Diesel Generator Set

MTU 16V4000 DS2500

380V – 11 kV/50 Hz/prime power/NEA (ORDE) optimized
16V4000G24F/water charge air cooling

Optional equipment and finishing shown. Standard may vary.

Product highlights

Benefits
— Low fuel consumption
— Optimized system integration ability
— High reliability
— High availability of power
— Long maintenance intervals

Support
— Global product support offered

Standards
— Engine-generator set is designed and manufactured in facilities certified to standards ISO 2008:9001 and ISO 2004:14001
— Generator set complies to ISO 8528
— Generator meets NEMA MG1, BS5000, ISO, DIN EN and IEC standards
— NFPA 110

Power rating
— System ratings: 2120 kVA - 2360 kVA
— Accepts rated load in one step per NFPA 110
— Generator set complies to G3 according to ISO 8528-5
— Generator set exceeds load steps according to ISO 8528-5

Performance assurance certification (PAC)
— Engine-generator set tested to ISO 8528-5 for transient response
— 75% load factor
— Verified product design, quality and performance integrity
— All engine systems are prototype and factory tested

Complete range of accessories available
— Control panel
— Power panel
— Circuit breaker/power distribution
— Fuel system
— Fuel connections with shut-off valve mounted to base frame
— Starting/charging system
— Exhaust system
— Mechanical and electrical driven radiators
— Medium and oversized voltage alternators

Emissions
— NEA (ORDE) optimized

Certifications
— CE certification option
— Unit certificate acc. to BDEW (German Grid-Code)
**Application data**

1. All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).
2. Values referenced are in accordance with ISO 3046-1. Conversion calculated with fuel density of 0.83 g/ml. All fuel consumption values refer to rated engine power.

### Engine

- **Manufacturer**: MTU
- **Model**: 16V4000G24F
- **Type**: 4-cycle
- **Arrangement**: 16V
- **Displacement**: l 76.3
- **Bore**: mm 170
- **Stroke**: mm 210
- **Compression ratio**: 16.4
- **Rated speed**: rpm 1500
- **Engine governor**: ECU 9
- **Max power**: kWm 1965
- **Air cleaner**: dry

### Fuel system

- **Maximum fuel lift**: m 5
- **Total fuel flow**: l/min 20

### Fuel consumption

<table>
<thead>
<tr>
<th></th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 100% of power rating:</td>
<td>471.1</td>
<td>199</td>
</tr>
<tr>
<td>At 75% of power rating:</td>
<td>358.7</td>
<td>202</td>
</tr>
<tr>
<td>At 50% of power rating:</td>
<td>247.4</td>
<td>209</td>
</tr>
</tbody>
</table>

### Liquid capacity (lubrication)

<table>
<thead>
<tr>
<th></th>
<th>Total oil system capacity: l</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine jacket water capacity: l</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>Intercooler coolant capacity: l</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

### Combustion air requirements

<table>
<thead>
<tr>
<th></th>
<th>m³/h</th>
<th>kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion air volume</td>
<td>2.5</td>
<td>68.5</td>
</tr>
<tr>
<td>Max. air intake restriction</td>
<td>mbar 90</td>
<td></td>
</tr>
<tr>
<td>Heat radiated to ambient</td>
<td>kW 70</td>
<td></td>
</tr>
</tbody>
</table>

### Cooling/radiator system

<table>
<thead>
<tr>
<th></th>
<th>m³/hr</th>
<th>kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant flow rate (HT circuit)</td>
<td>660</td>
<td></td>
</tr>
<tr>
<td>Coolant flow rate (LT circuit)</td>
<td>430</td>
<td></td>
</tr>
<tr>
<td>Heat rejection to coolant</td>
<td>kW 660</td>
<td></td>
</tr>
<tr>
<td>Heat radiated to charge air cooling</td>
<td>kW 430</td>
<td></td>
</tr>
<tr>
<td>Fan power for electr. radiator (40°C)</td>
<td>kW 70</td>
<td></td>
</tr>
</tbody>
</table>

### Exhaust system

<table>
<thead>
<tr>
<th></th>
<th>°C</th>
<th>mbar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust gas temp. (after turbocharger)</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Exhaust gas volume</td>
<td>m³/s 6.6</td>
<td></td>
</tr>
</tbody>
</table>

### Liquid capacity (optimization)

<table>
<thead>
<tr>
<th></th>
<th>AMPS</th>
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### Standard and optional features

#### System ratings (kW/kVA)

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>kWe</th>
<th>kVA</th>
<th>AMPS</th>
</tr>
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<td><strong>Generator model</strong></td>
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<td>kVA</td>
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</tr>
<tr>
<td><strong>Exhaust system</strong></td>
<td></td>
<td></td>
<td></td>
<td>70</td>
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#### Standard and optional features

