

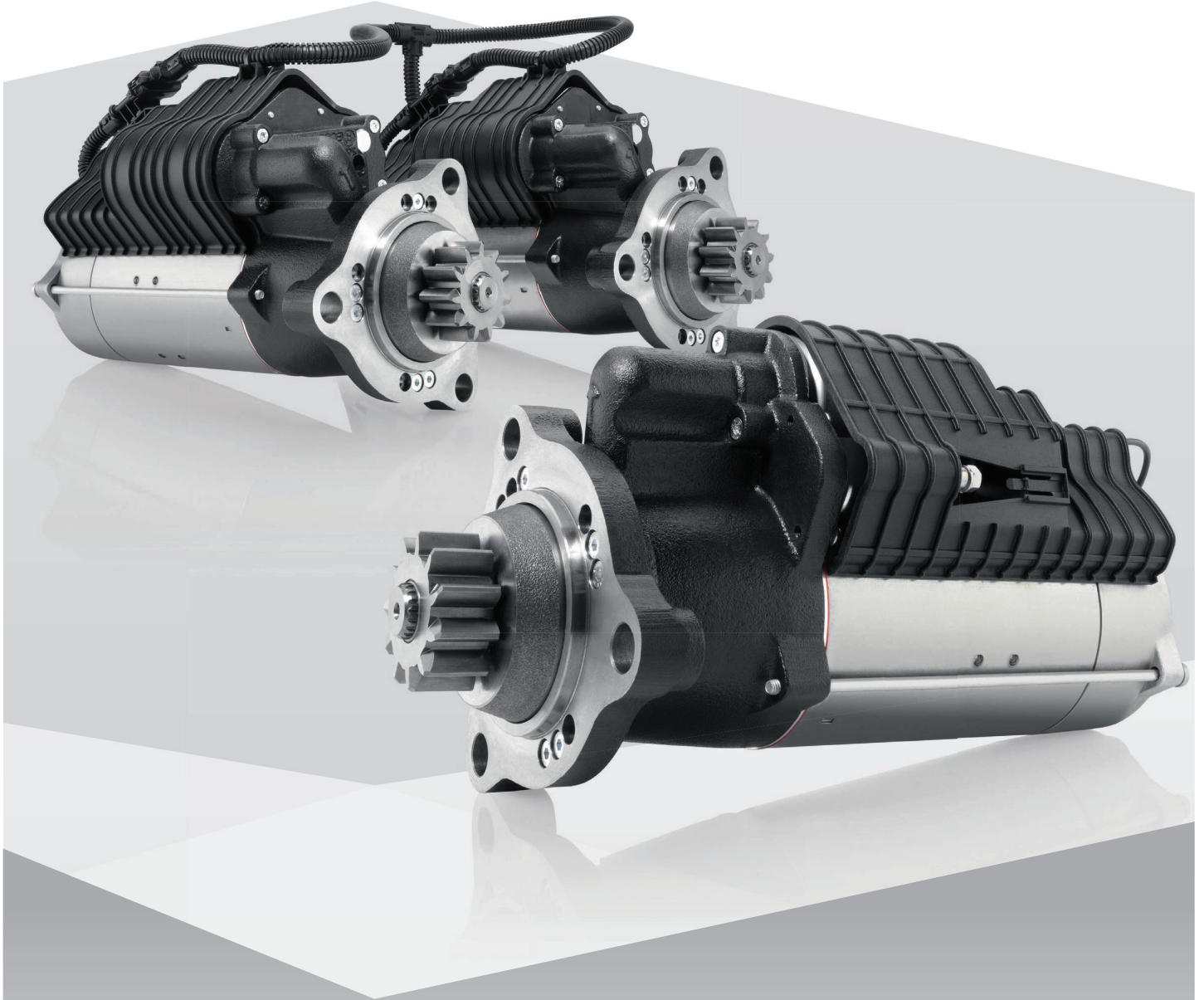


**BOSCH**

Invented for life

# HEF/HEP 109 STARTERS

**Bosch heavy-duty off-highway starters  
for top starting performance**



**WE ARE AN OFFICIAL OFF-HIGHWAY  
SALES PARTNER FOR BOSCH!**

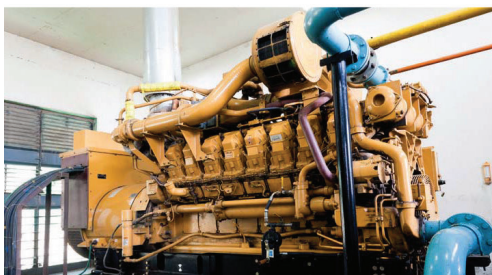
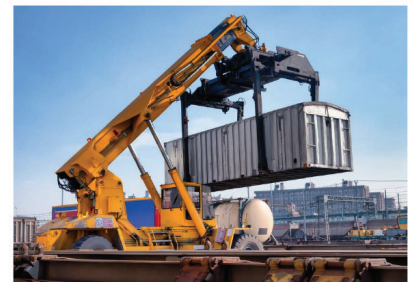


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TRY SOME

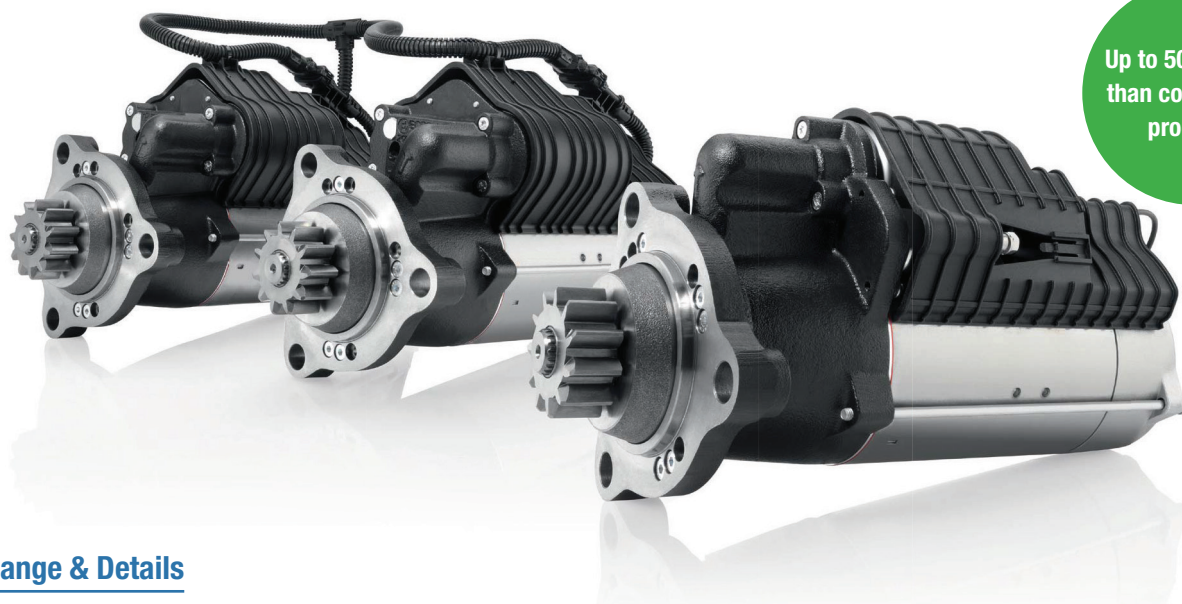
**TRY SOME**  
AUTO-ELECTRICAL ENGINEERING

**Overview**

**Around the world, large-displacement engines are used for ore mining, decentralised supply of electric energy, construction machinery, agricultural vehicles as well as marine and railway vehicles.** Whether displacements of up to 180 ℓ, high-thermal loads, or applications with additional hydraulic loads, Bosch HEF 109 starters ensure reliable starting – both as single-starter solutions or parallel-starter systems.



**Starter range for several off-highway applications:** Bosch HEF 109 starters are available in different versions meeting the specific requirements of different environmental conditions and off-highway applications. The modular starter concept allows free selection of the performance features and even their partial combination (see table) – ideal for individual alignment with different specific requirements.



