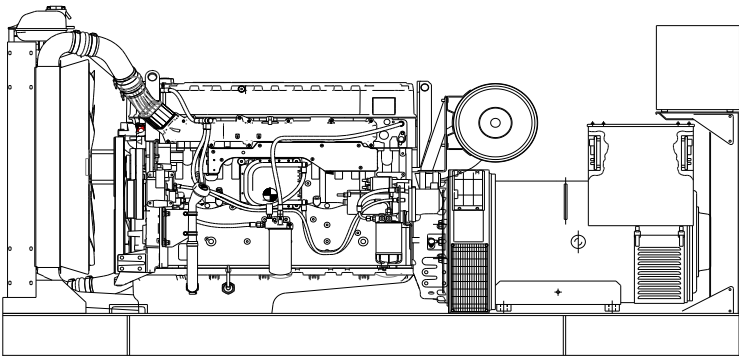


Volvo TWD1644GE diesel engine

Sincro SK355LM alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 55°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
CJ715VS	715	572	650	520

APPLICATION DATA

Volvo TWD1644GE Engine

Standard Features

The TWD1644GE is a powerful, reliable and economical Generating Set Diesel built on the dependable in-line six design.

Durability & low noise

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

To maintain a controlled working temperature in cylinders and combustion chambers, the engine is equipped with piston cooling. The engine is also fitted with replaceable cylinder liners and valve seats/guides to ensure maximum durability and service life of the engine.

Low exhaust emission

The state of the art, high-tech injection and charging system with low internal losses contributes to excellent combustion and low fuel consumption.

The TWD1644GE fulfils EU Stage 2 exhaust emission levels

Easy service & maintenance

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

Engine and Block

- ◊Optimized cast iron cylinder block with optimum distribution of forces without the block being unnecessarily heavy.
- ◊Wet, replaceable cylinder liners
- ◊Piston cooling for low piston temperature and reduced ring temperature
- ◊Tapered connecting rods for reduce risk of piston cracking
- ◊Crankshaft induction hardened bearing surfaces and fillets with seven bearings for moderate load on main and high-end bearings
- ◊Case hardened and nitrocarburized transmission gears for heavy duty operation
- ◊Keystone top compression rings for long service life
- ◊Viscous type crankshaft vibration dampers to withstand single bearing alternator torsional vibrations
- ◊Replaceable valve guides and valve seats
- ◊Over head camshaft and four valves per cylinder

Technical Specifications

Manufacturer	VOLVO
Model	TAD1644GE
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	16,12
Bore X Stroke, mm	144 X 165
Compression Ratio	16,8:1
Combustion System	Direct injection
Aspiration	Turbocharged,water-to-air charge coole
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	630
Fan Power, kW/m	21
BMEP gross, Mpa	3,13
Exhaust gas temp.(after turbo), °C	480
Exhaust gas flow (after turbo),m ³ / min	100
Mean piston speed, m / s	8,3

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
TWD1644GE	630	609	575	554

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	50
Engine+Radiator coolant cap., Liters	160
Jacket coolant flow, Liters / sec	4.8

- ◊New TWD-cooling system with optimized priority and cold charge air coolers
- ◊Two water cooled charge air coolers
- ◊Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop
- ◊Coolant filter as standard

Fuel System

Type of injection system	Direct injection
Fuel injector	Electronic unit injector
Governor type	Volvo / EMS

- ◊Non-return fuel valve
- ◊Fuel prefilter with water separator and water-in-fuel indicator / alarm
- ◊Gear driven low-pressure fuel pump
- ◊Fine fuel filter with manual feed pump and fuel pressure switch
- ◊Fuel shut-off valve

Fuel Consumption

grams per kWh	%100 Load	193 g/kWh
	%75 Load	195 g/kWh
	%50 Load	195 g/kWh
	%25 Load	221 g/kWh

Lubricating System

Type	Pressurized
Capacity, Liters	48
Lub oil pressure ,kPa	300 - 650
◊Full flow oil cooler	
◊Full flow disposable spin-on oil filter, for extra high filtration	
◊The lubricating oil level can be measured during operation	
◊Gear type lubricating oil pump, gear driven by the transmission	

Electrical System

Alternator	Bosch / 80 A
Starter motor (DC)	Mitsubishi Electric
Starter motor power	7,0 kW
◊Engine Management System 2 (EMS2), an electronically controlled processing system which optimizes engine performance.It also includes advanced facilities for diagnostics and fault tracing	
◊The instruments and controls connect to the engine via the CAN SAE1939 interface, either through the Control Interface Unit(CIU) or the Display Control Unit(DCU)	
◊Sensors for oil pressure, oil temp, boost pressure, boost temp, coolant temp, fuel temp, water in fuel, fuel pressure and two speed sensors.	

alternator

Sincro SK355LM 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

DBL1 automatic voltage regulator provides 0,25 % 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
SK355LM	715	572	650	520

