DAR AL-EBDA'A
POWER GENERATORS COMPANY

Perkins® TECHNICAL DATA SHEET

PL2250

Prime Power	Standby Power	Voltage/Ph	Hz/RPM	PF
2250 kVA/1800 kW	2500kVA/2000 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 4016-61TRG3
Alternator Make /Model	Leroy Somer LSA52.3 L9
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	255	380	14403
Open Type	675	220	343	10503

ENGINE SPECIFICATIONS

Engine Make Model	PERKINS 4016-61TRG3
No. of Cylinders	16 60° Vee form
Cycle	4 Stroke
Aspiration	Turbocharged
Cooling Method	Water cooled
Governing Type	Electronic
Governing Class	G2 - ISO 8528 Part 1
Compression Ratio	13.6:1
Displacement	61.1 L
Bore/Stroke	160 x 190 mm
Dynamic Charging Alter nator	55AMP, 24V

LUBRICATION SYSTEM

Oil Filter Type	Spin-On Full Flow
Total Oil Capacity	237 L
Oil Type	API-CH-4 or ACEA E5

AIR SYSTEM

Air Filter Type	Dry Element
Combustion Air Flow (PRP)	132 m³/min
Combustion Air Flow (ESP)	145 m³/min
Max Air Filter Intake Restriction	3.7 kPA

COOLING SYSTEM

Total Coolant Capacity (L)	316 L
Cooling Fan Air Flow	2430 m³/ min
Radiator Fan Load	51 kW
Cooling system design	Above 50ºC
Heat Radiation to Room (PRP)	109 kW

Exhaust System

Muffler Type	Industrial Grade
Max. Back Pressure	3.0 kPa
Exhaust Gas Flow (PRP/ESP)	387 m³/ min
Exhaust Gas Tempera ture	< 439ºC

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.

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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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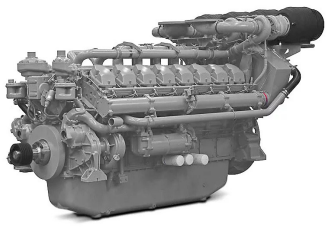
PL2250



Perkins Engine
4016-61TRG3

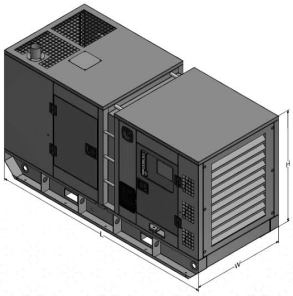
Engine Fuel System	
Recommended Fuel	Class A2 Diesel
Fuel Consumption Standby	529 L/hr
Fuel Consumption 100% PRP	470 L/hr
Fuel Consumption 75% PRP	344 L/hr
Fuel Consumption 50% PRP	234 L/hr

Leroy Somer
LSA52.3 L9

ALTERNATOR SPECIFICATIONS	
Alternator Make /Model	Leroy Somer LSA52.3 L9
AVR Model	D510C
Number of Poles	4
Number of Winding Leads	12
Type of Bearing	Single Bearing Insulation
Insulation Class - Temp Rise	Cont. H - 125/40ºC Ingress
Ingress Protection Rating	IP 23
Excitation System	AREP + PMI
Voltage Regulation	+ 0.5%
Harmonic Coefficient THF	< 2%
Tel. influence TIF	< 50
Cooling air flow	2.5 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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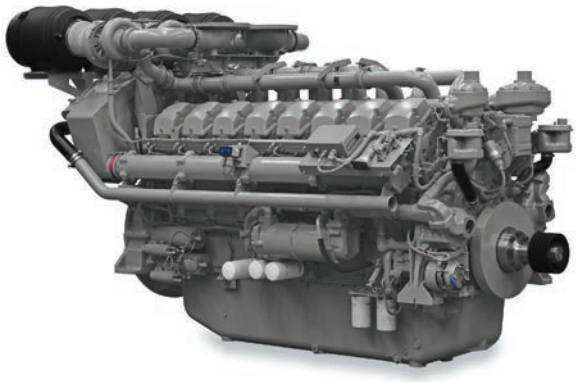
4000 Series 4016-61TRG3 Diesel Engine – ElectropaK

2083 kWm @ 1500 rpm net standby power

The Perkins® 4000 Series family of 6, 8, 12 and 16 cylinder diesel engines was designed in advance of today's uncompromising demands within the power generation industry and includes superior performance and reliability.

The 4016-61TRG3 is a turbocharged, air-to-water charge-cooled, 16 cylinder diesel engine.

Its premium design and specification features provide economic and durable operation as well as exceptional power to weight ratio, improved serviceability, low gaseous emissions, overall performance and reliability essential to the power generation market. The 4016-61TRG3 is specially tuned for improved load acceptance response in standby duty.



