



## Power Conversion

# Model 1450



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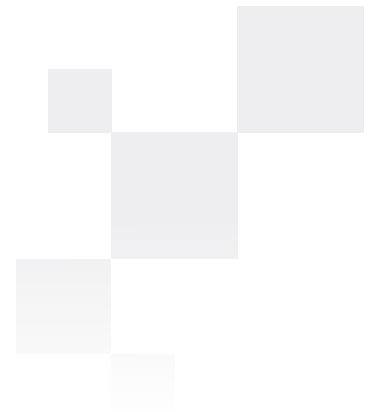
## DC/DC Converter



The Curtis Model 1450 is a high-efficiency DC/DC converter designed to provide a reliable, regulated voltage output for battery-powered vehicles. With an extensive input voltage range, it accommodates a variety of applications, ensuring versatility and adaptability. The 1450 DC/DC with its integrated connectors, its compact design, and advanced safety protections make it an ideal solution for seamless integration by vehicle manufacturers.

### FEATURES

- ▶ The wide input operating voltage range of 24-120VDC allows a single model to address most battery-powered vehicle applications, simplifying acquisition and reducing inventory, change management, and service costs.
- ▶ Output isolation/regulation, over-voltage protection, reverse polarity protection and ESD protection ensure safe operation.
- ▶ IP67 and IP69k protection and a wide operating temperature range allow use in harsh environments.
- ▶ The specialized input and output connectors are recognized as industry-leading, high-reliability components. They ensure safe installation and dependable wiring for seamless integration.
- ▶ Optional Enable Pin allows the converter to be used in power-down mode to limit current draw in energy critical applications (See the [Specifications](#)).
- ▶ 12V and 24V Nominal output voltage models are designed for parallel installation. Formally tested up to 6 units, providing a combined power output of up to 3kW.
- ▶ Dedicated models for Auxiliary Battery permanently connected to the output.
- ▶ Compliance with multiple industry norms ensures safe operation: EN12895, EN1175:2020, UL583, EN61000-4-3, EN61000-4-2, IEC 60068-2-27, and IEC 60068-2-6.



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### SPECIFICATIONS

12V Absolute

12V Nominal

24V Absolute

24V Nominal

#### Input

Voltage Range (continuous operation)	24-120VDC			
Nominal Battery Voltage	36-96VDC			
Under Voltage Lockout, Turn-On Voltage Threshold	24.4V			
Under Voltage Lockout, Turn-Off Voltage Threshold	22.8V			
Over Voltage Lockout, Turn-Off Voltage Threshold	122.25V			
Over Voltage Lockout, Turn-On Voltage Threshold	119.0V			
Maximum Current (Vin = 24.5 VDC, 100% load)	23.95A	23.95A	23.7A	23.7A
Maximum No-Load Current (Vin = 24.5 VDC)	84mA	82mA	58mA	66mA
Maximum No-Load Current (Vin = 48 VDC)	38mA	48mA	26mA	34mA
Maximum No-Load Current (Vin = 72 VDC)	27mA	31mA	19mA	22mA
Input Current - Disabled (Vin = 48 VDC)	1mA			
Maximum Reverse Polarity Voltage	-150V			

#### Output

Operating Current Range (Vin = 24-120 VDC)	0-41.7A	0-37.0A	0-20.8A	0-18.5A
Voltage Set Point (No load)	12V $\pm$ 0.1V	14V $\pm$ 0.1V	24V $\pm$ 0.2v	28V $\pm$ 0.2V
Voltage Set Point (Full load)	12V $\pm$ 0.1V	13.5V $\pm$ 0.1V	24v $\pm$ 0.2V	27V $\pm$ 0.2V
Voltage Ripple and Noise (Full Load, Vpp, 20 Mhz bandwidth)	<120mV			
Current Limit (Maximum Continuous)	41.7A	37.0A	20.8A	18.5A
Output Capacitance (ESR > 10 m $\Omega$ )	2mF	2mF	1.36mF	1.36mF
Minimum Efficiency @ 50% Load (Vin = 48 VDC)	>89%	>90%	>90%	>91%
Minimum Efficiency @ 100% Load (Vin = 24 VDC)	>84%	>85%	>86%	>87%
Minimum Efficiency @ 100% Load (Vin = 48 VDC)	>87%	>88%	>88%	>89%
Minimum Efficiency @ 100% Load (Vin = 72 VDC)	>87%	>88%	>88%	>89%
Start-Up Time	1.5s			
Parallel Operation	No	Yes	No	Yes

