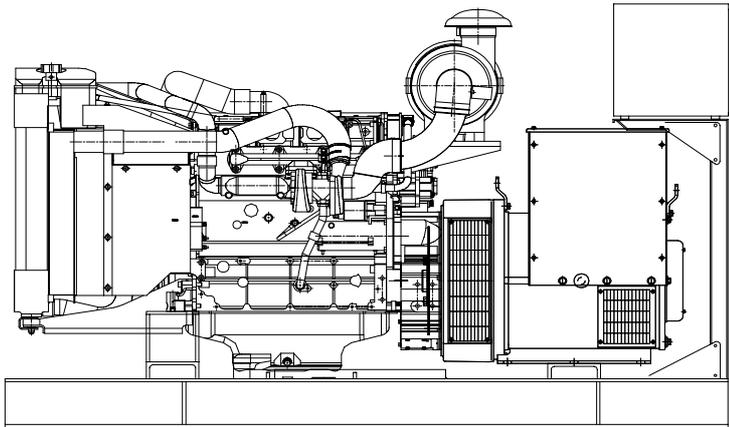




Volvo TAD531GE diesel engine

Leroy Somer LSA 44.2 VS45 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 4 cylinder, water cooled engine
- ◊ 60°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

	Standby		Prime	
	kVA	kW	kVA	kW
	111	88	100	80

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.

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
- ◊
- ◊

Features

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

Technical Specifications

Manufacturer	VOLVO	تولید کننده
Model	TAD531GE	مدل
Type	4 cycle, water-cooled, diesel engine	تیپ
Number of cylinders	4	تعداد سیلندرها
Cylinder arrangement	In-line	آرایش سیلندرها
Displacement, Liters	4.76	جا به جایی
Bore X Stroke, mm	108 X 130	قطر سیلندر X کورس پیستون
Compression Ratio	18:1	نسبت تراکم
Combustion System	Direct injection	سیستم احتراق
Aspiration	Turbocharged, air-to-air intercooled	سیستم تنفس
Rotation	Anti-clockwise viewed towards flywheel	چرخش
Gross engine power, kWb	102	قدرت ناخالص موتور
Fan Power, kWm	4	قدرت فن
BMEP gross, bar	17	
Exhaust gas temp.(after turbo), °C	557	دمای گاز خروجی از اگزوز
Exhaust gas flow (after turbo), m ³ / min	18.4	جریان هوای خروجی از اگزوز

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
TAD531GE	102	98	92	88

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	60
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	

Fuel System

Type of injection system	Direct injection
Fuel injection pump	Bosh single injection pump
Total Fuel flow, Liter/h	360
Governor type	Heinzmann EDC4
◊Six hole fuel injection nozzles	
◊ Direct injection unit pumps	
◊Washable fuel prefilter with water separator	
◊Rotary low pressure fuel pump	
◊Fine fuel filter of disposable type	

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

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

Leroy Somer LSA 44.2 VS45 Alternator

Standard Features

Top of the Range Electrical Performance

Class H insulation
Standard 12-wire re-connectable winding, 2/3 pitch
High efficiency and motor starting capacity
R 791 interference suppression conforming to standard EN 55011 group 1 class B standard for European zone (CE marking)

Protection System Suited to the Environment

The LSA 44.2 is IP23

Reinforced Mechanical Structure Using Finite Element Modelling

Compact and rigid assembly to better withstand generator-set vibrations
Steel frame
Cast iron flanges and shields
Twin-bearing and single bearing versions designed to be suitable for engines on the market
Half-key balancing
Greased for life bearings (regreasable bearings optional)

Accessible Terminal Box Proportioned for Optional Equipment

Easy access to the voltage regulator and to the connections
Possible inclusion of accessories for paralleling, protection and measurement
8 way terminal block for reconnecting voltage reconnection

Compliant with International Standards

The LSA 44.2 alternator conforms to the main international standards and regulations:

