MV ELECTROSYSTEMS

IGBT based Auxiliary Converter (3×130kVA) for electric locomotives

IGBT based Auxiliary Converter is designed for 25 kV AC electric locomotive of 6000 HP (as per spec. no. CLW/ES/3/IGBT/0485 ALT – D, FEB 2016) for goods and passenger Locomotives (WAP5, WAP7, WAG9 and WAG9H).

Technical Features

- Flexibility in design as indigenous technology
- Modular design and each module serve an individual control function.
- Designed to sustain wide voltage and frequency variations of catenary.
- Easy maintenance and low life cycle cost
- Safety interlocking system.
- Voltage indication for safety of maintenance staff

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Technical Specification

Input : 16.5 to 31KVac, 1Ph, 50Hz,

Output : 3×415Vac ±5% (L-L), 3Ph, 50Hz, 3x130kVA, VVVF 110Vdc ±5%, 80A

Communication Bus: CAN/TCN/MICAS (optional)

Operating Ambient Temp.: 0 to 70°C

Uniqueness

Availability of full auxiliary power, in case of MR blower failed.

Completely designed and developed in India.

Stainless Steel (SS-304) enclosures with IP54 protections

Digital signal processor-based electronics for controlling and monitoring.

ISO 9001:2015
ISO 14001:2015

MAKE IN INDIA

MV ELECTROSYSTEM LTD.

Unit - 1
Plot No. 7, site No. 2, 14/3, Mathura Road, Faridabad, Haryana-121001

Unit - 2
Baghola Tatarpur Road, Prithla Industrial Zone, Distt. Palwal, Haryana, India - 121102

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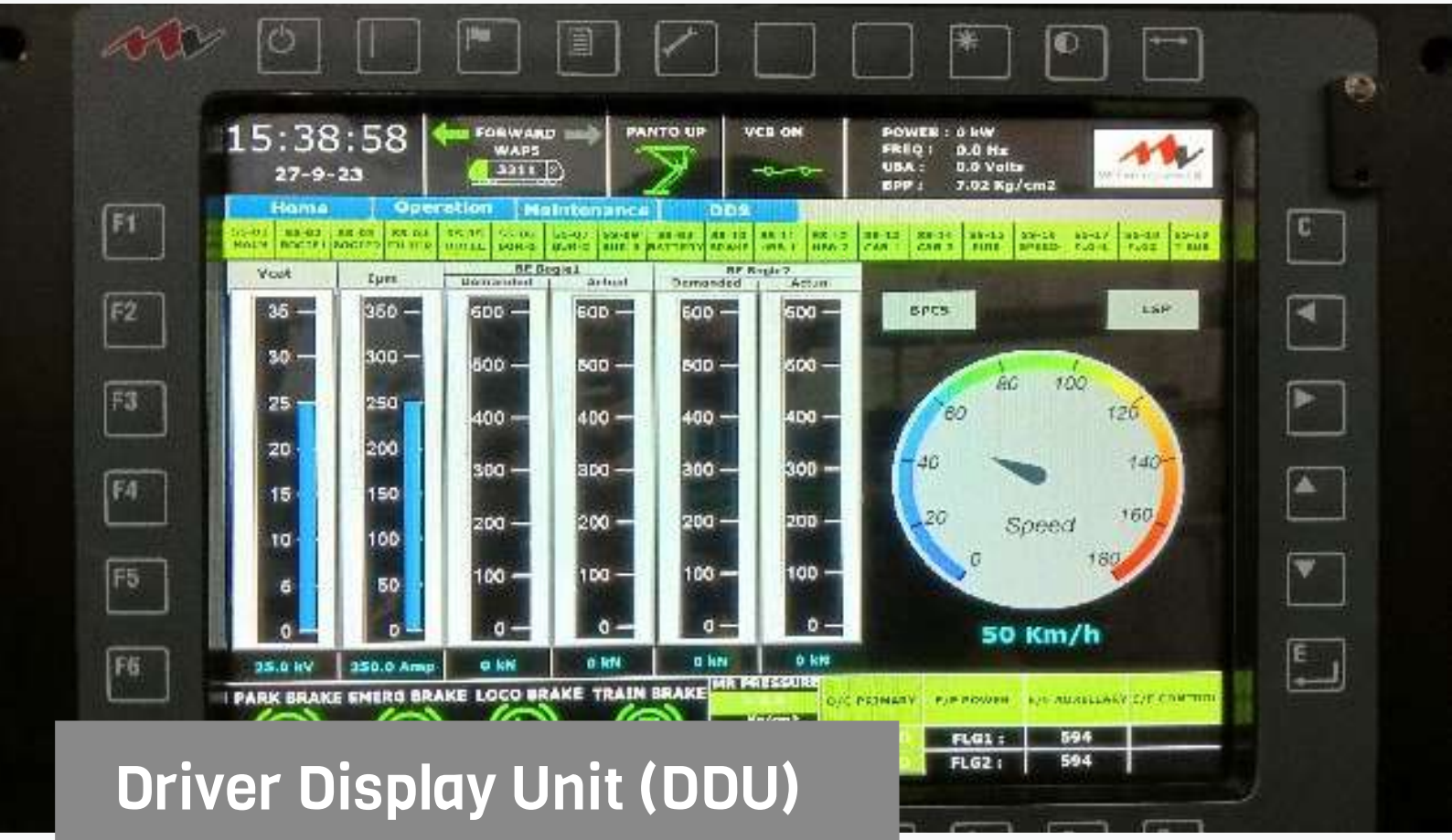

