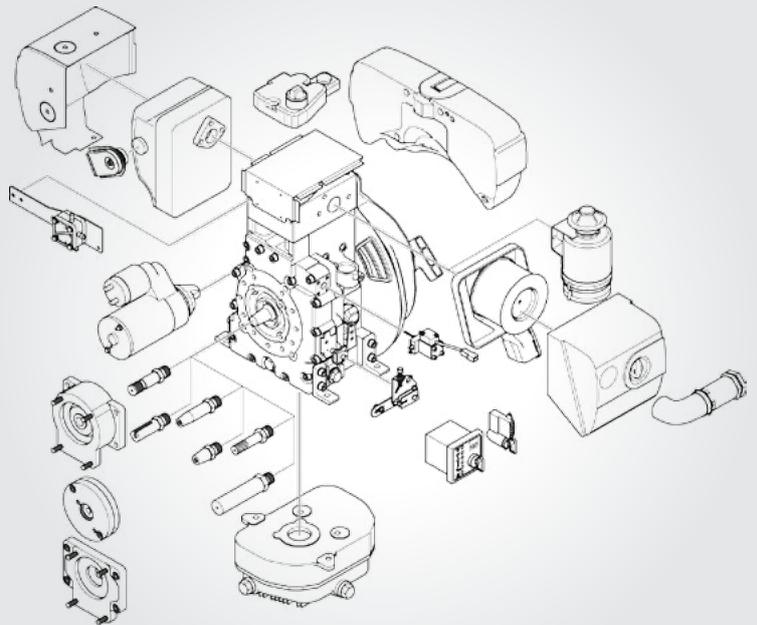


CREATING POWER SOLUTIONS.



1B20 | 1B20V
1B27
1B30 | 1B30V
1B40 | 1B40V
1B50 | 1B50V

Hatz Diesel



1B20V / 1B30V / 1B40V / 1B50V

As the only engine manufacturer worldwide, Hatz offers a diesel series with vertical crankshaft. For many applications, such as the prime example of the lawnmower, this design provides major advantages and significantly simplifies installation.

Flexibility through additional equipment

The Hatz B-series can be fully customized 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 B-series has been tried and tested a hundred thousand times in harsh surroundings.

Environmental aspects

In our company protection of the environment is regarded as a key component of the company objectives. For example, the B-series engines are exclusively produced and marketed to the specification of the strict EPA Tier IV exhaust directive, even in countries where no limits are imposed on exhaust emission.

One power train – many variants

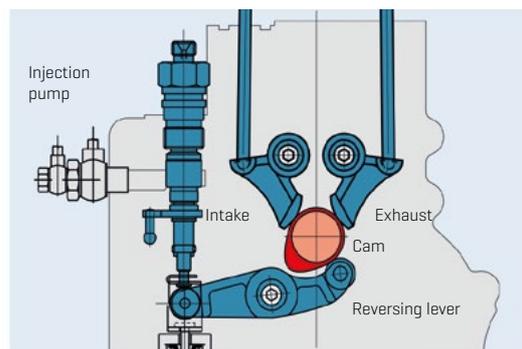
Thanks to the intelligent design of the engines, not only is it possible to offer various displacements based on the same power train but we have also succeeded in bringing the entire series as vertical engines [engine with vertical crankshaft and horizontal cylinder] with the same basic power train onto the market. For the customer, this provides many options for making the best possible use of the existing space on a machine, either height-optimized with the vertical engine, or with the conventional engine with optimum base area.

Optional noise package

Depending on the engine type the current low noise level can be significantly reduced further, by up to 2 decibels, by a noise package. This is possible thanks to optimizations in the area of intake and exhaust components.

SCS [Single Cam System]

One of the numerous innovations of the B-series is the single cam system, where the injection pump and the two valves are operated by just one cam and rocker arm. This design detail, for which Hatz has applied for a patent, substantially determines the very short overall length of the engine. In addition, the camshaft is driven via a gear wheel which is, at the same time, a component and drive of the oil pump.



