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KNOW HOW IS THE FUTURE

The Converter Intelligent!

DC-DC Converter Qone CompactPCI®-100



Output Power up to 100 Watt

Isolated

Quad-Output

For standard euro-rack size 19”

The intelligent converter.
Effective, flexible, small.
Made by AUTRONIC.

Its merits are:

- High power density
- Overtemperature shutdown
- Short circuit protection
- Remote on/off
- Coated assembly
- Glued parts for better vibration resistance
- Fixed switching frequency
- Yellow LED to indicate operating mode
- According to Railway Standard EN 50155 and 50121-3-2 (EMC)
- Inrush current limiting
- Reverse polarity protection
- Hold up time of 10ms
- Supply Fail (FAL)
- Derating Signal (DEG)
- Sense (S)
- Enable Signal (EN)

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Order Numbers and Specific Characteristics

Other type on request.

V_{out}	V_{out} nom (V)	I_{out} nom (A)	P_{out} max (W)	η typ (%)[1]	I_{in} max (A)[6]	Order Number HEC-4DB/M/L system slot left	Order Number HEC-4DB/M/R system slot right			
$V_{in\ nom}$ = 24 V $V_{in\ betrieb}$ = 16 to 30 V, $V_{in\ grenz}$ = 14,4 to 36 V [2) 3)]										
1	5 [4)]	14								
2	3,3 [4)]	14	100 [5)]	≥ 78	9	82 81 89 0422 1	82 82 89 0422 6			
3	12	2								
4	-12	1								
$V_{in\ nom}$ = 36 V $V_{in\ betrieb}$ = 24 to 45 V, $V_{in\ grenz}$ = 21,6 to 51 V [2) 3)]										
1	5 [4)]	14								
2	3,3 [4)]	14	100 [5)]	≥ 77	6,2	84 81 89 0422 5	84 82 89 0422 1			
3	12	2								
4	-12	1								
$V_{in\ nom}$ = 72 V $V_{in\ betrieb}$ = 48 to 90 V, $V_{in\ grenz}$ = 43,2 to 101 V [2) 3)]										
1	5 [4)]	14								
2	3,3 [4)]	14	100 [5)]	≥ 77	3	86 81 89 0422 9	86 82 89 0422 5			
3	12	2								
4	-12	1								
$V_{in\ nom}$ = 110 V $V_{in\ betrieb}$ = 77 to 138 V, $V_{in\ grenz}$ = 66 to 160 V [2) 3)]										
1	5 [4)]	14								
2	3,3 [4)]	14	100 [5)]	≥ 76	2	87 81 89 0422 2	87 82 89 0422 7			
3	12	2								
4	-12	1								

[1)] P_{out} = 0,8 $P_{out\ max}$; V_{in} = $V_{in\ nom}$

[2)] Converter input **and** critical input according to Railway Standard EN 50155 ($V_{in\ operating}$, $V_{in\ range}$ and hold-up S2).

[3)] Converter switches on at $V_{in\ operating\ min}$

[4)] 3,3 V adjusted to 3,4 V and 5 V adjusted to 5,1 V

[5)] Derating ≥ +60°C; Derating-Factor: ca. 2W/K

[6)] Recommended fuse: Quick-acting wire fuse I_{rat} = 1,5 x $I_{in\ max}$; high switching off capacity; for disconnecting from the preceding supply, sufficient current of the supply point to trigger the fuse in case of short-circuit has to be made sure (t<300 ms).

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Technical Data

For T_{amb}=25°C, $V_{in\ nom}$, $P_{out\ max}$, unless otherwise specified.

