DAR AL-EBDA'A
POWER GENERATORS COMPANY

Perkins® TECHNICAL DATA SHEET

PL1250

Prime Power	Standby Power	Voltage/Ph	Hz/RPM	PF
1250 kVA/1000 kW	1375kVA/1100 kW	400/3Ph	50/1500	0.8

Prime power
unlimited hours usage with an average load factor of 80% of the published prime power over each 24 hours period. a 10% overload is
available for1 hour in every 12 hours operaton.
The generator is working normally at 55 degrees with derating
Standby power
Limited to 500 hours annual usage with an average load factor of 80% of the published Standby power rating over each 24 hour
period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on Standby power.
Available in 60HZ for all voltage ratings.
Standard Reference Condition
Note: Standard reference conditions 40°C (104°F) Air Inlet Temp, 100m (328 ft) A.S.L. 30% relative humidity.

Diesel Generator Set

Engine Make /Model	PERKINS 4012-46TWG2A
Alternator Make /Model	Leroy Somer LSA50.2 M6
Control Panel	DSE 7320 MKII
Base Frame / Silent Canopy	Robust Structure/ Corrosion Resistant
Circuit Breaker Type	3 Pole MCCB (4P Available as optional)
Built in Base Fuel Tank Capacity	N/A
Battery	Maintenance free Lead Acid

Dimensions	Length (cm)	Width (cm)	Height (cm)	Weight (KG)
Close Type	1200	240	350	11178
Open Type	521	200	220	9600

ENGINE SPECIFICATIONS

Engine Make Model	PERKINS 4012-46TWG2A
No. of Cylinders	12 60° Vee form
Cycle	4 Stroke
Aspiration	Turbocharged
Cooling Method	Water cooled
Governing Type	Electronic
Governing Class	G2 - ISO 8528 Part 1
Compression Ratio	13:1
Displacement	45.8 L
Bore/Stroke	160 x 190 mm
Dynamic Charging Alter nator	40AMP, 24V

LUBRICATION SYSTEM

Oil Filter Type	Spin-On Full Flow
Total Oil Capacity	177 L
Oil Type	API-CH-4 or ACEA E5

AIR SYSTEM

Air Filter Type	Dry Element
Combustion Air Flow (PRP)	84 m³/min
Combustion Air Flow (ESP)	96 m³/min
Max Air Filter Intake Restriction	3.7 kPA

COOLING SYSTEM

Total Coolant Capacity (L)	201 L
Cooling Fan Air Flow	1176 m³/ min
Radiator Fan Load	58 kW
Cooling system design	Above 50ºC
Heat Radiation to Room (PRP)	89 kW

Exhaust System

Muffler Type	Industrial Grade
Max. Back Pressure	7 kPa
Exhaust Gas Flow (PRP/ESP)	240 m³/ min
Exhaust Gas Tempera ture	< 482ºC

Comply with Standards

ISO 3046, BS 5514, DIN 6271, NEMA-MGI, DIN EN, BS 5000, IEC 60034,IEC 60947-2

PL Generator Set Reliable, Premium Power Supply

Features & Benefits:

- PL Gen set is driven by Perkins Engine, a world-renowned manufacturer with over 85 years of experience and a strong reputation for innovation, quality, and customer support across 182 countries through 3,500 outlets.
- PL Gen set is equipped with a Leroy Somer Alternator, one of the leading global alternator manufacturers, offering more than 99 years of experience, over 120 active patents, operations in more than 40 countries, and over 80 service centers.
- PL Gen set comes with a DSE Control System, supplied by one of the UK's leading manufacturers, with more than 40 years of expertise in advanced, reliable, and user-friendly generator controllers.
- Low fuel consumption, providing greater efficiency and reducing overall fuel operating costs.
- Compact and durable construction, minimizing transportation requirements and reducing storage expenses.
- Engineered with a space-efficient configuration, making it suitable for critical applications where installation space comes at a premium.
- Low noise and reduced vibration levels, ideal for sensitive and critical environments where noise control is essential.
- Easy servicing and extended operating life, helping reduce maintenance requirements and associated service costs.
- Every unit is rigorously tested, including load, cooling, vibration, and noise testing, before being delivered to the customer.
- Designed for simple operation and reliable performance, even under demanding environmental and harsh operating conditions.
- Fitted with a built-in fuel tank providing sufficient capacity for approximately 8 to 10 hours of operation.
- Fully engineered with a wide selection of optional accessories available to meet different operational requirements.

Mob.: +964 790 137 7841
+964 771 648 8838
info@dar-alebdaco.com
www.dar-alebdaco.com
Branch 1 - Iraq - Baghdad - Camp Sarah - Near Square52 - Opposite Al-Jumhuriya Preparatory Girls school
Branch 2 - Iraq - Baghdad - Khalid Ibn Al-Walid Street - Opposite the Martyrs Foundation

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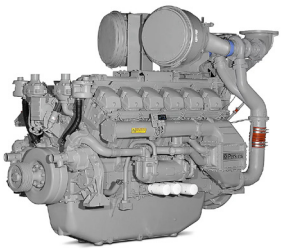
POWER GENERATORS COMPANY

Perkins® TECHNICAL DATA SHEET

PL1250



Perkins Engine
4012-46TWG2A

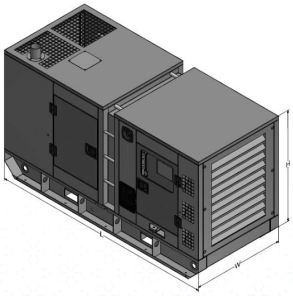
Engine Fuel System	
Recommended Fuel	Class A2 Diesel
Fuel Consumption Standby	288 L/hr
Fuel Consumption 100% PRP	259 L/hr
Fuel Consumption 75% PRP	196 L/hr
Fuel Consumption 50% PRP	143 L/hr

Leroy Somer
LSA50.2 M6

ALTERNATOR SPECIFICATIONS	
Alternator Make /Model	Leroy Somer LSA50.2 M6
AVR Model	R450
Number of Poles	4
Number of Winding Leads	12
Type of Bearing	Single Bearing
Insulation Class - Temp Rise	Cont. H - 125/40ºC
Ingress Protection Rating	IP 23
Excitation System	AREP
Voltage Regulation	+ 0.5%
Harmonic Coefficient THF	< 2%
Tel. influence TIF	< 50
Cooling air flow	1.8 m³/ Sec

DSE 7320MKII

Controller Make & Model | DeepSea 7320MKII	
Operation Mode	AMF
Display	Graphic Back-lit LCD (132x64) pixles
Ingress Protection Rating	IP65
Binary Inputs/Outputs	9 / 8
Analog Inputs	4
Measurement	Vac, A, Hz, kVA, kW, Vdc
Event Log	Alarms log, Hrs log
Communication	USB



Enclosure Type	
Drainage	Fuel and Water Drainage Provision
Transportation	Tested Single Point Lifting Facility & Forklift Pockets
Ingress Protection	IP 23
Lifting	ISO Standard Lifting
Canopy RAL Color	RAL 9010 - Powder coated
Base frame RAL Color	RAL 9011 - Powder coated
Noise Pressure level	TBD

WARRANTY

1. WARRANTY POLICY

DPG generators are covered for 1,000 operating hours or one year, whichever comes first, against manufacturing defects. Warranty excludes improper fuel, misuse, incorrect operation, and maintenance-related failures. Minimum operating load: 60%.

2. DOCUMENTATION

Each generator is supplied with Operation & Maintenance Manual, GAD, Wiring Diagram, and FAT Report.

3. OPTIONAL FEATURES

Engine: Heavy-Duty Air Filter, Coolant/Oil Heater, Fuel & Water Separator, Oil Rotary Pump.
Alternator: Anti-Condensation Heater, PMG + AVR, Double Bearing, RTD Sensors.

Cooling & Control: 55°C or Remote Radiator, AMF/Parallel Operation, Remote Annunciator, 4-Pole Manual/Motorized Breaker.
ATS & Battery: Contactor or Motorized ATS, Nickel-Cadmium or Maintenance-Free Battery, Charger, Selector Switch and Current Meter.
Exhaust: Residential, Critical or Hospital Grade Mufflers.

Available Voltages:400/230V, 480/277V, 380/220V, 440/254V, 416/240V, 220/127V, 208/120V.

Due to continuous research & product development, we reserve the right to change specification with out notice

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4000 Series 4012-46TWG2A Diesel Engine – ElectropaK

Non-Emissions compliant

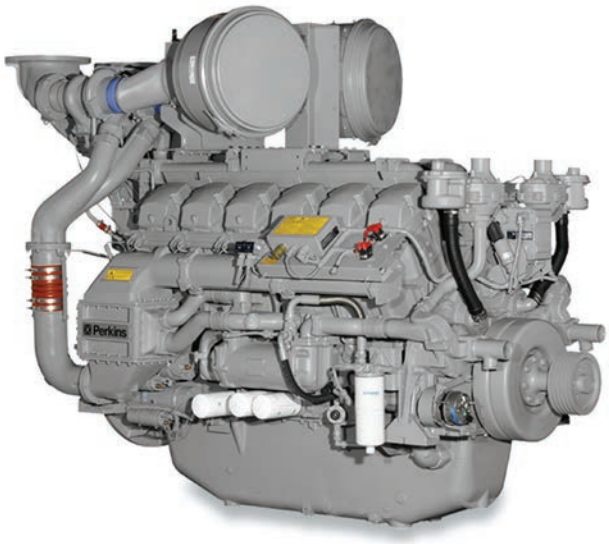
1166 kWm @ 1800 rpm net standby power

The 4012-46TWG engine has been developed using the latest engineering techniques and builds on the strengths of the already very successful 4012 Series family and addresses today's uncompromising demands within the power generation industry.

Developed from a proven heavy-duty industrial base these products offer superior performance and reliability.

The 4012-46TWG2A is a turbocharged and air-to-water charge-cooled, 12 cylinder diesel engine which offers a choice of temperate or tropical cooling. Its premium features provide exceptional power-to-weight ratio resulting in exceptional fuel consumption.

The overall performance and reliability characteristics makes this one of the prime choices for today's power generation industry.



