# Technical Sales Document
- Product Data -

| | | | |
|---|---|---|---|
| **Name** | 16V4000G94S | **Speed [rpm]** | 1800 |
| **Application Group** | 3D | **Nominal power [kW]** | 2740 |
| **Dataset** | Ref. 25°C/55°C | **Nominal power [bhp]** | 3674 |
| | | **Frequency [Hz]** | 60 |
| **Exhaust Regulations** | Fuel-consumption optimized; | | |

## Reference conditions

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 6 | Intake air temperature | | 25 | °C |
| 7 | Charge-air coolant temperature | | 45 | °C |
| 8 | Barometric pressure | | 1000 | mbar |
| 9 | Site altitude above sea level | | 100 | m |
| 10 | Raw-water inlet temperature | | - | °C |

## 0. Data-relevant engine design configuration

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 8 | Engine rated speed switchable (1500/1800 rpm) | | - | - |
| 12 | Engine with sequential turbocharging (turbochargers with cut-in/cut-out control) | | - | - |
| 13 | Engine without sequential turbocharging (turbochargers without cut-in/cut-out control) | | X | - |

## 1. Power-related data

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 1 | Engine rated speed | A | 1800 | rpm |
| 2 | Reduction gear - Output speed | A | - | rpm |
| 3 | Mean piston speed | | 12.6 | m/s |
| 5 | Fuel stop power ISO 3046 | A | 2740 | kW |
| 9 | Mean effective pressure (MEP) (Fuel stop power ISO 3046) | | 23.9 | bar |
| 18 | Performance map No. | | - | - |
| 38 | Performance map No. (cont.) | | - | - |
| 20 | Performance map, amendment index | | - | - |

## 2. General Conditions (for maximum power)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 46 | Individual power calculation (ESCM) required for maximum power | | X | - |
| 1 | Intake air depression (new filter) | A | 15 | mbar |
| 2 | Intake air depression, max. | L | 30 | mbar |
| 3 | Exhaust back pressure | A | 30 | mbar |
| 4 | Exhaust back pressure, max. | L | 85 | mbar |
| 5 | Fuel temperature at fuel feed connection | R | 25 | °C |
| 9 | Fuel temperature at fuel feed connection, max. (w/o power reduction) | L | 55 | °C |
| 10 | Fuel temperature at fuel feed connection, max. | L | 55 | °C |
| 18 | Fuel temperature at fuel feed connection, min. | L | - | °C |

## 3. Consumption

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 17 | Specific fuel consumption (be) - 100 % CP (+ 5 %; EN 590; 42.8 MJ/kg) | R | - | g/kWh |

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Maximum engine power that cannot be run continuously on some applications (stabilization reserve)
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Engine power that can be run continuously under standard conditions

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| | | **Frequency [Hz]** | 60 |

**Exhaust Regulations** Fuel-consumption optimized;

| | | | | |
|---|---|---|---|---|
| 18 | Specific fuel consumption (be) - 75 % CP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | - | g/kWh |
| 19 | Specific fuel consumption (be) - 50 % CP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | - | g/kWh |
| 20 | Specific fuel consumption (be) - 25 % CP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | - | g/kWh |
| 21 | Specific fuel consumption (be) - FSP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | - | g/kWh |
| 56 | Specific fuel consumption (be) - 100 % FSP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | 215 | g/kWh |
| 57 | Specific fuel consumption (be) - 75 % FSP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | 205 | g/kWh |
| 58 | Specific fuel consumption (be) - 50 % FSP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | 209 | g/kWh |
| 59 | Specific fuel consumption (be) - 25 % FSP<br>(+ 5 %; EN 590; 42.8 MJ/kg) | R | 236 | g/kWh |
| 73 | No-load fuel consumption | R | 39.0 | kg/h |
| 92 | Lube oil consumption after 100 h of operation<br>(B = fuel consumption per hour)<br>Guideline value does not apply for the design<br>of EGAT systems. Please consult the Applications<br>Center with regard to the layout of EGA systems. | R | 0.3 | % of B |
| 62 | Lube oil consumption after 100 h of operation, max.<br>(B = fuel consumption per hour) | L | 1.0 | % of B |

