

---

## Windscreen wiper and wash systems

---



### Application

- For all vehicle types

# Windscreen wiper and wash systems

The requirements on windscreen wiper and wash systems vary considerably according to the application involved. But whether we are talking about mass transit systems or very high-speed trains, moderate or extreme climatic conditions – Knorr-Bremse can always offer the right solution.

## CUSTOMER BENEFITS

- Highly economical, low life cycle costs
- Wide variety of functions
- High availability
- Long life components
- Long-term security of original parts supply
- Compliance with railway norms (e.g. EMC, fire protection)
- Customized systems for every vehicle type

## VARIETY

The first electric windscreen wiper and wash systems from Knorr-Bremse were based on components originally developed for the automotive industry. When it became clear that these modified systems were no longer sufficient to meet increasingly specific customer demands, the company started to develop systems tailored to the needs of the rail sector. Today, at its site in Mödling, Austria, Knorr-Bremse produces a wide range of solutions for a huge variety of different applications. All systems are subject to rigorous testing with state-of-the-art equipment.



## THE SYSTEMS

### PBS



*Wiper motor*

Pneumatic Basic Systems are simple to use and do not require a power supply. However they offer fewer functions than other systems. Knorr-Bremse produces them mainly in order to uphold longterm supply agreements.

### EBS

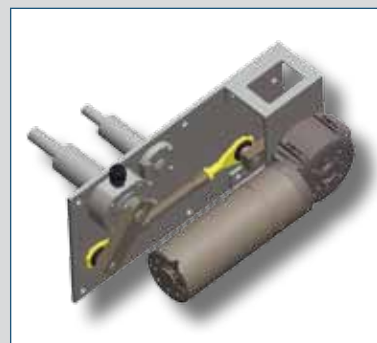


*Wiper motor*

The components of the Electrical Basic System were taken over from the automotive industry and modified to meet the needs of the rail sector. All wiping movements and angles realized are with levers and hinged rods. Compared with PBS, these easy-to-install systems offer further functions:

- Park function
- Two wiper speeds
- Interval wiping
- Dry wiping, with two to three double wipes following washing

### EAS



*Drive unit*

The ultra-reliable and durable Electrical Advanced System was specially developed by Knorr-Bremse for the rail vehicle industry. In technical terms the realization of the wiper movement is comparable to that for EBS systems.

- Operating life at least 10 million double wipes
- Original spare parts supply for 30 years
- Washer supply integrated into drive unit



## EHS



*Drive unit*

Electrical High End Systems are systems specially developed for rail vehicles based on proven and tested components such as drive systems, rotary givers and control systems that have proved to be particularly robust on IFE doors.

- Operating life at least 12 million double wipes
- Original spare parts supply for 30 years
- Washer supply integrated into drive unit
- Wetting of windscreen prior to wiping saves wear
- Adaptive torque control
- Synchronization of two wipers drives without mechanical link
- Flexible adaptation of park position, wiping angle and speed

