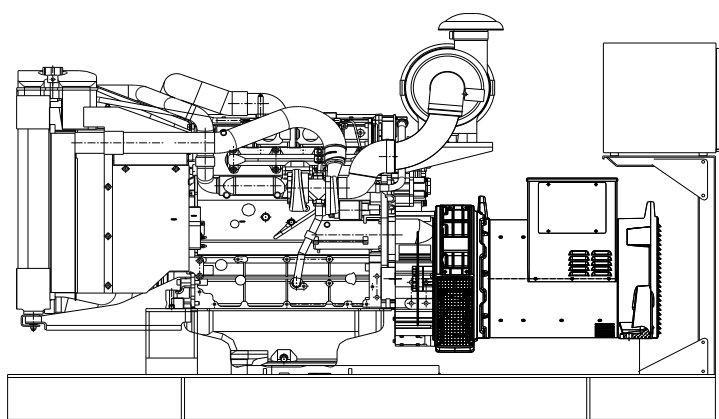


Volvo TAD531GE diesel engine

Sincro SK225ML alternator



**Standard Generator Features**

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 4 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

**Optional Features**

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
<b>CJ110VS</b>	<b>111</b>	<b>89</b>	<b>100</b>	<b>80</b>

**APPLICATION DATA**

**Volvo TAD531GE Engine**

**Standard Features**

The TAD531GE is a powerful, reliable and economical Generating Set diesel

**Durability & low noise levels**

Designed for easiest, fastest and most economical installation. Well-balanced to produce smooth and vibration-free operation with low noise level.

**Low exhaust emission levels**

The state of the art, high-tech injection and charging system with low internal losses contributes to excellent combustion and low fuel consumption. The TAD531GE is certified for EU Stage2 exhaust emission regulations.

**Easy service & maintenance**

Easily accessible service and maintenance points contribute to the ease of service of the engine.

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
<b>TAD531GE</b>	<b>102</b>	<b>98</b>	<b>92</b>	<b>88</b>

**Cooling System**

Type	Tropical, heavy duty type
Ambient temperature, °C	50
Engine+Radiator coolant cap., Liters	19.7
Jacket coolant flow, Liters / sec	2.71
◊Efficient cooling system thermostatically controlled	
◊Belt driven coolant pump	
◊Fan guard	
◊Belt guard	

**Technical Description**

- ◊Optimized cast iron cylinder block with optimum distribution of forces
- ◊Piston cooling for low piston temperature and reduced ring temperature
- ◊Drop forged connection rods
- ◊Crankshaft hardened bearing surfaces and fillets for moderate load on main and bigend bearings
- ◊Keystone top compression rings for long service life
- ◊Replaceable valve guides and valve seats
- ◊Three PTO positions at flywheel end
- ◊Lift eyelets

**Fuel System**

Type of injection system	Direct injection
Fuel injection pump	Bosh single injection pump
Total Fuel flow, Liter/h	360
Governor type	Volvo Mechanical
◊Six hole fuel injection nozzles	
◊ Direct injection unit pumps	
◊Washable fuel prefilter with water seperator	
◊Rotary low pressure fuel pump	
◊Fine fuel filter of disposable type	

**Features**

- ◊Governor with can-bus communication
- ◊Compact design
- ◊High power to weight ratio
- ◊Emissions compliant
- ◊Noise optimized engine design

**Fuel Consumption**

grams per kWh	%100 Load	219 g/kWh
	%75 Load	217 g/kWh
	%50 Load	221 g/kWh
	%25 Load	244 g/kWh

**Technical Specifications**

Manufacturer	VOLVO
Model	TAD531GE
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	4
Cylinder arrangement	In-line
Displacement, Liters	4.76
Bore X Stroke, mm	108 X 130
Compression Ratio	18:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air intercooled
Rotation	Anti-clockwise viewed towards flywheel
Gross engine power, kWb	102
Fan Power, kWm	4
BMEP gross, bar	17
Exhaust gas temp.(after turbo), °C	557
Exhaust gas flow (after turbo),m <sup>3</sup> / min	18.4

**Lubricating System**

Type	Pressurized
Capacity, Liters	13
Lub oil pressure , bar	4
◊Oil dipstick	
◊Full flow disposable spin-on oil filter, for extra high filtration	
◊Rotary type lubricating oil pump driven by crankshaft	

**Electrical System**

Alternator	Bosh, 12 Volt, 55Amp
Starter motor (DC)	Bosh / EV
Starter motor power	3.1 kW

# alternator

## Sincro SK225ML Alternator

### Standard Features

#### Electrical performance

Class H insulation

Windings are vacuumed under pressurized polyester resin and varnished

Standard 12-wire re-connectable winding, 2/3 pitch

High efficiency and motor starting capacity

#### Protection degree

Sincro alternators are standard IP23

All the rotating and electrically energized parts are fully guarded.

