



# 1011. The engine for construction equipment.



11 - 61 kW at 1500 - 3000 min<sup>-1</sup>



## Engines with conventional cooling system

### These are the characteristics of the 1011:

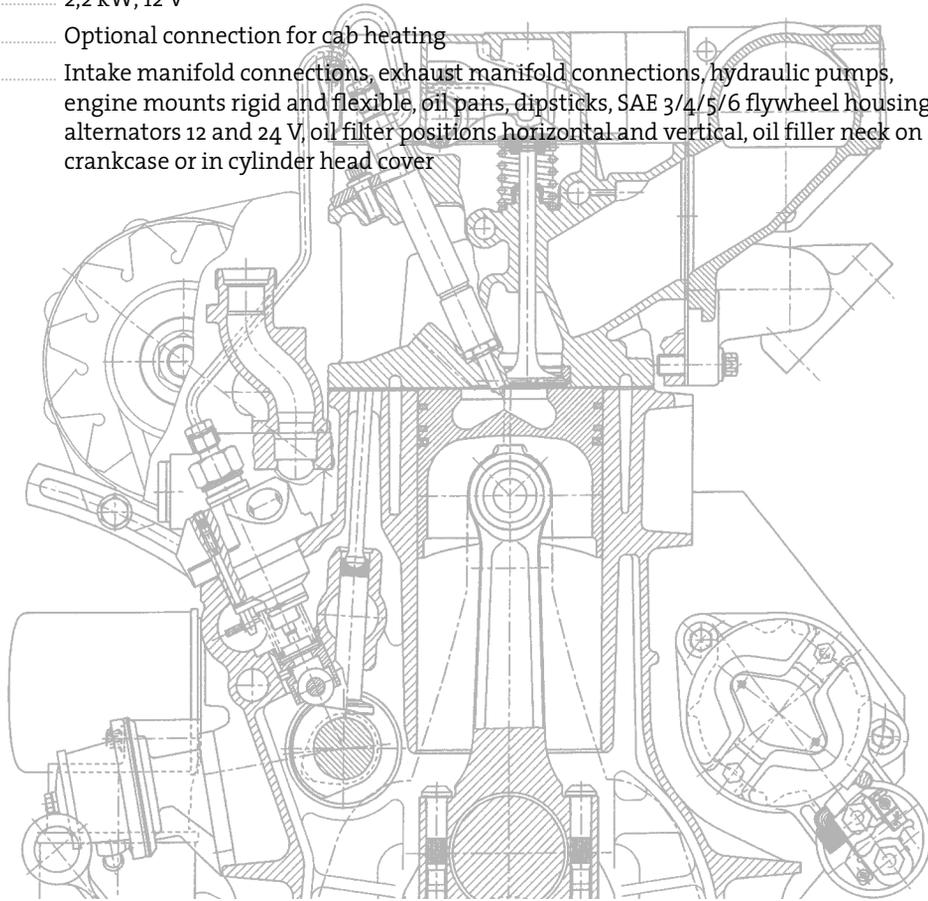
- 2-, 3- and 4-cylinder naturally aspirated in-line engines.
- 3- and 4-cylinder engines also turbocharged.
- Fully oil-cooled.
- Acoustically optimized crankcase.
- All service points on one engine side.
- Compact engine design.
- Worldwide service network with more than 3,000 service bases.

### These are the benefits for you:

- ▶ Low noise emission, no expensive insulation measures for noise reduction.
- ▶ Long maintenance intervals: 1,000 h oil change intervals and low fuel consumption allow savings in operating cost.
- ▶ Low installation costs.
- ▶ Service- and user-friendly.
- ▶ Cooling and lubrication with oil avoid corrosion and cavitation. High reliability, long service life and less wear parts.

