4
-1
N
2

Rating @ 0.8 PF		Prime rating	Stand-by rating				
Voltage *1	Freq."2	PT 12.5°3	PT 14S*4				
400 V	50 Hz	12.5 KVA	14.0 KVA				
~	-		2				

The above ratings represent the generating set capability guarantied within ±3% at the reference conditions equivalent to those specified in ISO 8528/1, ISO 3046/1 and BS 5514/1

NOTES

- 1 The applicable voltage range is 380V to 415V for 50Hz applications.
- 2 This generating set is of fixed speed of 1500rpm.
- 3 PT12.5 is the prime power rating of the generating set, where a variable load and unlimited hours usage are applied on the generating set with an average load factor of 80% of the prime rating over each 24 hour period. Noting that a 10% overload is available for 1 hour in every 12 hours operation.
- 4 PT14S is a standby power rating of the generating set, where a variable load limited to an annual usage up to 500 hours is applied, with 300 hours of which may be continuous running. Noting that no overload is permitted.

Model	Perkins 403A-1:	5G1					
Cylinders	3; vertical in-line						
Aspiration	Naturally aspira						
Combustion	Indirect injection	n					
Cooling System	Water cooled						
Displacement	1.496 L						
Oil consumption	0.1 % of fuel consumption						
Lube oil capacity	6.0 L Max						
Coolant capacity	6.0 L						
Governor	Mechanical						
Emissions regulations	Non-Compliant						
Speed	1500 rpm	1800 rpm					
Fuel Consumption PT12.5	3.6 L/H	4.4 L/H					
Fuel Consumption PT14S	4.0 L/H	4.9 L/H					
Radiator Cooling Air Flow	36.6 m³/min	51.0 m³/min					
Max Exhaust Gas Flow	2.70 m³/min	3.36 m³/min					

The above performance data are valid as per the following specs:

- Diesel Fuel is according to BS2869 Class A2 or equivalent.
- Lubricating oil is according to API CH4 (15W/40).
- The coolant should be 50% antifreeze and 50% fresh water.

Model	Leroy Somer I	LSA 40VS2
Regulation	± 1%	
International protection	IP23	
Insulation class	Н	
Terminals	12	
Frequency	50 Hz	60 Hz
Coolant Air Flow	0.06 m ³ /s	0.07 m ³ /s

Shipping Data											
Length	Width	Height	Weight								
1500 mm	610 mm	990 mm	460 kg								

All information given in this leaflet is correct at the time of printing but it may be changed subsequently by the company







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400 Series 403A-15G1 Electropak

13.2 kWm @ 1500 rpm

The Perkins® 400 Series engine family continues to set new standards in the compact engine market. Developed alongside customers to fulfill their needs in the generator set, compressor, agricultural and general industrial markets.

These new ElectropaKs provide compact power, from a robust family of 3 and 4 cylinder diesel engines designed to provide economic and durable operation at prime and standby duties, hitting the key power nodes required by the power generation industry.

Powered by your needs

 The 403A-15G1 ElectropaK is a powerful but quiet 1.5 litre naturally aspirated 3-cylinder compact package

Compact, clean, efficient power

 Design features on the 400D range of ElectropaKs ensures clean rapid starting in all conditions whilst delivering impressive performance with low operating costs in a small, efficient package size

Lower operating costs

- Approved for operation on biodiesel* concentrations of up to 20%
- Oil and filter changes are 500 hours, dependent on load factor
- Engine durability and reliability, the warranty offering and ease of installation combine to drive down the cost of ownership



Product support

With highly trained
 Perkins distributors in thousands of communities in over
 180 countries, you are never far away from expert product knowledge, genuine parts and a range of advanced diagnostic technology for keeping your engine in peak condition

Warranties and Service Contracts

We provide one-year warranties for constant speed engines and two-year warranties for variable speed models, as standard. These are supported by multilevel Extended Service Contracts that can be bought additionally

Discover more

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www.perkins.com/distributor To find your local distributor

		Typical G	Generator					
Engine speed	Type of Operation	Outpu	ut (Net)	Gro	oss	N	Low Idle	
		kVA	kWe	kWm	hp	kWm	hp	
1500	Prime power	13.0	10.4	12.2	16.4	12.0	16.0	n/a
1500	Standby power	15.0	11.4	13.5	18.1	13.2	17.6	n/a

^{*}Subject to conformance with ASTM D6751 and EN14214.

