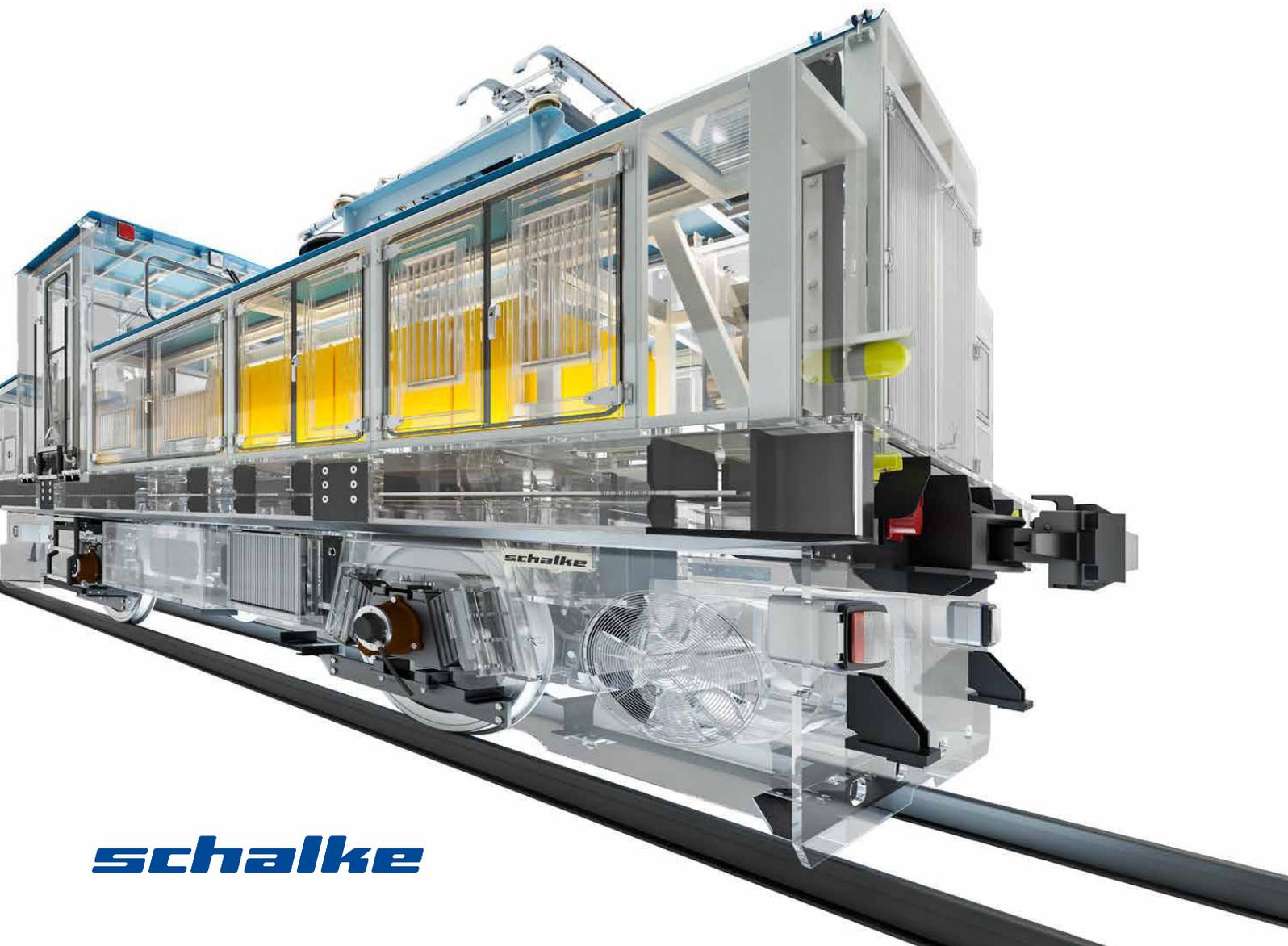


# KEEP YOUR BUSINESS ON TRACK



## SCHALKE LOCOMOTIVES FOR SPECIAL PURPOSES

The ultimate specialists and uniquely developed to suit exacting customer requirements, these locomotives offer a high power density under extreme conditions and can be custom-built for demanding traction tasks in industry or ports. Here too, the Modu-Trac design concept featuring exchangeable traction modules plays a key role.



