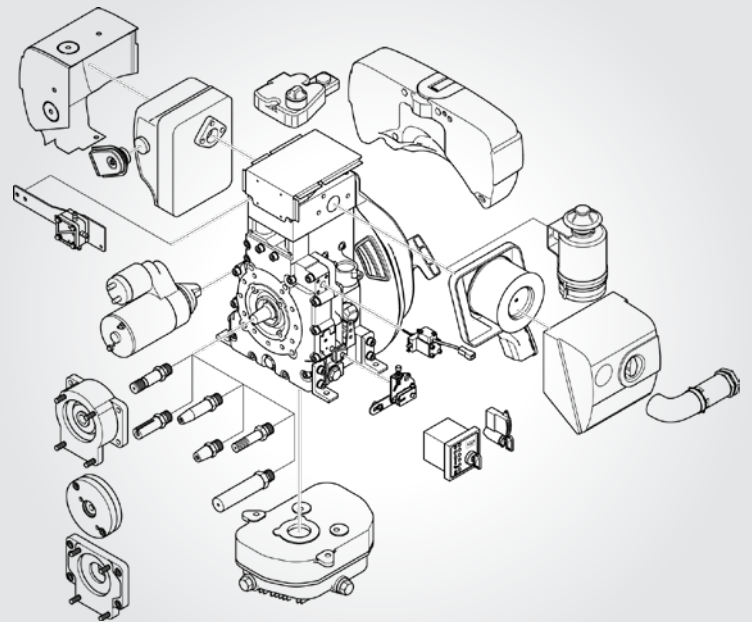


CREATING POWER SOLUTIONS.



## Data sheet B-series

**Hatz industrial diesel engines**



**1B30, 1B40, 1B50 Silent**

Depending on the engine type the already low noise level can be significantly reduced further, by 2 to 4 decibel [A], by an optional silent noise package, decreased power, and speed. This is possible thanks to optimisations in the area of intake and exhaust components.

**Flexibility through additional equipment**

The Hatz B-series can be fully customised to the needs of the customer with an almost endless list of accessory parts. Among other things, there are six different output shafts for each type, an electric start with 12 or 24 V as well as various options for fuel tanks and filters, to name but the most important ones.

# Hatz B-series: Flexible solution for all areas

The Hatz B-series scores high marks in mobile and stationary operations with compact installation dimensions and for all applications with a power requirement up to 8 kilowatts due to its low weight. With its robustness and longevity, the series sets standards in the market. Regardless of whether on vibration plates or in the inhospitable environment of the Antarctic, the Hatz B-series has been tried and tested a hundred thousand times in harsh surroundings.

## From a mechanical masterpiece to the smartengine

The Single Cam System patented by Hatz essentially determines the very short overall length of the mechanically controlled engines. The injection pump and the valves are operated by a single cam and rocker arms. The Hatz E1 technology, on the other hand, controls the injection electronically. It enters into a fruitful relationship with the core engine of the B-series, which has proven its excellence hundreds of thousands of times. And thus creates completely new possibilities.

## Ready for the Internet of Things (IoT)

Models of the B-Series are well equipped to redefine business models or increase their efficiency. Thanks to the Hatz E1 technology, the associated electronic engine control and connected solutions, for the first time in this performance class machine manufacturers can expand their customer relationships, lessors can optimize the utilization of their fleets and machine operators can ensure more efficient processing of their orders.

## Environmental aspects

At Hatz protection of the environment is regarded as a key component of the company objectives. For example, the B-series engines have been exclusively produced and marketed for years in accordance to

the specification of the US EPA Tier 4 exhaust directive, even in countries where no limits are imposed on exhaust emission. Models in the B-Series meet both North American requirements and EU Stage V. All engines of the B-series comply with the European specifications.

## One power train – many variants

Thanks to the intelligent design of the engines, it is possible to offer various displacements based on the same power train. For the customer, this provides many options for making the best possible use of the existing space on a machine. Additionally this saves both time and money for the development and construction of entire machinery series.

