

Technical Data

1100 Series

Electropak

1104C-44TAG2

88 kWe @ 1500 rev/min
100 kWe @ 1800 rev/min

Basic technical data

Number of cylinders	4
Cylinder arrangement.....	In-line
Cycle	4 Stroke
Induction system	Turbocharged, air-to-air charge cooled
Compression ratio	18.3 : 1
Bore.....	105
Stroke.....	127
Cubic capacity.....	4,4 litres (269 cu.in.)
Direction of rotation.....	Anticlockwise viewed on flywheel
Firing order.....	1,3,4,2
Estimated total weight (dry).....	500 kg (1100 lb)
Estimated total weight (wet)	520 kg (1144 lb)

Overall dimensions

-height965,7
-length	1259,4
-width (including mounting brackets)720,8

Moments of inertia (kgm²)

-engine (Includes fan pulleys, fan & flywheel):.....	
-with 1,31kgm ² flywheel	1,51kgm ² (35.8lbf ²)
-with 1,13kgm ² flywheel	1,33kgm ² (31.6lbf ²)
-flywheel	1,31kgm ² (31.1lbf ²) & 1,13kgm ² (26.8lbf ²) options

Centre of gravity

-forward from rear of block.....	T.B.A.
-above centre line of block	T.B.A.
-offset to RHS of centre line	T.B.A.

Performance

Note: All data based on operation to ISO/TR14396, ISO3046/1 standard reference conditions.

Speed variation at constant load.....	0.5%
Cyclic irregularity at rated power.....	
-with 1,31kgm ² flywheel (1500 rev/min).....	0,029
-with 1,31kgm ² flywheel (1800 rev/min).....	0,017
-with 1,13kgm ² flywheel (1500 rev/min).....	0,040
-with 1,13kgm ² flywheel (1800 rev/min).....	0,022

Test conditions

-air temperature.....	25°C
-barometric pressure	100kPa
-relative humidity.....	30%

Sound level

Average sound pressure level for bare engine (without inlet and exhaust) at 1 metre (1500 rev/min).....	87.2 dBa
(without inlet and exhaust) at 1 metre (1800 rev/min).....	89.3 dBa
-all ratings certified to within.....	± 5%

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.

90% of the prime power rating can be applied 10 seconds after the starter motor is energised. The remaining 10% can be applied 15 seconds after start if the ambient temperature is not less than 15 °C (59 °F). If it is less than 15 °C (59 °F), an immersion heater is recommended. For additional information, contact Perkins Technical Service Department.

General installation (50 Hz)

Designation	Units	Type of operation and application	
		Prime	Stand-by
		50Hz	50Hz
Gross engine power	kW (bhp)	93,6 (125.5)	103 (138.1)
Brake mean effective pressure	kPa (lbf/in ²)	1702 (246.9)	1873 (271.5)
Mean piston speed	m/s (ft/s)	6,35 (20.83)	6,35 (20.83)
ElectropaK net engine power	kW (bhp)	89,0 (119.2)	97,9 (131.2)
Engine coolant flow 35 kPa system restriction	l/min (UK gal/min)	142 (31.1)	142 (31.1)
Combustion air flow	m ³ /min (ft ³ /min)	6,01 (212)	6,27 (221)
Exhaust gas flow (max)	m ³ /min (ft ³ /min)	15,2 (536)	16,3 (574)
Exhaust gas temperature (max)	°C (°F)	514 (957)	543 (1009)
Cooling fan air flow (200kPa External Restriction)	m ³ /min (ft ³ /min)	165,6 (5848)	165.6 (5848)
Energy balance			
Energy in fuel (Fuel heat of combustion)	kW (Btu/min)	228,1 (12972)	251 (14269)
Gross heat to power	kW (Btu/min)	93,6 (5323)	103,0 (5858)
Energy to coolant and lubricating oil	kW (Btu/min)	46,1 (2620)	50,7 (2881)
Energy to exhaust	kW (Btu/min)	71,7 (4079)	78,9 (4485)
Heat to radiation	kW (Btu/min)	6,8 (385)	7,5 (424)
Heat to charge cooler	kW (Btu/min)	9,9 (565)	10,9 (621)

