



Rail

POWERPACK SERIES 1600 – 1800 EU STAGE V SERIES 4000 EU STAGE V



A Rolls-Royce
solution

Engines and PowerPacks to drive your future: our solutions for EU Stage V

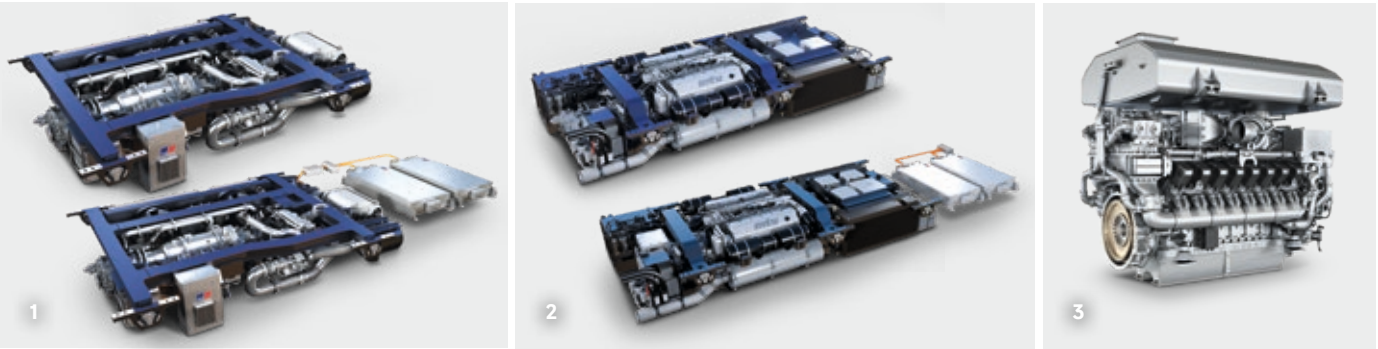
With increasingly stringent emission standards the rail industry is facing major challenges. Vehicle manufacturers, rail operators and other players are having to respond ever more quickly, and with ever-increasing agility, to emissions- and noise-sensitive environments, while at the same time maximizing equipment availability.

Under challenging circumstances like these, it pays to have a strong partner by your side—a partner who thinks ahead and focuses on achieving sustainable success for your business above all else. By presenting our green drive solutions portfolio as EU-Stage-V-ready, we take the next logical step. Not only are all new MTU PowerPacks available as Hybrid solutions, but our modular strategy sets the stage for continuous improvements without alterations to the MTU PowerPack footprint. The Series 4000 is our masterpiece for the locomotive segment. This engine is always one step ahead of the future: the first engine in its class with EU Stage IIIB certification in 2012 –and now EU-Stage-V-ready. Available in 12V and 16V cylinder configurations, this engine provides clean power and pure profitability in all conditions. All drive solutions are ready to repower your equipment, helping you extend the life of your investment.

- 1 MTU PowerPack Series 1800/Hybrid Solution
- 2 MTU PowerPack Series 1600/Hybrid Solution
- 3 Series 4000 R04

Series		MTU PowerPack Series 1800	MTU PowerPack Series 1600	Series 4000 R04
Configuration		6H	12V	12V, 16V
Rated power	kW	315 - 375	565 - 736	1500 - 2400
	bhp	422 - 503	758 - 987	2012 - 3218
Rated speed	rpm	1800	1900	1800
Bore/stroke	mm	128/166	122/150	170/210
Bore/stroke	in	5.0/6.5	4.8/5.9	6.7/8.3
Displacement	l	2.14	1.75	4.77
	cu in	130	107	291
Emissions technology		SCR + DPF	SCR + DPF	EGR + DPF
Emission		EU Stage V*	EU Stage V*	EU Stage V*

* available 2021 Specifications are subject to change without notice.



PowerPacks for underfloor/roof mounting - Series 4000 for engine room installation

DESIGNED FOR THE FUTURE. BUILT FOR YOUR SUCCESS.

The PowerPack: Compact. Modular. Flexible.

The MTU PowerPack is an innovative drive system that seamlessly combines all individual system elements into a single, functional unit mounted on a supporting frame. All our modular MTU PowerPacks in the future will be Stage V-ready – allowing for continuous development and improvement without alterations to the footprint. Every MTU PowerPack can be individually configured, including hybridization. The drive system itself, as well as MTU EnergyPacks, are designed for underfloor or roof installation, and are characterized by their particularly flat design. We supply all four types of power transfer: diesel-electric, diesel-mechanical, diesel-hydraulic and hybrid solutions. Every MTU PowerPack can be individually configured.

PowerPack key benefits at a glance:

