A WORLD WHERE EVERYTHING IS PERFECTLY CONNECTED

www.dellner.com
I would like, at the outset, to extend my gratitude to our customers and suppliers for your contribution to Dellner’s success.

Dellner has been very busy in recent years. We have opened offices and facilities in nine new locations in the last 2 years, both to secure our focus on supporting our customers at a local level, and to meet demand for local content in particular regions. These activities have been coordinated by our new business development function, which facilitates alignment between our sales, manufacturing and support functions and guarantees quality, performance and profitability during the execution of our global growth strategy. We have focused on maintaining strong communication with our external stakeholders to ensure that our growth is aligned with and secures the interests of our customers, suppliers and shareholders.

Dellner’s reputation for being global and acting locally is demonstrated by the experienced service technicians we have in place to carry out works locally for our customers in our fully equipped workshops in Sweden, Poland, the UK, France, Italy, Germany, China, Australia, India, Malaysia, Brazil, Argentina and the US. We are also hard at work with our new Mobile Service Container, which is a portable workshop and warehouse concept that allows Dellner to carry out complete overhaul and repair works at short notice, and to the highest standard, at our customers’ own facilities.

In addition, we have secured our cost base through optimisation of our facilities and supply chain, including expansion of our factory in Chennai, India, to produce gangways and couplers in a brand new, world class facility. We are midway through significant expansions of new production sites in China and North America which will guarantee we can continue to deliver on growing market needs in those regions in the future.

Dellner has also maintained focus on providing innovative technical solutions in a rapidly changing technological environment market while meeting the performance specifications of our products. Some examples include the coupler application for -50°C in Russia, special lightweight coupler head developments for North America and Monorails, and a new 1 Gb data contact for inter-car communications and video surveillance. Dellner has introduced the Dellner Ethernet ConneXion (DEX500) modem, offering a cost-effective way to use existing low frequency or UIC train lines to transmit network data across rail cars. We have also introduced new technical solutions to widen our product portfolio for Crash Energy Management applications, including the double-acting damper produced in house. These initiatives are defined by our customers, and motivated by Dellner’s ambition to offer them the highest level of support and innovation to the market.

As you can see, our global growth strategy has been focused on reducing waste and costs, increasing quality and delivery performance and making sure we live up to our reputation for excellent customer and after-market services.

I look forward to continuing this journey with our customers and suppliers, and take this opportunity to thank the motivated and committed members of the Dellner team who have made our success, and our customer’s success, possible.
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   A few words from our CEO

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Dellner is one of the world’s leading suppliers of train connection systems, with more than 78 years of experience in the rail industry. Based in Falun, Sweden, with 22 subsidiaries around the world and more than 1000 employees globally, Dellner continues with its steady, robust growth in couplers, gangways, front hatches, dampers and crash energy management, as well as the service segment of the rail industry.

Founded in 1941, we have years of tested, proven experience in producing safe and reliable train connections, and providing innovative, state-of-the-art and cutting-edge products for our customers.

In 2019 Dellner Couplers, together with Dellner Components and Dellner Dampers, was acquired by EQT, a Swedish private equity company. Quality and prompt delivery will remain our number one focus along with our relationship with the car builders and operators in all regions. Strategic investments in the expansion of our existing product portfolio and new product areas like freight and digitalization will also get our full attention during the coming year, insuring our place as market leader.
“All our activities, objectives, values and our success are defined by our customers and are driven by our motivation to offer them the highest level of support and innovation.”

DAVID PAGELS CEO & President

DELLNER
SITES OVERVIEW

5 manufacturing subsidiaries
17 sales & service subsidiaries
Dellner Components
Dellner Dampers

HQs including final assembly and aftermarket services
Sites with production, final assembly and aftermarket service
Sites with final assembly and aftermarket service
Sites with aftermarket service
Sales office
Delner’s story began in 1941 when Gunnar Delner established a small production company in Northern Sweden, called Ingenieur-Buro Gunnar Dellner, and began manufacturing couplers for the domestic market. His first customer was SJ (Swedish State Railway), which asked him to produce its first automatic couplers.

Seven years later, Ingenieur-Buro Gunnar Dellner won an order for 360 couplers for the Warsaw Metro – Poland’s only rapid transit system.

After 1952, Ingenieur-Buro Gunnar Dellner was renamed several times:

- RUNNVIK-MECHANISCHERWERKSTATT
- JAN DELNER U. CO.
- AB DELNER MALMCO
- DELNER COUPLERS AB

Until 1960, Gunnar Delner supplied automatic couplers to numerous customers in Europe, such as Paris Metro, SNCF, Rome Metro, and FS (Italian State Railway).

The company has now grown to become a major global player in Train Connection Systems and serves customers all over the world.

Delner’s focus has always been on innovative research and design. By doing so, we’ve been responsible for several global breakthroughs in the rail industry.

In 1984, Delner was the first manufacturer to launch the gas hydraulic damper in couplers. This was followed in the 1990s by the production of snow gaiters and front hatch mechanisms.

More recently, the company’s focus has been on new products from front to intermediate train systems.

One of our biggest milestones was the acquisition of the Woodville factory, which enabled us to produce gangways in-house. This acquisition meant Delner became the world’s leading system integrator for the interface between rail cars and train front ends.

In 2019, Delner has reached another milestone in its railway journey as together with Delner Components and Delner Dampers was acquired by the Private Equity company - EQT. Supported by the famous Wallenberg family, EQT was founded in 1994 in Sweden and now operates from 15 countries across Europe, Asia and North America. It invests in companies with a mission to develop their strengths and support them in sustainable growth. For Delner, it is a new chapter which will even enhance its technical, operational, commercial and legal structures. As the industry leader in supplying full Train Connection Systems, Delner will continue delivering cutting edge and high-quality products as well as the best service to its customers worldwide.

“... we were the first manufacturer to launch the gas hydraulic damper in couplers”

DAVID PAGELS CEO & President
MISSION
VISION AND VALUES

MISSION
To provide innovative Train Connection Systems and excellent global services, to make travel safer, more reliable and profitable.