#### General

Maximum Isolation Voltage, Input to Output	1.5kV
Maximum Isolation Voltage, Output to Case	1.5kV
Minumum Isolation Resistance, conductors to case	>2M $\Omega$
Typical Switching Frequency	100kHz
Weight	960g
Dimensions W x L x H	92 mm x 170 mm x 56 mm

# Model 1450

## DC/DC Converter



### SPECIFICATIONS continued

#### Environmental

##### Operating Temperature:

-40° to +85°C

##### Storage Temperature:

-40° to +105°C

##### Over Temperature Protection (de-rating)

>75°C

##### Humidity (non-condensing):

100% RH

##### Protection Level:

IP67 and IP69k compliant

##### Vibration (IEC 60068-2-6):

5G, 5-500Hz, 3 planes

##### Shock (IEC 60068-2-27):

30G, 3 planes

#### Safety

EN 1175:2020

UL 583

#### EMC

##### Radiated Emission

**EN12895:** 30-1000MHz 34-45dBμV/m

##### UN/ECE Reg 10/ ISO 13766-1:

Broadband Limits

30-75MHz 62-52dBμV/m

75-400MHz 52-63dBμV/m

400-1000MHz 63dBμV/m

Narrowband

30-75MHz 52-42dBμV/m

75-400MHz 42-53dBμV/m

400-1000MHz 53dBμV/m

##### Immunity:

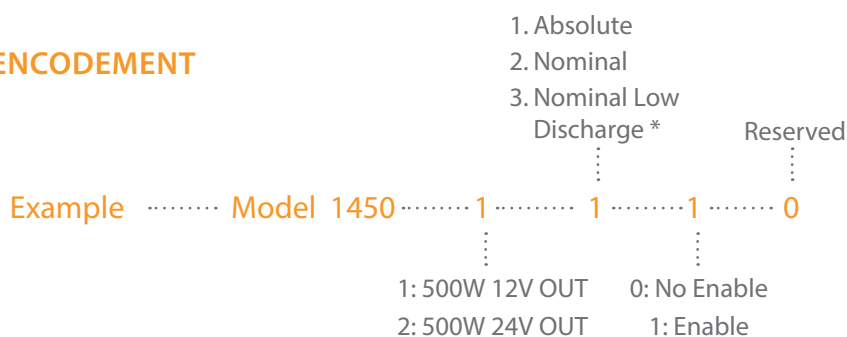
**ESD:** Compliant with EN12895, EN61000-4-2, ISO 13766-2, ISO 10605. Test level ±8kV Contact, ±15kV Air.

**Radiated:** Compliant with EN12895, EN61000-4-3, UN/ECE Reg 10, ISO 13766-2, ISO 11452-2.

**BCI:** Compliant with ISO 13766-2:2018, ESA Test ISO 11452-4

**Fast Transient Burst:** Compliant with UN/ECE Reg 10, ES TRIN, EN 61000-4-4.

### MODEL ENCODEMENT



*\*For permanently connected Aux Battery*

### DESIGN CONSIDERATIONS

#### Remote On / OFF

The Model 1450 features an Enable control function. The Enable Pin is located on the primary side of the converter, allowing it to turn on when connected to IN+ and turn off when connected to IN- or left floating.

