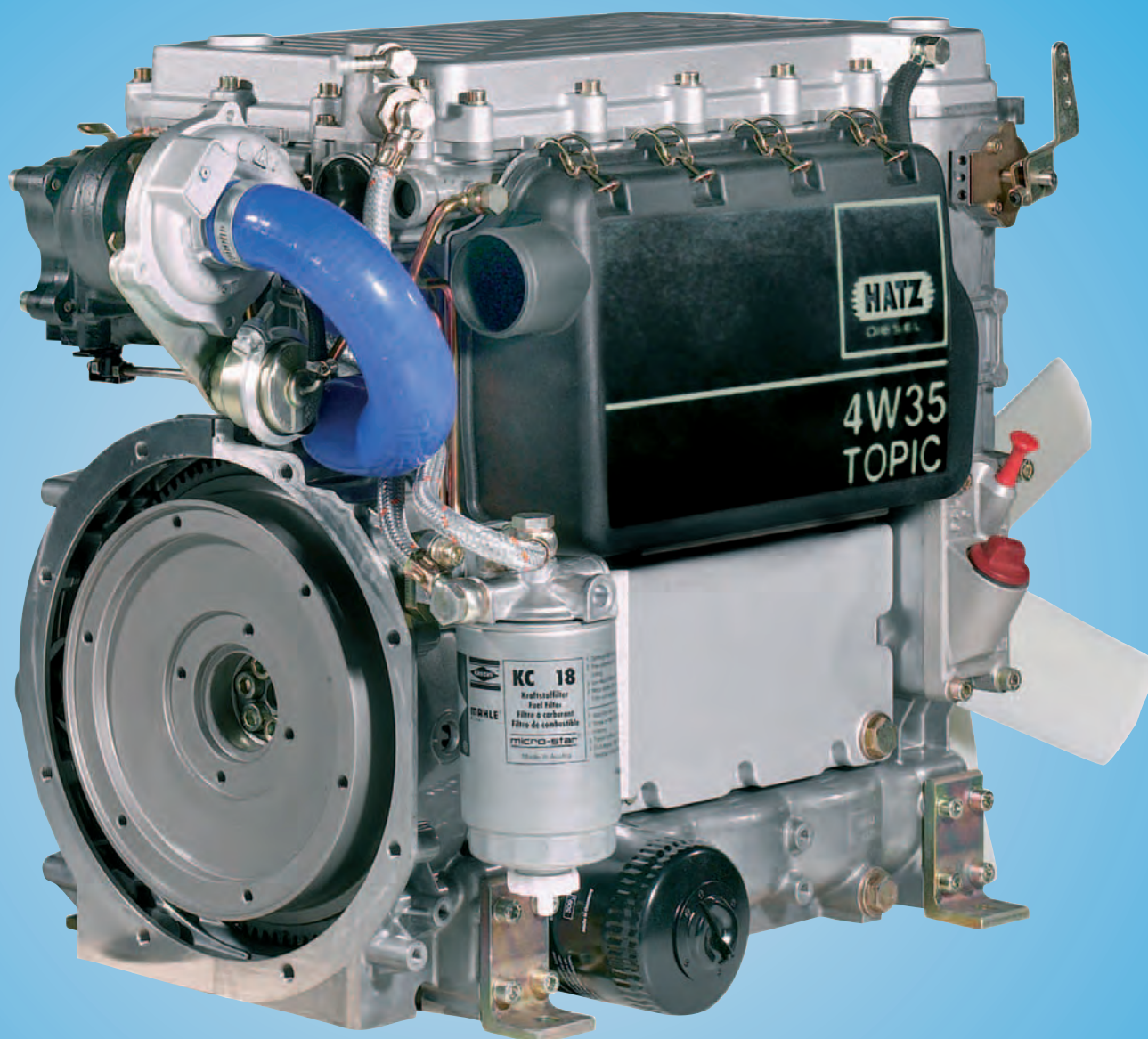


W35 TOPIC



5.5 - 30.6 kW · 7.5 - 41.6 HP

A NEW ENGINE GENERATION

Exhaust reduced types on request

EPA II
CARB II
ECE-R24
EU 97/68 -
Stage II/3A

2W35 • 3W35 • 4W35 • 4W35T

The new liquid-cooled series made by HATZ

Features and assets

The 2-4W35 TOPIC engines are liquid-cooled in-line engines with reciprocating engine drive of modular design.