Specification				
Number of cylinders	12 60º Vee form			
Bore and stroke	160 x 190 mm		6.3 x 7.5 in	
Displacement	45.842 litres		2797 in^3	
Aspiration	Turbocharged and air to water charge cooled			
Cycle	4 stroke			
Combustion system	Direct injection			
Compression ratio	13:1			
Rotation	Anti-clockwise, viewed from flywheel end			
Total lubricating capacity	177 litres		46.7 US gal	
Cooling system	Water-cooled			
	Temperate		Tropical	
Total coolant capacity	196 litres	51.7 US gal	201 litres	53 US gal

www.perkins.com

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Final weight and dimensions will depend on completed specification.

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Perkins®

THE HEART OF EVERY GREAT MACHINE

4000 Series 4012-46TWG2A Diesel Engine – ElectropaK

Non-Emissions compliant

1166 kWm @ 1800 rpm net standby power

Features and benefits

Dependable power

- Individual 4 valve per cylinder give optimised gas flows
- Unit fuel injectors ensure ultra fine fuel atomisation and hence controlled rapid combustion
- Commonality of components with other engines in the 4000 Series family for reduced stocking level
- Capable emissions of TA Luft (1986)

Low operating costs

- Oil change service intervals are set at 500 hours as standard
- Designed to provide low cost of ownership, simple maintenance and reduced downtime
- Class leading warranty
  Prime power - 12 months unlimited hours. For engines that operate less than 6,000 hours the warranty is available for two years or until the application reaches 6,000 hours (whichever is sooner).

  Standby power - three years or 1,500 hours (whichever is sooner).

  See Perkins Warranty Policy for further details
- Perkins Platinum Protection - comprehensive cover from as little as 5 percent* of the cost of your engine

  Talk to your local distributor or visit www.perkins.com/platinum protection for more details

World class product support

- Our experienced global network of distributors and dealers, fully trained engine experts deliver total service support around the clock, 365 days a year. They have a comprehensive suite of web based tools at their disposal, covering technical information, parts identification and ordering systems, all dedicated to maximising the productivity of your engine
- Perkins actively pursues product support excellence by insisting our distribution network invest in their territory to provide customers with a consistent quality of support across the globe
- Throughout the entire life of a Perkins engine, we provide access to genuine parts giving 100% reassurance that you receive the very best in terms of quality for lowest possible cost, wherever your Perkins powered machine is operating in the world

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

*Terms and conditions apply

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Technical information

Air inlet

- Mounted air filters and turbocharger

Fuel system

- Direct fuel injection system with fuel lift pump
- Governing to ISO 8528-5 class G3 with isochronous capability
- Full-flow spin-on filters

Lubrication system

- Wet full aluminium sump with filler and dipstick
- Full flow spin-on oil filters

Cooling system

- Two twin thermostats
- System designed for ambient temperatures of up to 50°C

Electrical equipment

- 24V starter motor and 24V alternator with integral regulator and DC output
- Turbine inlet temperature protection
- Twin high coolant temperature protection switch
- Twin low oil pressure protection switch

Flywheel and housing

- Flywheel to SAE J620 Size 18
- SAE 0 flywheel housing

Optional equipment

- 4 metre wiring harness
- Secondary electric start
- Immersion heater
- Single exhaust outlet pipe
- Exhaust counter flanges
- Temperate radiator kit
- 21” flywheel

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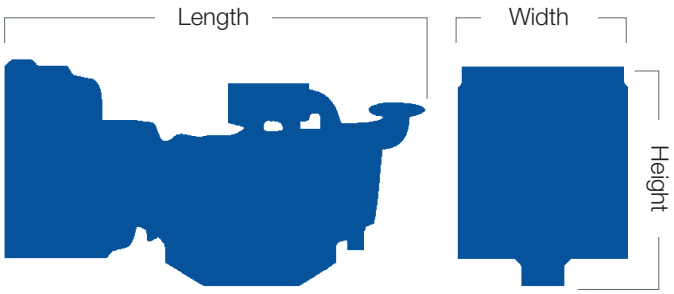

Engine package weights and dimensions				
	Temperate		Tropical	
Length	3714 mm	146 in	3714 mm	146 in
Width	1780 mm	70 in	1978 mm	79 in
Height	2255 mm	89 in	2255 mm	89 in
Weight (dry)	5220 kg	11508 lb	5283 kg	11647 lb

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4000 Series 4012-46TWG2A Diesel Engine – ElectropaK

Non-Emissions compliant

1166 kWm @ 1800 rpm net standby power

Speed rpm	Type of operation	Typical generator output (Net)		Engine power			
				Gross		Net	
		kVA	kWe	kWm	hp	kWm	hp
1800	Baseload Power	989	791	891	1194	833	1117
	Prime Power	1250	1000	1113	1492	1055	1414
	Standby (maximum)	1375	1100	1224	1641	1166	1563

The above ratings represent the engine performance capabilities guaranteed within plus or minus 3% at the reference conditions equivalent to those specified in ISO 8528/1, ISO 3046/1, BS 5514/1.

Rating conditions: 25°C air inlet temperature, barometric pressure 100 kPa, relative humidity 30%. Please consult your distributor or the factory for ratings in other ambient conditions. *Note: For full ratings please refer to Perkins Engines Company Limited. All electrical ratings are based on an average alternator efficiency and a power factor of 0.8.* **Fuel specification:** BS2869: Class A2.

Rating definitions

Baseload power: Power available for continuous full load operation. No overload is permitted. **Prime power:** Power available for variable load with an average load factor not exceeding 80% of the prime power rating in any 24 hour period. Overload of 10% 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 up to a maximum of 500 hours per year. No overload is permitted.

Percent of prime power	Fuel consumption at 1800 rpm g/kWh	Fuel consumption at 1800 rpm l/hr
Standby (maximum)	220	298
Prime power	217	266
Continuous baseload	216	209

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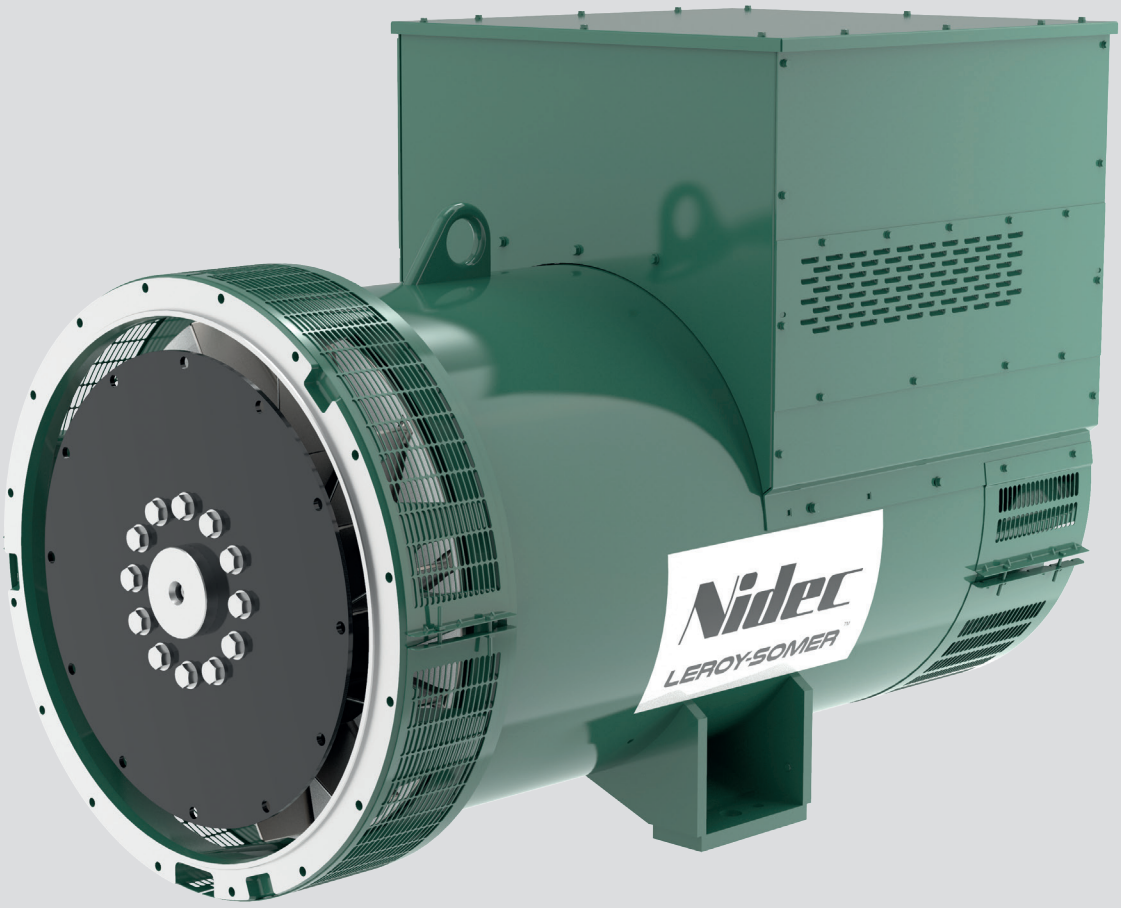


LSA 50.2

Low Voltage Alternator - 4 pole

1100 to 1640 kVA - 50 Hz / 1250 to 2000 kVA - 60 Hz

Electrical and mechanical data

LEROY-SOMER™

Nidec

All for dreams

The best of performance

Nidec Leroy-Somer LSA 50.2 alternator has been designed to offer you the best power generation performances. With its meticulous design and optimized architecture, the LSA 50.2 strikes the perfect balance between compactness, reliability, performance and longevity.
Whatever your application, the LSA 50.2 will meet your needs and will adapt to all situations.

Standards

Nidec Leroy-Somer LSA 50.2 alternator meets all key international standards and regulations, including IEC 60034, NEMA MG 1.32-33, ISO 8528-3, CSA C22.2 n°100-14 and UL 1446 (UL 1004 on request). Also compliant with IEC 61000-6-2, IEC 61000-6-3, IEC 61000-6-4, VDE 0875G, VDE 0875N and EN 55011, group 1 class A for European zone.
Nidec Leroy-Somer LSA 50.2 alternator can be integrated in EC marked generator set, and bears EC, UKCA and CMIM markings.
It is designed, manufactured and marketed in an ISO 9001 and ISO 14001 quality assurance environment.