## 4. Model-related data (basic design)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 1 | Naturally aspirated engine | | - | - |
| 2 | Engine with exhaust turbocharger (ETC) | | - | - |
| 3 | Engine with exhaust turbocharger (ETC) and intercooler | | X | - |
| 4 | Exhaust piping, non-cooled | | X | - |
| 5 | Exhaust piping, liquid-cooled | | - | - |
| 33 | Working method: four-cycle, diesel, single-acting | | X | - |
| 34 | Combustion method: direct injection | | X | - |
| 36 | Cooling system: conditioned water | | X | - |
| 37 | Direction of rotation: c.c.w. (facing driving end) | | X | - |
| 6 | Number of cylinders | | 16 | - |
| 7 | Cylinder configuration: V angle | | 90 | degrees (°) |
| 8 | Cylinder configuration: in-line vertical | | - | - |
| 10 | Bore | | 170 | mm |
| 11 | Stroke | | 210 | mm |
| 12 | Displacement, cylinder | | 4.77 | liter |
| 13 | Displacement, total | | 76.3 | liter |
| 14 | Compression ratio | | 16.4 | - |
| 40 | Cylinder heads: single-cylinder | | X | - |
| 41 | Cylinder liners: wet, replaceable | | X | - |
| 42 | Piston design: composite piston | | - | - |
| 49 | Piston design: solid-skirt piston | | X | - |
| 21 | Number of piston compression rings | | 2 | - |
| 22 | Number of piston oil control rings | | 1 | - |
| 24 | Number of inlet valves, per cylinder | | 2 | - |
| 25 | Number of exhaust valves, per cylinder | | 2 | - |
| 15 | Number of turbochargers | | 4 | - |

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| | | **Frequency [Hz]** | 60 |

**Exhaust Regulations** Fuel-consumption optimized;

| | | | | |
|---|---|---|---|---|
| 16 | Number of L.P. turbochargers | | 4 | - |
| 17 | Number of H.P. turbochargers | | - | - |
| 18 | Number of intercoolers | | 1 | - |
| 19 | Number of L.P. intercoolers | | 1 | - |
| 20 | Number of H.P. intercoolers | | - | - |
| 28 | Standard flywheel housing flange (engine main PTO) | | 00 | SAE |
| 50 | Static bending moment at standard flywheel housing flange, max. | L | 15 | kNm |
| 51 | Dynamic bending moment at standard flywheel housing flange, max. | L | 75 | kNm |
| 43 | Flywheel interface (DISC) | | 21 | - |

## 5. Combustion air / exhaust gas

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 8 | Charge-air pressure before cylinder - CP | R | - | bar abs |
| 27 | Charge-air pressure before cylinder - FSP | R | 3.7 | bar abs |
| 9 | Combustion air volume flow - CP | R | - | $m^3/s$ |
| 10 | Combustion air volume flow - FSP | R | 3.7 | $m^3/s$ |
| 11 | Exhaust volume flow (at exhaust temperature) - CP | R | - | $m^3/s$ |
| 12 | Exhaust volume flow (at exhaust temperature) - FSP | R | 10.0 | $m^3/s$ |
| 13 | Exhaust temperature before turbocharger - CP | R | - | °C |
| 14 | Exhaust temperature before turbocharger - FSP | R | 700 | °C |
| 15 | Exhaust temperature after turbocharger - CP | R | - | °C |
| 16 | Exhaust temperature after turbocharger - FSP | R | 515 | °C |
| 17 | Exhaust temperature after engine - CP | R | - | °C |
| 18 | Exhaust temperature after engine - FSP | R | 515 | °C |

## 6. Heat dissipation

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 9 | Heat dissipated by engine coolant - CP with oil heat | R | - | kW |
| 11 | Heat dissipation by engine coolant - CP with oil heat, with charge-air heat | A | - | kW |
| 60 | Heat dissipated by engine coolant - CP (high-temperature circuit) | R | - | kW |
| 61 | Heat dissipated by engine coolant - CP (low-temperature circuit) | R | - | kW |
| 13 | Heat dissipated by engine coolant - CP without oil heat, with charge-air heat | R | - | kW |
| 15 | Heat dissipated by engine coolant - CP with oil heat, without charge-air heat | R | - | kW |
| 16 | Heat dissipated by engine coolant - FSP with oil heat, without charge-air heat | R | 1115 | kW |
| 17 | Heat dissipated by engine coolant - CP without oil heat, without charge-air heat | R | - | kW |
| 22 | Heat dissipated by oil - CP | R | - | kW |
| 24 | Charge-air and oil heat dissipation - CP | R | - | kW |
| 26 | Charge-air heat dissipation - CP | R | - | kW |
| 27 | Charge-air heat dissipation - FSP | R | 750 | kW |
| 38 | Heat dissipated by exhaust gas - CP | R | - | kW |
| 31 | Heat dissipated by return fuel flow - CP | R | - | kW |
| 32 | Heat dissipated by return fuel flow - FSP | R | 6 | kW |

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| | | | | |
|---|---|---|---|---|
| 33 | Radiation and convection heat, engine - CP | R | - | kW |
| 34 | Radiation and convection heat, engine - FSP | R | 90 | kW |
| 35 | Radiation and convection heat, genset - CP<br>(engine + generator + 10m insulated exhaust pipework) | R | - | kW |