- state-of-the art injection equipment with pump/nozzle unit
- active environmental protection via exhaust gas quality according to 97 / 68 EU, stage II/3A, and EPAII.

compact

due to an optimum component design.

light-weight

due to the use of cast aluminium for all parts of the housing.

silent

due to optimization of the housing structures via the finite elements method, and application of our internally developed noise reduction technology.

beautiful

due to clearly structured contours.

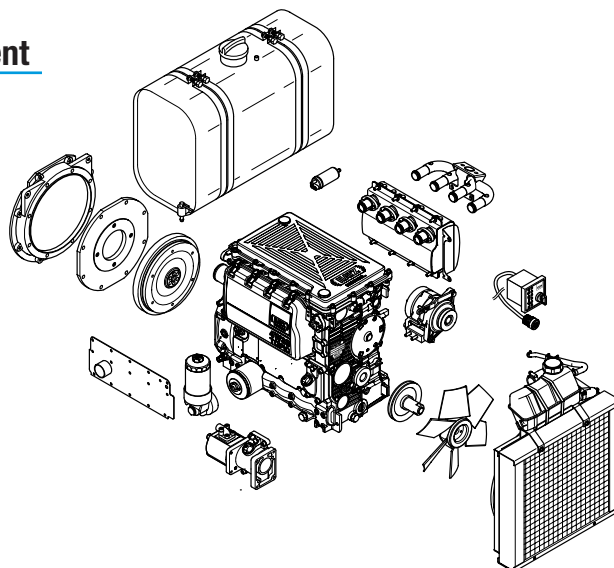
Description of components

- Cylinder crank case incl. timing case and oil sump made of cast aluminum.
- Single cylinder heads in modular design, of cast aluminum.
- Pump/nozzle unit developed by HATZ, with hydro-mechanical control (electronic optional).
- Mechanical control block, made by HATZ, for: delivery characteristic, timing, engine speed, torque characteristic (fuel-delivery correction), smoke suppression on starting. In the case of supercharged engines, the full load delivery regulation is defined via the charge air pressure.
- Light-weight pistons with deflection-free piston pin and open combustion chamber
- Connecting rod "cracked" and with widened piston pin support.
- Crankshaft with integrally cast balancing weights made of ductile iron.
- Overhead camshaft, driven by a double-track, smooth-running chain with lifetime lubrication (no toothed belt).
- Forced-feed oil lubrication with suction mechanism in the oil sump for severely inclined positions.
- Coolant pump driven by geared wheel (no belt) facilitating service for hose connections.
- PTO for two hydraulic pumps with gear drive (48 Nm).
- Alternator (12 V / 27 A) (basic design) integrated in flywheel (no belt)
Additionally available 55 A / A 95 A three-phase generator with v-belt drive
- Electric starter 12 V or 24 V.