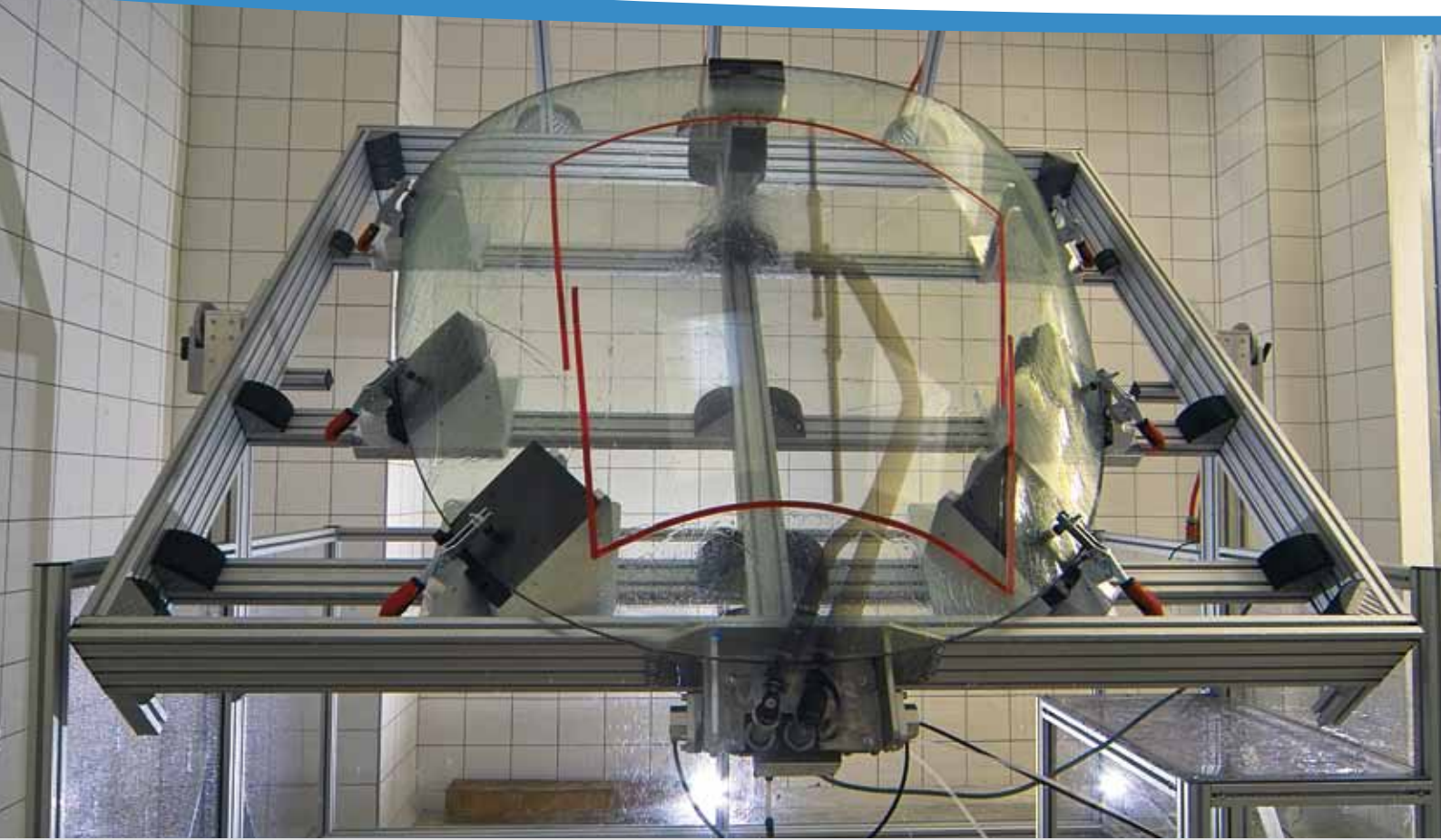
## PHS



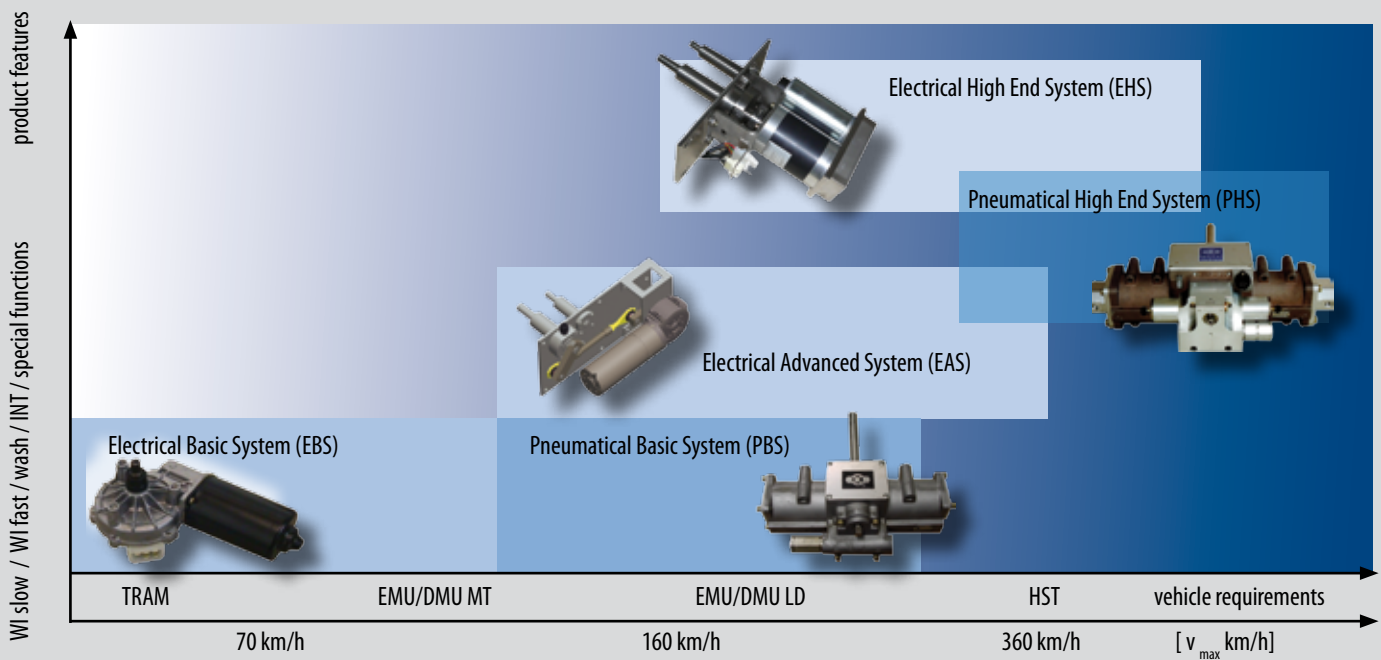
*Wiper motor*

Electro-pneumatic hybrid systems were specially developed for high-speed trains with spheroidal front windscreens. An electrical control module converts signals from the operating element and wiper drive into functions via an electro-pneumatic unit.

- 200 Nm breakaway torque
- Pneumatic emergency operation
- Optimal aerodynamic design of the wiper arm



## WWWS – PRODUCT PORTFOLIO



## Rail Vehicle Systems

**Knorr-Bremse Systeme für Schienenfahrzeuge GmbH**  
Moosacher Straße 80  
80809 Munich  
Germany  
Tel: +49 89 3547-0  
Fax: +49 89 3547-2767

### Europe – Africa

Austria  
**Dr. techn. J. ZELISKO GmbH**  
Mödling  
Tel: +43 2236 409-0  
Fax: +43 2236 409-279

**Knorr-Bremse GmbH**  
Mödling  
Tel: +43 2236 409-0  
Fax: +43 2236 409-412

**Knorr-Bremse GmbH Division IFE**  
Kematen/Ybbs  
Tel: +43 7448 9000  
Fax: +43 7448 9000-65110

France  
