

- Topology for load step from no-load
- Chassis mounting
- Wide input voltage range
- Turn-on current limitation
- EMC / disturbances EN50121-3-2 / 55011.A
- Fire protection EN5510 / EN45545
- Safety EN60950 -SELV-
- Ambient conditions EN60068-2-6
- Shock/vibration EN 61373
- Input / output filter
- Synchronous rectification¹⁾

- for
- Railway
 - Vehicles
 - Instrumentation



© registered trademark of company SYKO GmbH & Co. KG

Series HC16.U/B

NEW with zero-load capability

Main points:

Output:

- Regulation $\Sigma (U_{in}+I_{out}+T_U)\pm 3\%$ double-out²⁾
- Max. unsymmetrical load (160/40)%
- Regulation $\Sigma (U_{in}+I_{out}+T_U)<\pm 1\%$ single-out²⁾
- Accuracy absolute $\pm 1\%$
- Ripple (over T_U): $< 20 \text{ mV}_{pp}$
- Spikes $< 50 \text{ mV}_{pp}$ (T 1:1/50MHz)
- Response time $\Delta I=100\% < 10 \text{ ms}$
- Constant current limitation $< 1,2 I_{o \text{ max}}$
- Output spike filter (C - L² - C)
- No-load, over load, short circuit proof
- 100%-load step / zero load capable
- Easy for parallel operation²⁾
- Reset UA=Okay-Signal (UA=>95%)

Input:

- Burst/Surge EN61000-4-4/5
- No-load current $< 10 \text{ mA}$ (with Inhibit)
- On-Off-application (inhibit) surge proof, up to U_{imax} (see principle diagram)
- On-Off switch hysteresis at under voltage and delayed restart
- Input filter acc. to EN 55011.A
- Low input capacity
- Emergency fuse 5 x 20mm internal
- Option: long term transient proof 50V-50ms / 70V-2ms

In general:

- No electrolytic capacitors in chopping circuits
- LED for $U_{out} = OK$
- Connector DIN 41612, 15 pin, style H (option Screw terminal)
- Buck regulator / push-pull-topology
- Clock frequency 60 kHz/80kHz
- Isolation test voltage $1500V_{AC}$ 1 min
- Isolation coordination EN50124
Air/creepage distances Inp.-Outp.: $> 2,8 \text{ mm}$
- Ambient temperature $-25^\circ\text{C} / +70^\circ\text{C}$
Option: $-40^\circ\text{C} / +85^\circ\text{C}$ EN50155 TX
- Derating 1,2%/°C $> 60^\circ\text{C}$
- Over temperature turn-off $> 110^\circ\text{C}$
- Limit temperature on KK-★ 95°C
- MTBF SN29500/40°C: $> 2,7 \text{ mio h}$
- Shock/vibration acc EN61373,
Category 1, class B, any mounting position
- Weight approx. 0,9kg
- CE-conformity for railway applications

