



Integrated Electronic Relay Valve (IERV)

Smart Solution for Brake System

Smart Solution 1

Compact and lightweight

- Compact size and lightweight (W263×D223×H346mm, 23.0kg) : Flexible layout
- Layout closer to the bogie: Improve braking response time

Smart Solution 2

High performance and high reliability

- Interacting between propulsion system and BC (Brake Cylinder) pressure control per bogie or per axle : Achievement of highly accurate braking performance
- Emergency brake control by variable load valve without SW: Ensure high reliability
- HW timer protection is applied for WSP: Ensure high reliability
- Diagnostic function : Contribution to failure detection at early stage and stable operation
- Certification : CMMI (level 2) / SIL (level 4 ~ 2)

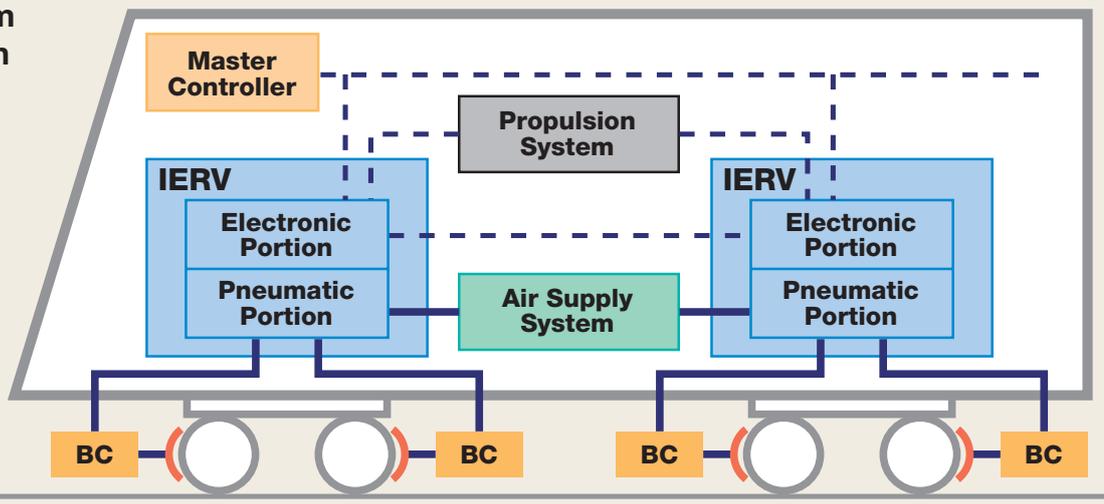


Smart Solution 3

Easy maintenance

- Replace per package/module/board : Improve MTTR and reduce maintenance cost
- PCB replacement can be performed without removing the IERV from the car. : Improve MTTR

Brake system configuration



IERV Main Function

Function

Service brake control

Distributed braking system control is achieved by controlling per bogie or per axle. High accuracy braking performance is achieved by interacting between the control unit and propulsion system.

Emergency brake control

BC pressure of emergency brake is controlled only by the air suspension pressure from variable load valve.

Wheel slide protection

WSP is performed per bogie or per axle. HW timer is applied for WSP to prevent false skid detection.

Networks

Ethernet, Lon Works, RS485 and MVB are available for network connection between brake systems, monitoring system and propulsion system.

Remote isolation of service brake

As for service brake, BC pressure is released by external command. This is not applicable for emergency brake.

BC pressure compensation

When one IERV is failed, the lost BC pressure is compensated with other IERV by cross blending control.

Diagnostic function

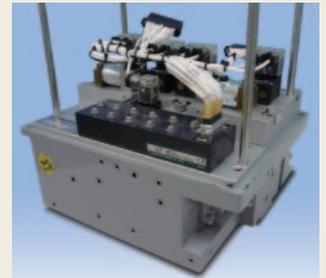
Failure detection at early stage can be achieved by self diagnostic function.

Monitoring

Brake performance verification and adjustment are possible using maintenance PC.



Electronic portion



Pneumatic portion

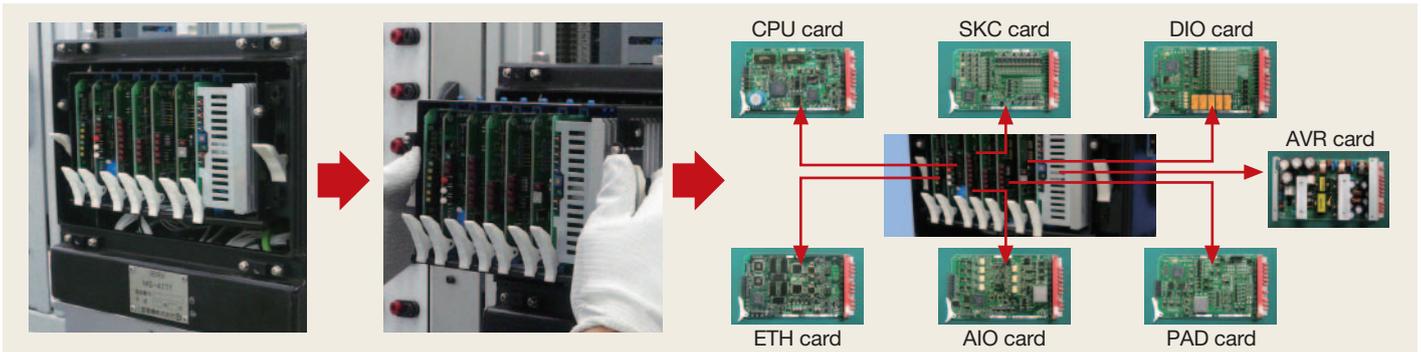
Maintenance

Replacement per package, per module or per board

- Package replacement :
IERV complete
- Module replacement :
Pneumatic portion or electronic portion
- PCB replacement :
Each unit consists of seven PCBs which can be removed separately.
Easy to replace due to rack structure.
(Without removing the IERV from the car)

Environment

Water Proof	: IP66
Shock and Vibration	: IEC61373 Cat 1 Class A
EMC	: EN50121
Design Temperature	: -40 to 85°C [-40 to 185°F]
Operational Temperature	: -40 to 70°C [-40 to 158°F]
Relative Humidity	: 0 to 100%Rh (no condensation)



Board replacement without dismantling the IERV from the car

MITSUBISHI ELECTRIC CORPORATION

<http://www.MitsubishiElectric.com>