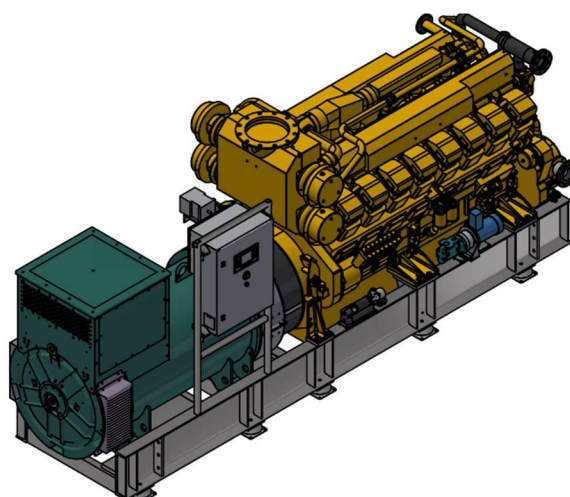


MAS-2350-1500

# MITSUBISHI AUXILIARY SET

Quality, reliability, performance, and partnership  
- Mitsubishi Heavy Industries Group.



## RATING

|                             |                                       |
|-----------------------------|---------------------------------------|
| Generating set model        | MAS-2350-1500                         |
| Generator voltage           | 400 V                                 |
| Frequency                   | 50 Hz                                 |
| Generator output PRP        | 2352 kVA                              |
| Power factor – min          | 0.8                                   |
| Duty                        | Auxiliary/DEP                         |
| Rating                      | PRP – Prime Power                     |
| Average load factor for 24h | "80% or lower<br>>90% for max 3h/24h" |
| Overload                    | 110% for 1h/12h                       |
| Installation location       | Indoors                               |

## DESIGN CONDITIONS

|                                         |                |
|-----------------------------------------|----------------|
| Ambient temp - max                      | 45 °C          |
| Ambient temp – min                      | 0°C            |
| Altitude (maxi)                         | 1000m a.s.l    |
| Relative humidity (maxi)                | 85%            |
| Fuel oil LHV                            | 42700kl/kg     |
| Fuel oil                                | Diesel         |
| Fuel oil gravity at 15°C                | 0.83 to 0.87   |
| Fuel oil sulfur content max             | 0.2% by weight |
| Fuel oil viscosity min(60°C)/max(50°C)  | 2.0/8.0 cSt    |
| Fuel oil cetane number – min            | 45             |
| Lube oil capacity – max (incl. filters) | 290 l          |
| Emissions                               | IMO II         |

## ALTERNATOR DATA

|                                       |                  |
|---------------------------------------|------------------|
| Alternator Make                       | Leroy Somer      |
| Alternator Type                       | LSA 52.3 UL16 4p |
| Bearing configuration                 | double           |
| Insulation class                      | H                |
| Temperature rise class                | F                |
| Cooling method                        | Air              |
| Protection                            | IP23             |
| Excitation system                     | Digital          |
| PT100 for bearing and stator winding  | Included         |
| AVR for single and parallel operation | Included         |
| Space heater                          | Included         |

## ENGINE DATA

|                                     |                             |
|-------------------------------------|-----------------------------|
| Engine model                        | S16R2-T2MPTAW-5             |
| Engine speed                        | 1500 rpm                    |
| Engine brake output                 | 1960 kW                     |
| Cylinder configuration              | 16 60°V                     |
| Total displacement                  | 79.9 l                      |
| Bore x Stroke                       | 170 x 220 mm                |
| Compression ratio                   | 14.0:1                      |
| Turbocharged                        | Turbo-Charged, Inter Cooler |
| Governor                            | Electric                    |
| Cooling method (engine driven pump) | Water                       |
| Starting method                     | Battery                     |

## CE COMPLIANCE

2006/42/EC : machinery

## LANGUAGE - UNITS

Drawings, documents, nameplates in English

SI metric system

### PERFORMANCES @ PRIME

|                                          |            |
|------------------------------------------|------------|
| Generator output                         | 1882,4 kWe |
| Specific consumption – ISO3046/1 : 0/+5% | 209 g/kWh  |
| Fuel oil consumption @ 100%              | 482 l/hr   |
| Fuel oil consumption @ 75%               | 361 l/hr   |
| Exhaust gas temperature                  | 460 °C     |
| Exhaust gas flow rate                    | 454 m³/min |
| Air intake flow rate                     | 172 m³/min |
| Noise level@ 1m (open skid)              | -          |

