Industrial Generator Set - T1650

Ratings Range

400/230 V - 50 Hz

Standby	**kW**	1320
	kVA	1650
Prime	**kW**	1200
	kVA	1500

Benefits and features

Rehlko premium quality

- Rehlko provides **one source responsibility** for the generating set and accessories
- The generator set, its components and a wide range of options have been **fully developed, prototype tested, factory built**, and production tested
- The generator sets are designed in accordance to ISO8528
- Approved for use with HVO (Hydrotreated Vegetable Oil) according to EN15940

Rehlko premium performances

Engines

- High reliability enhanced through a simple design for optimal functional performances
- High performances turbochargers providing high engine performances under all loads
- Easy operation and maintenance: accessories requiring daily maintenance are conveniently located on the same side of the engine

Alternator

- Provide industry leading motor starting capability
- Excitation system to permit sustained overcurrent > 300% In, during 10 sec
- Built with a class H insulation and IP23

Cooling

- A compact and complete solution using a mechanical or an electrical radiator fan (depending of genset type)
- High temperature and altitude product capacity available

Control panel

- The Rehlko wide controller range provides the reliability and performances you expect from your equipment. You can program, manage and diagnose it easily and in an efficient way

Rehlko worldwide support

- A standard two-year or 1000-hours limited warranty for standby applications.
- A standard one-year or 2500 hours limited warranty for prime power applications.
- A worldwide product support

General Specifications

Manufacturer	Rehlko
Engine ref.	S12R-PTAA2
Alternator choices	KH04450T KH05090T
Performance class	G3
Voltage (V)	400/230 380/220 415/240
Controllers	Terminal block M80 APM403 APM802
Emission level	Fuel consumption optimization
Data Center / Mission Critical Rating	Same as the Standby Rating below
Type of Cooling	Radiator
Factory installed enclosures	ISO20 ISO20SSI

"* Volumetric Fuel consumption is up to 4% higher when using HVO than Diesel Fuel"

Generator sets ratings

		Standby rating			Prime rating	
	Hz	kWe	kVA	Amps	kWe	kVA
400/230	50	1320	1650	2382	1200	1500
380/220	50	1280	1600	2431	1164	1455
415/240	50	1320	1650	2296	1200	1500

Engine Specifications	
Engine brand	MITSUBISHI
Engine ref.	S12R-PTAA2*
Air inlet system	Turbo
Cylinder configuration	12 - V
Displacement (l)	49,03
Bore (mm) x Stroke (mm)	170 x 180
Compression ratio	13.5 : 1
Speed 50Hz (RPM)	1500
Maximum stand-by power at rated RPM (kW)	1441
Governor type	Electronic
Frequency regulation, steady state (%)	+/- 0.25%

Lubrication System	
Oil Filter Quantity and type****	
Charge Air coolant	Water/Air + Air/Air

*****Rehlko recommends the use of genuine oil and filters.*

Fuel System	
Maximum fuel pump flow (l/h)	
Max head on fuel return line (m fuel)	2
Fuel Filter Quantity and type	
Fuel	Diesel Fuel/HVO

* Engine reference may be partially modified depending on genset application, options selected by the customer and lead time required.

Consumption with cooling system	
Specific consumption @ ESP Max Power (g/kW.h)	207
Specific consumption @ PRP Max Power (g/kW.h)	209
Specific consumption @ 75% of PRP Power (g/kW.h)	207
Specific consumption @ 50% of PRP Power (g/kW.h)	216

Cooling system and charge air cooler	
Radiator & Engine capacity (l)	350
Fan power 50Hz (kW)	45
Fan air flow w/o restriction (m3/s)	27
Available restriction on air flow (mm H2O)	20
Type of coolant	Glycol-Ethylene
Radiated heat to ambiant (kW)	113
Heat rejection to coolant HT (kW)	529
Coolant capacity HT, engine only (l)	125
Outlet coolant temperature (°C)	95
Max coolant temperature, Shutdown (°C)	98
Max. pressure at inlet of HT water pump (mbar)	981
Thermostat begin of opening HT (°C)	71
Thermostat end of opening HT (°C)	85

Exhaust system	
Heat rejection to exhaust (kW)	1206
Exhaust gas temperature @ ESP (°C)	
Exhaust gas flow @ ESP (l/s)	5717
Electrical system	
Battery voltage (V)	24
Air Intake system	
Combustion air flow (l/s)	2150
Radiated heat to ambiant (kW)	113

Alternator Specifications	
Number of pole	4
Technology	Brushless
AVR Regulation	Yes
Insulation class	H
Indication of protection	IP23
Number of bearing	1
Number of wires	06
Coupling	Direct
Overspeed (rpm)	2250
Voltage regulation at established rating (+/- %)	0,5
Unbalanced load acceptance ratio (%)	8

Alternator standard features

- All models are brushless, rotating-field alternators
- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- The AVR voltage regulator provides superior short circuit capability
- Self-ventilated and dip proof construction
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds
- Superior voltage waveform

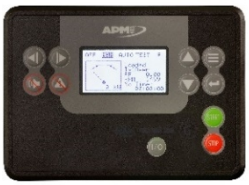
Note: See Alternator Data Sheets for alternator application data and ratings, efficiency curves, voltage dip with motor starting curves, and short circuit decrement curves.

