

mitsubishi DIESEL ENGINE TECHNICAL INFORMATION	ITEM No.	T0402-0001E Rev.6 (1/7)
	DATE	MAY, 2018

Exhaust Gas Emission Data

Exhaust Gas Emission Data is enclosed herein.

The specifications are subject to change without notice.

Revision	First Edition : May, 2008	Engine Engineering Department High Speed Engine Designing Section		
	Rev.1: February, 2013			
	Rev.2: April, 2016	Approved by	Checked by	Drawn by
	Rev.3: October, 2016	M.NAKAMURA	T.TSUKAMOTO	T.NISHIOKA
	Rev.4: January, 2017			
	Rev.5: October, 2017			
	Rev.6: MAY, 2018			

**EXHAUST GAS EMISSION DATA OF DIESEL ENGINE FOR GENERATOR
For Reference**

MODEL	S6A3-PTA		S12A2-PTA		S12H-PTA		S6R-PTA		S12R-PTA		S12R-PTA2		S12R-PTAA2 (W/FAN)		S16R-PTA		S16R-PTA2		S16R-PTAA2 (W/FAN)		S16R2-PTA		S16R2-PTAW		S16R2-PTAW-E		S16R2-PTAW2-E	
	400/ 1500	800/ 1500	679/ 1500	761/ 1800	930/ 1500	1020/ 1800	515/ 1500	595/ 1800	1110/ 1500	1190/ 1800	1195/ 1500	1340/ 1800	1277/ 1500	1387/ 1800	1480/ 1500	1590/ 1800	1630/ 1500	1775/ 1800	1684/ 1500	1885/ 1800	2167/ 1500 *1	2167/ 1500 *1	2167/ 1500 *1	2275/ 1500 *1	2167/ 1500 *1	2275/ 1500 *1	2430/ 1500 *1	2430/ 1500 *1
Prime Rating kW/min ⁻¹ (without fan)																												
NOx g/Nm ³	900	890	852	825	877	852	901	940	852	940	950	852	940	779	852	950	852	828	754	686	659	560	638					
g/kW·h	3.7	3.7	3.5	3.4	3.8	3.6	3.7	3.5	3.7	3.5	3.9	3.7	3.5	3.2	3.7	3.9	3.7	3.4	3.1	3.9	3.6	3.5	3.5					
g/kW·h	8.6	8.6	7.7	7.7	8.8	8.2	8.4	8.4	7.7	8.4	8.8	7.7	8.4	7.3	7.7	8.8	7.7	7.7	7.1	6.1	5.8	5.7	5.4					
CO g/Nm ³	(220)	(210)	(210)	(210)	(310)	(210)	310	210	(310)	(210)	(310)	(210)	(320)	(200)	(210)	(310)	(210)	(320)	(200)	128	119	94	84					
g/Nm ³	(0.44)	(0.45)	(0.44)	(0.45)	(0.59)	(0.43)	0.52	0.39	(0.59)	(0.43)	(0.59)	(0.43)	(0.55)	(0.42)	(0.56)	(0.43)	(0.59)	(0.42)	(0.45)	0.45	0.38	0.33	0.27					
g/kW·h	(1.2)	1.4	(1.2)	1.4	(1.8)	(1.4)	1.5	1.2	(1.8)	(1.4)	(1.8)	(1.2)	(1.5)	(1.2)	(1.6)	(1.8)	(1.2)	(1.5)	(1.2)	0.7	0.5	0.5	0.4					
HC g/Nm ³	(50)	(50)	(50)	(50)	(110)	(120)	110	120	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	(110)	49	35	45	54					
g/Nm ³	(0.05)	(0.06)	(0.05)	(0.06)	(0.11)	(0.13)	0.09	0.11	(0.11)	(0.13)	(0.11)	(0.13)	(0.10)	(0.13)	(0.10)	(0.13)	(0.11)	(0.10)	(0.13)	0.09	0.06	0.09	0.10					
g/kW·h	(0.15)	(0.18)	(0.15)	(0.18)	(0.31)	(0.38)	0.27	0.34	(0.31)	(0.38)	(0.31)	(0.35)	(0.29)	(0.38)	(0.29)	(0.38)	(0.31)	(0.29)	(0.38)	0.14	0.10	0.14	0.15					
CO ₂ %	6.7	6.2	6.7	6.2	6.9	6.5	8.0	7.1	6.9	6.5	6.7	6.5	6.7	6.5	6.7	6.5	6.7	6.5	6.5	7.4	8.0	7.2	7.9					
g/kW·h	619	646	619	646	619	625	598	619	619	625	620	613	619	612	619	612	620	613	619	645	643	643	631					
g/Nm ³	0.12	0.12	0.12	0.11	0.12	0.11	0.10	0.12	0.12	0.11	0.10	0.09	0.09	0.08	0.11	0.12	0.11	0.12	0.09	0.07	0.03	0.03	0.03					
g/kW·h	0.37	0.37	0.38	0.37	0.38	0.37	0.34	0.35	0.35	0.37	0.34	0.33	0.33	0.31	0.33	0.33	0.33	0.33	0.31	0.31	0.04	0.04	0.04					

