



SDEC POWER

Z
SERIES
POWER
GENERATION ENGINES



G-DRIVE POWERPACK

Power Generation Specification

TECHNICAL DATA SHEET

Power Output Range
74kW – 88kW

STAGE II EMISSION COMPLIANT
FOR USE IN THE FOLLOWING TERRITORIES. ASIA, MIDDLE EAST AND AFRICA.

Z SERIES DIESEL ENGINE

MODELS	MAX ENGINE OUTPUT		RATED GENERATOR OUTPUT	
	Prime kW	Standby kW	Prime kVA	Standby kVA
4ZTAA4.1-G22 (1500 rpm)	74	81	80	83
4ZTAA4.1-G22 (1800 rpm)	80	88	81	89

Generator outputs calculated using nett engine power at 0.8 power factor, at an altitude below 1000 m.a.s.l. and 40-degree Celsius ambient temperature.
Refer to the outputs and ratings tables for exact site conditions.



Build specification for export markets

Manufactured in the People's Republic of China

TECHNICAL ENGINE SUMMARY

SPECIFICATIONS

4ZTAA4.1-G22

Fuel Type	Diesel	
Method Of Cooling	Water Cooled – Set Mounted Radiator	
Number Of Cylinders	4	
Engine Type	Inline 4 Stroke	
Bore x Stroke mm x mm	105 x 118	
Cylinder Liner Type	Wet Liner	
Total Displacement cc / L	4100 / 4.1	
Combustion Type	Direct Injection	
Aspiration - Naturally or Turbo	Turbo Charged	
Make of Turbo Charger	SDEC	
Valves Per Cylinder	1 per cylinder	
Compression Ratio	18:1	
Firing Order	1:3:4:2	
Swept Volume in cm ³	4087 @ 1500rpm	
Mean Piston Speed in m/min	354 @ 1500rpm	425 @ 1800rpm
Cyclic Irregularity	0.060-0.075 δs	
Fuel System	BQ Series Inline Pump	
Steady State Speed Stability at Constant Load	G2 Class $\leq \pm 1.5$	
Flywheel & Bellhousing SAE	SAE 3-11.5	
Number of Teeth on Flywheel	126	
Direction of Rotation (Viewed from Flywheel)	Counterclockwise	
Moment of Inertia (Engine and Alternator) kgm ²	3.0-5.0 kgm ² depending on the alternator	
Moment of Inertia (Engine) kgm ²	1.2-1.5 kgm ²	

PROTECTIONS & SENSORS

Method of Protection Against High Engine Temperature	KE00105(3/8-18NPT)
Method of Protection Against Low Oil Pressure	KE21103(NPT1/8;0-10)
Method of Protection Against Low Water Level	JKE00120 1/2"-G
Method of Protection Against High Water Temperature	KE00105(3/8-18NPT)

WEIGHTS & DIMENSIONS

Weight (Dry) / Weight (Wet) (kg)	370 / 384
Length x Width x Height (Engine Only) mm	927 × 627 × 959
Length x Width x Height (Engine Only + Radiator) mm	1145 × 732 × 1004

RATINGS / OUTPUTS

kW (Gross kWm)	1500	1800
Max kw	81	88
kW (Nett kWm) Rated	1500	1800
Continuous kW	59	64
Prime kW	74	80
Standby kW	81	88
kWe (Nett kWe)	1500	1800
Continuous kWe	56	61
Prime kWe	70	76
Standby kWe	77	85
Based on an alternator efficiency of 95%		
kVA		
Continuous kVA @ 0,8pf	60	65
Prime kVA @ 0,8pf	75	81
Standby kVA @ 0,8pf	83	89

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations.

STANDBY POWER RATING

Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Standby Power rating. This rating should be applied where reliable utility power is available. A Standby rated engine should be sized for a maximum of an 80% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

PRIME POWER RATING

Applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

UNLIMITED TIME RUNNING PRIME POWER

Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours. The total operating time at 100% Prime Power shall not exceed 500 hours per year. A 10% overload capability is available for a period of 1 hour within a 12-hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

LIMITED TIME RUNNING PRIME POWER

Limited Time Prime Power is available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating.