#### Parallel Connection of Multiple Units

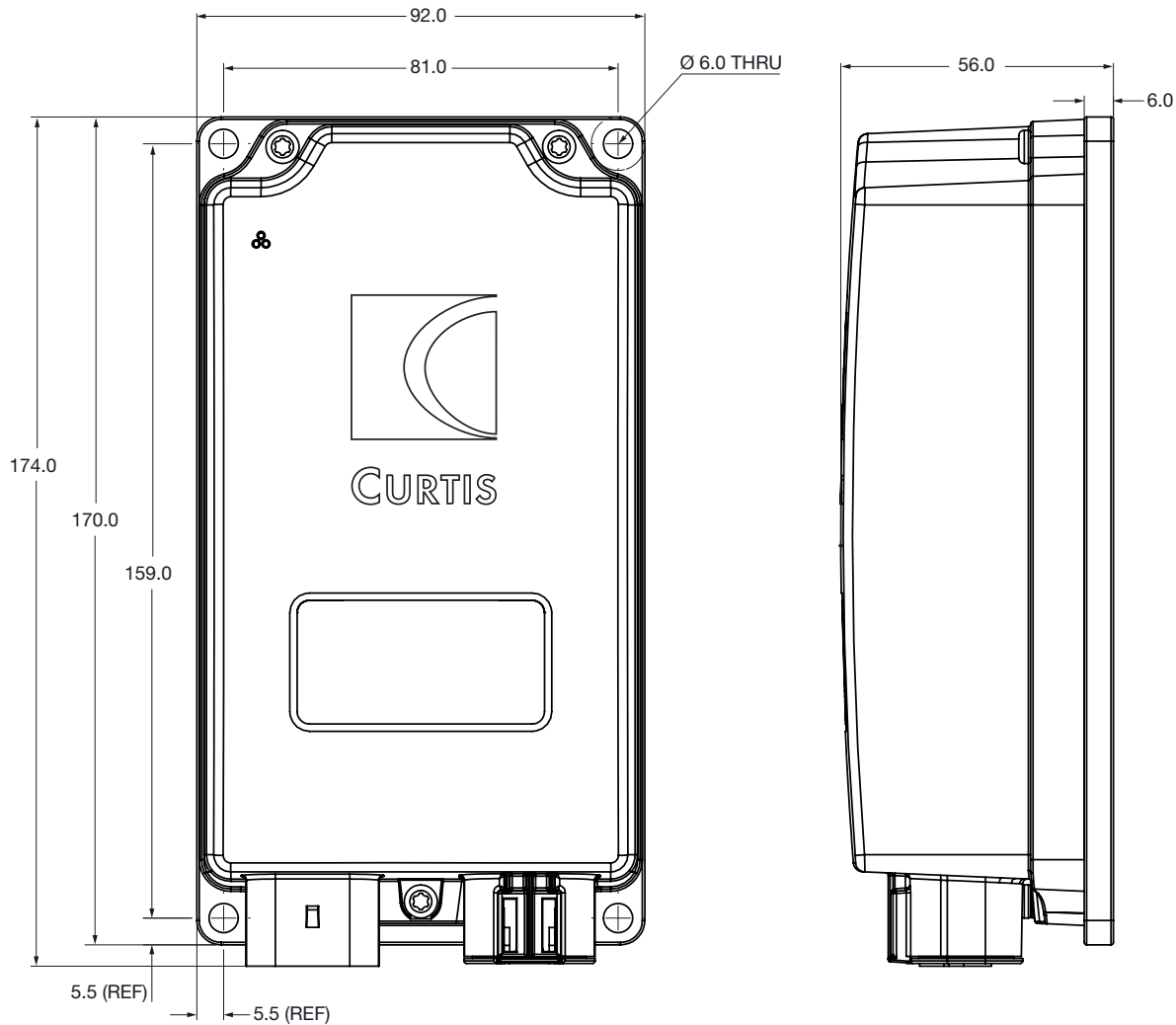
The parallel operation of up to six nominal output voltage models has been successfully verified, delivering a combined output power of up to 3kW. When connecting multiple units in parallel, the impedance of the cables from each unit to the junction point must be maintained within ±5% of one another.

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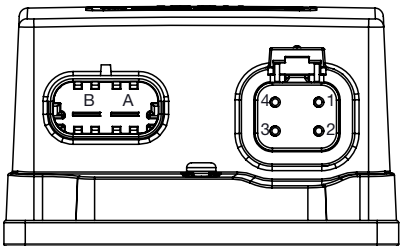
## DC/DC Converter



### DIMENSIONS mm



### CONNECTOR



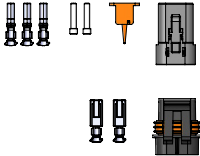
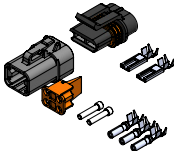
Connector	Pin #	Function
Input	1	Unused
	2	IN-
	3	IN+
	4	Enable
Output	A	OUT+
	B	OUT-



Input Connector:  
Deutsch DTP



Output Connector:  
APTIV METRI-PACK 630



Mating Connector Kit available on demand:  
Curtis PN 1867104

### WARRANTY Two year limited warranty from time of delivery.