## Optional silent noise package

Depending on the engine type the current low noise level can be significantly reduced further, by up to 4 decibels [A], by a silent noise package. This is possible thanks to optimisations in the area of intake and exhaust components.

## Award

The Hatz B-series has been honored with the Euromot innovation prize for optimum carburation and emission quality.

Sales area Exhaust certificate	[rpm]	IFN Rating F/IFN/ICFN Rating							
		1B20	1B30E	1B30	1B30VE	1B30V	1B40	1B50E	1B50
US EPA T4f/CARB constant	–	3000, 3600	–	3000, 3600	–	–	1800, 3000, 3600	–	–
US EPA T4f variable	–	3000, 3600	–	3000, 3600	–	–	3000, 3600	–	–
Europe EU V constant	3000, 3600	3000, 3600	2950–3000, 3600	3000, 3100, 3600	3000, 3100	3000, 3600	1800, 3000, 3600	1500, 3000, 3600	–
Europe EU V variable	2700–3350	3000, 3600	2000–3600	3000, 3600	2500, 2800, 3000, 3600	2250–3600	3000, 3600	2500–3600	–
Less regulated	1500–3600	3000, 3600	1500–3600	3000, 3600	1500–3600	1500–3600	3000, 3600	1500–3600	–

# Technical data, performance table

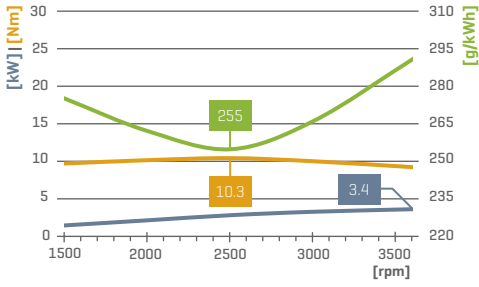
Technical data		1B20	1B30E	1B30	1B30VE	1B30V	1B40	1B50E	1B50		
Engine	Type	Air cooled 4-stroke diesel engine									
	Cylinder	1									
	Direct injection	mechanical	electronical	mechanical	electronical	mechanical	mechanical	electronical	mechanical		
	Position of crank shaft	horizontal	horizontal		vertical		horizontal		horizontal		
	Bore x stroke [mm / in]	69 x 65 / 2.72 x 2.56	80 x 69 / 3.15 x 2.72		80 x 69 / 3.15 x 2.72		88 x 76 / 3.46 x 2.99		93 x 76 / 3.66 x 2.99		
	Displacement [l / cu in]	0.243 / 14.83	0.347 / 21.18		0.347 / 21.18		0.462 / 28.19		0.517 / 31.55		
	Mean piston speed @ 3000 rpm [m/s / ft/min]	6.5 / 1279.53	6.9 / 1358.27		6.9 / 1358.27		7.6 / 1496.06		7.6 / 1496.06		
	Compression ratio	22:1	21.5:1		21.5:1		20.5:1		20.5:1		
	Lubrication oil consumption, related to full load	max. 1% of fuel consumption									
	Lubrication oil capacity	max. [l / US qts]	0.9 / 0.951	1.2 / 1.27	1.1 / 1.162	1.2 / 1.27	1.1 / 1.16	1.5 / 1.528	1.6 / 1.69	1.5 / 1.528	
		min. [l / US qts]	0.4 / 0.423	0.7 / 0.74	0.6 / 0.634	0.7 / 0.74	0.6 / 0.63	0.7 / 0.739	0.8 / 0.85	0.7 / 0.739	
	Speed control	Lowest idle speed [rpm]	approx. 1000						approx. 800		
		Static speed droop @ 3000 rpm	approx. 5%	configurable	approx. 5%	configurable	approx. 5%	approx. 5%	configurable	approx. 5%	
Control method		mechanical	CAN J1939, multi stage switch, analog	mechanical	CAN J1939, multi stage switch, analog	mechanical	mechanical	CAN J1939, multi stage switch, analog	mechanical		
Installation Data	Combustion air required @ 3000 rpm approx. [kg/h / cfm] <sup>1</sup>	25.2 / 12.3		37.8 / 18.5			49.8 / 24.3		56.4 / 27.6		
	Cooling air required @ 3000 rpm approx. [kg/h / cfm] <sup>1</sup>	306 / 150		432 / 210			528 / 258		552 / 270		
	Starter [V]	12 [1.0 kW / 1.3 hp]   24 [1.6 kW / 2.1 hp]									
	Alternator charging current @ 3000 / 1500 rpm [A]	14 / 7 [14 V]   7 / 4 [28 V]									
Battery capacity min. / max. [Ah]	36 / 55 [12 V]   24 / 44 [24 V]										
Dimensions	Engine with recoil start [kg / lb]	28.0 / 61.7	–	35.0 / 77.2	–	37.0 / 81.6	48.0 / 105.8	–	51.2 / 112.9		
	Engine with electric start [kg / lb]	32.8 / 72.3	40.8 / 90.0	39.8 / 87.7	42.8 / 94.4	41.8 / 92.2	53.3 / 117.5	57.5 / 126.8	56.5 / 124.6		
	L x W x H [mm / in]	292 x 367 x 401 / 11.5 x 14.4 x 15.8	322 x 411 x 431 / 12.7 x 16.2 x 17.0	322 x 404 x 431 / 12.7 x 15.9 x 17.0	398 x 432 x 385 / 15.7 x 17.0 x 15.2	370 x 432 x 366 / 14.6 x 17.0 x 14.4	334 x 412 x 480 / 13.1 x 16.2 x 18.9	334 x 438 x 480 / 13.1 x 17.2 x 18.9	334 x 412 x 480 / 13.1 x 16.2 x 18.9		