IEC 60034, NEMA MG 1.22, ISO 8528, CSA, CSA/UL

It can be integrated into a CE marked generator set

The LSA 44.2 is designed, manufactured and marketed in an ISO 9001 environment

Model	Standby		Prime	
	kVA	kW	kVA	kW
LSA 44.2 VS45	116	92	105	84

Technical Specifications

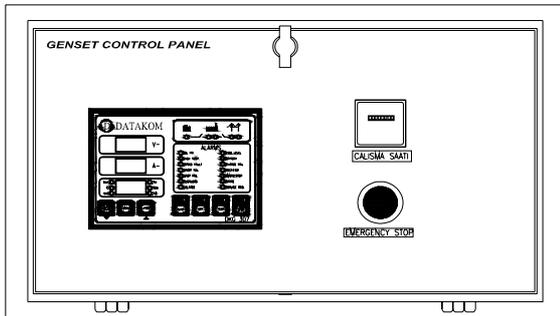
Manufacturer	LEROY SOMER	تولید کننده
Model	LSA 44.2 VS45	مدل
Type	4-Poles, Rotating Field, Brushless	تیپ
Standby power at rated voltage, kVA	116	توان standby در ولتاژ نامی
Efficiency, %	90,3	راندمان
Power factor	0.8	ضریب قدرت
Phase	3	فاز
Frequency, Hz	50	فرکانس
Speed, Rpm	1500	سرعت
Voltage, V	400	ولتاژ
Excitation	Shunt	سیستم تحریک
Stator windings	2/3 Pitch factor	
Regulation	AVR, Automatic Voltage Regulator	تنظیم ولتاژ
Voltage Regulator	R 230	رگولاتور ولتاژ
Voltage Regulation, %	± 0.5	درصد تنظیم ولتاژ
Total Harmonic TGH / THC	at no load < 1.5% - on load < 2%	
Waveform: NEMA = TIF	< 50	
Waveform: I.E.C = THF,	< 2%	
Insulation class	H	کلاس عایق
Overspeed, Rpm	2250	حداکثر سرعت مجاز
Construction	Single bearing, direct coupled	نحوه کوپلینگ
Coupling	Flexible	کوپلینگ
Amortisseur Windings	Full	
Connection	WYE	اتصال
Rotor	Dynamic balanced	روتور
Protection class	IP23	کلاس حفاظت
Air flow, m³ / min	0,37	دبی هوای خنک کننده

Optional Equipment

- ◊ Filters on air inlet and air outlet (IP44)
- ◊ Windign protection for clean environmetns with relative humidity greater than 95%
- ◊ Space heaters
- ◊ Thermal protection for winding
- ◊ Digital voltage regulator
- ◊ PMG system

Control Panel

Standard Equipments



- ◊Datakom DKG307 digital automatic control module
- ◊Hourmeter
- ◊Emergency stop button

Datakom DKG307 Control Module

Description

◊The DKG-307 is a comprehensive AMF unit for a single generating set operating in standby mode.

◊In AUTOMATIC position, DKG-307 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-307 provides a comprehensive set of digitally adjustable timers, 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

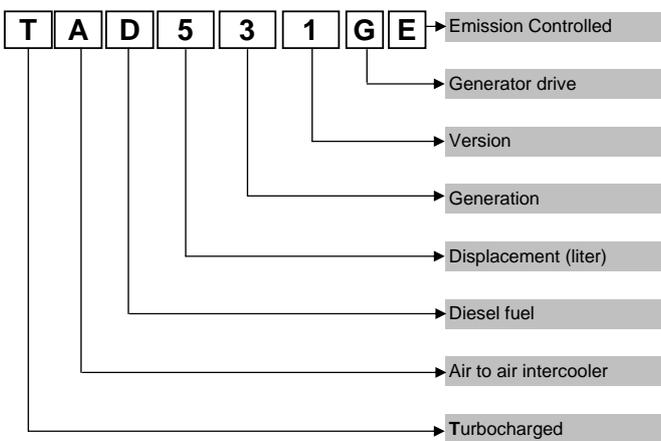
Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