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 ICFN Rating F/IFN/ICFN Rating				
		1B20 1B20V	1B27	1B30 1B30V	1B40 1B40V	1B50 1B50V
USA [EPA/CARB constant speed]		2250-3000	–	2500-3600	2250-3300	2500-3600
USA [EPA 2-Speed]		2250-3600	2800-3600	2500-3600	2250-3600	2500-3000
USA [EPA variable speed]		–	–	2500-3600	–	2500-3600
All others [Non-Epa]		1500-3600	1500-3600	1500-3600	1500-3600	1500-3600

Technical data, performance table

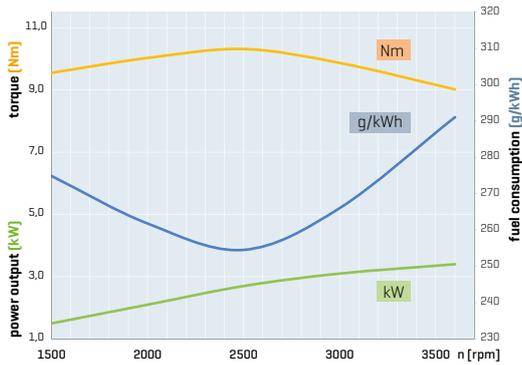
Technical data		1B20 / 1B20V	1B27	1B30 / 1B30V	1B40 / 1B40V	1B50 / 1B50V	
Type	Air cooled single cylinder 4-stroke diesel engine with direct injection, horizontal crankshaft (variant V with vertical crankshaft)						
Bore x stroke [mm / inches]	69 x 65 / 2.72 x 2.56	74 x 65 / 2.91 x 2.56	80 x 69 / 3.15 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 / 14.82	0.280 / 17.09	0.347 / 21.18	0.462 / 28.19	0.517 / 31.55		
Engine	Mean piston speed at 3000 rpm [m/s / ft/min]	6.5 / 1280		6.9 / 1358	7.6 / 1496		
	Compression ratio	22 : 1	21.5 : 1	21.5 : 1	20.5 : 1	20.5 : 1	
	Lub. oil consumption, related to full load	max. 1 % of fuel consumption					
	Lub. oil capacity max - min [l / US qts]	0.9 - 0.4 / 0.95 - 0.42		1.1 - 0.6 / 1.16 - 0.63	1.5 - 0.7 / 1.59 - 0.74		
Speed control							
• Lowest idle speed	approx. 1000 rpm					approx. 800 rpm	
• static speed droop	approx. 5% at 3000 rpm						
Installation Data	Combustion air required at 3000 rpm approx. ¹⁾ [m ³ /min / cu.ft./min]	0.35 / 12	0.42 / 15	0.52 / 18	0.69 / 24	0.78 / 28	
	Cooling air required at 3000 rpm approx. ¹⁾ [m ³ /min / cu.ft./min]	4.2 / 148	4.2 / 148	6.0 / 212	7.3 / 257	7.6 / 268	
	Starter	12 V - 1.0 kW — 24 V - 1.6 kW					
	Alternator charging current at 3000/1500 rpm	14 V - 14 A / 7 A — 28 V - 7 A / 4 A					
	Battery capacity [min / max Ah]	12 V - 36 / 55 Ah — 24 V - 24 / 44 Ah					
Weight	Engine with recoil start [kg / lbs.]	standard 28.0 / 61.7	29.0 / 63.9	35.0 / 77.1	48.0 / 105.8	51.2 / 112.9	
		V-version 30.0 / 66.1	—	37.0 / 81.6	—	—	
	Engine with electric start 12 V or 24 V [kg / lbs.]	standard 32.8 / 72.2	33.8 / 74.5	39.8 / 87.7	53.3 / 117.5	56.5 / 124.6	
		V-version 34.8 / 76.7	—	41.8 / 92.1	55.3 / 121.9	58.5 / 128.9	