Technical Specifications

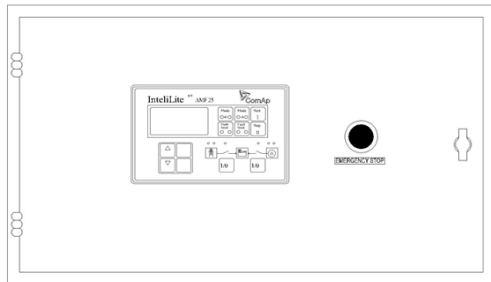
Manufacturer	SINCRO
Model	SK355LM
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	715
Efficiency, %	94.6
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	DBL 1
Voltage Regulation, %	± 0,25
THC	< 2.5%
THF	< 2.5%
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



- ◊ComAp IntelliLiteNT AMF25 digital automatic control module
- ◊Emergency stop button

ComAp IntelliLiteNT AMF25 Control Module

Description

- ◊The model AMF25 is an Automatic Mains Failure Control module.
- ◊The modul is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using USB and a PC. This interface also provides real time diagnostic facilities

◊

Specifications

- ◊180mm x 120mm dimensions
- ◊Graphic 128 x 64 pixel display
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (with USB)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA,kW ve Cosφ measurements
- ◊Communication with MODEM / Ethernet
- ◊Modbus RTU
- ◊User selectable RS232 or RS485 communications.
- ◊3 analog inputs, 7 digital inputs, 7 digital outputs

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL MODE SELECTOR
 LCD PAGE

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

Analog 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
 Generator Phase Rotation Error
 Loss of Speed Sensing Signal
 Mains Out of Limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Temperature

Cold : BS EN 60068-2-1 to -20°C/-40°C

Hot : BS EN 60068-2-2 to 70°C

Electrical Safety

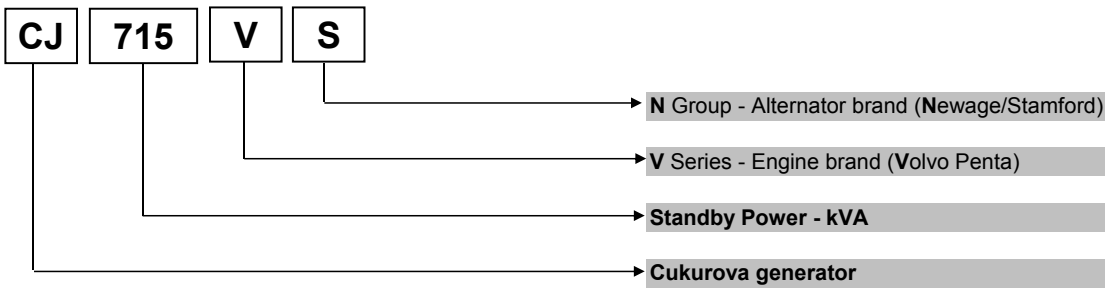
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Optional Accessories

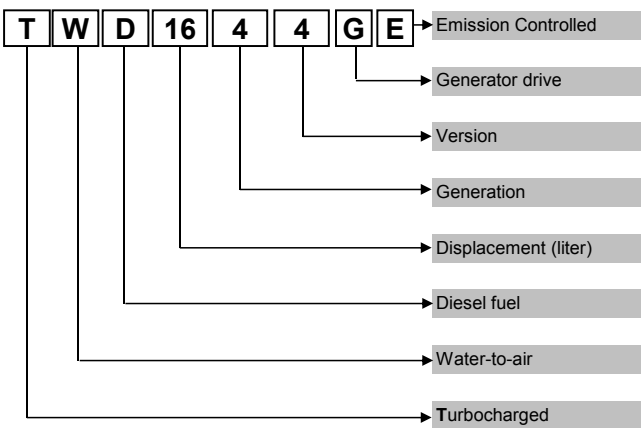
RS232 Extension Board
 RS485 Extension Board
 Ethernet Plug-in Module
 GSM Plug-in Module
 Remote Annunciator

Model Codes and General Information

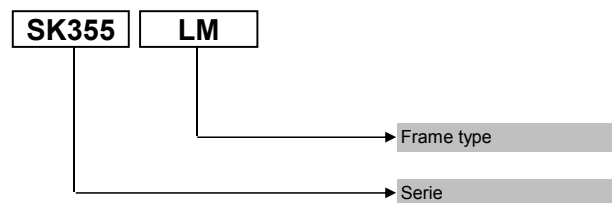
Cukurova Diesel Generator



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)