U_{in} V	P_{out} W	U_{out} V		I_{out} A	I_{out} A	Model number
				static	dyn. 10s	
16,8 - 34	100/150	5,1 (S)		20,0	30,0	HC16-U24-05-200/300
14,4 dyn. = 85% U_{out}	150/240	12 (S)		12,5	19,8	HC16-U24-12-125/198
	150/240	15 (S)		10,0	16,0	HC16-U24-15-100/160
Option:	150/225	24 (D)		6,3	9,4	HC16-U24-24-063/094
long term transients	150/225	48 (D)		3,1	4,7	HC16-U24-48-031/047
50V/10ms 70V/2ms	150/225	± 12 (D)		$\pm 6,3$	$\pm 9,4$	HC16-B24-12-063/094
	150/225	± 24 (D)		$\pm 3,1$	$\pm 4,7$	HC16-B24-24-031/047
16,8 - 52	140/220	12 (S)		11,7	18,0	HC16-U30-12-117/180
14,4 dyn. = 85% U_{out}	140/220	15 (S)		9,3	14,7	HC16-U30-15-093/147
surge proof	140/210	24 (D)		5,8	8,8	HC16-U30-24-058/088
sym. 1kV / 42Ω bzw.	140/210	48 (D)		2,9	4,4	HC16-U30-48-029/044
unsym. 2kV / 42Ω	140/210	110 (D)		1,3	1,9	HC16-U30-110-013/019
	140/210	± 12 (D)		$\pm 5,8$	$\pm 8,8$	HC16-B30-12-058/088
	140/210	± 24 (D)		$\pm 2,9$	$\pm 4,4$	HC16-B30-24-029/044
22 - 68	160/240	12 (S)		13,3	20,0	HC16-U50-12-133/200
19 dyn. = 85% U_{out}	160/240	15 (S)		10,7	16,0	HC16-U50-15-107/160
110V/10ms	160/240	24 (D)		6,6	10,0	HC16-U50-24-066/100
	160/240	48 (D)		3,3	5,0	HC16-U50-48-033/050
	160/240	110 (D)		1,45	2,2	HC16-U50-110-014/022
	160/240	± 12 (D)		$\pm 6,6$	$\pm 10,0$	HC16-B50-12-066/100
	160/240	± 24 (D)		$\pm 3,3$	$\pm 5,0$	HC16-B50-24-033/050
42 - 154	160/240	12 (S)		13,3	20,0	HC16-U80-12-133/200
surge proof	160/240	15 (S)		10,7	16,0	HC16-U80-15-107/160
sym. 1kV / 42Ω bzw.	160/240	24 (D)		6,6	10,0	HC16-U80-24-066/100
unsym. 2kV / 42Ω	160/240	48 (D)		3,3	5,0	HC16-U80-48-033/050
	160/240	110 (D)		1,45	2,2	HC16-U80-110-014/022
	160/240	± 12 (D)		$\pm 6,6$	$\pm 10,0$	HC16-B80-12-066/100
	160/240	± 24 (D)		$\pm 3,3$	$\pm 5,0$	HC16-B80-24-033/050
Version H				-40°C up to $+85^\circ\text{C}$		additional charge
HC16.XX.XX.XXX.A				DIN rail mounting with housing		additional charge
Modification costs of possible changes above values:						on request
Option: 72V-battery with U_{in} : (43 - 102)V						on request
(D) with rectifying diode / (S) with Synchronous rectifying ¹⁾						
1) Warning: (Synchronous switches)						
Output sided energy carrier like batteries must be decoupled with diodes.						

The **HC16** series with an output power up to 150 W and a dynamical load steps from zero to 240W is developed for mobile applications and high operational reliability.

The input works with low input capacity and for the chopping circuit high current capable capacitors are chosen. Wet electrolytic capacitors are not used for the chopping circuit. Input sided surge disturbances are limited to system suitable values.

The clever and mechanically stable build up results an ideal heat connection to the flange heat sink. The **HC16.C**'s direct chassis mounting is possible with very good heat connection based on the extended flange heat sink. The converter is equipped with an under voltage switch-off 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 over temperature protection.

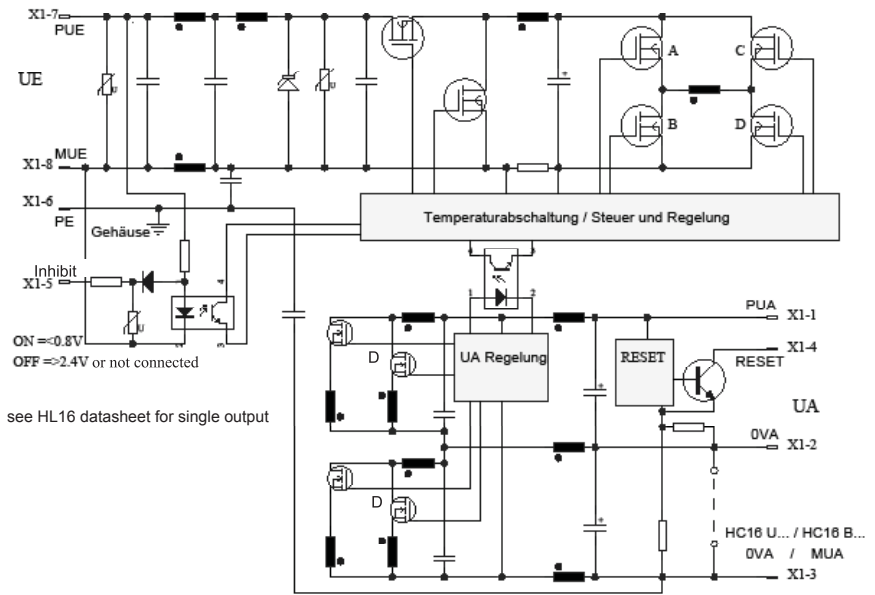
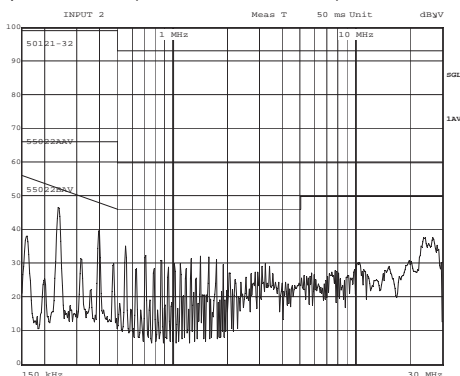
1)

For output voltages up to 15V including, the diode „D“ is replaced by a synchronous rectifier to result higher efficiencies. The parallel operation without an external decoupling diode is not allowed.

