Redesign DC/DC-converter for railway applications in public transport

Redesign of E44010-A5700 L04
24V//60V DC 1,5A

In principle, there are increased requirements for electrical and electronic equipment in vehicles used in local public transport with regard to service life, reliability, immunity to interference, long-term operational maintenance and availability.
The present power supply, as a redesign of the original assembly from Siemens, meets or exceeds the underlying standards (EN 60950, UI60950 or EN50155 RIA12).
The devices have a modular structure and are pin and function compatible for plug-and-play replacement of the Siemens DC/DC converter E44010 A5700 L04 C.
The input modules for galvanic separation of input/output voltage are designed for nom. 24 DC. Separation voltage UE//UA 1500V.
The working range of the DC/DC-converter modules used ranges from 17V to 30V and is also equipped with an active transient protection that prevents the specified overvoltages (for 20ms) of twice the nom. input voltage up to 48V safely eliminated, as well as transients up to 1000V//50μs.
The module has various voltage and current monitoring circuits that are available as low levels on the binary outputs if:

- the input voltage <UE_{min} or the output current> IA_{max}
- the output voltage is <or> UA_{soll},
- the load current exceeds the max. value ~ 2.7A, or the input voltage falls below the value UE_{min}, this is state saved and output via a binary output
- and the LED on the front panel goes out.

The MTBF of the DC/DC-converter modules is> 350,000h, this corresponds to the required service life of 24h/d for> 30a for the purpose.
The 19" 3U rack is mechanically robust in accordance with the requirements for vehicle applications and withstands vibrations in 3 axes with an amplitude of 7.5 mm at 5-150Hz and an acceleration of 20m/s^2

Redesign

Technical data:

PCB-card	: 100x160mm Frontplate 12TE 3HE, Siemens, with handle
Plug-in	: DIN 41612 24F + 7H, z+b+d
Supply voltage	: nom. 24 DC, min. 17V DC, max. 30V DC
Power	: max. 100VA
Efficiency	: approx. 85%
Temperature range	: -40... +85°C, derating from 60°C
Output	: 60V DC; 1,5A, galvanic seperate to UE
Controls/ control output	: UE < UE min; UA < UA soll; UA > UA soll; IA > IA max, with memory function
Remote input	: UA off

DIE ENTWICKLER
VEW Vereinigte Elektronikwerkstätten GmbH
Edisonstraße 19 * Pob: 330543 * 28357 Bremen
Fon:(+49) 0421/271530 Fax(+49) 0421/273608
E-Mail: VEW-GmbH-Bremen@t-online.de