Engine output max. [kW / hp] [rpm]		1B20	1B30E <sup>2</sup>	1B30	1B30VE <sup>2</sup>	1B30V	1B40	1B50E <sup>2</sup>	1B50
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For variable speed.	3600	–	4.5 / 6.0	5.0 / 6.7	4.5 / 6.0	5.0 / 6.7	7.3 / 9.8	7.9 / 10.6 8.1 / 10.9 <sup>3</sup>	7.9 / 10.6
	3000	3.1 / 4.2	4.1 / 5.6	4.6 / 6.2	4.1 / 5.6	4.6 / 6.2	6.8 / 9.1	7.6 / 10.2	7.6 / 10.2
	2800	2.9 / 3.9	4.0 / 5.3	4.5 / 6.0	4.0 / 5.3	4.5 / 6.0	6.6 / 8.9	7.3 / 9.8	7.3 / 9.8
	2600	–	3.8 / 5.1	4.2 / 5.6	3.8 / 5.1	4.2 / 5.6	6.3 / 8.4	6.9 / 9.3	6.9 / 9.3
	2300	–	3.5 / 4.7	3.9 / 5.2	3.5 / 4.7	3.9 / 5.2	5.7 / 7.6	6.2 / 8.3	–
	2000	–	3.1 / 4.1	3.4 / 4.6	3.1 / 4.1	3.4 / 4.6	–	5.3 / 7.1	–
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For constant speed.	3600	3.4 / 4.6	4.5 / 6.0	5.0 / 6.7	4.5 / 6.0	5.0 / 6.7	7.3 / 9.8	7.9 / 10.6 8.1 / 10.9 <sup>3</sup>	7.9 / 10.6
	3100	–	–	–	4.2 / 5.6	4.7 / 6.3	–	–	–
	3000	3.1 / 4.2	4.1 / 5.5	4.6 / 6.2	4.1 / 5.5	4.6 / 6.2	6.8 / 9.1	7.6 / 10.2	7.6 / 10.2
	1800	–	–	–	–	–	–	4.7 / 6.3	–
	1500	–	–	–	–	–	–	–	3.9 / 5.2
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For variable speed. Less regulated markets	3600	3.4 / 4.6	4.5 / 6.0	5.0 / 6.7	4.5 / 6.0	5.0 / 6.7	7.3 / 9.8	7.9 / 10.6 8.1 / 10.9 <sup>3</sup>	7.9 / 10.6
	3000	3.1 / 4.2	4.1 / 5.6	4.6 / 6.2	4.1 / 5.6	4.6 / 6.2	6.8 / 9.1	7.6 / 10.2	7.6 / 10.2
	2800	2.9 / 3.9	4.0 / 5.3	4.5 / 6.0	4.0 / 5.3	4.5 / 6.0	6.6 / 8.9	7.3 / 9.8	7.3 / 9.8
	2600	2.8 / 3.8	3.8 / 5.1	4.2 / 5.6	3.8 / 5.1	4.2 / 5.6	6.3 / 8.4	6.9 / 9.3	6.9 / 9.3
	2300	2.5 / 3.4	3.5 / 4.7	3.9 / 5.2	3.5 / 4.7	3.9 / 5.2	5.7 / 7.6	6.2 / 8.3	6.2 / 8.3
	2000	2.1 / 2.8	3.1 / 4.1	3.4 / 4.6	3.1 / 4.1	3.4 / 4.6	4.9 / 6.6	5.3 / 7.1	5.3 / 7.1
	1800	1.9 / 2.5	2.7 / 3.6	3.0 / 4.0	2.7 / 3.6	3.0 / 4.0	4.4 / 5.9	4.7 / 6.3	4.7 / 6.3
	1500	1.5 / 2.0	2.1 / 2.8	2.3 / 3.1	2.1 / 2.8	2.3 / 3.1	3.5 / 4.7	3.9 / 5.2	3.9 / 5.2