Electrical characteristics and performances

- Class H insulation
- 2/3 pitch winding, standard 6-wire (6S) reconnectable or 12-wire (6) optional
- Voltage range:
  - 50 Hz: 220V - 240V and 380V - 415V (440V)
  - 60 Hz: 208V - 240V and 380V - 480V
- High efficiency and motor starting capacity
- Other voltages are possible with optional adapted windings:
  - 50 Hz: 440V (no. 7), 500V (no. 9), 550V (no. 22 or 23), 600V (no. 22 or 23), 690V (no. 52)
  - 60 Hz: 380V and 416V (no. 8), 600V (no. 9), 690V (no. 22 or 23)

Excitation and regulation system

Excitation system			Regulation options		
AVR	**AREP**	**PMG** (option)	**C.T. Current transformer for paralleling**	**Mains paralleling**	**Remote voltage potentiometer**
D350	Standard	Standard	√		√
D550	Option	Option	√	√	√

3-phase sensing is included as a standard with digital regulators.

Protection system and options

- The LSA 50.2 is IP 23
- Complete 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%
  - Reinforced winding protection for harsh environments and relative humidity greater than 95%
  - Space heater
  - Thermal protection for stator windings and shields

Mechanical construction

- Compact and rigid assembly to better withstand generator vibrations
- Steel frame
- Cast iron flanges and shields
- Two-bearing and single-bearing versions designed to be suitable for engines on the market
- Half-key balancing
- Greased for life bearings, regreasable bearings (optional)
- Standard direction of rotation: clockwise when looking at the drive end view (for anti-clockwise, derate the machine by 5%)

Terminal box design

- Easy access to the voltage regulator and to the connections
- Possible inclusion of accessories for paralleling, protection and measurement
- Connection bars for voltage reconnection

General characteristics

Insulation class	H	Excitation system	AREP / PMG
Winding pitch	2/3 (wind.6S - 6-wire / wind.6 - 12-wire option)	AVR type	D350
Number of wires	6 (12 option)	Voltage regulation (*)	± 0.25 %
Protection	IP 23	Short-circuit current	300% (3 IN) : 10s
Altitude	≤ 1000 m	Total Harmonic Distortion THD (**) in no-load	< 3.5 %
Overspeed	2250 R.P.M.	Total Harmonic Distortion THD (**) on linear load	< 3.5 %
Air flow	1.8 m³/s (50 Hz) / 2.2 m³/s (60 Hz)	Waveform: NEMA = TIF (**)	< 50

(*) Steady state (**) Total harmonic distortion between phases, no-load or on-load (non-distorting)

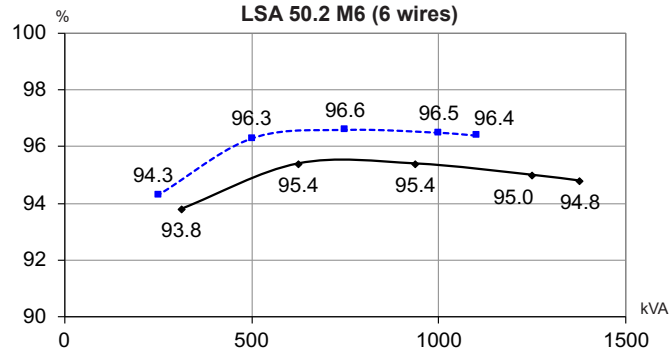
Ratings 50 Hz - 1500 R.P.M.

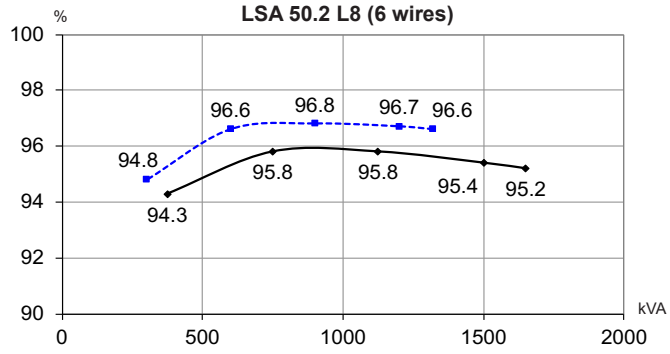
kVA / kW - P.F. = 0.8																	
Duty/T°C		Continuous duty/40°C				Continuous duty/40°C				Stand-by/40°C				Stand-by/27°C			
Class/T°K		H/125°K				F/105°K				H/150°K				H/163°K			
Phase		3 ph.				3 ph.				3 ph.				3 ph.			
Y		380V	**400V**	415V	440V	380V	**400V**	415V	440V	380V	**400V**	415V	440V	380V	**400V**	415V	440V
Δ		220V	**230V**	240V		220V	**230V**	240V		220V	**230V**	240V		220V	**230V**	240V	
6 wires version winding no. 6S																	
LSA 50.2 M6	kVA	1250	**1250**	1250	1190	1125	**1125**	1125	1095	1315	**1315**	1315	1275	1375	**1375**	1375	1330
	kW	*1000*	***1000***	*1000*	*952*	*900*	***900***	*900*	*876*	*1052*	***1052***	*1052*	*1020*	*1100*	***1100***	*1100*	*1064*
LSA 50.2 L7	kVA	1350	**1350**	1350	1260	1215	**1215**	1215	1150	1420	**1420**	1420	1365	1485	**1485**	1485	1425
	kW	*1080*	***1080***	*1080*	*1008*	*972*	***972***	*972*	*920*	*1136*	***1136***	*1136*	*1092*	*1188*	***1188***	*1188*	*1140*
LSA 50.2 L8	kVA	1450	**1500**	1500	1440	1320	**1350**	1350	1320	1520	**1575**	1575	1555	1595	**1650**	1650	1625
	kW	*1160*	***1200***	*1200*	*1152*	*1056*	***1080***	*1080*	*1056*	*1216*	***1260***	*1260*	*1244*	*1276*	***1320***	*1320*	*1300*
LSA 50.2 VL10	kVA	1600	**1640**	1600	1545	1455	**1475**	1455	1420	1680	**1720**	1680	1670	1760	**1800**	1760	1730
	kW	*1280*	***1312***	*1280*	*1236*	*1164*	***1180***	*1164*	*1136*	*1344*	***1376***	*1344*	*1336*	*1408*	***1440***	*1408*	*1384*
12 wires version winding no. 6 (option)																	
Y		380V	**400V**	415V	440V	380V	**400V**	415V	440V	380V	**400V**	415V	440V	380V	**400V**	415V	440V
Δ		220V	**230V**	240V		220V	**230V**	240V		220V	**230V**	240V		220V	**230V**	240V	
YY			**200V**		220V		**200V**		220V		**200V**		220V		**200V**		220V
LSA 50.2 M6	kVA	1045	**1100**	1140	1210	940	**990**	1026	1089	1045	**1100**	1140	1210	1045	**1100**	1140	1210
	kW	*836*	***880***	*912*	*968*	*752*	***792***	*821*	*871*	*836*	***880***	*912*	*968*	*836*	***880***	*912*	*968*
LSA 50.2 L8	kVA	1250	**1300**	1350	1430	1125	**1170**	1215	1287	1250	**1300**	1350	1430	1250	**1300**	1350	1430
	kW	*1000*	***1040***	*1080*	*1144*	*900*	***936***	*972*	*1030*	*1000*	***1040***	*1080*	*1144*	*1000*	***1040***	*1080*	*1144*

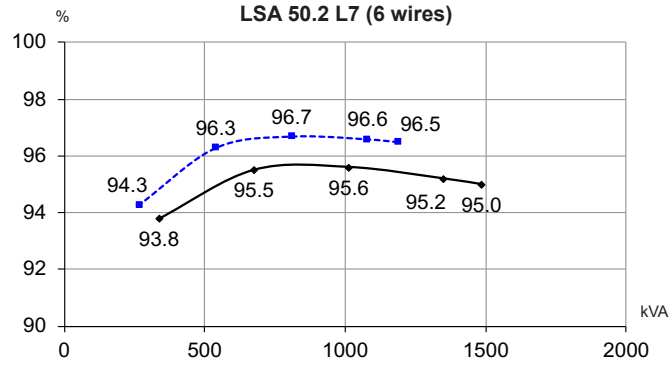
Ratings 60 Hz - 1800 R.P.M.