¹⁾ For other rpm there is a linear reduction in the air requirement

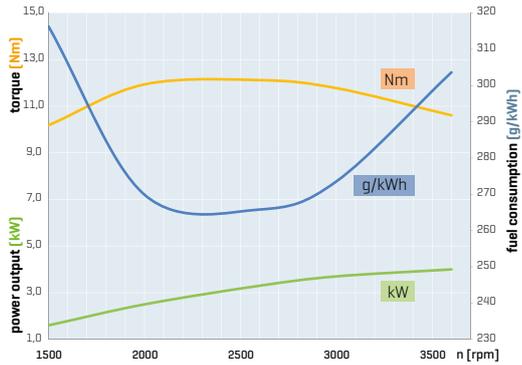
Performance table	(rpm)	1B20 / 1B20V	1B27	1B30 / 1B30V	1B40 / 1B40V	1B50 / 1B50V	
Vehicle output acc. to DIN ISO 1585. [kW / HP]	3600	3.5 / 4.8	— / —	5.4 / 7.3	7.5 / 10.2	8.5 / 11.6	
	3000	3.1 / 4.2	— / —	5.0 / 6.8	7.1 / 9.7	8.0 / 10.9	
	2600	2.8 / 3.8	— / —	4.6 / 6.3	6.6 / 9.0	7.4 / 10.1	
	2300	2.5 / 3.4	— / —	4.1 / 5.6	6.0 / 8.2	6.6 / 9.0	
	2000	2.2 / 3.0	— / —	3.6 / 4.9	5.2 / 7.2	5.7 / 7.8	
	1800	1.9 / 2.6	— / —	3.3 / 4.5	4.6 / 6.3	5.1 / 6.9	
	1500	1.6 / 2.2	— / —	2.6 / 3.5	3.8 / 5.2	4.2 / 5.7	
ISO net brake fuel stop power [IFN] for strong intermittent load acc. to ISO 3046-1. [kW / HP]	3600	3.4 / 4.6	4.0 / 5.4	5.0 / 6.8	7.3 / 9.9	7.9 / 10.7	
	3000	3.1 / 4.2	3.7 / 5.0	4.6 / 6.3	6.8 / 9.2	7.6 / 10.3	
	2600	2.8 / 3.8	3.4 / 4.6	4.2 / 5.7	6.3 / 8.6	6.9 / 9.4	
	2300	2.5 / 3.4	3.0 / 4.1	3.9 / 5.3	5.7 / 7.8	6.2 / 8.4	
	2000	2.1 / 2.9	2.5 / 3.4	3.4 / 4.6	4.9 / 6.7	5.3 / 7.2	
	1800	1.9 / 2.6	2.2 / 3.0	3.0 / 4.1	4.4 / 6.0	4.7 / 6.4	
	1500	1.5 / 2.0	1.6 / 2.2	2.3 / 3.1	3.5 / 4.8	3.9 / 5.3	
ISO-standard power [ICXN] [10% overload permissible]. [kW / HP]	3600	3.1 / 4.2	— / —	4.5 / 6.1	6.5 / 8.8	7.1 / 9.7	
	3000	2.8 / 3.8	— / —	4.2 / 5.7	6.1 / 8.8	6.8 / 9.2	
	EPA variable speed; EPA constant speed	2600	2.5 / 3.4	— / —	3.8 / 5.2	5.6 / 7.6	6.2 / 8.4
	2300	2.2 / 3.0	— / —	3.5 / 4.8	5.1 / 6.9	5.5 / 7.5	
	ISO-standard fuel stop power [no overload permissible] acc. to ISO 3046-1. For constant speed and constant load [ICFN].	2000	1.9 / 2.6	— / —	3.1 / 4.2	4.4 / 6.0	4.8 / 6.5
	1800	1.7 / 2.3	— / —	2.7 / 3.7	3.9 / 5.3	4.2 / 5.7	
	1500	1.4 / 1.9	— / —	2.1 / 2.9	3.2 / 4.4	3.5 / 4.8	

