## DCR240 Series DC/DC Voltage Converter



### Benefits

- Ultra-Quiet
- Power sensitive electronics without interference
- Rugged & Reliable
- Ensure years of safe and trouble free operation

## Applications

- · Railway / Transportation
- Mining
- Oil Rigs
- Military Applications
- · Marine / Automotive / RV
- Electric Utilities and Substations
- Telecom Power Plants
- Manufacturing Locations
- · Steel Mills
- Industrial Controls
- OEM Applications

# **DC/DC Converters**

DCR240 (isolated)

### Description

The DCR240 series consists of PWM DC-DC converters, with a galvanic isolation between input and output. The converters operate at a fixed switching frequency and use push-pull converter topology.

There are two options to choose:

- 1 With remote sensing
- 2 With low output voltage alarm

For maximum regulation, the remote sensing terminals can be connected to the load. This will allow a power cable voltage drop of up to 0.3 V on each cable to be offset.

The device is protected against overload and short-circuits by means of a current limiting circuit.

The device is also protected against reverse polarity input voltage, and the input fuse blows if an improper connection is made.

When a converter input under voltage condition occurs, the converter is disabled, thus preventing the battery from becoming totally discharged.

#### Features

- Designed according to EN50155
- Fire and smoke: EN45545-2 approved
- High input-output isolation
- · Standard size Eurocard 3U
- · Adjustable output voltage
- Input voltage OK LED
- · Output voltage presence LED
- · Remote inhibit
- Option: remote sensing or alarm
- · Full electronic protection
- 2 years parts and labour warranty

# **Specifications** (Specifications Subject to Change Without Notice)

	24Vin	36Vin	48Vin	72Vin	110Vin
	14,4V 30V	21,6V 47V	28,8V 60V	43,2V 90V	66V 144V
	16,8V 30V <sup>(1)</sup>	25,2V 47V <sup>(1)</sup>	33,6V 60V <sup>(1)</sup>	50,4V 90V <sup>(1)</sup>	77V 144V <sup>(1)</sup>
5Vout	<b>DCR240-24-5</b>	<b>DCR240-36-5</b>	<b>DCR240-48-5</b>	<b>DCR240-72-5</b>	<b>DCR240-110-5</b>
	180W 80%	180W 80%	180W 80%	180W 81%	180W 81%
12Vout	<b>DCR240-24-12</b>	<b>DCR240-36-12</b>	<b>DCR240-48-12</b>	<b>DCR240-72-12</b>	<b>DCR240-110-12</b>
	240W 83%	240W 83%	240W 84%	240W 88%	240W 86%
24Vout	<b>DCR240-24-24</b>	<b>DCR240-36-24</b>	<b>DCR240-48-24</b>	<b>DCR240-72-24</b>	<b>DCR240-110-24</b>
	240W 87%	280W 87%	280W 88%	280W 90%	280W 91%
48Vout	<b>DCR240-24-48</b>	<b>DCR240-36-48</b>	<b>DCR240-48-48</b>	<b>DCR240-72-48</b>	<b>DCR240-110-48</b>
	240W 88%	280W 88%	280W 89%	280W 90%	280W 92%

