

# 1106D-E70TAG3

# 1100

163 kWm (Gross) @ 1500 rpm  
184 kWm (Gross) @ 1800 rpm

## Electropak

### Basic technical data

Number of cylinders	6
Cylinder arrangement	In-line
Cycle	4 stroke
Induction system	Turbocharged and air charge cooled
Combustion system	Direct injection diesel
Compression ratio	16.8 : 1
Bore	105 mm
Stroke	135 mm
Cubic capacity	7.01 litres
Direction of rotation	Anticlockwise when viewed from flywheel
Firing order	1, 5, 3, 6, 2, 4
Estimated total weight (dry)	788 kg
Estimated total weight (wet)	822 kg

### Overall dimensions (Electropak)

Height	1142 mm
Length (air cleaner fitted)	1763 mm
Width	788 mm

### Moments of inertia

Engine rotational components	0.27 kgm <sup>2</sup>
Flywheel	1.26(SAE2) kgm <sup>2</sup>

### General installation

General Installation	Units	50 Hz (1500 rpm)		60 Hz (1800 rpm)	
		Prime	Standby	Prime	Standby
Gross engine power	kW	148.1	162.8	167	183.5
Brake mean effective pressure	kPa	1689.5	1856.6	1587.4	1743.4
Mean piston speed	m/s	6.75		8.1	
Electropak nett engine power	kW	141.3	155.9	156.9	173.4
Engine coolant flow (against 35 kPa restriction)	litres/min	142		170	
Combustion air flow (at STP)	m <sup>3</sup> /min	11.9	12.4	14.9	15.3
Exhaust gas flow (maximum)	m <sup>3</sup> /min	26.40	26.60	30.57	31.30
Exhaust gas temperature (maximum) in manifold (after turbocharger)	°C	491		440	
Nett engine thermal efficiency	%	37.5	38.0	39.3	39.9
Typical genset electrical output (0.8pf 25°C)	kWe	120	138	136	153
	kVA	150	172	170	191
Regenerative power (estimated)	kW	12.5		14.1	
Assumed alternator efficiency	%	91	91	91	92
Energy balance					
Heat in fuel	kW	376.6	410.0	424.7	460
Power to cooling fan	kW	4		7	
Power to coolant and lubricating oil	kW	64	72.5	68.9	76.8
Power to residual losses (alternator)	kW	2.8		3.1	
Power to exhaust	kW	113.7	118.9	126.0	131.8
Energy to charge coolers	kW	25.6	26.1	35.4	37.6
Power to radiation	kW	25.2	26.6	27.4	29.1

**Prime power:** Unlimited hours usage with an average load factor of 80% of the published prime power over each 24 hour period. A 10% overload is available for 1 hour in every 12 hours operation.

**Standby power:** Limited to 500 hours annual usage, with an average load factor of 80% of the published standby power rating over each 24 hour period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on standby power.

### Centre of gravity, Electropak

Forward from rear of block (wet)	476 mm
Above crankshaft centre line (wet)	176 mm
Offset to RHS of crankshaft centre line (wet)	-16 mm

### Performance

Speed variation at constant load	± 0.26%
Cyclic irregularity at standby power	0.004
All ratings within	± 3%

**Note:** All data based on operation to ISO 3046-1:2002 standard reference conditions.

### Sound level

Average sound pressure level for standby power @ 1 m... TBC

### Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	44%
Air inlet restriction at maximum power	- 5 kPa (maximum)
Exhaust back pressure at maximum power	15 kPa (maximum)
Fuel temperature	40°C

If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for these changes. For full details, contact Perkins Technical Service Department.

## Cooling system

### Cooling pack

Overall weight (wet) .....	90 kg
Overall face area .....	564924 mm <sup>2</sup>
Width .....	716 mm
Height .....	789 mm

### Radiator

Face area .....	351,840 mm <sup>2</sup>
Number of rows and materials .....	4 rows, Aluminium
Matrix density and material .....	10 fins per inch, Aluminium
Width of matrix .....	440 mm
Height of matrix .....	800 mm
Pressure cap setting (Min.) .....	100 kPa

### Charge cooler

Face area .....	203,483 mm <sup>2</sup>
Number of rows and materials .....	2 rows, Aluminium
Matrix density and material .....	10 fins per inch, Aluminium
Width of matrix .....	220 mm
Height of matrix .....	789 mm

