

Colorado Department of Public Health and Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South Denver, CO 80246

RECEIVED

APR - 8 2021

APCD
Stationary
Sources

**APEN AND CONSTRUCTION PERMIT EXEMPTION
FLEXENTIAL CORPORATION, COMPARK
ARAPAHOE COUNTY, COLORADO**

To Whom It May Concern,

April 7, 2021

Flexential Corporation (Flexential) operates a data center, COMPARK, located in Arapahoe County at 8636 S. Peoria Street in Englewood, Colorado. This submittal is intended to verify the exempt status of a new 3490kW diesel-fueled emergency generator, G5. G5 provides emergency backup power to the data center.

Ramboll
1999 Broadway
Suite 2225
Denver, CO 80202
USA

Criteria pollutant emissions from G5 are all less than 1 ton per year (TPY) making it exempt from the APEN requirements per Regulation 3, Part A.II.D.1.a. COMPARK currently maintains four existing emergency engines all with exempt status based on annual actual hours of operation less than 24hrs.

T +1 303.382.5460
www.ramboll.com

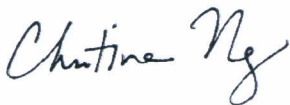
Per Regulation 3, Part B, II.D.2, COMPARK does not have any emission sources that contribute to the facility wide uncontrolled actuals exceeding the permitting thresholds for nonattainment areas therefore, this facility is exempt from permitting.

Flexential is submitting the attached APEN, supporting documentation, and associated fees which we anticipate will result in a letter of confirmation of exemption.

Please contact Natalie Ohlhausen at (303) 382-5479 or contact nohlhause@ramboll.com if you have any questions related to this application.

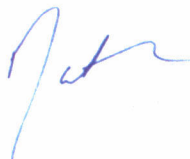
Principal

Sincerely,



Christine B. Ng, PhD, CPEA

Principal
D +1 (303) 382-5467
ehodek@ramboll.com



Natalie Ohlhausen

Senior Managing Consultant
D +1 (303) 382-5479
nohlhausen@ramboll.com

FLEXENTIAL CORPORATION
Compark, Denver CO

Emergency Generator Engine G5 Emissions Calculations

Table 1. Emergency Generator Parameters

Engine Data	
Name	Emergency Generator
Number of Engines	1
Manufacturer	MTU
Model Number	20V4000G94S
Operating Load	100%
Max rating (kW)	3,490
Max rating (HP)	4,680
Fuel consumption Full Load (gal/hr):	1,620
Operating Rating (MMBtu/hr):	221.99
Hours of operation per year:	29

Table 2. Emergency Generator Fuel Data

Fuel Data	
Fuel Type	Diesel
Heating Value (BTU/lb)	19,300
Density (lb/gal)	7
Diesel Heating Value (BTU/gal)	137,030

Table 3. Emergency Generator Criteria Pollutants and GHG Emissions

Pollutant	Emission Factor	Units	Total Emissions	
Criteria Pollutant ^a			lb/hr	TPY
VOC	0.24	g/kW-hr	1.85	2.68E-02
NOx	8.4	g/kW-hr	64.94	0.9
CO	1.2	g/kW-hr	9.39	0.14
PM (Filterable)	0.09	g/kW-hr	0.72	0.01
PM ₁₀	0.06	g/kW-hr	0.48	0.01
PM _{2.5}	0.09	g/kW-hr	0.72	0.01
SO ₂	0.09	g/kW-hr	0.72	1.05E-02
Greenhouse Gases ^{b,c}				
CO ₂	161.38	lb/MMBtu	35,824	519
CH ₄	2.2E-03	lb/MMBtu	0.49	7.10E-03
N ₂ O	2.2E-04	lb/MMBtu	0.05	7.10E-04
CO ₂ e	161	lb/MMBtu	35,851	520

^a Criteria pollutants emission factors are based on manufacturer specification sheet for MTU 20V4000G94S engine.

^b Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

^c CO₂e calculated based on global warming potential (GWP) for each Greenhouse gas: CO₂ = 1; CH₄ = 25; and N₂O = 298 (40 CFR Part 98, Subpart A).