Notes

- Allowance: +25%
- Condition: 100kPa(750mmHg) barometric pressure, 298K(25°C) ambient temperature and 30% relative humidity.
- NOx, CO, HC[PPM]: with 13% O₂ Level.
- NOx, CO, HC, Particulates[g/Nm³]: with 5% O₂ Level.
- NOx, CO, HC, Particulates[g/PS·h]: with 13% O₂ Level.
- CO₂[%]: Calculated Data.
- (): Estimated Data.
- *1: Standby Rating.
- These data are subject to change without notice.

EXHAUST GAS EMISSION DATA OF S12A2-PTA2 FOR GENERATOR

For Reference.

MODEL		S12A2-PTA2	
Stand-by Rating kW/min ⁻¹ (without fan)		840/1500	950/1800
NO _x	g/kW·h	8.35	7.93
CO	g/kW·h	1.56	0.57
HC	g/kW·h	0.26	0.29
PM	g/kW·h	0.273	0.191

※The above values are D2 mode values.

※The value is not guaranteed.

※The value is subject to change without notice.

EXHAUST GAS EMISSION DATA OF Y1 SERIES ENGINES FOR GENERATOR

MODEL	Stand-by Rating (without fan) kW/min ⁻¹		EPA Tier1 Emission Regulations (D2 mode)														
S6R-Y1PTA-5	583/1500	-	<table border="1"> <tr> <td>NOx</td> <td>g/kW·h</td> <td>9.2</td> </tr> <tr> <td>CO</td> <td>g/kW·h</td> <td>11.4</td> </tr> <tr> <td>HC</td> <td>g/kW·h</td> <td>1.3</td> </tr> <tr> <td>PM</td> <td>g/kW·h</td> <td>0.54</td> </tr> </table>	NOx	g/kW·h	9.2	CO	g/kW·h	11.4	HC	g/kW·h	1.3	PM	g/kW·h	0.54		
NOx	g/kW·h	9.2															
CO	g/kW·h	11.4															
HC	g/kW·h	1.3															
PM	g/kW·h	0.54															
S6R-Y1PTA-4	-	670/1800															
S12A2-Y1PTA-1	-	900/1800															
S12H-Y1PTA-4	1020/1500	-															
S12H-Y1PTA-3	-	1140/1800															
S12R-Y1PTA-3	1220/1500	-															
S12R-Y1PTA-2	-	1403/1800															
S16R-Y1PTA-4	1701/1500	-															
S16R-Y1PTA-2	-	1750/1800															
S16R-Y1PTAA2-3	1939/1500	-															
S16R-Y1PTAA2-1	-	2149/1800															

※The above values are D2 mode values.

※These engines are EPA Tier1 certified.

The specifications are subject to change without notice.

EXHAUST GAS EMISSION DATA OF Y2 SERIES ENGINES FOR GENERATOR

MODEL	Stand-by Rating (without fan) kW/min-1		EPA Tier2 Emission Regulations (D2 mode)											
	S6R-Y2PTAW-1	-	685/1800	<table border="1"> <tr> <td>NOx + HC</td> <td>g/kW·h</td> <td>6.4</td> </tr> <tr> <td>CO</td> <td>g/kW·h</td> <td>3.5</td> </tr> <tr> <td>PM</td> <td>g/kW·h</td> <td>0.2</td> </tr> </table>			NOx + HC	g/kW·h	6.4	CO	g/kW·h	3.5	PM	g/kW·h
NOx + HC	g/kW·h	6.4												
CO	g/kW·h	3.5												
PM	g/kW·h	0.2												
S12A2-Y2PTAW-2	-	900/1800												
S12H-Y2PTAW-1	-	1140/1800												
S12R-Y2PTAW-1	-	1403/1800												
S16R-Y2PTAW-1	-	1750/1800												
S16R-Y2PTAW2-1	-	2180/1800												

※The above values are D2 mode values.
 ※These engines are EPA Tier2 certified.