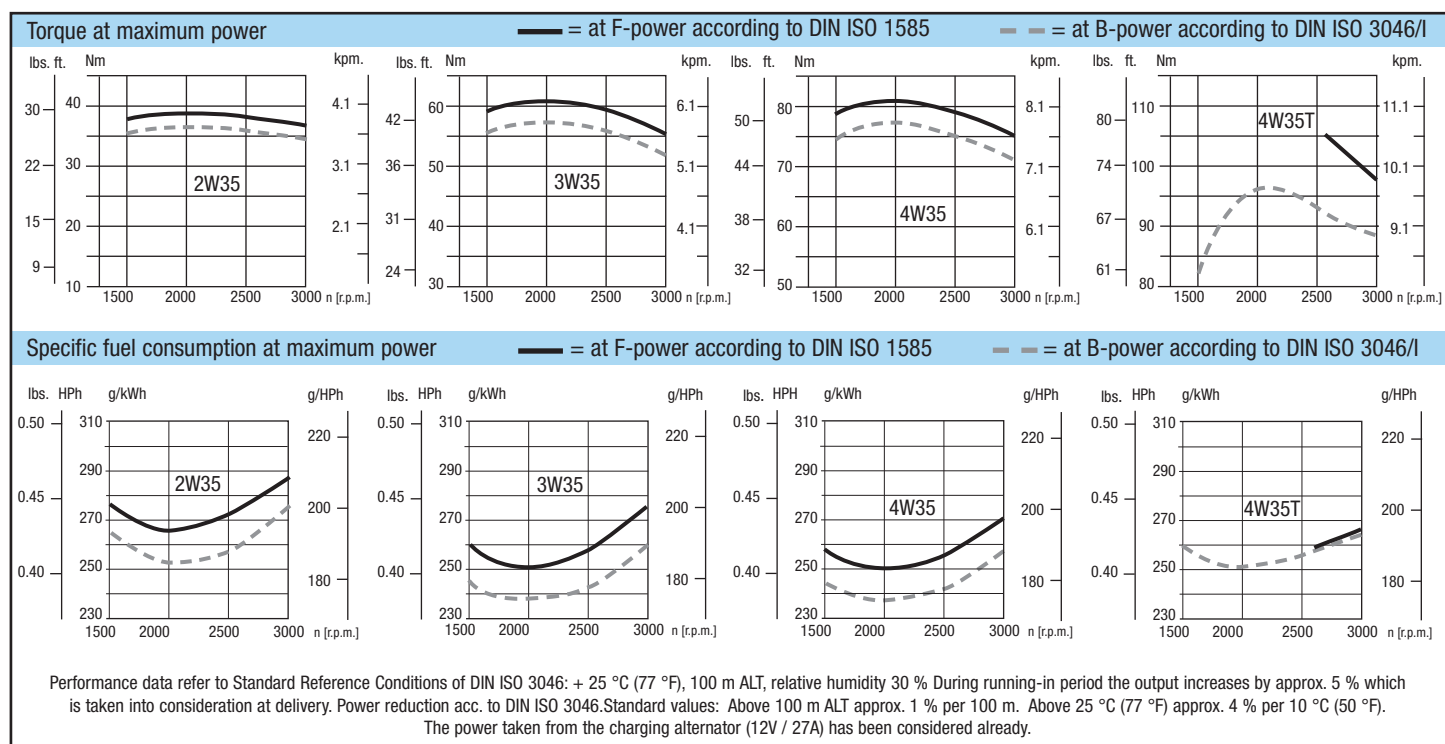
Innovation status

- Implementation of new technologies (15 patents), rugged dimensioning, precise manufacturing and accurate assembly.
- The modular design and the innovative concept allow considerable advantages regarding installation and service, such as e.g. access from above to the cylinder head down to the connecting-rod bearings located at the bottom.

Additional equipment



Technical data		2W35	3W35	4W35	4W35T
Number of cylinders		2	3	4	4
Bore x stroke	mm	70 x 90	70 x 90	70 x 90	70 x 90
	inches	2.76 x 3.54	2.76 x 3.54	2.76 x 3.54	2.76 x 3.54
Displacement	l	0.692	1.038	1.384	1.384
	cu.in.	42.20	63.30	84.41	84.41
Mean piston speed at 3000 r.p.m.	m/s	9	9	9	9
	ft/min	1772	1772	1772	1772
Compression ratio		21	21	21	20
Lub. oil consumption		approx. 0.5 % of fuel consumption, related to full load			
Lub. oil capacity max. / min.	l	2.5 / 1.3	3.4 / 2.0	4.4 / 2.8	4.4 / 2.8
	US qts	2.64 / 1.37	3.59 / 2.11	4.64 / 2.96	4.64 / 2.96
Speed control	Idle speed	approx. 1000 r.p.m.			
	Static speed drop	10 % at all speed applications; approx. 5% at 1500/1800/3000/3600 rpm in generator application			



