

Brochure main description		@1500rpm	@1800rpm
Application & simbol		Power Generation	
Engine identification main		S8000	
Engine identification rating		31-34	
Engine features		G-Drive	
Emission feature		no emission	
Main characteristics		@1500rpm	@1800rpm
Emission certification		no emission	
Commercial code (for order)		80313AM1P.S550	
Commercial power	kW	30	32
Specific power	kW/l	10.7	11.7
Electric commercial power (estimation alternator power output stand-by power???)	kWe [kVA]	27 [34]	30 [37]
BMEP gross stand-by power"	bar	7.9	7.3
Oil consumption on mission (average)	% fuel consumption	<0.1	<0.1
Technical code (Pregnana productions)			
Technical code / family (only for homologation purpose)		8031.05.372	
Cycle		diesel 4 stroke	
Air charging system		Natural aspirated	
Number of cylinder		3	
Configuration (cylinder arrangement)		in line	
Bore	mm	104	
Stroke	mm	115	
Stroke / Bore		1.10	
Displacement	l	2.9	
Unit displacement	l	0.96	
Bore pitch	mm	115	
Valves per cylinder		2	
Cooling		liquid	
Direction of rotation (from flywheel side)		anti clockwise viewed from flywheel	
Compression ratio		18±0.5:1	
Firing order		1-3-2	
Injection type		direct, mech injection pump	
Be10	h	8000	
Cylinder Head			
Single / Multiple		Single	
Material		Cast Iron	
Head air circulation		in line	
Camshaft			
Layout		OHV	
Cam carrier		on inlet valve	
Material and heat treatment		Steel C43 Norm - Ind Hardening	
Valve train		mechanical tappet & pushrod	
Drivetrain (timing system)		by gear	
Valve actuation		tappet & pushrod	
Variable valve actuation system		no	
Cylinder block (crankcase)		structural	
Material of cylinder block		Cast Iron GH190 stab	
Type of liners		block liners	
Crankcase ventilation		closed	
Oil separator		coalescent filter	

(continue...)

Main characteristics			@1500rpm	@1800rpm
Crankshaft & counterweights				
Material			Steel - 40CrMo 4H - ISO Annealing 185÷241 HB	
Acceptable inertia (clutch)	kgm²		0.53	
Balancing	gr*mm		600	
Turbocharger & EGR system				
Turbocharger type			-	
Max turbine inlet temperature	°C		-	
Max boost pressure	mbar		-	
Method of cooling the turbocharger			-	
EGR			-	
Exhaust flap				
Exhaust flap supplier			-	
Actuation type			-	
Exhaust flap cooling			-	
Switchability (1500-1800 rpm)		yes/no	yes	
Emission level 1500rpm			no emission	
Emission level 1800rpm			no emission	
References values				
Engine dimension LxWxH (indicative values)		mm	620x552x815	
G-drive dimension LxWxH (indicative values)		mm	962 x 630 x 947	
Max permissible engine inclination		deg	climb 25 descent 20 trasv 35	
Engine Weight - Dry (no fluids, value purely indicative)		kg	284	
Engine Weight - Wet (with fluids, value purely indicative)		kg	300	
G-Drive Weight - Dry (no fluids, value purely indicative)		kg	351	
G-Drive Weight - Wet (with fluids, value purely indicative)		kg	360	
Center of gravity (FFOB or RFOB according to picture, standard engine layout)	X	mm	-8.92	
	Y	mm	99.7	
	Z	mm	183	
Principal moment of inertia (reference on center of gravity)	I _x	kgm²	1.43e+07	
	I _y	kgm²	1.72e+07	
	I _z	kgm²	2.34e+07	
Mass moment of inertia - rotating components (excluding flywheel)		kgm²	0.102	
Mass moment of inertia - standard flywheel		kgm²	0.53	
Bending moment on the flywheel housing	point 1		0	
	point 2		183	
	point 3		99.7	
Max static mounting surface load		N	within safety factors, see guideline	
Intermittent load:		MPa	n/a	
Continuous load:		MPa	n/a	
Rear main bearing load		MPa	n/a	
Max bending moment available from front of the crankshaft:			n/a	
0 deg		Nm	n/a	
90 deg		Nm	n/a	
180 deg		Nm	n/a	

(continue...)