### 7. Coolant system (high-temperature circuit)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 17 | Coolant temperature<br>(at engine outlet to cooling equipment) | A | 100 | °C |
| 57 | Coolant temperature differential after/before engine, from | R | 7 | K |
| 58 | Coolant temperature differential after/before engine, to | R | 9 | K |
| 23 | Coolant temperature differential after/before engine | L | 11 | K |
| 20 | Coolant temperature after engine, limit 1 | L | 102 | °C |
| 21 | Coolant temperature after engine, limit 2 | L | 104 | °C |
| 25 | Coolant antifreeze content, max. | L | 50 | % |
| 30 | Cooling equipment: coolant flow rate | A | 81 | m³/h |
| 31 | Coolant pump: pressure differential | R | 3.5 | bar |
| 35 | Coolant pump: inlet pressure, min. | L | 0.5 | bar |
| 36 | Coolant pump: inlet pressure, max. | L | 2.5 | bar |
| 39 | Engine: coolant pressure differential<br>with thermostat | R | 2.8 | bar |
| 41 | Pressure loss in off-engine cooling system, max. | L | 0.7 | bar |
| 72 | Pressure loss in off-engine cooling system, min. | L | 0.55 | bar |
| 43 | Pressure loss in off-engine cooling system, max.<br>without thermostat | L | 0.7 | bar |
| 70 | Pressure loss in off-engine cooling system, min.<br>without thermostat | L | 0.55 | bar |
| 45 | Flow resistance (X) coefficient<br>engine w/ thermostat, w/o cooling equipment | R | 0.53 | mbar/(m³/h)² |
| 47 | Breather valve (expansion tank)<br>opening pressure (excess pressure) | R | 1.0 | bar |
| 54 | Cooling equipment: height above engine, max. | L | 15 | m |
| 53 | Cooling equipment: operating pressure | A | 2.5 | bar |
| 73 | Coolant level in expansion tank, below min.<br>alarm | L | - | - |
| 74 | Coolant level in expansion tank, below min.<br>shutdown | L | X | - |
| 50 | Thermostat, starts to open | R | 79 | °C |
| 51 | Thermostat, bypass closed | R | 92 | °C |
| 52 | Thermostat, fully open | R | 92 | °C |
| 48 | Breather valve (expansion tank)<br>opening pressure (depression) | R | -0.1 | bar |
| 49 | Pressure in cooling system, max. | L | 5.0 | bar |

### 8. Coolant system (low-temperature circuit)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 53 | Coolant temperature<br>(at engine outlet to cooling equipment) | R | 64 | °C |
| 9 | Coolant temperature before intercooler<br>(at engine inlet from cooling equipment) | A | 45 | °C |
| 14 | Coolant temperature before intercooler, limit 1 | L | 75 | °C |
| 61 | Coolant temperature before intercooler, shutdown | L | - | °C |

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| | | | | |
|---|---|---|---|---|
| 15 | Coolant temperature before intercooler, limit 2 | L | - | °C |
| 54 | Coolant temperature differential after/before intercooler, min. | L | 16 | K |
| 55 | Coolant temperature differential after/before intercooler, max. | L | 20 | K |
| 13 | Coolant antifreeze content, max. | L | 50 | % |
| 17 | Charge-air temperature after intercooler, max. | L | 80 | °C |
| 76 | Temperature differential between intake air and charge-air coolant before intercooler | A | 20 | K |
| 75 | Temperature differential between intake air and charge-air coolant before intercooler, max. | L | 22 | K |
| 45 | Charge-air temperature after intercooler, max. for compliance with "TA-Luft" at CP | L | - | °C |
| 56 | Coolant pump: flow rate | A | 35 | m³/h |
| 20 | Cooling equipment: coolant flow rate | A | 35 | m³/h |
| 21 | Intercooler: coolant flow rate | R | 35 | m³/h |
| 22 | Coolant pump: pressure differential | R | 2.1 | bar |
| 24 | Coolant pump: inlet pressure, min. | L | 0.5 | bar |
| 25 | Coolant pump: inlet pressure, max. | L | 2.5 | bar |
| 29 | Pressure loss in off-engine cooling system, max. | L | 0.7 | bar |
| 62 | Pressure loss in off-engine cooling system, min. | L | 0.55 | bar |
| 31 | Pressure loss in off-engine cooling system, max. without thermostat | L | 0.7 | bar |
| 63 | Pressure loss in off-engine cooling system, min. without thermostat | L | 0.55 | bar |
| 43 | Cooling equipment: height above engine, max. | L | 15 | m |
| 36 | Breather valve (expansion tank) opening pressure (excess pressure) | R | 1.0 | bar |
| 37 | Breather valve (expansion tank) opening pressure (depression) | R | -0.1 | bar |
| 42 | Cooling equipment: operating pressure | A | 2.5 | bar |
| 67 | Coolant level in expansion tank, below min. alarm | L | - | - |
| 68 | Coolant level in expansion tank, below min. shutdown | L | X | - |
| 39 | Thermostat, starts to open | R | 38 | °C |
| 40 | Thermostat, bypass closed | R | 51 | °C |
| 41 | Thermostat, fully open | R | 51 | °C |

