



CURTIS

Power Conversion



# DC / DC Converter

## Model 1420



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## DC/DC Converter

Curtis Model 1420 is a high efficiency DC/DC converter designed to provide a reliable and regulated low voltage output for battery-powered vehicle accessories. Integrated connector, industry standard footprint and important safety protection allows Model 1420 to be easily integrated by vehicle manufacturers.



See a 360° view of the 1420 model at:  
[curtisinstruments.com/360view](http://curtisinstruments.com/360view)

### FEATURES

- ▶ Wide input voltage range (18–106 VDC) allows use in most battery powered vehicles with only one part number, thereby minimizing acquisition, inventory, change management and service costs.
- ▶ High efficiency (91% at full load, 48 VDC) minimizes operating and energy costs.
- ▶ Output isolation/regulation, over-voltage protection, reverse polarity protection and ESD protection ensure safe operation.
- ▶ IP67 protection and wide operating temperature range allows use in harsh environments.
- ▶ Convenient and backward compatible mounting.
- ▶ Molex Mini-fit Sr. connectors allow easy installation and wiring.
- ▶ Optional enable pin allows converter to be used in power-down mode to limit current draw in energy critical applications.
- ▶ Integrated fuse holder provide safety and allows easy replacement.
- ▶ Compliance with industry norms ensures safe operation; UL60950, RoHs, CE, EMC (EN12895, CISPR11 Class A), ISO7637-2 transient conduction.



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## DC/DC Converter

### SPECIFICATIONS



15495200-0001, 4, 7  
(12.4 VDC  
Output Version)

15495200-0002, 5, 8  
(13.7 VDC  
Output Version)

15495200-0003, 6, 9  
(24.0 VDC  
Output Version)

#### Input

	15495200-0001, 4, 7 (12.4 VDC Output Version)	15495200-0002, 5, 8 (13.7 VDC Output Version)	15495200-0003, 6, 9 (24.0 VDC Output Version)
Voltage Range (continuous operation)	18 – 106 VDC	18 – 106 VDC	18 – 106 VDC
Maximum Input Voltage (10 minutes operating, no time derating vs. input)	126 VDC	126 VDC	126 VDC
Under Voltage Lockout, Turn-On Voltage Threshold	16 – 18 VDC	16 – 18 VDC	16 – 18 VDC
Under Voltage Lockout, Turn-Off Voltage Threshold	14 – 16 VDC	14 – 16 VDC	14 – 16 VDC
Maximum Current (Vin = 18 VDC, 100% load)	13.5 A	13.5 A	13.5 A
Maximum No-Load Current @ 24 VDC	240 mA	180 mA	220 mA
Maximum No-Load Current @ 48 VDC	100 mA	100 mA	120 mA
Maximum No-Load Current @ 72, 80 VDC	80 mA	80 mA	100 mA
Maximum Reverse Polarity Voltage	106 VDC	106 VDC	106 VDC

#### Output

	15495200-0001, 4, 7 (12.4 VDC Output Version)	15495200-0002, 5, 8 (13.7 VDC Output Version)	15495200-0003, 6, 9 (24.0 VDC Output Version)
Operating Current Range (Vin = 18-27 VDC)	0 – 16 A	0 – 14.5 A	0 – 8 A
Operating Current Range (Vin = 27-106 VDC)	0 – 24 A	0 – 22 A	0 – 12.5 A
Voltage Set Point (Total Vin range, io = 0)	12.6 VDC Typ	14.1 VDC Typ	25.0 VDC Typ
Voltage Set Point (Vin = 18-27 VDC, io = 8A)	12.4 VDC Typ	13.8 VDC Typ	24.7 VDC Typ
Voltage Set Point (Vin = 27-106 VDC, io = 12.5A)	12.2 VDC Typ	13.7 VDC Typ	24.5 VDC Typ
Voltage Ripple and Noise (Full Load, Vpp, 20 Mhz bandwidth)	150 mV Max	100 mV Max	100 mV Max
Current Limit (Vin = 24 VDC)	23 A	19 A	12 A
Current Limit (Vin = 36, 48, 72, 80 VDC)	32 A	29 A	17 A
Voltage Protection	14 – 17 VDC	15 – 18 VDC	25 – 28 VDC
Output Capacitance (ESR > 10 mohm)	5000 uF Max	5000 uF Max	2000 uF Max
Minimum Efficiency @ 100% Load (Vin = 24 VDC)	85%	85%	85%
Minimum Efficiency @ 100% Load (Vin = 48 VDC)	87%	87%	89%
Minimum Efficiency @ 100% Load (Vin = 72, 80 VDC)	89%	88%	90%
Minimum Efficiency @ 60% Load (Vin = 48 VDC)	88%	87%	89%
Start-up time (Vin = 48 VDC)	600 ms typ, 800 ms max	600 ms typ, 800 ms max	700 ms typ, 1000 ms max
Start-up time (Vin = 72 VDC)	850 ms typ, 1200 ms max	850 ms typ, 1200 ms max	850 ms typ, 1200 ms max
Start-up time, Enable (Vin = 48 VDC or 72 VDC)	250 ms typ, 400 ms max	250 ms typ, 400 ms max	250 ms typ, 400 ms max