Main characteristics		@1500rpm	@1800rpm
Environmental operating conditions			
Max altitude for declared performances	m		1000
Max ambient temperaturefor declared performances	°C		40
Min guaranteed temperature for cold start w/o any aid (stand alone engine)	°C		-10
Min guaranteed temperature for cold start with grid heater (stand alone engine)	°C		-25
Min guaranteed temperature for cold start with grid heater and block heater (stand alone engine)	°C		-30
Time preheating for manifold heater	s	@ - 3°C : 0 ; -30°C : 21	
Time post heating for manifold heater	s	@ - 3°C : 0 ; -20°C : 200	
Low idle continuous operation time (recommended)	h		3
(*) Engine performance		@1500rpm	@1800rpm
Continuous power (gross) [mecc]	kW	23	25
Prime power (gross) [mecc]	kW	28	31
Stand-by power (gross) [mecc]	kW	31	34
Fan consumption [mecc]	kW	0.4	0.75
Continuous power (net) [mecc]	kW	22	24
Prime power (net) [mecc]	kW	28	30
Stand-by power (net) [mecc]	kW	31	33
Typical generator output	rend		0.88
Generator available power @ Prime power	kVA (kWe)	30	34
Generator available power @ Stand by	kVA (kWe)	33	37.4
Power reduction due to ambient conditions			
Temperature above xx°C	%/5°C	2% each 5°C above 30°C	
Altitude > 1000 < 3000m	%/500m	5 % each 400 m	
Altitude > 3000m	%/500m	7% each 500 m	
Power limitation due to safety protections			
Max water temperature (switch on of the MIL lamp)	°C		
Start derating: switch on of the warning coolant temperature lamp (amber color)	°C		
Altitude level: gradual reduction of transient response by smoke map correction from	m	-	-
Fuel temperature	°C		
Intake manifold air temperature	°C		
ATS max gas inlet temperature	°C	-	-
Max allowed exhaust temperature	°C		
Turbine overheating protection	°C	-	-
Oil temperature protection	°C		
Oil pressure protection	bar		

Fuel system			@1500rpm	@1800rpm
Fuel density		kg/l		0.84
Injection system type				mechanical
Injection model type				VE rotary
Injection model pump				
Injection pressure		bar		
Injector				
Injector installation (sleeve, sealing flat or conical)				
Injector nozzle				
Engine fuel compatibility			see GOLD Documentation on fluids	
Feed pump				
Max flow		l/h		
Nominal feed pressure		bar		
Fuel filter				
Max continuous allowable fuel temperature (without derating)	T_{1p}	°C		
Max relative pressure at gear pump inlet	P_{1p}	bar		
Min relative pressure at gear pump inlet	P_{1p}	bar		
Max back flow relative pressure	P_{rl}	bar		
Max heat rejection to return fuel		kW		
Max fuel flow		kg/h		
Min fuel tank venting requirement		m³/h		
Prefilter / water separator micron size		µm		
Air intake system			@1500rpm	@1800rpm
Aftercooling type			-	-
Interstage cooling type			-	-
Air filter type				dry
Loads on turbocharger on compressor intake		kg	-	-
Loads on turbocharger on compressor outlet		kg	-	-
Charge air flow (max)		kg/h		
Exhaust system			@1500rpm	@1800rpm
Max back pressure (after exhaust flap) @ rated power with clean system				7 (70)
Max mechanical load on turbine flange		kg	-	-
Max exhaust flow rate		kg/h		
Energy to exhaust		kcal/kWh	641	684



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Lubrication system		@1500rpm	@1800rpm
Oil sump capacity			
Max	l		8.2
Min	l		3.5
Oil system capacity including filter	l		2
Oil pump type			candle
Oil pump drive arrangement		by gear	by gear
Min oil pump flow	l/min		
Max oil pump flow (@ rated speed)	l/min		
Min oil pressure @ low idle (engine oil temp at 120°C)			
Min oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)		
Max oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)		
Max oil temperature @ full load (in main gallery)	°C		125
Max oil pressure peak on cold engine	bar		
Oil cooler type			
Transducer for indicating oil temperature and pressure			
Max engine angularity - longitudinal / transversal (std oil pan)	0/360°		10
Allowed engine gradability during installation on vehicle	0/360°		
Oil servicing intervals	h	see GOLD Documentation on fluids	
Oil filter type		see GOLD Documentation on fluids	
Oil filter capacity	l		
Max oil content admitted in blow by gas (after filter)	g/h		
Approved engine oil specifications		see GOLD Documentation on fluids	
Oil for cold condition mission (T° ambient < -25°C)			