### 10. Lube oil system

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 1 | Lube oil operating temp. before engine, from | R | 88 | °C |
| 2 | Lube oil operating temp. before engine, to | R | 94 | °C |
| 3 | Lube oil operating temp. after engine, from | R | 100 | °C |
| 4 | Lube oil operating temp. after engine, to | R | 110 | °C |
| 5 | Lube oil temperature before engine, limit 1 | L | 99 | °C |
| 6 | Lube oil temperature before engine, limit 2 | L | 101 | °C |
| 7 | Lube oil operating pressure before engine (measuring block) | R | 5.2 | bar |
| 8 | Lube oil operating press. bef. engine, from | R | 4.7 | bar |
| 9 | Lube oil operating press. bef. engine, to | R | 6.5 | bar |
| 10 | Lube oil pressure before engine, alarm | L | - | bar |
| 33 | Lube oil pressure before engine, limit 1(speed-related value, consult MTU) | L | 3.9 | bar |

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|---|---|---|---|---|
| 11 | Lube oil pressure before engine, shutdown | L | - | bar |
| 34 | Lube oil pressure before engine, limit 2 (speed-related value, consult MTU) | L | 3.6 | bar |
| 17 | Lube oil pump(s): oil flow, total | R | 840 | liter/min |
| 19 | Lube oil fine filter (main circuit):<br>number of units | | 5 | - |
| 20 | Lube oil fine filter (main circuit):<br>number of elements per unit | | 1 | - |
| 21 | Lube oil fine filter (main circuit):<br>particle retention | R | 0.014 | mm |
| 32 | Lube oil fine filter (main circuit):<br>pressure differential, max. | L | 1.5 | bar |
| 35 | Lube oil fine filter (main circuit):<br>make (standard): MANN & HUMMEL | | X | - |

### 11. Fuel system

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 1 | Fuel pressure at fuel feed connection, min.<br>(when engine is starting) | L | -0.1 | bar |
| 57 | Fuel pressure at fuel feed connection, min.<br>(when engine is running) | L | -0.3 | bar |
| 2 | Fuel pressure at fuel feed connection, max.<br>(when engine is starting) | L | 1.5 | bar |
| 65 | Fuel pressure at fuel feed connection, max.<br>(permanent) | L | 0.5 | bar |
| 37 | Fuel supply flow, max. | A | 20 | liter/min |
| 4 | Fuel pressure before injection pump, from<br>(high-pressure pump) | R | 5.0 | bar |
| 5 | Fuel pressure before injection pump, to<br>(high-pressure pump) | R | 8.1 | bar |
| 6 | Fuel pressure before injection pump, min.<br>(high-pressure pump) | L | 5.0 | bar |
| 7 | Fuel pressure before injection pump<br>with engine not running, max. (high-pressure pump) | L | 1.5 | bar |
| 8 | Fuel return flow, max. | A | 6 | liter/min |
| 10 | Fuel pressure at return connection on engine, max. | L | 0.5 | bar |
| 12 | Fuel temperature differential before/after engine | R | 30 | K |
| 38 | Fuel temperature after high-pressure pump, alarm | L | 100 | °C |
| 15 | Fuel prefilter: number of units | A | - | - |
| 16 | Fuel prefilter: number of elements per unit | A | - | - |
| 17 | Fuel prefilter: particle retention | A | - | mm |
| 29 | Fuel prefilter: make (standard): MANN & HUMMEL | | - | - |
| 18 | Fuel fine filter (main circuit): number of units | A | 1 | - |
| 19 | Fuel fine filter (main circuit): number of elements per unit | A | 1 | - |
| 20 | Fuel fine filter (main circuit): particle retention | A | 0.005 | mm |
| 21 | Fuel fine filter (main circuit): pressure differential, max. | L | 1.0 | bar |
| 32 | Fuel fine filter (main circuit):<br>make (standard): MANN & HUMMEL | | X | - |