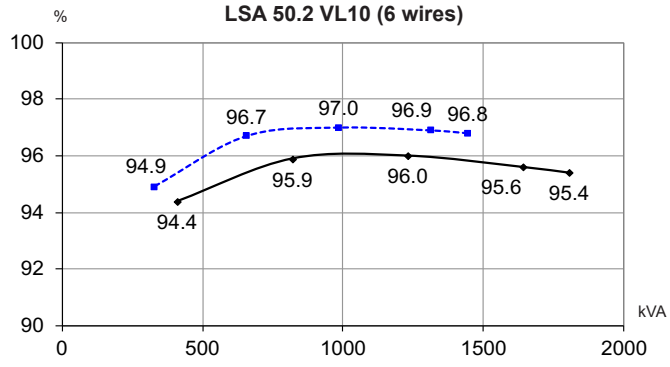
kVA / kW - P.F. = 0.8																	
Duty/T°C		Continuous duty/40°C				Continuous duty/40°C				Stand-by/40°C				Stand-by/27°C			
Class/T°K		H/125°K				F/105°K				H/150°K				H/163°K			
Phase		3 ph.				3 ph.				3 ph.				3 ph.			
Y		380V	416V	440V	**480V**	380V	416V	440V	**480V**	380V	416V	440V	**480V**	380V	416V	440V	**480V**
Δ		220V	240V			220V	240V			220V	240V			220V	240V		
6 wires version winding n°6S																	
LSA 50.2 M6	kVA	1285	1405	1455	**1560**	1155	1265	1310	**1405**	1350	1475	1530	**1640**	1410	1545	1600	**1720**
	kW	*1028*	*1124*	*1164*	***1248***	*924*	*1012*	*1048*	***1124***	*1080*	*1180*	*1224*	***1312***	*1128*	*1236*	*1280*	***1376***
LSA 50.2 L7	kVA	1375	1500	1555	**1680**	1240	1350	1400	**1510**	1440	1575	1630	**1765**	1510	1650	1710	**1850**
	kW	*1100*	*1200*	*1244*	***1344***	*992*	*1080*	*1120*	***1208***	*1152*	*1260*	*1304*	***1412***	*1208*	*1320*	*1368*	***1480***
LSA 50.2 L8	kVA	1485	1625	1720	**1875**	1335	1460	1550	**1685**	1560	1705	1805	**1965**	1630	1785	1890	**2060**
	kW	*1188*	*1300*	*1376*	***1500***	*1068*	*1168*	*1240*	***1350***	*1250*	*1364*	*1444*	***1572***	*1304*	*1428*	*1512*	***1650***
LSA 50.2 VL10	kVA	1635	1785	1860	**2000**	1470	1605	1675	**1800**	1715	1875	1950	**2100**	1800	1965	2050	**2200**
	kW	*1308*	*1428*	*1488*	***1600***	*1176*	*1284*	*1340*	***1440***	*1372*	*1500*	*1560*	***1680***	*1440*	*1572*	*1640*	***1760***
12 wires version winding n°6 (option)																	
Y		380V	416V	440V	**480V**	380V	416V	440V	**480V**	380V	416V	440V	**480V**	380V	416V	440V	**480V**
Δ		220V	240V	240V		220V	240V	240V		220V	240V	240V		220V	240V	240V	
YY			208V	220V	**240V**		208V	220V	**240V**		208V	220V	**240V**		208V	220V	**240V**
LSA 50.2 S4	kVA	990	1080	1145	**1250**	891	972	1030	**1125**	990	1080	1145	**1250**	990	1080	1145	**1250**
	kW	*792*	*864*	*916*	***1000***	*713*	*778*	*824*	***900***	*792*	*864*	*916*	***1000***	*792*	*864*	*916*	***1000***
LSA 50.2 M6	kVA	1210	1320	1400	**1525**	1089	1188	1260	**1372**	1210	1320	1400	**1525**	1210	1320	1400	**1525**
	kW	*968*	*1056*	*1120*	***1220***	*871*	*950*	*1008*	***1098***	*968*	*1056*	*1120*	***1220***	*968*	*1056*	*1120*	***1220***
LSA 50.2 L8	kVA	1430	1565	1655	**1800**	1287	1409	1490	**1620**	1430	1565	1655	**1800**	1430	1565	1655	**1800**
	kW	*1144*	*1252*	*1324*	***1440***	*1029*	*1127*	*1192*	***1296***	*1144*	*1252*	*1324*	***1440***	*1144*	*1252*	*1324*	***1440***

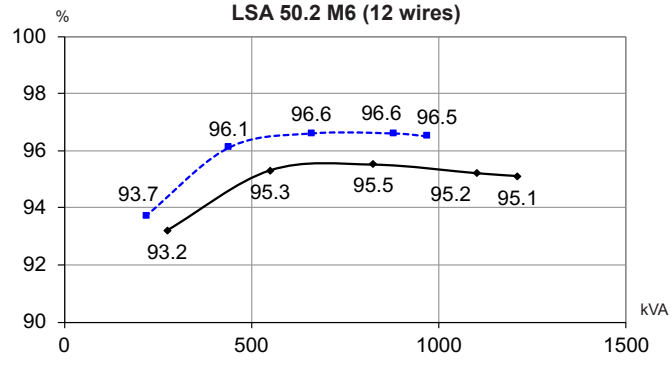
Efficiencies 400V - 50 Hz (— P.F.: 0.8) (--- P.F.: 1)

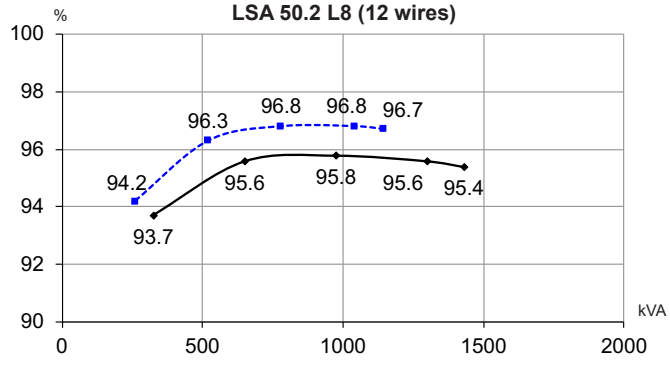












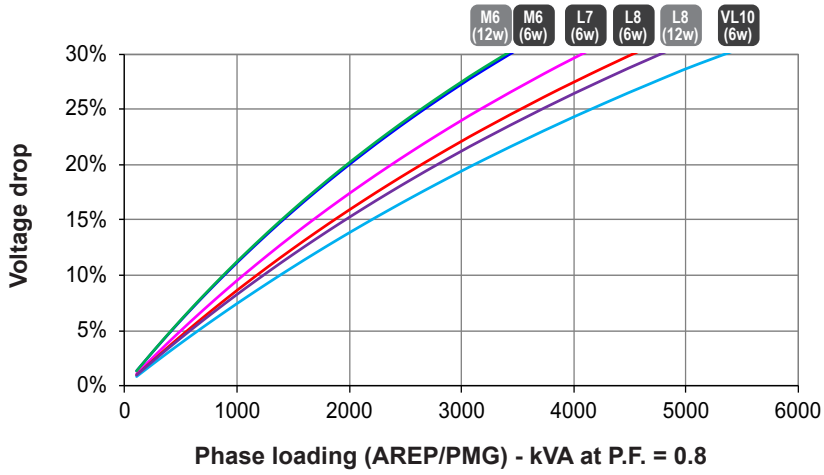
Reactances (%). Time constants (ms) - Class H / 400 V

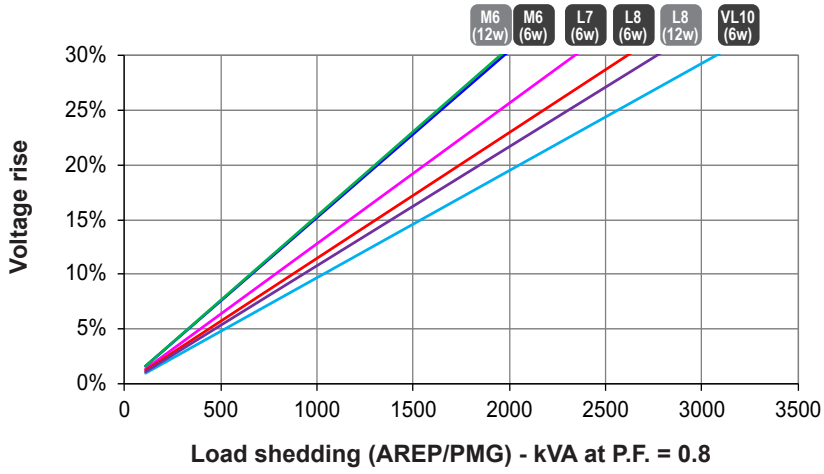
		M6 (6w)	L7 (6w)	L8 (6w)	VL10 (6w)	M6 (12w)	L8 (12w)
Kcc	Short-circuit ratio	0.32	0.34	0.32	0.33	0.36	0.37
Xd	Direct-axis synchronous reactance unsaturated	392	364	378	362	345	329
Xq	Quadrature-axis synchronous reactance unsaturated	200	185	193	184	176	168
T'do	No-load transient time constant	3634	3750	3910	4058	3634	4247
X'd	Direct-axis transient reactance saturated	29.1	26.2	26.1	24.1	25.6	20.9
T'd	Short-circuit transient time constant	180	180	180	180	180	180
X"d	Direct-axis subtransient reactance saturated	16.5	14.8	14.8	13.6	14.5	11.8
T"d	Subtransient time constant	18	18	18	18	18	18
X"q	Quadrature-axis subtransient reactance saturated	17.3	15.5	15.4	14.2	15.2	13.4
Xo	Zero sequence reactance	0.8	0.72	0.72	0.66	0.71	0.58
X2	Negative sequence reactance saturated	16.92	15.21	15.14	13.94	14.89	12.67
Ta	Armature time constant	27	27	27	27	27	27

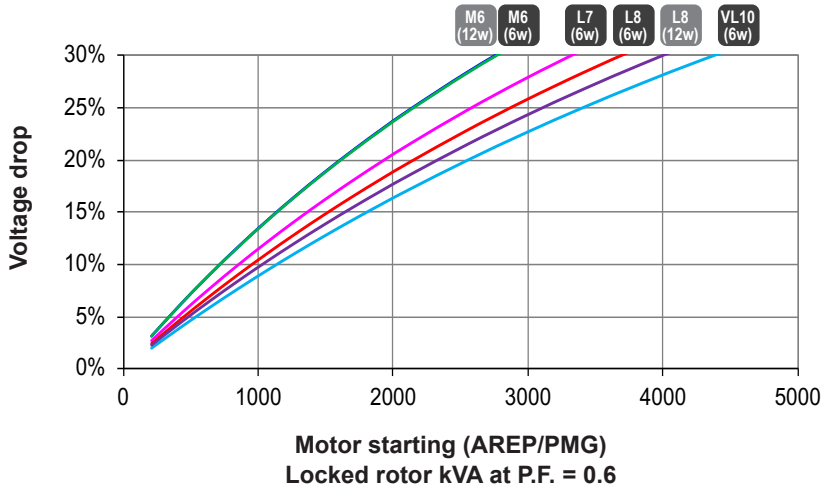
Other class H/400 V data

io (A)	No-load excitation current	0.82	0.85	0.78	0.78	0.82	0.79
ic (A)	On-load excitation current	3.6	3.48	3.38	3.26	3.21	3.02
uc (V)	On-load excitation voltage	45.2	43.7	42.4	40.8	40.4	37.9
ms	Response time (ΔU = 20% transient)	500	500	500	500	500	500
kVA	Start (ΔU = 20% cont. or 30% trans.)	2763	3324	3704	4387	2765	4003
%	Transient ΔU (on-load 4/4) - P.F.: 0.8 $_{LAG}$	13.6	12.5	12.5	11.7	12.3	10.5
W	No-load losses	14039	15299	15454	16552	14039	15322
W	Heat dissipation	52218	53790	57594	59458	43714	47854