Power output, torque und fuel consumption

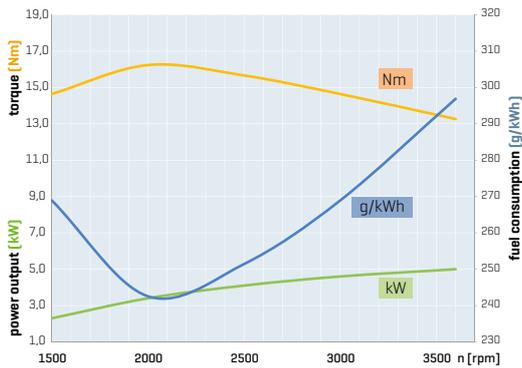
1B20 and 1B20V



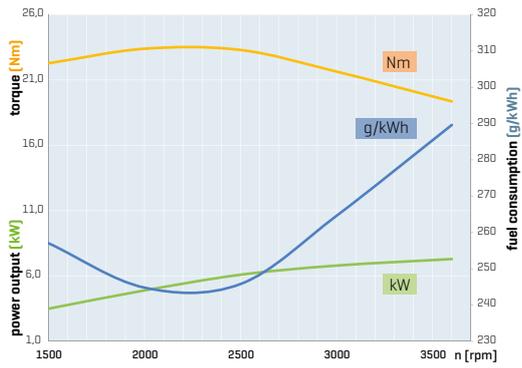
1B27



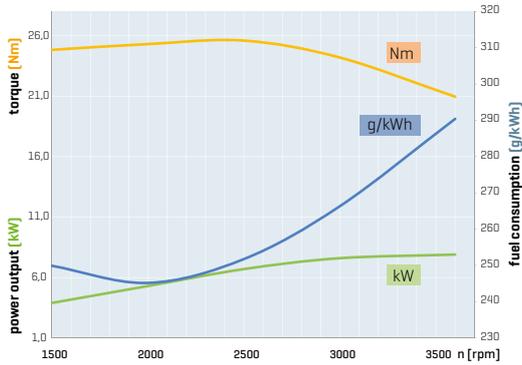
1B30 and 1B30V



1B40 and 1B40V



1B50 and 1B50V



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.