### 12. General operating data

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|---|---|---|---|---|

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| | | | | |
|---|---|---|---|---|
| 1 | Cold start capability: air temperature<br>(w/o starting aid, w/o preheating) - (case A) | R | 10 | °C |
| 2 | Additional condition (to case A):<br>engine coolant temperature | R | 10 | °C |
| 3 | Additional condition (to case A): lube oil temperature | R | 10 | °C |
| 4 | Additional condition (to case A): lube oil viscosity | R | 15W40 | SAE |
| 9 | Cold start capability: air temperature<br>(w/o starting aid, w/ preheating) - (case C) | R | 0 | °C |
| 10 | Additional condition (to case C):<br>engine coolant temperature | R | 40 | °C |
| 11 | Additional condition (to case C): lube oil temperature | R | -10 | °C |
| 12 | Additional condition (to case C): lube oil viscosity | R | 15W40 | SAE |
| 21 | Coolant preheating, heater performance (standard) | R | 9 | kW |
| 22 | Coolant preheating, preheating temperature, min. | L | 32 | °C |
| 3506 | Coolant preheating, preheating temperature, max. | L | 55 | °C |
| 23 | Lube oil priming pump: flow rate | R | N | liter/min |
| 24 | Lube oil priming pump: pressure | R | N | bar |
| 25 | Lube oil priming pump: rated power | R | N | kW |
| 26 | Lube oil priming pump: cut-in interval<br>pump cut-in every ... minutes | R | N | min |
| 27 | Lube oil priming pump: cut-in duration | R | N | min |
| 28 | Breakaway torque (without driven machinery)<br>coolant temperature +5°C | R | 2200 | Nm |
| 30 | Breakaway torque (without driven machinery)<br>coolant temperature +40°C | R | 1750 | Nm |
| 29 | Cranking torque at firing speed (without driven machinery)<br>coolant temperature +5°C | R | 1200 | Nm |
| 31 | Cranking torque at firing speed (without driven machinery)<br>coolant temperature +40°C | R | 880 | Nm |
| 96 | Starting is blocked if the engine coolant temperature is<br>below | | 0 | °C |
| 92 | Run-up period to rated speed<br>(without driven machinery) | R | N | s |
| 93 | Run-up period to rated speed<br>(with driven machinery)<br>(* at general conditions) | R | 6 | s |
| 37 | High idling speed, max. (static) | L | 1900 | rpm |
| 38 | Limit speed for overspeed alarm / emergency shutdown | L | 1950 | rpm |
| 39 | Limit speed for overspeed alarm | L | 1950 | rpm |
| 42 | Firing speed, from | R | 80 | rpm |
| 43 | Firing speed, to | R | 120 | rpm |
| 44 | Engine coolant temperature before starting full-load operation, recommended min. | R | 60 | °C |
| 3515 | Minimum continuous load (operation > 10h) | R | 30 | kW/cyl |
| 49 | Extended low or no-load operation possible<br>(consultation required) | | X | - |
| 50 | Engine mass moment of inertia<br>(without flywheel) | R | 12.7 | kgm² |
| 52 | Standard flywheel mass moment of inertia | R | 10.4 | kgm² |
| 51 | Engine mass moment of inertia<br>(with standard flywheel) | R | 23.1 | kgm² |
| 69 | Speed droop (with electronic governor) adjustable, from | R | 0 | % |
| 70 | Speed droop (with electronic governor) adjustable, to | R | 8 | % |
| 95 | Number of starter ring-gear teeth on engine flywheel | | 182 | - |

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# Technical Sales Document
- Product Data -

| | | | |
|---|---|---|---|
| **Name** | 16V4000G94S | **Speed [rpm]** | 1800 |
| **Application Group** | 3D | **Nominal power [kW]** | 2740 |
| **Dataset** | Ref. 25°C/55°C | **Nominal power [bhp]** | 3674 |
| | | **Frequency [Hz]** | 60 |
| **Exhaust Regulations** | Fuel-consumption optimized; | | |

## 13. Starting (electric)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 2309 | Manufacturer | | Delco | - |
| 2310 | Number of starter | | 2 | - |
| 2312 | Starter electrically redundant | | - | - |
| 2313 | Rated power per starter | R | 9 | kW |
| 2314 | Starter, rated voltage | R | 24 | VDC |
| 2315 | Rated short-circuit current per starter | L | 1900 | A |
| 2316 | Power consumption per starter (at an engine speed of 100 rpm) | R | 580 | A |
| 2317 | Internal resistance of power supply + line resistance per starter | A | 0.008 | Ω |
| 2318 | Manufacturer | | Bosch | - |
| 2319 | Number of starter | | 2 | - |
| 2320 | Starter electrically redundant | | - | - |
| 2321 | Rated power per starter | R | 11.3 | kW |
| 2322 | Starter, rated voltage | R | 24 | VDC |
| 2323 | Rated short-circuit current per starter | L | 2190 | A |
| 2324 | Power consumption per starter (at an engine speed of 100 rpm) | R | 750 | A |
| 2325 | Internal resistance of power supply + line resistance per starter | A | 0.0047 | Ω |
| 2326 | Manufacturer | | Prestolite | - |
| 2327 | Number of starter | | 1 | - |
| 2328 | Starter electrically redundant | | - | - |
| 2329 | Rated power per starter | R | 15 | kW |
| 2330 | Starter, rated voltage | R | 24 | VDC |
| 2331 | Rated short-circuit current per starter | L | 3000 | A |
| 2332 | Power consumption per starter (at an engine speed of 100 rpm) | R | 1400 | A |
| 2333 | Internal resistance of power supply + line resistance per starter | A | 0.0045 | Ω |
| 2334 | Manufacturer | | Prestolite | - |
| 2335 | Number of starter | | 2 | - |
| 2336 | Starter electrically redundant | | X | - |
| 2337 | Rated power per starter | R | 15 | kW |
| 2338 | Starter, rated voltage | R | 24 | VDC |
| 2339 | Rated short-circuit current per starter | L | 3000 | A |
| 2340 | Power consumption per starter (at an engine speed of 100 rpm) | R | 1400 | A |
| 2341 | Internal resistance of power supply + line resistance per starter | A | 0.0045 | Ω |
| 3374 | Manufacturer | | Prestolite | - |
| 3375 | Number of starter | | 2 | - |
| 3376 | Starter electrically redundant | | - | - |
| 3377 | Rated power per starter | R | 9 | kW |
| 3378 | Starter, rated voltage | R | 24 | VDC |
| 3379 | Rated short-circuit current per starter | L | 1900 | A |
| 3380 | Power consumption per starter (at an engine speed of 100 rpm) | R | 530 | A |
| 3383 | Internal resistance of power supply + line resistance per starter | A | 0.005 | Ω |
| 2347 | Generally valid data for starter | | X | - |
| 2342 | Rated starting-attempt Duration (at +20°C ambient temperature with battery | R | 5 | s |
| 2343 | Interval between starts (at rated starting-attempt duration), min. | L | 20 | s |
| 2345 | Maximum acceptable starting-attempt duration | L | 15 | s |

