



ITEM NO.

M0206-0009E Rev 2

DATE

October, 2011

Specification Sheets of S6R-(Z3)MPTAW Engine

Specification sheet of:

- S6R-MPTAW (in compliance with IMO MARPOL 73/78, Annex VI, Regulation 13, Tier 2)
- S6R-Z3MPTAW (in compliance with EU NRMM Stage IIIA Inland Waterway Vessel engines, category V1:4)

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	Rev.1 : July, 2011			
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		M. VERMEULEN		SC



**GENERAL ENGINE DATA**

Type	-----	4-Cycle, Water Cooled	
Aspiration	-----	Turbo-Charged, Inter Cooler (Fresh water to Cooler)	
Cylinder Arrangement	-----	Inline	
No.of Cylinders	-----	6	
Bore mm(in.)	-----	170	(6.69)
Stroke mm(in.)	-----	180	(7.09)
Displacement Liter(in. <sup>3</sup> )	-----	24.51	(1496)
Compression Ratio	-----	14.5 : 1	
Dry Weight - Engine only - kg(lb)	-----	2830	(6240)
Wet Weight - Engine only - kg(lb)	-----	3015	(6648)

**PERFORMANCE DATA**

Steady State Speed Stability Band at any Constant Load(Generator Use)			
Hydraulic (std.) or Electric Governor - %	-----	±0.25 or better	
Idling Speed -rpm	-----	600~650	
Maximum Overspeed Capacity - rpm	-----	2195	
Moment of Inertia of Rotating Components J - kg · m <sup>2</sup> (lb · ft <sup>2</sup> )	-----	10.79	(1024)
(Includes 18 inch Flywheel)			
Cyclic Speed Variation with Flywheel at	1800rpm	-----	1/182
	1500rpm	-----	1/123

**ENGINE MOUNTING**

Maximum Bending Moment at Rear Face of Flywheel Housing - N · m (lb · ft)	-----	1961	(1447)
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**AIR INLET SYSTEM**

Maximum Intake Air Restriction (Includes piping)- kPa (in. H <sub>2</sub> O)	-----	3.92	(15.7)
Maximum Allowable Intake Air Temperature-°C (°F)	-----	45	(113)

**EXHAUST SYSTEM**

Maximum Allowable Back Pressure - kPa (in. H <sub>2</sub> O)	-----	4.41	(17.7)
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**LUBRICATION SYSTEM**

Oil Pressure at Idle - MPa (psi)	-----	0.2~0.3	(29~43)
at Rate Speed - MPa (psi)	-----	0.5~0.64	(71~93)
Maximum Oil Temperature-°C (°F)	-----	110	(230)
Oil Capacity of Marine Pan	High - liter (U.S.gal)	-----	140 (37.0)
	Low - liter (U.S.gal)	-----	110 (29.1)
Total System Capacity (Includes Oil Filter) - liter (U.S.gal)	-----	160	(42.3)
Maximum Installation Angle	Front Up	-----	8°
	Front Down	-----	8°
Maximum Instantaneous Operating Angle	Front Up	-----	25°
(Engine Level)	Front Down	-----	15°
	Side to Side	-----	22.5°

**COOLING SYSTEM**

Jacket water system

Cooling system: Closed fresh water type High Temperature (HT) system with treated water/glycol mixture			
Coolant Capacity of Jacket Water System (Engine only) - liter (U.S.gal)	-----	43	(11.4)
Maximum External Friction Head at Engine Outlet-MPa(psi)	-----	0.034	(5.0)
Jacket Water Standard Thermostat (Modulating) Range-°C (°F)	-----	71~85	(160~185)
Maximum Allowable Coolant Temperature at Engine Outlet-°C (°F)	-----	95	(203)
Recommended Coolant Temperature at Engine outlet-°C (°F)	-----	80	(176)

Charge air cooler cooling system

Cooling system: Closed fresh water type Low Temperature (LT) system with treated water/glycol mixture			
Coolant Capacity of Charge Air Cooler (Engine only) - liter (U.S.gal)	-----	7	(1.8)
Maximum External Friction Head at Intercooler Outlet-MPa(psi)	-----	0.035	(5.1)
Charge Air Cooler Standard Thermostat (Modulating) Range-°C (°F)	-----	35~50	(95~122)
Maximum Coolant Temperature at Intercooler Inlet, MPTAW type-°C (°F)	-----	see page 4/4	
Minimum Coolant Expansion Space -% of System Capacity	-----	10	
Recommended Static Head of Coolant above Crankshaft Center - m(ft)	MAX.	-----	10 (32.8)
	MIN.	-----	7 (23.0)

The specifications are subject to change without notice.

