

# *Air Quality Improvement*



## **APPLICATIONS**

High-Speed Trains | Light Rail Vehicles | Locomotives | Metros |  
Passenger Coaches | Regional and Commuter Trains



# OPTIMIZING AIR QUALITY



**FOLLOWING ITS COMMITMENT TO AIR QUALITY IMPROVEMENT INITIATIVES, MERAK HAS DEVELOPED AIR CLEANING SYSTEMS FOR HVAC UNITS** specifically designed for desert or dusty environments, which filter sand and other particles from the fresh air. Conscious of corporate responsibility for the development of environmentally sustainable products, the air filters in these systems are supplied with newly developed self-cleaning mechanisms which reduces the maintenance effort.

## **AIR QUALITY IS IMPORTANT**

Air quality has always been a priority for Merak, due to its vital importance both in protecting passengers' health and comfort and for extending the lifespan of the HVAC system. This is especially the case in desert environments where dust and sand cause a sooner deterioration of the systems' components.

One of the main cost factors in HVAC maintenance especially in desert environments is the frequency with

which the filters which retain the dirt particles need to be changed. With rail systems expanding in countries with desert-like areas like Saudi Arabia Merak is responding to the customers' need for cleaner air while keeping maintenance cost in line.

The company's sand filtration systems, which allow only clean air into the HVAC unit, represent a major advance in HVAC technology.

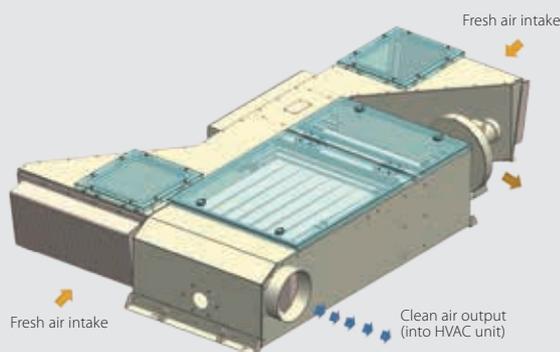
## AIR QUALITY IMPROVEMENT

### MERAK HAS DEVELOPED TWO DIFFERENT SYSTEMS FOR SAND FILTRATION:

#### CYCLONIC SYSTEM

The sand filtration system architecture is based on a structured approach that includes the following stages:

- >> Fresh air grilles and dampers: prevent large particles or water from entering the system. Depending on the wind direction and direction of travel, air is taken in from one side of the vehicle or the other. In case of a sandstorm, grilles from both sides can be closed to protect the system.
- >> Cyclonic filters: the air is directed through cyclonic filters to separate sand, only letting clean air into the unit. A turbo ventilator then removes the sand from the cyclonic separator. This "sand self-emptying" process reduces maintenance cost.
- >> Filter bags: the air then passes through specialized filter bags, where the remaining particles are completely removed.

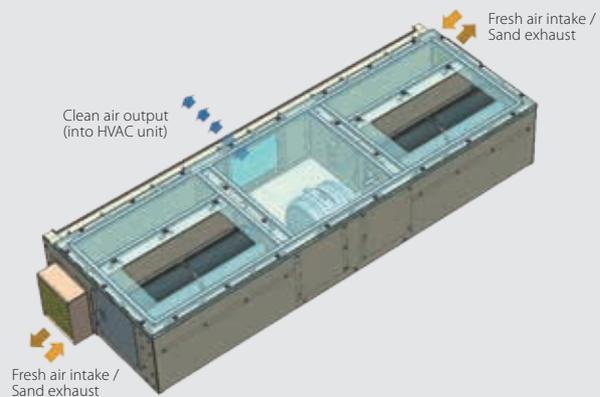


The system is being successfully deployed in several projects in the Middle East and Africa.

#### PULSATING SYSTEM

This system works with the following steps for sand filtration:

- >> Fresh air grilles: keep the heavier sand and dust particles from entering the unit.
- >> Cartridge filters with a degree of filtration F9.
- >> Merak's latest development consists of a system where the filters are cleaned with pulses of pressurized air, and the sand particles evacuated to the outside of the unit. The cleaning cycles as well as the filter duration depend on the ambient pollution and have to be analysed case by case.



#### CUSTOMER BENEFITS:

- Maximum air quality assurance
- Application in all HVAC systems in desert environments
- System efficiency regardless of the direction of wind and travel
- Fresh air inlets protected in case of sandstorms
- Low maintenance costs due to sand self-cleaning system
- Low time for cartridge filter exchange
- Filter exchange according to the preventive vehicle maintenance periods

**Merak**  
**Knorr-Bremse España, S.A.**

Parque Empresarial La Carpetania  
 C/Miguel Faraday, 1  
 28906 Getafe - Madrid  
 Spain

Tel.: +34 911 459 400  
 Fax: +34 911 459 444

WWW.MERAK-HVAC.COM  
 WWW.KNORR-BREMSE.COM



Knorr-Bremse Group

This publication may be subject to alteration without prior notice. A printed copy of this document may not be the latest revision. Please contact your local Knorr-Bremse representative or check our website [www.knorr-bremse.com](http://www.knorr-bremse.com) for the latest update. The figurative mark „K“ and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Copyright 2013 © Knorr-Bremse AG. All rights reserved. Including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.