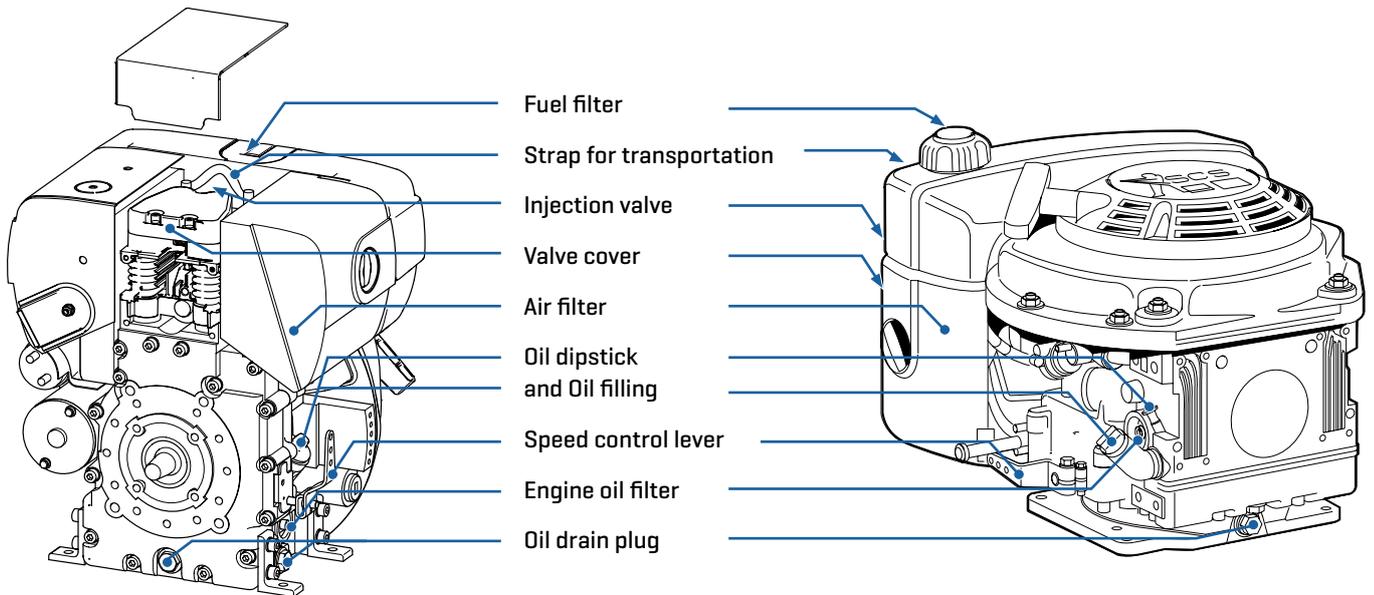
Shaft forms

Selection of available shaft forms

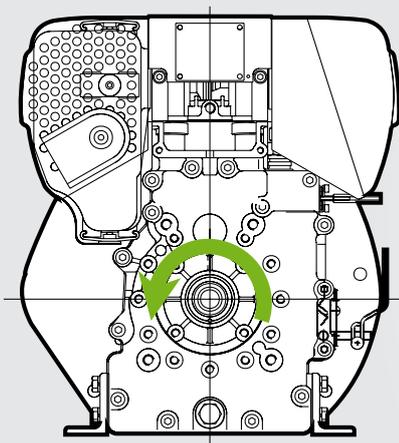
¹⁾ according to SAE J 609 ²⁾ according to LEMA LES 1203-1991

Cylindrical with key way	"7" Cyl. 3/4" ¹⁾	"2" ¹⁾	"9" Cyl. ²⁾	Cylindrical with thread	"1" ¹⁾	"5" ²⁾
	<p>1B20/27: ø 19.05 mm 5/16" - 24 UNF 2B</p>	<p>ø 25.4 mm 1B30/7/16" - 20 UNF 2B 1B40/50: 3/8" - 24 UNF 2B</p>	<p>1B20: ø 20 mm 1B27/1B30/ 1B40/1B50: ø 25 mm 1B20/27: M 8 1B30/40/50: M 10</p>		<p>ø 25.4 mm 1" - 14 UNS 2A Only 1B30/40/50</p>	<p>1B20: ø 20 mm 1B27/30: ø 25 mm 1B20: M 18 x 1.5 1B27/30: M 20 x 1.5</p>
Conical	"3" ²⁾	"4" SAE Gen. ¹⁾	"6" ital. ¹⁾	Universal	X crank shaft	
	<p>1B20: ø 25 mm 1B27: ø 26 mm 1B30/40/50: ø 30 mm 1B20: 1:5 1:10 M 10 1B20: M 8</p>	<p>1B20/27: ø 19.83 mm 1B30/40/50: ø 25.4 mm 1:5.333 5/16" - 24 UNF 2B</p>	<p>1B20/27/30 ø 23 mm 1.5 M 8 1.5 M 8</p>		<p>At crankshaft $J_{max} = 0.04 \text{ kgm}^2$</p>	