**Freinrail Systèmes Ferroviaires S.A.**  
Reims  
Tel: +33 3 2679-7200  
Fax: +33 3 2679-7201

Germany  
**Knorr-Bremse Systeme für Schienenfahrzeuge GmbH Zweigniederlassung Berlin**  
Berlin  
Tel: +49 30 9392-0  
Fax: +49 30 9392-2409

Hungary  
**Knorr-Bremse Vasúti Jármű Rendszerek Hungária Kft.**  
Budapest  
Tel: +36 1421 1100  
Fax: +36 1421 1192

Italy  
**Frensissemi S.r.l.**  
Florence  
Tel: +39 055 3020-1  
Fax: +39 055 3020-333

**Microelettrica Scientifica SpA**  
Rozzano  
Tel: +39 02 575-731  
Fax: +39 02 575-10 940

Netherlands  
**IFE Tebel Technologies B.V.**  
Leeuwarden  
Tel: +31 58 297-3333  
Fax: +31 58 212-8800

Poland  
**Knorr-Bremse Systemy dla Kolejowych Środków Lokomocji PL Sp. z o.o.**  
Kraków  
Tel: +48 12 260-96 10  
Fax: +48 12 260-96 20

Romania  
**Knorr-Bremse SRL**  
Bucharest  
Tel: +40 37 400-5155  
Fax: +40 21 332-3321

Russia  
**Knorr-Bremse Systeme für Schienenfahrzeuge GmbH**  
Moscow  
Tel: +7 495 739-01 13  
Fax: +7 495 739-01 14