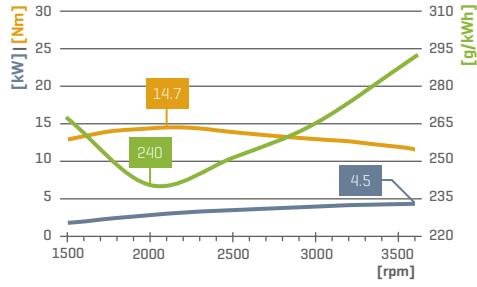
<sup>1</sup> For other rpm there is a linear reduction in the air requirement. <sup>2</sup> Power ratings include generator power <sup>3</sup> EU Stage V only

# Maximum power output, torque and fuel consumption

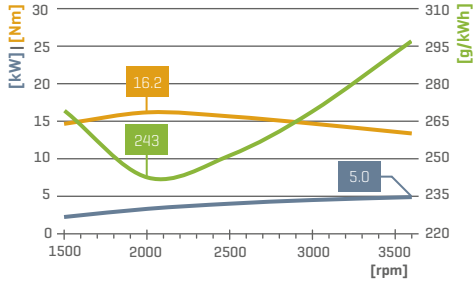
## 1B20



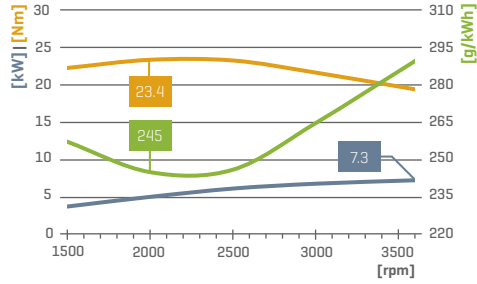
## 1B30E<sup>2</sup> | 1B30VE<sup>2</sup>