VISION
To become the preferred supplier for train coupler and gangway systems.

"It is a pleasure to observe how Dellner extends and explores markets. At each trade fair there are more and more customers at our booths who appreciate our work and the quality of our products. Our external communication is always focused on our customers, who are at the centre of all activities.*

Izabela Drozdz, Global Marketing Coordinator, DELLNER POLAND

RESPECT
We believe respect is mutual and requires awareness in everything we do. We strive for our organisation and people to be clear, reliable, and attentive.

ACTION
We are energetic; we get things done quickly and efficiently. We constantly focus on improving our performance and we always try to learn from our experiences.

JOY
Success pleases us; we’re proud of what we do and we do things that make us proud.

TEAM
We’re stronger as a team, and we benefit from our differences. We support each other in our drive to develop as individuals, and as a group.

OUR CORE VALUES
KEEP TOGETHER

RESPECT | JOY | ACTION | TEAM
"Designing the systems which connect trains is a huge responsibility for the designers. I am very proud of the fact that the couplers that I have helped design are in service all over the world. I never know when, on holiday, I will travel on a train with "my" products..."

Bente Rost, Mechanical Design Engineer, DELLNER SWEDEN
AUTOMATIC COUPLERS

Automatic couplers enable railway vehicles to connect instantly, without human intervention. Our multi-function couplers can provide safe and reliable mechanical, pneumatic connections as well as electrical connections between vehicles. They also optimise energy absorption, giving the maximum protection for the vehicle and its passengers.

We offer many different coupler types, to suit the required forces and technical demands of each application. Thanks to a comprehensive range of coupler heads – including latch type, SA3, Tightlock and Georg-Fischer – Dellner couplers are compatible with almost every other brand of coupler used in the world today.

Applications:
- Commuters
- Metro
- HST
- LRV
- People Movers

Applications:
- Commuters
- Metro
- HST
- LRV
- People Movers
MODULAR CONCEPT OF AUTOMATIC COUPLERS

Dellner’s modular couplers add flexibility and functionality – and give operators better spare part availability, and lower maintenance costs. The modular approach also means we can offer shorter lead-times, arranging delivery as soon as the order is placed, and accelerating our customers’ own production. Importantly, the products are a proven, solid solution – demonstrating their worth daily on hundreds of trains worldwide.

Applications:
- Commuters
- Metro
- HST
- LRV
- People Movers

ELECTRICAL COUPLER ACTUATOR
CABLE SUPPORT
PIVOT ANCHOR:
highly efficient energy absorption

REMOTE UNCOUPLING
HEATERS

COUPLER HEAD:
compatible with all existing coupler heads worldwide

BP VALVE
MRP VALVE
UC VALVE

COUPLER CONTROL

APPLICATIONS:
- Commuters
- Metro
- HST
- LRV
- People Movers
Adapters provide safe and reliable connections in unforeseen and emergency situations. At Dellner, we offer adapters compatible with every coupler in the world – making it easy for our customers to satisfy weight and force level requirements. We also offer a choice of both MRP and BP pneumatic connections.

Each train line faces different environmental conditions. We can create bespoke solutions to ensure a safe, cost effective and reliable service for every train in your fleet.

We offer a wide range of solutions which protect couplers from snow, ice, dust, and sand. They not only safeguard coupler functionality – even in severe weather conditions – but also increase component lifespan.

Applications:
- Commuters
- Metro
- HST
- LRV
- People Movers

COUPLER PROTECTION PRODUCTS

Applications:
- Commuters
- HST
- People Movers
DATA TRANSMISSION PRODUCTS

Dellner supports the transmission of every kind of digital signal throughout the train: from onboard internet, video, infotainment and passenger counting to communication links for train safety.

CHOICE OF CONTACTS

Our electrical couplers provide different types of contacts for transferring analogue signals, power, and Ethernet up to 1 Gbit. It’s excellent if you need to introduce high-speed data transmission in new vehicles or upgrades of existing rolling stock.

DEX500

Dellner Ethernet ConneXion (DEX500) modems are a cost-effective way to transmit network data across the couplers, using existing low-frequency or UIC train lines. They work without replacing old contacts; even oxidised or dirty couplings will not disrupt transmission. 128-bit AES encryption ensures data security is maintained.
CRASH ENERGY MANAGEMENT

Crash Energy Management is a vital part of Dellner’s Train Connection Systems. We design our products to ensure passenger safety and train availability at all times.

Our Crash Energy Management components are located in the front of a train and between the cars. They help to handle the impacts of everyday train operations. In serious collisions they absorb energy from impact forces and stop carriages from twisting and climbing — potentially saving passengers’ lives. Dellner Train Connection Systems are therefore a key part of any comprehensive train safety management system.

We have developed our own software where we can simulate coupling, towing, snatch and crash scenarios according to standards or general requirements. This enables us to find the most cost-effective solutions to keep forces and accelerations at acceptable levels — saving lives and preventing damage to the structure of the train.

- Crash Energy Management is essential to meet relevant standards, such as EN 15227, and to enable high-speed coupling performance.
- The effect of a collision on a train depends on the behaviour of the energy absorbers built into the couplers.
- Whatever the impact conditions, the couplers should not bottom out, otherwise high deceleration will occur.
- Energy should be absorbed along the train, controlling impact forces between carriages, to reduce acceleration and deceleration at each point.

Applications:
- Commuters
- Metro
- HST
- LRV
- People Movers

FOUR STAGE PERFORMANCE OF CEM’S ELEMENTS
**GAS-HYDRAULIC BUFFERS AND VISCO-ELASTIC BUFFERS**

Gas-hydraulic buffers offer the best regenerative energy absorption at coupling and collision speeds. The buffer's characteristics can be adjusted so deceleration is always kept to a minimum.