Specification				
Number of cylinders	16 60º Vee form			
Bore and stroke	160 x 190 mm		6.3 x 7.5 in	
Displacement	61.123 litres		3730 in^3	
Aspiration	Quad turbocharged. 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	237.2 litres		62.7 US gal	
Cooling system	Water-cooled			
	Temperate		Tropical	
Total coolant capacity	260 litres	68.7 US gal	270 litres	71.3 US gal

www.perkins.com

Photographs are for illustrative purposes only and may not reflect final specification.
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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 4016-61TRG3 Diesel Engine – ElectropaK

2083 kWm @ 1500 rpm net standby power

Features and benefits

Dependable power

- Individual 4 valve cylinder heads 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 levels
- 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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THE HEART OF EVERY GREAT MACHINE

4000 Series 4016-61TRG3 Diesel Engine – ElectropaK

2083 kWm @ 1500 rpm net standby power

Technical information

Air inlet

- Mounted air filter and turbocharger

Fuel system

- Direct fuel injection system with fuel lift pump
- Digital governing to ISO 8528-5 class G2 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
- Raw water pump

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
- Removal of raw water pump

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THE HEART OF EVERY GREAT MACHINE

4000 Series 4016-61TRG3 Diesel Engine – ElectropaK

2083 kWm @ 1500 rpm net standby power

Engine package weights and dimensions				
	Temperate		Tropical	
Length	4542 mm	179 in	4562 mm	180 in
Width	2185 mm	86 in	2185 mm	86 in
Height	3175 mm	125 in	3736 mm	147 in
Weight (dry)	5570 kg	12280 lb	5570 kg	12280 lb

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4000 Series 4016-61TRG3 Diesel Engine – ElectropaK

2083 kWm @ 1500 rpm net standby power

Speed rpm	Type of operation	Typical generator output (Net)		Engine power			
				Gross		Net	
		kVA	kWe	kWm	hp	kWm	hp
1500	Baseload power	1800	1440	1600	2144	1500	2010
	Prime power	2250	1800	1975	2647	1875	2513
	Standby power	2500	2000	2183	2925	2083	2791

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

Ratings conditions: 25ºC air inlet temperature, barometer pressure 100 kPa, relative humidity 30%. Please consult your distributor or the factory for ratings in 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:** BS 2869 Class A1 + A2 or ASTM D975 No 2D.

Rating definitions

Continuous baseload: 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 for a maximum of 500 hours per year. No overload is permitted.

Percent of prime power	Fuel consumption at 1500 rpm g/kWh	Fuel consumption at 1500 rpm l/hr
Standby power	209	529
Prime power	205	470
Baseload power	200	371
75%	200	344
50%	204	234
25%	220	126

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THE HEART OF EVERY GREAT MACHINE

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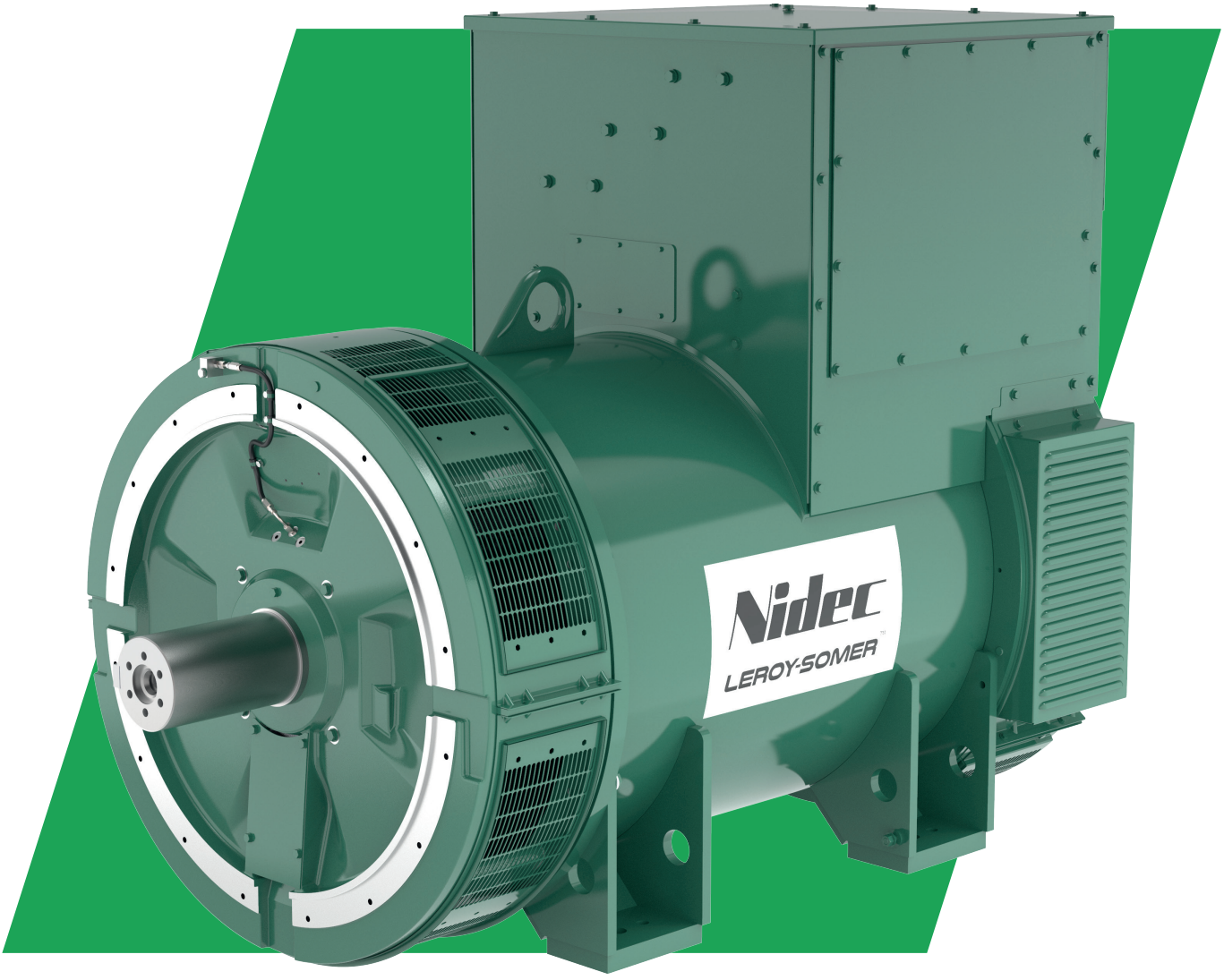