2)

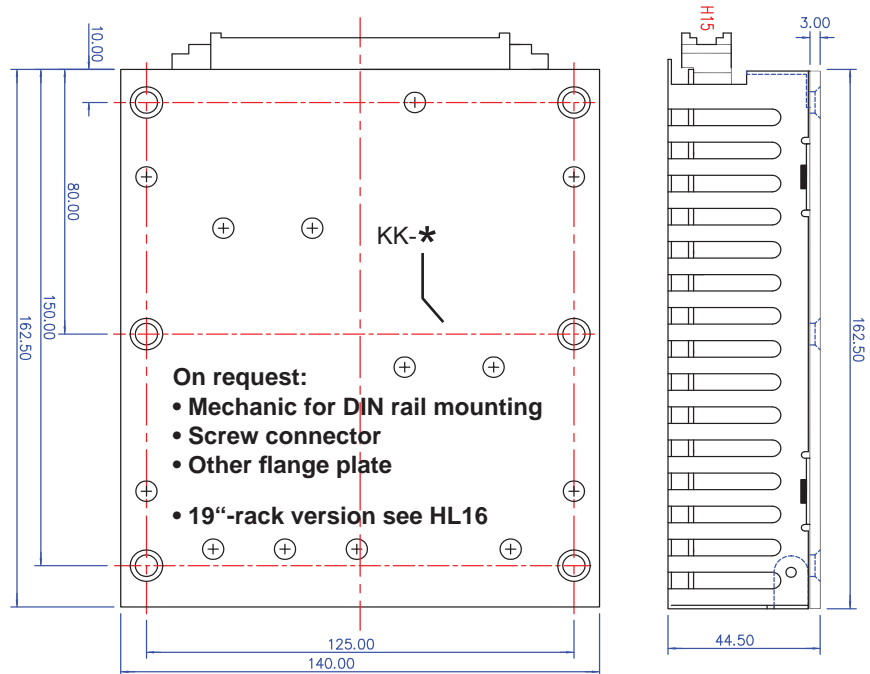
For output voltages higher than 12V and an amplitude stability of $\pm 2,5\% = f(U_{in}/I_{out}/TU)$ the control loop's feed back with optical couplers is not necessary. This results a limited parallel operation and redundancy. The double output version is regulated to $\pm U_{out}$. The tracking is max. $\pm 3\%$ at unsymmetrical loads.

Measurement of radio interference
Input conducted (HC 16.U 10.24.070/090)



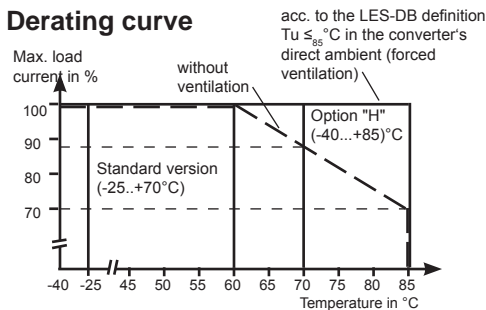
see HL16 datasheet for single output

Mechanics

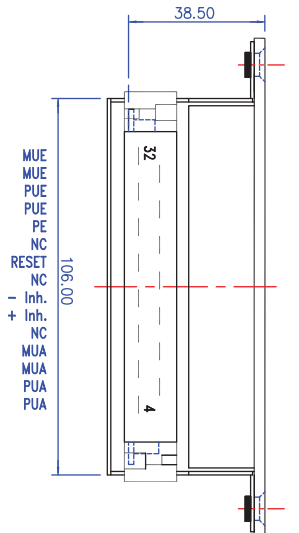
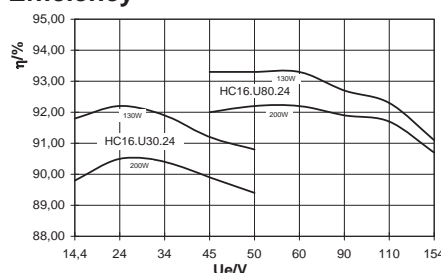


- On request:**
- Mechanic for DIN rail mounting
 - Screw connector
 - Other flange plate
 - 19"-rack version see HL16

Derating curve



Efficiency



© registered trademark of company SYKO GmbH & Co. KG