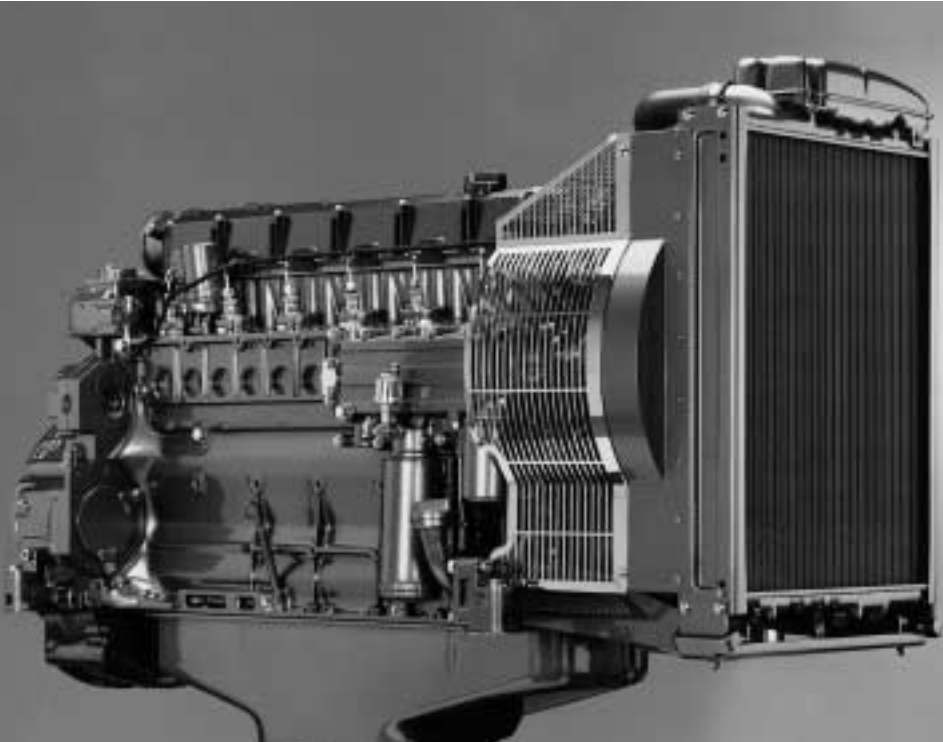


# 1012 E / 1013 E

For pump applications

56 - 149 kW at 1800/2300 rpm



Low operating noise level

Exemplary low fuel and oil consumption

Long service intervals

Easy, low-cost installation

Minimal weight

Incomparably low exhaust emission

Meets all industrial exhaust regulations

**BDC**

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# 1012 E / 1013 E

For pump applications

56 - 149 kW at 1800/2300 rpm

## ► Engine description

Type of cooling:	Liquid cooling, thermostatically controlled, charge-air cooled with air-to-air charge cooler
Crankcase:	High grey cast iron crankcase; for monobloc construction, "wet-type" liners
Crankcase breather:	Closed circuit crankcase breather
Cylinder head:	Grey cast iron block-type cylinder head
Valve arrangement/ Control:	Two valves per cylinder, actuated via tappets, push rods and rocker arms; Gear-driven camshaft
Piston:	Three-ring aluminium piston
Piston cooling:	Oil-cooled with spray nozzles; in part, piston with cooling channel
Connecting rod:	Forged steel rod
Crankshaft:	Forged steel shaft with integral counterweights
Camshaft:	Steel camshaft
Lubrication system:	Forced-feed circulation lubrication with gear pump
Lube oil cooler:	Oil cooler integrated in coolant circuit
Lube oil and fuel filter:	Paper-type microfilter as replaceable cartridge full-flow filter
Injection pump/ Governor:	Single injection pumps for each cylinder integrated in crankcase Mechanical centrifugal governor (standard); electronic engine governor (EMR) optional
Fuel lift pump:	Mechanical rotor-type pump integrated in V-belt tensioner
Injection nozzle:	Six-hole nozzle, non-leakage
Alternator:	Three-phase alternator, 12V or 24V
Starter motor:	12V or 24V
Cold start system:	Electrical intake air preheater, for spontaneous and environment-friendly cold starting
Heating system:	Optional connection to engine cooling circuit for cab heating
Ancillary power take-offs:	3 for compressors, automatic breathing

- Water-cooled 4 and 6-cylinder in-line engine
- High-pressure fuel injection system with single injection pumps
- Displacement : 0.8 and 1.2 l/cylinder
- Turbocharging and turbocharging with charge-air cooling
- Electronic governor (option)
- All service points on one side

