

# 1106D-E70TAG5

# 1100

234.5 kWm (Gross) @ 1800 rpm

## ElectropaK

Series

### 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> |

### 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     | ± 0.76% |
| Cyclic irregularity at standby power | 0.009   |
| 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... 101.7dB(A)

### Test conditions

|  |                   |
|--|-------------------|
| Air temperature                        | 25°C              |
| Barometric pressure                    | 100 kPa           |
| Relative humidity                      | 48%               |
| Air inlet restriction at maximum power | - 8 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.

### General installation

| General Installation   | Units               | Standby |
|--|---------------------|---------|
| Gross engine power   | kW                  | 234.5   |
| Brake mean effective pressure                                      | kPa                 | 2234.1  |
| Mean piston speed  | m/s                 | 8.1     |
| ElectropaK nett engine power                                       | kW                  | 223.5   |
| Engine coolant flow (against 35 kPa restriction)                   | litres/min          | 170.0   |
| Combustion air flow (at STP)                                       | m <sup>3</sup> /min | 18.5    |
| Exhaust gas flow (maximum)   | m <sup>3</sup> /min | 38.47   |
| Exhaust gas temperature (maximum) in manifold (after turbocharger) | °C                  | 553     |
| Nett engine thermal efficiency                                     | %                   | 39.8    |
| Typical genset electrical output (0.8pf 25°C)                      | kWe                 | 200     |
|  | kVA                 | 250     |
| Regenerative power (estimated)                                     | kW                  | 3.0     |
| Assumed alternator efficiency                                      | %                   | 92      |
| Energy balance   |                     |         |
| Heat in fuel   | kW                  | 590.8   |
| Power to cooling fan   | kW                  | 8.5     |
| Power to coolant and lubricating oil                               | kW                  | 91.9    |
| Power to exhaust   | kW                  | 181.2   |
| Power to residual losses (alternator)                              | kW                  | 3.1     |
| Energy to charge coolers   | kW                  | 47.4    |
| Power to radiation   | kW                  | 35.2    |

**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.

## Cooling system

### Cooling pack

|                      |                        |
|----------------------|------------------------|
| Overall weight (wet) | 90 kg                  |
| Overall face area    | 611200 mm <sup>2</sup> |
| Width                | 764 mm                 |
| Height               | 800 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 (minimum) | 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              | 258 mm                      |
| Height of matrix             | 789 mm                      |

### Fan

|                     |           |
|---------------------|-----------|
| Diameter            | 686 mm    |
| Drive ratio         | 1.2:1     |
| Number of blades    | 9         |
| Material            | Nylon     |
| Type                | Pusher    |
| Air flow @ 1800 rpm | 6.75 kg/s |
| Power @ 1800 rpm    | 8.5 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 (minimum)     | 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                              | 1800 | 0.12  | 6.2  |
| Duct allowance with inhibited coolant at 46°C |      |       |      |
| Minimum air flow                              | 1800 | 0.200 | 5.6  |

## Electrical system

|   |   |
|---|---|
| Alternator  | 13SI  |
| Alternator voltage  | 12 volts  |
| Alternator output   | 100 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

|                             | 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 - 1800 rpm  | 10 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 |           |
|------------------|-----------------------------------|-----------|
|                  | 1800 rpm                          |           |
|                  | g/kWh                             | litres/hr |
| 110% Prime power | 210.2                             | 59.1      |
| 100% Prime power | 214.9                             | 54.4      |
| 75% Prime power  | 229.1                             | 43.5      |
| 50% Prime power  | 233.4                             | 29.5      |
| 25% Prime power  | 253.0                             | 16.0      |