Higher protection degree can be supplied on request

#### Costruction

Single bearing design

Bearings are dimensioned for heavy duty

Steel frame

Cast iron flanges and shields

#### Automatic Voltage Regulator

**BL4U** automatic voltage regulator provides 1 % regulation and underspeed protection

#### Transient features

Transient voltage drop for rated step load at 0.8 power factor is less than 18%

#### Single phase operation

All brushless alternators can be connected for single phase use

#### Standards

Sincro alternators conforms to the main international standards and regulations:

**IEC 34.1, IEC 34.5, IEC 34.22, EN55011, EN50081-1, EN50082-2**

Model	Standby		Prime	
	kVA	kW	kVA	kW
<b>SK225ML</b>	<b>121</b>	<b>96,8</b>	<b>110</b>	<b>88</b>

### Technical Specifications

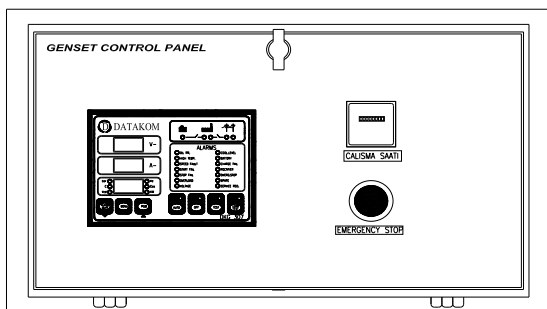
Manufacturer	SINCRO
Model	SK225ML
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	121
Efficiency, %	91.1
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	BL 4U
Voltage Regulation, %	± 1
THC	< 2%
THF	< 3%
Short circuit current	>300 % In
Insultion class	H
Leads	12
Construction	Single bearing, direct coupled
Connection	WYE
Protection class	IP23

### Optional Equipment

- ◊N° 3 Thermal contacts N.C. (N.O. On request)
- ◊Protection IP23
- ◊Protection IP44 (90 % of output power)
- ◊N° 1 PT100 on the bearing
- ◊Tropicalized winding
- ◊Device for parallel operation with other alternators
- ◊Space heaters 230V
- ◊N° 3 Thermistor PTC
- ◊N° 3 Thermoresistors PT100
- ◊N° 1 Potentiometer for voltage remote control
- ◊Special voltages

## Control Panel

### Standard Equipments



- ◊ Datakom DKG digital automatic control module
- ◊ Hourmeter
- ◊ Emergency stop button

## Datakom DKG Control Module

### Description

◊ The DKG-300/309 series is a comprehensive AMF unit for a single generating operating in standby mode.

◊ In AUTOMATIC position, DKG monitors mains phase voltages and controls the automatic starting, stopping and load transfer of the generating set in case of a mains failure and once the generator is running, it monitors internal protections and external fault inputs. If a fault condition occurs, the unit shuts down the engine automatically and indicates the failure source with the corresponding red led lamp.

◊ The DKG-300/309 series provides a comprehensive set of digitally adjustable threshold levels, input and output configurations and operating sequences. The unauthorized access to program parameters is prevented by the program lock input. All programs may be modified via front panel pushbuttons, and do not require an external unit.

◊ The fault conditions are considered in 2 categories as Warnings and Alarms. Measured values have separate programmable limits for warning and alarm conditions.

◊ The service request indicator lamp turns on at the expiration of either engine hours or time limits.

◊ It is possible to monitor the operation of the system locally or remotely with the WINDOWS based PC utility program.

◊ The unit is designed for front panel mounting. It is fitted into the cut-out with the steel spring removed. Connections are made with 2 part plug and socket connectors.

### Pushbutton Controls

STOP / START  
AUTO, TEST, MANUAL  
LCD PAGE

### Features

- Automatic mains failure with genset control and protection
- Remote Start operation capability
- Analogue temperature and oil pressure inputs
- Genset KW and Power Factor measurement
- Engine hours run counter
- Periodic maintenance request display
- 165 programmable parameters
- Battery backed-up real time clock
- Weekly operation schedule programs
- Daily, weekly, monthly exerciser
- Event logging with time stamp
- Statistical counters
- Serial RS-232 data output for telemetry on PC
- Free MS-Windows remote monitoring SW
- Configurable analogue inputs: 2
- Configurable digital inputs: 7
- Configurable relay outputs: 2
- Output expansion capability
- Small dimensions (155x115x48mm)

### Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3, total
Generator total power	kW L1, L2, L3, total
Generator power factor	Cosφ L1, L2, L3, total