## ► Technical data

Engine types		BF4M 1012 E	BF4M 1012 EC	BF4M 1013 E	BF4M 1013 E	BF4M 1013 EC
Number of cylinders		4	4	4	4	4
Bore/Stroke	mm	94/115	94/115	108/130	108/130	108/130
Displacement	l	3.19	3.19	4.76	4.76	7.15
Compression ratio	17.5	17.5	19.0	19.0	19.0	19.0
<b>Power ratings for Pump sets <sup>1)</sup></b>						
Power ratings for continuous operation <sup>2)</sup>	kW	56	69	74	86	92
Fan output at speed	kW	3.2	4.4	4.3	3.4	10.6
	rpm	2300	2200	1800	2300	1800
Ambient temperature*	°C	56	57	69	38	66
Mean effective pressure	bar	9.16	11.80	10.36	9.43	8.58
Intermittent operation <sup>2)</sup> at speed	kW	62	76	81	95	100
	rpm	2300	2200	1800	2300	1800
Mean effective pressure*	bar	10.14	13.0	11.34	10.41	9.32
Ambient temperature*	°C	50	55	66	40	68
Minimum idle speed	rpm	650	650	800	800	800
Specific fuel consumption <sup>3)</sup>	g/kWh	208	200	201	202	202
Weight with cooling system without air filter, water and oil <sup>4)</sup>	kg	410	433	538	538	563

1) Power ratings without deduction of fan power requirement

2) Fuel stop power to ISO 3046/1 (IFN) and DIN 6271

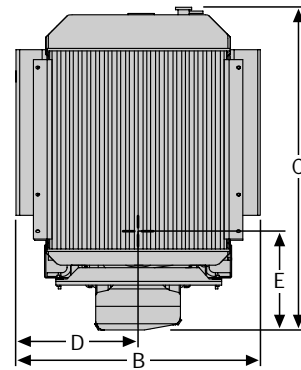
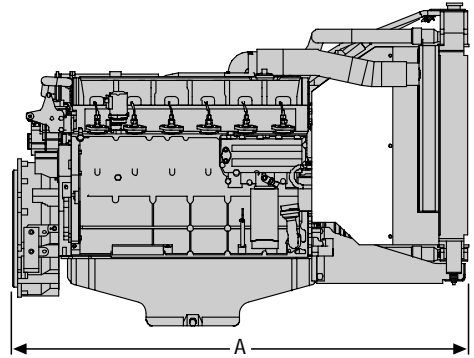
3) Best full load consumption using diesel fuel of density 0.835 kg/dm<sup>3</sup> at 15°C

4) Without starter motor/alternator, radiator and liquids, but with flywheel and flywheel housing

\* Ambient temperature >50 °C; BF4M 1013 E 38 °C

## ➤ Dimensions

BF4M 1013 EC	BF6M 1013 E	BF6M 1013 EC
4	6	6
108/130	108/130	108/130
7.15	7.15	7.15
19.0	19.0	19.0
104	111	134
6.8	6.7	8.5
2200	1800	1800
51	54	54
7.93	10.35	18.74
114	123	149
2200	1800	1800
8.70	11.47	13.89
52	54	53
800	800	800
202	202	205
563	730	750

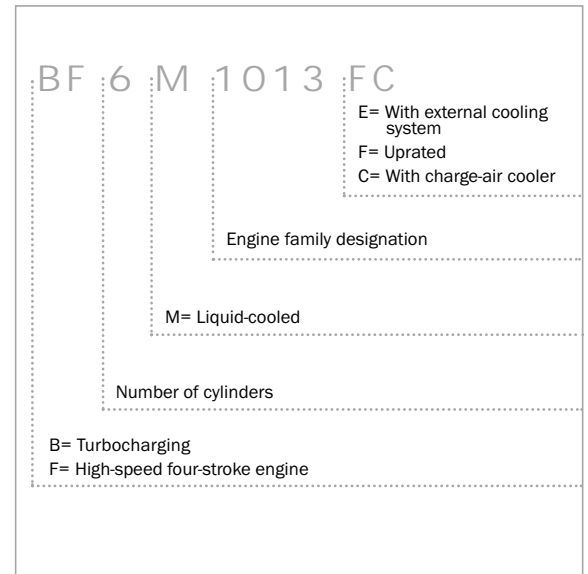


Engine type	A	B	C	D	E
	mm	mm	mm	mm	mm
<b>BF4M 1012 E</b>	1069	612	859	302	235
<b>BF4M 1012 EC</b>	1129	736	908	381	235
<b>BF4M 1013 E</b>	1177	652	952	317	295
<b>BF4M 1013 EC</b>	1318	739	1001	390	295
<b>BF6M 1013 E</b>	1462	678	1052	317	345
<b>BF6M 1013 EC</b>	1602	866	1140	433	345

## ➤ Standard specification

Standard engine:	Basic parts
Cooling system:	External cooling system charge-air cooler mounted Pusher-type fan Guard
Exhaust system components:	Turbocharger, central arrangement (air inlet at flywheel end) Counterflange (loose) Without exhaust silencer
Filter:	With air filter mounted, with service indicator connection Service indicator (loose) Fuel filter (mounted) Fuel prefilter (loose)
Governor:	Mechanical governor Mechanical fine speed control
Flywheel:	Flywheel for 10" and 11.5" connection $J=0.8725 \text{ k m}^2$
Adapter housing:	SAE 3 housing
Engine mounting:	Rigid engine mounting, front end
Engine electrics:	Electric engine shutdown (de-energised for shutdown) Starter motor 12V, 3.1 kW Alternator 14V, 55A Oil pressure switch Coolant temperature sensor with switch contact With cable harness and connector
Miscellaneous:	Paint finish Without operation manual

## ➤ Engine type





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