**Capacity**
- STROKE: 50-370 mm
- FORCE: 200-400/900/1500 kN

**Features**
- FULLY REVERSIBLE ENERGY ABSORPTION UP TO INTERMEDIATE SPEEDS
- VELOCITY SENSITIVE
- KEEPS DECELERATION TO A MINIMUM
- UP TO 90% EFFICIENCY

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>STROKE: 50-370 mm</td>
<td>FULLY REVERSIBLE ENERGY ABSORPTION</td>
</tr>
<tr>
<td>FORCE: 200-400/900/1500 kN</td>
<td>VELOCITY SENSITIVE</td>
</tr>
</tbody>
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**Friction Spring Damper**

**Gas-Hydraulic & Friction Spring Damper**

**Single Acting Damper**

**Double Acting Damper**

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**Gas-hydraulic Buffers and Visco-elastic Buffers**
Rubber elements are a reliable and easy-to-maintain way to absorb energy reversibly.

**Capacity**
- STROKE: 7-55 mm
- FORCE: UP TO 1500 kN

**Features**
- FULLY-REVERSIBLE ENERGY ABSORPTION UP TO MODERATE SPEEDS
- VELOCITY SENSITIVE
- KEEPS DECELERATION TO A MINIMUM
- UP TO 70% EFFICIENCY

**Spherical Rubber Bearing**

**EFG 2**

**Standard Rubber Springs**
- **Front-mounted**
  - Force [kN]: F max 350
  - Stroke [mm]: S max -40
- **Back-mounted**
  - Force [kN]: F max 1100
  - Stroke [mm]: S max -40

**Strong Rubber Springs**
- **Front-mounted**
  - Force [kN]: F max 1500
  - Stroke [mm]: S max +1000
- **Back-mounted**
  - Force [kN]: F max -240
  - Stroke [mm]: S max 50

**Front-mounted with Internal Release**
**Back-mounted with Deformation Tube Behind**
Front-end systems / Crash energy management / Rubber elements

EFG 3

**STANDARD RUBBER SPRINGS**

- **Force [kN]**
  - \( F_{\text{max}} 680 \)
  - \( F_{\text{max}} 820 \)
- **Stroke [mm]**
  - \( S_{\text{max}} 40 \)
  - \( S_{\text{max}} 55 \)

**STRONG RUBBER SPRINGS**

- **Force [kN]**
  - \( F_{\text{max}} 1500 \)
  - \( F_{\text{max}} 850 \)
- **Stroke [mm]**
  - \( S_{\text{max}} 40 \)
  - \( S_{\text{max}} 55 \)

Front-mounted with internal release

Front-mounted

Back-mounted

**RUBBER DOUGHNUT**

- **Force [kN]**
  - \( F_{\text{max}} 1500 \)
  - \( F_{\text{max}} -1200 \)
- **Stroke [mm]**
  - \( S_{\text{max}} 39 \)
  - \( S_{\text{max}} 36 \)

Front-mounted

Back-mounted
**DEFORMATION TUBES**

Deformation tubes are a highly robust and efficient energy absorption component. The energy is absorbed by expanding (or collapsing) a tube over a mandrel, creating a very repeatable structural plastic deformation that, together with the friction, determines the deformation force. The correlation between static and dynamic tests concludes that deformation tubes are non-velocity dependent.

**Capacity**
- STROKE: 50-1200 mm
- FORCE: 200-2500 kN

**Features**
- NON-REVERSIBLE ENERGY ABSORPTION (MUST BE REPLACED AFTER USE)
- NON-VELOCITY SENSITIVE
- 100% EFFICIENCY

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**CRASH BOXES**

Crash boxes offer a very high energy absorption capacity. They work parallel to the coupler and are typically combined with anti-climbers for optimal structural collapse, because they are not designed to transfer high vertical and lateral loads.

**Capacity**
- STROKE: 50-1000 mm
- FORCE: 200-3000 kN

**Features**
- NON-REVERSIBLE ENERGY ABSORPTION (MUST BE REPLACED AFTER USE)
- NON-VELOCITY SENSITIVE
- CLOSE TO 100% EFFICIENCY
- ABSORBS RESIDUAL IMPACT AFTER INITIAL COLLISION
- SHAPE CAN VARY TO FIT THE SPACE AVAILABLE
- RELEASE/SHEAR BOLTS ENSURE THE COUPLER RELEASES IN A CONTROLLED MANNER AND PUSHERS THROUGH THE TRAIN POCKET WITHOUT INTERFERING WITH CRASH BOXES OR THE STRUCTURE OF THE CAB
Override protection components must be able to withstand high bending moments created by vertical offset loading, to keep the train on the track. They can work parallel to the coupler, and will typically engage only after its deformation tube stroke and coupler release have been fully used. A stabilising function can also be built into the draft gear.

**Capacity**
- STROKE: 50-750 mm
- FORCE: 200-2500 kN

**Features**
- CHOICE OF REVERSIBLE, NON-REVERSIBLE, AND COMBINED ENERGY ABSORPTION
- NON-VELOCITY SENSITIVE (NON-REVERSIBLE ABSORBERS) OR VELOCITY SENSITIVE (REVERSIBLE ABSORBERS/COMBINED)
- 70-100% EFFICIENCY

**STG – STABILISING FUNCTION IN THE DRAFT GEAR: REVERSIBLE ENERGY ABSORPTION**

**COMBINED ABSORBER: A REVERSIBLE GAS-HYDRAULIC BUFFER IN SERIES WITH A DEFORMATION TUBE**

**NON-REVERSIBLE ABSORBERS**

**COMBINED ABSORBERS ASSEMBLED WITH FRONT BUMPER (FOR LRV 250 kN – 400 kN)**
“Every process, component and product at Dellner is produced with maximum attention to detail. We are all travellers and we know that the quality of Train Connection Systems is important in order to make travelling safe and reliable for everybody.”