## Induction system

### Maximum air intake restriction

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

## Lubrication system

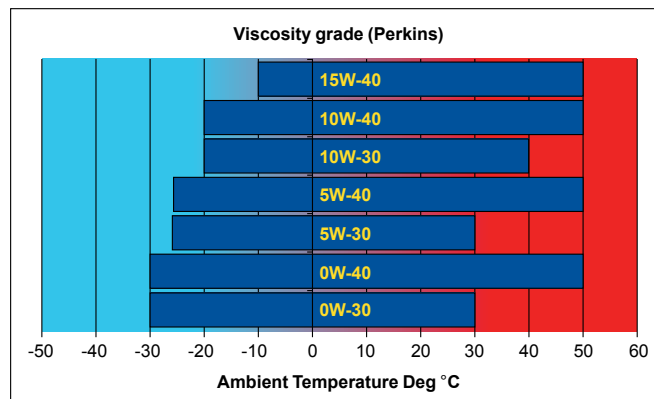
Maximum total system oil capacity ..... 17.5 litres  
 Minimum oil capacity in sump ..... 12.5 litres  
 Maximum oil capacity in sump ..... 15.5 litres  
 Maximum engine operating angles -  
 Front up, front down, right side, left side..... 7°  
 Sump drain plug tapping size .....3/4 - 16 UNF  
 Shutdown 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.

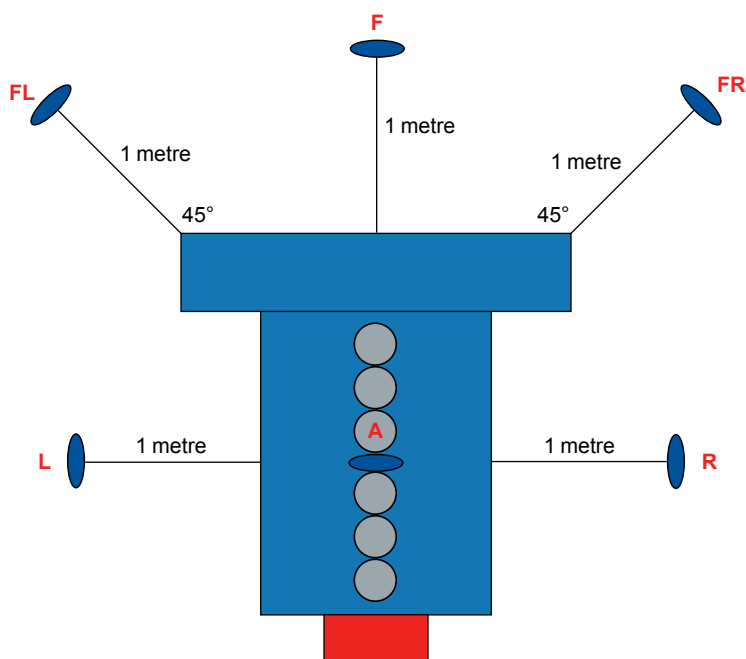
**Initial load application:** When engine reaches rated speed (15  
 seconds maximum after engine starts to crank).

| Description                   | Units   | 1800 rpm |
|-------------------------------|---------|----------|
| % of prime power              | %       | 66       |
| Load                          | kWe     | 120      |
| Transient frequency deviation | %       | 8.7      |
| Frequency recovery time       | Seconds | 0.8      |