FLEXENTIAL CORPORATION
Compark, Denver CO

Emergency Generator Engine G5 Emissions Calculations

Table 4. Emergency Generator HAP Emissions

Hazardous Air Pollutants (HAPs)			
Pollutant	Emission Factor ^a (lb/MMBtu)	Total Emissions	
		(lb/hr)	(lb/yr)
Acetaldehyde	2.52E-05	0.01	1.62E-01
Acrolein	7.88E-06	1.75E-03	5.07E-02
Benzene	7.76E-04	0.17	5.00E+00
Formaldehyde	7.89E-05	0.02	5.08E-01
Naphthalene	1.40E-04	0.03	0.90
Propylene	2.79E-03	0.62	1.80E+01
Toluene	2.81E-04	0.06	1.81E+00
Xylenes	1.93E-04	0.04	1.24E+00
Benzo(a)pyrene	2.57E-07	5.71E-05	1.65E-03
Benzo(a)anthracene	6.22E-07	1.38E-04	4.00E-03
Benzo(b)fluoranthene	1.11E-06	2.46E-04	7.15E-03
Chrysene	1.53E-06	3.40E-04	9.85E-03
Dibenz(a,h)anthracene	3.46E-07	7.68E-05	2.23E-03
Indeno(1,2,3-cd)pyrene	4.14E-07	9.19E-05	2.67E-03
Acenaphthene	4.68E-06	1.04E-03	3.01E-02
Acenaphthylene	9.23E-06	2.05E-03	0.06
Anthracene	1.23E-06	2.73E-04	7.92E-03
Benzo(g,h,i)perylene	5.56E-07	1.23E-04	3.58E-03
Benzo(k)fluoranthene	2.18E-07	4.84E-05	1.40E-03
Fluoranthene	4.03E-06	8.95E-04	2.59E-02
Fluorene	1.28E-05	2.84E-03	8.24E-02
Phenanthrene	4.08E-05	0.01	2.63E-01
Pyrene	3.71E-06	8.24E-04	2.39E-02
Total POM	2.12E-04	4.71E-02	1.36E+00

^aEmission factors from AP-42 Section 3.4, Large Stationary Diesel and Dual-Fuel Engines (October 1996).

[~]Maximum potential hourly emissions are based on operation of one emergency generator engine with a rated capacity of 4,680 bhp operating at full load. Annual emissions are based on 29 hours of operation per year per emergency generator engine.

Contents

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G94S				
Rated power [kW]	3490				
Rated speed [rpm]	1800				
Applicationgroup	3D				
Legislative body	EPA Stationary EMERG T2 (40CFR60)				
Test cycle	D2				
Data Set No.	XZ54954100429				
Data Set Basis	US EPA Nonroad Tier 2 (40CFR1039)				
Fuel sulphur content [ppm]	7.8				

Content

Page

Disclaimer.....	2
Emission data sheet (EDS).....	3
Not to exceed emission values.....	4

 MTU Friedrichshafen GmbH All industrial property rights reserved. Disclosure, reproduction or use for any other purpose is prohibited unless our express permission has been given. Any infringement results in liability to pay damages.		PDF	Name	Project no. 1331796	Size A4
		Configurator	Lenhof, Torsten (TKEE)	Order no. 1331796	
		Approver1	Kneifel, Alexander (TKFV)	EDS-ID	
		Approver2	Pizzuto, Gus (TKEE)	124-01.12.2020	
		Approver3	Buecheler, Otto (TKM)	Title Emission data sheet	
		Approver4			
		User	Schroeder, Chris (TSSC)		
		Engine model 20V4000G94S			
Emissionstage EPA Stationary EMERG T2 (40CFR60)					Sheet 1 of 4
Emissionstage basis US EPA Nonroad Tier 2 (40CFR1039)					

Description of Revision	Frequency
Data generated by EDS Creator version 1.0 and unipilot. Ref.-dataset: RP057_121219_1800_D2_Cycle;1_D;1.nc for 239 in EDS platform.	
Configuration-ID 239	Documentation Jeff Hansen Compark/Flexential 3MW order

General Disclaimers (valid for Measured and NTE values)

Please note that these data are physical and/or technical values only referring to and representing a normative defined operating condition. Any change in operating time and conditions will have impact on physical values and engine behavior, which must be considered and assessed within the complete propulsion system especially in regard to emission compliance and product safety.

Measurements listed in this EDS are representative of the listed engine rating at the time of testing. These measurements and results can change according to instrumentation, boundary condition, and engine to engine variability. In addition - changes to the engine family hard or software may occur which could result in changes to some of the listed values.