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### SPECIFICATIONS continued

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(12.4 VDC  
Output Version)

15495200-0002, 5, 8  
(13.7 VDC  
Output Version)

15495200-0003, 6, 9  
(24.0 VDC  
Output Version)

#### General

Maximum Isolation Voltage, Input to Output	2000 VDC	2250 VDC	2250 VDC
Maximum Isolation Voltage, Output to Case	500 VDC	550 VDC	550 VDC
Minimum Isolation Resistance, Input to Output	10 Mohm	10 Mohm	10 Mohm
Typical Isolation Capacitance, Input to Output	2000 pF	9000 pF	7000 pF
Typical Switching Frequency	200 kHz	175 kHz	160 kHz
Weight	950g	950g	950g

#### Environmental

Storage Temperature Range	-40° to +125° C	-40° to +125° C	-40° to +125° C
Operating Temperature Range	-40° to +75° C	-40° to +75° C	-40° to +75° C
Over Temperature Protection	120° C	108° C	118° C
Humidity (non-condensing)	95% relative humidity	95% relative humidity	95% relative humidity
Protection Level	IP 67	IP 67	IP 67
Vibration (IEC 60068-2-6)	10g, 15 – 200 Hz, 3 planes	10g, 15 – 200 Hz, 3 planes	10g, 15 – 200 Hz, 3 planes
Shock (IEC 60068-2-27)	50g, 3 planes	50g, 3 planes	50g, 3 planes
Emission (EN12895)	30 – 1000 MHz, 34 – 45 dBuV/m	30 – 1000 MHz, 34 – 45 dBuV/m	30 – 1000 MHz, 34 – 45 dBuV/m
Immunity (EN12895, EN61000-4-3)	10V/m, 27–1000 MHz AM, 10V/m, 900 MHz, FM	10V/m, 27 – 1000 MHz AM, 10V/m, 900 MHz, FM	10V/m, 27 – 1000 MHz AM, 10V/m, 900 MHz, FM
ESD (EN12895, EN61000-4-2)	Direct: ± 2kV, ± 4kV; Air: ± 2kV, ± 4kV, ± 8kV	Direct: ± 2kV, ± 4kV; Air: ± 2kV, ± 4kV, ± 8kV	Direct: ± 2kV ± 4kV; Air: ± 2kV, ± 4kV, ± 8kV

### DESIGN CONSIDERATIONS

#### Remote On / OFF

Models 1420E-0007, -0008 and -0009 have Enable control function. This Enable PIN is designed on the primary side of converter, the converter will turn on when the Enable PIN connected to the VIN+, and turn off when the Enable PIN connected to the VIN- or floating.

#### Parallel Connection of Multiple Units

Two units parallel operation is verified, please contact Curtis if more than two units need to be paralleled. While paralleling multiple units, the impedance of the cables from unit to junction point of each unit should be within ±5% of each other.