Transient voltage variation 400V - 50 Hz

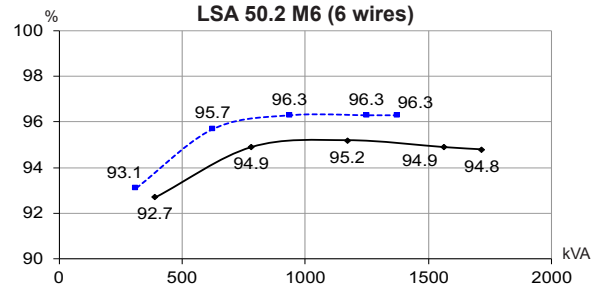


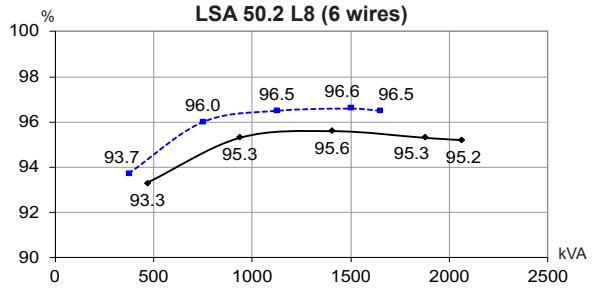


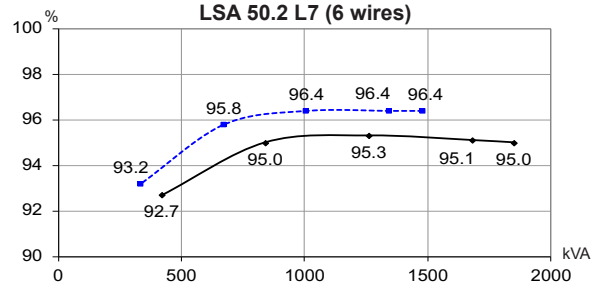


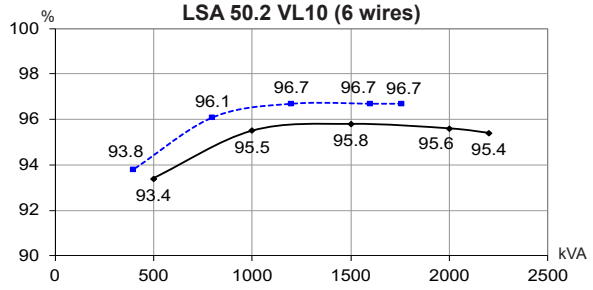
1) For a starting P.F. other than 0.6, the starting kVA must be multiplied by K = Sine P.F. / 0.8
2) For voltages other than 400V (Y), 230V(Δ) at 50 Hz, then kVA must be multiplied by $(400/U)^2$ or $(230/U)^2$.

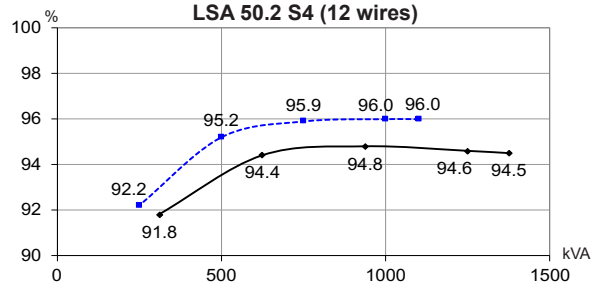
Efficiencies 480V - 60 Hz (— P.F.: 0.8) (--- P.F.: 1)

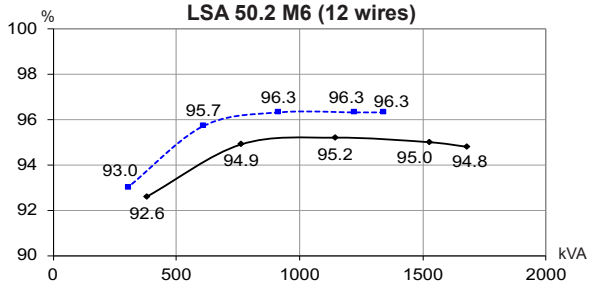


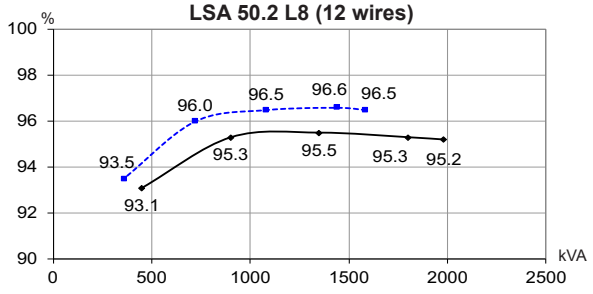








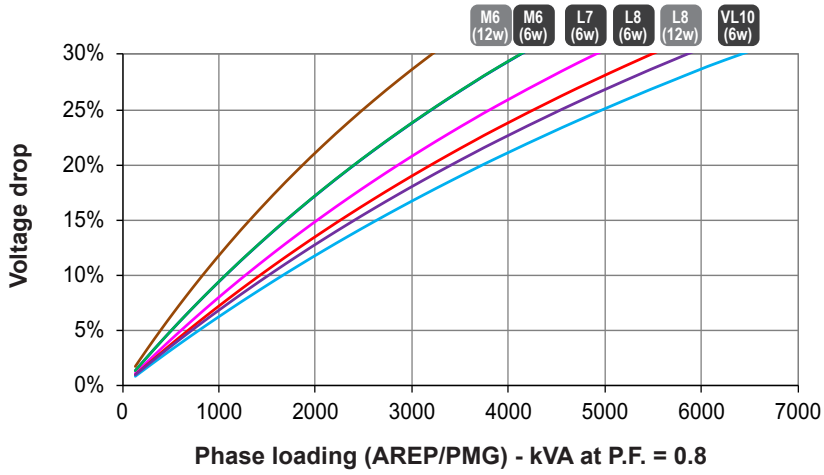


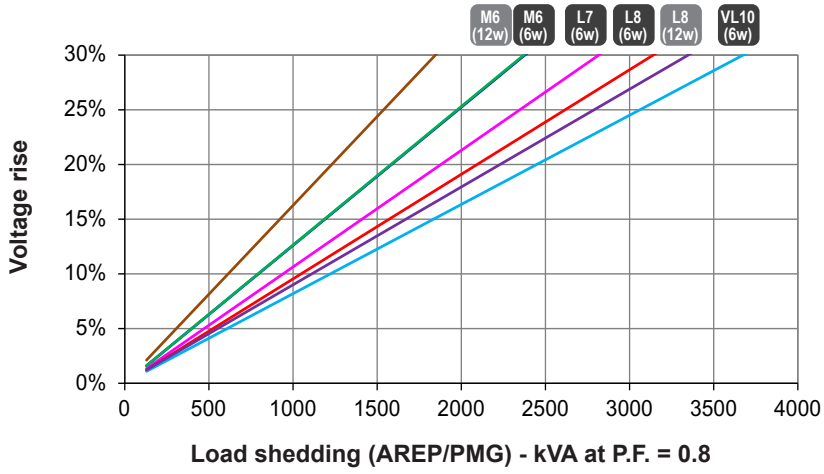


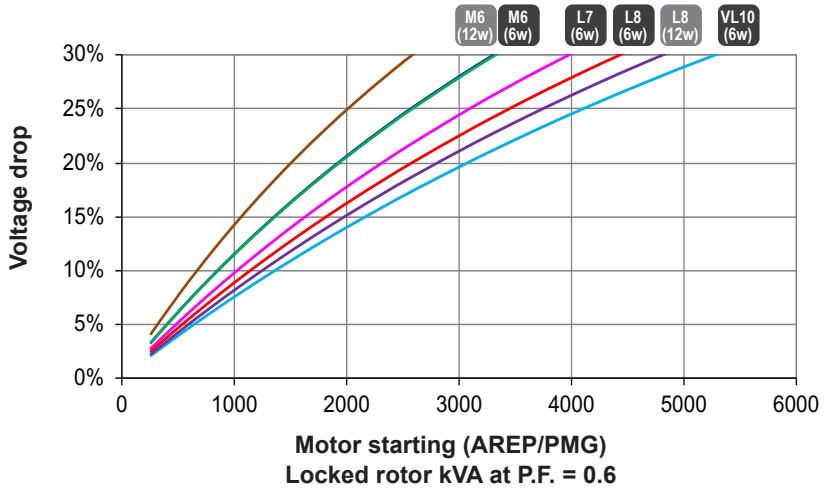
Reactances (%). Time constants (ms) - Class H / 480 V

		M6 (6w)	L7 (6w)	L8 (6w)	VL10 (6w)	S4 (12w)	M6 (12w)	L8 (12w)
Kcc	Short-circuit ratio	0.31	0.33	0.3	0.32	0.3	0.31	0.32
Xd	Direct-axis synchronous reactance unsaturated	407	377	394	368	394	398	380
Xq	Quadrature-axis synchronous reactance unsaturated	208	192	201	187	201	203	193
T'do	No-load transient time constant	3634	3750	3910	4058	3411	3634	4247
X'd	Direct-axis transient reactance saturated	30.3	27.2	27.2	24.5	31.2	29.6	24.1
T'd	Short-circuit transient time constant	180	180	180	180	180	180	180
X"d	Direct-axis subtransient reactance saturated	17.1	15.4	15.4	13.8	17.7	16.7	13.7
T"d	Subtransient time constant	18	18	18	18	18	18	18
X"q	Quadrature-axis subtransient reactance saturated	18	16.1	16.1	14.4	18.6	17.6	15.5
Xo	Zero sequence reactance	0.84	0.75	0.75	0.68	0.86	0.82	0.67
X2	Negative sequence reactance saturated	17.6	15.78	15.77	14.17	18.19	17.21	14.62
Ta	Armature time constant	27	27	27	27	27	27	27
Other class H/480 V data								
io (A)	No-load excitation current	0.82	0.85	0.78	0.78	0.78	0.82	0.79
ic (A)	On-load excitation current	3.69	3.56	3.47	3.27	3.49	3.61	3.38
uc (V)	On-load excitation voltage	46.4	44.8	43.6	41	44	45.5	42.5
ms	Response time (ΔU = 20% transient)	500	500	500	500	500	500	500
kVA	Start (ΔU = 20% cont. or 30% trans.)	3305	3977	4433	5272	2578	3321	4803
%	Transient ΔU (on-load 4/4) - P.F.: 0.8_{LAG}	14	12.9	12.9	11.9	14.3	13.7	11.7
W	No-load losses	22080	23864	24115	25675	20444	22080	23916
W	Heat dissipation	65871	67848	72952	73168	56038	63910	69953

