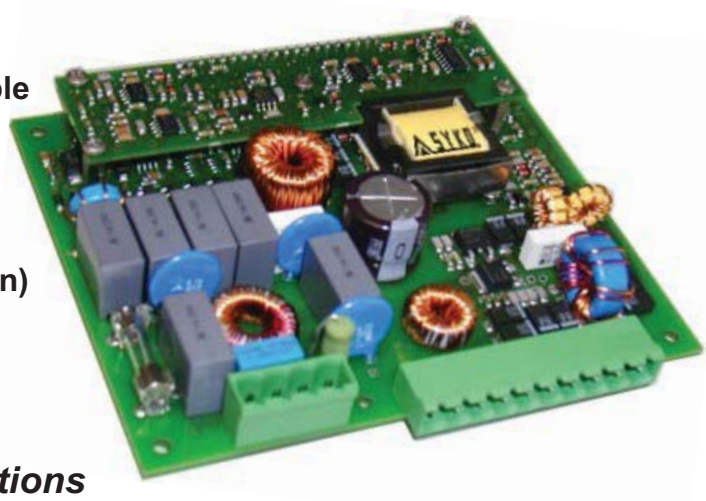
- **Input voltage range up to > 1:10**
- **Open build-up / chassis mounting**
- **High shock/vibration reliability**
- **Heat sink (option) customized adjustable**
- **Over voltage protection (Logic)**
- **Dyn. and stat. power limited**
- **EN 50155 / EN 50121 / EN 55011.B**
- **Hold-up time >10 ms (EN 50155, S2) from $U_{in\ min}$, external extendable (Option)**
- **EN 61000-4-4/5 disturbances level 3 and 1,8kV / 42Ω**

For display-systems in mobile and special technology applications



Series CNR·U/B

Display-supply with intelligent functions

General:

Outputs Uout1 / Uout2 / Uout3:
- Toleranz Uout1/3: ±1,5% / Uout2: ±3%
- Regulation factor $\Sigma(U_{in}+I_{out}+T_U) < \pm 1,5\%$
- Ripple < $20mV_{pp}$(const. over T_U)
- Spikes < 100 mV_{pp} (T 1:1/50MHz)
- Current limiting approx. 1,1 I_{outmax}
- No-load-, over-load-, short circuit proof
- No basic load necessary
- Signals BST Confirmation; Inhibit Uout1 ON / OFF; SBout Switch position; PFout Power-Fail
- Output Uout1 (5,1V) switchable (Aux.-voltage Uout3 is active at any time)
- When Uout1 is switched off, Uout2 can be used with sum-consumption power for a heater-operation at <15°C
- Plug: MSTB 2,5 HC/10-ST-5,08

Input:
- Stationary-current <4 mA (SB open, Uin 150 V)
- No-load power approx. 1 W (active)
- Special release logic for the use in railway systems (application)
- Reverse pol. protection (length diode) / surgefest
- Input filter in accordance to EN 55011.B
- Under voltage-switch off with amplitude- and time-hysteresis
- Power-fail-signal and hold-up time with energy activation at U_{inmin}<14,4V
- Input-interupt-bridging >10 ms in acc. to EN 50155 option S2 from U_{inmin} Option: External extendable
- Plug: MSTB 2,5 HC/4-ST-5,08

General:
- Isolation test voltage 1,5 KV_{AC} 1 Min,
- Ambient temperature in acc. to LES-DB -25/+70°C (-40/+85°C short term) Derating 2%/°C >70°C with convection
- Derating 1,2%/°C >60°C without convection
- Heat conduction by mounting the power semiconductors on the customers heat-sink with pads
- Flange temperature max. 95°C at ✱-Point
- MTBF On request
- Shock/vibration in acc. to EN 50155
- Weight approx. 200 g
- Dimensions 120 x 100 x 23 mm³
- Application report on request