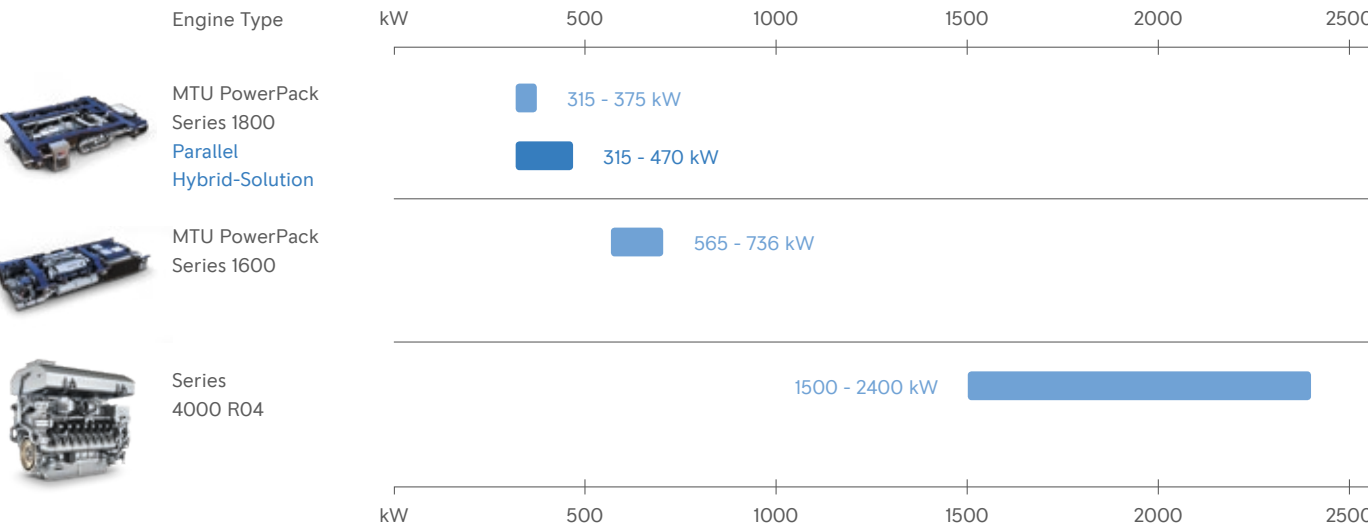
- Scope for individual configuration; flexible and standardized interface solutions
- Continuous development and improvement without alterations to the footprint
- Low operating costs
- High performance efficiency
- Lowest fuel consumption
- Minimal exhaust emissions
- Long service life and excellent reliability
- Simple maintenance
- High level of availability
- Minimal resource requirement thanks to plug & play design
- Ready for repowering projects: extend the life of your investment

The Series 4000 R04:

Always one step ahead of the future. The Series 4000 was the first rail engine in its class with EU Stage IIIB certification in 2012 – and now EU-Stage-V-ready. With its superb mix of key in-engine and post-combustion technologies, the Series 4000 is on track to continue as one of the world's most fuel-efficient, environmentally friendly and reliable locomotive engines. A compact, highly economical powerhouse that really goes the distance. The Series 4000 has proven itself thousands of times over, and like it's predecessors, the latest edition is a force to be reckoned with. Working for you. And for the environment.

Series 4000 key benefits at a glance:

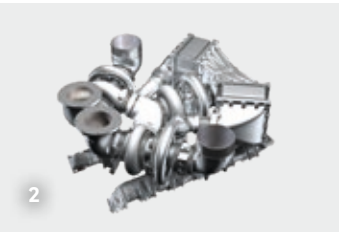
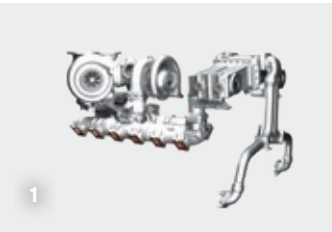
- EU-Stage-V-ready
- Reliable performance: in all conditions
- Clean power – pure profitability
- Identical footprint to the previous model (EU Stage IIIB)
- Ready for repowering projects: extend the life of your investment



KEY TECHNOLOGIES FOR THE REDUCTION OF EMISSION AND CONSUMPTION.

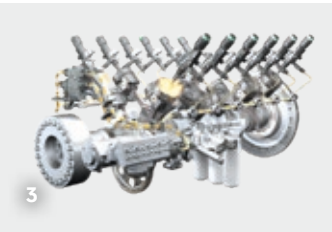


Engine model		Exhaust Gas Aftertreatment		Internal Emission Technology		
		SCR	DPF	EGR	2st Turbocharging	Advanced CR
Railcar	Series 1800	■	■			
Railcar	Series 1600	■	■			■
Locomotive	Series 4000		■	■	■	■

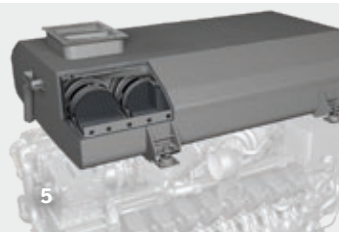
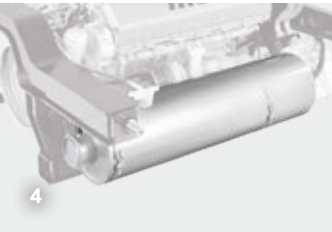


1 Enhanced common rail injection
We have been using common rail systems successfully for over 20 years now. Our systems capability means we're able to exploit potential during the combustion process to help make engines especially clean and economical.

2 Two-Stage Turbocharging
Turbocharging enables our engines to achieve low fuel consumption, lowest emissions and high power output across a wide speed range. Turbochargers are finely adjusted to suit the demands on the engine in terms of cost-effectiveness, performance, dynamic response and service life. Space-saving integration of turbochargers into the engine brings the customer the added benefits of compact design.



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4 Selective Catalytic Reduction (SCR)
The SCR system can remove more than 90% of nitrogen oxides from exhaust gas. In SCR development, We have primarily focused on low fuel consumption and a low space requirement for SCR components.

5 Diesel Particulate Filter (DPF)
Our Diesel Particulate Filters are capable of lowering soot emissions to levels that in some cases are well below the statutory limits. Statutory limits form part of the emissions concept.