



Battery Electric Locomotive (BEL) 100% Zero-Emission

Medha - Your locomotive technology partner

Medha offers conversion kit and turn-key solutions to convert non-compliant diesel locomotive to a 100% battery operated locomotive. Any locomotive, 4-axle or 6-axle will be made zero-emission (ZE) compliant.

Converted battery-electric locomotive (BEL) will have same or similar horse-power and load haulage capacity as diesel locomotive. HP rating will range between 1000HP to 2400HP.

Battery size and charger ratings are optimized to meet operating duty-cycle requirements, cut-down idling and reduce wastage of available power.

Medha offers extended warranty terms to match useful life of the locomotive, ensuring continued availability of parts and service support and to overcome technological obsolescence.

ZE Locker



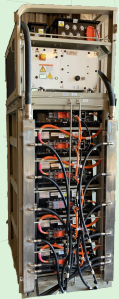
Pre-assembled and pre-tested, ready-to-install unit. Includes power modules, locomotive control system, battery management system, contactors and electrical switchgear

Auxiliary Converter & Inverter



Converts high voltage to lower voltages to power auxiliary equipment including blowers, compressor, lighting and 64V battery charge

Battery Stacks



Modular unit - includes battery banks, SBMS, BTMS, interconnecting pipes and cables

Control Desk



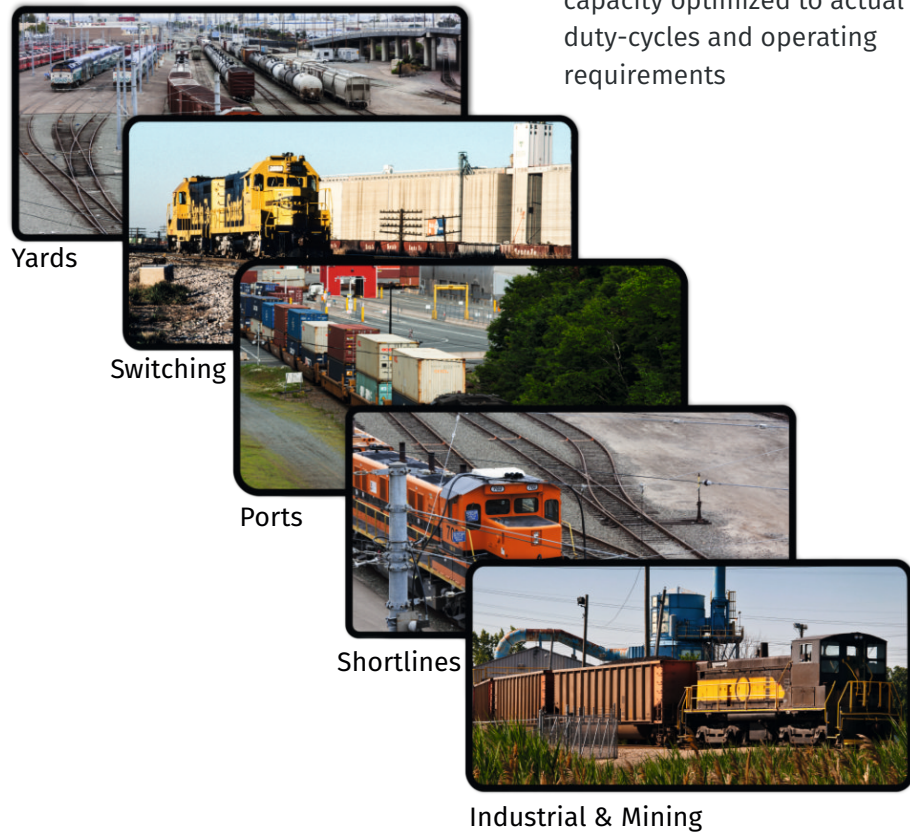
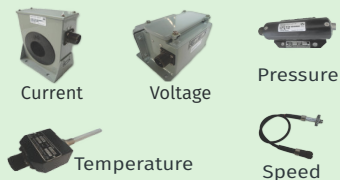
Fully assembled, ready-to-install control stand includes two 10.4" TFT touchscreens for interface, data log and fault-data download

