R16CC

Engine ref.	S4L2-SD
Kohler Alternator description	KH00351T
Canopy	M3126
Performance class	G2



GENERAL CHARACTERISTICS

Frequency (Hz)	50 Hz
Voltage (V)	400/230
Standard Control Panel	APM303
Optional control panel	APM403

Voltage	ESP		PRP		Standby Amps
	kWe	kVA	kWe	kVA	
400/230	12,8	16	11,6	14,5	23

DESCRIPTIVE

- Four-pole circuit breaker
- Connection terminal box rental type
- Containment fuel tank and large autonomy
- Forks and frame protection pads
- Residual Current Device and earthing rod
- Inlet air preheating
- Battery isolating switch
- Oil drainage pump
- Heavy duty air filter with interchangeable cartridge
- Primary fuel filter
- Heat hand protections (EC standards)
- Access door to the radiator

SMALL AUTONOMY DIMENSIONS

Length (mm)	1850
Width (mm)	901
Height (mm)	1355
Dry weight (kg)	735,00
Tank capacity (L)	153,00

SOUND LEVELS

Acoustic pressure level @1m in dB(A) 50Hz (75% PRP) (Associated uncertainty)	76 (0,70)
Acoustic pressure level @7m in dB(A) 50Hz (75% PRP) (Associated uncertainty)	63

POWER DEFINITION

PRP : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1. ESP : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1. Overload is not allowed.

TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Intlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

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ENGINE CHARACTERISTICS

GENERAL ENGINE DATAS

Engine brand	MITSUBISHI
Engine ref.	S4L2-SD
Air inlet system	Atmo
Cylinder configuration	L
Number of cylinders	4
Displacement (l)	1,76
Charge Air coolant	
Bore (mm) x Stroke (mm)	78,00 x 92,0
Compression ratio	22 : 1
Speed 50Hz (RPM)	1500
Pistons speed (m/s)	4,60
Maximum stand-by power at rated RPM (kW)	15,8
Frequency regulation, steady state (%)	+/- 2.5%
BMEP @ PRP (bar)	6,6
Governor type	Mechanical

COOLING SYSTEM

Radiator & Engine capacity (l)	4,90
Fan power 50Hz (kW)	0,70
Fan air flow w/o restriction (m3/s)	0,80
Available restriction on air flow (mm H2O)	10,00
Type of coolant	Glycol-Ethylene

EMISSIONS

Emission PM (mg/Nm3) 5% O2	100
Emission CO (mg/Nm3) 5% O2	120
Emission THC+NOx (g/kWh)	0,000
Emission HC (mg/Nm3) 5% O2	40

EXHAUST

Exhaust gas temperature @ ESP (°C)	410
Exhaust gas flow @ ESP (l/s)	48,7
Max. exhaust back pressure (mm H2O)	700

FUEL

Fuel consumption @ ESP Max Power (l/h)	4,7
Fuel consumption @ PRP Max Power (l/h)	4,4
Fuel consumption @ 75% of PRP Power (l/h)	3,4
Fuel consumption @ 50% of PRP Power (l/h)	2,6
Maximum fuel pump flow (l/h)	18,0

OIL

Oil system capacity including filters (l)	5,90
Min. oil pressure (bar)	1,0
Max. oil pressure (bar)	4,0
Oil consumption 100% ESP 50Hz (l/h)	0,030
Oil sump capacity (l)	5,40

HEAT BALANCE

Heat rejection to exhaust (kW)	14
Radiated heat to ambiant (kW)	2,0
Heat rejection to coolant HT (kW)	14

AIR INTAKE

Max. intake restriction (mm H2O)	200
Combustion air flow (l/s)	18,20

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ALTERNATOR CHARACTERISTICS

Kohler Alternator description	KH00351T
Number of Phase	Three phase
Power factor (Cos Phi)	0,8
Altitude (m)	0 à 1000
Overspeed (rpm)	2250
Number of pole	4
Capacity for maintaining short circuit at 300% of rated current for 10 s	Yes
Insulation class	H
T° class (H/125K), continuous 40°C	H / 125°K
T° class (H/163K), standby 27°C	H / 163°K
AVR Regulation	Yes
Total Harmonic Distortion in no-load DHT (%)	<3.5
Total Harmonic Distortion, on linear load DHT (%)	<5
Wave form : NEMA=TIF	<50
Wave form : CEI=FHT	<2
Number of bearing	Single Bearing
Coupling	Direct
Voltage regulation at established rating (+/- %)	0,50
Recovery time (Delta U = 20% transcient) (ms)	500
Indication of protection	IP 23
Technology	Brushless

Continuous Nominal Rating 40°C (kVA)	15,0
Standby Rating 27°C (kVA)	16,5
Efficiencies 100% of load (%)	85,3
Air flow (m3/s)	0,060
Short circuit ratio (Kcc)	0,604
Direct axis synchro reactance unsaturated (Xd) (%)	190,0
Quadra axis synchro reactance unsaturated (Xq) (%)	97,0
Open circuit time constant (T'do) (ms)	837,00
Direct axis transcient reactance saturated (X'd) (%)	16,8
Short circuit transcient time constant (T'd) (ms)	74,000
Direct axis subtranscient reactance saturated (X"d) (%)	8,4
Subtranscient time constant (T"d) (ms)	7,000
Quadra axis subtranscient reactance saturated (X"q) (%)	16,80
Subtranscient time constant (T"q) (ms)	7,0
Zero sequence reactance unsaturated (Xo) (%)	0,70
Negative sequence reactance saturated (X2) (%)	12,66
Armature time constant (Ta) (ms)	11,000
No load excitation current (io) (A)	1,03
Full load excitation current (ic) (A)	2,79
Full load excitation voltage (uc) (V)	17,9
Engine start (Delta U = 20% perm. or 30% trans.) (kVA)	44,77
Transcient dip (4/4 load) - PF : 0,8 AR (%)	13,00
No load losses (W)	539,78
Heat rejected to ambient air (kW)	2,06
Unbalanced load acceptance ratio (%)	8

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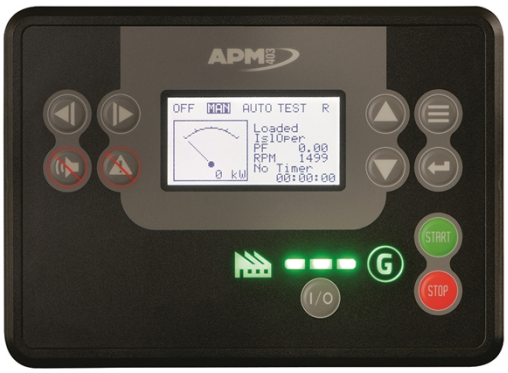
CONTROL PANEL

APM303, comprehensive and simple



The APM303 is a versatile unit which can be operated in manual or automatic mode. It offers the following features:
Measurements:
phase-to-neutral and phase-to-phase voltages, fuel level
(In option : active power currents, effective power, power factors, Kw/h energy meter, oil pressure and coolant temperature levels)
Supervision:
Modbus RTU communication on RS485
Reports:
(In option : 2 configurable reports)
Safety features:
Overspeed, oil pressure,coolant temperatures, minimum and maximum voltage, minimum and maximum frequency
(Maximum active power P<66kVA)
Traceability:
Stack of 12 stored events
For further information, please refer to the data sheet for the APM303.

APM403, basic generating set and power plant control



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

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