	Symbol	Unit	min	typ	max	Notes
Input Characteristics						
Input voltages	V_{in}	V				
Nominal input voltages	$V_{in\ nom}$	V				1)
Input voltage range						
– Min. input voltage	$V_{in\ min}$	V				1)
– Max. input voltage	$V_{in\ max}$	V				1)
Threshold						
– Voltages on threshold	$V_{in\ on}$	V		1,05 $V_{in\ min}$		
– Voltage off threshold	$V_{in\ off}$	V		$V_{in\ min}$		
Input current	I_{in}	A				
– Max. input current	$I_{in\ max}$	A				1)
– No load input current	$I_{in\ off}$	mA_{eff}	30		170	switched off by EN or INH
Output Characteristics						
Output voltages	V_{out}	V				short circuit protected and zero load operation
Nominal output voltages	$V_{out\ nom}$	V				1)
– Accuracy		%		±0,2		for all outputs at no-load operation; for 3,3 and 5 V double value
Regulation						
– Line regulation		mV		0		$V_{in\ operating\ min}$ – $V_{in\ operating\ max}$; $I_{out\ nom}$
– Static load regulation (V_{out} 1 and 2)		mV		30		0 % – 100 % I_{nom}
– Static load regulation (V_{out} 3 and 4)		mV		30		0 % – 100 % I_{nom}
– Dynamic load change						25% - 75% - 25% $I_{out\ nom}$
Voltage deviation (V_{out} 1 and 2)		mV		15		per A load change; without ext. capacitor
Voltage deviation (V_{out} 1 and 2)		mV		10		per A load change; with ext. capacitor 1500µF
Voltage deviation (V_{out} 3 and 4)		mV		90		per A load change
Recovery time (V_{out} 1 and 2)		ms		1		
Recovery time (V_{out} 3 and 4)		ms		0,4		
– Temperature coeff. (V_{out} 1 and 2)		%/K		0,01		
– Temperature coeff. (V_{out} 3 and 4)		%/K		0,01		
Rising characteristics						
– Rise time (V_{out} 1 and 2)		ms		500	1000	after connecting V_{in}
– Overshoot		%		4		for no-load operation and I_{nom} at measured output
Ripple and noise		mVss		50		V_{ss} / 20 MHz bandwidth
Overvoltage protection (V_{out} 1 and 2)		V		1,2 $V_{out\ nom}$		external supply not permissble
Output current	I_{out}	A				
– Nominal output current	$I_{out\ nom}$	A				1)
Overcurrent protection						automatical restart after ca. 1,5 s
– Overcurrent protection (V_{out} 1 and 2)		A	1,05 $I_{out\ nom}$		1,3 $I_{out\ nom}$	common shutdown
– Overcurrent protection (V_{out} 3 and 4)		A	1,05 $I_{out\ nom}$		1,5 $I_{out\ nom}$	
Output power	P_{out}	W				
– Max. output power	$P_{out\ max}$	W				1)
Derating						1)
Efficiency	η	%				Mix: $I_{out\ 1,\ 3,\ 4}$ = 0,6 $I_{out\ nom\ 1,\ 3,\ 4}$; $I_{out\ 2}$ = 0,3 $I_{out\ nom\ 2}$ 1)
Overtemperature shutdown		°C		100		converter temperature restart after colling-off ca. 5K, min. 1,5 s.

Derate Signal (DEG)	
Warning criteria	Temperature > 95°C (typ.). Risk of overtemperature exists.
Ambient Temperature Range	
Operating	-40 up to +85°C
Storage/Transport	-40 up to +100°C
MTBF	
	500.000 h at T_{amb} = 25°C
Isolation	
Input/Output	1.500 V_{eff}
Input/Case	1.500 V_{eff}
Output/Case	500 V_{eff}

EMC	
Product standard	EN 61204 :1993
Emission	conducted emission acc. to EN 55011 2) Class A
Immunity	
Electrostatic discharge (ESD)	EN 61000-4-2, Criterion A (6kV / 8kV)
Electric field	EN 61000-4-3, Criterion A (10V/m)
HF-current injection	EN 61000-4-6, Criterion B (10V)
Fast transient (Burst)	EN 61000-4-4, Criterion B (2kV)
Transient (Surge)	EN 61000-4-5, Criterion B (0,5kV / 1,8kV)
Mechanical Stress	
Shock	IEC 68-2-27
Continous shock	IEC 68-2-29
Vibration	IEC 68-2-6

1) See table „Order Numbers and Specific Charateristics“ (page 2).
2) In built-in-condition our devices may show different EMC properties.

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Control Functions according to PICMG® 2.11 CompactPCI® Specification

Sense (S) at $V_{out\ nom}$ 3,3 V and 5 V

Sense connection is not required. If it is accomplished, the voltage at the load is reduced by ca. 100 mV. This feature provides compensation of voltage drops (max. 0,2 V each line) at V_{out1} and V_{out2} between power supply and load. The pins Sense return, Sense +5 V and Sense +3,3 V must be connected with the load. The sense signal should not be longer than 3m.

Derate Signal (DEG)

Output "Open-Collector", Emitter grounded (npn-Transistor) Current 5 mA / Voltage 5 V
Active –low, V_{max}=5V

Supply Fail Signal (FAL)

Output "Open-Collector", Emitter grounded (npn-Transistor) Current 5 mA / Voltage 5 V
FAL switches Low, if one of the outputs is out of tolerance or if V_{in} breaks down. If V_{in} breaks down, it remains 5 ms between the edge of the FAL-Signal and the break down of V_{out}.