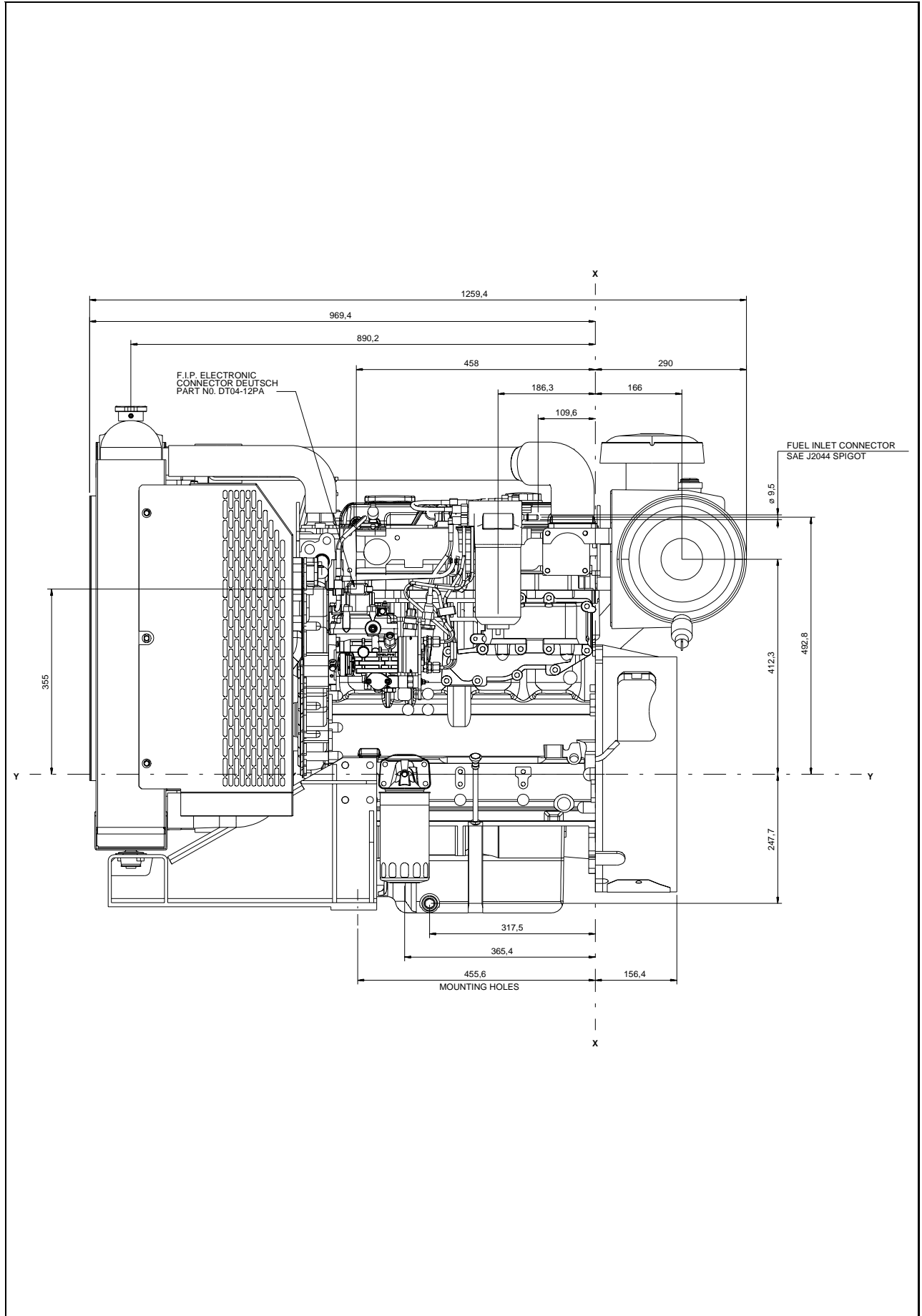
The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C (127 °F) or 46 °C (114.8 °F) if a canopy is fitted. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Perkins Technical Service Department.