Transient voltage variation 480V - 60 Hz





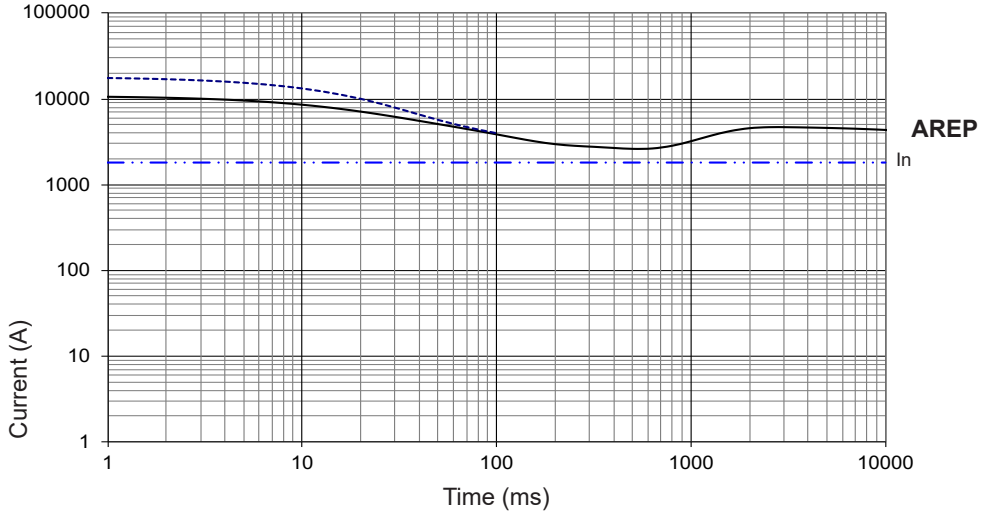


1) For a starting P.F. other than 0.6, the starting kVA must be multiplied by K = Sine P.F. / 0.8
2) For voltages other than 480V (Y), 277V (Δ), 240V (YY) at 60 Hz, then kVA must be multiplied by $(480/U)^2$ or $(277/U)^2$ or $(240/U)^2$.

3-phase short-circuit curves at no load and rated speed (star connection Y)

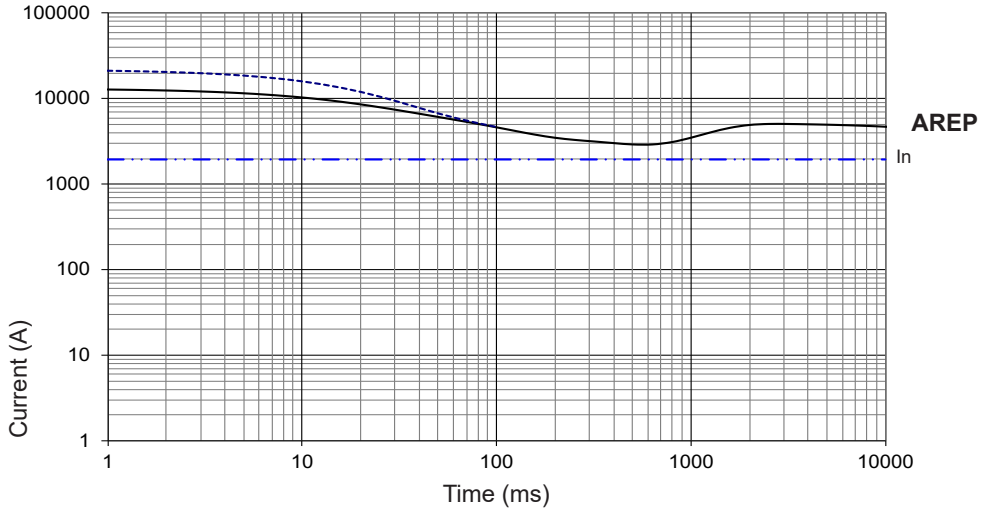
LSA 50.2 M6
(6 wires)

Symmetrical ——
Asymmetrical - - -



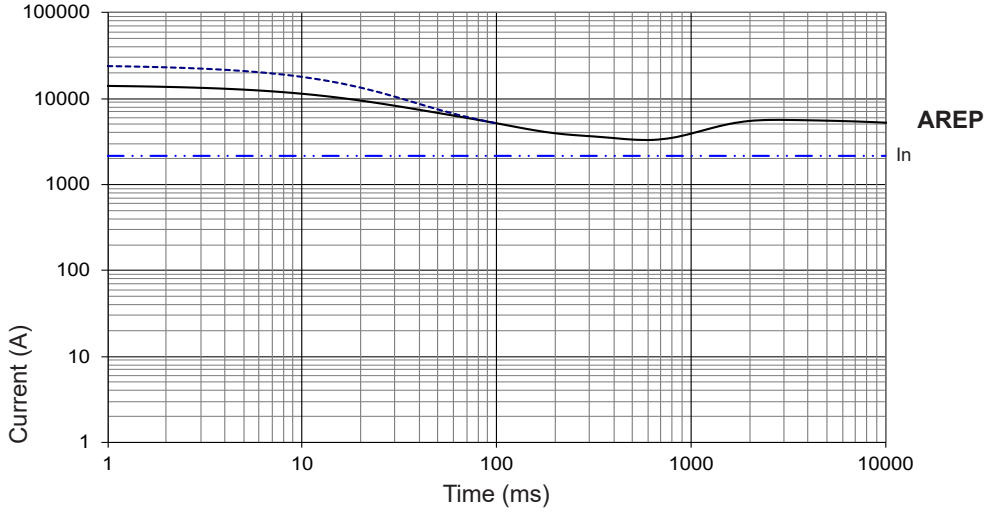
LSA 50.2 L7
(6 wires)

Symmetrical ——
Asymmetrical - - -



LSA 50.2 L8
(6 wires)

Symmetrical ——
Asymmetrical - - -

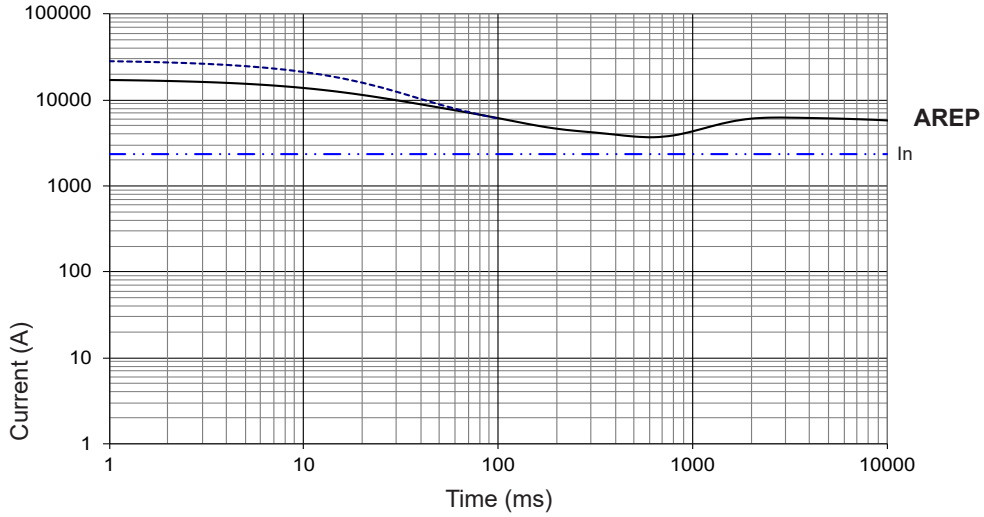


Influence due to connection
Curves shown are for star (Y) connection.
For other connections, use the following multiplication factors:
- Series delta : current value x 1.732 - Parallel star : current value x 2

3-phase short-circuit curves at no load and rated speed (star connection Y)

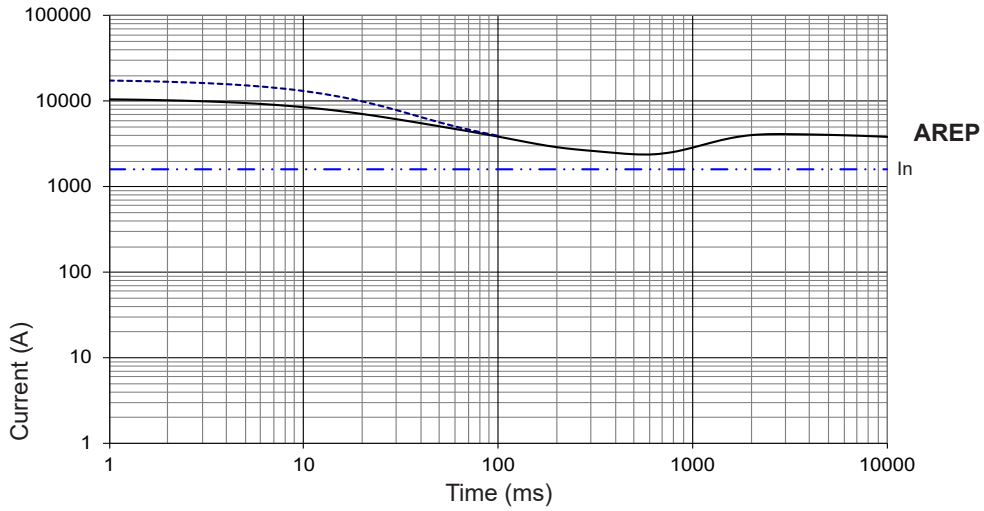
LSA 50.2 VL10 (6 wires)

Symmetrical ——
Asymmetrical - - -



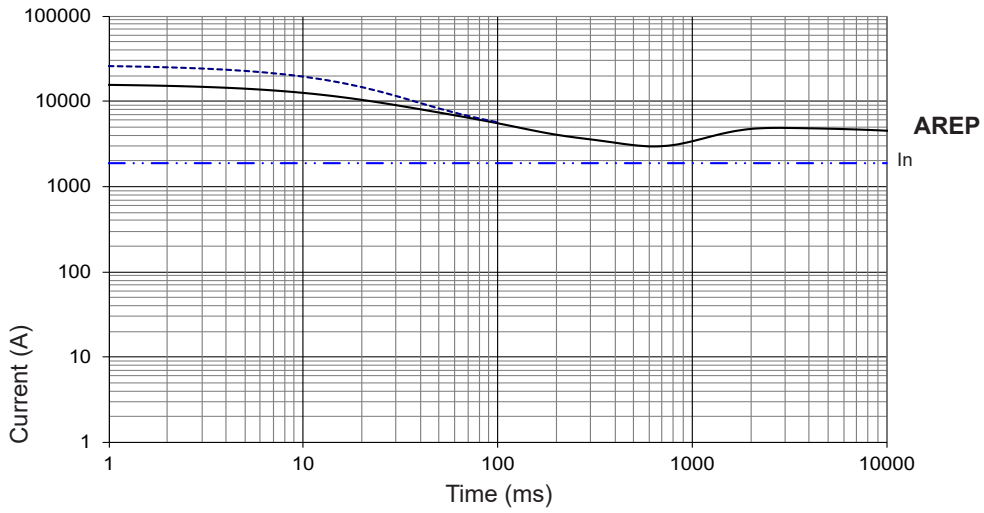
LSA 50.2 M6 (12 wires)

