



IGBT Traction Equipment for the Articulated Low-Floor Light Rail Vehicle "LEOLINER" of the

LEOLINER Fahrzeug-Bau Leipzig

Articulated Low-Floor Light Rail Vehicle "LEOLINER"

To cope with the volume of passengers, small and flexible vehicle units are needed by many transport undertakings, particularly by small undertakings, and as feeders for large transport undertakings. For this purpose, the LEOLINER Fahrzeug-Bau Leipzig GmbH makes the "LEOLINER", which is a successful series vehicle. Reliable Kiepe components were selected for the electrical vehicle equipment.

Project characteristics

- Economical low-floor articulated light rail vehicle featuring welded, all-steel construction; designed for heavy-duty use
- High flexibility due to vehicle's traction, its reverse driver's cab and switch control as the customer wishes
- Multifunctional roof-mounted equipment enclosure with air-cooled IGBT inverter in three-phase technology with power system feed-in, static converter and different switch-gear and transformers
- Automatically controlled passenger room heating and air conditioning system for the driver's cab
- Economical maintenance through the use of well-established technology
- Pantograph with electrical actuation

The concept prepared for the electrical vehicle equipment ensures high comfort for the passengers as well as reliable and low-maintenance operation for the operator. The key component in this concept is the roof-mounted equipment container, which comprises two interdependent traction inverters, a static on-board power converter as well as control functions for the vehicle coupling. When delivered, the roof-mounted equipment enclosure has already been cabled and pretested and is ready for installation on the vehicle.

Each of the fully selective power trains consists functionally of an IGBT traction inverter with its own traction control module, its own braking resistor and two traction motors. This concept, which prioritises optimal redundancy of the systems, ensures high availability of the vehicle.

It will be possible to make diagnoses for the delivered drive components with the help of the Windows-based Kiepe diagnostic system with extensive acquisition of operational data and event data. These data collected in the vehicle can be read out and evaluated by way of a commercial standard PC (laptop). This greatly simplifies trouble shooting.



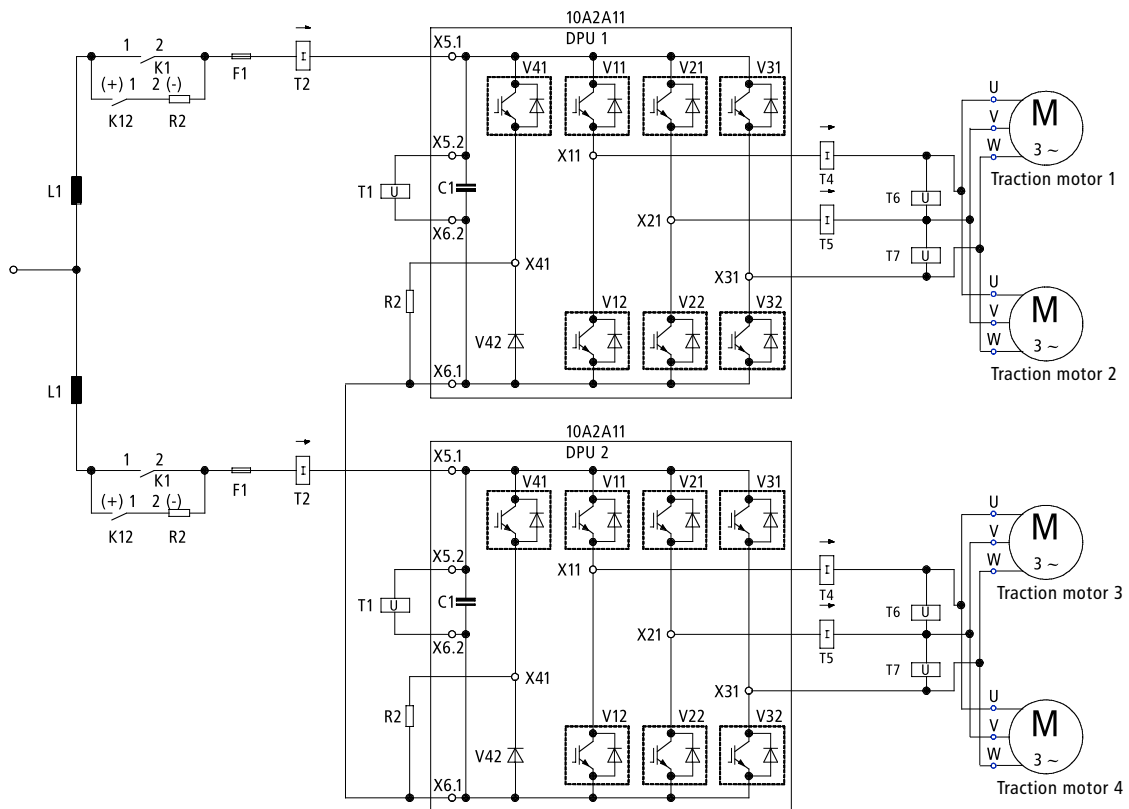
Arrangement of equipment



- 1 Roof-mounted equipment enclosure Kiepe DGG 325
- 2 Braking resistor

- 3 Current collector
- 4 Air conditioning unit for driver's cab Kiepe HKL 305

Main circuit diagram



Technical data	
Design	Six-axle two-part articulated uni directional tramcar with a 60% low-floor share
Type	NGTW 6 »LEOLINER«
Gauge	1,458 mm (also 1,435, 1,067 und 1,000 mm possible)
Maximum speed	approx. 70 km/h
Line voltage	DC 600 and 750 V (+20%, -30%)
Axle arrangement (acc. to DIN 30052)	Bo' + 2'Bo'
Carbody length over couplers	23,102 mm
Carbody length / width over sheet	22,590 / 2,300 mm
Carbody height over TOR	3,690 mm
Boarding height	approx. 290 mm
Vehicle weight (acc. to DIN 25008)	approx. 27,300 kg
Seating / Standing (4 persons/m ²)	39 + 1 / 79
Wheel diameter for driven bogie (new/worn)	700 / 550 mm
Gear ratio	8.775 : 1
Roof-mounted equipment enclosure	
Traction inverters	2 Kiepe IGBT direct pulse inverters
Input voltage	DC 600 or 750 V (+20%, -30%)
Output	2 x 200 kW (100% ED), 2 x 450 kW for t < 20 sec.
Design	Pulse inverter operated directly at the network
Cooling	Forced ventilation by fan
Characteristics	<ul style="list-style-type: none"> - Compact design due to IGBT technology - Triggering of the drive units via optical waveguides - Jerkfree starting and braking - Reduction of the primary energy consumption by recovery to the network - Contactless power/brake changeover and contactless changeover of direction of travel - Redundant design
Control	
	2 traction control units with microprocessor technology with a traction control module (ASM) and an inverter control module (USM)
Construction	Electronic assembly and input/output assembly in compact housing
Cooling	Air cooling
Supply voltage	DC 24 V (+25%, -30%)
Design	Sequential vehicle control via microprocessor
Characteristics	<ul style="list-style-type: none"> - Wheel slip/slide protection - Hill holder - Line current limiting - Recovery to the network with continuous monitoring of the network capacity - Event/fault recorder - Acquisition of operational data / diagnosis / fault analysis via PC
Traction motors	
	4 three-phase asynchronous motors
Rated output	65 kW
On-board power supply	
	Static on-board converter in modular design with Kiepe IGBT technology
Input	DC 600 or 750 V (+20%, -30%)
Outputs	3 AC 400/230 V, 50 Hz square-wave
	8.5 kVA, DC 24 V, 150 A total current
Battery charge	Constant voltage/constant current curve

Subject to change without notice