### HEAT BALANCE

|                                                 |                  |
|-------------------------------------------------|------------------|
| Heat rejection (HT / LT)                        | 756 / 514 kW     |
| Heat rejection (exhaust)                        | 1661 kW          |
| Thermal radiation (engine block)                | 151 kW           |
| Thermal radiation (generator)                   | -                |
| Coolant temperature at HT outlet - max          | 95 °C            |
| Coolant temperature at LT inlet - max           | 32 °C            |
| Coolant temperature at LT inlet - derating 5.2% | -                |
| Flow rate of coolant radiator circuit – HT/LT   | 1650 / 890 l/min |
| Coolant capacity (engine only)                  | 190 l            |

### TOLERANCES AND CONDITIONS

Efficiency data for average conditions (avg) – derating above 1000 m asl or 40°C intake air temperature or 32°C LT coolant inlet temperature

Fuel input: 0/+5% (ISO3046/1). Submitted to fuel oil specification confirmation

Heat rejection data: +/- 12%. Add 17% margin for remote dry air cooler design

Exhaust gas flow / temperature: +/- 6% - +/- 8%

Pictures are not contractual and may include optional accessories

These data are not contractual. They can be modified by MTEE without prior notice

### STANDARDS

I.S.O. : International Standard Organization

C.E.N. : European Standard Committee

I.E.C. : International Electric Commission

J.I.S. : Japanese Industrial Standards (for engine)

J.E.C. : Japan. Electrotechnical committee (engine)

J.E.M. : Japan Elec. Manufacturers Association (Eng.)

Manufacturers standards

### GENERATOR SET EMBEDDED CONTROL PANEL

Automatic start and shutdown DCU410 system mounted in door of interface box with the following functions

LCD displaying engine rpm, control voltage, lube oil pressure and temperature, cooling water temperature, water temperature, charge air pressure, exhaust temperature after turbo

3 automatic start attempts acc. to class requirements.

Automatic shutdown for low oil pressure, high water temperature HT and overspeed

Control of pre lube pump

Start and Stop switch

Hour meter

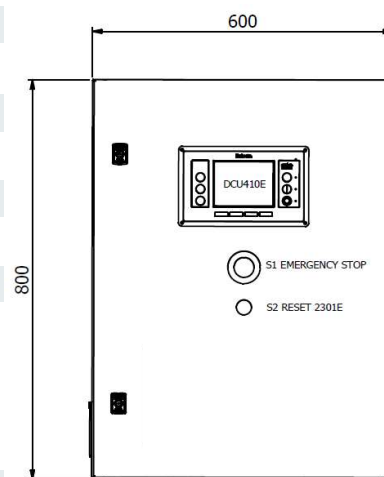
RS-485/TCP IP converter for serial communication with IAS, Modbus protocol

Common alarm

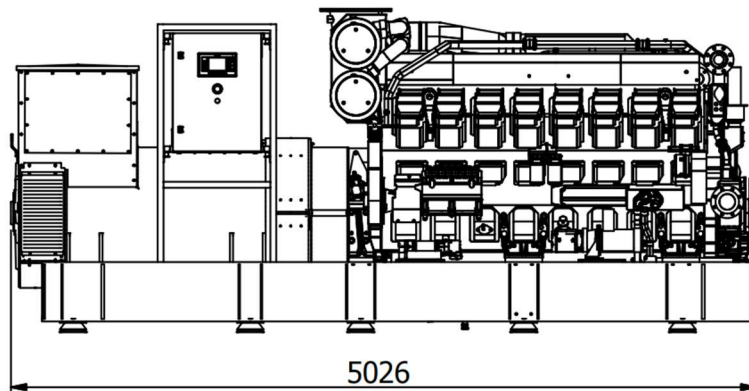
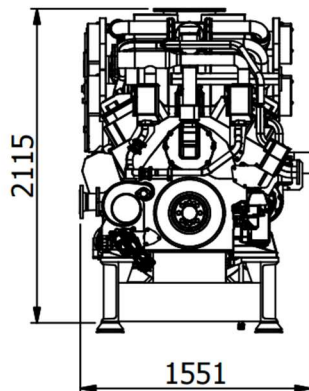
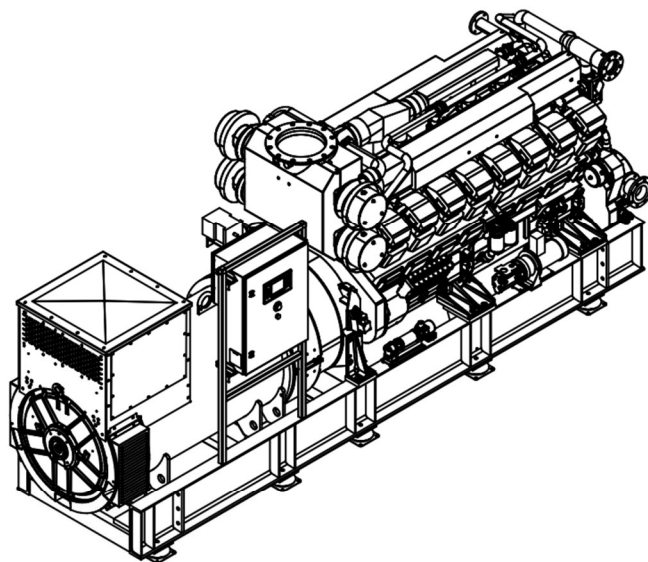
Stop System; 24V stop solenoid