### Fan

Diameter .....	610 mm
Drive ratio .....	1.25:1
Number of blades .....	7
Material .....	Nylon
Type .....	Pusher
Air flow @ 1800 rpm .....	5.76 kg/s
Power @ 1800 rpm .....	7 kW

### Coolant

Total system capacity .....	21 litres
System drawdown capacity .....	10%
Engine capacity .....	9.5 litres
Maximum top tank temperature .....	108°C
Temperature rise across engine (Maximum rating dependent) .....	12°C
Maximum permissible external system resistance .....	35 kPa
Thermostat operation range .....	82°C to 95°C
Shutdown switch setting .....	114°C
Coolant pump method of drive .....	Gear
Recommended coolant immersion heater rating (Min.) .....	0.75 kW
Recommended coolant .....	BS6580 - 1992, ASTM D3306 and ELC coolants to 1E1966

### Duct allowance

Maximum additional restriction (duct allowance to cooling airflow and resultant minimum air flow) - Standby power

Description	rpm	kPa	kg/s
Duct allowance with inhibited coolant at 53°C			
Minimum air flow	1500	0.125	3.5
	1800	0.12	5.2
Duct allowance with inhibited coolant at 46°C			
Minimum air flow	1500	0.200	3.25
	1800	0.200	4.6

## Electrical system

Alternator .....	8SI
Alternator voltage .....	12 volts
Alternator output .....	65 amps
Starter .....	AZF
Starter motor voltage .....	12 volts
Starter motor power .....	4.0 kW
Number of teeth on the flywheel .....	126
Pull-in current of starter motor solenoid @ 25°C maximum <sup>(1)</sup> .....	12 volts 68 amps
Hold-in current of starter motor solenoid @ 25°C maximum <sup>(1)</sup> .....	12 volts 20 amps
Engine stop method .....	CAN link signal or Hardwire input to engine ECM

<sup>1</sup> All leads to rated at 10 amps minimum

### Cold start recommendations

Minimum required cranking speed over TDC .....

60 rpm
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	5 to -5°C	-5 to -20°C	-20 to -25°C
Starter	AZF		
Battery	1 x 750CCA	2 x 750CCA	2 x 900CCA
Maximum breakaway current	NA		
Cranking current	1000A		
Aids	None	Glowplugs	
Minimum mean cranking speed	130 rpm	100 rpm	100 rpm

**Note:** Battery capacity is defined by the 20 hour rate

**Note:** If a change to a low viscosity oil is made, the cranking torque necessary at low ambient temperatures is much reduced. The starting equipment has been selected to take advantage of this. It is important to change to the appropriate multigrade oil in anticipation of operating in low ambient temperatures

### Exhaust system

Maximum back pressure - 1500 rpm & 1800 rpm .....	15 kPa
Exhaust outlet, internal diameter .....	115.9 mm

## Fuel system

### Injection components

Injector ..... Electronic CRIN2  
 Fuel pump ..... CB28

### Fuel priming

Priming pump type ..... Manual  
 Maximum priming time ..... 180 seconds

### Fuel feed

Maximum fuel flow ..... 6.6 litres/min  
 Maximum suction head at engine fuel pump inlet ..... -17 kPa  
 Maximum static pressure head ..... 10 kPa  
 Fuel temperature at engine fuel pump inlet ..... 75°C  
 Tolerance on fuel consumption ..... ± 5%

### Fuel specification

Fuel standard ..... Various (contact Perkins Technical Department)

### Fuel consumption

Load	Type of operation and application			
	1500 rpm		1800 rpm	
	g/kWh	litres/hr	g/kWh	litres/hr
110% Prime power	210.0	40.8	209.0	45.9
100% Prime power	212.2	37.5	212.1	42.3
75% Prime power	223.2	29.6	231.7	34.7
50% Prime power	229.2	20.3	238.7	23.8
25% Prime power	246.1	10.9	260.2	13.0

## Induction system

### Maximum air intake restriction

Clean filter ..... 4 kPa  
 Dirty filter ..... 8 kPa  
 Air filter type ..... paper element