South Africa  
**Knorr-Bremse (SA) (Pty) Ltd.**  
Spartan  
Tel: +27 11 961-7800  
Fax: +27 11 975-8249

**Microelettrica Scientifica (PTY) Ltd**  
Johannesburg  
Tel: +27 11 794-3330  
Fax: +27 11 794-7428

Spain  
**Merak Sistemas Integrados de Climatización, S.A.**  
Madrid  
Tel: +34 91 495-90 00  
Fax: +34 91 691-09 97

**Sociedad Española de Frenos Calefacción y Señales, S.A.**  
Madrid  
Tel: +34 91 145-9400  
Fax: +34 91 145-9444

Sweden  
**Knorr-Bremse Nordic Rail Services AB**  
Lund  
Tel: +46 46 3293-50  
Fax: +46 46 1489-71

Switzerland  
**Oerlikon-Knorr Eisenbahntechnik AG**  
Niederhasli  
Tel: +41 44 852-31 11  
Fax: +41 44 852-31 31

United Kingdom  
**Knorr-Bremse Rail Systems (UK) Ltd.**  
Melksham  
Tel: +44 1225 898-700  
Fax: +44 1225 898-705

### America

Brazil  
**Knorr-Bremse Sistemas para Veículos Ferroviários Ltda.**  
São Paulo  
Tel: +55 11 5681-1129  
Fax: +55 11 5686-8344

Canada  
**Knorr Brake Ltd.**  
Kingston  
Tel: +1 613 389-46 60  
Fax: +1 613 389-87 03

USA  
**IFE North America**  
Westminster  
Tel: +1 410 875-1468  
Fax: +1 410 875-1225

**Knorr Brake Corporation**  
Westminster  
Tel: +1 410 875-09 00  
Fax: +1 410 875-90 53

**Merak North America LLC**  
Westminster  
Tel: +1 410 875-09 00  
Fax: +1 410 875-14 49

**Microelettrica-USA**  
Randolph  
Tel: +1 973 598-0806  
Fax: +1 973 598-0677

**New York Air Brake Corporation**  
Watertown  
Tel: +1 315 786-52 00  
Fax: +1 315 786-56 76

### Asia – Australia

Australia  
**Knorr-Bremse Australia Pty. Ltd.**  
Granville NSW  
Tel: +61 2 8863-6500  
Fax: +61 2 8863-6151

China  
**Knorr-Bremse Asia Pacific (Holding) Limited**  
Hong Kong  
Tel: +852 3657-9800  
Fax: +852 3657-9900

**Knorr-Bremse Systems for Rail Vehicles (Suzhou) Co. Ltd. Beijing Office**  
Beijing  
Tel: +86 10 6802-9088  
Fax: +86 10 6802-9087

**Knorr-Bremse Nankou Air Supply Unit (Beijing) Co. Ltd.**  
Beijing  
Tel: +86 10 5164-2640  
Fax: +86 10 6978-2010

**Knorr-Bremse Systems for Rail Vehicles (Suzhou) Co. Ltd.**  
Suzhou New District  
Tel: +86 512 6616-5666  
Fax: +86 512 6616-5817

**Merak Railways Technologies (Shanghai) Co. Ltd.**  
Shanghai  
Tel: +86 21 5192-8000  
Fax: +86 21 5192-8111

**Westinghouse Platform Screen Doors (Guangzhou) Ltd.**  
Guangzhou  
Tel: +86 20 8770-8700  
Fax: +86 20 8770-1110

India  
**Knorr-Bremse India Private Ltd.**  
Faridabad  
Tel: +91 129 227-64 09  
Fax: +91 129 227-59 35

Japan  
**Knorr-Bremse Rail Systems Japan Ltd.**  
Tokyo  
Tel: +81 3 53 91-10 13  
Fax: +81 3 53 91-10 22

Korea  
**Knorr-Bremse Rail Systems Korea Ltd.**  
Seoul  
Tel: +82 2 22 80-55 55  
Fax: +82 2 22 80-55 99

 **KNORR-BREMSE**

 **WESTINGHOUSE**  
platform screen doors

 **IFE**  
Innovations  
For  
Entrance Systems

 **merak**

 *Microelettrica Scientifica*

**ZELISKO**

**railservices**

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 2007 © 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.



Knorr-Bremse Group