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1986, BS 5514/1. Derating may be required for conditions outside these; consult Perkins Engines Company Limited. Generator powers are typical and are based on typical alternator efficiencies and a power factor (cos.) of 0.8.

Fuel specification: BS 2869: Part 2 1998 Class A2 or ASTM D975 D2.

Rating Definitions: Prime Power: Power available at variable load in lieu of a main power network. Overload of 10% is permitted for 1 hour in every 12 hours operation. Standby (maximum): Power available at variable load in the event of a main power network failure. No overload is permitted.



400 Series 403A-15G1 Electropak

13.2 kWm @ 1500 rpm



Standard electropaK specification

Air inlet

Mounted air filter

Fuel system

- Mechanically governed cassette type fuel injection pump
- Split element fuel filter

Lubrication system

- Wet steel sump with filler and dipstick
- Spin-on full-flow lub oil filter

Cooling system

- Thermostatically-controlled system with belt driven coolant pump and pusher fan
- · Mounted radiator, piping and guards

Electrical equipment

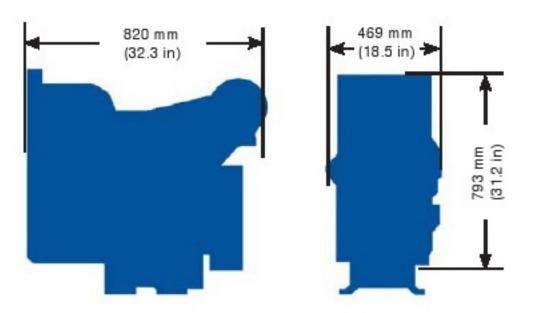
- 12 volt starter motor and 12 volt 15 amp alternator with DC output
- Oil pressure and coolant temperature switches
- 12 volt shut-off solenoid energised to run
- Glow plug cold start aid and heater/starter switch

Flywheel and housing

- 1500 rev/min
- High inertia flywheel to SAE J620 Size 190.5 mm (7½ in) Heavy
- Flywheel housing SAE 4 Long

Mountings

Front and rear engine mounting bracket



Fuel Consumption											
Engine Speed	1500 rpm										
Engine Speed	g/kWh	l/hr									
Standby	251	4.1									
Prime power	248	3.7									
75% of prime power	252	2.8									
50% of prime power	277	2.0									

General Data

Number of cylinders
Cylinder arrangementVertical in-line
Cycle4 stroke
Aspiration
Combustion systemIndirect injection
Compression ratio
Bore and Stroke
Displacement
Direction of rotationAnti-clockwise viewed on flywheel
Cooling system
Total coolant capacity 6.0 litres (1.58 US gals)
Total lubrication system capacity 6.0 litres (1.58 US gals)
Dimensions
Length820 mm (32.3 in)
Width469 mm (18.5 in)
Height
Total weight (dry)
Final weight and dimensions will depend on completed specification.

Optional equipment

Parts book

Option groups

A selection of optional items is available to enable you to prepare a specification precisely matched to your needs.

Photographs are for illustrative purposes only and may not

reflect final specification.

All information in this document is substantially correct at time of printing and may be altered subsequently.