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| | | | | |
|---|---|---|---|---|
| 2344 | Interval between starts<br>(when starting-attempt duration > rated starting-attempt duration) | R | 60 | s |
| 2346 | Starting attempts within 30 minutes<br>(at +20°C ambient temperature with battery full), max. | L | 6 | - |
| 3565 | Disengagement of starter pinion at engine Speed<br>Note: Exceeding the guideline value of the disengagement speed will reduce | R | 400 | rpm |
| 3566 | Disengagement of starter pinion at engine speed, max. | L | 500 | rpm |

### 15. Starting (pneumatic/oil pressure starter)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 35 | Pneumatic starter: make Gali | | - | - |
| 36 | Pneumatic starter: make TDI | | X | - |
| 5 | Starting air pressure before starter motor, min. | R | 8 | bar |
| 6 | Starting air pressure before starter motor, max. | R | 9 | bar |
| 7 | Starting air pressure before starter motor, min. | L | 8 | bar |
| 8 | Starting air pressure before starter motor, max. | L | 9 | bar |
| 18 | Start attempt duration (engine preheated) | R | 3 | s |
| 19 | Start attempt duration (engine not preheated) | R | 5 | s |
| 20 | Start attempt duration, max. | L | - | s |
| 114 | Air consumption/start attempt<br>(engine preheated)<br>Engine without generator<br>Control with engine controller | R | 1.1 | m³n |
| 115 | Air consumption/start attempt<br>(engine not preheated)<br>Engine without generator<br>Control with engine controller | R | 1.2 | m³n |
| 116 | Air consumption with external control<br>for air-starter (per second | R | 0.6 | m³n |
| 23 | Starting air tank for 3 start attempts<br>(max. 40 bar) (engine preheated) | R | - | liter |
| 24 | Starting air tank for 3 start attempts<br>(max. 30 bar) (engine preheated) | R | - | liter |
| 25 | Starting air tank for 6 start attempts<br>(max. 40 bar) (engine preheated) | R | - | liter |
| 26 | Starting air tank for 6 start attempts<br>(max. 30 bar) (engine preheated) | R | - | liter |
| 27 | Starting air tank for 10 start attempts<br>(max. 40 bar) (engine preheated) | R | - | liter |
| 28 | Starting air tank for 10 start attempts<br>(max. 30 bar) (engine preheated) | R | - | liter |
| 29 | Starting air tank for 3 start attempts<br>(max. 40 bar) (engine not preheated) | R | N | liter |
| 30 | Starting air tank for 3 start attempts<br>(max. 30 bar) (engine not preheated) | R | N | liter |
| 31 | Starting air tank for 6 start attempts<br>(max. 40 bar) (engine not preheated) | R | N | liter |
| 32 | Starting air tank for 6 start attempts<br>(max. 30 bar) (engine not preheated) | R | N | liter |
| 33 | Starting air tank for 10 start attempts<br>(max. 40 bar) (engine not preheated) | R | N | liter |