CONTINUOUS POWER RATING

Applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

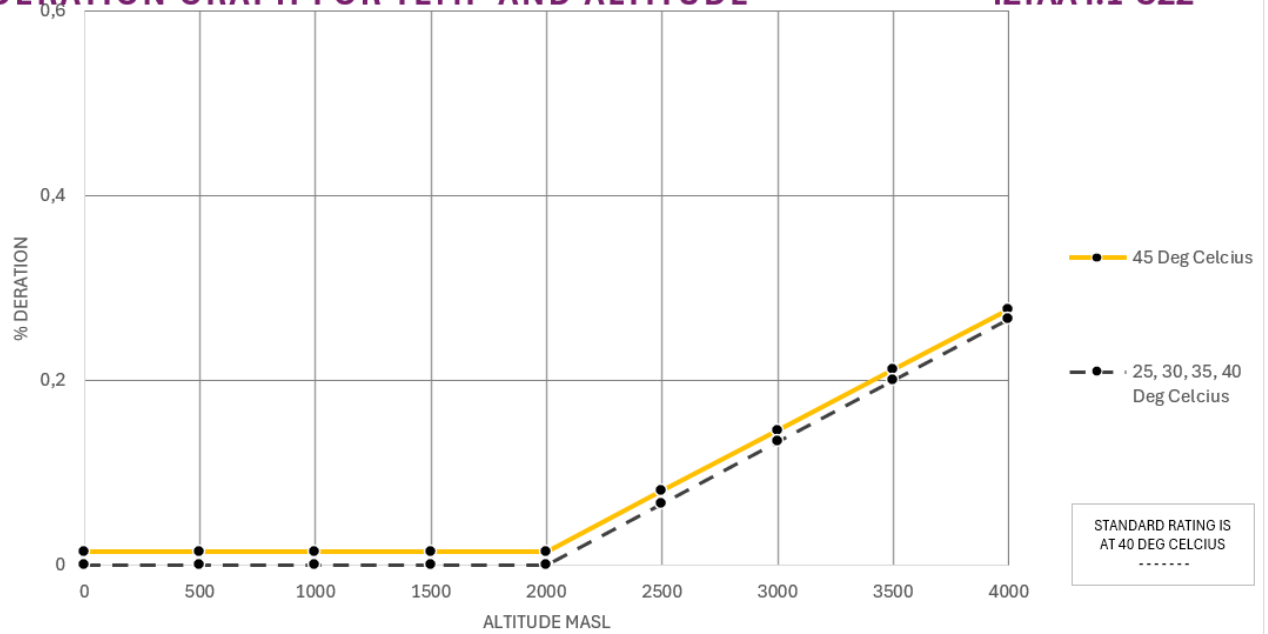
NB: DC VARIABLE SPEED POWER RATING

Please consult with engineering for applications where variable speed engines are required for D.C. generator set applications.

RATINGS – DERATION CURVES

DERATION GRAPH FOR TEMP AND ALTITUDE

4ZTAA4.1-G22



Alt. Temp	500	1000	1500	2000	2500	3000	3500	4000
45	2%	2%	2%	2%	8%	15%	21%	28%
40	0%	0%	0%	0%	7%	13%	20%	27%
35	0%	0%	0%	0%	7%	13%	20%	27%
30	0%	0%	0%	0%	7%	13%	20%	27%
25	0%	0%	0%	0%	7%	13%	20%	27%

25,30,35 and 40 degrees celcius derates all at the same level

TEST CONDITIONS

Air temperature. 27 °C
 Barometric pressure. 100 kPa
 Relative humidity 30%
 Air inlet restriction at maximum power (nominal) 2,5 kPa
 Intercooler Pressure at maximum power (nominal) 2,5 kPa
 Exhaust back pressure at maximum pressure (nominal) ... 3,0 kPa
 Fuel temperature (inlet pump) 55 °C maximum