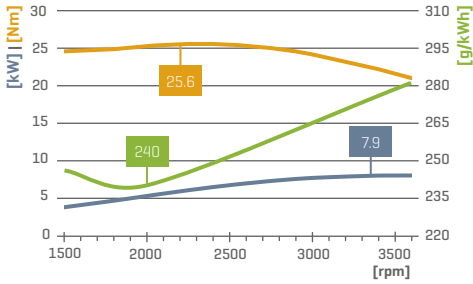
## 1B30 | 1B30V



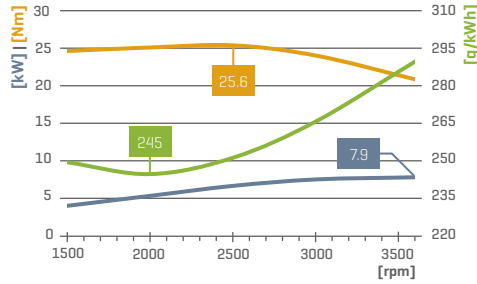
## 1B40



## 1B50E<sup>2</sup>



## 1B50



### Performance data

Performance data refer to Standard Reference Conditions of ISO 3046-1 (IFN): + 25 °C (77 °F), 100 kPa, relative humidity 30 %.

During running-in period the output increases by approx. 5 % which is taken into consideration at delivery. Power reduction acc. to ISO 3046-1. Standard values: Above 100 m ALT approx. 1 % per 100 m. Above 25 °C (77 °F) approx. 4 % per 10 °C (50 °F). The power taken from charging alternator also has to be added to the demand of power.