Emissions data measurement procedures are conducted according to applicable rules and standards as per "Emission Stage/Optimization". Potential deviations from these procedures are documented internally.

The listed emission values relate to the corresponding certification data. Seller doesn't take any responsibility or liability neither out or in connection with the contract nor on any other basis

- beyond these specified operating conditions of the engine
 - and for any installation/modification of the entire propulsion system by the customer itself or any third party
- and the customer will indemnify MTU on first demand for any third party claim out or in connection with this.

Seller reserves the right to amend specifications and information without notice and without obligation or liability. No liability for any errors, facts or opinions is accepted. Customers must satisfy themselves as to the suitability of this product for their application. No responsibility for any loss as a result of any person placing reliance on any material contained in this data sheet will be accepted.

Seller reserves all rights in the information contained in this data sheet. It shall not be reproduced, made available to a third party or otherwise used in any way whatsoever.

When applicable, emission values are measured after combined exhaust streams.

Measured Emissions data is based on single operating points and thus cannot be used to compare to regulations which use values based on a weighted cycle.

Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures, and instrumentation. Over time deterioration may occur which may have an impact on emission levels.

The SO₂ emission rates comprehend exclusively the SO₂ content as found in the fuel source, oil consumption effects are not included. Variation of sulfur content in the fuel changes only the stated SO₂ emissions, cross sensitivity to other emissions (e.g. particulates) is not possible.

All values based on metric units, inaccuracies for non metric values can occur, values are not binding.

EAT Specific Disclaimers (valid for EDS values)

NH₃ emissions levels measured with AVL SESAM i60/ 4 FT Multi Component Exhaust Measurement System (FTIR) including EPA 40 CFR 1065 legislation compliant automated checks for linearity.

Generators or engines with exhaust after-treatment systems require a stabilization period of approximately 1 hour to ensure stable temperatures across SCR prior to performing an emissions test. Performing emissions measurements before a stable temperature has been achieved can result in inconsistent emission values. NO_x Values only applicable if temperatures across SCR reached for DEF Dosing.

NTE Disclaimers (valid for NTE calculated values)

Calculated not to exceed values (NTE) are not proven by tests and therefore the accuracy is not guaranteed.

All emission data shown in chapters Emission Data Sheet, Not to Exceed Values, and Type Approval were gathered from a corresponding certification engine under test conditions shown above and complying to corresponding TEN data.

GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII OR EPA 40 CFR PART 1039 SUBPART 101 FOR MEASURING HC, CO, PM, AND NO _x .							
Locality	Agency	Regulation	Tier/Stage	Max. Limit G/(kW -HR)			
U.S. (INCL CALIF)	EPA	Stationary	Emergency Stationary	T2	T3	T4	
			- Tier 2 (>560kW)			0.67	
			- Tier 3 (<560kW)	6.4	4.0	0.19	
			Generator sets	3.5	3.5	3.5	
			- Tier 4 (<>560kW)	0.20	0.20	0.03	
			NO _x +				
			NMHC:				
			CO:				
			PM:				

		 MTU Friedrichshafen GmbH	PDF	Name	Project no. 1331796	Size A4	
			Configurator	Lenhof, Torsten (TKEE)	Order no. 1331796		
Description of Revision		Frequency	Approver1	Kneifel, Alexander (TKFV)	EDS-ID	Title Emission data sheet	
			Approver2	Pizzuto, Gus (TKEE)	124-01.12.2020		
			Approver3	Buecheler, Otto (TKM)			
			Approver4				
			User	Schroeder, Chris (TSSC)			
			Engine model				
			20V4000G94S				
			Emissionstage				Sheet 2 of 4
			EPA Stationary EMERG T2 (40CFR60)				
Configuration-ID 239		Documentation Jeff Hansen Compark/Flexential 3MW order	Emissionstage basis US EPA Nonroad Tier 2 (40CFR1039)				

Engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G94S				
Applicationgroup	3D				
Legislative body	EPA Stationary EMERG T2 (40CFR60)				
Test cycle	D2				
Fuel sulphur content [ppm]	7.8				
mg/mN ³ values base on residual oxygen value of [%]	Measured				