Notes:

All data is based on the engine operating without, alternator, optional equipment and driven components. Data shown above represents gross engine performance capabilities obtained and corrected in accordance with GB/T1147.1-2017 and Equivalent ISO 3046-1:2002

Standards for ratings (continuous, prime, standby) in accordance with GB/T2820 and Equivalent ISO 8528-1:2018

LOAD ACCEPTANCE AND GOVERNING CLASS

Initial load acceptance					
When engine reaches rated speed					
(Withing 15 seconds after engine starts to crank)					
Step Load	Prime Power Load kWm	Load kW _e nett	Expected frequency deviation %	Frequency recovery time seconds	Frequency stability
25% - 75%	19 – 56	18– 53	3-5% dip	≤ 5-10	± 0.5%
0% - 100%	0 – 74	0 – 70	5-8% dip	≤ 10-15	± 0.5%
100 – 0% load drop	74 – 0	70 – 0	5-7% overshoot	≤ 3-4	± 0.5%

VALVES AND MECHANICS

VALVE MECHANISM		
Type	Overhead Valves	
Number of Valves	1 Intake & 1 Exhaust / per Cylinder	
Valve Lashes when Cold	Intake 0.35mm	
	Exhaust 0.40mm	
VALVE TIMING	OPENING	CLOSE
Intake Valve	18 ° BTDC	54 ° ABDC
Exhaust Valve	62 ° BBDC	18 ° ATDC

ELECTRICAL SYSTEM

CHARGING ALTERNATOR	
Charging Alternator Manufacturer	SDEC-4K41ZD-52300
Charging Alternator	70 A 12 V
Voltage Regulator	Built In IC Regulator
STARTER MOTOR	
Starter Motor Manufacturer	SDEC-4K41ZD-51100
Number of Starter Motors	1
Starter Motor Power	3.8 kW
Starter Motor Voltage	12 V
BATTERIES (NOT SUPPLIED / RECOMMENDED)	
Battery Capacity	110-120 Amp Hour
Number of Battery & Type	1 x 12V Lead Acid

FUEL CONSUMPTION

MODEL \ LOAD	25%	50%	75%	100%	110%
1500 rpm g/kWh	62	114	166	212	232
1500 rpm l/h	6	10	15	19	20
1800 rpm g/kWh	64	115	168	215	235
1800 rpm l/h	6	11	16	21	22

FUEL SYSTEM

Injection System	
Type	Electronic
Injection Pump	Kang Da
Injection Nozzle	Multi-Hole Type
Opening Pressure	24mPa
Injection Timing	14 -17 °
Feed Pump	Mechanical
Governor	Electronic
Governing Class	G2
Speed Controller	Fortrust C2004
Fuel Filtration	
Fuel Filter	Spin On Type
Fuel Filters Type	Full Flow Cartridge
Fuel Filters	1 Primary
Water Separator	Optional
Fuel	
Fuel Type	Diesel
Suggested Grade / Class	50 ppm or better
Bio Diesel Compatible	Confirm the ratio with the factory prior to use