Input undervoltage shutdown	INPUT				
Maximum allowed input ripple   15% Vin nom (EN50155)	Input voltage range	See table			
OUTPUT         See table           Output voltage adjustment         10% +0% Vo nom           Vi min = 80% Vi nom         -10% +15% Vo nom¹0           Line regulation (lo = nom)         < 0.2 % (lo = nom)	Input undervoltage shutdown	55% to 60% Vi nom			
Output voltage         See table           Output voltage adjustment         Vi min = 60% Vi nom           Vi min = 70% Vi nom         -10% +0% Vo nom           Vi min = 70% Vi nom         -10% +15% Vo nom()           Line regulation (lo = nom)         < 0.2 % (lo = nom)	Maximum allowed input ripple	15% Vin nom (EN50155)			
Output voltage adjustment         V Inin = 60% Vi Inom         -10% +15% Vo nom           V Imin = 70% Vi Inom         -10% +15% Vo nom(n)           Line regulation (lo = nom)         < 0.2 % (lo = nom)	OUTPUT				
Vi min = 60% Vi nom	Output voltage	See table			
Vi min = 70% Vi nom	Output voltage adjustment				
Line regulation (lo = nom)	Vi min = 60% Vi nom	-10% +0% Vo nom			
Load regulation (Vin = nom)	Vi min = 70% Vi nom	-10% +15% Vo nom <sup>(1)</sup>			
Ripple	Line regulation (Io = nom)	< 0,2 % (lo = nom)			
Noise (BW = 20MHz)	Load regulation (Vin = nom)	< 0,2 % (Vin = nom; lo: 0100%)			
Storage temperature	Ripple	< 50 mVpp			
Storage temperature	Noise (BW = 20MHz)	< 100 mVpp			
Operating temperature range         10: 100%         -25°C 60°C (-40°C 60°C, see note-1)           Operating temperature range         10: 75%         -25°C 70°C (-40°C 70°C, see note-1)           Operating temperature range         10: 75.%         -25°C 85°C, see note-1)           Maximum Relative humidity         95% with no condensation           Shock and vibration         EN61373 Category 1 class B body mounted           MTBF         400.000h @ 40°C according to IEC81709           EMC         Emission           Emission         EN61000-6-3 EN50121-3-2           Immunity         EN61000-6-2 EN50121-3-2           SAFETY         Safetry           Safety         EN60950 EN50155           Dielectric strength Input-Output         3000Vac, 4200Vdc 1min.           Dielectric strength Input-GND         1500Vac, 2100Vdc 1min.           Fire and smoke         EN45545-2           MECHANICAL         Approximate weight           Approximate weight         640g           Dimensions         100 x 220 x 38.5mm           CONTROL         Remote sense (option)         < 0.3V per pole	ENVIRONMENTAL				
Operating temperature range         lo :75%         -25°C 70°C (-40°C 70°C, see note-1)           Operating temperature range         lo : 37.5%         -25°C 85°C (-40°C 85°C, see note-1)           Maximum Relative humidity         95% with no condensation           Shock and vibration         EN61373 Category 1 class B body mounted           MTBF         400.000h @ 40°C according to IEC61709           EMC         EM6000           Emission         EN61000-6-3 EN50121-3-2           Immunity         EN61000-6-2 EN50121-3-2           SAFETY         Safety           Safety         EN60950 EN50155           Dielectric strength Input-Output         3000Vac, 2400Vdc 1min.           Dielectric strength Input-GND         1500Vac, 2100Vdc 1min.           Dielectric strength Output-GND         1500Vac, 2100Vdc 1min.           Fire and smoke         EN45545-2           MECHANICAL         Approximate weight           Approximate weight         640g           Dimensions         100 x 220 x 38.5mm           CONTROL         Threshold: 0.850.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V           PROTECTIONS         Threshold: 0.850.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V           PROTECTIONS         Current limiting	Storage temperature	-40°C 85°C			
Operating temperature range   Io: 37.5%   -25°C 85°C (-40°C 85°C, see note-1)	Operating temperature range lo: 100%	-25°C 60°C (-40°C 60°C, see note-1)			
Maximum Relative humidity Shock and vibration EN61373 Category 1 class B body mounted  MTBF 400.000h @ 40°C according to IEC61709  EMC Emission EN61000-6-3 EN50121-3-2  Immunity EN61000-6-2 EN50121-3-2  SAFETY Safety EN60950 EN50155 Dielectric strength Input-Output 3000Vac, 4200Vdc 1min. Dielectric strength Input-GND 1500Vac, 2100Vdc 1min. Dielectric strength Output-GND 1500Vac, 2100Vdc 1min. Fire and smoke EN45545-2  MECHANICAL Approximate weight 640g Dimensions 100 x 220 x 38.5mm  CONTROL Remote sense (option)  Low output voltage alarm (option)  Threshold: 0.850.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	Operating temperature range lo :75%	-25°C 70°C (-40°C 70°C, see note-1)			