### Optional Input Functions

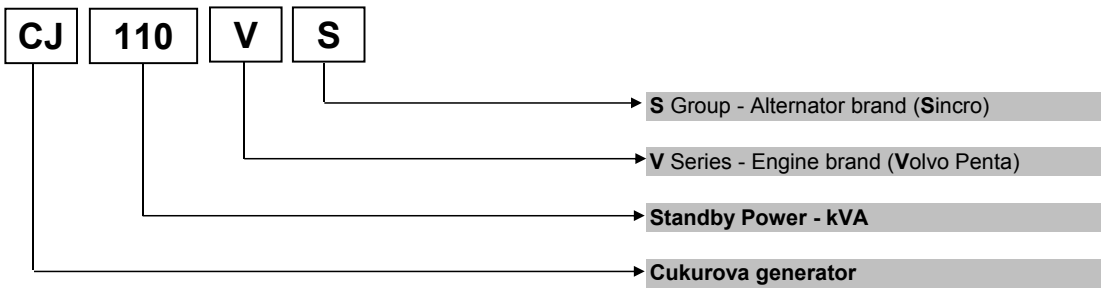
Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

### Alarm Channels

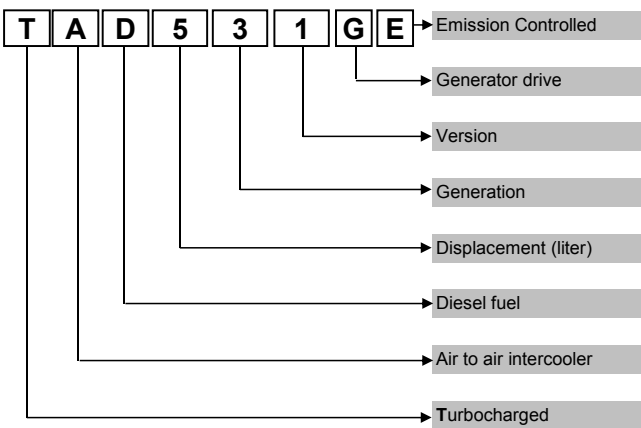
- Under/over generator voltage
- Over-current
- Under/over generator frequency
- Under/over speed
- Charge fail
- Emergency stop
- Low oil pressure
- High engine temperature
- Fail to start
- Low/high DC battery voltage
- Reverse power
- Generator phase rotation error
- Generator short-circuit protection
- Loss of speed sensing signal
- Mains out of limits

**Model Codes and General Information**

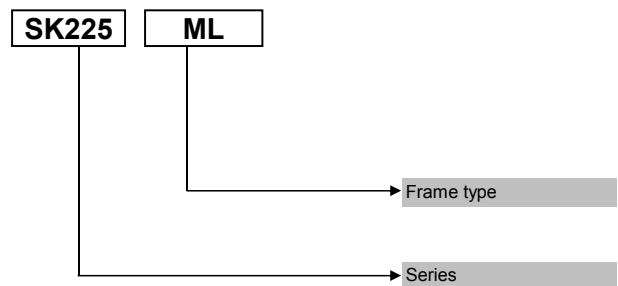
Cukurova Diesel Generator



**Volvo Penta Diesel Engine**



**Sincro Alternator**



**Information**

**Power Ratings**

**Standby power rating** is for the supply of emergency power at variable load for the duration of the non-availability of the mains power supply. No overload capacity is available at this rating. A standby rated engine should be sized for an average load factor of 80% based on published standby rating for 500 operating hours per year. Standby ratings should never be applied except in true emergency power failure conditions.

**Prime power rating** is available for unlimited hours per year with a variable load of which the average engine load factor is 80% of the published power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

**Continuous power rating** is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

**Electric Formulas**

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

**kWm**: Mechanical Power

**kWe** : Electrical Power

**pf** : Power factor

**E** : Alternator efficiency

**I** : Current (A)

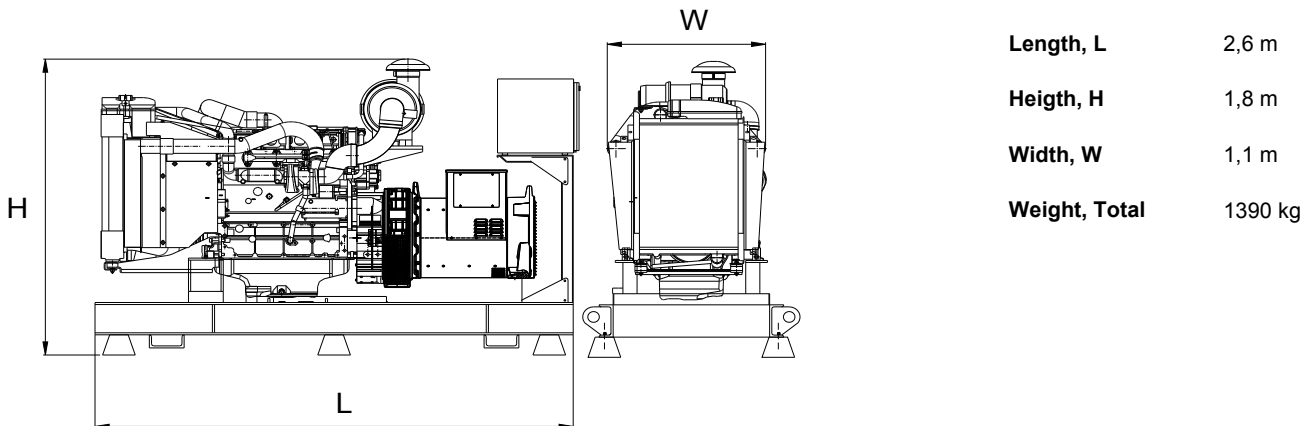
**U** : Voltage (V)