LSA 52.3

Low Voltage Alternator - 4 poles

1860 to 2750 kVA - 50 Hz / 2230 to 3400 kVA - 60 Hz

Electrical and mechanical data

LEROY-SOMER™

The best of performance

The Leroy-Somer™ LSA 52.3 alternator has been designed to offer you the best power generation performances.
With its meticulous design and optimized architecture, the LSA 52.3 strikes the perfect balance between compactness, reliability, performance and longevity.
Whatever your application, the Leroy-Somer™ LSA 52.3 alternator will meet your needs and will adapt to all situations.

Standards

The Leroy-Somer™ LSA 52.3 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.
The Leroy-Somer™ LSA 52.3 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)
- Voltage range:
  - 50 Hz: 380V - 400V - 415V
  - 60 Hz: 440V - 480V
- High efficiency and motor starting capacity
- Other voltages are possible with optional adapted windings:
  - 50 Hz: 440V (no. 7), 500V (no. 9), 600V (no. 23), 690V (no. 52)
  - 60 Hz: 380V and 416V (no. 8), 600V (no. 9), 690V (no. 22)

Excitation and regulation system

Excitation system			Regulation options		
AVR	**AREP + PMI**	**PMG**	**C.T. Current transformer for paralleling**	**Mains paralleling**	**Remote voltage potentiometer**
D550	Standard	Option	√	√	√

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

Protection system and options

- Degree of protection: 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% (derating 6%)
  - Space heater
  - Protection or metering CTs
  - Thermal protection for stator winding and/or bearings (PT100)

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
- Regreasable bearings
- Clockwise rotation in standard

Terminal box design

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

General characteristics

Insulation class	H	Excitation system	AREP + PMI
Winding pitch	2/3 (wind. 6S)	AVR type	D550
Number of wires	6	Voltage regulation (*)	± 0.25%
Protection	IP 23	Short-circuit current	300% (3 IN) : 10s
Altitude	≤ 1000 m	Total Harmonic Distortion THD (**) in no-load	< 4%
Overspeed	2250 R.P.M.	Waveform: NEMA = TIF (**)	< 50
Air flow	2.5 m³/s (50 Hz) - 2.8 m³/s (60 Hz)	Waveform: I.E.C. = THF (**)	< 2%

(*) steady state (**) between phases

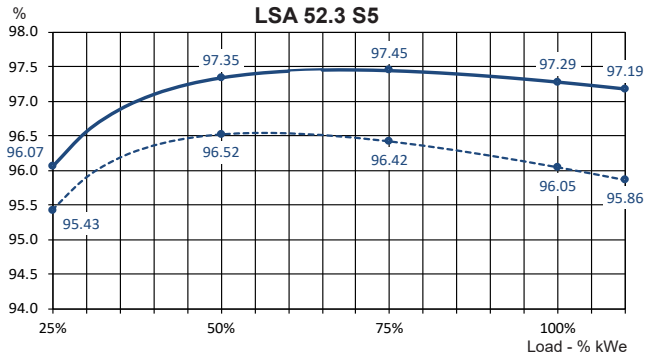
Ratings 50 Hz - 1500 R.P.M.