General installation (60 Hz)

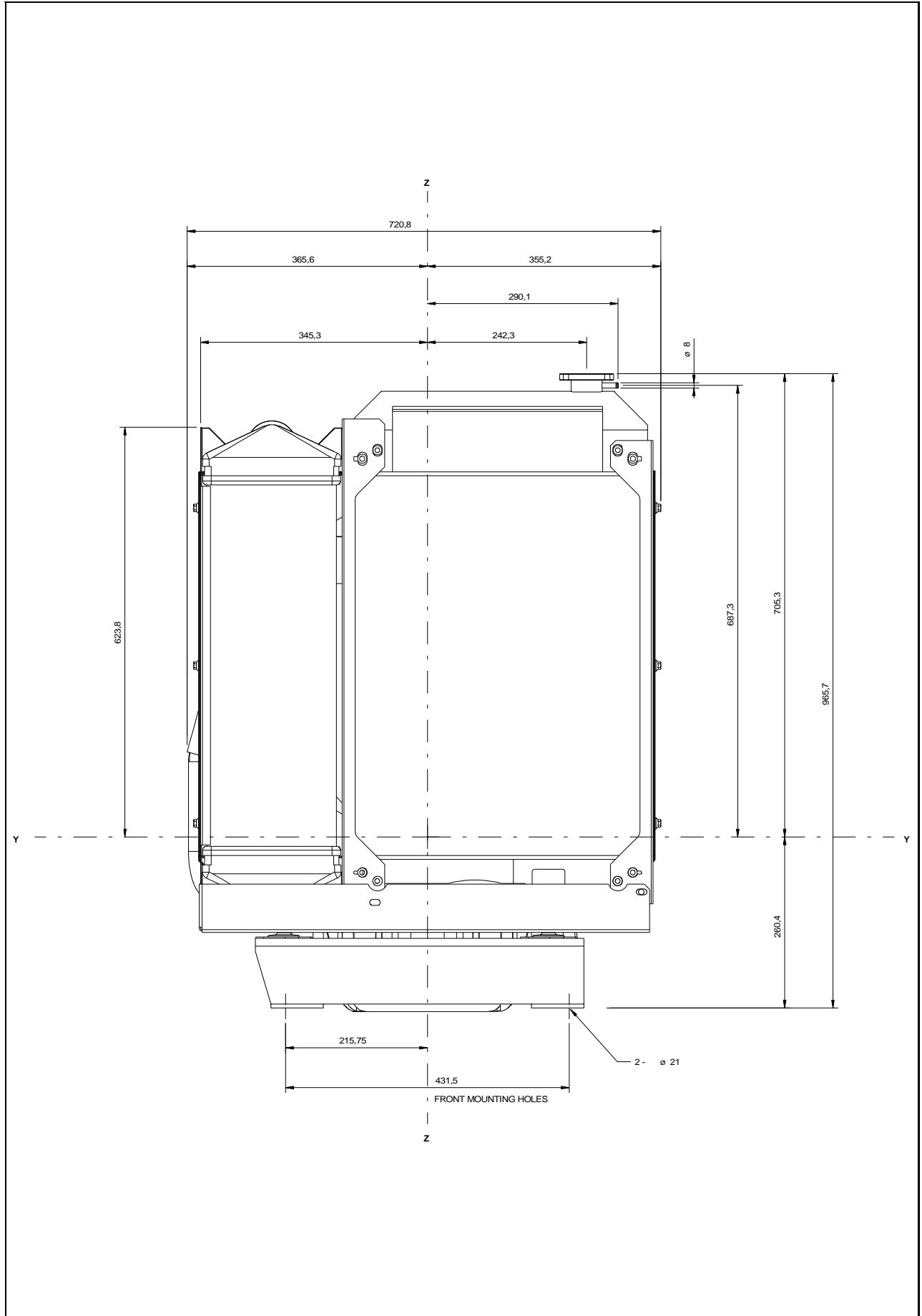
Designation	Units	Type of operation and application	
		Prime	Stand-by
		60Hz	60Hz
Gross engine power	kW (bhp)	106,8 (143.2)	117,5 (157.5)
Brake mean effective pressure	kPa (lbf/in ²)	1618 (234.7)	1780 (258.1)
Mean piston speed	m/s (ft/s)	7,62 (25.00)	7,62 (25.00)
ElectropaK net engine power	kW (bhp)	101,5 (136.0)	111,6 (149.6)
Engine coolant flow 35 kPa system restriction	l/min (UK gal/min)	170 (37.4)	170 (37.4)
Combustion air flow	m ³ /min (ft ³ /min)	7,75 (274)	7,80 (276)
Exhaust gas flow (max)	m ³ /min (ft ³ /min)	18,4 (651)	20,4 (721)
Exhaust gas temperature (max)	°C (°F)	517 (963)	574 (1065)
Cooling fan air flow (200kPa External Restriction)	m ³ /min (ft ³ /min)	225,6 (7966)	225,6 (7966)
Energy balance			
Energy in fuel (Fuel heat of combustion)	kW (Btu/min)	275,2 (15649)	304,4 (17312)
Gross heat to power	kW (Btu/min)	106,8 (6074)	117,5 (6682)
Energy to coolant and lubricating oil	kW (Btu/min)	57,7 (3280)	64,0 (3641)
Energy to exhaust	kW (Btu/min)	89,8 (5106)	99,7 (5668)
Heat to radiation	kW (Btu/min)	8,5 (482)	9,4 (535)
Heat to charge cooler	kW (Btu/min)	12,4 (7.7)	13,8 (785)

