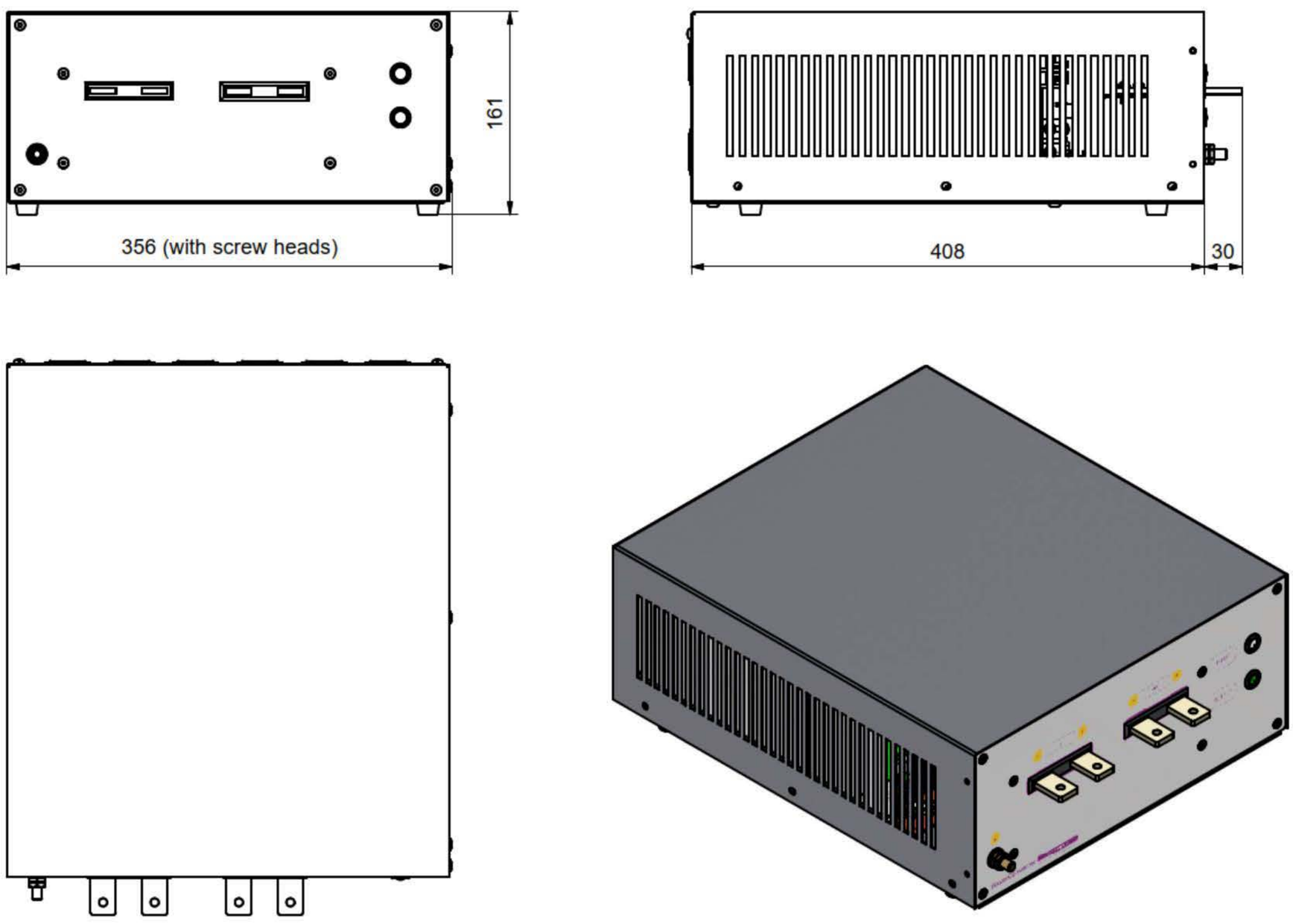
Indicator	Physical appearance	Meaning
INPUT	White LED 	Input voltage present
OUTPUT	Green LED 	Output voltage present

3. Installation and maintenance

3.1 Mechanical mounting

The H-3000-DCDCC-48V converter shall be operated free standing in horizontal position. There shall always be enough free space around the deivce to ensure free vetilation airflow.

There shall be appropriate room around the rear, and side ventilation grilles to ensure continuous cooling air intake and venting. Blocking of the airflow can result in operation failures or damage of the device.



Device dimensions (mm)

3.2 Electric connection

Dangerous voltage hazard! Electric installation shall be always performed by a person with appropriate qualification.

Verify, that there is no voltage present on all wires before connecting. De-energize the H2FC and turn off all input and output switches / circuit breakers.

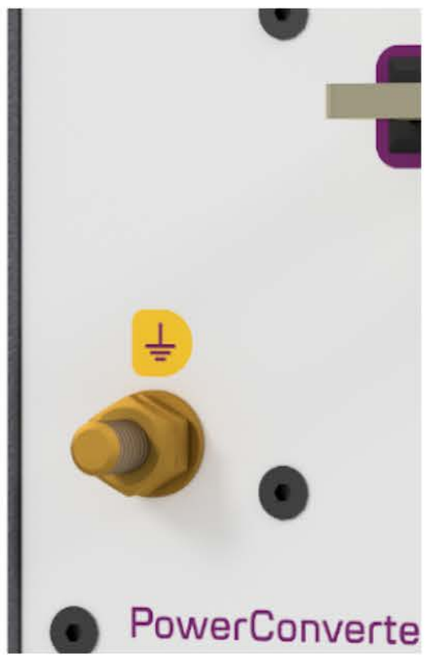
Do not connect potentials out of the allowable range of the device.

Do not connect circuits where higher current may flow than maximum range of the device.

Use conductors sized for the maximum current and power of the circuitry. Using undersized conductors can lead to overheating, damage, and potential fire hazards.

Warning. Always keep the correct polarity when connecting the input and output. Reverse polarity can damage the device permanently.

Always use the earthing terminal to ensure appropriate protective earthing



Earthing terminal

3.3 Maintenance instructions

Before each operation, check if the connection wires are not damaged and the venting is not blocked. Avoid moisture penetration inside the device.

At least once a month or after a longer period of operation vacuum the dust from the venting grilles. Always clean the surface of the device with a dry towel. Avoid using aggressive or abrasive cleaning agents.

3. Instructions for safe disposal of the product

Packaging and waste equipment must be disposed of in accordance with Directive 2002/96/EC and relevant national laws.

Tab. 5: Waste categories

Waste type	Category
Packaging waste	Non-hazardous
Electrical and electronic equipment waste	Hazardous waste