Blower & Compressor



Electrically driven traction motor blowers and compressor

Sensors



Battery size and charging capacity optimized to actual duty-cycles and operating requirements

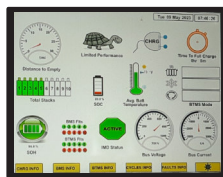
Operating Parameters

- ✔ 1-2 shift operations
(3 shifts possible with intermittent charging)
- ✔ Slow and medium speeds
- ✔ Moderate run-miles per day
- ✔ Similar Horse-Power (1000-2400 HP diesel equivalent)
- ✔ Same haulage capacity as replaced diesel locomotive
- ✔ Single or Multi-Unit operation

10.4" TFT Screens



IDLE SCREEN



TFT 2 MAIN SCREEN



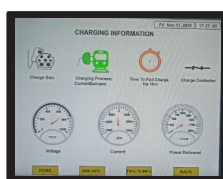
LOGIN SCREEN



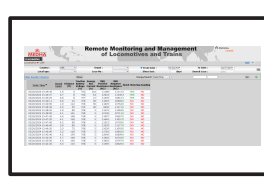
SUMMARY DATA



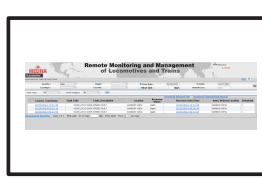
MAIN MENU SCREEN



TFT 2 CHARGING INFO SCREEN

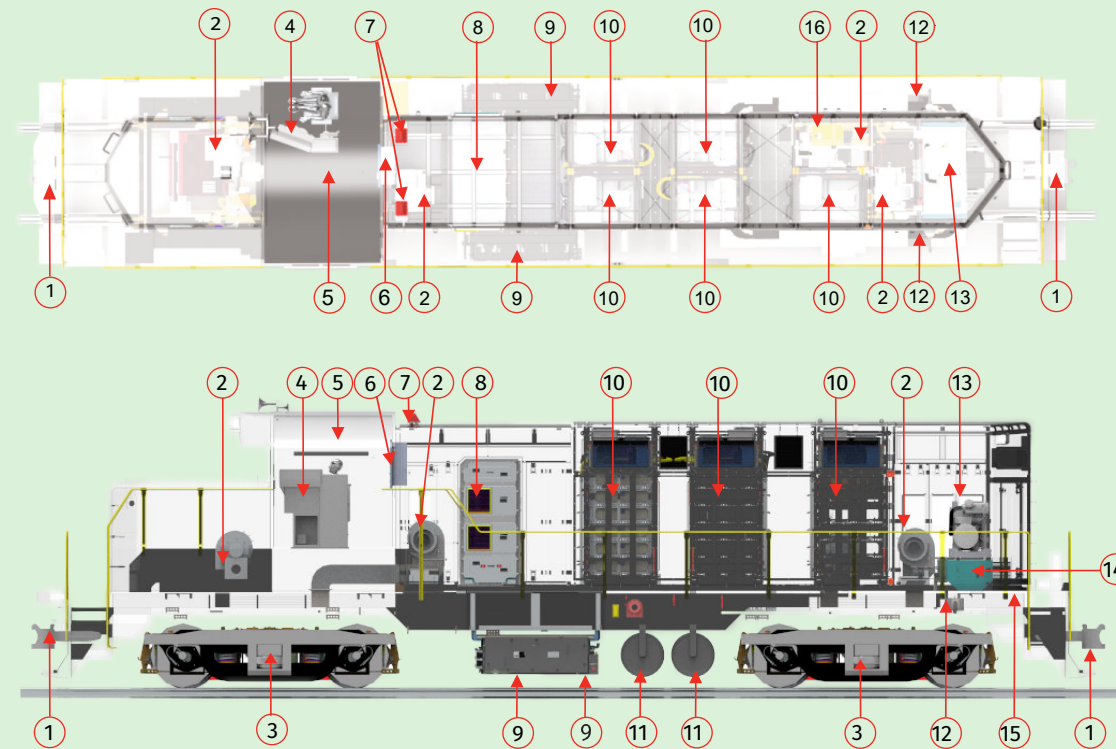


LONG TERM DATA



FAULT DATA

Remote Monitoring, Recording and Fault Diagnostics



- 1 COUPLERS
- 2 TM BLOWER(S)
- 3 TRUCKS(WITH TM, BRAKE SYSTEM...)
- 4 DRIVER CONSOLE(10.4" SCREENS)
- 5 DRIVER CAB
- 6 SWITCH PANEL
- 7 LRMS ANTENNA
- 8 ZE LOCKER
- 9 AUXILIARY CONVERTER / INVERTER
- 10 BATTERY STACKS (PRE-ASSEMBLED)
- 11 AIR RESERVOIR TANKS
- 12 CHARGING SOCKETS
- 13 COMPRESSOR
- 14 SAND BOX
- 15 LOCO BODY
- 16 JUNCTION BOX

Removed Items

- Locomotive Hood
- Fuel Tank
- Engine
- Alternator
- Driver Console
- Electrical Panel
- Dynamic Grids
- Radiator Fan(s)
- Turbocharger wires, Cables, Electrical Switchgear, Pipings...

Retained Items

- Locomotive Underframe
- Driver Cab
- 64V battery
- Trucks
- Wheels and Axles
- Traction Motors
- Gearbox
- Brake System

New Items

- ZE Locker
- Control Desk with 10.4" touchscreens
- Battery Stacks (Pre-Assembled)
- Auxiliary Converter/Inverter
- Traction Motor Blower(s)
- Compressor (electrical driven)
- Switch Panel, Emergency Switch,
- Sensors, Cables, Base Plates, Ballast Weight...
- Locomotive Body

Features

- ✔ Locomotive remote monitoring and fault diagnostics