## Engine description

Type of cooling:	External oil cooling
Crankcase:	Grey cast iron
Crankcase breather :	Closed-circuit breather
Cylinder head:	Block-type cast iron cylinder head
Valve arrangement/ Timing:	Overhead valves in cylinder head, one inlet and one exhaust valve per cylinder, actuated via tappets, push rods and rocker arms, driven by toothed belt and camshaft
Piston:	Three-ring piston, two compression rings and one oil scraper ring
Piston cooling:	Oil-cooled with spray nozzles
Connecting rod:	Drop-forged steel rod
Crankshaft and big-end bearings:	Ready-to-install plain bearings
Crankshaft:	Nodular cast iron
Camshaft:	Steel shaft in bi-metal bearings
Lubrication system:	Forced-feed circulation lubrication with rotary pump which feeds both lubricating and cooling systems (and cab heating if fitted)
Lube oil cooler:	Externally arranged
Lube oil filter:	Paper-type micro-filter as replaceable cartridge full flow filter
Injection pump/ governor:	Single injection pumps with mechanical centrifugal governor
Fuel lift pump:	Serviceable, with integrated strainer
Injection nozzle:	Five-hole nozzle
Fuel filter:	Replaceable cartridge
Alternator:	Three-phase alternator, 14 V; 60 A (Standard)
Starter motor:	2,2 kW; 12 V
Heating system:	Optional connection for cab heating
Options:	Intake manifold connections, exhaust manifold connections, hydraulic pumps, engine mounts rigid and flexible, oil pans, dipsticks, SAE 3/4/5/6 flywheel housings, alternators 12 and 24 V, oil filter positions horizontal and vertical, oil filler neck on side of crankcase or in cylinder head cover



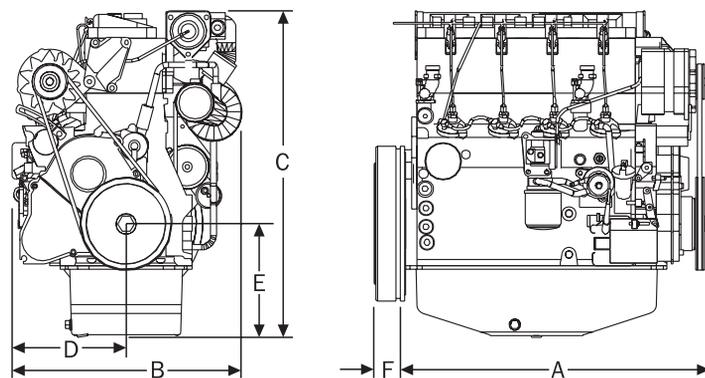
## ► Technical data

Engine type		F2M1011	F3M1011F	BF3M1011F	F4M1011F	BF4M1011F
Number of cylinders		2	3	3	4	4
Bore/stroke	mm	91/105	91/112	91/112	91/112	91/112
Displacement	l	1.37	2.18	2.18	2.91	2.91
Compression ratio		18.5	18.5	18.5	17.0	17.0
Max. rated speed	min <sup>-1</sup>	3000	3000	2800	3000	2800
Mean piston speed	m/s	10.5	11.2	10.5	11.2	10.5

### Power ratings for construction equipment engines<sup>1)</sup>

Power ratings for automotive- and industrial engines <sup>2)</sup>	kW	22.6	35.6	45.5	48.1	61.0
at speed	min <sup>-1</sup>	3000	3000	2800	3000	2800
Mean effective pressure	bar	6.62	6.52	8.93	6.61	8.98
Power ratings for continuous operation <sup>3)</sup>	kW	21.6	33.7	43.2	46.0	58.2
at speed	min <sup>-1</sup>	3000	3000	2800	3000	2800
Mean effective pressure	bar	6.33	6.17	8.47	6.32	8.57
Max. torque	Nm	84	130	180	176	239
at speed	min <sup>-1</sup>	1800	1800	1800	1800	1800
Minimum idle speed	min <sup>-1</sup>	900	900	900	900	900
Specific fuel consumption <sup>4)</sup>	g/kWh	229	221	226	218	207
Weight to DIN 70020, Part 7A <sup>5)</sup>	kg	161	200	210	243	249