## Lubrication system

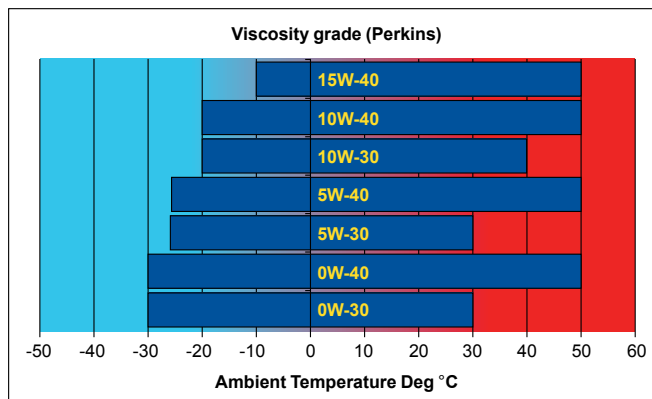
Maximum total system oil capacity ..... 17.5 litres  
 Minimum oil capacity in sump ..... 12.5 litres  
 Maximum oil capacity in sump ..... 15.5 litres  
 Maximum engine operating angles -  
 Front up, front down, right side, left side ..... 7°  
 Sump drain plug tapping size ..... 3/4 - 16 UNF  
 Shutdown switch setting (where fitted)  
 Oil pressure shut down switch ..... 90 kPa Falling

### Lubricating oil

Relief valve opening pressure ..... 430 kPa  
 Pressure at maximum speed ..... 340 kPa  
 Maximum continuous oil temperature (in rail) ..... 125°C  
 Oil consumption at full load (% of fuel) ..... < 0.1

## Recommended SAE viscosity

A multigrade oil must be used which conforms to API CH4 or CI4  
 ACEA E5 must be used, see illustration below:



## Mountings

Maximum static bending moment at rear face of block ..... 1130 Nm  
 Maximum permissible overhung load  
 on the flywheel ..... Calculated on request  
 Maximum bending moment at rear of flywheel housing ..... ± 3000 in Shock Nm

### Load acceptance

The data below complies with the requirements of classification 3 and 4  
 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5.

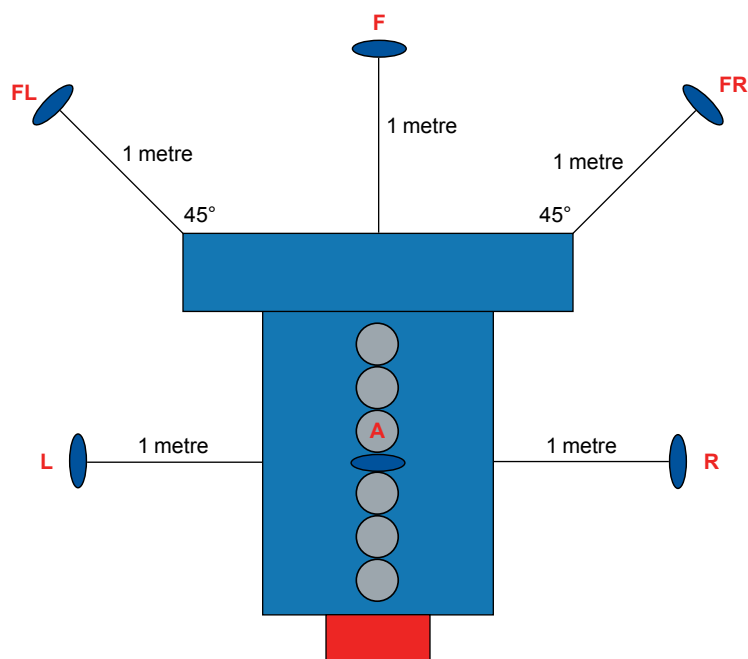
**Initial load application:** When engine reaches rated speed (15  
 seconds maximum after engine starts to crank).

Description	Units	1500 rpm	1800 rpm
% of prime power	%	90.0	82.5
Load	kWe	125.0	114.7
Transient frequency deviation	%	20.3	8.9
Frequency recovery time	Seconds	1.8	0.8