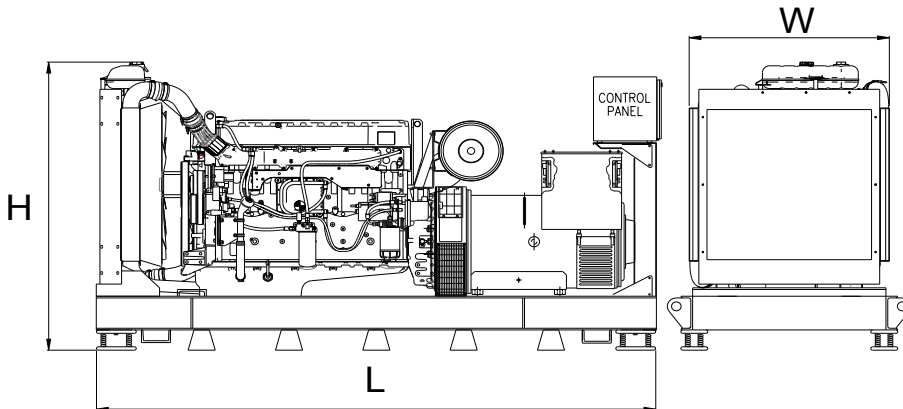
U : Voltage (V)

kVA : Power

Rpm: Revolutions per minute

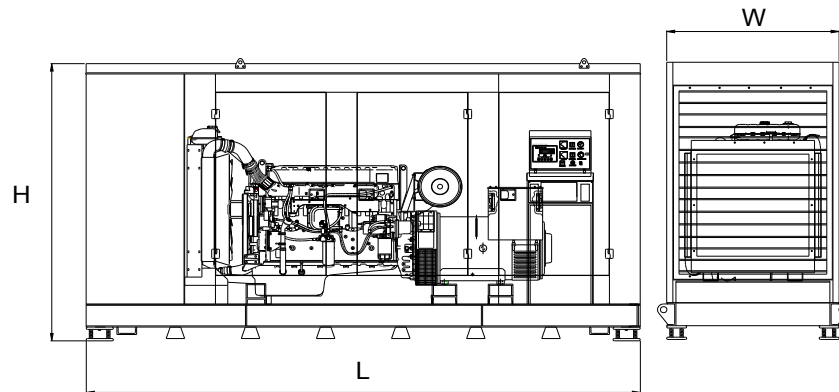
General Dimensions

Standard Generator



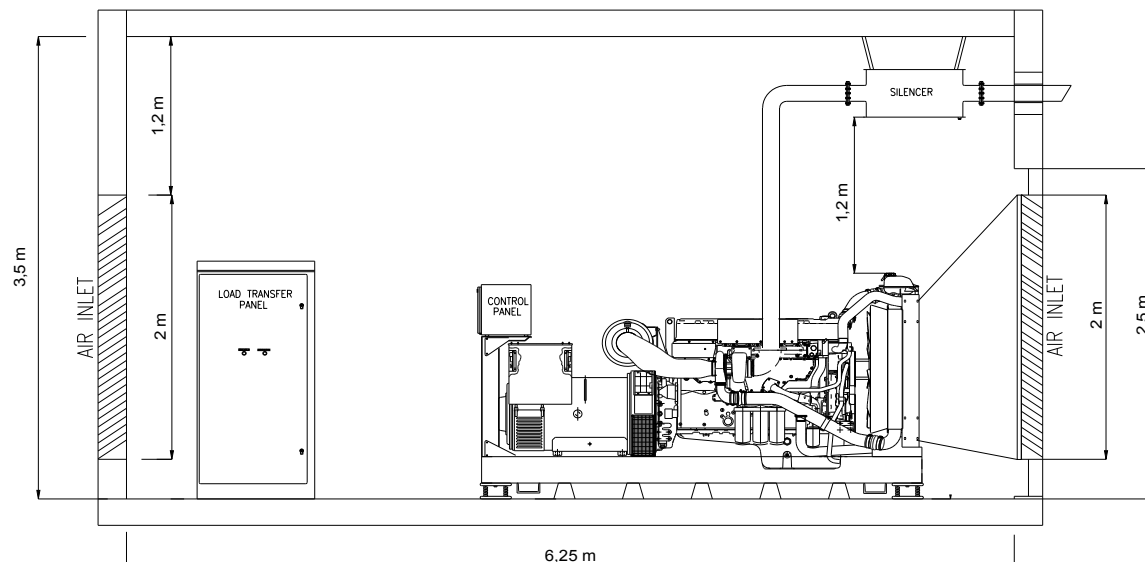
Length, L	3,5 m
Height, H	2,1 m
Width, W	1,4 m
Weight, Total	5400 kg

Generator with Soundproof Canopy



Length, L	5,1 m
Height, H	2,6 m
Width, W	1,7 m
Weight, Total	7100 kg

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

<p>CUKUROVA PowerGeneration</p>	<p>CUKUROVA JENERATOR SANAYII TICARET A.S.</p>
	<p><u>Izmir Factory</u></p>
	<p>Aegean Free Zone, Boss Sokak</p>
	<p>No:11, Gaziemir - Izmir, Turkey</p>
	<p>Tel : +90 232 252 2026 Fax : +90 232 252 2027</p>