Per-Olov Ljung, Operations Manager, DELLNER SWEDEN

INTERMEDIATE SYSTEMS

SEMI-PERMANENT COUPLERS AND MODULAR CONCEPT

GANGWAYS
INTERMEDIATE SYSTEMS

SEMI-PERMANENT COUPLERS

Semi-permanent couplers provide manual coupling between multiple units. They ensure safe and rigid connections between units, and are a cost-effective option for rolling stock that are rarely separated. Our semi-permanent couplers can include electrical and pneumatic connections. They are available with gangway support and impact absorbing elements to maximise safety during a collision.

MODULAR CONCEPT

Like our automatic couplers, Dellner semi-permanent couplers are designed around a modular approach. This makes them extremely flexible with more than 500 different options. It also ensures high availability of spare parts, short lead-times and lower maintenance costs.

Applications:
- Commuters
- LRV
- Metro
- People Movers
- HST

- MAXIMUM PERFORMANCE WITH SUPERIOR QUALITY AND SAFETY
- FAST DELIVERY AND HIGH AVAILABILITY OF SPARE PARTS
- SHORTER SERVICE AND MAINTENANCE TIME
- PROVEN IN ACTIVE USE WITH REFERENCES WORLDWIDE

INTERMEDIATE SYSTEMS / SEMI-PERMANENT COUPLERS
GANGWAYS

Our fully-synchronised intermediate systems can include a large variety of gangways, suitable for all applications. These are made from an exclusive, in-house silicone material which delivers enhanced durability, better fire resistance, and high noise attenuation.

We customise our gangways to suit your needs – meeting even the most demanding requirements, such as bespoke shapes and sizes, special colours and materials, unusual applications and operating environments, high tensile strength, and vandal-resistant implants.

Naturally, Dellner gangways are compliant with all significant international standards, and guarantee low maintenance costs for a low total cost of ownership.

Applications:
- Commuters
- Metro
- HST
- LRV
- People Movers
SERVICES

OVERHAULS
SPARE PARTS
UPGRADES & MODERNISATIONS
REPAIRS
MAINTENANCES
SERVICE CONTRACTS
TECHNICAL SUPPORT & TRAINING
MOBILE SERVICE CONTAINER
DELLNER SERVICE CENTERS
UTILISATION OF DIGITAL TECHNOLOGIES

“I travel to our customers whenever they need field service support. I treat every case individually and fix the issue in the shortest possible time. I’m happy to be part of maintaining the quality of products which are so crucial to the functioning and reliability of the whole train.”

Arkadiusz Bialas Service Technician DELLNER POLAND
To ensure the quality and integrity of our products throughout their life cycles, we recommend regular and comprehensive overhauls (every eight years for gangways, and every ten years for couplers).

During an overhaul, we carry out stringent checks on critical components, including repairs or replacements for worn or damaged components. Every critical component is taken apart, carefully repaired, and reassembled ready for service.

Benefits to you:
- REGULAR OVERHAULS AND COMPREHENSIVE REPAIRS
- MINIMAL ROLLING-STOCK DOWNTIME
- LOCALLY SERVICED TO THE HIGHEST STANDARDS

When unexpected repairs and replacements are needed, we understand that time is money, and downtime should be kept to a minimum. That’s why we keep a large number of spare parts for all types of product (both OEM and non-OEM) at each of our locations worldwide.

Benefits to you:
- HIGH AVAILABILITY AND RELIABILITY
- FAST SUPPORT ANYWHERE IN THE WORLD
- QUALITY SPARE PARTS HELD LOCALLY FOR ALL TYPES OF PRODUCT (BOTH OEM AND NON-OEM)
UPGRADES AND MODERNISATIONS

We understand the need to modernise fleets to keep up with changing demands, and reduce the high costs involved with fleet replacements. That’s why we offer upgrades to existing products, including function and technology upgrades which help modernise older rolling stock and keep trains safely in service for longer.

We provide:

- COMPETITIVELY-PRICED NEW PRODUCT FUNCTIONS
- LOWER MAINTENANCE COSTS
- LIFETIME PRODUCT FUNCTIONALITY
- SAFETY AND AVAILABILITY IMPROVEMENTS
REPAIRS

The application and usage of different train parts, as well as their exposure to environmental damage and accidents, can greatly affect their operational life.

We take each job on a case-by-case basis, maintaining the highest standards both on site and at our subsidiaries.

We provide:

- COMPETITIVELY-PRICED NEW PRODUCT FUNCTIONS
- LOWER MAINTENANCE COSTS
- LIFETIME PRODUCT FUNCTIONALITY
- SAFETY AND AVAILABILITY IMPROVEMENTS
MAINTENANCES

Every Dellner product comes with the reassurance of lifetime support. We recognise that our products can only perform to the highest standards with regular and proper maintenance. That's why we have a team of experienced service technicians who perform all works on-site, wherever you're located.

Benefits to you:
- ENHANCED QUALITY AND SAFETY
- REDUCED DOWNTIME
- FEWER MAJOR REPAIRS
- INCREASED PRODUCT LIFE EXPECTANCY
- REDUCED OVERTIME COSTS
- MORE PROACTIVE MAINTENANCE

SERVICE CONTRACTS

Dellner offers four maintenance agreements at fixed low prices: Dellner Bronze, Dellner Silver, Dellner Gold, and Dellner Customised Service. Each plan ensures fast and local maintenance, enhanced safety, and less downtime for your train fleet.

Customised – benefits include
- SPECIAL NEEDS OF DELLNER’S CUSTOMERS ARE THE BASIS FOR OFFERING CUSTOMISED SERVICE CONTRACTS

Bronze – benefits include
- FIXED PRICES BASED ON A YEARLY ANNUAL PURCHASE VOLUME
- FAST DELIVERY AND REPAIRS WITH GUARANTEED LEAD-TIMES
- LOCALLY HELD SPARE PARTS

Gold – benefits include
- ALL BRONZE AND SILVER BENEFITS
- ALL NECESSARY MAINTENANCE UPGRADES
- 24-HOUR SERVICE HOT-LINE
- “FIT AND FORGET” CONCEPT THAT ENSURES MAXIMUM AVAILABILITY OF THE TRAIN FLEET

Silver – benefits include
- ALL BRONZE BENEFITS
- YEARLY CHECK-UP
- OPTION OF EXTENDED WARRANTY
TECHNICAL SUPPORT AND TRAINING

The right training and support means products can be better maintained, which greatly reduces the risk of downtime. That’s why our experienced local staff are ready to support you with technical advice and training programs for your employees, tailored to your needs.