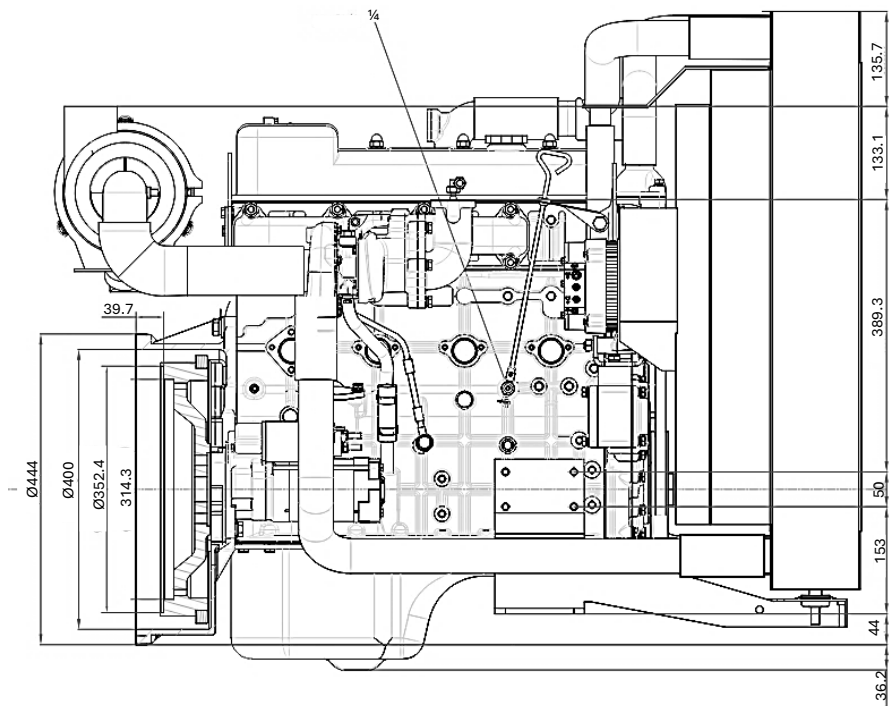
LUBRICATION SYSTEM

Oil Lubrication System	
Lubrication Method	Fully forced pressure feed type
Oil Pump Type	Gear type driven by crankshaft
Oil Pan Capacity	
High Level / Low Level (Litres)	10 / 8
Angularity limit	
Front Down	25 °
Front Up	35 °
Side to Side	35 °
Oil Filtration	
Oil Filter	Spin On Type
Oil Filters Type	Full Flow Cartridge
Oil Filters	1 Primary
Oil	
Oil Type	Multigrade Oil
Suggested Grade / Class	CF 15W/40

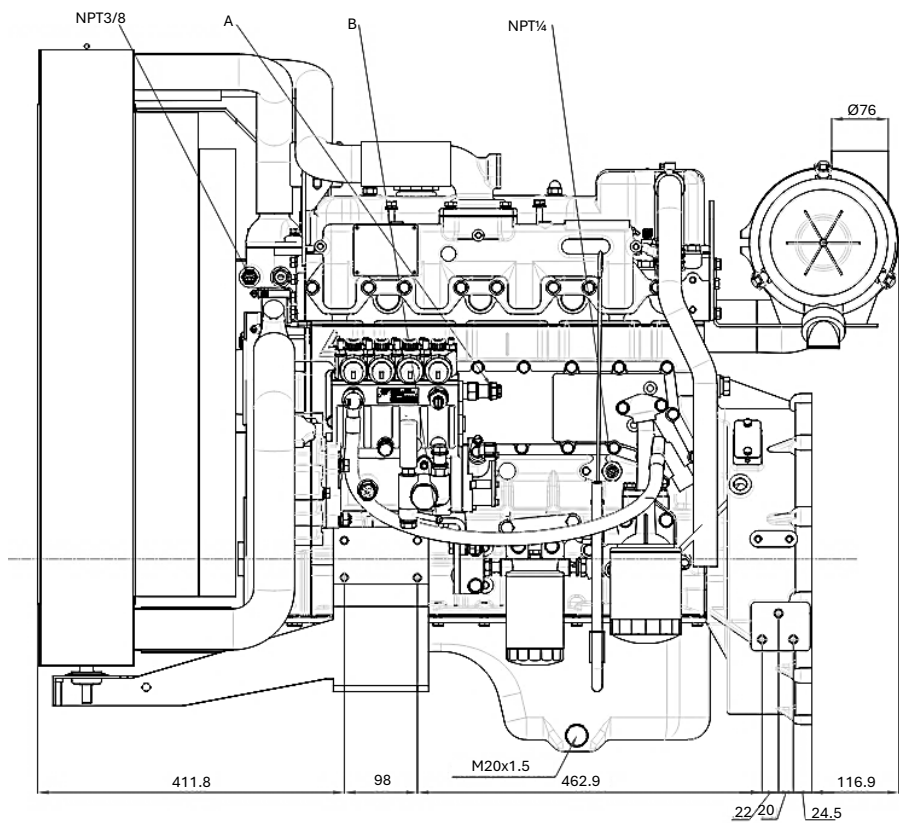
Cooling System	
Cooling Method	Fresh Water Forced Circulation
Water Capacity (Engine Only)	8.54 litres
Water Lid Min. Pressure	70 kPa
Water Pump	Centrifugal Type
	Belt Driven
Water Pump Capacity 1500 rpm	25 L/min
Water Pump Capacity 1800 rpm	28L/min
Thermostat	Wax–Pellet Type
	Opening Temp. 72°C
	Full Open Temp. 82°C
Cooling Fan Type	Blower Type, Plastic
Drive Type	Mechanically Driven
Cooling Fan Construction	7 x Plastic Blades
Cooling Fan Size	490 mm Diameter
Cooling Fan Power Consumption	3.5kw
Cooling Air Flow	10.8 m ³ /s
Radiator	
Type	Set Mounted
Manufacturer	LK
Construction	Copper Core
Treatment	Tropicalised
Temperature	50 Degree
Intercooled	No
Antifreeze	
Fuel Type	Premix (50/50)
Compliant Grade / Class	ASTM D-3306 ASTM D-6210 SAE J814
Main Ingredient	50% Glycol or More