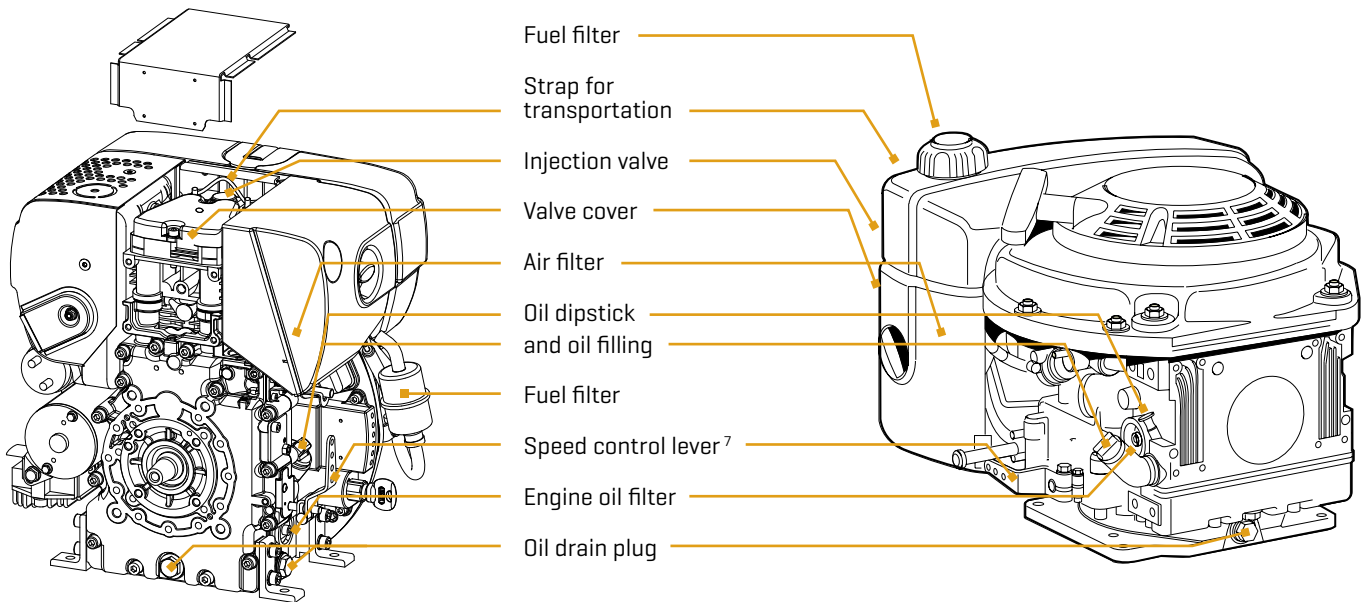
## Shaft forms

### Selection of available shaft forms

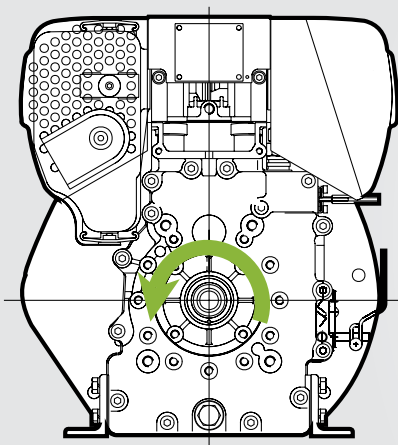
	"7" Cyl. 3/4" <sup>4</sup>	"2" <sup>4,6</sup>	"9" Cyl. <sup>5</sup>
Cylindrical with key way			
	1B20: ø 19.05 mm / 0.75 in 5/16" - 24 UNF 2B	ø 25.4 mm / 1.0 in 1B30: 7/16" - 20 UNF 2B 1B40/50: 3/8" - 24 UNF 2B	1B20: ø 20 mm / 0.79 in 1B30/1B40/1B50: ø 25 mm / 0.98 in 1B20: M 8 1B30/40/50: M 10
Conical	"3" <sup>5</sup>	"4" SAE Gen. <sup>4,6</sup>	"6" ital.
	1B20: ø 25 mm / 0.98 in 1B30/40/50: ø 30 mm / 1.18 in 1B20: 1:5 1:10 M 10 1B20: M 8	1B20: ø 19.83 mm / 0.78 in 1B30/40/50: ø 25.4 mm / 1.0 in 1:5.333 5/16" - 24 UNF 2B	1B20/30: ø 23 mm / 0.91 in 1:5 M 8 1B40/50: 1:5 M 8
Universal	X crank shaft		
	At crankshaft J <sub>max</sub> = 0.04 kgm <sup>2</sup>		

<sup>4</sup>According to SAE J 609 <sup>5</sup>According to LEMA LES 1203-1991 <sup>6</sup>Only for mechanically controlled engine types

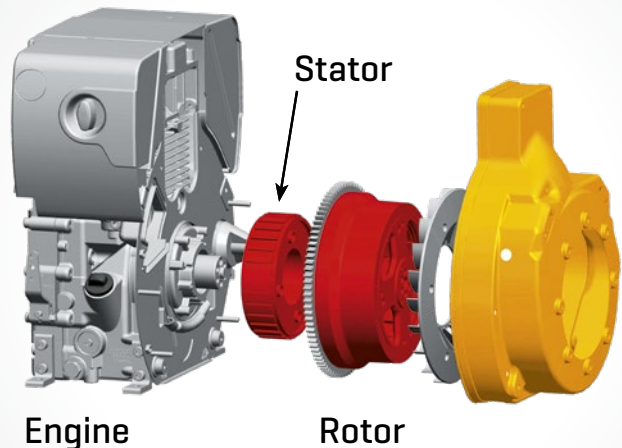
## Maintenance and operating points



## Power-take-off points



Power-take-off shaft, governor side, with max. engine speed, sense of rotation anti-clockwise.

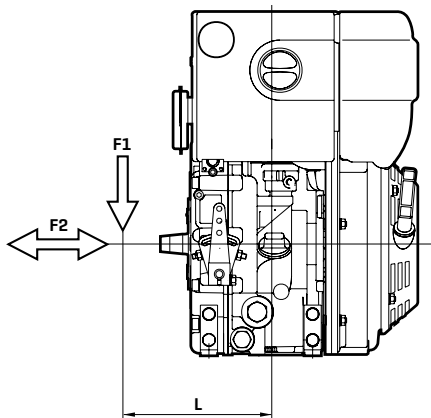


Engine

Rotor

A permanent magnet alternator from 2 to 7 kW can be mounted on the flywheel side.