The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C (127 °F) or 46 °C (114.8 °F) if a canopy is fitted. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Perkins Technical Service Department.

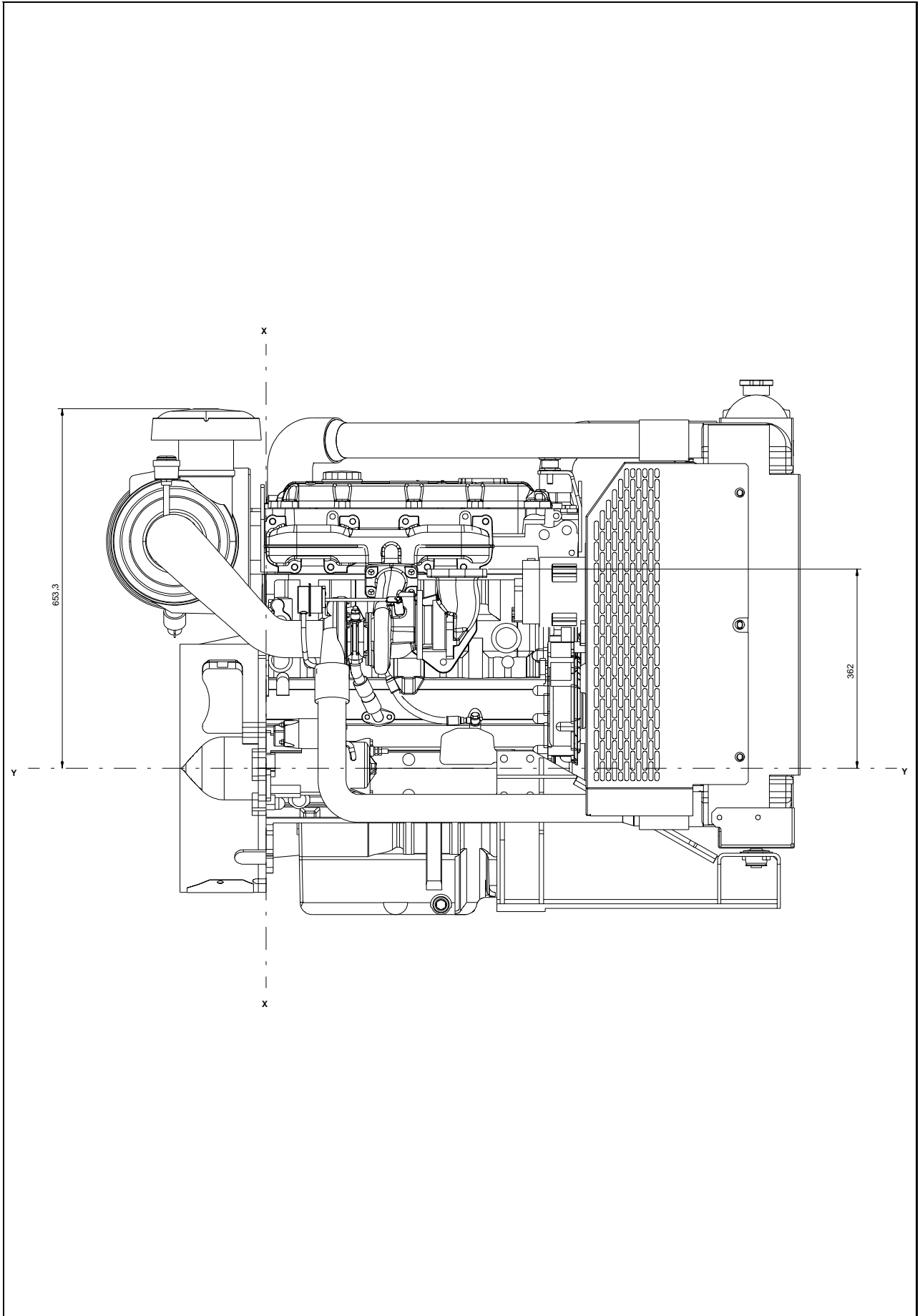
1104C-44TAG1 ElectropaK, left side view



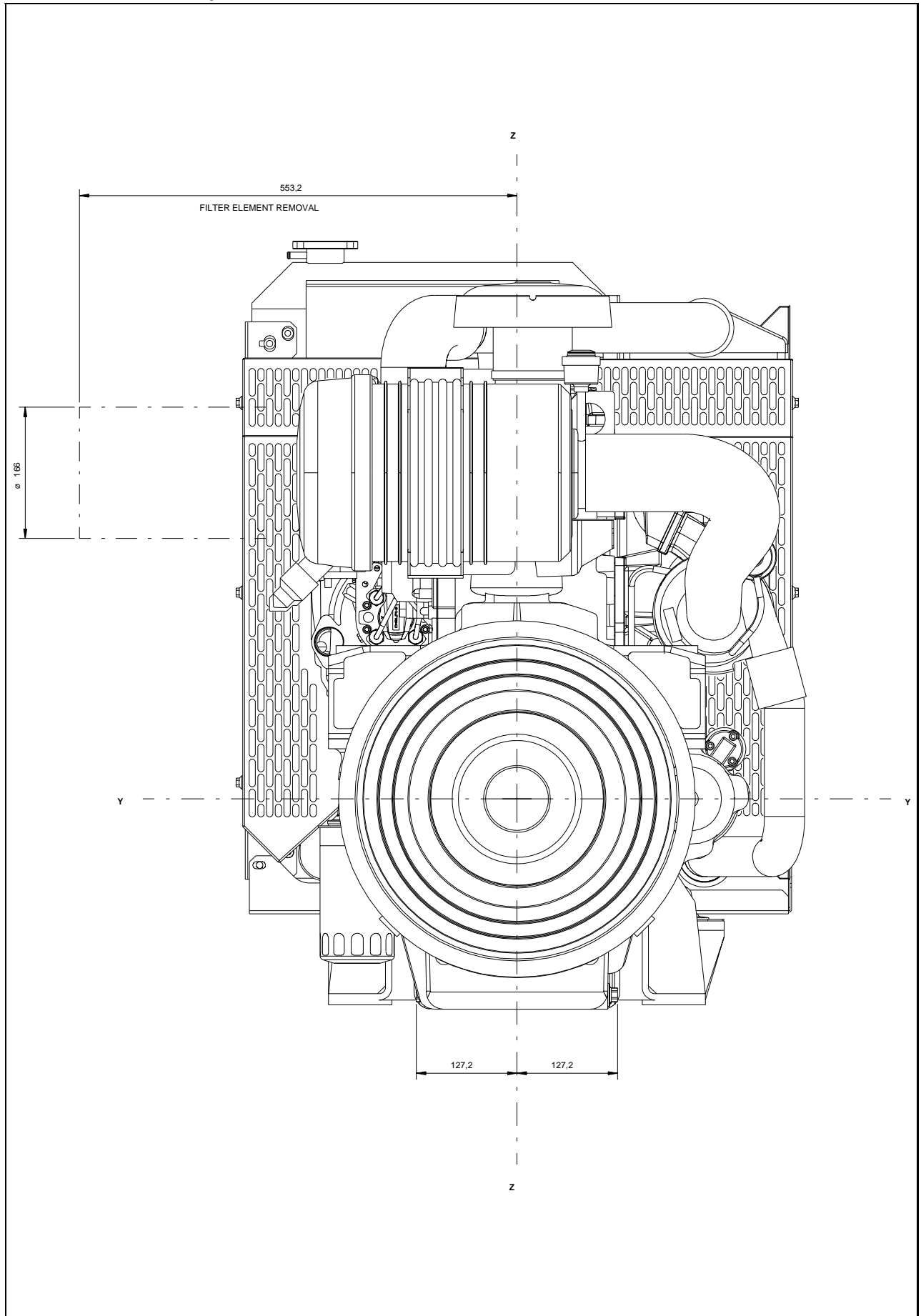
1104C-44TAG1 ElectropaK, front view



1104C-44TAG1 ElectropaK, right side view



1104C-44TAG1 ElectropaK, rear view



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Cooling system

Radiator

- face area 0,25m² (2.69ft²)
- rows and materials..... 38 Aluminium
- matrix density and material 9.4 Aluminium Fins Per Inch
- width of matrix.....439mm (17.3")
- height of matrix570mm (22.4")
- pressure cap setting 100kPa
- Estimated cooling air flow reserve ??