Heat Rejection	
Heat Rejection to Coolant	8kcal/sec (1500 rpm) 9kcal/sec (1800 rpm)
Heat Rejection to Intercooler	5kcal/sec (1500 rpm) 5kcal/sec (1800 rpm)
Max. Permissible Restrictions	3kPa
Permissible Restrictions: Intercooler	10kPa
Intake System kPa	4
Max. Permissible Altitude m.a.s.l.	1000m (3280 ft)
Exhaust System	
Exhaust Gas flow	21m ³ /min (1500 rpm) 25m ³ /min (1800 rpm)
Exhaust Gas Temperature Max °C	550
Exhaust Outlet Size (Internal) mm	Ø48
Exhaust Outlet Flange Size mm	78
Exhaust Flange & Bellow Supplied	No
Back Pressure for Total System at Standby Power	10 kPa Max
Exhaust Smoke (FSN)	≤2.5
Turbo Charger	
Manufacturer	SDEC
Boost Pressure Ratio	18:1
Water Jacket Cooling Data (Optional)	
Coolant Flow - litres/min	5l/min
Coolant Exit Temperature (max) °C	70-85 °C
Coolant Inlet Temperature (min) °C	-40 °C
Coolant Inlet Temperature (max) °C	+60 °C to +70 °C
Suggested Pump Rating kW	1 kW
Colour of the engine	
RAL(Colour)	RAL 9006 (White/Silver Aluminium)