## Permissible load on power-take-off points



**1B20 / 1B30 / 1B30V**

max. permissible radial force

$$F1 = \frac{60\,000}{L [\text{mm}] - 70} [\text{N}]$$

max. permissible axial force

$$F2 = 800 [\text{N}]$$

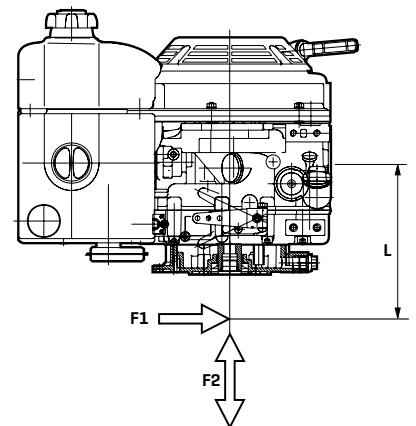
**1B40 / 1B50**

max. permissible radial force

$$F1 = \frac{62\,600}{L [\text{mm}] - 84} [\text{N}]$$

max. permissible axial force

$$F2 = 1200 [\text{N}]$$



**1B30E / 1B30VE / 1B50E**

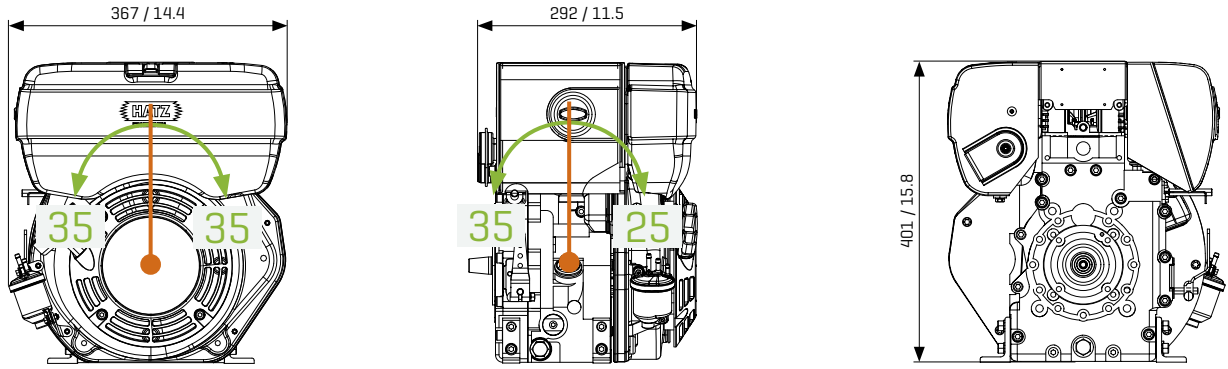
Values on request

<sup>7</sup>Only for mechanically controlled engine types

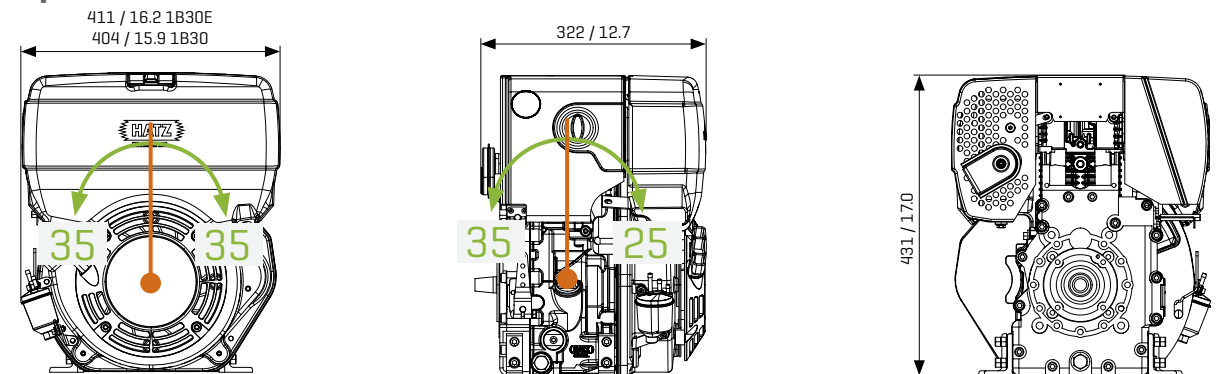
# Dimensions [mm / in] and inclinations<sup>8</sup> [°]