Symmetrical ——
Asymmetrical - - -



LSA 50.2 L8 (12 wires)

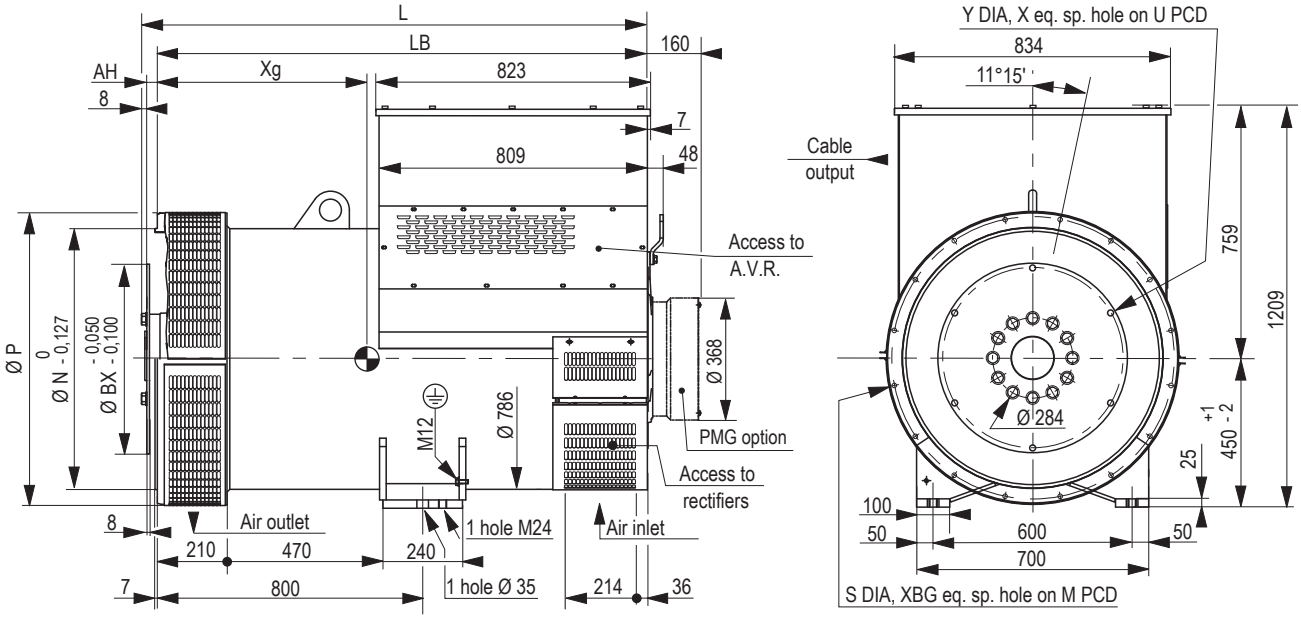
Symmetrical ——
Asymmetrical - - -



Influence due to short-circuit
Curves are based on a three-phase short-circuit.
For other types of short-circuit, use the following multiplication factors.

	3-phase	2-phase L/L	1-phase L/N
Instantaneous (max.)	1	0.87	1.3
Continuous	1	1.5	2.2
Maximum duration (AREP/PMG)	10 sec.	5 sec.	2 sec.

Single-bearing dimensions



Dimensions (mm) and weight				
Type	L without PMG maxi*	LB	Xg	Weight (kg)
LSA 50.2 S4	1302	1278	620	2290
LSA 50.2 M6	1402	1378	640	2490
LSA 50.2 L7	1502	1478	690	2760
LSA 50.2 L8	1502	1478	710	2980
LSA 50.2 VL10	1602	1578	760	3260

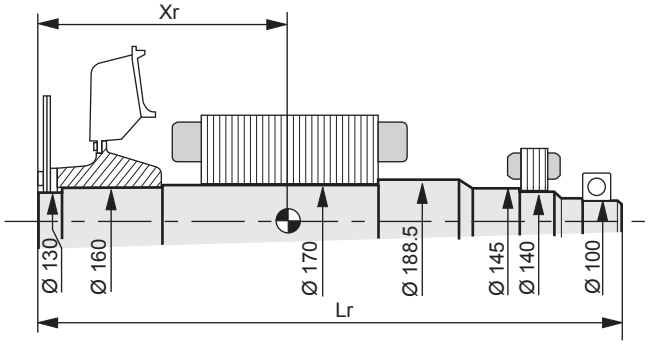
* L maxi = LB + AH maxi + 8

Coupling		
Flex plate	**18**	**21**
Flange S.A.E 0	X	
Flange S.A.E 00	X	X

Flange (mm)					
S.A.E.	P	N	M	XBG	β°
0	880	647.7	679.5	16	14
00	880	787.4	850.9	16	14

Flex plate (mm)					
S.A.E.	BX	U	X	Y	AH
21	673.1	641.3	12	18	0
18	571.5	542.9	6	18	15.7

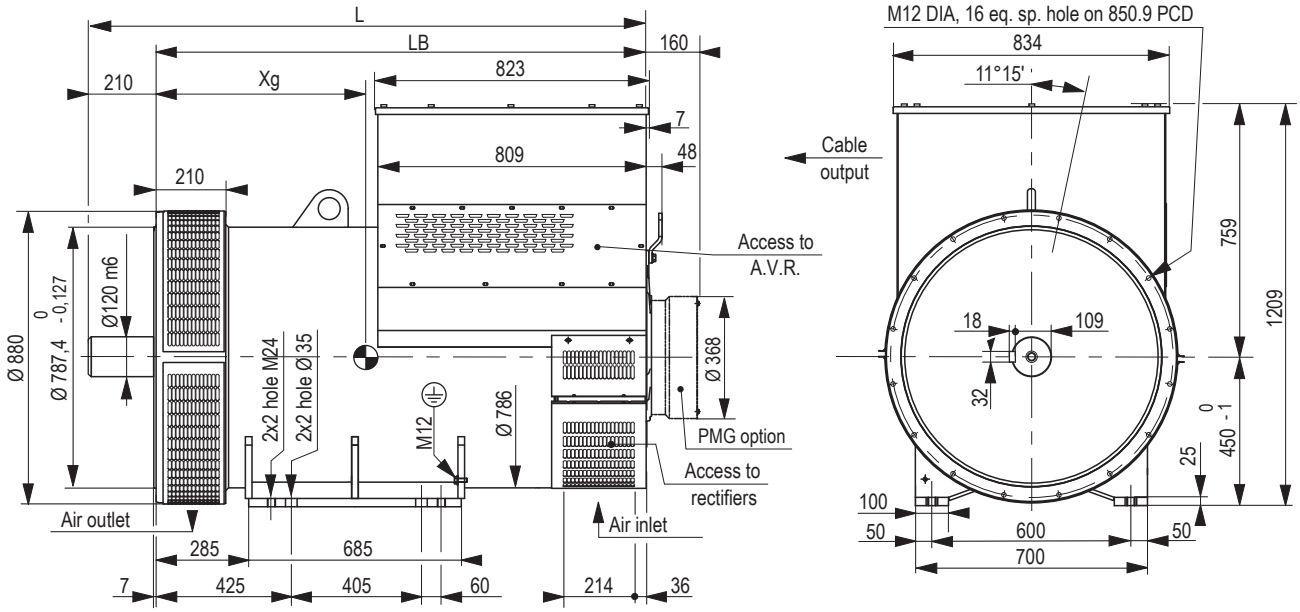
Torsional analysis data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm²): (4J = MD²)								
Flange	S.A.E. 18				S.A.E. 21			
Type	Xr	Lr	M	J	Xr	Lr	M	J
LSA 50.2 S4	564	1320.5	833	18.17	549	1320.5	831	18.62
LSA 50.2 M6	608	1420.5	934	20.6	593	1420.5	932	21.09
LSA 50.2 L7	643	1520.5	1005	22.23	627	1520.5	1003	22.68
LSA 50.2 L8	667	1520.5	1082	24.6	652	1520.5	1081	25.05
LSA 50.2 VL10	714	1620.5	1192	27.27	698	1620.5	1191	27.72

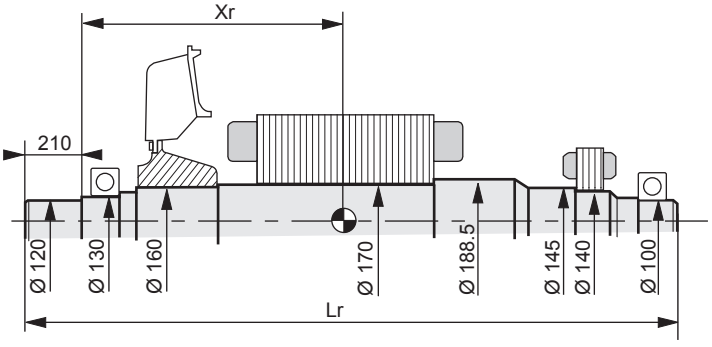
NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D drawings can be downloaded from the Leroy-Somer site, 3D drawing files are available upon request.
The torsional analysis of the transmission is imperative. All values are available upon request.