Driver Display Unit (DDU) for electric locomotives

The DDU is a basic interface between loco driver and locomotive main control system through CAN/RS485 (as per spec. no. CLW/ES/3/0487 ALT – C, March 2013). DDU is an intelligent graphical driver display unit in three phase locomotives of WAP5 / WAP7 / WAG9 / WAG9H classes being operated by Indian railways. The DDU has wide display area for various predefined screens which are used to monitor status information related to locomotive sub systems.

Technical Features

Supply voltage range 43 ~ 160 Vdc
Power dissipation (max.) ≤15W
Back Light Automatic / Manual (Through key board and software)
Interface via USB, Power, CAN, RS-485
Operating Ambient Temperature 0 to 70^{0}C

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Technical Specification

- 10.4" TFT Screen (800 X 600 pixels) with LED backlight similar to existing Diagnostics terminal
- Low Power Consumption
- Trouble shooting assistance to the driver
- Viewing of cab meters
- Viewing of various sub systems and equipment internal status
- Upgradable to indicate en-route speed restriction charts.
- DDU work with multi-Locomotive.
- Driver parameters (Wheel- Diameter, Loco no. etc.) configurable
- EMI protection is used to meet the EN50155 and the IEC 801-x specifications
- Encased in a robust metallic box with natural cooling

Uniqueness

Communication between DDU and VCU through CAN/ Rs485.

Resistant to shock and vibration, well protected against dust and water (Ip65).

ARM Microcontrollers based control system (flexibility in design).

Completely designed and developed in India.