Shock and vibration EN61373 Category 1 class B body mounted  MTBF 400.000h @ 40°C according to IEC61709  EMC  Emission EN61000-6-3 EN50121-3-2  Immunity EN61000-6-2 EN50121-3-2  SAFETY  Safety EN60950 EN50155  Dielectric strength Input-Output 3000Vac, 4200Vdc 1min.  Dielectric strength Input-GND 1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND 1500Vac, 2100Vdc 1min.  Fire and smoke EN45545-2  MECHANICAL  Approximate weight 640g  Dimensions 100 x 220 x 38.5mm  CONTROL  Remote inhibit range 5V 24V  Remote sense (option) < 0.3V per pole  Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits Current limiting  Against reverse input voltage. Input fuse  Against input under-voltage. Under-voltage lock-out	Operating temperature range lo: 37.5%	-25°C 85°C (-40°C 85°C, see note-1)			
MTBF  MTBF  MO0.000h @ 40°C according to IEC61709  EMC  Emission  EN61000-6-3 EN50121-3-2  EN61000-6-2 EN50121-3-2  SAFETY  Safety  EN60950 EN50155  Dielectric strength Input-Output  3000Vac, 4200Vdc 1min.  Dielectric strength Input-GND  1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND  1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND  EN45545-2  MECHANICAL  Approximate weight  640g  Dimensions  100 x 220 x 38.5mm  CONTROL  Remote inhibit range  5∨ 24V  Remote sense (option)  Coupling alarm (option)  Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits  Current limiting  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	Maximum Relative humidity	95% with no condensation			
EMIC Emission EN61000-6-3 EN50121-3-2 Immunity EN61000-6-2 EN50121-3-2 SAFETY Safety EN60950 EN50155 Dielectric strength Input-Output 3000Vac, 4200Vdc 1min. Dielectric strength Input-GND 1500Vac, 2100Vdc 1min. Dielectric strength Output-GND 1500Vac, 2100Vdc 1min. Fire and smoke EN45545-2 MECHANICAL Approximate weight 640g Dimensions 100 x 220 x 38.5mm  CONTROL Remote inhibit range 5V 24V Remote sense (option) < 0.3V per pole Low output voltage alarm (option) Threshold: 0.850.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS Against reverse input voltage. Against input under-voltage. Under-voltage lock-out	Shock and vibration	EN61373 Category 1 class B body mounted			
Emission EN61000-6-3 EN50121-3-2  Immunity EN6090-6-2 EN50121-3-2  SAFETY  Safety EN60950 EN50155  Dielectric strength Input-Output 3000Vac, 4200Vdc 1min.  Dielectric strength Input-GND 1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND 1500Vac, 2100Vdc 1min.  Pire and smoke EN45545-2  MECHANICAL  Approximate weight 640g  Dimensions 100 x 220 x 38.5mm  CONTROL  Remote inhibit range 5V 24V  Remote sense (option) < 0.3V per pole  Low output voltage alarm (option) Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	MTBF	400.000h @ 40°C according to IEC61709			
Immunity EN61000-6-2 EN50121-3-2  SAFETY  Safety EN60950 EN50155  Dielectric strength Input-Output 3000Vac, 4200Vdc 1min.  Dielectric strength Input-GND 1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND 1500Vac, 2100Vdc 1min.  Fire and smoke EN45545-2  MECHANICAL  Approximate weight 640g  Dimensions 100 x 220 x 38.5mm  CONTROL  Remote inhibit range 5V 24V  Remote sense (option) < 0.3V per pole  Low output voltage alarm (option) Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against reverse input voltage. Input fuse  Against input under-voltage. Under-voltage lock-out	EMC				
Safety EN60950 EN50155 Dielectric strength Input-Output 3000Vac, 4200Vdc 1min. Dielectric strength Input-GND 1500Vac, 2100Vdc 1min. Dielectric strength Output-GND 1500Vac, 2100Vdc 1min.  Fire and smoke EN45545-2  MECHANICAL Approximate weight 640g Dimensions 100 x 220 x 38.5mm  CONTROL Remote inhibit range 5V 24V Remote sense (option) 5V 24V Low output voltage alarm (option) 1500Vac, 200 Vonom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS Against overloads and short-circuits Current limiting Against reverse input voltage.  House Sense (option) 1000 Final Imput fuse Under-voltage lock-out	Emission	EN61000-6-3 EN50121-3-2			
Safety EN60950 EN50155  Dielectric strength Input-Output 3000Vac, 4200Vdc 1min.  Dielectric strength Input-GND 1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND 1500Vac, 2100Vdc 1min.  Fire and smoke EN45545-2  MECHANICAL Approximate weight 640g Dimensions 100 x 220 x 38.5mm  CONTROL Remote inhibit range 5V 24V Remote sense (option) 5V 24V Remote sense (option) 7Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS Against overloads and short-circuits Current limiting Against reverse input voltage. Input fuse Against input under-voltage. Under-voltage lock-out	Immunity	EN61000-6-2 EN50121-3-2			