SIDE VIEW - RHS

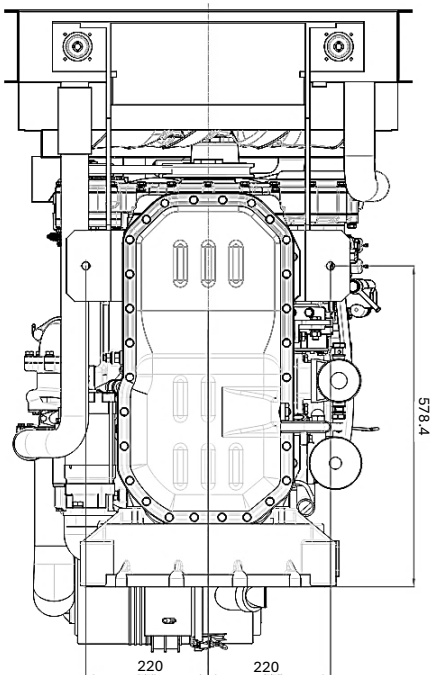


SIDE VIEW - LHS

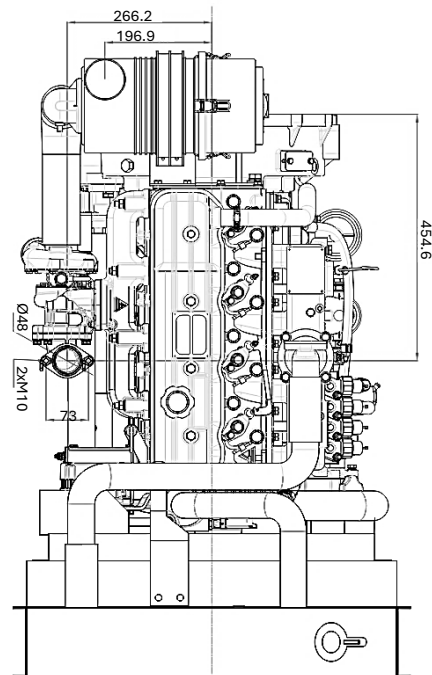


DRAWINGS ENGINE & RADIATOR

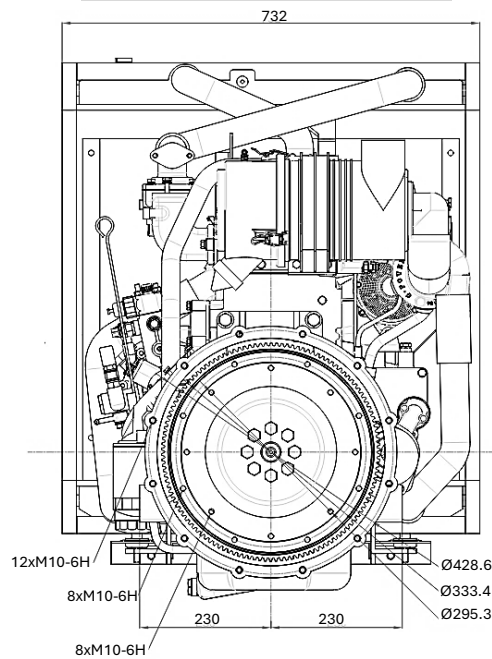
BOTTOM VIEW - LOW



TOP VIEW - AERIAL



REAR VIEW - FLYWHEEL



SERVICE AND CRITICAL PARTS

SERVICE HOURS		50	100	250 Monthly	1000 Annually
SERVICE PART	PART NO.				
Air Filter (Inner)	4050124	-	-	Yes	Yes
Air Filter (Outer)	-	-	-	-	-
Fuel Filter (Outer)	4K41ZT31-24100	-	-	Yes	Yes
Fuel / Water Separator	-	-	-	-	-
Oil Filter	4K39T-32000	-	-	Yes	Yes
Fan Belt	490B-41001-36	Check for wear or damage	Check for wear or damage	Check for wear or damage	Yes
Timing Belt	-	-	-	-	-
Oil	CF 15W/40	Check Level	Check Level	Yes	Yes
Anti-Freeze	Premix (50/50)	Check Level	Check Level	Check Level	Check Level
CRITICAL PARTS					
SERVICE PART	PART NO.				
Charging Alternator	490B-52000-15				
Starter Motor	490B-51000-18				
Valve Cover Gasket	A498B-11002				
Radiator	S1583				
Speed Controller / ECU	ESG2002A800C-W				
Turbocharger	4K41LT31-19001-2				
Lift Pump	Provide engine build no				
Fuel Pump	4K41ZT31-21100-2				
Oil Pump	A495BZL-31000				

NOTES

NOTES

MANUFACTURER DETAILS

HEADQUARTERS & FACTORY



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