ISO 9001:2015
ISO 14001:2015

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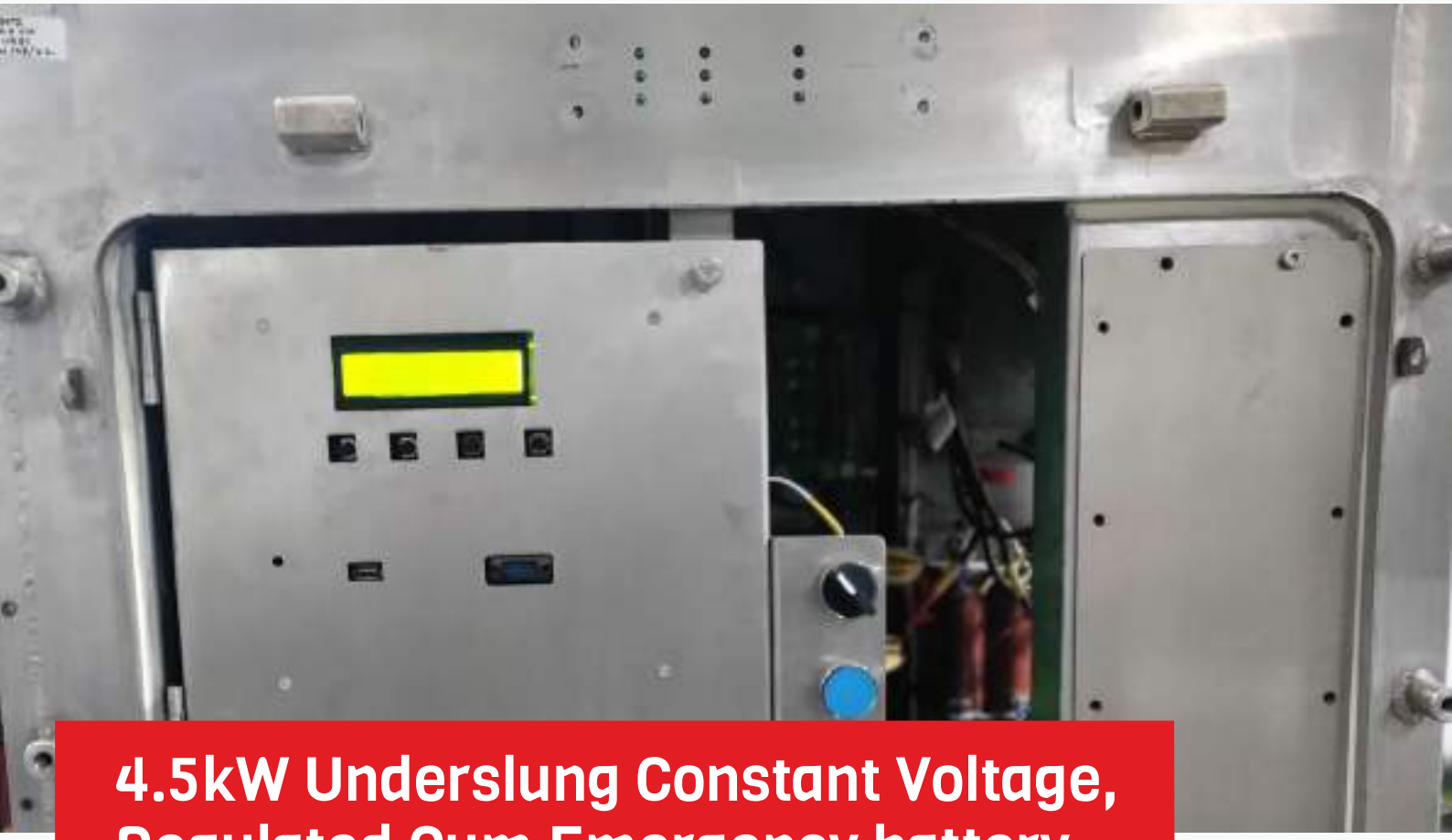

4.5kW Underslung Constant Voltage, Regulated Cum Emergency battery Charger for LHB Coaches

The battery charger is used in both AC and Non-AC coaches for DC load and Battery charging requirements (as per spec. no. RDSO/PE/SPEC/AC/0183 Rev '1' - 2018). For redundancy it incorporates Emergency Battery Charger of 2.5kW (for critical loads).