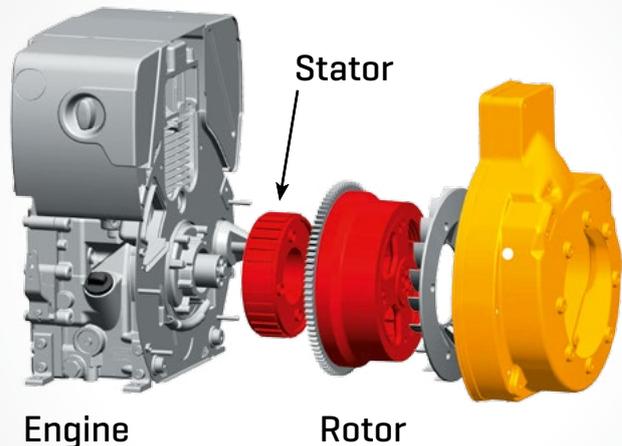
Maintenance and operating points



Power-take-off points



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

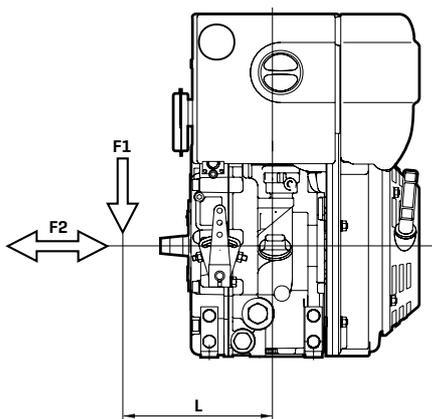


Engine

Rotor

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

Permissible load on power-take-off points



**1B20 / 1B27 / 1B30
1B20V / 1B30V**

max. permissible radial force

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

max. permissible axial force

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

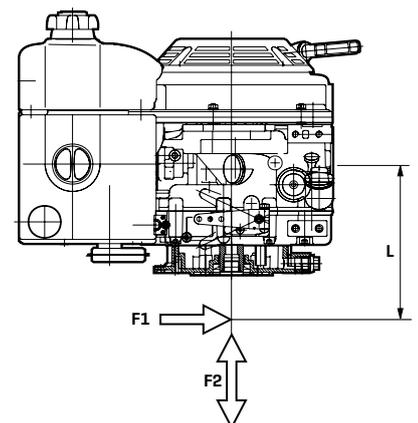
**1B40 / 1B50
1B40V / 1B50V**

max. permissible radial force