Dielectric strength Input-Output  Dielectric strength Input-GND  1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND  1500Vac, 2100Vdc 1min.  Fire and smoke  EN45545-2  MECHANICAL  Approximate weight  640g  Dimensions  100 x 220 x 38.5mm  CONTROL  Remote inhibit range  5V 24V  Remote sense (option)  Coutput voltage alarm (option)  Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	SAFETY				
Dielectric strength Input-GND  1500Vac, 2100Vdc 1min.  Dielectric strength Output-GND  1500Vac, 2100Vdc 1min.  Fire and smoke  EN45545-2  MECHANICAL  Approximate weight  640g  Dimensions  100 x 220 x 38.5mm  CONTROL  Remote inhibit range  5V 24V  Remote sense (option)  Coutput voltage alarm (option)  Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	Safety	EN60950 EN50155			
Dielectric strength Output-GND  1500Vac, 2100Vdc 1min.  Fire and smoke  EN45545-2  MECHANICAL  Approximate weight  640g  Dimensions  100 x 220 x 38.5mm  CONTROL  Remote inhibit range  5V 24V  Remote sense (option)  Low output voltage alarm (option)  PROTECTIONS  Against overloads and short-circuits  Against reverse input voltage.  Against input under-voltage.  Against input under-voltage.  Under-voltage lock-out	Dielectric strength Input-Output	3000Vac, 4200Vdc 1min.			
Fire and smoke EN45545-2  MECHANICAL  Approximate weight 640g  Dimensions 100 x 220 x 38.5mm  CONTROL  Remote inhibit range 5V 24V  Remote sense (option) < 0.3V per pole  Low output voltage alarm (option) Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits Current limiting  Against reverse input voltage. Input fuse  Against input under-voltage. Under-voltage lock-out	Dielectric strength Input-GND	1500Vac, 2100Vdc 1min.			
MECHANICALMECHANICALApproximate weight640gDimensions100 x 220 x 38.5mmCONTROLFemote inhibit rangeRemote inhibit range5V 24VRemote sense (option)< 0.3V per pole	Dielectric strength Output-GND	1500Vac, 2100Vdc 1min.			
Approximate weight  Dimensions  100 x 220 x 38.5mm  CONTROL  Remote inhibit range  5V 24V  Remote sense (option)  Low output voltage alarm (option)  PROTECTIONS  Against overloads and short-circuits  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	Fire and smoke	EN45545-2			
Dimensions 100 x 220 x 38.5mm  CONTROL  Remote inhibit range 5V 24V  Remote sense (option) < 0.3V per pole  Low output voltage alarm (option) Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits Current limiting Against reverse input voltage. Input fuse  Against input under-voltage. Under-voltage lock-out	MECHANICAL				
CONTROL         Remote inhibit range       5V 24V         Remote sense (option)       < 0.3V per pole	Approximate weight	640g			
Remote inhibit range 5V 24V  Remote sense (option) < 0.3V per pole  Low output voltage alarm (option) Threshold: 0.85 0.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits Current limiting  Against reverse input voltage. Input fuse  Against input under-voltage. Under-voltage lock-out	Dimensions	100 x 220 x 38.5mm			
Remote sense (option) < 0.3V per pole  Low output voltage alarm (option) Threshold: 0.850.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS Against overloads and short-circuits Current limiting Against reverse input voltage. Input fuse Against input under-voltage. Under-voltage lock-out	CONTROL				
Low output voltage alarm (option)  Threshold: 0.850.90 Vo nom. Open when alarm Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	Remote inhibit range	5V 24V			
Isolated solid state relay: max.100mA, 160V  PROTECTIONS  Against overloads and short-circuits Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	Remote sense (option)	< 0.3V per pole			
PROTECTIONS Against overloads and short-circuits Against reverse input voltage. Against input under-voltage. Under-voltage lock-out	Low output voltage alarm (option)				
Against overloads and short-circuits  Against reverse input voltage.  Against input under-voltage.  Under-voltage lock-out	PROTECTIONS	, ,			
Against reverse input voltage. Input fuse Against input under-voltage. Under-voltage lock-out		Current limiting			
Against input under-voltage.  Under-voltage lock-out					
	<u> </u>	'			
Adainst indut over-currents   Indut tuse	Against Input over-currents	Input fuse			

Note-1: The unit can start up and work at an ambient temperature of -40°C with the following restrictions:

1) Do not actuate over the connectors below -25°C. 2) The output ripple can rise up to 150mVpp at -40°C

#### Available from:







The power conversion company

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