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FUEL SYSTEM

Fuel Injection Pump	-----	Mitsubishi PS6 Type x 1
Maximum Suction Head of Feed Pump - kPa (in. Hg)	-----	14.7 (4.3)
Maximum Level of Fuel Tank - m	Continuous Use -----	5.0
	Stand-by Use -----	2.0
Minimum Fuel Oil Supply Pipe Inner Diameter - mm(in.)	-----	16 (0.63)
Minimum Fuel Oil Leak Pipe Inner Diameter - mm(in.)	-----	16 (0.63)

STARTING SYSTEM

Battery Charging Alternator - V-Ah	-----	24-35
Starting Motor Capacity - V -kW	-----	24-7.5
Maximum Allowable Resistance of Cranking Circuit - m Ω	-----	2.5
Recommended Minimum Battery Capacity		
At 5°C (41°F) and above - Ah	-----	200
Below 5°C (41°F) through -5°C (23°F)	-----	500
Cranking Ampere of Starter at 5°C (41°F) / -5°C (23°F)		
Static Ampere -A		370 / 500
Momentary Ampere -A		700 / 960

ACCESSORY EQUIPMENT

Air Cleaner	Silencer Type
Exhaust Manifold	Water Cooled
Turbocharger	Air cooled
Air Cooler	Fresh Water Cooled
Breather	Conduction Type
Governor	Hydraulic PSG Type or electronic (optional)
Fuel Injection Pump	
Fuel Feed Pump	
Fuel Injection Pipe	Double walled Type
Fuel Injection Nozzle	
Fuel Filter	Paper Element Type
Lubricating Oil Pump	
Lubricating Oil Cooler	
Lubricating Oil Filter(Full-Flow)	Paper Element Type
Lubricating Oil Filter(By-Pass Flow)	Paper Element Type
Oil Pan	Large Capacity,steel
Lubricating Oil Thermostat	
Cooling Water Pumps (HT, LT)	
Cooling Water Thermostats (HT, LT)	
Starter	Earth Floated Type
Alternator	Earth Floated Type
Stop Solenoid	DC24V-15A
Engine Support	Marine Type
Accessory Drive	Front Drive Pulley

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ENGINE RATING

All data represent net performance according to ISO 3046 with standard accessories such as fuel injection pump, water pump, L.O. pump and charging alternator under the condition of 100 kPa (750 mm Hg) barometric pressure, 298 K (25 °C) ambient temperature and 30% relative humidity.

ITEM Engine Model	UNIT	propulsion use			auxiliary generator	
		-Z3MPTAW-3	-MPTAW-3	-MPTAW-2	-MPTAW-5	-MPTAW-4
Rating		Heavy Duty		Medium Duty	50 Hz	60 Hz
Rated engine speed	rpm	1600		1650	1500	1800
Emission Regulation (Test cycle)	EU Stage IIIA category V1:4	E2 (CPP) or E3 (FPP)	-	-	-	-
	IMO Tier 2	E2 (CPP) or E3 (FPP)	E2 (CPP) or E3 (FPP)	E2 (CPP) or E3 (FPP)	D2	D2
No. of Cylinders		6				
Bore	mm	170				
	(in.)	(6.69)				
Stroke	mm	180				
	(in.)	(7.09)				
Displacement	liter	24.51				
	(in. <sup>3</sup> )	(1496.00)				
Rated output	kW	470		520	545	635
	(HP)	(630)		(697)	(731)	(851)
Brake Mean Effective Pressure	MPa	1.44		1.54	1.78	1.73
	(psi)	(209)		(223)	(258)	(251)
Mean Piston Speed	m/s	9.6		9.9	9.0	10.8
	(ft/min)	(1890)		(1949)	(1772)	(2126)
Maximum Regenerative Power	kW	62		65	56	78
Absorption Capacity	(HP)	(83)		(87)	(75)	(104)
Intake Air Flow	m <sup>3</sup> /min	43		48	48	59
	(CFM)	(1518)		(1695)	(1695)	(2083)
Exhaust Gas Flow	m <sup>3</sup> /min	114		127	128	157
	(CFM)	(4025)		(4484)	(4520)	(5544)
Coolant Flow	liter/min	880		910	820	990
	(U.S. GPM)	(232)		(240)	(217)	(261)
Coolant(Jacket water) Pressure (water pump outlet)	MPa	0.20		0.21	0.17	0.25
	(psi)	(29)		(30)	(25)	(36)
Coolant Flow to Inter Cooler (Max. Flow: 400L/min)	liter/min	350		350	350	350
	(U.S. GPM)	(92)		(92)	(92)	(92)
Oil Flow	liter/min	320		330	290	360
	(U.S. GPM)	(85)		(87)	(77)	(95)
Radiated Heat to Ambient	kJ/hr	67786		75888	76093	93473
	(BTU/min)	(1071)		(1199)	(1202)	(1477)
Heat Rejection to Coolant (include water cooled manifold)	kJ/hr	949005		1062430	1065299	1308616
	(BTU/min)	(14994)		(16786)	(16832)	(20676)
Heat Rejection to Inter Cooler (PTAW Version)	kJ/hr	542289		607103	608743	747781
	(BTU/min)	(8568)		(9592)	(9618)	(11815)
Heat Rejection to Exhaust	kJ/hr	1268415		1442296	1361127	1796666
	(BTU/min)	(20041)		(22788)	(21506)	(28387)
Cooling system	Direct Sea Water Cooling Max. sea water temp. at intercooler inlet	°C	N/A			
	Intermediate Fresh Water Cooling Max. fresh water temp. at intercooler inlet	°C	Max. 38°C (When sea water temp. 32°C)			
	Radiator Cooling* Max. coolant temp. at intercooler inlet	°C	N/A		Max. 45°C (When Air Temp. 25°C)	
Noise Level (1 m height & distance) (excludes, Intake,Exhaust)	dB(A)	-		-	-	-
Maximum No Load Governed Speed	rpm	1720		1774	1575	1890

\*In case of radiator cooling method at IACS standard reference conditions, 15% output de-rating has to be applied.

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APPLICATION: MARINE