Automatic control of engine auxiliaries and power supply:

- Intercooler water (LT) pump
- Jacket water heater and pump
- Alternator space heater



MAS-2350-1500 S16R2-T2MPTAW-5- LAYOUT



Dry Weight = 14 910 kg

## SCOPE OF SUPPLY

|                   |                                                                                                   | ● Standard item<br>○ Option |
|-------------------|---------------------------------------------------------------------------------------------------|-----------------------------|
| Engine            | Mitsubishi engine                                                                                 | ●                           |
|                   | SOLAS compliant exhaust insulation and protection for fuel and oil connections                    | ●                           |
|                   | Heavy duty frame with vibration absorbers                                                         | ●                           |
|                   | Electrical Pre-lube pump with oil drain/filling                                                   | ●                           |
|                   | Cooling heater with internal circulation pump and flexible below connections                      | ●                           |
|                   | Alarm switch for fuel leakage                                                                     | ●                           |
|                   | Woodward Pro Act digital + Governor system                                                        | ●                           |
|                   | Woodward speed controller 2301E (built into control cabinet)                                      | ●                           |
|                   | Protect guard for moving parts                                                                    | ●                           |
|                   | LT/HT interface flexible bellows                                                                  | ●                           |
|                   | Electrical LT pump and Thermostat (delivered loose supply for optimal installation in vessel)     | ●                           |
| Generator         | Air-cooled Generator IP 23 with Digital AVR                                                       | ●                           |
|                   | PT-100 bearing and windings                                                                       | ●                           |
|                   | Anti-condensation heater                                                                          | ●                           |
|                   | Flexible coupling with TVC calculation                                                            | ●                           |
|                   | Droop CT                                                                                          | ●                           |
| Control system    | Type approved Control system (cabinet) including package aux class including sensors and mounting | ●                           |
|                   | Based on Auto-Maskin                                                                              | ●                           |
|                   | Electrical starter cabinet: for heater, lubrication oil primer pump and LT pump                   | ●                           |
| Documentation     | IMO2 certificate                                                                                  | ●                           |
|                   | Drawing and design engineering (GAD, P&ID, Electrical Drawings)                                   | ●                           |
|                   | Test running of complete sets at Spikkestad, Norway before shipment / Test Report                 | ●                           |
|                   | Mitsubishi Warranty                                                                               | ●                           |
| Options (mounted) | Water cooled Generator                                                                            | ○                           |
|                   | Drip tray oil filter                                                                              | ○                           |
|                   | Mechanical LT cooling water pump v-belt driven and Thermostat                                     | ○                           |
|                   | Drip trays fuel filter                                                                            | ○                           |
|                   | Lifting lugs                                                                                      | ○                           |
|                   | Exhaust temperature monitoring on every cylinder                                                  | ○                           |
| Options (loose)   | Silencer (35dB)                                                                                   | ○                           |
|                   | Exhaust compensator                                                                               | ○                           |
|                   | Plate Heat exchanger                                                                              | ○                           |
|                   | Expansions tanks LT (4ol) / HT (6ol)                                                              | ○                           |
|                   | Remote Genset Control Panel                                                                       | ○                           |
|                   | Start battery and battery box                                                                     | ○                           |
|                   | Battery isolation switch cabinet                                                                  | ○                           |
|                   | Battery charger                                                                                   | ○                           |
|                   | IMO3 SCR system and Urea pump and certificate                                                     | ○                           |

MITSUBISHI TURBOCHARGER AND ENGINE EUROPE B.V.  
Damsluisweg 2,  
1332 EC Almere, The Netherlands  
France  
Phone: + 31-36-358-8311  
e-mail : [info@mtee.eu](mailto:info@mtee.eu)  
Web : [www.mtee.eu](http://www.mtee.eu)

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### More information

Contact your local Mitsubishi Engine & Energy dealer for more information regarding Mitsubishi Generator Sets and optional equipment.  
Or visit [www.mtee.eu](http://www.mtee.eu)