Engine raw emissions*

Cycle point	[-]	n1	n2	n3	n4	n5
Power	kW	3490	2617	1745	872	349
Power relative	[-]	1	0.75	0.5	0.25	0.1
Engine speed	rpm	1800	1800	1800	1800	1800
Engine speed relative	[-]	1	1	1	1	1
Filter smoke number	FSN	0.26	0.33	0.14	0.4	0.1
Exhaust temperature after ETC	grdC	519.2	452.8	418.1	377.7	256.7
Exhaust back pressure after ETC (static)	mbar	66	49	30	15	7
Exhaust back pressure after ETC (total)	mbar	77	57	35	17	8
Exhaust mass flow wet	kg/h	19326.9	17162	13617.4	9295.1	6582.8
NOX-Emissions specific	g/kWh	6.49	5.51	4.8	3.68	10.31
SO2-Emissions specific	g/kWh	0.003	0.003	0.003	0.004	0.005
CO-Emissions specific	g/kWh	0.72	0.79	0.59	1.41	6.42
HC1-Emissions specific	g/kWh	0.14	0.21	0.32	0.7	2.18
NMHC-Emissions specific	g/kWh	0.142	0.214	0.318	0.696	2.157
NOX+HC1-Emissions specific	g/kWh	6.634	5.722	5.122	4.379	12.484
NOX+NMHC-Emissions specific	g/kWh	6.634	5.722	5.122	4.378	12.466
CO2-Emissions specific	g/kWh	664.5	667.9	701.6	801.1	970.1
PT-Emissions specific (Meas.)	g/kWh	0.063	0.088	0.081	0.234	0.65

		 MTU Friedrichshafen GmbH	PDF	Name	Project no. 1331796	Size A4
			Configurator	Lenhof, Torsten (TKEE)	Order no. 1331796	
			Approver1	Kneifel, Alexander (TKFV)	EDS-ID 124-01.12.2020	
			Approver2	Pizzuto, Gus (TKEE)		
			Approver3	Buecheler, Otto (TKM)		
Approver4						
Description of Revision		Frequency	User		Schroeder, Chris (TSSC)	Title Emission data sheet
			Engine model 20V4000G94S			
Data generated by EDS Creator version 1.0 and uniplot. Ref.-dataset: RP057_121219_1800_D2_Cycle;1_D;1.nc for 239 in EDS platform.		All industrial property rights reserved. Disclosure, reproduction or use for any other purpose is prohibited unless our express permission has been given. Any infringement results in liability to pay damages.	Emissionstage EPA Stationary EMERG T2 (40CFR60)			Sheet 3 of 4
			Emissionstage basis US EPA Nonroad Tier 2 (40CFR1039)			
Configuration-ID 239	Documentation Jeff Hansen Compark/Flexential 3MW order					

Engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G94S				
Applicationgroup	3D				
Legislative body	EPA Stationary EMERG T2 (40CFR60)				
Test cycle	D2				
Fuel sulphur content [ppm]	7.8				
mg/mN ³ values base on residual oxygen value of [%]	Measured				

Not to exceed emission values*

Cycle point	[-]	n1	n2	n3	n4	n5
Power	kW	3490	2617	1745	872	349
Power relative	[-]	1	0.75	0.5	0.25	0.1
Engine speed	rpm	1800	1800	1800	1800	1800
Engine speed relative	[-]	1	1	1	1	1
NOX-Emissions specific	g/kWh	8.44	7.16	6.24	5.52	
CO-Emissions specific	g/kWh	1.22	1.35	1.13	2.81	
HC1-Emissions specific	g/kWh	0.24	0.36	0.6	1.39	
NMHC-Emissions specific	g/kWh	0.242	0.365	0.605	1.392	
NOX+HC1-Emissions specific	g/kWh	8.681	7.525	6.849	6.917	
NOX+NMHC-Emissions specific	g/kWh	8.681	7.525	6.849	6.915	
PT-Emissions specific (Meas.)	g/kWh	0.094	0.14	0.121	0.352	

