

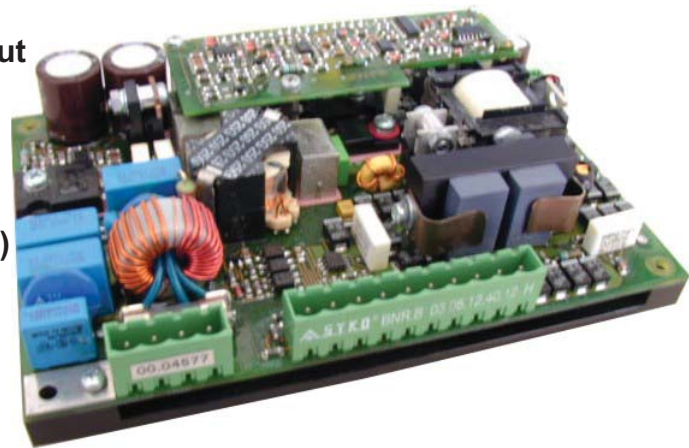
double / triple output  
up to 40 Watt

DC/DC converters  
with isolation



- Input voltage range up to > 1:10
- Open build-up / chassis mounting
- Power switchable between heater/output
- 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  $U_{inmin}$  external extendable (option)
- EN 61000-4-4/5 disturbances level 3 and 1,8kV / 42Ω

For display-systems in mobile and special technology applications



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## Series BNR-B/T

Display-supply with intelligent functions

### General:

#### Outputs Uout1 / Uout2 / UH1:

- Accuracy absolute  $\pm 1\%$
- Regulation factor  $\Sigma(U_{in}+I_{out}+T_U) < \pm 1,5\%$
- Ripple  $< 20mV_{pp}$  (const. over  $T_U$ )
- Spikes  $< 50 mV_{pp}$  (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
- Outputs switchable over HZG=ON (Aux. voltage UH1 is active at any time)
- Heater-output not short circuit proof
- Connector: MSTB 2,5 HC/10-ST-5,08  
Heater-connector: MC1,5/2-ST-3,81

#### Input:

- Stationary-current  $< 3 mA$  (at inhibit,  $U_{in} 150 V$ )
- 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
- Active transient filter (Patent)
- Under voltage-switch off with amplitude- and time-hysteresis
- Power-fail-signal and hold-up time with energy activation at 1,08  $U_{inmin}$
- Input-interrupt-bridging  $> 10 ms$  in acc. to EN 50155 option S2 from  $U_{inmin}$   
Option: External extendable
- Connector: MSTB 2,5 HC/4-ST-5,08

### General:

- Connection: Standard plug or customized cable/connector (option)
- Isolation test voltage 1,5  $KV_{AC}$  1 Min,
- Ambient temperature in acc. to LES-DB -25/+70°C (-35/+85°C short term)  
Derating 2%/°C  $> 70^\circ C$  with convection
- Flange temp. max. +95°C at \*-point
- Derating 1,2%/°C  $> 60^\circ C$  without convection
- Heat conduction through chassis mounting
- MTBF On request
- Shock/vibration in acc. to EN 50155
- Weight approx. 320 g
- Dimensions: 146 x 100 x 31  $mm^3$
- Application report on request

$U_{in}$ V	$U_{out1:2}$ V	$I_{out1:2}$ A	PA stat-dyn <sup>1)</sup> A	Model-number
<b>10 - 34</b>	3,3-12	5,0-2,0	38/45	BNR-B 20-03-12-50-20
<b>8V dyn.</b>	5,1-12	5,0-2,0	38/45	BNR-B 20-05-12-50-20
50V-50ms / 70V-2ms	5,1-24	5,0-1,0	38/45	BNR-B 20-05-12-50-10
+Burst/Surge	12-12	2,0-2,0	38/45	BNR-B 20-12-12-20-20
1,8kV / 42Ω	15-15	1,6-1,6	38/45	BNR-B 20-15-15-16-16
Additionally the Auxiliary voltage UH1>4,8V/100mA is available at any time				
<b>14,4 - 52</b>	5,1-12	5,0-2,0	38/45	BNR-B 24-05-12-50-20
+Burst/Surge	5,1-24	5,0-1,0	38/45	BNR-B 24-05-24-50-10
Level 3	12-12	2,0-2,0	38/45	BNR-B 24-12-12-20-20
1,8kV / 42Ω	15-15	1,6-1,6	38/45	BNR-B 24-15-15-16-16
Additionally the Auxiliary voltage UH1>4,8V/100mA is available at any time				
	5,1±12	5,0±0,4	35/43	BNR-T 24-05-12-50-04
	5,1±15	5,0±0,4	35/43	BNR-T 24-05-15-50-04
<b>14,4 - 154</b>	3,3-12	5,0-2,0	35/43	BNR-B 03-03-12-50-20
+Burst/Surge	5,1-12	4,0-2,0	35/43	BNR-B 03-05-12-40-20
Level 3	5,1-24	4,0-1,0	35/43	BNR-B 03-05-24-40-10
1,8kV / 42Ω	12-12	2,0-2,0	35/43	BNR-B 03-12-12-20-20
	15-15	1,6-1,6	35/43	BNR-B 03-15-15-16-16
Additionally the Auxiliary voltage UH1>4,8V/100mA is available at any time				
	5,1±12	5,0±0,4	35/43	BNR-T 03-05-12-50-04
	5,1±15	5,0±0,4	35/43	BNR-T 03-05-15-50-04
<b>45 - 154</b>	5,1-12	5,0-2,0	38/45	BNR-B 10-05-12-50-20
+Burst/Surge	5,1-24	5,0-1,0	38/45	BNR-B 10-05-24-50-10
Level 3	12-12	2,0-2,0	38/45	BNR-B 10-12-12-20-20
1,8kV / 42Ω	15-15	1,6-1,6	38/45	BNR-B 10-15-15-16-16
Additionally the Auxiliary voltage UH1>4,8V/100mA is available at any time				
	5,1±12	5,0±0,4	35/43	BNR-T 10-05-12-50-04
	5,1±15	5,0±0,4	35/43	BNR-T 10-05-15-50-04
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 ( $< 15^\circ C$ ambient temperature) the dynamical power value can be used as a static power out of the 12V-output				

DC/DC-converter of the **BNR-B** (double output) / **BNR-T** (triple output) series are special designs for the use in display-systems for mobile applications or special technology. All power semiconductors are mounted on one common flange-heat sink, which realizes the direct heat conduction to the chassis.