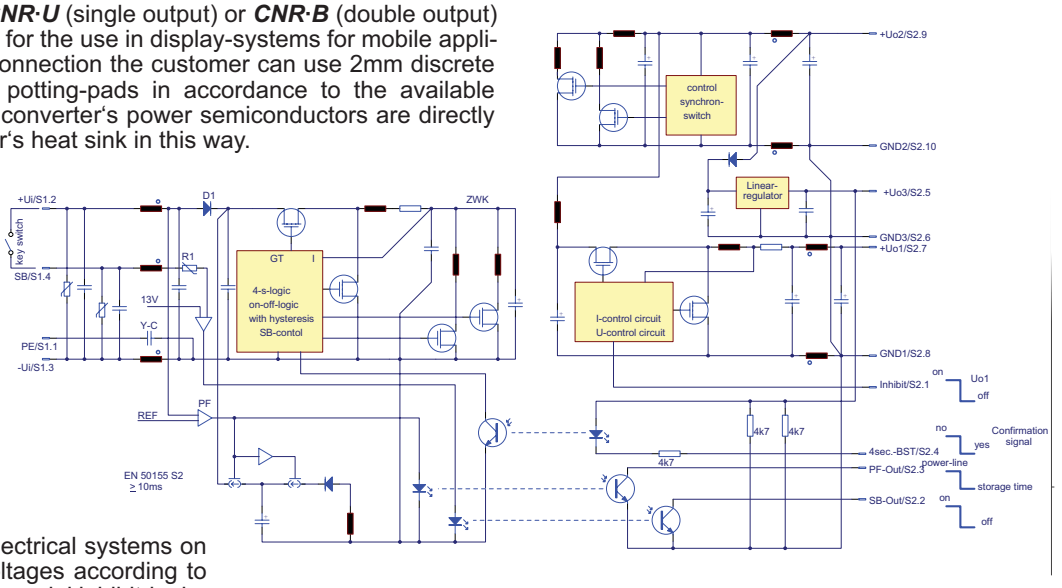
Uin	Uout1·2	Iout1·2	dyn·dyn	Model-
V	V	A	A	number
14,4 - 154	5,1	6,0	7,0	CNR·U 03·05·60
+Burst/Surge	12	2,5	3,0	CNR·U 03·12·25
level 3	24	1,2	1,4	CNR·U 03·24·12
+1,8kV / 42Ω	5,1·12	3,0·1,2	4,0·3,0	CNR·B 03·05·12·30·12
	3,3·12	3,0·1,4	4,0·3,0	CNR·B 03·03·12·30·14
Available max. output power ΣPA = 30W static and 35W[1] dyn.				
Additionaly the Auxiliary voltage Uout3: 5V/100mA is available at any time				
14,4 - 34	5,1	6,0	7,0	CNR·U 24·05·60
VG96916 T5	12	2,5	3,0	CNR·U 24·12·30
50V / 50ms	24	1,2	1,4	CNR·U 24·24·12
70V / 2ms	5,1·12	3,0·1,2	4,0·3,0	CNR·B 24·05·12·30·12
	3,3·12	3,0·1,4	4,0·3,0	CNR·B 24·03·12·30·14
Available max. output power ΣPA = 30W static and 35W[1] dyn.				
Additionaly the Auxiliary voltage Uout3: 5V/100mA is available at any time				
14,4 - 52	5,1	6,5	7,0	CNR·U 30·05·65
+Burst/Surge	12	2,7	3,0	CNR·U 30·12·27
Level 3	24	1,3	1,4	CNR·U 30·24·13
+1,8kV / 42Ω	5,1·12	3,5·1,3	4,0·3,0	CNR·B 30·05·12·35·13
	3,3·12	3,5·1,5	4,0·3,0	CNR·B 30·03·12·35·15
Available max. output power ΣPA = 32W static and 35W[1] dyn.				
Additionaly the Auxiliary voltage Uout3: 5V/100mA is available at any time				
45 - 154	5,1	6,5	7,0	CNR·U 80·05·65
+Burst/Surge	12	2,7	3,0	CNR·U 80·12·27
Level 3	24	1,3	1,4	CNR·U 80·24·13
+1,8kV / 42Ω	5,1·12	3,5·1,3	4,0·3,0	CNR·B 80·05·12·35·13
	3,3·12	3,5·1,5	4,0·3,0	CNR·B 80·03·12·35·15
Available max. output power ΣPA = 32W static and 35W[1] dyn.				
Additionaly the Auxiliary voltage Uout3: 5V/100mA is available at any time				
Modification costs for possible changes above values				On request

Notice:
Smaller inputs voltage ranges result higher efficiency
and higher functional reliability (less stress factors)

1) While using the heat-operation (<15°C ambient temperature) the dynamical power value can be used as a static power out of the 12V-output

DC/DC-converter of the ***CNR·U*** (single output) or ***CNR·B*** (double output) series are special designs for the use in display-systems for mobile applications. For the thermal connection the customer can use 2mm discrete heat-conducting pads or potting-pads in accordance to the available mechanical drawing. The converter's power semiconductors are directly connected to the customer's heat sink in this way.