 MTU Friedrichshafen GmbH		PDF	Name	Project no. 1331796	Size A4	
		Configurator	Lenhof, Torsten (TKEE)	Order no. 1331796		
Description of Revision	Frequency	Approver1	Kneifel, Alexander (TKFV)	EDS-ID		
		Approver2	Pizzuto, Gus (TKEE)	124-01.12.2020		
Data generated by EDS Creator version 1.0 and uniplot. Ref.-dataset: RP057_121219_1800_D2_Cycle;1_D;1.nc for 239 in EDS platform.		Approver3	Buecheier, Otto (TKM)	Title Emission data sheet		
		Approver4				
		User	Schroeder, Chris (TSSC)			
		Engine model 20V4000G94S				
Configuration-ID 239	Documentation Jeff Hansen Compark/Flexential 3MW order	Emissionstage				Sheet 4 of 4
		EPA Stationary EMERG T2 (40CFR60)				
		Emissionstage basis				
		US EPA Nonroad Tier 2 (40CFR1039)				

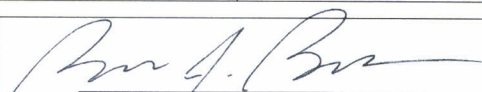


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2020 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: MTU America, Inc.
(U.S. Manufacturer or Importer)
Certificate Number: LMDDL95.4GTZ-007

Effective Date:
01/29/2020
Expiration Date:
12/31/2020


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
01/29/2020
Revision Date:
N/A

Model Year: 2020
Manufacturer Type: Original Engine Manufacturer
Engine Family: LMDDL95.4GTZ

Mobile/Stationary Indicator: Stationary
Emissions Power Category: $560 < kW \leq 2237$
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.



South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

December 6, 2019

Mr. Saeed Abolhasani / Ms. Nidhi Dobbala
MTU America, Inc.
39525 MacKenzie Drive
Novi, MI 48377

Dear Saeed/Nidhi,

The South Coast Air Quality Management District (South Coast AQMD) has extended Certified Equipment Permits (CEPs) to December 31, 2020 for the stationary emergency internal combustion (IC) engine models listed in the attached table. However, please be reminded that many of these certified diesel-fueled IC engines may not meet Rule 1470 requirements if installed at or near a sensitive receptor or near school grounds and, therefore, may require an aftertreatment system such as a diesel particulate filter in the exhaust stream.

Please note that the South Coast AQMD does not endorse or warrant any specific equipment or manufacturer. Modification of the equipment listed here will void this certification.

If you have additional questions or need further clarification on the CEP program, please feel free to contact CJ Chang at (909) 396-3293, cchang@aqmd.gov; or Susan Tsai at (909) 396-2529, stsai@aqmd.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "David Ono".

David Ono
Senior Engineering Manager
Engineering and Permitting

DO:GI:ST:CC



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Certified ICE-Emergency Generators

MTU AMERICA, INC.

Engine Mfg.	Model	Engine Rating	Appl. No.
MTU America	10V1600G80S	752 BHP	578846
MTU America	18V2000G76S	1839 BHP	578847
Mercedes-Benz	OM 924 LA	197.1 BHP	580124
Mercedes-Benz	OM 926 LA	331.2 BHP	580125
MTU America	6R1600G70S	419 BHP	518630
MTU America	6R1600G80S	460 BHP	518631
MTU America	8V1600G70S	548 BHP	518632
MTU America	8V1600G80S	601 BHP	518633
MTU America	12V1600G70S	822 BHP	503822
MTU America	12V1600G80S	896 BHP	503820
MTU America	12V2000G45 TB/TD (R1238A37)	952 BHP	495350
MTU America	12V2000G85 TB/TD (R1238A37)	1086 BHP	495342
MTU America	16V2000G45 TB/TD (R1638A37)	1227 BHP	495344
MTU America	16V2000G85 TB/TD (R1638A37)	1354 BHP	495345
MTU America	G43D (20V-4000 G43 3D, 20V-4000 G83 3B)	3674 BHP	470538
MTU America	G83L (20V-4000 G83L)	4680 BHP	470536
MTU America	G83L (20V-4000 G83L, 20V-4000 G83 3D)	4036 BHP	470537
MTU America	T1238A36 (12V-4000 G83)	2561 BHP	470532
MTU America	T1238A36 (12V-4000 G83, 12V-4000 G43)	2328 BHP	470534
MTU America	T1638A36 (16V-4000 G83 3D)	3353 BHP	470533
MTU America	T1638A36 (16V-4000 G43 3D, 16V-4000 G83 3B)	3058 BHP	608239



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Certified ICE-Emergency Generators

MTU AMERICA, INC.