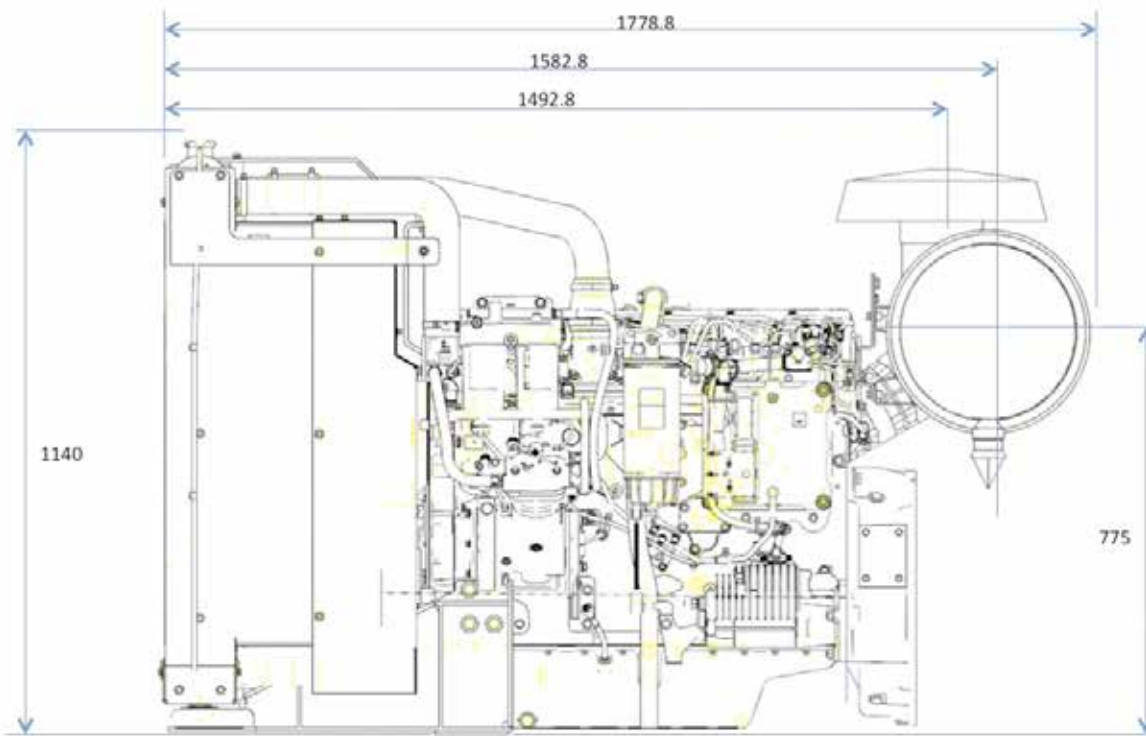
## Noise data

### Noise levels (predicted)

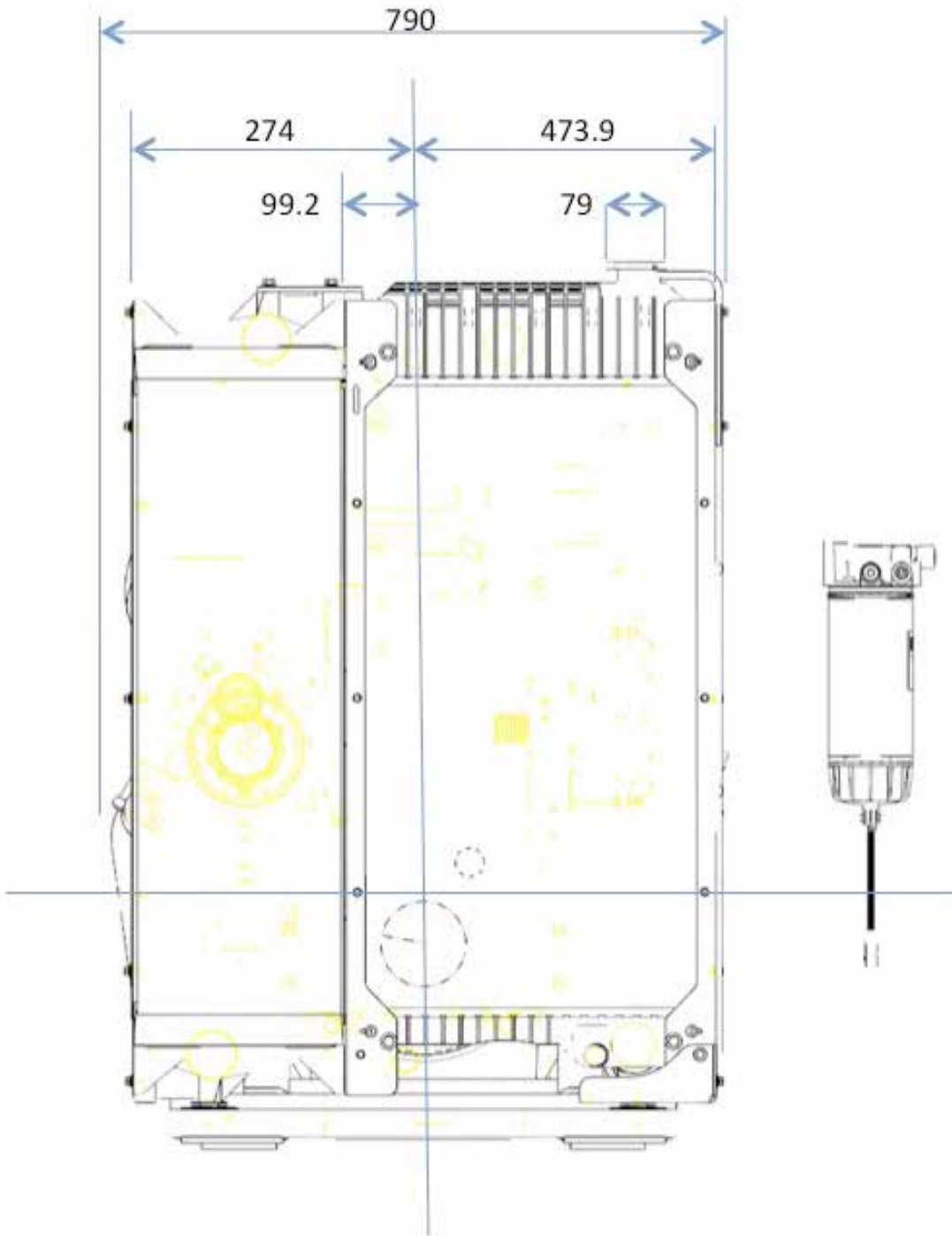
Prime power noise level dB(A)		
Position	50 Hz	60 Hz
F	95.6	99.8
R	95.8	99.4
L	95.4	99.0
A	93.3	96.4
FR	95.1	99.1
FL	95.2	99.0