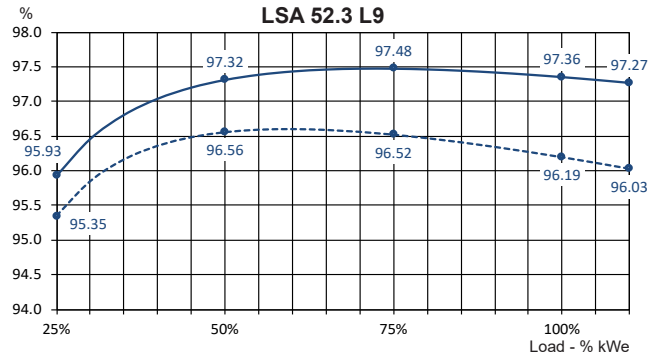
kVA / kW - P.F. = 0.8													
Duty/T°C		Continuous duty/40°C			Continuous duty/40°C			Stand-by/40°C			Stand-by/27°C		
Class/T°K		H/125°K			F/105°K			H/150°K			H/163°K		
Phase		3 ph.			3 ph.			3 ph.			3 ph.		
Y		380V	**400V**	415V	380V	**400V**	415V	380V	**400V**	415V	380V	**400V**	415V
LSA 52.3 S5	kVA	1860	**1860**	1860	1696	**1696**	1696	1953	**1953**	1953	2046	**2046**	2046
	kW	*1488*	***1488***	*1488*	*1357*	***1357***	*1357*	*1562*	***1562***	*1562*	*1637*	***1637***	*1637*
LSA 52.3 S6	kVA	2000	**2000**	2000	1824	**1824**	1824	2100	**2100**	2100	2200	**2200**	2200
	kW	*1600*	***1600***	*1600*	*1459*	***1459***	*1459*	*1680*	***1680***	*1680*	*1760*	***1760***	*1760*
LSA 52.3 S7	kVA	2200	**2200**	2200	2006	**2006**	2006	2310	**2310**	2310	2420	**2420**	2420
	kW	*1760*	***1760***	*1760*	*1605*	***1605***	*1605*	*1848*	***1848***	*1848*	*1936*	***1936***	*1936*
LSA 52.3 L9	kVA	2360	**2360**	2360	2152	**2152**	2152	2478	**2478**	2478	2596	**2596**	2596
	kW	*1888*	***1888***	*1888*	*1722*	***1722***	*1722*	*1982*	***1982***	*1982*	*2077*	***2077***	*2077*
LSA 52.3 L12	kVA	2560	**2560**	2560	2335	**2335**	2335	2688	**2688**	2688	2816	**2816**	2816
	kW	*2048*	***2048***	*2048*	*1868*	***1868***	*1868*	*2150*	***2150***	*2150*	*2253*	***2253***	*2253*
LSA 52.3 UL16	kVA	2750	**2750**	2750	2508	**2508**	2508	2888	**2888**	2888	3025	**3025**	3025
	kW	*2200*	***2200***	*2200*	*2006*	***2006***	*2006*	*2310*	***2310***	*2310*	*2420*	***2420***	*2420*

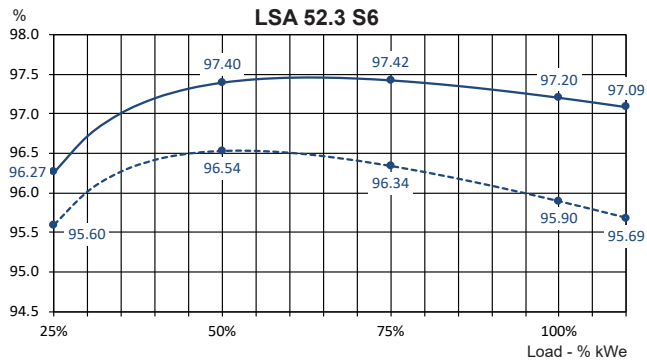
Ratings 60 Hz - 1800 R.P.M.