Benefits to you:
- LOCAL TECHNICAL ADVICE AND TRAINING
- EXPERIENCED SERVICE STAFF AND ENGINEERS
- COMPREHENSIVE PRODUCT MAINTENANCE KNOWLEDGE
- 24/7/365 SERVICE STAFF AVAILABILITY
MOBILE SERVICE CONTAINER

High rolling stock availability is one of your most important requirements. That’s why we offer Mobile Service Container – a combined mobile workshop and warehouse for both complete overhauls and general coupler repair work, all at your own location.

Our mobile workshop enables us to carry out works on-site for a quick turnaround, so your rolling stock can be back in service with minimum disruption.

On-site service also means customers save on unnecessary logistical and operational costs.

Mobile Service Container is based on a standard shipping truck which makes it highly mobile and available anywhere in the world.

The workshop is equipped with all the tools and equipment necessary for a complete overhaul, as well as most general and specific repair work.

Together with our mobile workshop, we also offer a mobile warehouse which contains all necessary spare parts for a quick overhaul or repair and is individually equipped for each job.
Our fully equipped workshops in Sweden, Poland, the UK, France, Italy, Germany, China, Australia, India, Malaysia, Brazil, and the US offer customers the highest quality services to ensure expectations are always met.

Our Service Centers carry out modernisations, renovations, overhauls, and upgrades on existing couplers and gangways.

We produce the majority of the components we use in our products in-house, which makes us highly flexible and able to meet short lead-times. And thanks to fast delivery and high part availability, our Service Centers guarantee shorter rolling-stock downtime for our customers.

Our competitive prices and close customer cooperation ensure we carry out renovations efficiently and get them right first time. What’s more, our focus on quality at every stage of the manufacturing process – as well as thorough product testing – helps provide our customers with complete passenger safety assurance.

All Dellner customers benefit from:

• High-availability service center – open seven days a week, all year round
• Modern facilities – focused on flexibility and turnaround speed
• Experienced teams – who focus on customers’ needs
• Competence center – for both OEM and non-OEM products
UTILISATION OF DIGITAL TECHNOLOGIES

Dellner applies new technologies to our products and services in a highly deliberate manner, selecting those that maximise the value to customers. Two such technologies are Additive Manufacturing and Remote Diagnostics.

Remote Diagnostics with Dellner ConneXion & Monitoring (DXM)

Dellner's Train Connection Systems are critical safety components on trains. Through Remote Diagnostics the safety and reliability can be continuously measured, while the life cycle costs can be improved through Condition Based Maintenance. Dellner decided to develop a platform-independent solution with DXM which can be integrated into the existing software system used in the fleet. Operational data and signals linked to our Crash Energy Management System can be accessed remotely. Immediate actions can be taken in close co-operation between our engineers and the operator. Services can be customised to the actual usage of the coupler; DXM is currently being tested to work with various platforms and will be available soon – as a retrofit or built into new couplers. For questions and to sign up for a trial, please contact us at digital@dellner.com.

Additive Manufacturing – 3D Printing of mock-ups

In order to shorten the time from the request to delivery of the product, Dellner uses their own 3D printers to create mock-ups for an early validation of the design. This has proven valuable on many occasions, specifically when testing new parts for modernisation projects in Dellner Service. There is often no 3D data of the train available and only by testing it in the real environment can the design be validated. In the shortest possible time, the parts designed can be printed and assembled to the coupler in the actual working environment. From this point, it is just a small step to deliver the final product with the perfect fit. Dellner is closely following the progress of additive manufacturing methods and contributing to the qualification of 3D in the supply of spare parts to the railway industry.
REFERENCE PROJECTS

NEW SALES

CORADIA POLYVALENT, p. 66  IEP, p. 62  C30, p. 68  SOUND TRANSIT 2, p. 75

MOSCOW METRO, p. 72  RIYADH, p. 74  AVENTRA PLATFORM, p. 64
IEP

Producer: Hitachi
Operator: First Great Western and East Coast, UK

The Intercity Express Programme (IEP) is an important step change in train travel in the UK. IEP provides an efficient means for passengers to travel on electrified and non-electrified routes, and enhances the customer experience with more modern trains, better interiors and seating arrangements, and of course, faster journey times. Hitachi Rail Europe is the supplier of new electric and bi-mode trains for both the Great Western Main Line and the East Coast Main Line.

Dellner supported Hitachi by supplying products for 122 train sets, equivalent to 1,488 gangways, 244 automatic and 1,488 semi-permanent couplers, and 244 adapter sets.

Dellner provided technical assistance to Hitachi for VAB (Vehicle Acceptance Body) approved supplied components.