Up to 50% lighter than comparable products

## Product Range & Details

HEF 109 starter for high power requirements, with a nominal output of up to 10 kW (24 V), HEF 109 starters are used to start diesel engines with a displacement of up to 30 l and usual cold-start requirements. Their robust, compact and modular design makes them a great solution. The starter systems are designed for up to 14 000 hours of operation in stationary machines and off-highway applications (some 800 000 km on-highway). They stand out for their high performance density and great cold-start performance. And, they are up to 50 % lighter than direct starters of the same performance class.

### HEP 109 parallel-starter systems for large engines

Parallel starter systems consisting of two or three synchronized HEP 109 starters increase the scope of application. They are suitable for diesel engines with up to 90 l and petrol engines with up to 180 l of displacement.

### Rotatable ductile-iron flange for high flexibility

- 8 possible mounting positions per part number
- Increased flexibility and cost effectiveness with small and medium batch sizes

### Protection class (IP57)

- Additional protection of starters used for tough off-highway applications
- Protection in case of short-term submersion

### Electrically insulated terminal 31

- Improved corrosion protection
- Ideal for marine applications and special application requirements of construction vehicles and railway applications.

### Reversible thermal-overload circuit breaker

- Safe protection against overloads
- Integrated into the starter harness

### Integrated mechanical relay (IMR) with optional plug connector

- Easy connection to the vehicle electrical system
- No external control relay required
- Controlled start via ECU is possible

### Smooth engaging

- Smooth electrical two-stage engaging
- Increased service life of ring gear and starter pinion

### Starter design in line with the specific application

- Designed for high cold-start performance, high starting torque and good start-up support
- Different motor parts with a thermal behaviour optimised for the specific application purpose

### Noseless bearing principle

- Optimised protection of the pinion shaft against dust, water and splash oil
- High installation flexibility due to the pinion shaft bearing located inside the starter

## Technical Data

Technical Data	HEF109-M 24 V	HEF109-MP 24 V	HEF109-L 24 V	HEP109-MP 24 V (2 x)	HEP109-L 24 V (2 x)	HEP109-MP 24 V (3 x)	HEP109-L 24 V (3 x)
Mechanical peak performance (At -20°C and SOC*=80 %)	7.62 kW	8.24 kW	10.0 kW	16.5 kW	20.0 kW	24.7 kW	30.0 kW
Typical scope of application: displacement up to (diesel)	... 16 l	...24 l	...30 l	...48 l	...60 l	...72 l	...90 l
Typical scope of application: displacement up to (petrol)	...32 l	...48 l	...60 l	...96 l	...120 l	...144 l	...180 l
Max. battery cold testing current EN	1300 CCA	1500 CCA	2000 CCA	3 000 CCA (2 x 1500 CCA parallel) 4 000 CCA (2 x 2 000 CCA parallel)	4 000 CCA (2 x 2 000 CCA parallel)	4 500 CCA (3 x 1 500 CCA parallel)	6 000 CCA (3 x 2 000 CCA parallel)
Starter weight	11.6 kg	< 14 kg	< 17 kg	2 x 16.5 kg	2 x 19.5 kg	3 x 16.5 kg	3 x 19.5 kg
Pole housing diameter	109 mm	109 mm	109 mm	109 mm	109 mm	109 mm	109 mm
Installation length (starter flange / commutator bearing cap)	287.5 mm	287.5 mm	319.5 mm	287.5 mm	319.5 mm	287.5 mm	319.5 mm
Typical control current	2 A	2 A	2 A	2 x 2 A	2 x 2 A	3 x 2 A	3 x 2 A

Scope of application



### Suitable for engine\*\*

Part Number**	CAT	Cummins	MTU
T020400445	C9; C11; C13; C15; C18	QSM11; QSX15; QSK19	-
T020400446 (1 or 2 starters)	C27; C32; 3408; 3412	QSK23; QST30; QSK38, QSK45	8V4000; 12V4000
T020400447 (special flange)	3508B; 3512B; 3516A/B/C	-	-
T020400448 (2 or 3 starters)	C175-X	QSK50; QSK60; QSK78; QSK95	16V4000; 20V4000

\* SOC = state of charge

\*\* Additional order numbers and applications upon request

These may not be stock items. Please speak to our sales representative about lead times. Lead times, price and availability can only be determined on receipt of an official quote from our supplier. This can sometimes take up to 3 days.

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