Cooling system		@1500rpm	@1800rpm
Type		liquid	
Recommended coolant		see GOLD Documentation on fluids	
Min radiator cap pressure	kPa (bar)	100 (1)	
Warnnig setting firts threshold	°C	103	
Max additional restriction	Pa	10	15
Air to boil (prime power, open genset configuration)	°C	63	63
Air to boil (stand by, open genset configuration)	°C	n/a	n/a
Fan		Pusher	
diameter	mm	450	
number of blades		8	
drive ratio		1.04:1	
speed	rpm/1'	1560	1872
air flow	m³/s	0.55 at 2.7	0.85 at 3.3
power consumption	kWm	0.6	0.95
Radiator			
Core dimensions LxWxh	mm	516 X 42 X 756.3	
Dry weight	kg	15	
Radiator coolant capacity	l	3	
Optimum coolant temperature range @ engine out (50% glycol)	°C	80-90	
Water pump type		centrifuge	
Water pump drive		belt	
Coolant capacity (engine only)	l	5	
Coolant capacity (radiator & hoses)	l	9	
Thermostat type		wax	
Thermostat position		on cylinder head	
Thermostat opening / fully open temperature	°C		
Coolant engine pressure outlet – inlet (delta pressure, open thermostat, high idle conditions)	bar		
Coolant flow to radiator @rated speed	l/min	62.3	75.4
Max coolant flow to accessories @ rated speed from cab heater	l/min		
Electrical, Electronic and Control Systems		@1500rpm	@1800rpm
System voltage	V	12	
Min cranking speed TDC @-30°C	rpm		
Average cranking speed	rpm		
Min battery voltage	V		
Mean battery voltage	V		
Min battery current	Ah		
Mean battery current	Ah		
Max starting circuit resistance (to starter)	mΩ		
Cold starting		@1500rpm	@1800rpm
Without air preheating	°C	-5	
With air preheating	°C	-12	



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Emission gaseus and particles		@1500rpm	@1800rpm
NOx Oxides of nitrogen	g/kWh	-	-
HC hydrocarbons	g/kWh	-	-
NOx+HC	g/kWh	-	-
CO Carbon monoxide	g/kWh	-	-
PT Particles	g/kWh	-	-
Maintenance		@1500rpm	@1800rpm
Oil drain interval	h		
Oil filter change	h		
Oil refilling time	h		
CCV filter change	h (y)		
Fuel filter change	h		
Fuel pre-filter change	h		
Belt replacement	h		
Valve lash check /adjustment	h		
AdBlue filter change	h		
DPF filter service	h		
Coolant change	h		
** Engine Noise		@1500rpm	@1800rpm
Overall sound pressure (engine only)	dBA	88	90
Overall sound pressure (with accessories only)	dBA	n/a	n/a
Exahust noise (w/o Muffler)	dBA		
Noise spectrum (octave analysis performed at the position of maximum noise) - diagram	Table dB-Hz		
*** Step load		@1500rpm	@1800rpm
G1 (% of PrP)	%	100	n/a
G2 (% of PrP)	%	100	100
G3 (% of PrP)	%	63	80
removal load (G1)	%		
removal load (G2)	%		
removal load (G3)	%		

* Maximum Rating Performance Data		@1500rpm	@1800rpm
Torque	Nm	205	192
Ambient temperature	°C	20	20
Fuel flow	g/s		
Fuel consumption (BSFC) (prime power)	l/h (kg/h) [g/kWh]	7.1 (6.0) [209]	8.1 (6.8) [214]
Fuel consumption (BSFC) (stand by)	l/h (kg/h) [g/kWh]	8.3 (7.0) [218]	9.4 (7.9) [218]
Fuel consumption (BSFC) (80% prime power)	l/h (kg/h) [g/kWh]	5.7 (4.8) [209]	6.4 (5.4) [213]
Fuel consumption (BSFC) (50% prime power)	l/h (kg/h) [g/kWh]	3.8 (3.2) [224]	4.3 (3.6) [225]
Fuel consumption (BSFC) (25% prime power)	l/h (kg/h) [g/kWh]	n/a	n/a
Exhaust Gas Flow	kg/h		