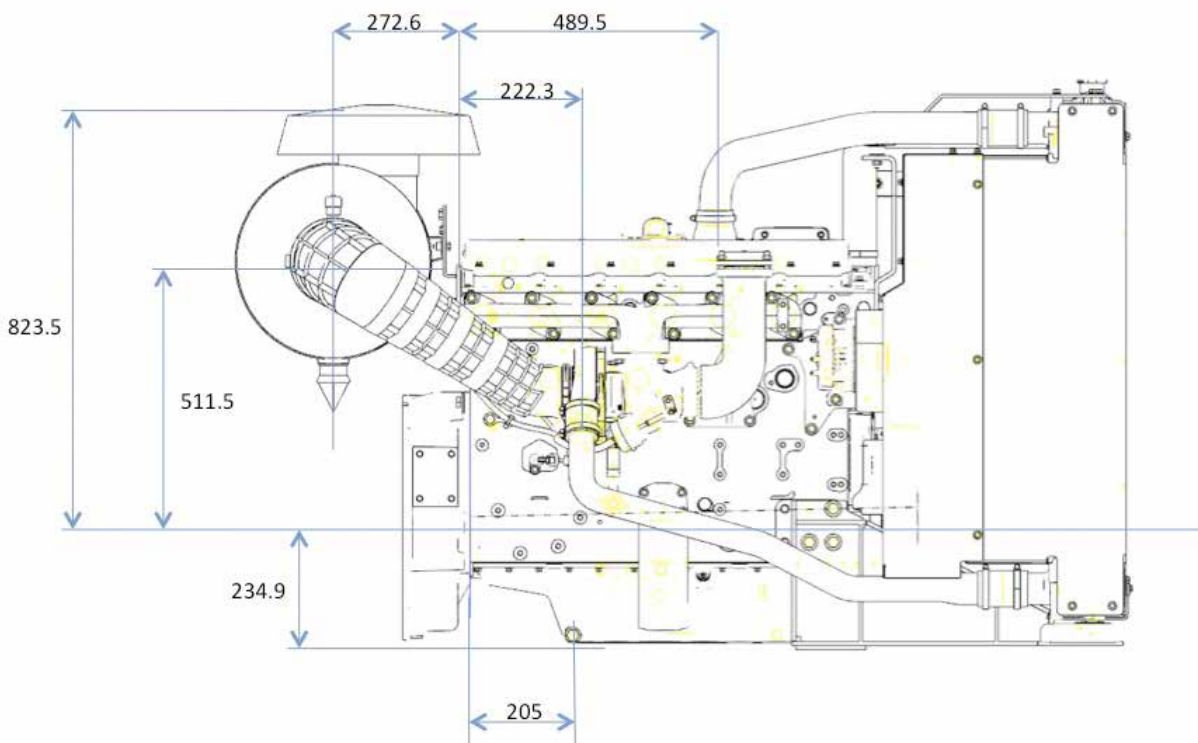
## 1106D-E70TAG3 - Left side view



# 1106D-E70TAG3 - Front view