The specifications are subject to change without notice.

EXHAUST GAS EMISSION DATA OF F1 SERIES ENGINES FOR GENERATOR

MODEL	Stand-by Rating (without fan) kW/min-1		EU Local Emission Regulations (France Local Emission Regulations Included)		
	S12R-F1PTAW2	1462/1500	-	NOx	mg/Nm3
S16R-F1PTAW2	1947/1500	-	CO	mg/Nm3	650
S16R2-F1PTAW	2167/1500	-	HC	mg/Nm3	150
			PM	mg/Nm3	50

※The above values are at 100% load (at Stand-by Power).

※The above values are measured at 5% O₂ content.

※Control method of emission level shall be compliant with EPA regulation.

Test Conditions

fa $0.96 \leq fa \leq 1.06$ fa: Engine specific parameter considering atmospheric condition
which is determined according to the following provisions.
(See EUROMOT 2004 - EC 1997 68 Consolidated - Annex III)

$$fa = (99/Ps)^{0.7} (Ta/298)^{1.5}$$

Ps: Dry Atmospheric pressure(kPa)

Ta: Absolute temperature of the intake air(K)

Fuel JIS K-2204 Type2

Tfi $33^{\circ}\text{C} \leq Tfi \leq 43^{\circ}\text{C}$ Tfi: The fuel temperature at the injection pump inlet.

The specifications are subject to change without notice.

EXHAUST GAS EMISSION DATA OF A2 SERIES ENGINES FOR GENERATOR

Mitsubishi exhaust emission controlled engine <EPA-Tier2 Comparable>
 [Green-Oriented Engine Series]

MODEL	Stand-by Rating (without fan) kW/min-1		Emission Controlled (D2 mode)											
	S6R-A2PTAW-1	595/1500	-	<table border="1"> <tr> <td>NOx + HC</td> <td>g/kW·h</td> <td>6.4</td> </tr> <tr> <td>CO</td> <td>g/kW·h</td> <td>3.5</td> </tr> <tr> <td>PM</td> <td>g/kW·h</td> <td>0.2</td> </tr> </table>			NOx + HC	g/kW·h	6.4	CO	g/kW·h	3.5	PM	g/kW·h
NOx + HC	g/kW·h	6.4												
CO	g/kW·h	3.5												
PM	g/kW·h	0.2												
S6R2-A2PTAW-5	772/1500	-												
S12R-A2PTAW-2	1225/1500	-												
S12R-A2PTAW2-2	1463/1500	-												
S16R-A2PTAW-3	1710/1500	-												
S16R-A2PTAW2-1	1947/1500	-												
S16R2-A2PTAW-1	2167/1500	-												

- ※We hereby declare that diesel engine for generator application made by Mitsubishi Heavy Industries Engine & Turbocharger,Ltd. [Green-Oriented Engine Series(G.O.E.S)] satisfy the internal Tier2 standard (EPA Tier2 comparable level) in the prescribed test conditions.
- ※The above values are D2 mode values.
- ※Test procedure: Pursuant to EPA CFR 40 Part 89 and ISO8178-1.
- ※Test conditions: Pursuant to EPA CFR 40 Part 89 except that JIS No.2 diesel fuel is used.
- ※Above emission results do not include Deterioration Factor (DF).
- ※These engines are not EPA Tier2 Certified.
- ※Test report is issued by Vehicle Certification Agency (VCA) (Report/Job number: TBD).
- ※This document proves that these engine models are manufactured and supplied under the supervision of MHIET quality assurance system and satisfy MHIET internal Tier2 emission standard.
- ※This document does not guarantee the same emission performance when fuel or operating environment is different.

The specifications are subject to change without notice.