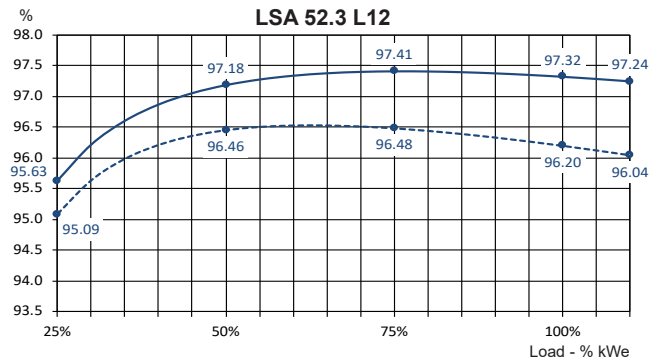
kVA / kW - P.F. = 0.8									
Duty/T°C		Continuous duty/40°C		Continuous duty/40°C		Stand-by/40°C		Stand-by/27°C	
Class/T°K		H/125°K		F/105°K		H/150°K		H/163°K	
Phase		3 ph.		3 ph.		3 ph.		3 ph.	
Y		440V	**480V**	440V	**480V**	440V	**480V**	440V	**480V**
LSA 52.3 S5	kVA	2046	**2232**	1866	**2036**	2149	**2344**	2250	**2455**
	kW	*1637*	***1786***	*1493*	***1629***	*1719*	***1875***	*1800*	***1964***
LSA 52.3 S6	kVA	2200	**2400**	2007	**2189**	2310	**2520**	2420	**2640**
	kW	*1760*	***1920***	*1606*	***1751***	*1848*	***2016***	*1936*	***2112***
LSA 52.3 S7	kVA	2420	**2640**	2207	**2408**	2541	**2772**	2662	**2904**
	kW	*1936*	***2112***	*1766*	***1926***	*2033*	***2218***	*2130*	***2323***
LSA 52.3 L9	kVA	2596	**2832**	2368	**2583**	2726	**2974**	2855	**3115**
	kW	*2077*	***2266***	*1894*	***2066***	*2181*	***2379***	*2284*	***2492***
LSA 52.3 L12	kVA	2850	**3250**	2599	**2964**	2993	**3413**	3135	**3575**
	kW	*2280*	***2600***	*2079*	***2371***	*2394*	***2730***	*2508*	***2860***
LSA 52.3 UL16	kVA	3100	**3400**	2827	**3101**	3255	**3570**	3410	**3740**
	kW	*2480*	***2720***	*2262*	***2481***	*2604*	***2856***	*2728*	***2992***

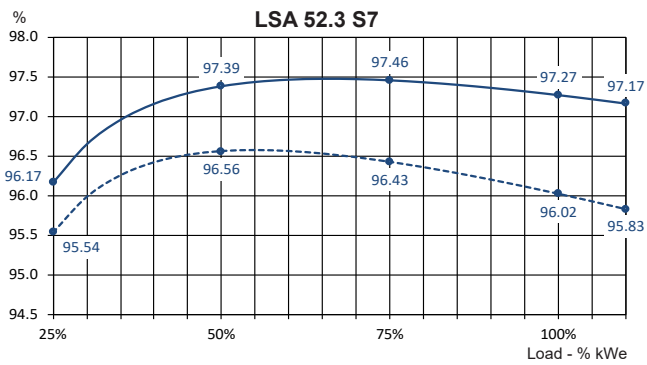
Efficiencies 400V - 50 Hz (--- P.F.: 0.8) (— P.F.: 1)

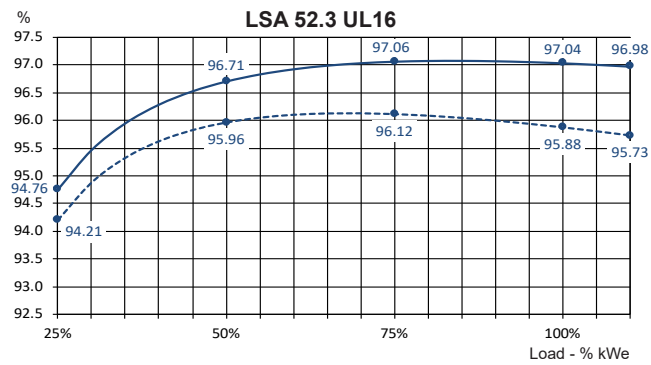












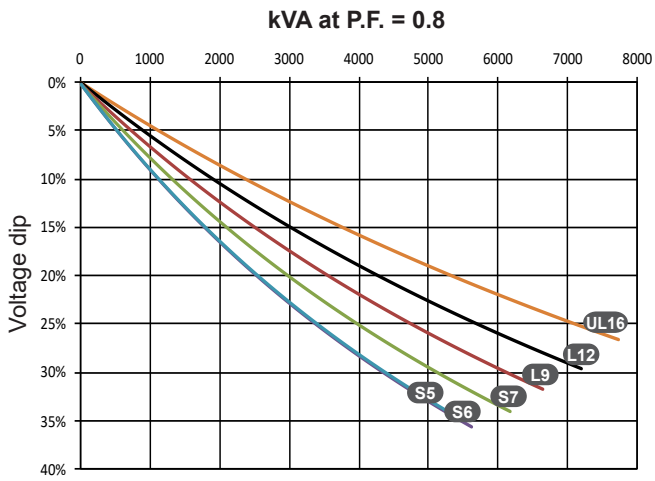
Reactances (%). Time constants (ms) - Class H / 400 V