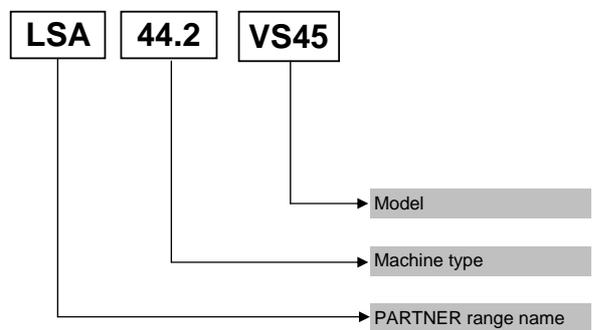
Alarm Channels

- 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

Volvo Penta Diesel Engine



Leroy Somer 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	$kW_m \times E$	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	$kVA \times pf$
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	$(2 \times 60 \times Frequency) / N^\circ Pole$	

kW_m: Mechanical Power

kW_e: Electrical Power

pf: Power factor

E: Alternator efficiency

I: Current (A)

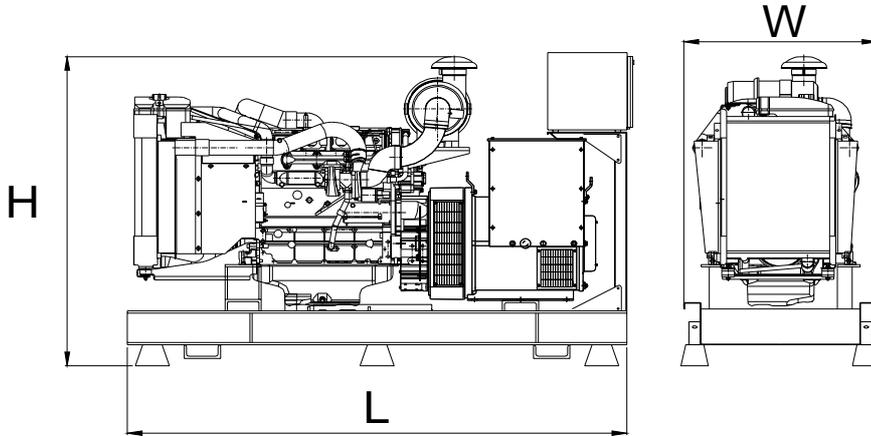
U: Voltage (V)

kVA: Power

Rpm: Revolutions per minute

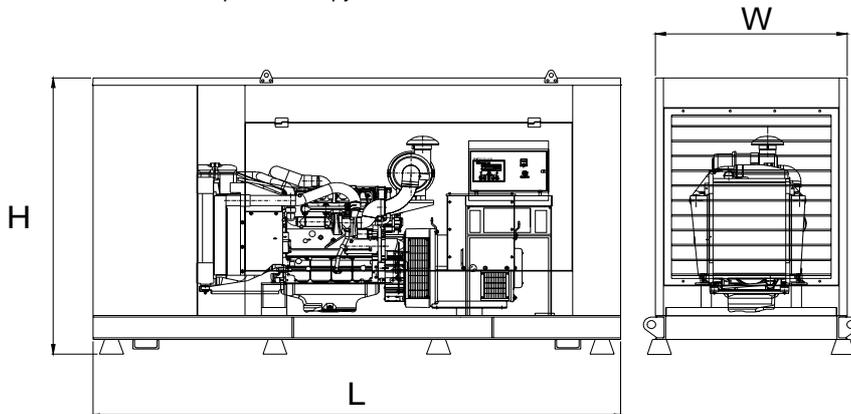
General Dimensions

Standard Generator



Length, L	2,2 m
Height, H	1,5 m
Width, W	0,85 m
Weight, Total	1350 kg

Generator with Soundproof Canopy



Length, L	3,3 m
Height, H	2 m
Width, W	1,2 m
Weight, Total	1800 kg

Generator Room Layout