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| **Dataset** | Ref. 25°C/55°C | **Nominal power [bhp]** | 3674 |
| | | **Frequency [Hz]** | 60 |
| **Exhaust Regulations** | Fuel-consumption optimized; | | |

| | | | | |
|---|---|---|---|---|
| 34 | Starting air tank for 10 start attempts (max. 30 bar) (engine not preheated) | R | N | liter |
| 101 | Hydraulic starter: make Huegli | | X | - |
| 102 | Starting oil pressure before starter motor, min. | R | 120 | bar |
| 103 | Starting oil pressure before starter motor, max. | R | 207 | bar |
| 104 | Starting oil pressure before starter motor, min. | L | 120 | bar |
| 105 | Starting oil pressure before starter motor, max. | L | 207 | bar |
| 107 | Start attempt duration (engine not preheated) | R | N | s |
| 108 | Start attempt duration, max. | L | N | s |
| 109 | Hydraulic oil consumption / start attempt (engine preheated) | R | N | liter |
| 110 | Hydraulic oil consumption / start attempt (engine not preheated) | R | N | liter |
| 111 | Minimum specification of hydraulic oil viscosity | R | MilSpec 5606 | - |

## 16. Inclinations - standard oil system (ref.: waterline)

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 15 | Longitudinal inclination, continuous max. driving end down (Option: max. operating inclinations) | L | 5 | degrees (°) |
| 16 | Longitudinal inclination, temporary max. driving end down (Option: max. operating inclinations) | L | - | degrees (°) |
| 17 | Longitudinal inclination, continuous max. driving end up (Option: max. operating inclinations) | L | 5 | degrees (°) |
| 18 | Longitudinal inclination, temporary max. driving end up (Option: max. operating inclinations) | L | - | degrees (°) |
| 19 | Transverse inclination, continuous max. (Option: max. operating inclinations) | L | 10 | degrees (°) |
| 20 | Transverse inclination, temporary max. (Option: max. operating inclinations) | L | - | degrees (°) |

## 18. Capacities

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 1 | Engine coolant capacity (without cooling equipment) | R | 175 | liter |
| 10 | Intercooler coolant capacity | R | 50 | liter |
| 11 | On-engine fuel capacity | R | 8 | liter |
| 14 | Engine oil capacity, initial filling (standard oil system) (Option: max. operating inclinations) | R | 300 | liter |
| 20 | Oil change quantity, max. (standard oil system) (Option: max. operating inclinations) | R | 240 | liter |
| 28 | Oil pan capacity, dipstick mark min. (standard oil system) (Option: max. operating inclinations) | L | 210 | liter |
| 29 | Oil pan capacity, dipstick mark max. (standard oil system) (Option: max. operating inclinations) | L | 240 | liter |

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## 19. Masses / dimensions

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 9 | Engine mass, dry<br>(basic engine configuration acc. to<br>scope of supply specification) | R | 7700 | kg |

## 21. Exhaust emissions

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 1972 | Emissions data sheet:<br>Fuel-consumption optimized | | EDS 4000 1277 | - |
| 411 | "TA-Luft" - FSP<br>Nitric oxide (NOx) (5% O2) | R | - | mg/m³n |
| 412 | "TA-Luft" - FSP<br>Carbon monoxide (CO) (5% O2) | R | - | mg/m³n |
| 413 | "TA-Luft" - FSP<br>Unburned hydrocarbons (HC) | R | - | mg/m³n |
| 414 | "TA-Luft" - FSP<br>Dust (5% O2) | R | - | mg/m³n |
| 415 | "TA-Luft" - FSP<br>Formaldehyde (5% O2) | R | - | mg/m³n |
| 354 | Regulation: stationary power plants in France - FSP<br>Nitric oxide (NOx) (5% O2) | R | - | mg/m³n |
| 355 | Regulation: stationary power plants in France - FSP<br>Carbon monoxide (CO) (5% O2) | R | - | mg/m³n |
| 356 | Regulation: stationary power plants in France - FSP<br>Unburned hydrocarbons (NMHC) | R | - | mg/m³n |
| 357 | Regulation: stationary power plants in France - FSP<br>Dust / particulates (5% O2) | R | - | mg/m³n |
| 316 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 1 -)<br>Nitric oxide (NOx) | R | - | g/kWh |
| 371 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 1 -) NOx-20%<br>Nitric oxide (NOx) | R | - | g/kWh |
| 365 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 1 -) NOx-40%<br>Nitric oxide (NOx) | R | - | g/kWh |
| 317 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 1 -)<br>Carbon monoxide (CO) | R | - | g/kWh |
| 318 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 1 -)<br>Unburned hydrocarbons (HC) | R | - | g/kWh |
| 319 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 1 -)<br>Particulates | R | - | g/kWh |
| 320 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 2 -)<br>Nitric oxide (NOx) + unburned hydrocarbons (HC) | R | - | g/kWh |

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**Exhaust Regulations** Fuel-consumption optimized;

| | | | | |
|---|---|---|---|---|
| 321 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 2 -)<br>Carbon monoxide (CO) | R | - | g/kWh |
| 323 | Regulation: US EPA "Nonroad"<br>(40 CFR 89 - Tier 2 -)<br>Particulates | R | - | g/kWh |
| 154 | Exhaust mass flow - FSP<br>(reference conditions) | R | - | kg/h |
| 155 | Residual oxygen content (O2) in dry exhaust - FSP<br>(standard conditions) | R | - | % (vol.) |
| 387 | Smoke index, FSN - FSP<br>- Filter Smoke Number - | R | - | - |