Two-bearing dimensions



Dimensions (mm) and weight				
Type	L without PMG	LB	Xg	Weight (kg)
LSA 50.2 S4	1488	1278	600	2330
LSA 50.2 M6	1588	1378	620	2530
LSA 50.2 L7	1688	1478	670	2800
LSA 50.2 L8	1688	1478	690	3010
LSA 50.2 VL10	1788	1578	740	3300

Torsional analysis data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm²): (4J = MD²)				
Type	Xr	Lr	M	J
LSA 50.2 S4	567	1509	800	17.24
LSA 50.2 M6	610	1609	900	19.71
LSA 50.2 L7	645	1709	971	21.29
LSA 50.2 L8	668	1709	1049	23.66
LSA 50.2 VL10	715	1809	1159	26.33

NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D drawings can be downloaded from the Leroy-Somer site, 3D drawing files are available upon request.
The torsional analysis of the transmission is imperative. All values are available upon request.

LEROY-SOMER™

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Moteurs Leroy-Somer SAS. Headquarters: Bd Marcellin Leroy, CS 10015, 16915 Angoulême Cedex 9, France. Share Capital: 32,239,235 €, RCS Angoulême 338 567 258.

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DSEGenset®

DSE®

DSE7310/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

KEY FEATURES

- Configurable power-up mode
- MPU fail delay
- Enhanced graphical user interface
- Drag & drop advanced PLC editor
- MSC ID within PLC GenComm override
- 4-Line back-lit LCD text display
- Multiple Display Languages
- Five key menu navigation
- LCD alarm indication
- Heated display option available
- Customisable power-up text and images
- DSENet expansion compatibility
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB, RS232 & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3 phase generator sensing and protection
- 3 phase mains (utility) sensing and protection (DSE7320 MKII only)
- Automatic load transfer control (DSE7320 MKII only)
- Generator current and power monitoring (kW, kvar, kVA, pf)
- Mains current and power monitoring (kW, kvar, kVA, pf) (DSE7320 MKII only)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Independent earth fault protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- 6 configurable DC outputs
- 2 configurable volt-free relay outputs
- 6 configurable analogue/digital inputs
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs
- Configurable 5 stage dummy load and load shedding outputs
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Manual and automatic fuel pump control
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- Simultaneous use of RS232 and RS485 communication ports
- True dual mutual standby using RS232 or RS485 for accurate engine hours balancing.
- MODBUS RTU support with configurable MODBUS pages.
- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- 3 configurable maintenance alarms
- Compatible with a wide range of CAN engines, including tier 4 engine support
- Uses DSE Configuration Suite PC Software for simplified configuration
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Modules can be integrated into building management systems (BMS) using MODBUS RTU

KEY BENEFITS

- Automatically transfers between mains (utility) and generator (DSE7320 MKII only) for convenience.
- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.

SPECIFICATIONS

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8 V to 35 V Continuous
5 V for upto 1 minute

CRANKING DROPOUTS
Able to survive 0 V for 100 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries. LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT
510 mA at 12 V, 240 mA at 24 V

MAXIMUM STANDBY CURRENT
330 mA at 12 V, 160 mA at 24 V

CHARGE FAIL/EXCITATION RANGE
0 V to 35 V

GENERATOR & MAINS (UTILITY)

VOLTAGE RANGE
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

MAGNETIC PICKUP

VOLTAGE RANGE
+/- 0.5 V to 70 V

FREQUENCY RANGE
10,000 Hz (max)

INPUTS

DIGITAL INPUTS A TO H
Negative switching

ANALOGUE INPUTS A & F
Configurable as:
Negative switching digital input
0 V to 10 V sensor
4 mA to 20 mA sensor
Resistive sensor

ANALOGUE INPUTS B, C, D & E
Configurable as:
Negative switching digital input
Resistive sensor

OUTPUTS

OUTPUT A & B (FUEL & START)
15 A DC at supply voltage

OUTPUTS C & D
8 A AC at 250 V AC (Volt-free)

AUXILIARY OUTPUTS E, F, G, H, I & J
2 A DC at supply voltage

DIMENSIONS

OVERALL
245 mm x 184 mm x 51 mm
9.6” x 7.2” x 2.0”

PANEL CUT-OUT
220 mm x 160 mm
8.7” x 6.3”

MAXIMUM PANEL THICKNESS
8 mm
0.3”

STORAGE TEMPERATURE RANGE
-40°C to +85°C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE
-30°C to +70°C
-22 °F to +158 °F

HEATED DISPLAY VARIANT
-40 °C to +70 °C
-40 °F to +158 °F

RELATED MATERIALS

TITLE	PART NO.
DSE7310 MKII & DSE7320 MKII Installation Instructions	053-181
DSE7310 MKII & DSE7320 MKII Operator Manual	057-253
DSE7310 MKII & DSE7320 MKII Configuration Suite PC Manual	057-243

DEEP SEA ELECTRONICS LTD
Highfield House, Hunmanby Industrial Estate, Hunmanby YO14 0PH
TELEPHONE +44 (0) 1723 890099
EMAIL sales@deepseaelectronics.com **WEBSITE** www.deepseaelectronics.com

DEEP SEA ELECTRONICS INC USA
3230 Williams Avenue, Rockford, IL 61101-2668 USA
TELEPHONE +1 (815) 316 8706
EMAIL usasales@deepseaelectronics.com **WEBSITE** www.deepseaelectronics.com

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VAT No.316923457

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DSEGenset®

DSE®

DSE7310/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

The DSE7310 MKII is an Auto Start Control Module and the DSE7320 MKII is an Auto Mains (Utility) Failure Control Module suitable for a wide variety of single, diesel or gas, gen-set applications.

Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs, remote PC and via SMS text alerts (with external modem).

The DSE7320 MKII will also monitor the mains (utility) supply. The modules include USB, RS232 and RS485 ports as well as dedicated DSENet® terminals for system expansion.

Both modules are compatible with electronic (CAN) and non-electronic (magnetic pick-up/alternator sensing) engines and offer an extensive number of flexible inputs, outputs and extensive engine protections so the system can be easily adapted to meet the most demanding industry requirements.

The extensive list of features includes enhanced event and performance monitoring, remote communications & PLC functionality. Dual mutual standby is now available on both the DSE7310 MKII & DSE7320 MKII using RS232 or RS485 communications. This provides for a simpler and more convenient installation with more advanced features such as true engine hours balancing.

The modules can be easily configured using the DSE Configuration Suite PC software. Selected front panel editing is also available.

ENVIRONMENTAL TESTING STANDARDS

ELECTRO-MAGNETIC COMPATIBILITY
BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

ELECTRICAL SAFETY
BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

TEMPERATURE
BS EN 60068-2-1
Ab/Ae Cold Test -30 ºC
BS EN 60068-2-2
Bb/Be Dry Heat +70 ºC

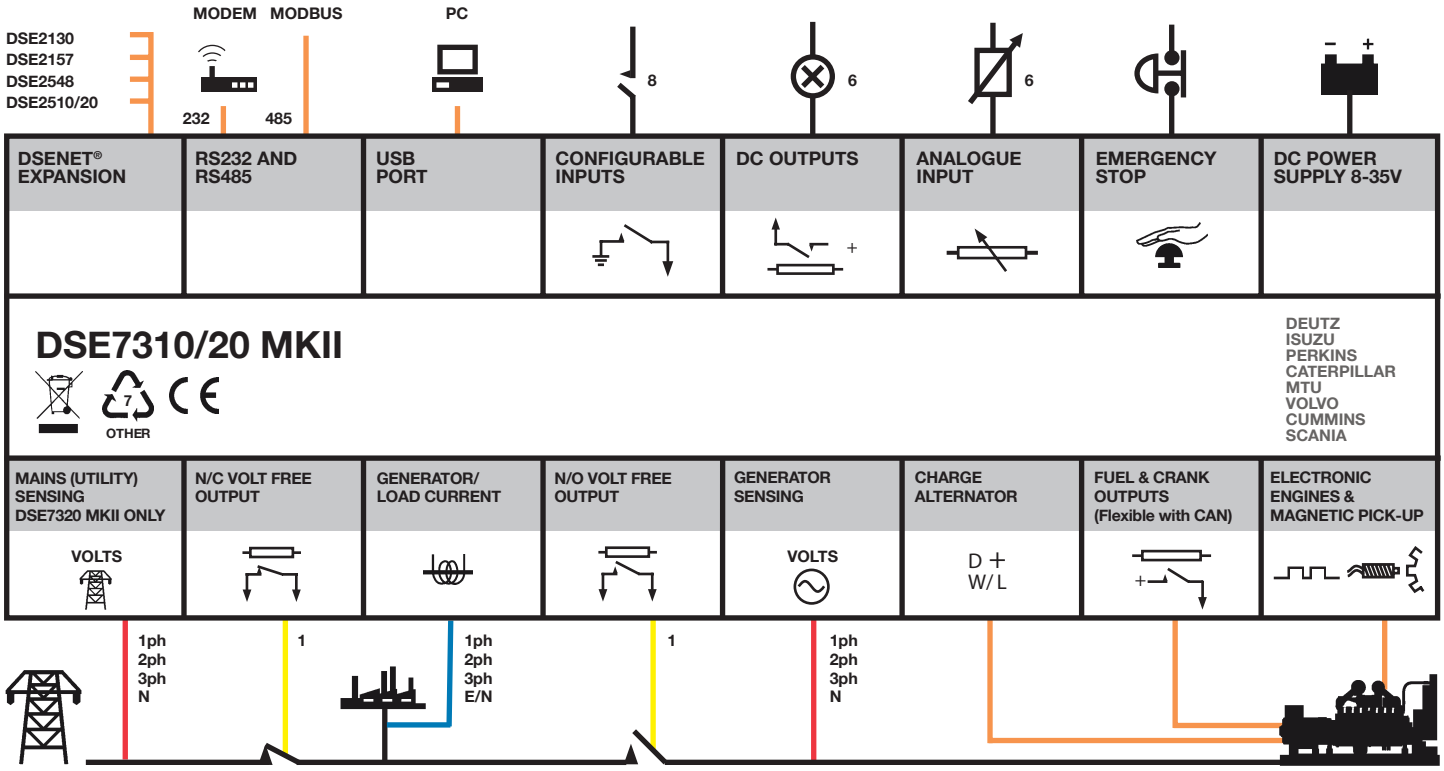
VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz at +/-7.5 mm,
8 Hz to 500 Hz at 2 gn

HUMIDITY
BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 ºC
at 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 ºC
at 93% RH 48 Hours

SHOCK
BS EN 60068-2-27
Three shocks in each of three major axes
15 gn in 11 mS

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES
BS EN 60529
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF GEN-SET APPLICATIONS



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