

single, double output  
up to 500 Watt

DC/DC system converters  
isolated



- Chassis mounting
- Heat sink with cooling fins (stable profile)
- Wide input voltage range
- EMC / disturbances EN 50121-3-2
- Fire protection DIN 5510 / EN 45545
- Safety EN60950 -SELV-
- Shock/Vibration EN 61373
- Input / Output spike filter
- Active input cross plug. protection
- Active hold-up time 10ms from  $U_{i-min}$

for  
• Railway  
• Vehicles  
• Systems



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## Series HC 51.U/B

### Main points:

#### Output:

- Regulation  $\Sigma (U_{in} + I_{out} + T_U) < \pm 2\%$
- Accuracy absolute  $\pm 1\%$
- option: unregulated/parallel operation 1)
- Ripple  $< 20 \text{ mV}_{pp}$  (over  $T_U$ )
- Spikes  $< 200 \text{ mV}_{pp}$  ( $T: 1:1/50\text{MHz}$ )
- Response time  $\Delta I = 50\% < 2 \text{ ms}$
- Constant current limitation  $< 1,2 I_{o,max}$
- Output spike filter (C - L<sup>2</sup> - C)
- No-load, over load, short circuit proof
- Turn off by exceeding limit temperature
- Power good=OK: LED green and Relay closed ( $250V_{AC} / 8A$ )
- Power fail signal ( $\leq 0,8V / 15mA$ )

#### Input:

- Burst/Surge EN50121 2kV / 42Ω
- Stand-by power  $< 5 \text{ Watt}$
- ON-OFF-application polarity free (inhibit)
- On-Off switch hysteresis at under voltage and delayed restart
- Input filter acc. to EN 55011.B
- Low input capacity
- Active polarity protection
- 10ms active hold-up time from  $< U_{i-min}$  constant over whole input range
- Emergency fuse on PCB

#### In general:

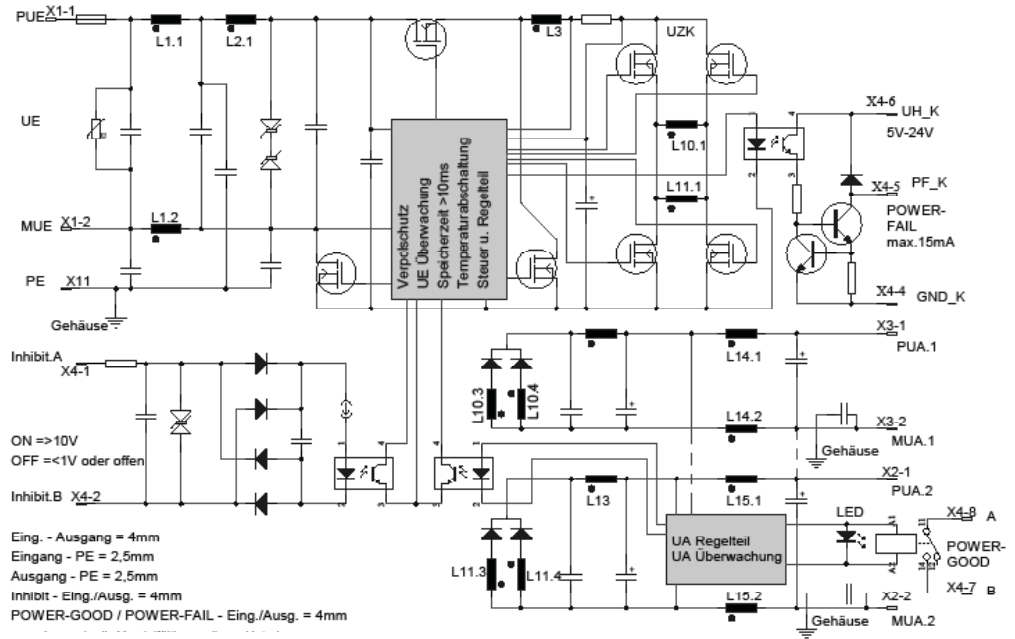
- Connection power: Wago spring clamp 0,2-6mm<sup>2</sup>
- interface: Phoenix MC1,5/8-GF-3,81
- Synchron Buck + push-pull topology
- Isolation test voltage 1,5 KV<sub>AC</sub> 1 min
- Air/creepage distances:  
Input - Output: 4mm  
Input/Output - PE: 2,5mm  
Interface - Input/Output: 4mm
- Ambient temperature  $-25^\circ\text{C}/+70^\circ\text{C}$
- Limit temperature on KK-★ 90°
- Option: short term  $-40^\circ\text{C}/+85^\circ\text{C}$  EN50155 TX
- Derating 1%  $> 60^\circ\text{C}$  for natural convection vertical mounting, forced convection tbd
- MTBF on request
- Shock/vibration acc. EN61373  
Kat. 1, Class B, any mounting position
- Weight approx. 4,1 kg chassis mounting with ribbed heat sink or flange heat sink
- CE-conformity for rolling stock applications