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www.perkins.com



THE HEART OF EVERY GREAT MACHINE

















Low Voltage alternators - 4 pole LSA 40

10 to 23 kVA - 50 Hz / 12.5 to 28 kVA - 60 Hz

Electrical and mechanical data

4250 en - 2013.07 / e

Low Voltage alternators 4 pole 3-phase PARTNER

LSA 40

10 to 23 kVA - 50 Hz / 12.5 to 28 kVA - 60 Hz

SPECIALLY ADAPTED TO APPLICATIONS

The LSA 40 alternator is designed to be suitable for typical generator applications, such as: backup, marine applications, rental, telecommunications, etc.

COMPLIANT WITH INTERNATIONAL STANDARDS

The LSA 40 alternator conforms to the main international standards and regulations:

IEC 60034, NEMA MG 1.32-33, ISO 8528/3, CSA, UL 1446, UL 1004 on request, marine regulations, etc.

It can be integrated into a CE marked generator.

The LSA 40 is designed, manufactured and marketed in an ISO 9001 environment.

TOP OF THE RANGE ELECTRICAL PERFORMANCE

- Class H insulation.
- Standard 12 wire re-connectable winding, 2/3 pitch, type no. 6.
- Voltage range:
 - 50 Hz: 220 V 240 V and 380 V 415 V (440 V)
 - 60 Hz: 208 V 240 V and 380 V 480 V
- High efficiency and motor starting capacity.
- Other voltages are possible with optional adapted windings:
 - 50 Hz: 440 V (no. 7), 500 V (no. 9),
 - 60 Hz: 380 V and 416 V (no. 8), 600 V (no. 9)
- R 791 interference suppression conforming to standard EN 55011 group 1 class B standard for European zone (CE marking).

EXCITATION AND REGULATION SYSTEM SUITED TO THE APPLICATION

Ex	citation syste	m	Regulation options									
Voltage regulator	SHUNI AREP		Current transformer for paralleling	Mains paralleling	3-phase sensing	Remote voltage potentiometer						
R220	Std		-	-	-	-						
R438		Std	C.T.*	R726*	R731*	√						
D510C*	Option	Option	C.T.*	included	included	1						

AVR voltage accuracy ± 1%

√: Possible mounting

* External mounting

PROTECTION SYSTEM SUITED TO THE ENVIRONMENT

- The LSA 40 is IP 23.
- Standard winding protection for clean environments with relative humidity ≤ 95%, including indoor marine environments.
- Options:
 - filters on air inlet: derating 5%,
 - filters on air inlet and air outlet (IP 44): derating 10%,
 - winding protection for harsh environments and relative humidity greater than 95%,
 - space heaters,
 - thermal protection for stator windings,
 - steel terminal box.

REINFORCED MECHANICAL STRUCTURE USING FINITE ELEMENT MODELLING

- Compact rigid assembly to better withstand generator vibrations.
- Steel frame.
- Aluminium flanges and shields.
- Two-bearing and single-bearing versions designed to be suitable for commercially-available heat engines.
- Half-key balancing.
- Permanently greased bearings.
- Direction of rotation : clockwise and anti-clockwise (without derating).

ACCESSIBLE TERMINAL BOX

- Easy access to the AVR and to the connections.
- 8 way terminal block for reconnecting the voltage.
- · Predrilled holes for cable gland.



2 Ref: 4250 en

Low Voltage alternators 4 pole 3-phase PARTINER

LSA 40

10 to 23 kVA - 50 Hz / 12.5 to 28 kVA - 60 Hz

General characteristics

Insulation class	Н	Excitation system	SHUNT	AREP					
Winding pitch	2/3 (wdg 6)	AVR type	R 220	R 438					
Number of wires	12	Voltage regulation (*)	±1%	±0.5%					
Protection	IP 23	Short-circuit current		300% (3 IN): 10 s					
Altitude	≤ 1000 m	Totale Harmonic distortion THD (*	**) in no-load : < 3%	according to IEC					
Overspeed	2250 min ⁻¹	Totale Harmonic distortion THD (**) on linear load : < 5% according to IEC							
Air flow	0.06 m ³ /s, 50 Hz - 0.072 m ³ /s, 60 Hz	Waveform: NEMA = TIF (**)		< 50					

^(*) Steady state. (**) Total harmonic distortion between phases, in no-load or on linear load.

