

Knorr-Bremse España, S.A. Merak

Calle Miguel Faraday 1
28906 Getafe
Spain
Tel: +34 911 459 400
Fax: +34 911 459 444
merak@merak-hvac.com
www.merak-hvac.com



Please, scan
the code for
more information
about our
locations



-  **KNORR-BREMSE**
-  **NEW YORK AIR BRAKE**
-  **IFE**
-  **MERAK**
-  **MICROELETTRICA**
-  **SELECTRON**
-  **EVAC**
-  **ZELISKO**
-  **RAILSERVICES**



HVAC ELECTRONIC CONTROL

**UNIFIED
COMMUNICATION
ARCHITECTURE**

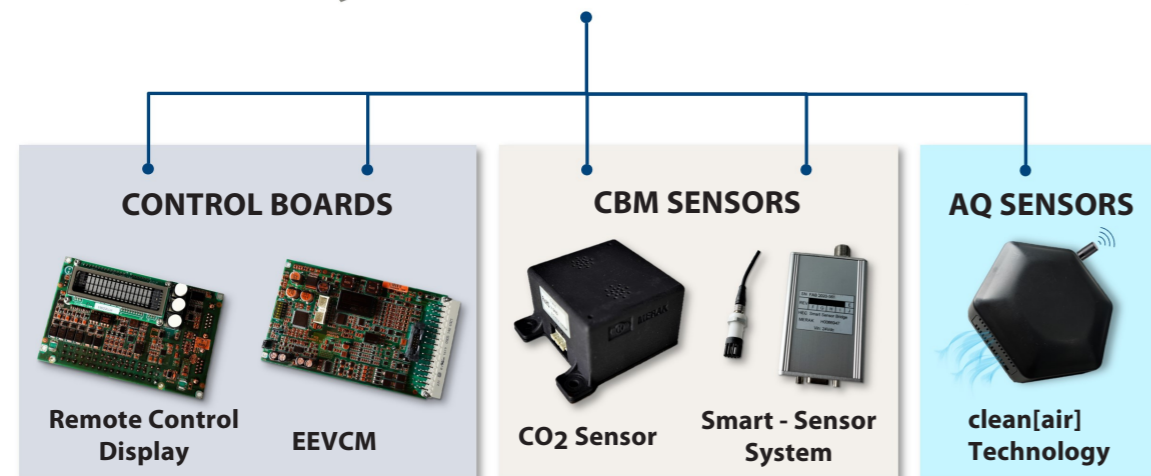
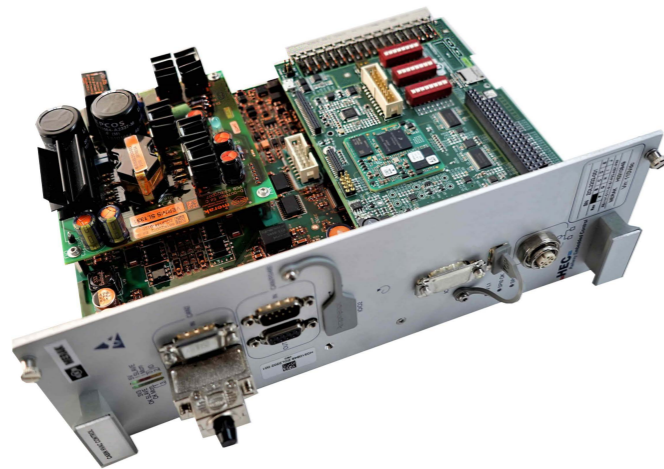


HEC (HVAC Electronic Control)

HEC is a state-of-the-art embedded controller designed for railway HVAC applications.

Customer benefits

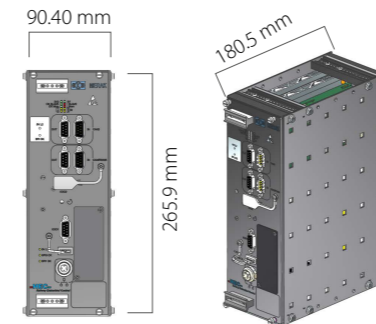
- State-of-the-art data integrity and protection support for communication networks
- Possibilities for a seamless integration of digital services into our products
- Strong focus on service reliability and robustness
- Comfort improvement by means of specialized peripheral product



HEC Communication Protocols

- Analog Signal: 4-20mA, 0-10V, 0-5V
- Data BUS: MODBUS, CAN, RS485, RS232, ETHERNET

HEC - Main control

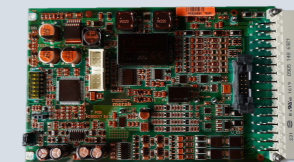


- Designed according to international railway standards, incl. EN, GOST and STM
- Compliant with cutting-edge protocols (i.e. TRDP, IPTCOM and CIP)
- Allows implementation of advance monitoring and condition-based maintenance (CBM) solutions
- Compatible with other Knorr-Bremse Group electronic subsystems

Additional control and sensing technology

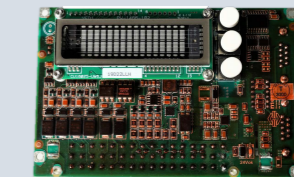
EEVCM

- Optimized cooling function
- Used with green refrigerants such as CO₂
- Reduced cost compared to COTS



Remote Control Display

- Integrated HMI and control functions
- Reduced cost → Optimum for Sleeper cars



Smart - Sensor System

- Cabling reduction (Onewire)
- Temperature monitoring in the whole vehicle



CO₂ Sensor

- NDIR CO₂ technology sensor
- Power supply: 24VDC
- Accuracy: 30ppm +/- 30%
- Measurement range: 0-10000ppm
- Operation temperature: 0-50°C



clean[air] - Sensor System

- Innovative sensing technology software
- Connected to clean[air] application
- Allows air quality data visualization, such as: HR, T, PM 2.5, CO₂ and VOC
- Already in service
- Wireless communication: LoRa and GSM 4G