$U_i$	$P_o$	$U_o$	$I_o$	model number
V	W	V	A	
<b>16,8 - 34</b>	<b>300</b>	15	20	HC51-U24-15-200
dyn. $\leq 14,4V$	<b>350</b>	24	14,5	HC51-U24-24-145
$U_o$ drops from $U_i < 16,8V$	<b>350</b>	110	3,2	HC51-U24-10-032
	<b>300</b>	15-15	10-10	HC51-B24-15-100
	<b>350</b>	24-24	7,3-7,3	HC51-B24-24-073
	<b>350</b>	48-48	3,6-3,6	HC51-B24-48-036
<b>25, 2 - 50,4</b>	<b>375</b>	15	25	HC51-U36-15-250
dyn. $\leq 21,6V$	<b>400</b>	24	16,6	HC51-U36-24-166
$U_o$ drops from $U_i < 25,2V$	<b>400</b>	110	3,6	HC51-U36-10-036
	<b>400</b>	24-24	8,3-8,3	HC51-B36-24-083
	<b>400</b>	48-48	4,2-4,2	HC51-B36-48-042
<b>50,4 - 101</b>	<b>400</b>	15	27	HC51-U72-15-270
dyn. $\leq 43,2V$	<b>500</b>	24	21	HC51-U72-24-210
$U_o$ drops from $U_i < 50,4V$	<b>500</b>	110	4,5	HC51-U72-10-045
	<b>500</b>	24-24	10,5-10,5	HC51-B72-24-105
	<b>500</b>	48-48	5,2-5,2	HC51-B72-48-052
<b>77 - 154</b>	<b>450</b>	15	30	HC51-U10-15-300
dyn. 66V	<b>600</b>	24	25	HC51-U10-24-250
$U_o$ stable over $U_i$	<b>600</b>	36	16,6	HC51-U10-10-166
	<b>600</b>	110	5,5	HC51-U10-10-055
	<b>530</b>	24-24	11-11	HC51-B10-24-110
	<b>530</b>	48-48	5,5-5,5	HC51-B10-48-055
<b>Version H</b>	-40°C up to +85°C			additional charge
<b>Version P 2)</b>	Primary sided voltage regulation. The output stability is: $f(U_i/I_o/T_a) \pm 3\%$ from no-load. With this option the converter can work in parallel operation.			additional charge
e.g. HC51.U10.24.210P	Modification costs of possible changes above values			on request

The chassis mountable **HC51** series with an output power up to 500W and high isolation is developed for mobile applications and high operational reliability.

An integrated emergency fuse and cross plugging protection protect without power loss against the converter's reverse polarity connection and defect. Current cascaded power stage and current resonant push-pull stage allow high and constant efficiencies.