**kVA** : Power

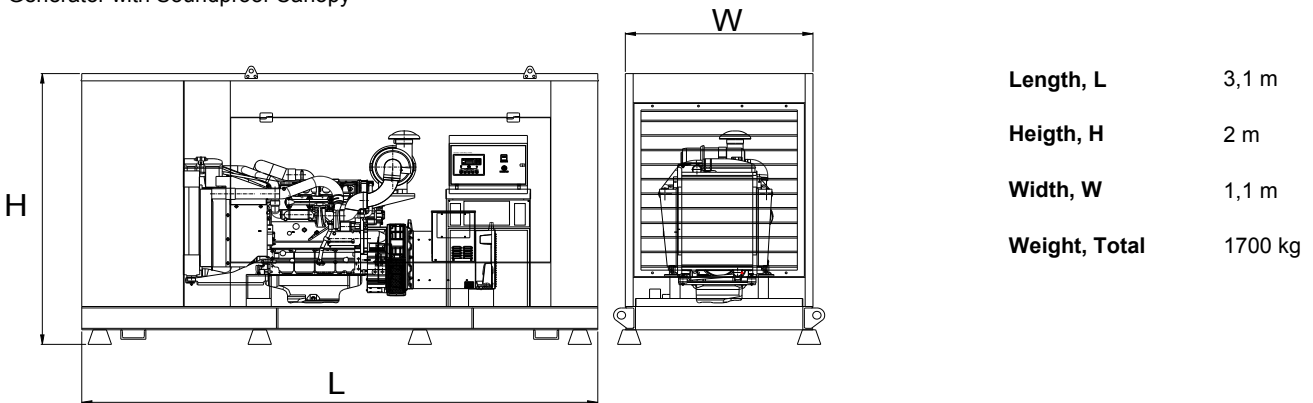
**Rpm**: Revolutions per minute

**General Dimensions**

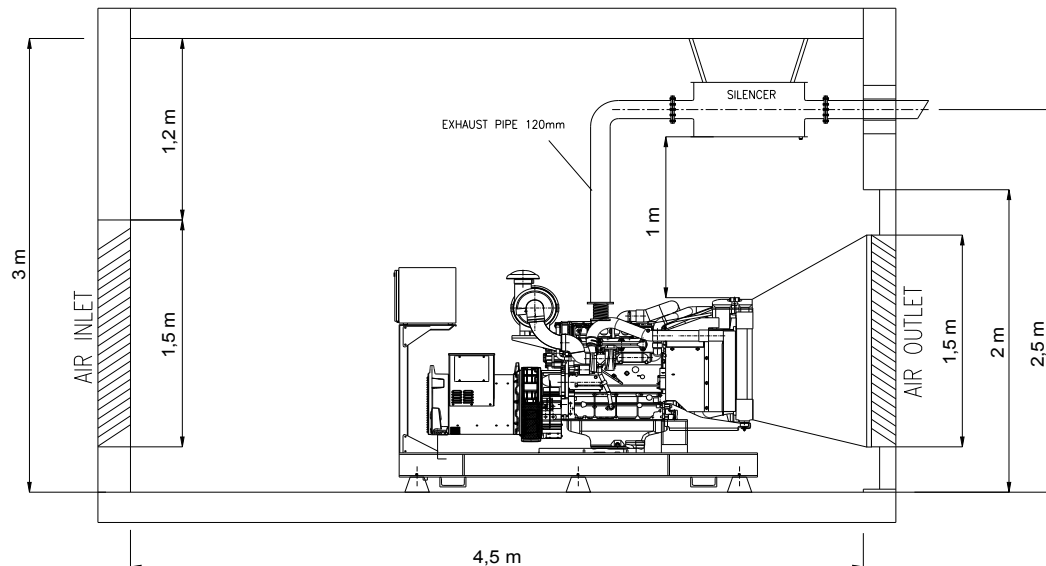
Standard Generator



Generator with Soundproof Canopy



**Generator Room Layout**



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice

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