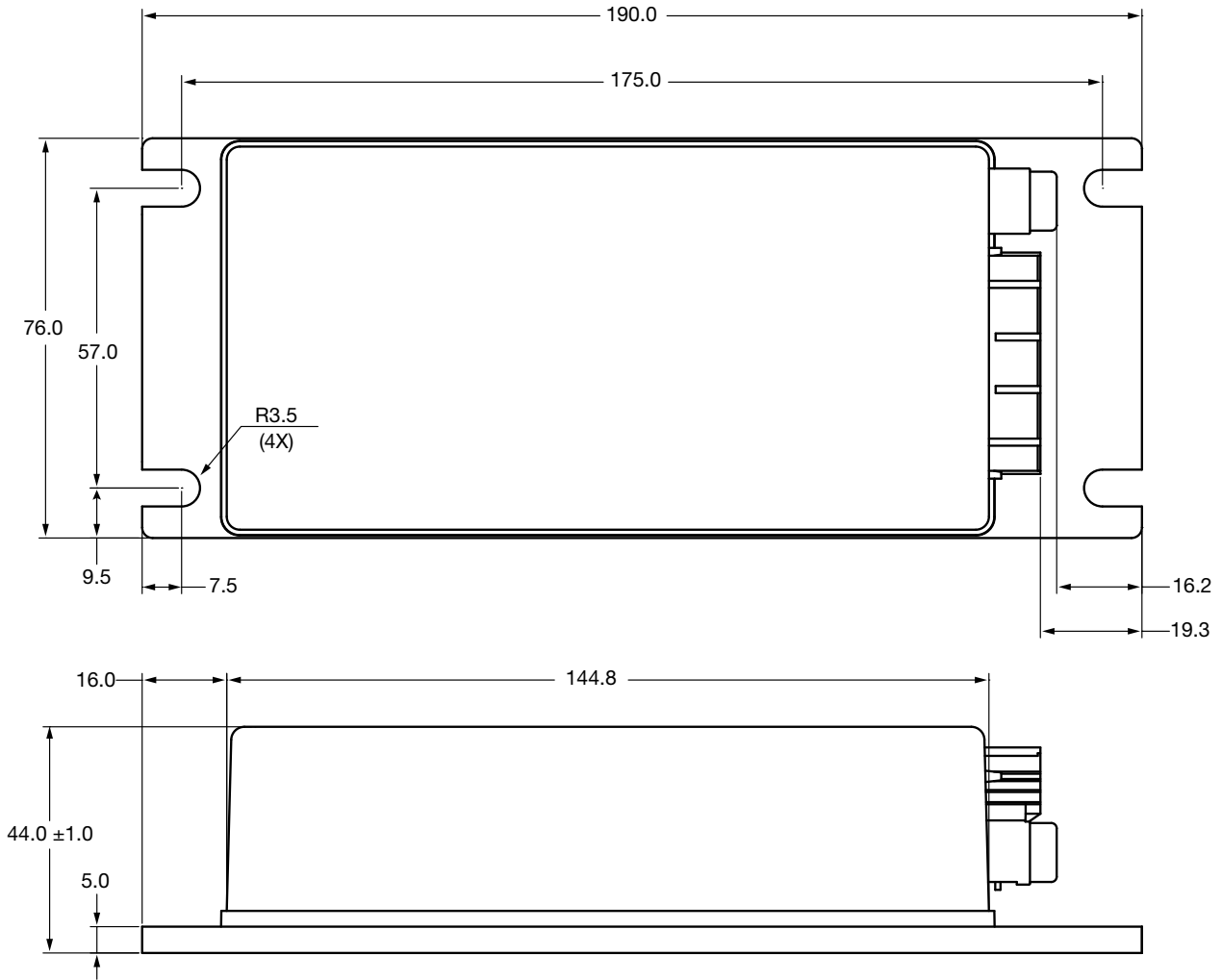
# Model 1420

## DC/DC Converter

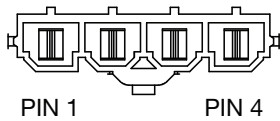


### DIMENSIONS mm (typical)

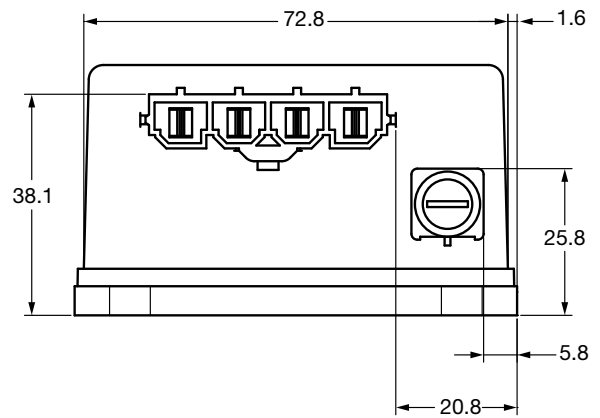
Models 1420E-0001, -0002 and -0003



### CONNECTOR



Pin #	Function
1	Output -
2	Output +
3	Input -
4	Input +



Header: Molex Part Number 42819-4213  
 Connector Housing: Molex part number 42816-0412  
 Connector Terminal: Molex part number 42815-0042