Technical Features

Integrated SMPS Technology with compact, light weight and rugged construction
Facility to receive data via commercially available pen drive
Facility to receive data via RS232 communication on laptops for data monitoring
Very low voltage and current ripples
Low noise level (<60dB)
Indications for battery reverse polarity
Constant voltage with current limiting feature
Capability to function and deliver in single phasing condition
Fully insulated for coach body on both positive and negative sides

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Technical Specification

4.5kW RBC

- **Input Operating Voltage Range** - 415V ± 15%, 50Hz ± 3%, 3 Ø, 4 wire system
- **Output Voltage Range** - 110V to 135 V DC (settable)
- **Output Current** - 35A (Battery Charging Current 10 to 15A, Load Current 20A)
- Full load Efficiency ≥ 92%
- **Type & AH rating of batteries** - Lead Acid, 70/120AH (both flooded and VRLA)
- **Operating Ambient Temperature:** 0 to 70°C

2.5kW RBC

- **Input Operating Voltage Range** - 240V ± 15%, 50Hz ± 3%, 1 Ø
- **Output Voltage** - 110V ± 5% DC
- **Output Current** - 22Amp

Uniqueness

Stainless Steel (SS-304) enclosures with IP65 protections.

IGBT based & DSP controlled, TI Microcontrollers based USB Host.

Completely designed and developed in India.

ISO 9001:2015
ISO 14001:2015

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IGBT based Traction Converter for electric locomotives

IGBT based traction converter is designed for electric locomotive of 6000 HP (as per spec. no. CLW/ES/3/IGBT/0486 ALT – E, APRIL 2016) for passenger and goods locomotives (WAP5, WAP7, WAG9 and WAG9H).

Traction converter has multiple line converters which convert single phase AC input to 2800V DC voltage. This DC link voltage is converted

Technical Features

Flexibility in design as indigenous technology

VVVF control of traction motor in both motoring and regenerative braking operation

Independent motor control for better wheel slip control and better attractive effort

Liquid cooled system

Modular design

Easy maintenance and low life cycle cost

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Technical Specification

- **Input:** 16.5 to 31KVac,1Ph,50Hz,
- **Output:** 0 to 2180Vac(L-L), 3Ph, 0-150Hz, 270A (Co-Co), 370A (Bo-Bo)
- **DC Link Voltage**: 2800V
- **Configuration**: Co-Co, Bo-Bo Locomotive
- **Operating Ambient Temperature**: 0 to 70°C

Uniqueness

Completely designed and developed in India.

Communication between converter and VCU through CAN/ TCN

Harmonics Compensation

Stainless Steel (SS-304) enclosures with IP54 protections

ISO 9001:2015
ISO 14001:2015

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Vehicle Control Unit (VCU) for electric locomotives

The 3-Phase locomotive with VCU employs a distributed architecture for Control and Data Communication (as per spec. no. CLW/C-D&D/ES/3/TCN-VCU/0547 ALT – A, MAY 2016). There are several racks (called bus stations) which are interconnected through optical fibre cable and communicated according to CAN Bus protocol. VCU and converters (Traction & Auxiliary) are communicated via optical CAN and interface with Driver Display Unit will be established via electrical CAN/RS-485 in three phase locomotives of WAP5/WAP7/WAG9/WAG9H classes being operated by Indian Railways.

Technical Specification

Supply voltage range 43 ~ 160 Vdc (110V DC nominal)
Interface - CAN based CPU- IO system interface, MVB/WTB/USB/RS485.
Storage - Flash and Battery backup RAM
Operating Ambient Temperature 0 to 70^{0}C

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Technical Features

- The equipment of the central unit
- Availability of different type of communication ports, number of digital and analog inputs/outputs
- Redundant communication lines between both VCUs.
- Low Power Consumption
- EMI protection is used to meet the EN50155 and the IEC 801-x specifications
- Encased in a robust metallic box with forced cooling.
- Redundancy in VCU1 and VCU2 Main processors. VCU1 processor will work as Master and VCU2 processor will work as redundant or slave.
- Redundant power supplies.
- Loco remote monitoring system (for internal use).

Uniqueness

Communication between VCU and converter through CAN/ TCN / MICAS (optional).

Completely designed and developed in India.

Resistant to shock and vibration and well protected against dust and water (Ip52).

ISO 9001:2015
ISO 14001:2015

MAKE IN INDIA

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