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

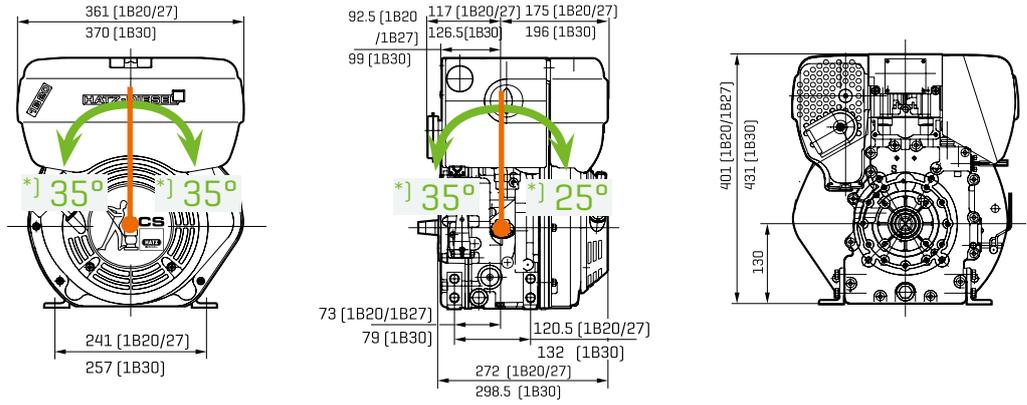
max. permissible axial force

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

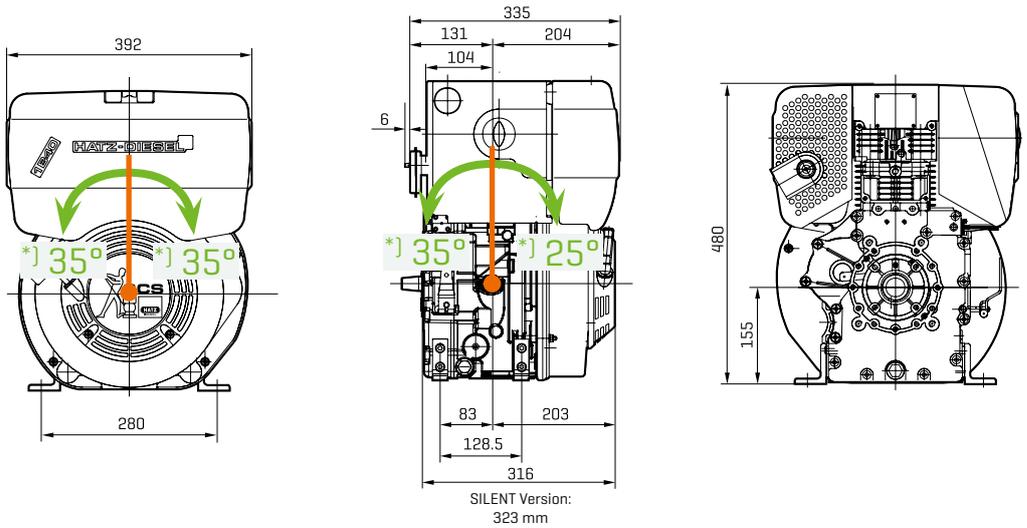


Dimensions

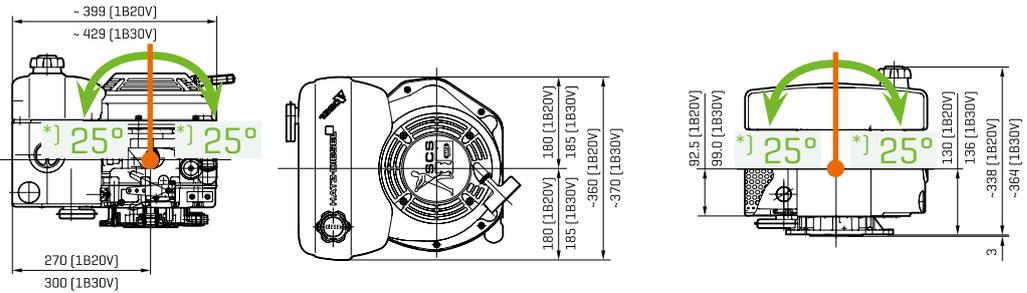
1B20
1B27
1B30



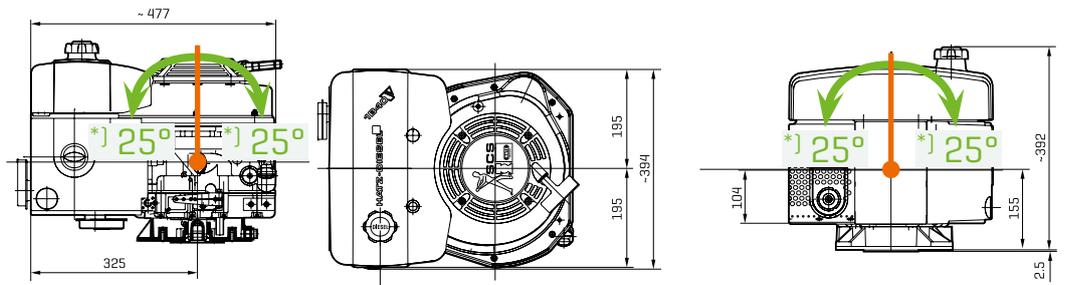
1B40
1B50



1B20V
1B30V



1B40V
1B50V



Spread at outlines ± 3 mm due to tolerance.
Drawings with detail and connection measures as PDF resp. DXF are shown under www.hatz-diesel.com.

*) max. permanent tilting

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