## 22. Acoustics

| No. | Description | Index | Value | Unit |
|---|---|---|---|---|
| 101 | Exhaust noise, unsilenced - CP<br>(free-field sound-pressure level Lp, 1m distance,<br>ISO 6798, +3dB(A) tolerance) | R | - | dB(A) |
| 201 | Exhaust noise, unsilenced - CP<br>(sound power level LW, ISO 6798, +3dB(A) tolerance) | R | - | dB(A) |
| 102 | Exhaust noise, unsilenced - FSP<br>(free-field sound-pressure level Lp, 1m distance,<br>ISO 6798, +3dB(A) tolerance) | R | 118 | dB(A) |
| 202 | Exhaust noise, unsilenced - FSP<br>(sound power level LW, ISO 6798, +3dB(A) tolerance) | R | 131 | dB(A) |
| 103 | Exhaust noise, unsilenced - CP<br>(free-field sound-pressure level Lp, 1m distance,<br>ISO 6798)<br>Spectrum No. | R | - | - |
| 203 | Exhaust noise,unsilenced - CP<br>(sound power level LW, ISO 6798)<br>Spectrum No. | R | - | - |
| 104 | Exhaust noise, unsilenced - FSP<br>(free-field sound-pressure level Lp, 1m distance,<br>ISO 6798) Spectrum No. | R | 736586e | - |
| 204 | Exhaust noise,unsilenced - FSP<br>(sound power level LW, ISO 6798)<br>Spectrum No. | R | N | - |
| 109 | Engine surface noise with attenuated<br>intake noise (filter) - CP<br>(free-field sound-pressure level Lp, 1m distance,<br>ISO 6798, +2dB(A) tolerance) | R | - | dB(A) |
| 209 | Engine surface noise with attenuated<br>intake noise (filter) - CP<br>(sound power level LW, ISO 6798, +2dB(A) tolerance) | R | - | dB(A) |
| 110 | Engine surface noise with attenuated<br>intake noise (filter) - FSP<br>(free-field sound-pressure level Lp, 1m distance,<br>ISO 6798, +2dB(A) tolerance) | R | 107 | dB(A) |

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| | | | | |
|---|---|---|---|---|
| 210 | Engine surface noise with attenuated intake noise (filter) - FSP (sound power level LW, ISO 6798, +2dB(A) tolerance) | R | 126 | dB(A) |
| 111 | Engine surface noise with attenuated intake noise (filter) - CP (free-field sound-pressure level Lp, 1m distance, ISO 6798) Spectrum No. | R | - | - |
| 211 | Engine surface noise with attenuated intake noise (filter) - CP (sound power level LW, ISO 6798) Spectrum No. | R | - | - |
| 112 | Engine surface noise with attenuated intake noise (filter) - FSP (free-field sound-pressure level Lp, 1m distance, ISO 6798) Spectrum No. | R | 736585e | - |
| 212 | Engine surface noise with attenuated intake noise (filter) - FSP (sound power level LW, ISO 6798) Spectrum No. | R | N | - |
| 131 | Engine surface noise, without intake noise - CP (free-field sound-pressure level Lp, 1m distance, ISO 6798, +2dB(A) tolerance) | R | - | dB(A) |
| 231 | Engine surface noise, without intake noise - CP (sound power level LW, ISO 6798, +2dB(A) tolerance) | R | - | dB(A) |
| 133 | Engine surface noise, without intake noise - CP (free-field sound-pressure level Lp, 1m distance, ISO 6798) Spectrum No. | R | - | - |
| 233 | Engine surface noise, without intake noise - CP (sound power level LW, ISO 6798) Spectrum No. | R | - | - |
| 117 | Intake noise, unsilenced - CP (free-field sound-pressure level Lp, 1m distance, ISO 6798) | R | - | dB(A) |
| 217 | Intake noise, unsilenced - CP (sound power level LW, ISO 6798) | R | - | dB(A) |
| 119 | Intake noise, unsilenced - FSP (free-field sound-pressure level Lp, 1m distance, ISO 6798) Spectrum No. | R | - | - |
| 219 | Intake noise, unsilenced - CP (sound power level LW, ISO 6798) Spectrum No. | | - | - |
| 125 | Structure borne noise at engine mounting brackets in vertical direction above resilient engine mounts - CP Spectrum No. | R | - | - |
| 126 | Structure borne noise at engine mounting brackets in vertical direction above resilient engine mounts - FSP Spectrum No. | R | 737709e | - |
| 127 | Structure born noise, vertically below the resilient engine mounts - CP Spectrum No. | R | - | - |

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