**MAIN FEATURES:**

**Automatic coupler**
- MECHANICAL COUPLER: TSI-COMPLIANT TYPE 10
- CENTRE SECTION: GAS-HYDRAULIC DAMPER
- PIVOT ANCHOR: DEFORMATION UNIT FOR CRASH ABSORPTION
- TOTAL ENERGY ABSORPTION FOR THE COUPLER: 1.6 MJ
- SIGNIFICANT CONTRIBUTION TO THE TOTAL TRAIN CRASH MANAGEMENT SYSTEM WITH DAMPERS, DEFORMATION UNITS AND SHEAR-OFF FUNCTION
- TOP-MOUNTED ELECTRICAL COUPLER INCLUDING 100 Mb ETHERNET CONNECTION
- PNEUMATIC CONNECTIONS FOR MAIN AIR AND BRAKE AIR

**Semi-permanent coupler**
- MECHANICAL COUPLER: MANUAL SOCKET JOINTS
- CENTRE SECTION: STIFF TUBE
- PIVOT ANCHOR: DEFORMATION TUBE
- TOTAL CAPACITY OF 2 MJ/CONNECTION
- SIGNIFICANT CONTRIBUTION TO THE TOTAL TRAIN CRASH MANAGEMENT SYSTEM WITH DEFORMATION UNITS AND SHEAR-OFF FUNCTION
- GANGWAY SUPPORT

**Gangway**
- 2-PIECE, DOUBLE-SKIN GANGWAY FOR OPTIMISED PERFORMANCE
- CUSTOM-MADE GANGWAY TO COPE WITH VERY LARGE MOVEMENTS
- COMPLIANCE WITH THE VS6853:1999 CATEGORY 1B AND TS EN 45545-2 FIRE & SMOKE REQUIREMENTS
- NOISE ATTENUATION LEVEL GREATER THAN 37 dB
- EXCELLENT AESTHETICS BOTH INSIDE AND OUT
- ABLE TO SPAN LARGER INTER-VEHICLE DISTANCES
- SMALL INSTALLATION FOOTPRINT TO VEHICLE END
- PROVIDES DESIGN LATITUDE BETWEEN COUPLER HEIGHT AND FLOOR LEVEL
- HIGH STABILITY AGAINST PRESSURE PULSE
AVENTRA PLATFORM

Producer: Bombardier
Operator: South Western Railway

Dellner has received an order for 1500 couplers from Bombardier Transportation. The couplers will be fitted to 90 AVENTRA trains (750 carriages) which Bombardier supplies to FirstGroup and MTR, for operation on the South Western Railway franchise in the United Kingdom. This is the largest ever single global contract for AVENTRA trains, and Dellner now has orders for a total of 406 trainsets for the AVENTRA platform.

MAIN FEATURES:

Automatic coupler
- MECHANICAL COUPLER: TYPE 12
- BOTTOM-MOUNTED ELECTRICAL COUPLER
- GAS-HYDRAULIC DAMPER
- SHEAR-OUT DEVICE WITH COMPACT DESIGN

Intermediate automatic coupler
- MECHANICAL COUPLER: TYPE 12
- GANGWAY SUPPORT PLATE
- CAMERA INTERFACE FOR DRIVER COUPLING SEQUENCE OVERVIEW
- BOTTOM-MOUNTED ELECTRICAL COUPLER
- GAS-HYDRAULIC DAMPER
- REAR-MOUNTED DEFORMATION TUBE

Semi-permanent coupler
- PATENTED SOCKET JOINT CONNECTION
- DEFORMATION TUBE
Alstom uses Dellner automatic couplers with spherical rubbers and semi-permanent couplers with EFG3 for its PP project in Algeria. The project involved building 17 train sets for national rail operator SNTF (Société Nationale des Transports Ferroviaires).

The trains are based on the Coradia Polyvalent design used by French operator SNCF and adapted to operating conditions in Algeria. The Algerian Coradia Polyvalent features electro-diesel operation (25 kV) and can achieve speeds up to 160 km/h.

With a total length of 110 metres, the train consists of six carriages, with capacity for 265 passengers, and will be used for long-distance services from Algiers to Oran, Béchar, Constantine, and Annaba.

**Main Features:**

**Automatic Coupler:**
- MECHANICAL COUPLER: TYPE 10
- TOP MOUNTED ELECTRICAL COUPLER (2 X 84)
- GAS-HYDRAULIC DAMPER (100 mm STROKE)
- VERTICAL SUPPORT AND CENTRING
- SPHERICAL RUBBER BEARING PIVOT ANCHOR
- BP, MRP, UC VALVES
- COUPLER CENTRAL UNIT
- ADDITIONAL SAND PROTECTION FOR GAS-HYDRAULIC BUFFER
- ADDITIONAL AIR CONNECTIONS FOR RESCUE OPERATIONS
- CABLE SUPPORT
- REMOTE AND MANUAL UNCOUPLING

**Semi-Permanent Coupler:**
- PIVOT ANCHOR: EFG3
- DEFORMATION UNIT IN CENTRE SECTION. SPLIT OF THE INTERFACE BETWEEN DEFORMATION UNIT AND PIVOT ANCHOR
- AIR CONNECTION ATTACHED TO CORE TUBE OF THE DEFORMATION UNIT
C30 STOCKHOLM

Producer: Bombardier Transportation
Operator: SL (Stockholms Lokaltrafik), Sweden

Bombardier customised the new high-technology MOVIA C30 Metros to meet the specific requirements of Stockholm’s lines for accessibility, reliability and passenger comfort. Dellner’s high-quality couplers and gangways are crucial to Bombardier in fulfilling these needs. A heavy focus is placed on integrating the gangways into the vehicles by following the interior design and external profile. It also provides a good aesthetic impression for traveling passengers.

Finally, specially designed adaptations of the coupler interfaces were made in order to support the mounting process of the couplers on the vehicles.

MAIN FEATURES:

Automatic coupler
• MECHANICAL COUPLERS: TYPE 330
• CENTRE SECTION: DEFORMATION TUBE
• PIVOT ANCHOR: EFG3
• BOTTOM-MOUNTED ELECTRICAL COUPLER
• HIGH-SPEED DATA TRANSMISSION
• MECHANICAL COUPLER COMPATIBLE WITH DELLNER COUPLERS ON EXISTING C20 SERIES TRAINS
• MODULAR DESIGN

Semi-permanent coupler
• CENTRE SECTION: DEFORMATION TUBE
• PIVOT ANCHOR: EFG2
• MODULAR DESIGN

Gangway
• GANGWAY WITH COUPLER SUPPORT
• SILICONE RUBBER TWIN-WALLED BELLOWS WITH COMBINED LOWER SKIRT
• ALUMINIUM VEHICLE MOUNTING FRAMES WITH BOLTED CONNECTION
• ALUMINIUM CENTRE FRAME RESTING ON THE COUPLER SUPPORT PLATE WITH POLYMERIC BEARING MATERIAL INTERFACE SURFACE ON THE BOTTOM OF THE CENTRE FRAME
• FIXED STAINLESS STEEL TREAD PLATES MOUNTED TO VEHICLES AND OVERLAPPING FLEXIBLE TREAD PLATES ATTACHED TO THE CENTRE FRAME
KLANG VALLEY

Producer: Rotem
Operator: MRTCorp.