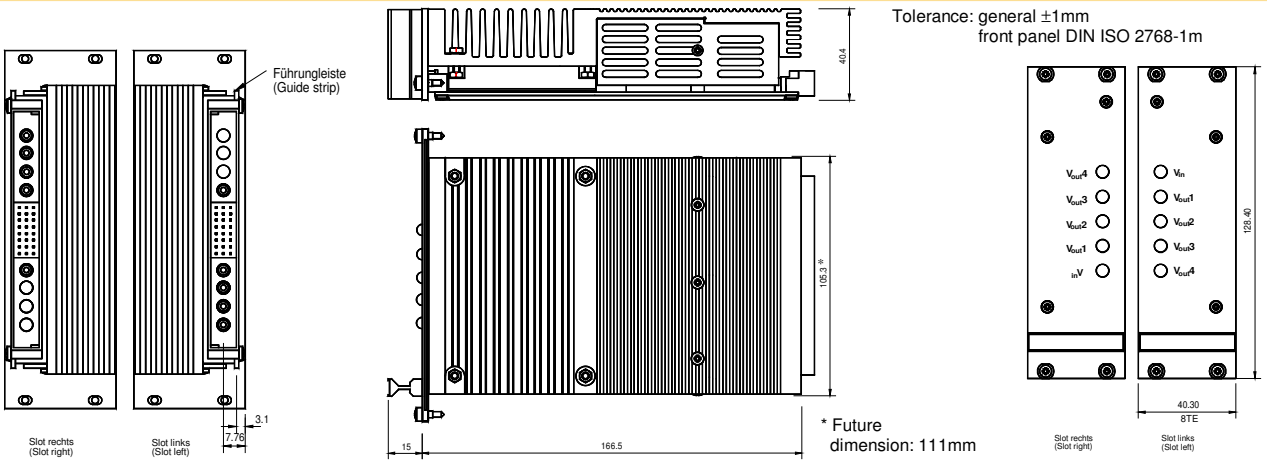
Enable Signal (EN) / Inhibit Signal (INH)

Inputs Reference to GND Low-Level: 0V...2,0V High-Level 4,5V…12V (Logic see table)

INH	Low	Low	High	High
EN	Low	High	Low	High
Power Status	"Off"	"Off"	"On"	"Off"

Additional Technical Data

Drawing (Dimensions in mm)



Packaging

Standard euro-size 19" Coated assembly; coated and glued parts for better vibration resistance

Class of protection

Class I DIN EN 60950

Degree of protection

IP20 DIN 40050 (IEC 529)

Pollution degree

Degree 2 DIN EN 60950

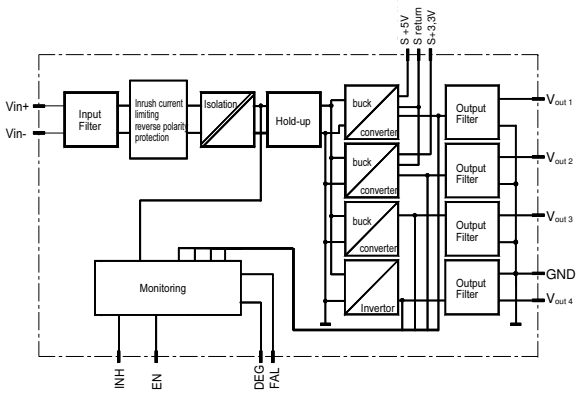
Weight

HEC-4DB/M ca. 900 g

Installation Instructions

The converters have to be installed according to the guidelines currently in force, like other open electronic component assemblies. Plug in not under voltage. Attention must be paid to sufficient ventilation, carry off heat, fastening and protection against accidental contact.
The pin B11, Case/PE : (⏚ / ⏚), has to be properly connected in order to assure operation.

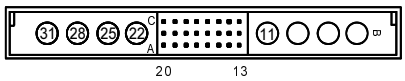
Block Diagram



Connection

Connector M24/8

Top View Connector



Pin Allocation

A13	NC	Not connected	**B17**	$V_{out\ 2}$	+ 3,3V Output Voltage
A14	INH	Inhibit Signal	**B18**	$V_{out\ 2}$	+ 3,3V Output Voltage
A15	NC	Not connected	**B19**	$V_{out\ 3}$	+ 12V Output Voltage
A16	S return	Sense return	**B20**	$V_{out\ 4}$	- 12V Output Voltage
A17	S +5V	Sense Vout1	**B22**	$V_{out\ 1}$	+ 5V Output Voltage
A18	S +3,3V	Sense Vout2	**B25**	GND	Ground
A19	$V_{out\ 3}$	+ 12V Output Voltage	**B28**	V_{in} +	+ Input Voltage
A20	$V_{out\ 4}$	- 12V Output Voltage	**B31**	V_{in} -	- Input Voltage
B2	NC	Not connected	**C13**	EN	Enable Signal
B5	NC	Not connected	**C14**	DEG	Derate Signal
B8	NC	Not connected	**C15**	FAL	Supply Fail Signal
B11	⏚ ⏚	Chassis Ground	**C16**	$V_{out\ 2}$	+ 3,3V Output Voltage
B13	$V_{out\ 2}$	+ 3,3V Output Voltage	**C17**	$V_{out\ 2}$	+ 3,3V Output Voltage
B14	$V_{out\ 2}$	+ 3,3V Output Voltage	**C18**	$V_{out\ 2}$	+ 3,3V Output Voltage
B15	$V_{out\ 2}$	+ 3,3V Output Voltage	**C19**	$V_{out\ 3}$	+ 12V Output Voltage
B16	$V_{out\ 2}$	+ 3,3V Output Voltage	**C20**	$V_{out\ 4}$	- 12V Output Voltage

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