Ratings 50 Hz - 1500 R.P.M.

kVA / kW	/ - P.I	F. = 0.	8	45		10.000					110000		Section 2								
Duty/T°C		С	ontinu	ous du	uty/40°	°C	С	ontinu	ous di	uty/40°	,C	Stand-by/40°C					807	Star	nd-by/2	27°C	
Class/T°K			H	1/125°	K		F/105°K						H	1/150°	K		H/163°K				
Phase 3 ph. 1 ph.			1 ph.		3	ph.		1 ph.	15	3	ph.		1 ph.		3	ph.		1 ph.			
Υ		380V	400V	415V	440V	ΔΔ	380V	400V	415V	440V	ΔΔ	380V 400V	415V	440V	ΔΔ	380V	400V	415V	440V	ΔΔ	
Δ		220V	230V	240V		230V	220V	230V	240V		230V	220V	230V	240V		230V	220V	230V	240V		230V
YY					220V					220V					220V					220V	
40 VS1	kVA	10	10	10	9	7	9	9	9	8	6.5	10.5	10.5	10.5	9	7.5	11	11	11	10	8
	kW	8	8	8	7.2	5.6	7.2	7.2	7.2	6.4	5.2	8.4	8.4	8.4	7.2	6	8.8	8.8	8.8	8	6.4
40 VS2	kVA	12.5	12.5	12.5	11	9	11.5	11.5	11.5	10	8	13.5	13.5	13.5	12	9.5	14	14	14	12.5	10
	kW	10	10	10	8.8	7.2	9.2	9.2	9.2	8	6.4	10.8	10.8	10.8	9.6	7.6	11.2	11.2	11.2	10	8
40 S3	kVA	15	15	15	13	10.5	14	14	14	12	10	16	16	16	14	11.5	16.5	16.5	16.5	15	12
	kW	12	12	12	10.4	8.4	11.2	11.2	11.2	9.6	8	12.8	12.8	12.8	11.2	9.2	13.2	13.2	13.2	12	9.6
40 S4	kVA	17.5	17.5	17.5	16	12.5	16	16	16	14	11.5	19	19	19	16.5	13.5	19.5	19.5	19.5	17	14
	kW	14	14	14	12.8	10	12.8	12.8	12.8	11.2	9.2	15.2	15.2	15.2	13.2	10.8	15.6	15.6	15.6	13.6	11.2
40 M5	kVA	20	20	20	18	14	18.5	18.5	18.5	16	13	21.5	21.5	21.5	19	15	22	22	22	20	15.5
	kW	16	16	16	14.4	11.2	14.8	14.8	14.8	12.8	10.4	17.2	17.2	17.2	15.2	12	17.6	17.6	17.6	16	12.4
40 L7	kVA	23	23	23	19	15	20	20	20	16	14	24	24	24	20	16	25	25	25	22	16.5
	kW	18.4	18.4	18.4	15.2	12	16	16	16	12.8	11.2	19.2	19.2	19.2	16	12.8	20	20	20	17.6	13.2

Ratings 60 Hz - 1800 R.P.M.