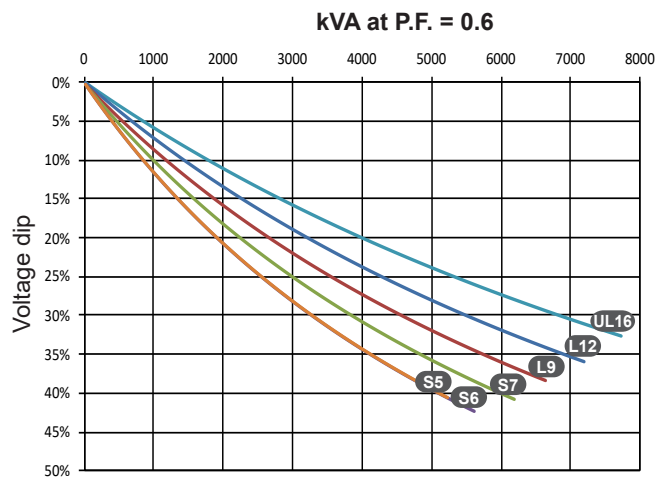
		S5	S6	S7	L9	L12	UL16
Kcc	Short-circuit ratio	0.35	0.32	0.35	0.39	0.42	0.51
Xd	Direct-axis synchronous reactance unsaturated	367	380	376	344	313	267
Xq	Quadrature-axis synchronous reactance unsaturated	187	194	192	175	160	136
T'do	No-load transient time constant	2760	2760	2870	2990	2760	2920
X'd	Direct-axis transient reactance saturated	28.7	30.9	28.9	26.1	23.6	20.3
T'd	Short-circuit transient time constant	254	264	260	267	245	261
X"d	Direct-axis subtransient reactance saturated	15	16.4	14.8	13.2	12.1	10.5
T"d	Subtransient time constant	23	23	22	22	13	14
X"q	Quadrature-axis subtransient reactance saturated	15.6	16.9	15.4	13.7	12.5	10.8
X0	Zero sequence reactance	2.3	2.5	2.6	2.5	2.7	2.6
X2	Negative sequence reactance saturated	15.3	16.7	15.1	13.4	12.3	10.6
Ta	Armature time constant	28	28	28	28	29	30

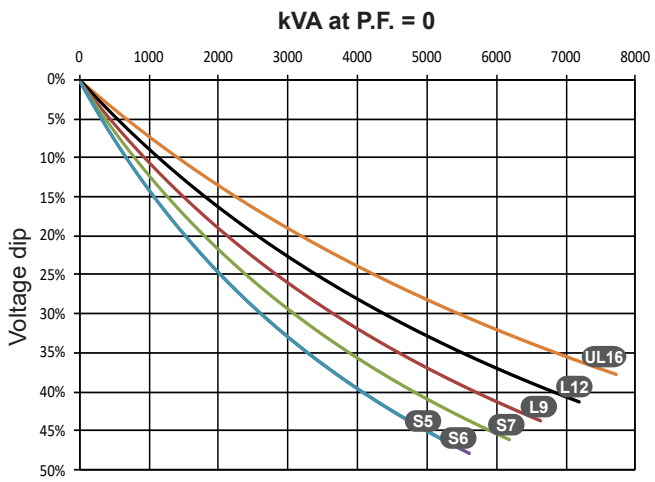
Other class H/400 V data

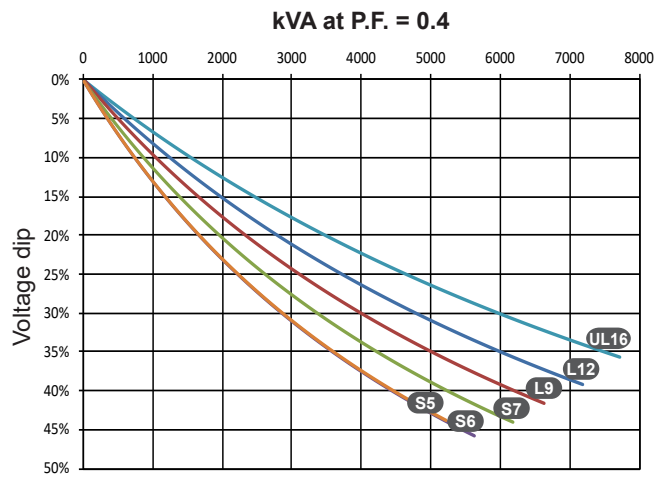
io (A)	No-load excitation current	1.2	1.2	1.2	1.2	1.3	1.4
ic (A)	On-load excitation current	4.4	4.7	4.6	4.4	4.1	3.9
uc (V)	On-load excitation voltage	45	47	47	44	42	38
kW	No-load losses	15	15	17	20	24	26
kW	Heat dissipation	68	76	79.5	79.2	81	100