Fan

- diameter.....559mm (22")
- drive ratio 1:1
- number of blades 10
- material Composite
- type Pusher

Coolant

Total system capacity

- with radiator 12,6l (22.2 pt)
- without radiator 7,0l (12.3 pt)
- Maximum top tank temperature 110°C
- Thermostat operation range 82-93°C (180-199°F)

Recommended coolant:

50% ethylene glycol with a corrosion inhibitor (BS 658 :1992 or MOD AL39) and 50% clean fresh water.

Electrical System

- type Negative Ground
- alternator 12V/24V Options
- starter motor 12V/24V Options

Cold start recommendations

Minimum cranking speed 80 rpm

Starter Motor Type	Minimum starting temperature		Minimum battery type for SAE lubricating oil viscosity			
	°C	°F	15W	10W	5W	0W
12volt, 3.0kW	-5	23	1 X B			
	-15	5	1 X B			
	-20	-4		1 X B		
	-25	-13				1 X B

Commercial ref number	Perkins code	Battery Minimum Performance	
		BS 3911	SAE J537
643	A	440	660
647	B	510	770
069	D	340	540
655	E	570	810

Exhaust system

- Maximum back pressure 15kPa
- Exhaust outlet size 64mm (2.5")

Fuel system

- Type of injection Direct
- Fuel injection pump Rotary
- Fuel atomiser Multi-hole
- Nozzle opening pressure 29,0 MPa (290 bar)

Fuel lift pump

- flow/hour 120-150 l/h (211-264 pt/m)
- pressure 30-75 kPa (4.4-10.9 psi)
- Maximum suction head 17 kPa (1.7m)
- Maximum static pressure head 10 kPa (1.0m)

Governor type

Perkins LCS Electronic Governor

Speed control to

ISO 8528, G3

Fuel specification

Fuel specification	USA Fed Off Highway EPA 2D 89.330-96
Density (kg/l @ 15 °C)	0,835/0,855
Viscosity (mm ² /s @ 40 °C)	2,0/4,5
Sulphur Content	0.2% Max.
Cetane Number	45 Min.

Fuel consumption litres/hr (UK gals/hr)

Speed	Power rating			
	110%	100%	75%	50%
60Hz	29,7 (6.6)	26,9 (5.9)	20,2 (4.5)	14,1 (3.1)
50Hz	24,9 (5.5)	22,6 (5.0)	17,1 (3.8)	11,8 (2.6)

Induction system

Maximum air intake restriction

- clean filter 5kPa
- dirty filter 8kPa
- air filter type 2 stage cyclonic/paper element

Lubrication system

Lubricating oil capacity:

- Total system 8,0l (14.1 pt)
- Minimum 5,5l (9.7 pt)

Maximum engine operating angles

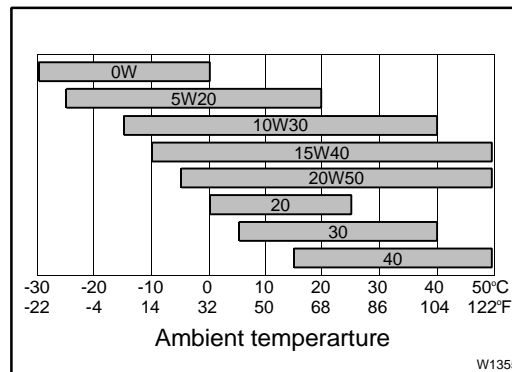
- front up, front down, right side or left side 30°

Lubricating oil pressure

- relief valve opens 415-470 kPa (60-68 psi)
- at maximum no-load speed 276-414 kPa (40-60 psi)
- Normal oil temperature 100°C (230°F)
- Max continuous oil temperature 125°C (257°F)
- Oil consumption at full load as a % of fuel consumption 0.15%

Recommended SAE viscosity

A single or multigrade oil must be used which conforms to API-CC/SE or CCMC-D1, see illustration below:



Mountings

- Maximum static bending moment at rear face of block 791Nm (583 lb.ft)



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