Engine Mfg.	Model	Engine Rating	Appl. No.
MTU America	10V1600G80S	752 BHP	551793
MTU America	12V2000G45TB	1045 BHP	551794
MTU America	12V2000G85TB	1194 BHP	608240
MTU America	16V2000G45TB	1354 BHP	551796
MTU America	16V2000G85TB	1495 BHP	551797
MTU America	16V4000G83L	3674 BHP	551792
MTU America	16V2000G86S	1839 BHP	608241
MTU America	10V1600G70S	685 BHP	602447
MTU America	12V4000G14S	2038 BHP	608244
MTU America	12V4000G24S	2328 BHP	608247
MTU America	12V4000G74S	2328 BHP	608248
MTU America	12V4000G84S	2561 BHP	608249
MTU America	16V4000G14S	2709 BHP	608250
MTU America	16V4000G24S	3058 BHP	608251
MTU America	20V4000G64S	3674 BHP	608253
MTU America	20V4000G44S	4036 BHP	608260
MTU America	16V4000G74S	3058 BHP	608263
MTU America	20V4000G94S	4680 BHP	608264
MTU America	20V4000G74S	4036 BHP	608265
MTU America	20V4000G24S	3674 BHP	608267
MTU America	20V4000G14S	3339 BHP	608268
MTU America	16V4000G84S	3353 BHP	608269
MTU America	16V4000G94S	3674 BHP	608270



**CERTIFIED EQUIPMENT PERMIT (CEP)
(NOT A PERMIT TO CONSTRUCT OR OPERATE)**

Granted on December 5, 2018

ID 180910

**Legal Owner
or Operator:**

MTU AMERICA, INC.
39525 MACKENZIE DR.
NOVI, MI 48377
ATTN: NIDHI DOBBALA

Equipment Location: SAME AS ABOVE

The equipment described below and as shown on the approved plans and specifications are subject to the special condition or conditions listed.

Equipment Description

Internal Combustion Engine, MTU America, Model No. 20V4000G94S, Diesel-Fueled, 20-Cylinder, 4-Cycle, Turbocharged, Rated at 4,680 BHP, Driving an Emergency Electrical Generator.

Manufacturer Condition

1. **This Certified Equipment Permit (CEP) is not a Permit to Construct or Operate.** The person constructing, installing or operating the equipment at each specific site shall obtain all necessary permit(s) to construct and permit(s) to operate and comply with any other District rules and regulations including the requirements of Regulation XIII.

End User Conditions

1. Operation of this equipment shall be in compliance with all data and specifications submitted with the application under which this permit was issued, unless otherwise noted below.
2. This equipment shall be properly maintained and kept in good operating condition at all times.
3. An operational non-resettable totalizing timer shall be installed and maintained to indicate the engine elapsed operating time.
4. This engine shall not be operated more than 200 hours in any one year, which includes no more than 50 hours in any one year for maintenance and testing purposes and 4.2 hours in any one month for maintenance and testing purposes.

ORIGINAL



**CERTIFIED EQUIPMENT PERMIT (CEP)
(NOT A PERMIT TO CONSTRUCT OR OPERATE)**

5. Operating beyond the 50 hours per year allotted for maintenance and testing purposes shall be allowed only in the event of a loss of grid power or up to 30 minutes prior to a rotating outage, provided that the utility distribution company has ordered rotating outages in the control area where the engine is located or has indicated that it expects to issue such an order at a certain time, and the engine is located in a utility service block that is subject to the rotating outage. Engine operation shall be terminated immediately after the utility distribution company advises that a rotating outage is no longer imminent or in effect.
6. This engine shall not be used as part of a demand response program using interruptible service contract in which a facility receives a payment or reduced rates in return for reducing its electric load on the grid when requested to do so by the utility or the grid operator.
7. The operator shall keep a log of engine operations documenting the total time the engine is operated each month and specific reason for operation as:
 - A. Emergency use.
 - B. Maintenance and testing.
 - C. Other (describe the reason for operating).

In addition, each time the engine is manually started, the log shall include the date of operation, the specific reason for operation, and the totalizing hour meter reading (in hours and tenths of hours) at the beginning and end of operation.

8. On or before January 15th of each year, the operator shall record in the engine operating log the following:
 - A. The total hours of operation for the previous calendar year, and
 - B. The total hours of engine operation for maintenance and testing for the previous calendar year.