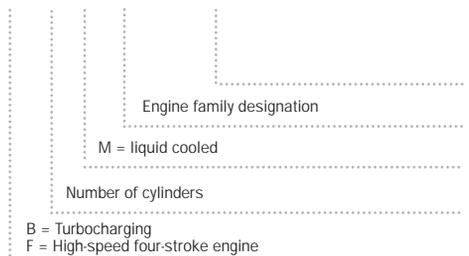
## ► Dimensions



Engine		A	B	C*	D	E	F
F2M1011	mm	328.0	456	702	243	220	80
F3M1011F	mm	519.0	451	678	243	220	80
BF3M1011F	mm	516.5	534	679	248	220	93
F4M1011F	mm	630.0	451	703	243	245	80
BF4M1011F	mm	630.0	495	703	243	245	80

## ► Model designation

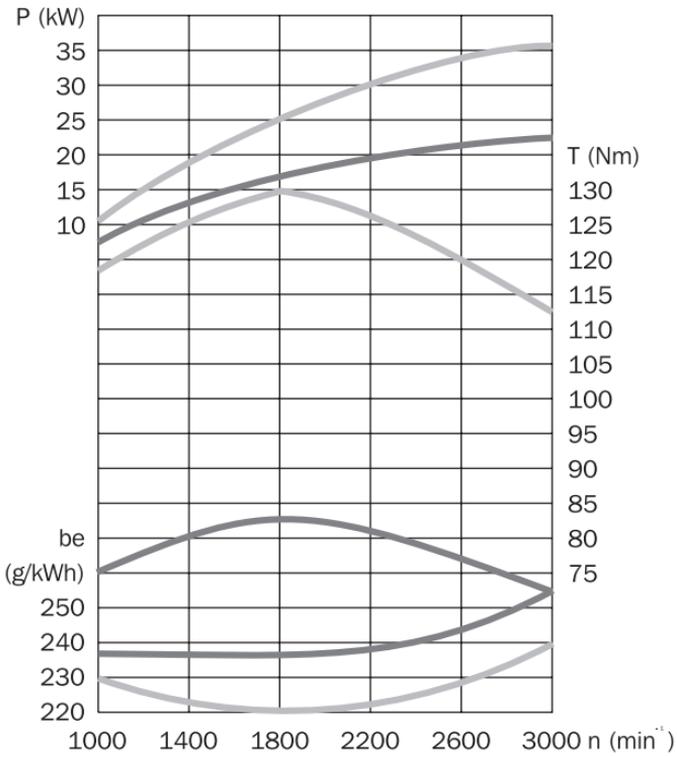
BF 4 M 1011



- 1) Power ratings at flywheel net, without cooling system.
  - 2) For intermittent operation to ISO 3046-1/ISO 1585.
  - 3) Fuel stop power acc. to 3046/1 (ICFN)
  - 4) At optimal operating point. Specific fuel consumption based on diesel fuel with a specific gravity of 0.835 kg/dm<sup>3</sup> at 15°C.
  - 5) Without cooling system, dry weight.
- \* With standard oil pan.

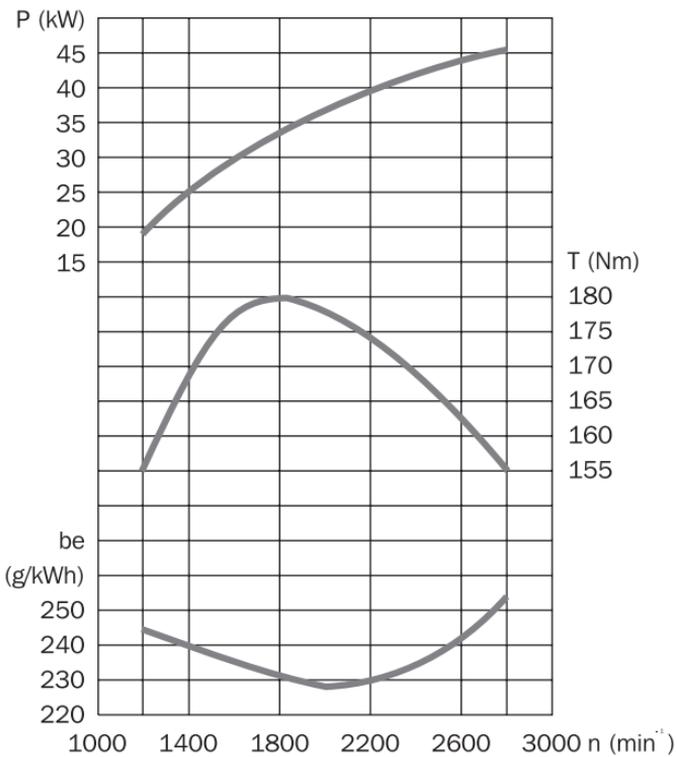
The values given in this data sheet are for information purposes only and not binding. The information given in the offer is decisive.