Performance table		SPECIAL OUTPUT ON REQUEST	2W35		3W35		4W35		4W35 T	
	Hatz-Stand.	r.m.p	kW	HP	kW	HP	kW	HP	kW	HP
Vehicle output acc. to DIN ISO 1585	F	3000	11.0	15.0	17.4	23.7	23.6	32.1	30.6	41.6
		2600	10.1	13.7	16.0	21.8	21.5	29.2	28.1	38.2
		2300	9.1	12.4	14.4	19.6	19.3	26.2	22.5	34.7
		2000	7.9	10.7	12.6	17.1	16.9	23.0	22.2	30.2
		1800	7.1	9.7	11.4	15.5	15.3	20.8	19.5	26.5
		1500	5.7	7.8	9.1	12.4	12.2	16.6	14.3	19.4
ISO net brake fuel stop power (IFN) for intermittent load acc. to DIN ISO 3046/I.	B	3600	11.6	15.8	18.4	25.0	24.7	33.6	29.8	40.5
		3000	10.5	14.3	16.6	22.6	22.5	30.6	27.8	37.8
		2600	9.6	13.1	15.3	20.8	20.5	27.9	25.5	34.7
		2300	8.7	11.8	13.8	18.8	18.5	25.2	23.2	31.6
		2000	7.6	10.3	12.1	16.5	16.2	22.0	20.0	27.2
		1800	6.8	9.3	10.9	14.8	14.6	19.9	17.7	24.1
ISO-standard power (ICXN) (10% overload permissible) and ISO-standard fuel stop power (no overload permissible) acc. to DIN ISO 3046. For constant speed and constant load (ICFN).	S	3000	9.5	12.9	15.1	20.5	20.5	27.9	25.0	34.0
		2600	8.7	11.8	13.9	18.9	18.6	25.3	23.0	31.3

Installation data		2W35	3W35	4W35	4W35T
Combustion air required at 3000 r.p.m. approx.1)	m ³ / min	0.72	1.08	1.44	2.32
	cu.ft./min	25.5	38.1	50.8	82.0
Cooling air required at 3000 r.p.m. approx.1)	m ³ / min	26	36	65	65
	cu.ft./min	918	1271	2295	2295
Permanent tilting	max. degrees	30°	25°, 30°	30°	30°
Starter		12 V - 1.2 kW – 24 V - 2.5 kW	12 V - 1.2 kW – 24 V - 3.0 kW	12 V - 2.0 kW – 24 V - 3.0 kW	12 V - 2.0 kW – 24 V - 3.0 kW
Current alternator charging at 3000 / 1500 r.p.m.		14 V - 27 A / 14 A - 28 V			
Battery capacity	min / max Ah	12 V - 36 / 55 Ah	12 V - 36 / 55 Ah	12 V - 44 / 88 Ah	12 V - 44 / 88 Ah
		24 V - 36 / 55 Ah	24 V - 36 / 55 Ah	24 V - 36 / 66 Ah	24 V - 36 / 66 Ah

¹⁾ For other r.p.m. there is a linear reduction of the air requirement ²⁾ Flywheel low ³⁾ All other positions

Permissible load on power-take-off points

Max. permissible radial load (all around) with belt drive
(chain drive available on request)

$$F_1 = \frac{270\,000}{L_1 \text{ (mm)} - 40} \text{ [N]} \quad F_3 = \frac{270\,000}{L_2 \text{ (mm)} - 40} \text{ [N]}$$

Max. permissible axial force

$$F_2 = F_4 = 3000 \text{ [N]}$$

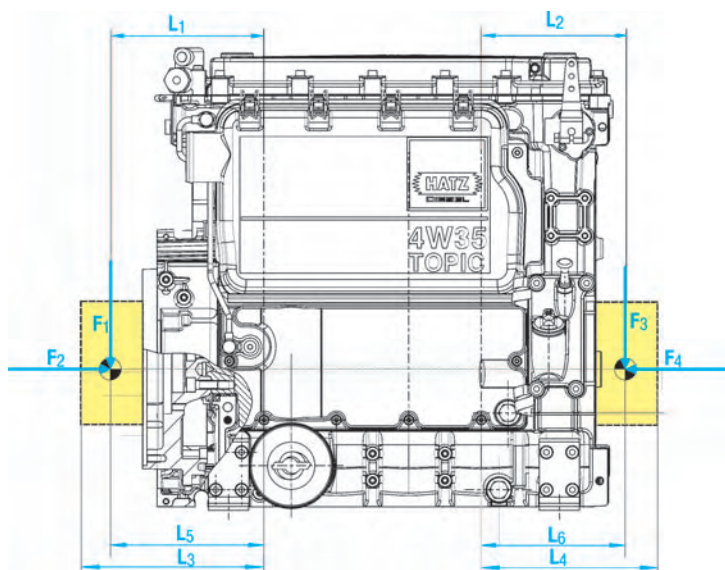
Additional rigid mass at the flywheel or at the crankshaft governor-side