Duty/T°C		C	ontinu	ous di	uty/40	°C	Continuous duty/40°C				Stand-by/40°C					Stand-by/27°C					
Class/T°K			H	1/125°	K		F/105°K						ŀ	H/150°	Ϋ́		H/163°K				
Phase		3 ph.			1 ph.	3 ph. 1 ph.				-	3	h.		1 ph.	3 ph.				1 ph.		
Υ		380V	380V 416V 440V		480V	ΔΔ	380V	416V	440V	480V	ΔΔ	380∨	416V	440V	480V	ΔΔ	380V	416V	440V	480V	ΔΔ
Δ		220V	240V			240V	220V	240V			240V	220V	240V			240V	220V	240V			240V
YY			208V	220V	240V			208∨	220V	240V			208V	220V	240V			208∨	220V	240V	
40 VS1	kVA	10	11	11.5	12.5	9	9.5	10.5	10.5	11.5	8.5	11	11.5	12.5	13.5	9.5	11.5	12	13	14	10
	kW	8.0	8.8	9.2	10.0	7.2	7.6	8.4	8.4	9.2	6.8	8.8	9.2	10	10.8	7.6	9.2	9.6	10.4	11.2	8
40 VS2	kVA	12.5	13.5	14.5	15.5	11.5	11.5	12.5	13.5	14.5	10.5	13.5	14.5	15.5	16.5	12	14	15	16	17	12.5
	kW	10.0	10.8	11.6	12.4	9.2	9.2	10	10.8	11.6	8.4	10.8	11.6	12.4	13.2	9.6	11.2	12	12.8	13.6	10
40 S3	kVA	15	16.5	17.5	19	13	14	15.5	16.5	17.5	12	16	18	19	20	13.5	17	18.5	19.5	21	14
	kW	12	13.2	14.0	15.2	10.4	11.2	12.4	13.2	14	9.6	12.8	14.4	15.2	16	10.8	13.6	14.8	15.6	16.8	11.2
40 S4	kVA	17.5	19	20	22	14.5	16.5	18	19	20.5	13	19	20.5	21.5	23.5	15	19.5	21	22	24.5	15.5
	kW	14.0	15.2	16.0	17.6	11.6	13.2	14.4	15.2	16.4	10.4	15.2	16.4	17.2	18.8	12	15.6	16.8	17.6	19.6	12.4
40 M5	kVA	20	22	23	25	16	18.5	20.5	21.5	23	15	21.5	23.5	25	27	17	22	24.5	26	27.5	17.5
	kW	16	17.6	18.4	20	12.8	14.8	16.4	17.2	18.4	12.0	17.2	18.8	20	21.6	13.6	17.6	19.6	20.8	22	14
40 L7	kVA	22	24.5	25.5	28	17.5	20.5	23	24	25	15.5	24	26	27.5	30	18.5	24.5	27	28.5	31	19.5
	kW	17.6	19.6	20.4	22.4	14	16.4	18.4	19.2	20	12.4	19.2	20.8	22	24	14.8	19.6	21.6	22.8	24.8	15.6

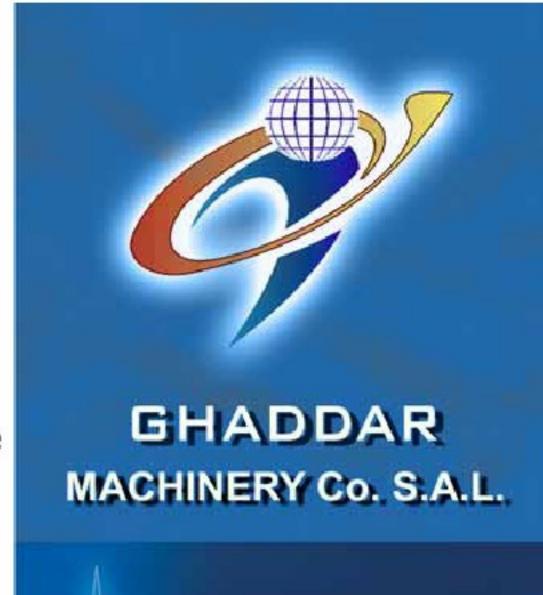
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COMPACT

This type is specially designed for the most tight spaces where other types fail to be installed. With its modern design that uses the latest technologies in fabrication and paint, this enclosure is considered to be GHADDAR MACHINERY Co.'s best selling type ever.