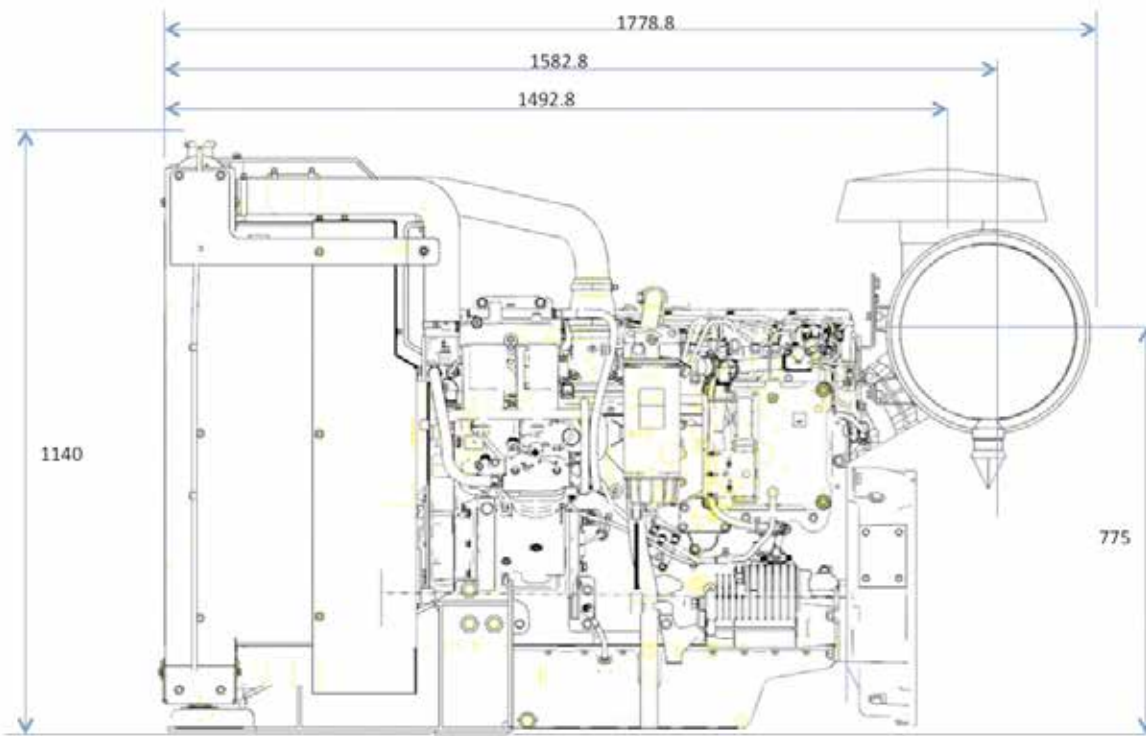
## Noise data

### Noise levels

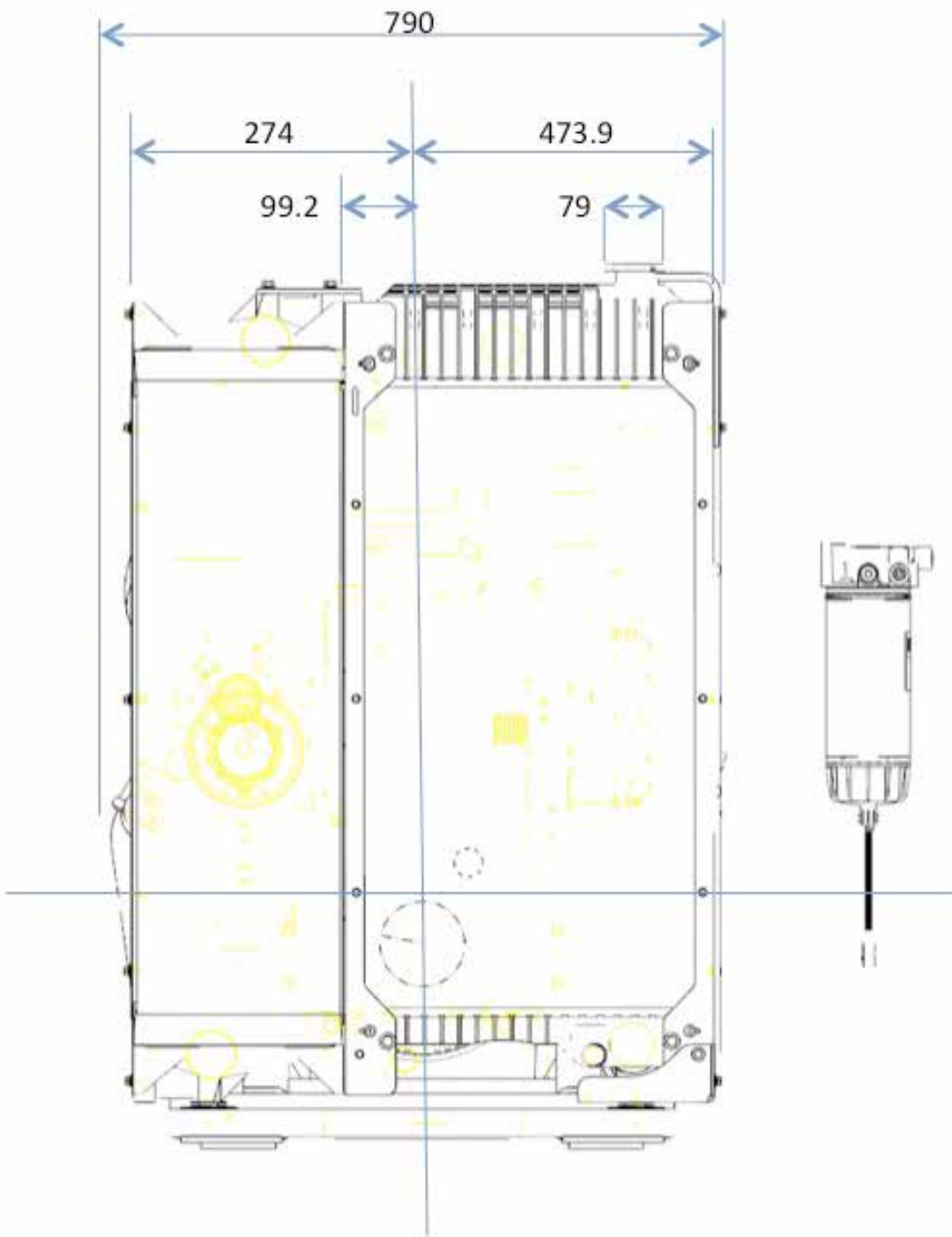
| Position | Noise level dB(A) |         |
|----------|-------------------|---------|
|          | Prime power       | Standby |
| A        | NA                | 99.7    |
| R        | NA                | 102.2   |
| FR       | NA                | 102.6   |
| F        | NA                | 103.7   |
| FL       | NA                | 101.9   |
| L        | NA                | 101.6   |