$$m_{\max} = 12 \text{ kg}$$

$$\text{max length } L_3 = L_4 = 225$$

$$\text{Distance of centre of gravity}$$

$$\text{max } L_5 = L_6 = 168$$

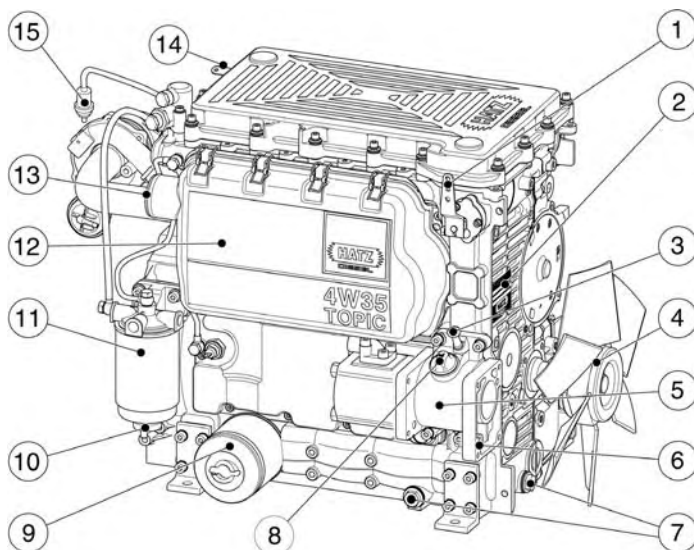


Turbo charged available on request

Pict. 1

Maintenance- and operating points

- 1 speed control
- 2 type plate
- 3 dipstick
- 4 fan (additional equipment)
- 5 hydraulic pump drive (additional equipment)
- 6 flange for further hydraulic pumps (additional equipment)
- 7 oil drain plug
- 8 oil filler plug
- 9 lubrication oil filter (replaceable)
- 10 water drain plug at fuel filter
- 11 fuel filter with water separator
- 12 dry-type air filter
- 13 air intake for combustion air
- 14 stop device
- 15 fuel pre-filter



Pict. 2

Electrical equipment

Instrument boxes are available as switchboard instruments with cable (2m) and will be delivered loose. Instrument box and cable harness are part of the additional equipment and supplied according to the number of electrical safety features which are required. If the engine has to be started at temperatures

below - 15 °C, engine must be fitted with a pre-heating system (glow plug) (additional equipment). Further additional equipments include automatic start and stop, remote control etc.

Circuit diagrams are available on demand.

2W35 • 3W35 • 4W35 • 4W35T

Power-Take-Off and Sense of Rotation

- P.T.O. flywheelside with engines speed, anti-clock-wise rotation (picture 3).
- P.T.O. crankshaft-governor side with engine speed, clock-wise rotation (picture 4).
- Permissible radial load of P.T.O. see picture 1.
- Hydraulic pump mounting as compact-designed additional equipment.

Engine Designations

- | | | |
|-----------------------------|-------|----------------------------|
| • Execution: two-cylinder | 2W35 | 5.5 up to 11.6 kW |
| • Execution: three-cylinder | 3W35 | 8.7 up to 18.4 kW |
| • Execution: four-cylinder | 4W35 | 11.7 up to 24.7 kW |
| | 4W35T | 13.0 up to 30.6 kW (Turbo) |

Engine Variants

- Variant XI : Engine with electric start 12 V.
- Variant XIII: Engine with electric start 24 V.

Weights

standard engine without air filter, exhaust silencer, cooler	2W35		3W35		4W35		4W35T	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
Variant XI / XIII	71	163	85	195	99	227	104	239

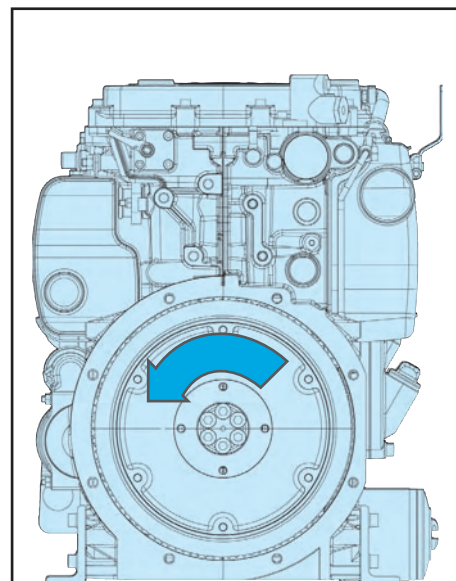
Scope of Delivery of Engine

Standard equipment: liquid-cooled, four-stroke, in-line diesel engine (2-, 3- and 4-cylinder) with vertical cylinder axis. Engine tested for full load on test bench. Direct injection with pump/nozzle unit, mechanical controlled, speed control for constant speed, speed control lever incl. stop-position. Cold-start device to approx. -15 °C. Coolant pump, thermostat. Horizontal oil filter. Flywheel SAE 6½, flywheel housing. Without lub oil, without cooling liquid.