Engine operating log shall be retained on site for a minimum of three calendar years and shall be made available to the Executive Officer or representative upon request.

9. This engine shall comply with all applicable requirements of Rule 431.2, Rule 1470, and Rule 1472.
10. This engine shall comply with the NMHC, NO_x, CO, and PM emission limits to be determined at the time of issuance of the end-user permit.
11. Sulfur content of diesel fuel supplied to the engine shall not exceed 15 ppm by weight.

ORIGINAL



CERTIFIED EQUIPMENT PERMIT (CEP)
(NOT A PERMIT TO CONSTRUCT OR OPERATE)

Please notify CJ Chang at (909) 396-3293 (cchang@aqmd.gov) when SCAQMD information packets are needed or if you have any questions concerning the Certification/Registration Program.

This Certified Equipment Permit is based on the plans, specifications, and data submitted as it pertains to the release of air contaminants and control measures to reduce air contaminants. No approval or opinion concerning safety and other factors in design, construction or operation of the equipment is expressed or implied.

This Certified Equipment Permit will become invalid if this application is cancelled. THIS PERMIT SHALL EXPIRE ON December 31, 2019 unless an extension is granted by the Executive Officer.

By

A handwritten signature in blue ink, appearing to read 'Merrill Hickman', written over a horizontal line.

MERRILL HICKMAN
Supervising Air Quality Engineer

ORIGINAL



Diesel Generator Set

MTU 20V4000 DS3000 45 °C

3,000 kWe/60 Hz/Standby (Fuel Consumption Optimized)/480 - 13,800V

System ratings

Voltage (L-L)	480V † ‡	600V ‡	4,160V	12,470V	13,200V	13,800V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	3,000	3,000	3,000	3,000	3,000	3,000
kVA	3,750	3,750	3,750	3,750	3,750	3,750
Amps	4,511	3,608	520	174	164	157
skVA@30% voltage dip	10,389	8,298	8,506	4,792	5,369	5,868
Generator model*	841-VL85-M	841-VL85-M	841-VL85-M	4P9.6-2100-M	4P9.6-2100-M	4P9.6-2100-M
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

† UL 2200 offered

‡ CSA offered

Certifications and standards

- Emissions
 - Fuel Consumption Optimized (FCO)
- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- Seismic certification – optional
 - IBC certification
 - OSHPD pre-approval
- UL 2200 – optional (refer to *System ratings* for availability)
- CSA – optional (refer to *System ratings* for availability)
 - CSA C22.2 No. 100
 - CSA C22.2 No. 14
- Performance Assurance Certification (PAC)
 - Generator set tested to ISO 8528-5 for transient response
 - Verified product design, quality, and performance integrity
 - All engine systems are prototype and factory tested
- Power rating
 - Accepts rated load in one step per NFPA 110
 - Permissible average power output during 24 hours of operation is approved up to 85%.

Standard features*

- MTU is a single source supplier
- Global product support
- 2 year standard warranty
- 20V4000 diesel engine
 - 95.4 liter displacement
 - Common rail fuel injection
 - 4-cycle
- Complete range of accessories
- Cooling system
 - Integral set-mounted
 - Engine-driven fan
- Generator
 - Brushless, rotating field generator
 - 2/3 pitch windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% short circuit capability
- Digital control panel(s)
 - UL recognized, CSA certified, NFPA 110
 - Complete system metering
 - LCD display

Standard equipment*

Engine

- Air cleaners
- Oil pump
- Oil drain extension and S/O valve
- Full flow oil filter
- Closed crankcase ventilation
- Jacket water pump
- Inter cooler water pump
- Thermostats
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 24V
- Governor - electronic isochronous
- Base - structural steel
- SAE flywheel and bell housing
- Charging alternator - 24V
- Battery box and cables
- Bulkhead fuel connectors
- Flexible exhaust connection
- Fuel consumption optimized

Generator

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds
- Self-ventilated and drip-proof
- Superior voltage waveform
- Digital, solid state, volts-per-hertz regulator
- No load to full load regulation
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 130 °C maximum standby temperature rise
- 2-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- $\pm 0.25\%$ voltage regulation
- 100% of rated load - one step
- 5% maximum total harmonic distortion

Digital control panel(s)

- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- CANBus ECU communications
- Windows®-based software
- Multilingual capability
- Remote communications to RDP-110 remote annunciator
- Programmable input and output contacts
- UL recognized, CSA certified, CE approved
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