One of the most modern in Europe:  
the ThyssenKrupp Schwelgern  
steel plant in Duisburg

# MMT-S-400-BDE

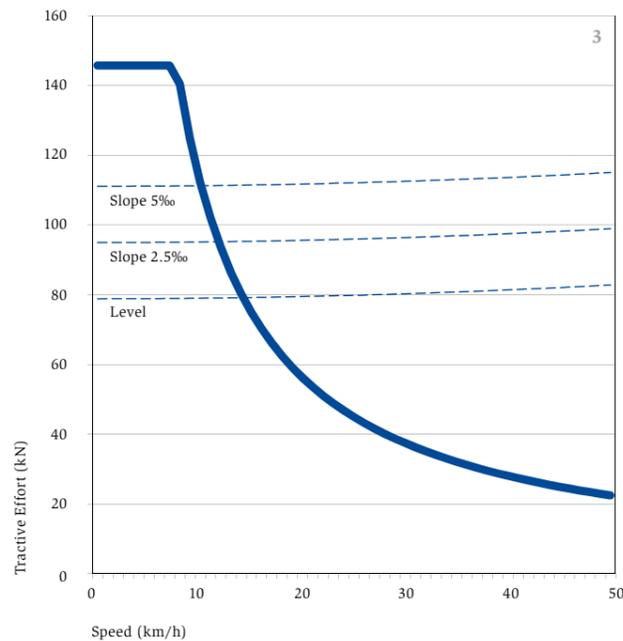
MODULAR SHUNTING LOCOMOTIVE  
FOR INDUSTRIAL AND PORT USE

Efficient logistical processes and the smooth distribution of goods in industry, freight depots and ports as well as compliance with the latest environmental standards are fundamental requirements for today's rolling stock fleet operators. Robust, reliable locomotives are called for, capable of continuous operation on a wide range of assignments. At the same time they need to be flexible and designed to meet the needs of the future, which means firstly being able to comply with increasingly restrictive requirements and secondly being equipped to handle new technological developments.

With these points in mind, Schalke has developed a specially adapted locomotive concept. The ModuTrac locomotive is modularly designed and equipped with quickly exchangeable power modules, enabling it to switch from one mode of traction to another, from diesel to battery operation for example. This ability makes the locomotive extremely flexible to use and means it can also be operated with the technologies of the future. The modular design is made possible by state-of-the-art inverter technology. The ModuTrac locomotive can be manufactured either as a

compact two-axle unit approximately 8 metres long or as a 17-metre, high-performance, four-axle version with correspondingly greater traction capability. With tractive effort between 150 and 390 kN and a maximum speed of 60 km/h, this locomotive provides the right solution for every purpose. Its ergonomically designed cab provides a good all-round view and can be optionally fitted with a camera to ease coupling procedures.

- Robust, modular design
- Various traction concepts available
- Future proven through exchangeable modules
- Designed for maximum efficiency and reliability
- Optional accessories such as radio remote control, train radio communication or air conditioning



1 Short and compact: this locomotive is ideal for intensive shunting work.

2 Four axle version.

3 Tractive Effort Diagram and  
- - - Resistance Curve for  
Hauling capacity: 600 t  
Curve radius: 50 m  
Example:  
two-axle locomotive with  
390 kW and a weight of 45 t

## Technical data

 <b>Power Modules</b> Diesel-Powerpack, Battery-Powerpack	 <b>Length</b> 8,000 / 17,000 mm
 <b>Power Transmission</b> AC	 <b>Width</b> 3,000 mm
 <b>Weight</b> 40-45 t / 80-90 t	 <b>Height</b> 4,250 mm
 <b>Axle Arrangement</b> Bo / Bo'Bo'	 <b>Maximum Speed</b> 50 / 60 km/h
 <b>Track Gauge</b> 1,000-1,600 mm	 <b>Tractive Effort</b> 150 / 390 kN (at $\mu = 0.33$ )
 <b>Power</b> 390 / 1,800 kW	