Transient voltage variation at load inrush: 400V - 50 Hz

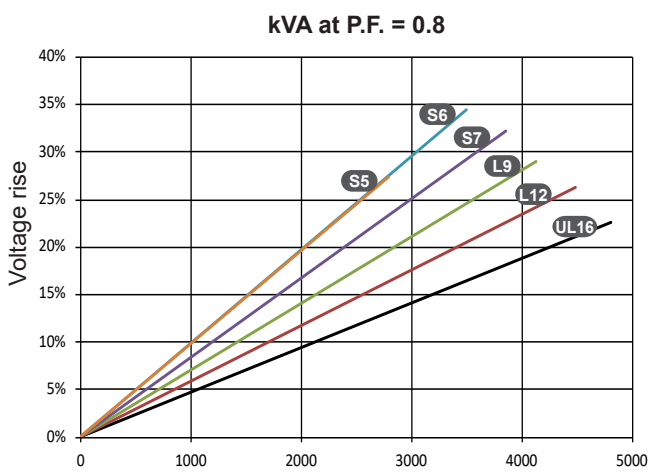




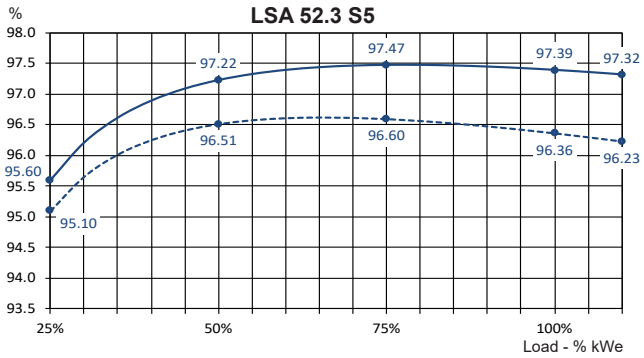


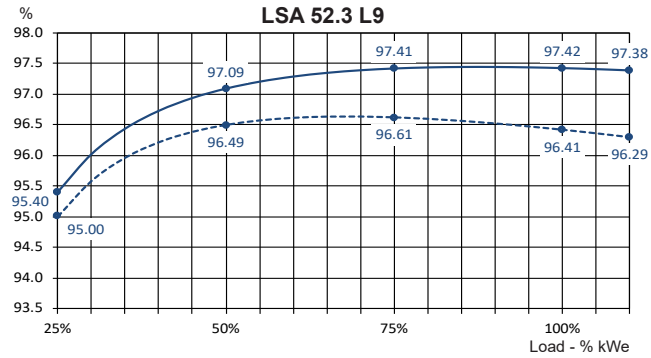


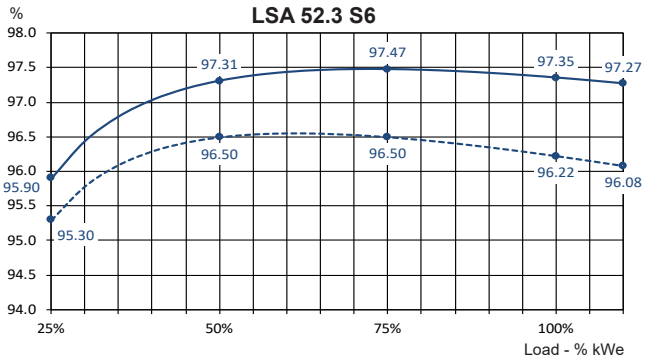
Transient voltage variation at load rejection: 400V - 50 Hz

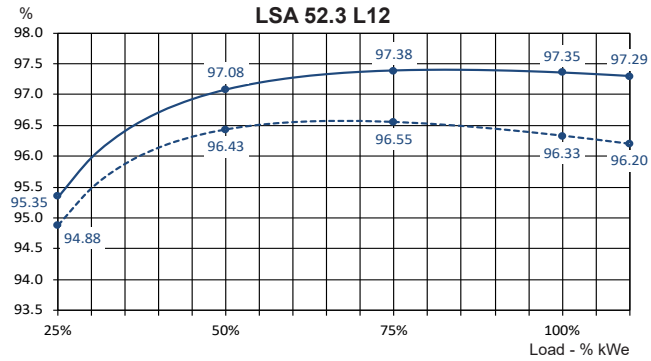


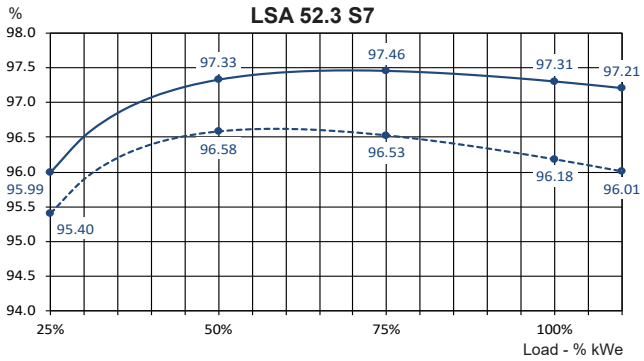
Efficiencies 480V - 60 Hz (--- P.F.: 0.8) (— P.F.: 1)