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

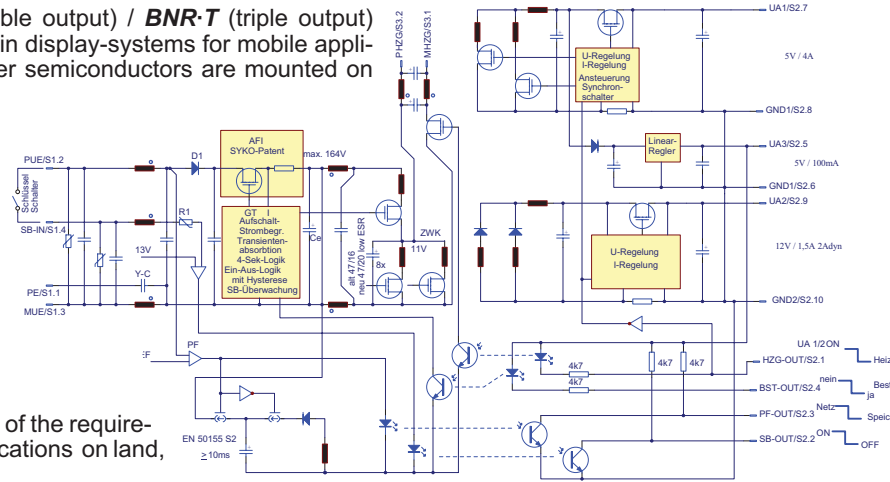
Special effort was put in the realisation of the requirements of the standards for mobile applications on land, in water and in the air.

A special inhibit-logic-circuit (key-switch SB as request-command) which is explained in the lower functional diagram 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 BNR-B/T usable in security relevant applications. The hold-up time is almost extendable to any value with external capacitors (optionally) and constant over the whole input voltage range.

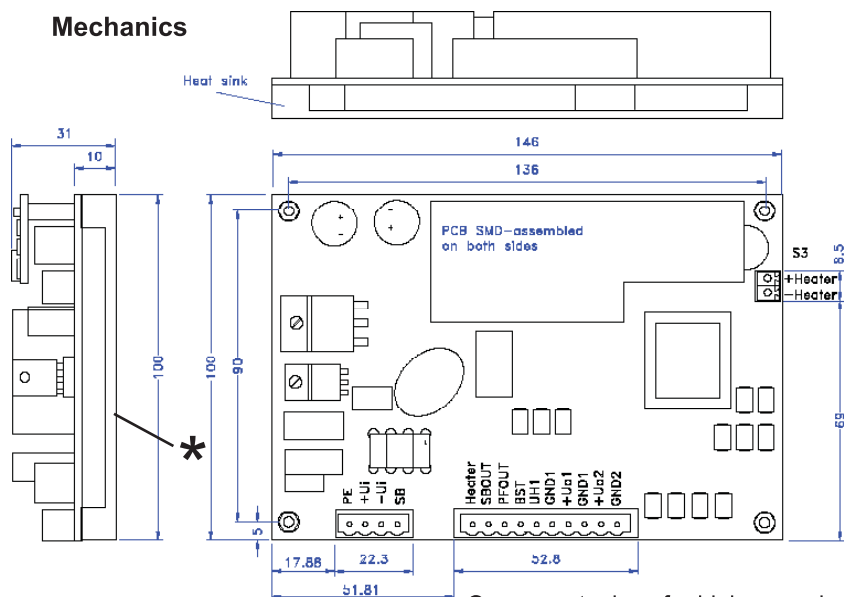
Railway known disturbances (transients or long term transients according to the VG/MIL-standards) are absorbed with the sufficient dimensioned active transient-protection-filter. (AFI - SYKO-Patent)

In the case that the converter is activated and the HZG-signal = ON (outputs Uout1 and Uout2 are switched off - just output UH1 stays active), the sum-output-power can be used for a heating operation at the HZG-plug.



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**Mechanics**

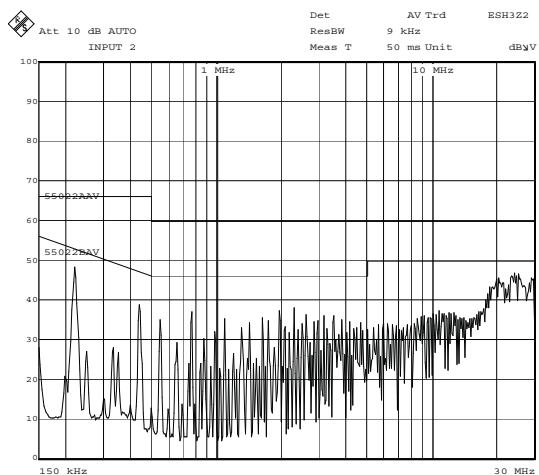


**Detailed functional description „BNR.B/T“ on request**

On request: plugs for higher requirements in gold plated version

**Functional diagram / Inhibit-logic circuit**

**Measurement of radio interference**



Title: BNR.B 20.05.12.40.20  
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