- **Engine**
  - Manufacturer: MTU
  - Model: 16V4000G24F
  - Type: 4-cycle
  - Arrangement: 16V
  - Displacement: l 76.3
  - Bore: mm 170
  - Stroke: mm 210
  - Compression ratio: 16.4
  - Rated speed: rpm 1500
  - Engine governor: ECU 9
  - Max power: kWm 1965
  - Air cleaner: dry
- **Fuel system**
  - Maximum fuel lift: m 5
  - Total fuel flow: l/min 20
- **Fuel consumption**
  - l/hr 471.1
  - g/kwh 199
- **Liquid capacity (lubrication)**
  - Total oil system capacity: l 300
  - Engine jacket water capacity: l 175
  - Intercooler coolant capacity: l 50
- **Combustion air requirements**
  - Combustion air volume: m³/h 2.5
  - Max. air intake restriction: mbar 660
- **Cooling/radiator system**
  - Coolant flow rate (HT circuit): m³/hr 68.5
  - Coolant flow rate (LT circuit): m³/hr 430
  - Heat rejection to coolant: kW 660
  - Heat radiated to charge air cooling: kW 430
  - Fan power for electr. radiator (40°C): kW 70
- **Exhaust system**
  - Exhaust gas temp. (after turbocharger): °C 480
  - Exhaust gas volume: m³/s 6.6

* cos phi = 0.8

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1 All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).
2 Values referenced are in accordance with ISO 3046-1. Conversion calculated with fuel density of 0.83 g/ml. All fuel consumption values refer to rated engine power.
Standard and optional features

**Engine**
- 4-cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Closed crankcase ventilation
- Governor-electronic isochronous
- Common rail fuel injection
- NEA (ORDE) optimized engine

**Generator**
- 4 pole three-phase synchronous generator
- Brushless, self-excited, self-regulating, self-ventilated
- Digital voltage regulator
- Anti condensation heater
- Stator winding Y-connected, accessible neutral (brought out)
- Protection IP23
- Insulation class H, utilization acc. to H
- Radio suppression EN55011, group 1, cl. B
- Short circuit capability 3xIn for 10sec
- Winding and bearing RTDs (without monitoring)
- Excitation by AREP
- Mounting of CT’s: 2 core CT’s
- Winding pitch: 2/3 winding
- Voltage setpoint adjustment ± 10%
- Meets NEMA MG-1, BS 5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS1359 and ISO 8528 requirements
- Leroy Somer low voltage generator
- Marathon low voltage generator
- Oversized generator
- Medium voltage generator

**Cooling system**
- Jacket water pump
- Thermostat(s)
- Water charge air cooling
- Mechanical radiator
- Electrical driven front-end cooler
- Jacket water heater

**Control panel**
- Pre-wired control cabinet for easy application of customized controller (V1+)
- Island operation (V2)
- Automatic mains failure operation with ATS (V3a)
- Automatic mains failure operation incl. control of generator and mains breaker (V3b)
- Island parallel operation of multiple gensets (V4)
- Automatic mains failure operation with short (< 10s) mains parallel overlap synchronization (V5)
- Mains parallel operation of a single genset (V6)
- Mains parallel operation of multiple gensets (V7)
- Basler controller
- Deif controller
- Complete system metering
- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- SAE J1939 engine ECU communications
- Parametrization software
- Multilingual capability
- Multiple programmable contact inputs
- Multiple contact outputs
- Event recording
- IP 54 front panel rating with integrated gasket
- Different expansion modules
- Remote annunciator
- Daytank control
- Generator winding temperature monitoring
- Generator bearing temperature monitoring
- Modbus TCP-IP

**Power panel**
- Available in 600x600 and 600x1000
- Phase monitoring relay 230V/400V
- Supply for battery charger
- Supply for jacket water heater
- Supply for anti condensation heating
- Plug socket cabinet for 230V compatible Euro/USA
- Supply for electrical driven radiator from 45kW – 75kW (PP 600x1000)

- Represents standard features
- Represents optional features
## Standard and optional features

### Circuit breaker/power distribution
- [ ] 3-pole circuit breaker
- [ ] 4-pole circuit breaker
- [ ] Manual-actuated circuit breaker
- [ ] Electrical-actuated circuit breaker
- [ ] Stand-alone solution in separate cabinet

### Fuel system
- [ ] Flexible fuel connectors mounted to base frame
- [ ] Fuel filter with water separator
- [ ] Fuel filter with water separator heavy-duty
- [ ] Switchable fuel filter with water separator
- [ ] Switchable fuel filter with water separator heavy-duty
- [ ] Separate fuel cooler
- [ ] Fuel cooler integrated into cooling equipment

### Starting/charging system
- [ ] 24V starter
- [ ] Starter batteries, cables, rack, disconnect switch
- [ ] Battery charger

### Mounting system
- [ ] Welded base frame
- [ ] Resilient engine and generator mounting
- [ ] Modular base frame design

### Exhaust system
- [ ] Exhaust bellows with connection flange
- [ ] Exhaust silencer with 10 dB(A) sound attenuation
- [ ] Exhaust silencer with 30 dB(A) sound attenuation
- [ ] Exhaust silencer with 40 dB(A) sound attenuation
- [ ] Y-connection-pipe

■ Represents standard features
□ Represents optional features
Weights and dimensions

<table>
<thead>
<tr>
<th>System</th>
<th>Dimensions (L x W x H)</th>
<th>Weight (dry/less tank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open power unit (OPU)</td>
<td>4766 x 1810 x 2330 mm</td>
<td>13395 kg</td>
</tr>
</tbody>
</table>

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

Sound data

— Consult your local MTU distributor for sound data.

Emissions data

— Consult your local MTU distributor for emissions data.

Rating definitions and conditions

— Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514 and AS 2789. Average load factor: ≤ 75%.
— Consult your local MTU Distributor for derating information.