Spread at box dimensions ± 3 millimeters due to tolerance.  
 Drawings with detail and connection dimensions as PDF and DXF  
 can be found at [www.hatz-diesel.com](http://www.hatz-diesel.com).

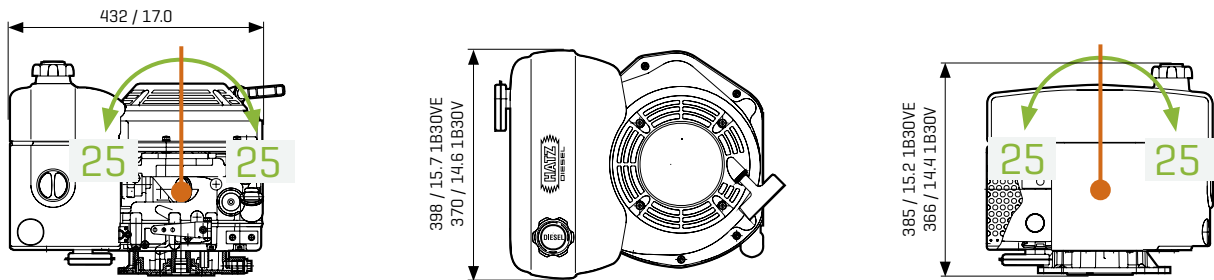
## 1B20



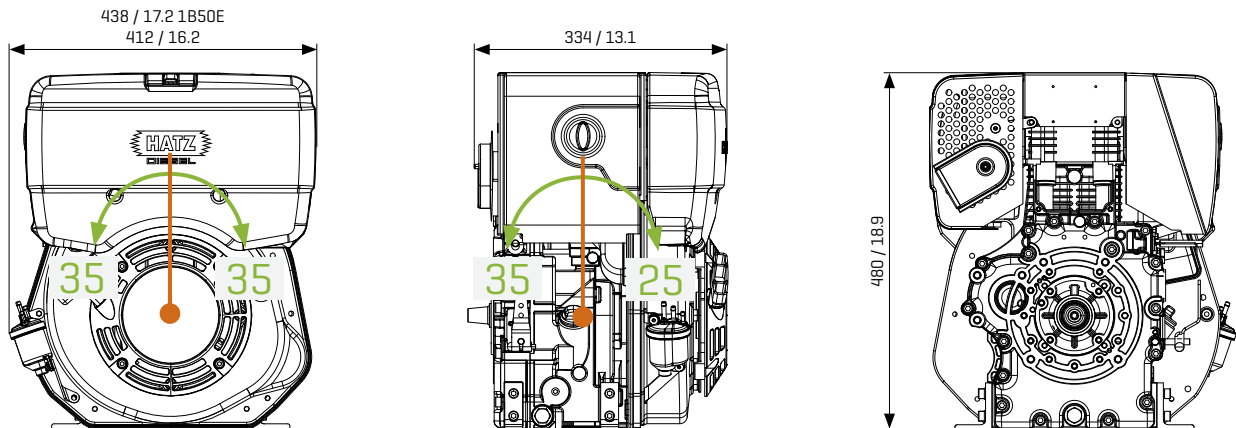
## 1B30E | 1B30



## 1B30VE | 1B30V



## 1B40 | 1B50E | 1B50



<sup>8</sup> Maximum permanent inclined positions

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