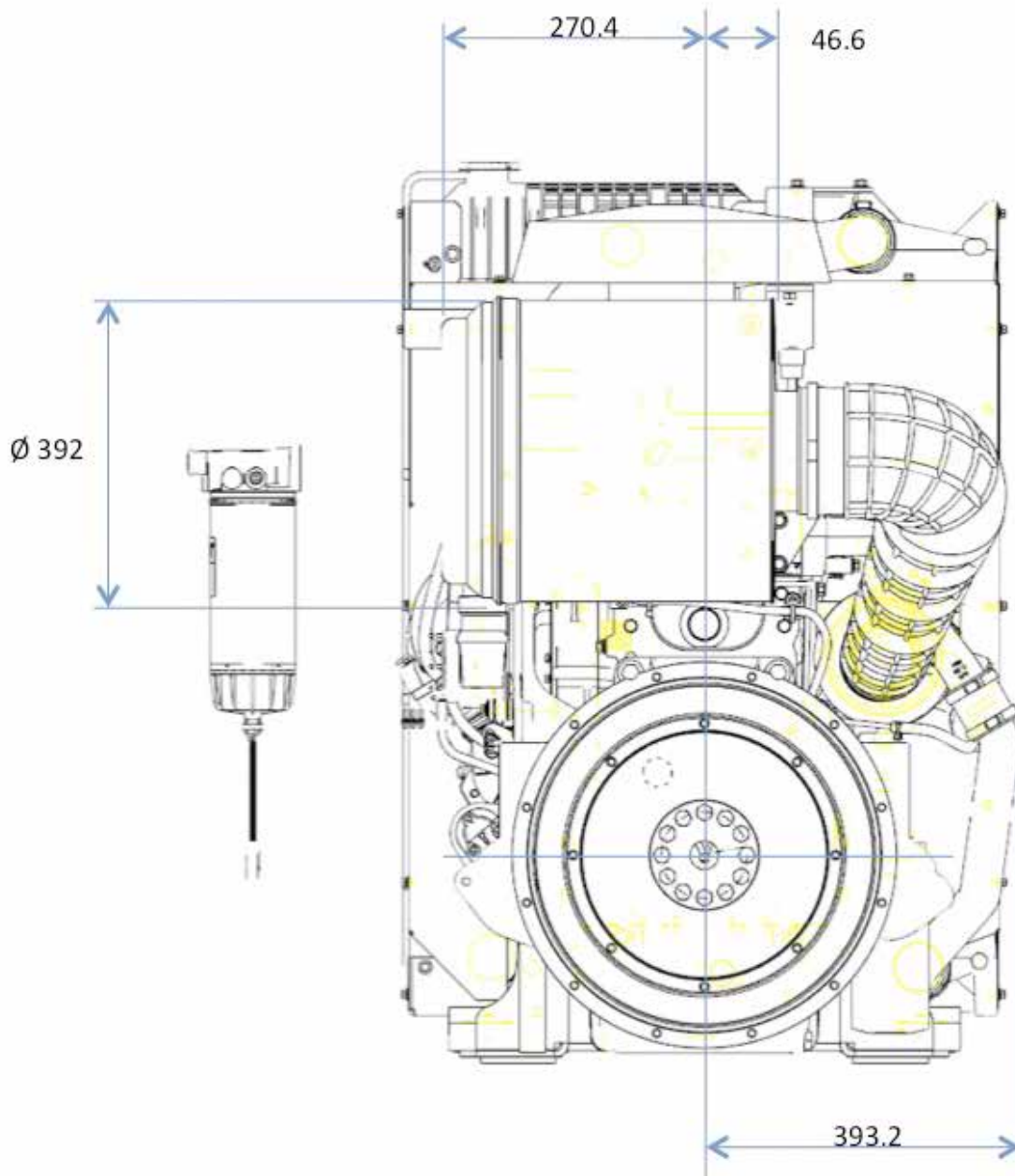


## 1106D-E70TAG3 - Right side view





# 1106D-E70TAG3 - Rear view





# 1106D-E70TAG3 - Plan view