## ► Standard engines



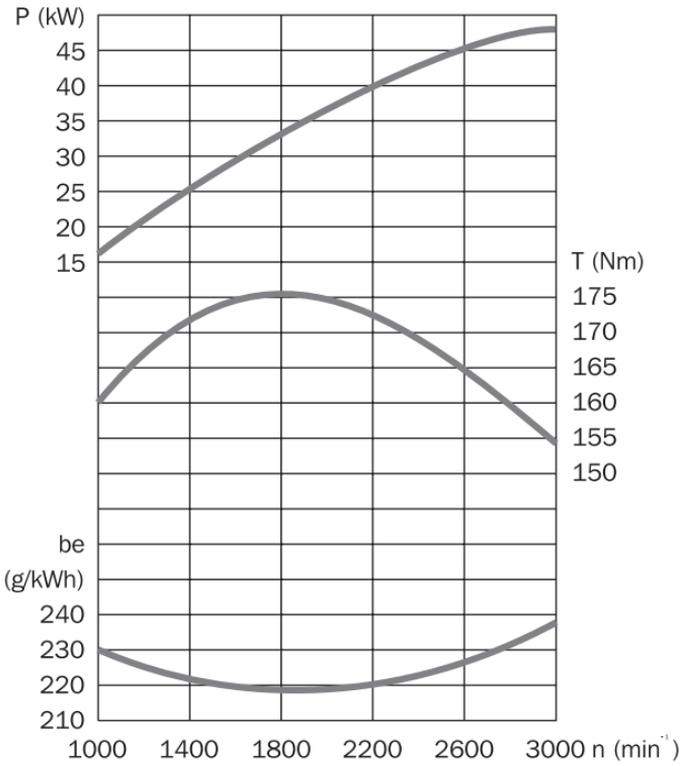
► F2M1011

► F3M1011F

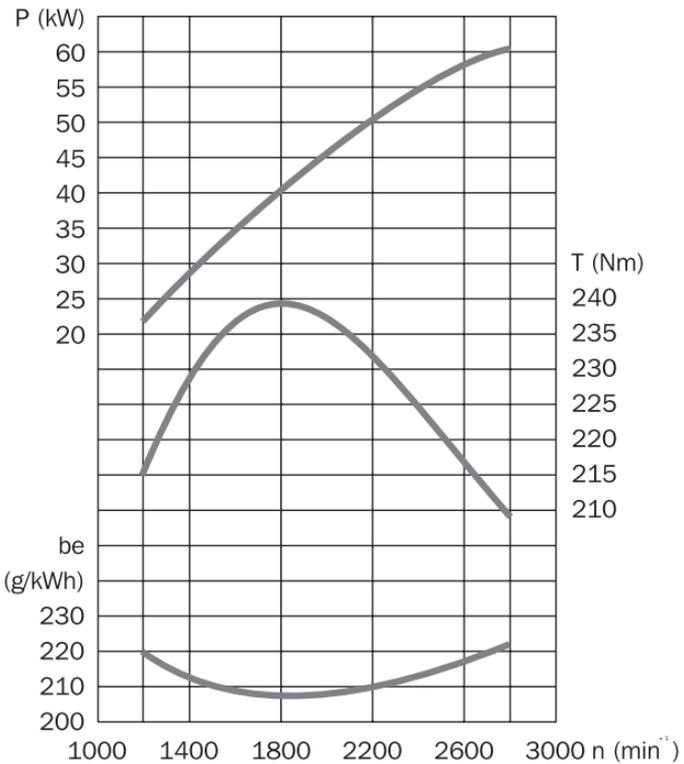


► BF3M1011F

► **Standard engines**



► F4M1011F



► BF4M1011F



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