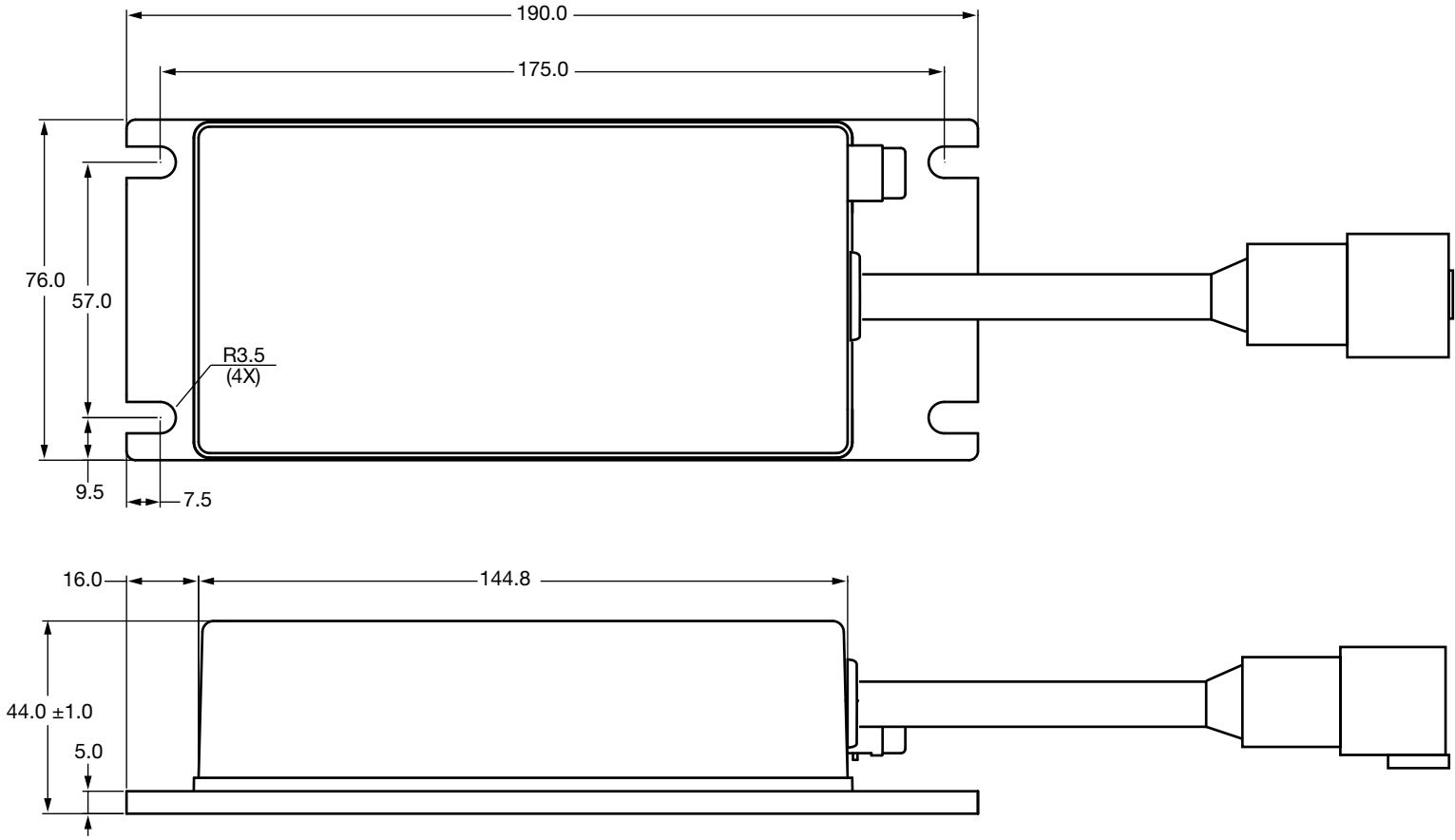
# Model 1420

## DC/DC Converter



### DIMENSIONS mm (typical)

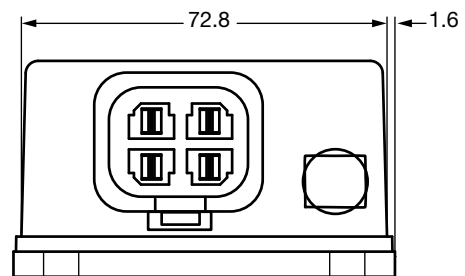
Models Models 1420E-0004, -0005, -0006



### CONNECTOR



Pin #	Function
1	Output -
2	Output +
3	Input -
4	Input +



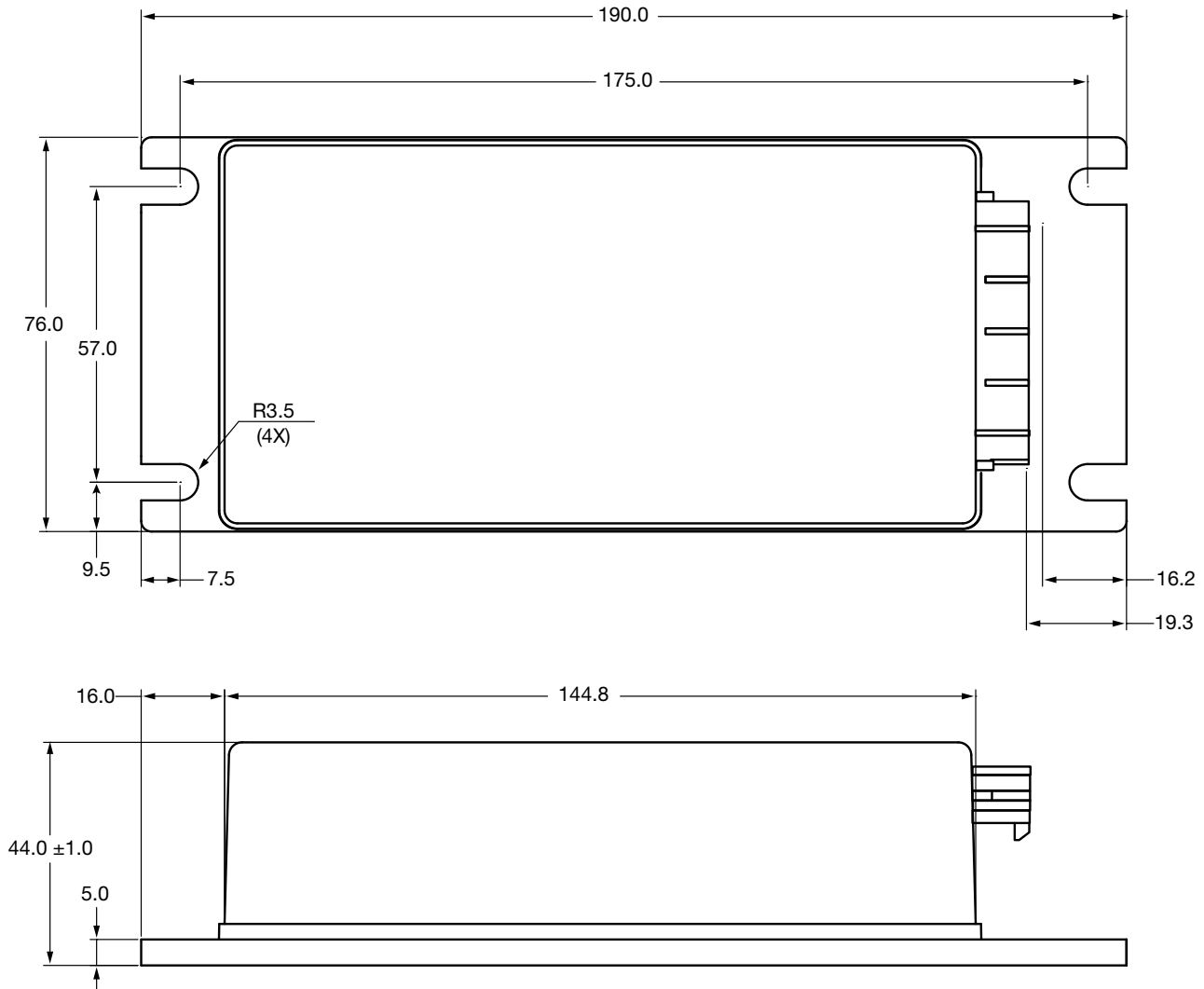
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## DC/DC Converter

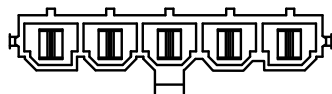


### DIMENSIONS mm (typical)

Models Models 1420E-0007, -0008 and -0009

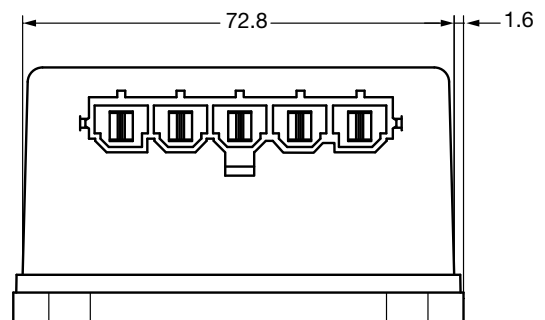


### CONNECTOR



PIN 1                      PIN 5

Pin #	Function
1	Output -
2	Output +
3	Input -
4	Input +
5	Enable



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



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Specifications subject to change without notice

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