Charasteristics:

- > Body and components made of steel with heat-treated highly corrosive powder coating.
- > Stainless steel locks and black zinc die-cast hinges.
- > One large door on each side to allow easy access for maintenance purposes.
- > Lube oil pipe can be reached externally to allow easy drainage.
- > Radiator fill access through a special rubber cap on the top of the enclosure.
- Special viewing window for the control panel in a lockable door.
- > Lifting points on the base frame.
- > Exhaust silencing system in the interior of the enclosure.
- > Fuel fill and battery are secured through lockable doors.
- > Emergency stop push button mounted on the exterior of the enclosure (optional).



Your Power Partner

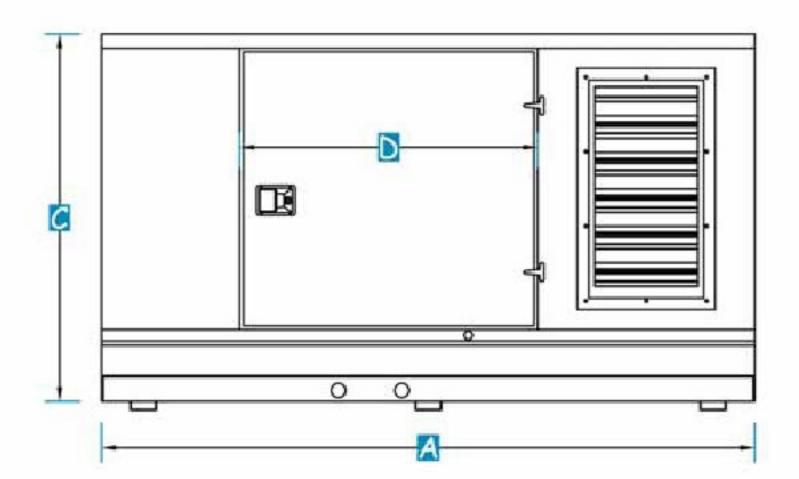


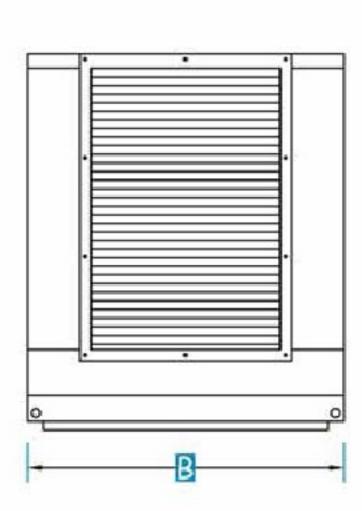
Range 9 - 60 KVA



Sound Pressure Levels (dBA)

Generating Set	Powertech	50 Hz					60 Hz						
		1 m		3 m		7 m		1 m		3 m		7 m	
		0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%
Engine model	KVA	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load
403C-11G	9	72.5	73.8	69.5	70.8	64.5	65.8	74.2	75.5	71.2	72.5	66.2	67.5
403C-15G	13	72.5	73.8	69.5	70.8	64.5	65.8	74.2	75.5	71.2	72.5	66.2	67.5
404C-22G	20	72.5	73.8	69.5	70.8	64.5	65.8	74.2	75.5	71.2	72.5	66.2	67.5
1103A-33G	30	74.7	76.2	71.2	72.7	66.2	67.7	76.6	78.1	73.1	74.6	68.1	69.6
1103A-33TG1	45	73.3	74.8	69.8	71.3	64.8	66.3	75.2	76.7	71.7	73.2	66.7	68.2
1103A-33TG2	60	73.3	74.8	69.8	71.3	64.8	66.3	75.2	76.7	71.7	73.2	66.7	68.2





Dimensions

Generating Set	Powertech	A: mm	B: mm	C: mm	D: mm	
Engine model	KVA					
403C-11G	9	2000	900	1260	876	
403C-15G	13	2000	900	1260	876 876 1020 1020	
404C-22G	20	2000	900	1260		
1103A-33G	30	2270	1100	1310		
1103A-33TG1	45	2270	1100	1310		
1103A-33TG2	60	2270	1100	1310	1020	