Application data

Engine

Manufacturer	MTU
Model	20V4000G94S
Type	4-cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression ratio	16.4:1
Rated rpm	1,800
Engine governor	electronic isochronous (ADEC)
Maximum power: kWm (bhp)	3,490 (4,680)
Speed regulation	± 0.25%
Air cleaner	dry

Liquid capacity (Lubrication)

Total oil system: L (gal)	390 (103)
Engine jacket water capacity: L (gal)	205 (54.2)
After cooler water capacity: L (gal)	50 (13.2)
System coolant capacity: L (gal)	860 (227)

Electrical

Electric volts DC	24
Cold cranking amps under -17.8 °C (0 °F)	4,200

Fuel system

Fuel supply connection size	-16 JIC 37° female 1" NPT adapter provided
Fuel return connection size	-16 JIC 37° female 1" NPT adapter provided
Maximum fuel lift - cranking: m (ft)	1 (3.3)*
Maximum fuel lift - running: m (ft)	3.1 (10)
Recommended fuel	diesel #2
Total fuel flow: L/hr (gal/hr)	1,620 (428)

* Fuel lift pump for cranking increases lift to: m (ft) 3.1 (10)

Fuel consumption

At 100% of power rating: L/hr (gal/hr)	785 (207)
At 75% of power rating: L/hr (gal/hr)	551 (146)
At 50% of power rating: L/hr (gal/hr)	379 (100)

Cooling - radiator system

Ambient capacity of radiator: °C (°F)	45 (113)
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H ₂ O)	0.12 (0.5)
Water pump capacity: L/min (gpm)	1,567 (414)
After cooler pump capacity: L/min (gpm)	567 (150)
Heat rejection to coolant: kW (BTUM)	1,260 (71,655)
Heat rejection to after cooler: kW (BTUM)	940 (53,457)
Heat radiated to ambient: kW (BTUM)	258 (14,698)
Fan power: kW (hp)	60.6 (81.3)

Air requirements

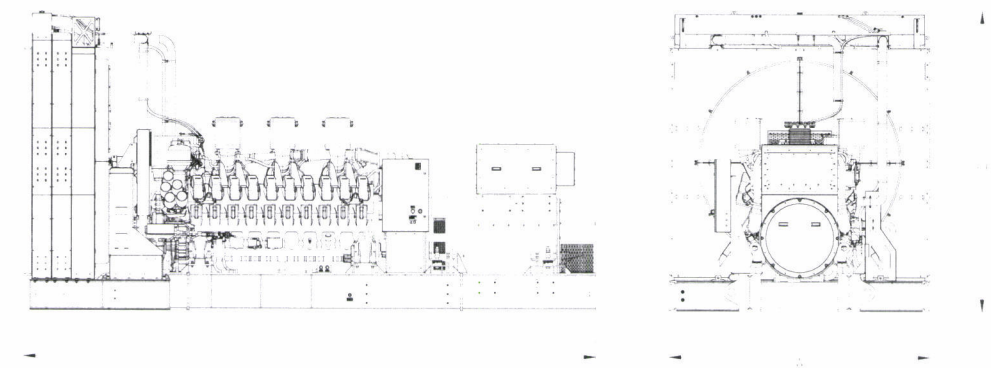
Aspirating: *m ³ /min (SCFM)	264 (9,323)
Air flow required for radiator cooled unit: *m ³ /min (SCFM)	3,082 (108,843)
Remote cooled applications: air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m ³ /min (SCFM)	936 (33,045)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Exhaust system

Gas temp. (stack): °C (°F)	510 (950)
Gas volume at stack temp: m ³ /min (CFM)	726 (25,638)
Maximum allowable back pressure at outlet of engine, before piping: kPa (in. H ₂ O)	8.5 (34.1)

Weights and dimensions



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (less tank)
Open power unit (OPU)	7,335 x 3,072 x 3,590 mm (288.77 x 120.93 x 141.34 in)	24,634 kg (54,318 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Sound data

Unit type	Standby full load
Level 0: Open power unit: dB(A)	94.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

Emissions data

NO _x + NMHC	CO	PM
4.44	0.59	0.04

— All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values). Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA standards.

Rating definitions and conditions

- Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- Consult your local MTU Distributor for derating information.