## GMF 4/4 287

### DIESEL-ELECTRIC LOCOMOTIVE

Schalke developed the four-axle GMF 4/4 287 diesel-electric locomotive especially for the needs of the “Infrastructure” department of Switzerland’s Rhaetian Railway. Its design fulfils a broad range of basic requirements for special circumstances, as the railway has a narrow loading gauge (tunnel gauge) and a low axle load of 16 tonnes. The narrow, metre-gauge track gauge includes small curve radii as tight as 40 metres. The locomotive is particularly suitable for high-altitude areas with steep slopes of 70‰ as an adhesion railway. Moreover, it is reliable under extreme climatic conditions: its application range stretches from temperatures of -35 °C to +40 °C and it even runs on fine, crystalline snow.

The implementation of these technical challenges has been combined with the integration of numerous specific components. For example, the locomotive is fitted with four different types of brake system, possesses the ability to run in multiple unit operation of up to three locomotives and is capable of a maximum speed of 100 km/h.

The official operating authorisation granted by the Swiss Federal Office of Transport (Schweizer Bundesamt für Verkehr - BAV) also makes this diesel locomotive unique on the market.

Its main duties comprise the transportation of heavy construction trains or special-purpose trains, even if the catenary wire is switched off, the operation of snow blowers in the winter, the rescue of trains that have broken down and shunting in various districts.

#### In use by Rhaetian Railway

Rhaetian Railway operates locomotives on spectacular routes, some of which are under UNESCO World Heritage protection. The routes feature very tight curve radii and extremely steep ascents and descents.

- High power density with 1,800 kW, low axle load and small loading gauge
- Designed to withstand extreme conditions such as cold and steep gradients
- Newly developed bogie for maximum speed of 100 km/h and small curve radii as tight as 40 metres
- Integration of four different brake systems

#### Technical data



**Power Module**  
Diesel Engine



**Length**  
16,690 mm



**Power Transmission**  
AC



**Width**  
2,650 mm



**Weight**  
64 t



**Height**  
3,885 mm



**Axle Arrangement**  
Bo'Bo'



**Maximum Speed**  
100 km/h



**Track Gauge**  
1,000 mm



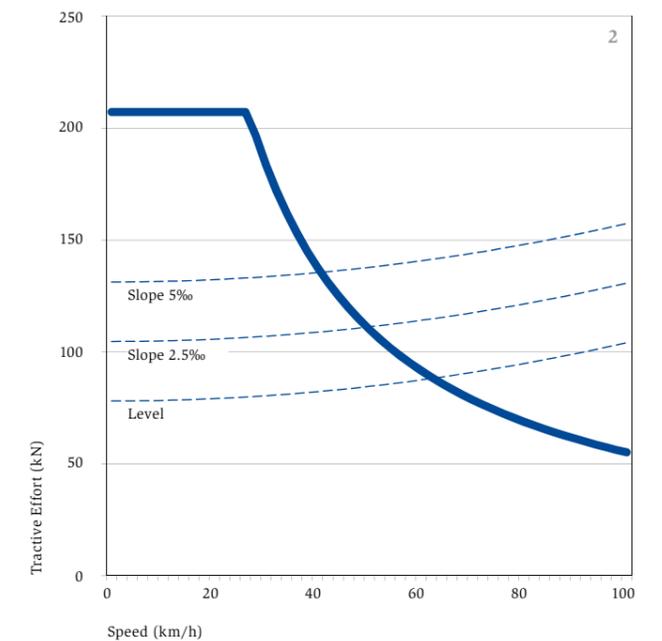
**Tractive Effort**  
210 kN (at  $\mu = 0.33$ )



**Power**  
1,800 kW

1 Versatile for the mountains: universal locomotive in use by Rhaetian Railway in Switzerland

2 Tractive Effort Diagram and Resistance Curve for ---  
Hauling capacity: 1,000 t  
Curve radius: 100 m



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