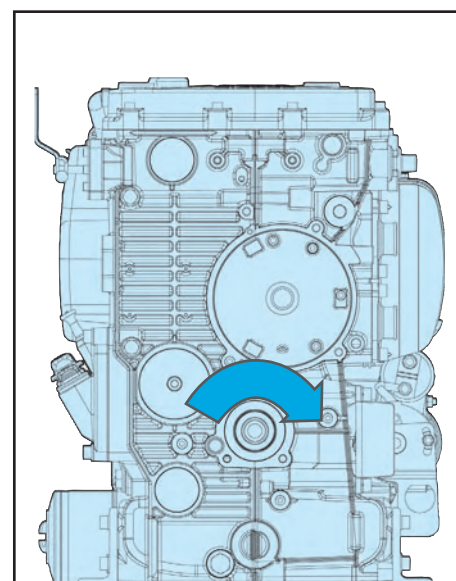
4W35T with turbocharger.

Accessories: gaskets for 1. maintenance

- **Variant XI:** Engine in standard equipment. With electric start 12 V (starter, gear ring, alternator integrated in flywheel: 14 V / 27 A at 3000 rpm, voltage regulator, wire with plug interface), oil-pressure switch, temperature switch for coolant. Fuel pre-filter, fuel feed pump, fuel micro-filter. Dry-type air filter. Exhaust manifold. Suction fan on crankshaft.
- **Variant XIII:** Engine in standard equipment with electric start 12V (starter, gear ring, alternator integrated in flywheel: 28 V / 14 A at 3000 rpm, voltage regulator, wire with interface), oil pressure switch, temperature switch for coolant. Fuel pre-filter, fuel feed pump, fuel micro-filter. Dry-type air filter. Exhaust manifold. Suction fan on crankshaft.