- ✔ Battery thermal management system
- ✔ Battery health monitoring and energy management
- ✔ Electrically driven traction motor blowers and compressor
- ✔ Emergency power cut-out
- ✔ Improved driver comfort features
- ✔ Similar driving experience as diesel locomotive
- ✔ Reduced number of moving parts on the locomotive
- ✔ Auto-test modes

Optional Features

- Regenerative braking energy
- HVAC/Cab heaters
- AC traction
- Range extender – hybrid option
- Extended warranty



One-stop-shop

Equipment and system integration, equipment manufacturing, installation and testing, fault-diagnostics and after-sales support services....



Flexibility

Any 4-axle or 6-axle locomotive can be converted; changeability of parts between locomotives; easy to adapt to different types of batteries....



Cost effectiveness (lower life-time cost of ownership)

Lower initial investment, reduced operating and maintenance costs, reduced fuel consumption costs....



Scalability

Optimized battery size and charger ratings to meet operational needs, configurable power settings....



Faster delivery

Modular design, delivered in one year or less....



Performance

Similar or higher horse-power, suitable to work under demanding environmental conditions from hot and humid to extreme cold....



Safer and healthier work environment

Reduced noise and vibrations, no idling, no harmful emissions, no oil spillage....



Reliability

Independent axle control with individual motor cut-out; inbuilt redundancy features; self-diagnostics, fault analysis, data log....

Medha's Commitment

Extended warranty to match useful life of locomotive, life-time support against technological obsolescence, continued availability of parts and services....



www.medha.com



Design > Manufacturing > Maintenance



6 McCrea Hill Road, Ballston Spa, NY, 12020 US

Phone: +1-518-381-7100 Fax: 518-381-7117
contact@medhatransportation.com