Basic terminal block
It is used as a basic terminal block for connecting a control unit. Offers the following functions:

- emergency stop button
- customer connection terminal block
- CE certified

M80 controller
The M80 is a dual-function control panel. It can be used as a basic terminal block for connecting a control unit and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters. Offers the following functions:

- Engine parameters: tachometer, working hours counter, coolant temperature indicator, oil pressure indicator
- emergency stop button
- customer connection terminal block
- CE certified



APM403 controller
The APM403 is a versatile control unit which allows operation in manual or automatic mode

- Measurements : voltage and current
- kW/kWh/kVA power meters
- Standard specifications: Voltmeter, Frequency meter.
- Optional : Battery ammeter.
- J1939 CAN ECU engine control
- Alarms and faults: Oil pressure, Coolant temperature, Overspeed, Start-up failure, alternator min/max, Emergency stop button.
- Engine parameters: Fuel level, hour counter, battery voltage.
- Optional (standard at 24V): Oil pressure, water temperature.
- Event log/ Management of the last 300 genset events.
- Mains and genset protection
- Clock management
- USB connections, USB Host and PC,
- Communications : RS485 INTERFACE
- ModBUS protocol /SNMP
- Optional : Ethernet, GPRS, remote control, 3G, 4G
- Websupervisor, SMS, E-mails

APM802 controller
Advanced power plant management control
Dedicated to power plant management APM802 provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility

Codes and Standards

Engine-generators set is designed and manufactured in facilities certified to standards ISO9001:2015 & ISO14001:2015. The generator sets and its components are prototype-tested, factory built and production tested and are in compliance with the relevant standards:

- Machinery Directive 2006/42/EC of May 17th 2006
- EMC Directive2014/30/UE
- Safety objectives set out in the Low Voltage Directive 2014/35/UE
- EN ISO 8528-13, EN 60034-1, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 55011, EN 1679-1 et EN 60204-1

Power ratings definition according to ISO8528-1 (2018-02 edition) and ISO-3046-1

Emergency Standby Power (ESP): The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Average load factor per 24 hours of operation is <80%.
Prime Power (PRP): At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour within 12 hour of operation. Average load factor per 24 hours of operation is <80%.
Data Center Mission Critical (DCP): Data Center Mission Critical power is defined as being the maximum power which a generating set is capable of delivering while supplying a variable or continuous electrical load and during unlimited run hours. Depending on the sites to supply and the availability of reliable utility, the generating set manufacturer is responsible to define what power level is able to supply to fulfil that requirement including hardware or software or maintenance plan adaptation.

Warranty informations

Standard warranty period:

- for Products in "back-up" service
  - 30 months from the date the Product leaves the plant
  - 24 months from the Product’s commissioning date
  - 1,000 running hours

The warranty expires when one of the above conditions is met.

- for Products in “prime” or "continuous" service (continuous supply of electricity, either in the absence of any normal electricity grid or to complement the grid),
  - 18 months from the date the Product leaves the plant
  - 12 months from the Product’s commissioning date
  - 2,500 running hours

The warranty expires when one of the above conditions is met.
For more details regarding conditions of application and scope of the warranty please refer to our General “terms & conditions of sales”.

Standard scope of supply

All our gensets are fitted with:

- Industrial water cooled DIESEL engine
- Radiator with coolant
- Electric starter & charge alternator 24 V D.C
- Electronic governor
- Standard air filter
- Single bearing alternator IP 23 T° rise/ insulation to class H/H
- Welded steel base frame with vibration attenuation mounts
- Flexible fuel lines & lub oil drain pump
- Exhaust outlet with flexible and flanges
- M80 control panel
- User’s manual (1 copy)
- Packing under plastic film
- Delivered with oil
- Delivered with antifreeze liquid

- Graphic display with touchscreen
- User language selectable
- Specially researched ergonomics
- High level of equipment availability
- USB and Ethernet ports
- Modbus protocol
- Making it easy to extend the installation
- -Complies with the international standard IEC 61131-3

Dimensions and Weights

Compact version	
Overall Size, max., L x W x H, (mm)	4978 x 2244 x 2458
Dry weight (kg)	11000
Tank capacity (L)	500

Container dimensions ISO20 soundproofed version	
Overall Size, max., L x W x H, (mm)	6058 x 2438 x 2896
Tank capacity (L)	500
Dry weight (kg)	16838
Sound power level guaranteed (Lwa) 50Hz (75% PRP)	119
Acoustic pressure level @1m in dB(A) 50Hz (75% PRP)	98
Acoustic pressure level @7m in dB(A) 50Hz (75% PRP)	89

Container dimensions ISO20 super soundproofed version	
Overall Size, max., L x W x H, (mm)	9140 x 2438 x 2896
Tank capacity (L)	500
Dry weight (kg)	17064
Sound power level guaranteed (Lwa) 50Hz (75% PRP)	107
Acoustic pressure level @1m in dB(A) 50Hz (75% PRP)	85
Acoustic pressure level @7m in dB(A) 50Hz (75% PRP)	76

** dimensions and weight without options*

Reference Conditions: 25°C Air Inlet Temperature, 40°C Fuel Inlet Temperature, 100 kPa Barometric Pressure; 10.7 g/kg of dry air Humidity. Intake Restriction set to maximum allowable limit for clean filter; Exhaust Back pressure set to maximum allowable limit; Fuel density at 0.85 kg/L.
Data was taken from a single engine test according to the test methods, fuel specification and reference conditions stated above and is subjected to instrumentation and engine-to-engine variability. Test conducted with alternate test methods, instrumentation, fuel or reference conditions can yield different results. Data and specifications subject to change without notice.