The result is a very high power compactness. The modern circuit-concept allows input voltage ranges of > 1:10. This brings the logistic advantage to be able to run on all worldwide available railway on-board networks without switch over.



Functional report „CNR.U/B“ on request

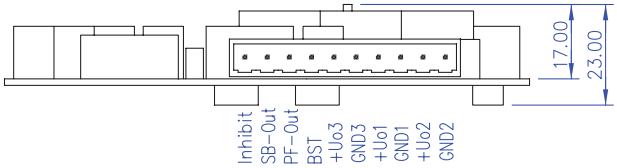
Special effort was put in the realisation of the requirements of the EN 50155/121-standard for electrical systems on rolling stock and over voltages according to the VG-MIL-standards. A special inhibit-logic-circuit (key-switch SB as request-command) which is explained in a application report (on request) simplifies enormous the power supply's system-integration. So the converter can be used without any external circuits and because of the low stationary current at not activated outputs the converter can stay stand-by on the network.

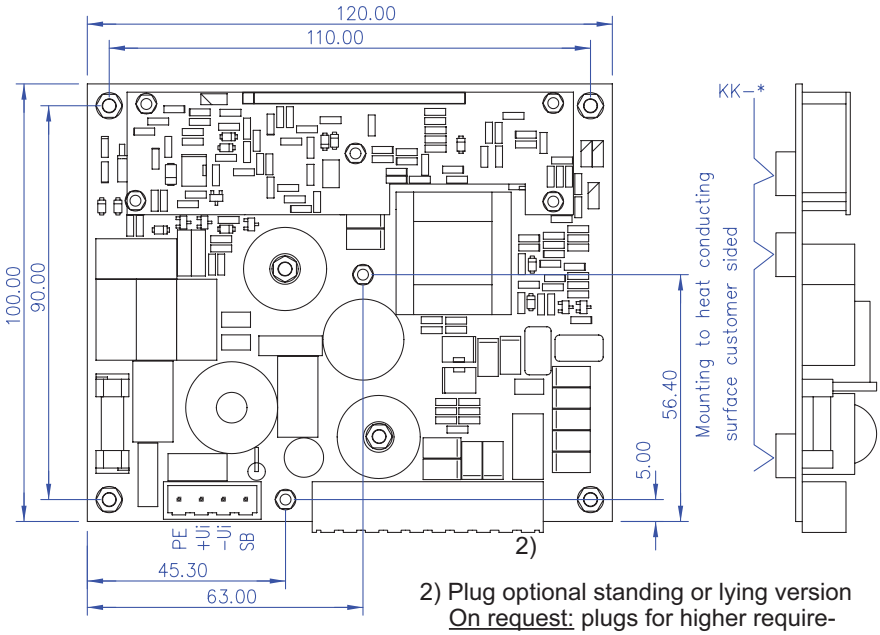
The power supply is equipped with a active hold-up time. Input sided interruptions can be bridged with times of > 10 ms from the minimum input voltage which makes the series CNR·U/B usable in security relevant applications. The hold-up time is almost extendable to any value with external capacitors and constant over the whole input voltage range.

Railway known disturbances (transients) are reduced with the sufficient dimensioned filter circuit and the standards EN 61000-4-4 (Burst) and EN 61000-4-5 (Surge) are kept.

The 5,1V (Uout1) can be switched off with the inhibit-command in the case that the converter is activated and the sum-power can be used for a heating operation at the 12V-output. The converter is activated with the SB-signal and can be confirmed as well as switched off with the BST-signal.

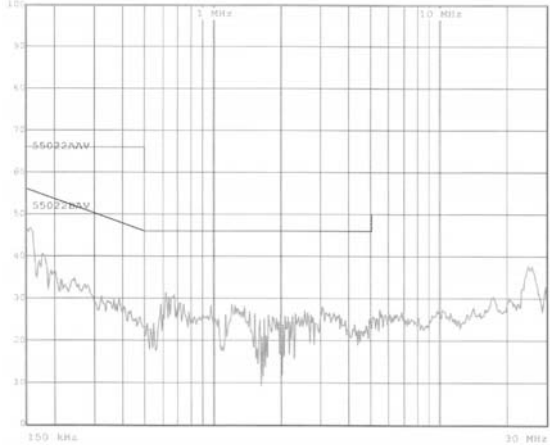
Mechanics





2) Plug optional standing or lying version
On request: plugs for higher requirements in gold plated version

Measurement of radio interference



Efficiency