Design air handling system data		@1500rpm	@1800rpm
Back pressure before DOC	kPa	-	-
Exhaust Gas Temp between HP-TC	°C		
Max admitted back pressure after SCR	kPa	-	-
Max admitted back pressure after TC	kPa		
Total water cooling power of engine (prime power)	kW [kcal/kWh]		
Total water cooling power of engine (stand by)	kW [kcal/kWh]		
Total pump water flow	l/s		
Total CAC power (air to air) (prime power)	kW [kcal/kWh]		
Total CAC power (air to air) (stand by power)	kW [kcal/kWh]		

- * Value measured (tolerance $\pm 3\%$) at flywheel according to one of more of the norms : ISO 3046/1, dir. 97/68 EC (w/o fan), DIN 6271, BS 5514, SAE J1349 . Test conditions : 50 hours of run-in, fuel EN 590, turbo air inlet temperature 25°C, atmospheric pressure 100 kPa, humidity 30% and other engine conditions in accordance to FPT Datasheets and Installation Guidelines.
- ** The figures for total noise levels are measured in Prime Power rating in a absorber environment condition and measured at a distance of one metre from the periphery of the engine.
- *** The impact load values comply with requirements of Classification 3 & 4 of ISO 8528 - 12 and G2 operating limits stated in ISO 8528 - 5 (% of Prime Power).
All tests were conducted using an engine installed and serviced to FPT recommendations, standard ambient condition. Generator powers are typical and are based on an average alternator efficiency and a power factor (cos. θ) of 0.8 and are for guidance only.
kWe=kWm x gen. eff.
kVA=kWe / 0.8

ACRONYMS LIST

Acronyms	Description
-	Not Needed
2stTC	Two Stage Turbo (sequential)
Ag	Agricultural
ASC	Ammonia Slip Catalyst (same as CUC)
ATS	After Treatment System
BSFC	Brake Specific Fuel Consumption
CAC	Charge Air Cooler
CCDPF	Close Coupled DPF
CCV	Crankcase Ventilation
CE	Construction Equipment
CI	Cast Iron
CRS	Common Rail System
CRSN	Common Rail System NKW (Commercial vehicles)
CUC	Clean Up Catalyst for ammonia (same as ASC)
DAVNT	Dual Axis Variable Nozzle Turbine
DCS	Drawing Coordinate System
DI	Direct Injection
DOC	Diesel Oxidation Catalyst
DOHC	Double Over Head Camshaft
DPF	Diesel Particulate Filter
ECEGR	External Cooled EGR
ECU	Engine Control Unit
EEGR	External EGR
EGR	Exhaust Gas Recirculation
epWG	Electro pneumatic WG
eVGT	Electrical VGT
eWG	Electrical WG
FFOB	Front Face of Block
FGT	Fixed Geometry Turbocharger (no WG)
FIE	Fuel Injection System
HD	Heavy Duty
HLA	Hydraulic Lash Adjusters
IDI	Indirect Injection

Acronyms	Description
iEGR	Internal EGR
ISC	Interstage Cooling
IPU	Industrial Power Unit
LD	Light Duty
LDCV	Light Duty Commercial Vehicles
LH	Left Hand Side
LWR	Laser Welded Rail
MD	Medium Duty
n/a	Not Available
NA	Natural Aspirated
NS	Non Structural
OHV	Over Head Valves
OPT	Option
PCP	Peak Cylinder Pressure
PTO	Power Take Off
RFOB	Rear Face of Block
RH	Right Hand Side
S	Structural
SAPS	Sulphated Ash, Phosphorus, Sulphur
SCR	Selective Catalytic Reduction catalyst
SCRoF	SCR on filter
SOHC	Single Over Head Camshaft
STD	Standard
TC	Turbocharged
TCA	Turbocharged, Charge Air Cooled
THM	Thermal Management
UFDPF	Under Floor DPF
UQS	Urea Quality Sensor
VE	Bosch Distributor Mechanical Pump
VFT	Variable Flow Turbine
VGT	Variable Geometry Turbocharger
WG	Waste Gate Turbocharger
XPI	Extra high Pressure Injection (Scania, Cummins)

*Unit of measure according to international system of unit.
Engine accessories and Options available on Option List.
All data is subject to change without notice.*

UPDATING

Revision	Description	Date
5.0	Updated document	Feb 2019