Pict. 3



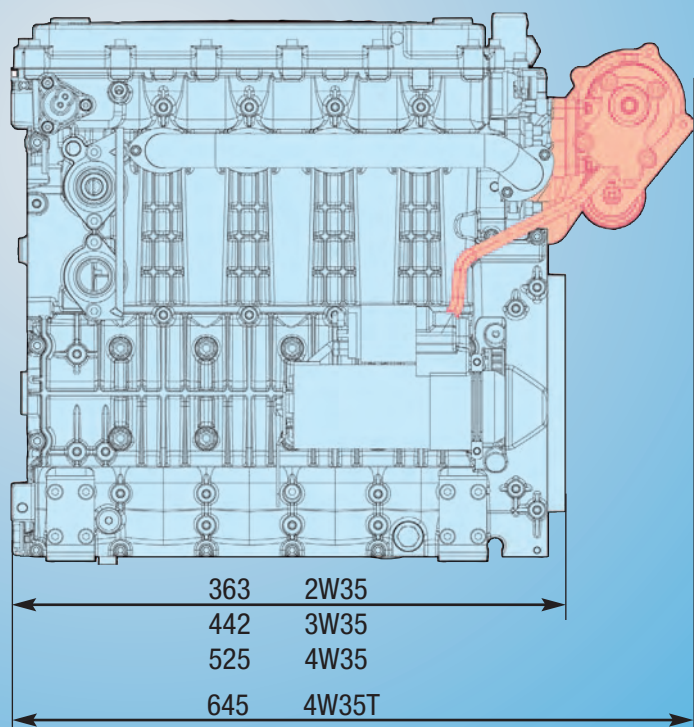
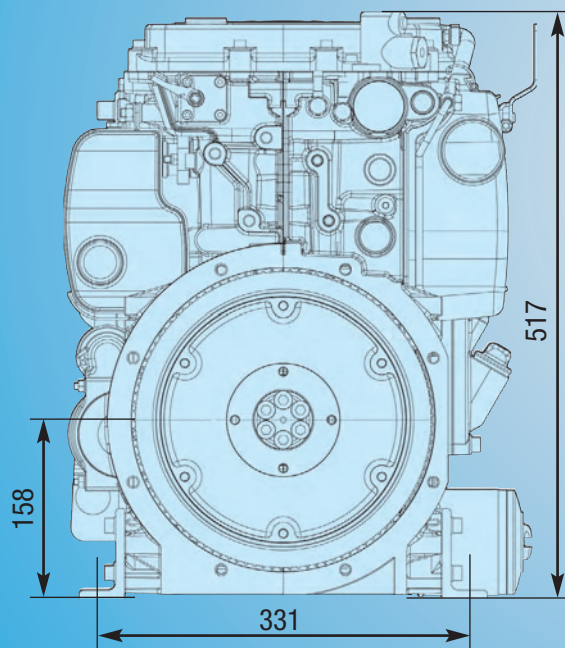
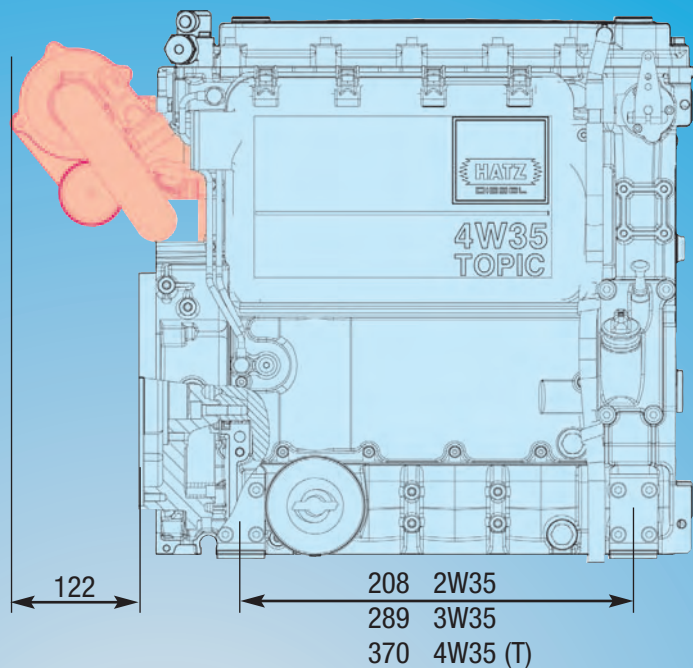
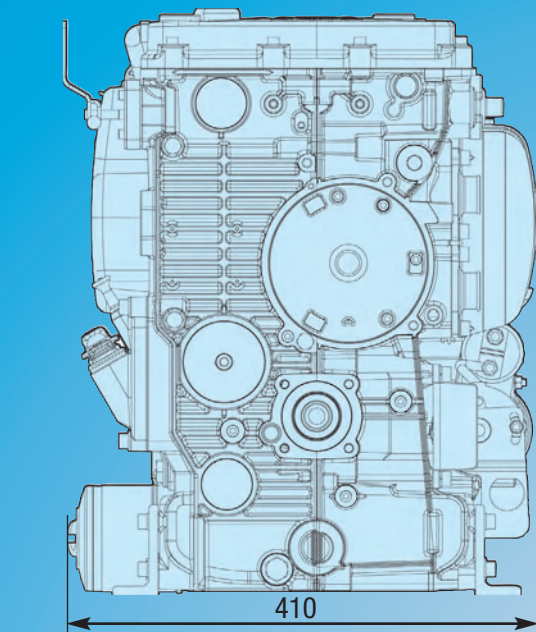
Pict. 4

Additional equipment

Thanks to the complete programme of additional equipment engine can be adapted to the special requirements of every application.

The required additional equipment is necessary for an operative engine.

Dimensions



Spread at outlines ± 3 mm due to tolerance.

Drawings with detailed - and connection measures can either be demanded or downloaded as pdf- resp. dxf-file which are shown in the Internet.



MOTORENFABRIK HATZ
D-94099 RUHSTORF • GERMANY

Telephone: +49 (0) 85 31 / 319-0 • Telefax: +49 (0) 85 31 / 319-418
www.hatz-diesel.de • eMail: marketing@hatz-diesel.de

5 /657 E - 05.06 - 3 Printed in Germany
 Modifications, which serve the technical improvements, are reserved.