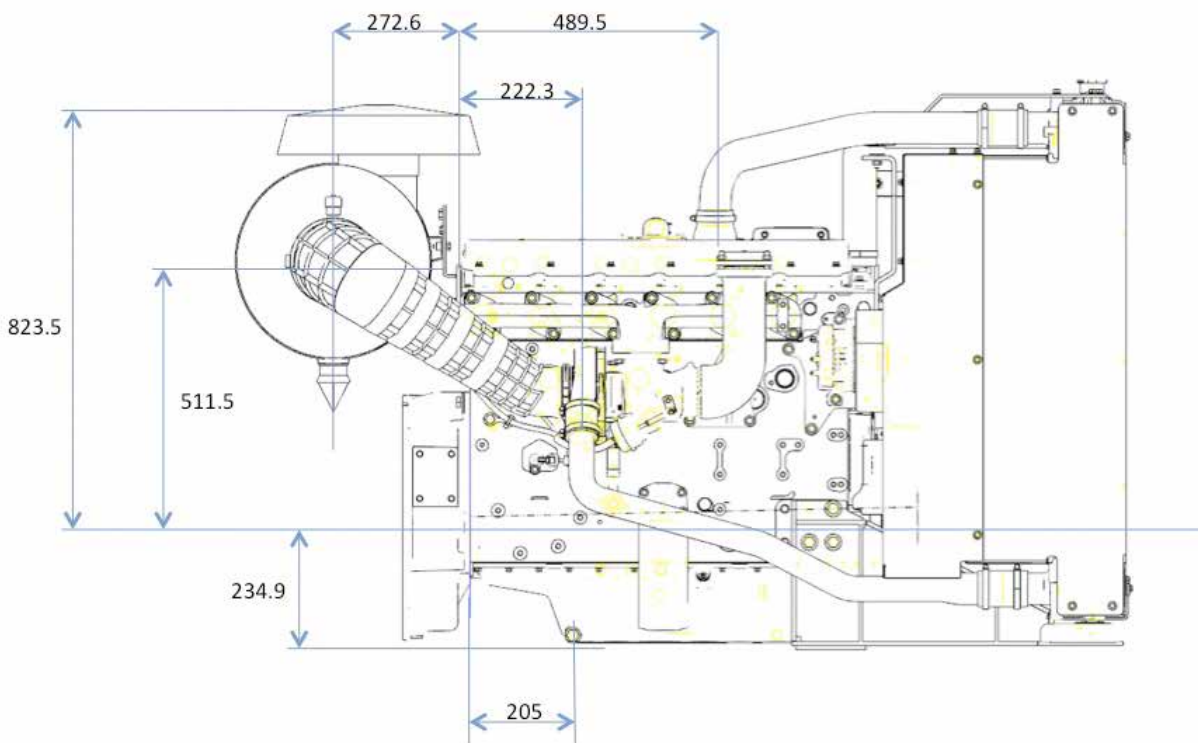
## 1106D-E70TAG5 - Left side view



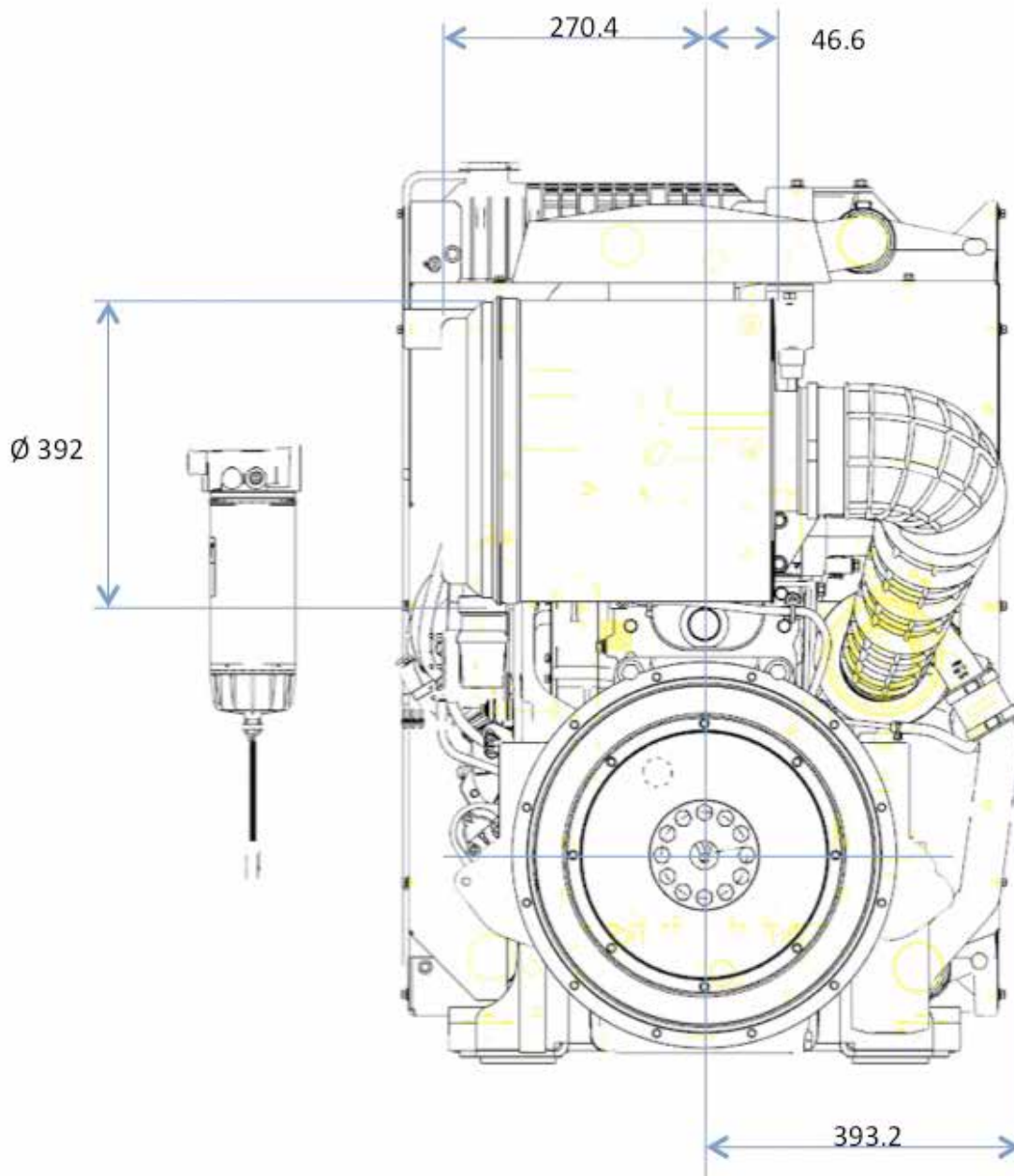
# 1106D-E70TAG5 - Front view



## 1106D-E70TAG5 - Right side view



## 1106D-E70TAG5 - Rear view





# 1106D-E70TAG5 - Plan view