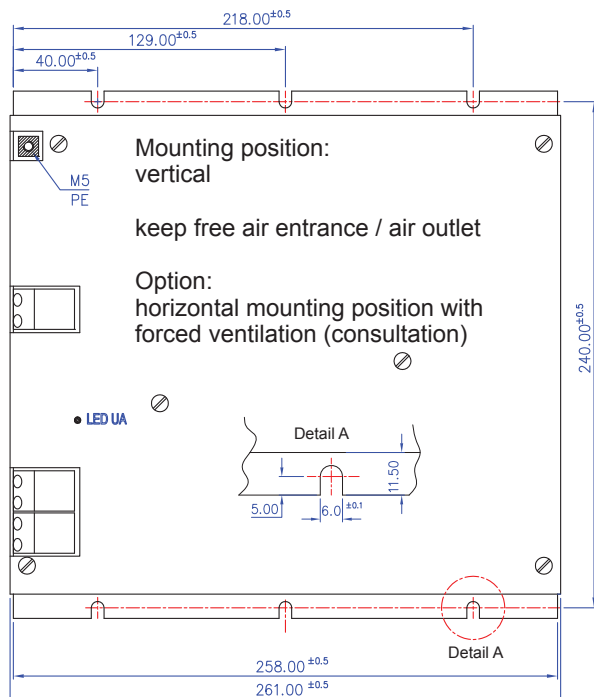
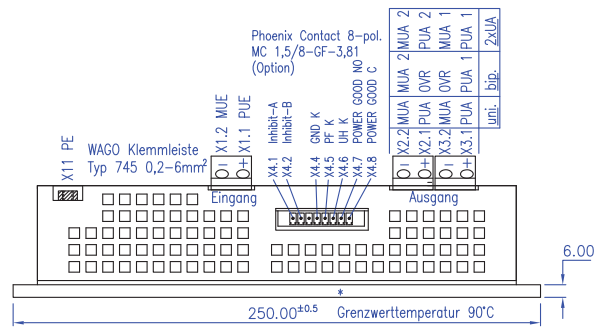
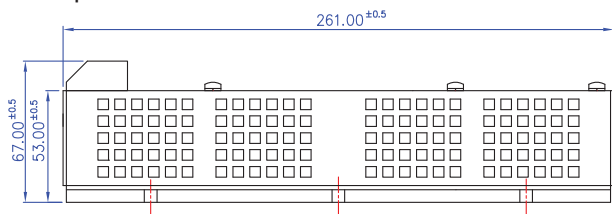
The converter is equipped with an under voltage monitoring function with amplitude- and time hysteresis. The integral switch on current limitation is done with an internal power limitation. The functionality is secured in the whole operational range up to limit values based on the chosen components, filters, security circuits, dynamical and statically current limitation, over voltage protection and separated auxiliary voltage processing.



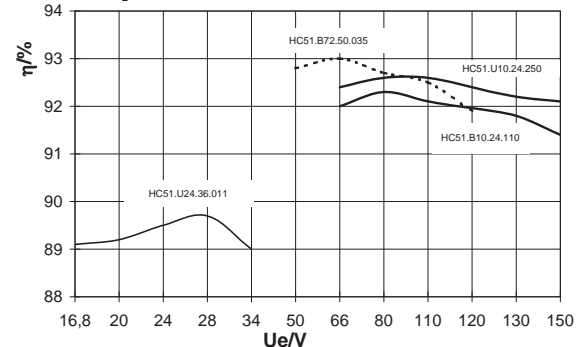
No wet electrolytic capacitors are used in chopping circuits. For a security redundant operation the output diode D can optionally be integrated. Also optionally to reduce the power loss approx. 25% the push-pull stage can be hard switched, the output diode can be replaced by synchronous switches and the diode D can be replaced by a switchable FET. The control loop's re-feeding is optionally not necessary. Failures of  $U_{out}$ /temperature are signalled with the integrated floating relay contact.

**Mechanik**

shown: flange heat sink  
on request: ribbed heat sink



**Efficiency**



**Derating curve**