The Klang Valley MRT2 metro system is a major infrastructure project designed to develop the urban transit system in the Greater Klang Valley area of Malaysia. Malaysian law requires that trains and critical sub-system assemblies must be built using a local workforce and components. That’s why Dellner has worked with Hyundai-Rotem to build its couplers at a new facility at Selangor.

This is our first facility in Malaysia and gives us an increased presence in the region to provide customers with a higher level of service and product support.

MAIN FEATURES:

Automatic coupler
- MECHANICAL COUPLER: TYPE 35 WITH REMOTE UNCOUPLING, AND COACH-SIDE EMERGENCY UNCOUPLING FOR EASY ACCESS
- MRP, BP, AND UC VALVES
- SMALL, TOP-MOUNTED ELECTRICAL COUPLER
- DOUBLE-ACTING GAS HYDRAULIC DAMPER
- PNEUMATIC CENTRING
- PIVOT ANCHOR: EFG3

Semi-permanent coupler
- MECHANICAL COUPLER: SOCKET JOINT TYPE
- GANGWAY SUPPORT
- PNEUMATIC CONNECTION FOR MAIN AND BRAKE AIR
- GAS-HYDRAULIC DAMPER
- PIVOT ANCHOR WITH ELASTOMER ELEMENTS FOR BUFF AND DRAFT ABSORPTION

Front hatch
- AUTOMATIC OPENING SEQUENCE
- PNEUMATICALLY ACTUATED
- INDEPENDENT EMERGENCY MODE ACTIVATION IN THE EVENT OF COMPRESSED AIR LOSS
With its 222 stations spanning 14 lines and 380 km of track, the Moscow Metro is one of the longest metro systems in the world and transports more than seven million people every day.

Dellner couplers were chosen for the new Moscow Metro 81-765/766/767 “Moskva” rolling stock, which entered operation in 2016. Dellner delivers 408 automatic couplers (without a mechanical head) and 2676 semi-permanent couplers for the Metro.

Like our entire coupler range, safety is always at the fore. That’s why a composition of our couplers creates a complete Crash Management System for additional comfort and protection.

**MAIN FEATURES:**

**Automatic coupler**

- CENTRE SECTION: DEFORMATION TUBE
- PIVOT ANCHOR: FRONT MOUNTED EFG2
- CENTERING DEVICE AND SUPPORT SYSTEM
- TWO PNEUMATIC CONNECTIONS

**Semi-permanent coupler**

- MECHANICAL COUPLERS: MANUAL SOCKET JOINTS
- CENTRE SECTIONS: DEFORMATION TUBE AND STIFF TUBE
- PIVOT ANCHORS: FRONT MOUNTED SPHERICAL RUBBER BEARING / EFG2
- TWO PNEUMATIC CONNECTIONS
RIYADH

Producer: Alstom
Operator: Arriyadh Development Authority

As part of the FAST consortium, Alstom has supplied 69 Riyadh-based “Metropolis” trains for lines 4, 5, and 6 of the city’s metro system. They’re comprised of two cars per set and are 36 metres long.

Sound transit 2

Producer: Siemens
Operator: Sound Transit

Dellner has provided couplers for new S70 light rail vehicles (LRVs) for Sound Transit, the regional transit system serving the Seattle and Central Puget Sound area in Washington, US.

It’s part of a package of 448 automatic couplers for three projects in Seattle, San Diego, and Minneapolis, to be delivered by 2023.

**MAIN FEATURES:**

**Automatic coupler**
- MECHANICAL COUPLER: TYPE 330
- TOP-MOUNTED ELECTRICAL COUPLER (2 X 84)
- DEFORMATION UNIT IN CENTRE SECTION
- PIVOT ANCHOR: EFG3 WITH INTEGRATED VERTICAL SUPPORT
- CENTRING DEVICE WITH MECHANICAL SPRINGS
- MRP AND UC VALVES
- COUPLER CONTROL UNIT
- REMOTE AND MANUAL UNCOUPLING

**Semi-permanent coupler**
- PIVOT ANCHOR: BACK-MOUNTED EFG3
- TEMPORARY VERTICAL SUPPORT
- HALF AND HALF DEFORMATION UNIT AND STIFF TUBE
- ADDITIONAL ATTACHMENTS FOR GANGWAY SUPPORT AND AIR CONNECTIONS
- PATENTED SOCKET JOINT CONNECTION
REFERENCE PROJECTS

DELLNER SERVICE

LONG-TERM SERVICE AGREEMENT, p. 82

COUPLER UPGRADE AND MODERNISATION, p. 80
Delhi Metro’s 70 RS 1 trains have been in uninterrupted service since December 2002. Despite 16 years of high performance, extremely hostile conditions such as heat (up to 45°C), dust, and humidity (more than 90% in the rainy season) were starting to have an impact on gangway integrity.

The overhaul involved replacing the old gangway rubber – including the inner and outer bellows. To keep costs low, metal components from the old gangway were reconditioned and reused.

Thanks to the overhaul, Delhi Metro has seen:

- **Cost savings** – by refurbishing the gangway and reconditioning old components
- **Enhanced performance** – without the need for new units
- **Improved aesthetics** – thanks to new rubber and reconditioned components
COUPLER UPGRADE AND MODERNISATION

Customer: Different
Location: Poland
Product: Non-OEM coupler
Activity: 667 automatic couplers and 250 semi-permanent couplers

Since 1997, Dellner Poland has been working with the Polish National Railway (PKP) to modernise its electric multiple unit (EMU) couplers—including the EN57 and ED72—which were more than 30 years old and under-performing. The first modernisation program was completed in 1998, and after 10 years in operation, quality and performance tests showed minimal wear had taken place on all coupler components.

Following this, Dellner successfully applied for a Certificate of Approval from the Polish Office of Rail Transportation to modernise its automatic couplers, followed by semi-permanent couplers a few years later.

To date, Dellner Poland has modernised hundreds of couplers for various Polish operators, which has helped them to:

- **Reduce costs** – compared to the time and expense of purchasing new rolling stock, and lower maintenance costs
- **Improve on-board facilities** – such as Ethernet connectivity, CCTV, passenger information, and advertising
- **Increase flexibility** – during peak hours when speed and capacity is essential
- **Boost efficiency** – due to fewer service interruptions and better fleet utilisation
As the exclusive supplier of services and spare parts for couplers and gangways on the Queensland New Generation Rolling Stock (QNGR) fleet in Brisbane, Australia, Dellner's programme involves overhauling its couplers every 10 years and its gangways every 15.

Dellner is committed to giving Bombardier:

- **Scheduled overhauls** – including maintenance and urgent support services
- **Shorter lead times** – for spares and stores management
- **Comprehensive training** – including evaluation and instruction
- **Thorough investigations** – for condition monitoring, analysis, and modification
- **Cost-saving initiatives** – shared across the partners
- **Local and prompt support services** – for its fleet and personnel

The benefits for Bombardier include:

- **More consistent standards and procedures** – for the entire life of the product
- **Reduced unit downtime** – which helps to keep down costs
- **Increased efficiency** – due to improved design and maintenance over the life of the partnership
- **One source of truth** – to keep all maintenance data safe, correct, and uninterrupted
- **Fixed costs** – for accurate maintenance planning expenditure
- **Proactive schedules** – to reduce unplanned maintenance and additional costs
- **Optimised fleet** – for a better customer experience
CORPORATE
SOCIAL RESPONSIBILITY

FOR DELLNER, SUSTAINABILITY IS A KEY SUCCESS FACTOR

We actively search for ways to incorporate sustainability everywhere our business has an impact, making decisions based around our core values: Respect, Action, Joy and Team. We take responsibility for our business decisions by considering the consequences from economic, technical, social, and ecological standpoints.

SOCIAL RESPONSIBILITY

We recognise we have a social responsibility to our communities, including occupational safety, preventative healthcare, and support for social projects at our sites. For example, we run health promotion campaigns and offer financial support to children’s homes, poor households, people with severe illnesses, and many more. We also support DKMS in Germany to encourage people to register on the donor-matching database to help find ‘genetic twins’ for people with blood cancer.

ENVIRONMENTAL RESPONSIBILITY

We continuously improve our processes to minimise our impact on the environment – optimising environmental performance, preventing pollution, and using resources more efficiently, including energy, water, packaging and other raw materials.

WORKING ENVIRONMENT

At Dellner, we create working environments where our employees can develop and thrive in a climate of physical and emotional wellbeing. To minimise accidents and illnesses, we take a structured approach to investigating, conducting and monitoring operations, helping us achieve a sound working environment.

EQUALITY

We do not discriminate between genders with regard to salary, career advancement or promotions. All employees are given equal opportunities for professional development, both within their existing fields and in new areas.

DIVERSITY

We take active measures to promote the equal rights and opportunities of our employees in the workplace. We believe in equality regardless of race, nationality, ethnicity or religious beliefs, as this creates better conditions for an innovative and inspiring work environment.
GREAT SUCCESS WITH GREAT PEOPLE

Dellner has been a part of the rail business for more than 78 years. Throughout this time, we have focused on innovative research and advanced design, resulting in several significant breakthroughs for the rail industry as a whole.

We have opened 22 subsidiaries and branches around the world which are dedicated to serving our customers with new products and services. This success is based on our most valuable resource – our people.

OUR PEOPLE, YOUR BENEFIT

We have more than 1000 employees around the world and we know that people only give their best if they are comfortable in their job and feel understood. That’s why Dellner focuses on mutual appreciation and dialogue beyond cultural boundaries.

Dellner’s headquarters are located in Sweden and the way we run our company is based entirely on the Swedish style of management, where the employee is the most important asset and has freedom of action at work. We trust our people and they trust Dellner.

We know that only satisfied employees can be creative, innovative, and dedicated to their work, which directly influences all areas of our business – and means we can serve you better.

OCCUPORTUNITY = DEVELOPMENT

There are many different ways of motivating employees to work efficiently. At Dellner, we achieve this by challenging our people and giving them opportunities for further development.

Fulfilment at work is one of the best drivers in life. That is why we like to surround ourselves with contented people who are motivated to give great service, create outstanding products, and help us accomplish our business goals.

NO BOUNDARIES, ONLY STRONG CONNECTIONS

Dellner benefits from having subsidiaries around the world – and our customers do too. Whenever we are working on special projects, we create international groups from different departments which can look at each topic from varied points of view. It helps us to investigate more ideas and to reach a solution in a shorter time. This approach also gives our people the opportunity to create bonds with coworkers from other countries, and gain a better understanding of other cultures and ways of working.

CONSTANT IMPROVEMENTS

In order to keep improving our products and services, and make breakthroughs, we need to keep learning. We invest in our people, and encourage them to think about new concepts, and challenge the knowledge they gain.

Work-related training and professional courses are an important part of our continuous improvement, and we also arrange regular knowledge-sharing meetings which strengthen our skills in areas like sales, procurement, marketing, and logistics – and prepare us for our next challenges.

THINKING OUTSIDE OF THE BOX

Dellner is an intelligent and professional organisation, with a passion for producing innovative solutions and high-quality Train Connection Systems. That’s why we remain so dedicated to research and development, and to recruiting highly creative and innovative people.