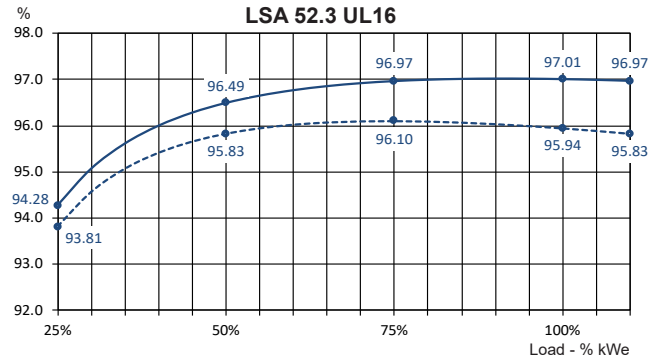








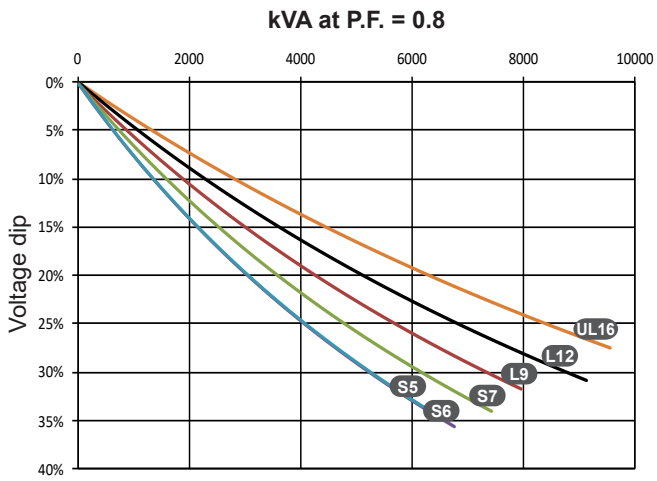


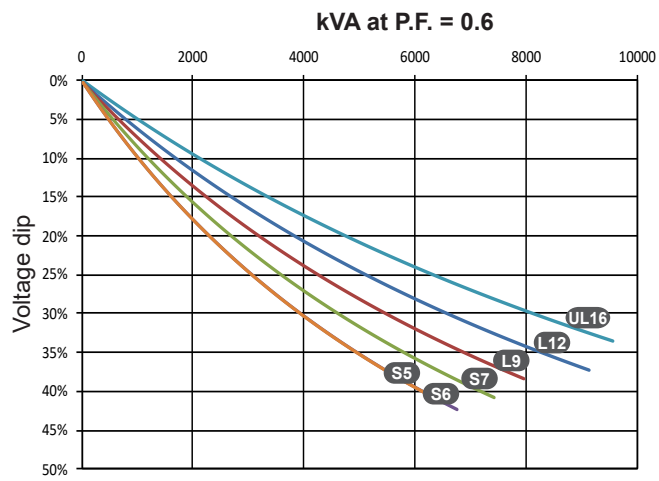


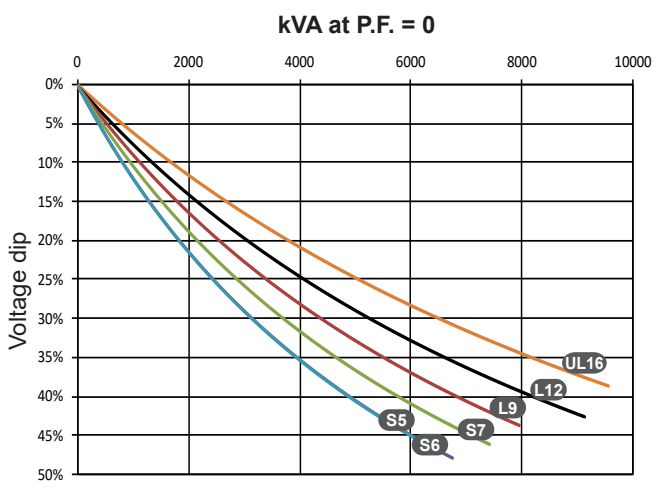
Reactances (%). Time constants (ms) - Class H / 480 V

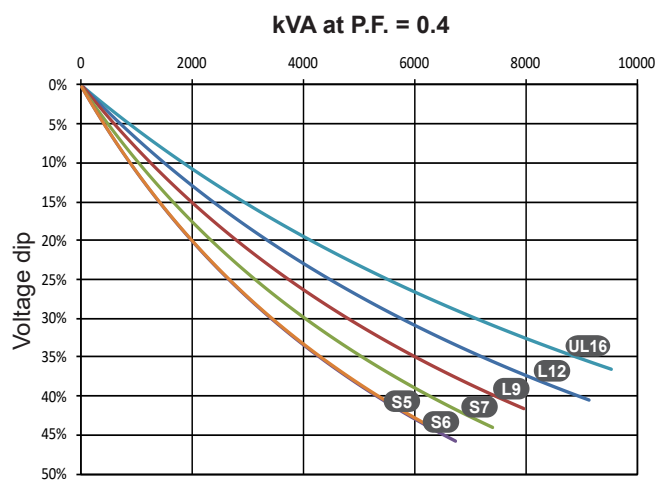
		S5	S6	S7	L9	L12	UL16
Kcc	Short-circuit ratio	0.35	0.32	0.35	0.39	0.40	0.49
Xd	Direct-axis synchronous reactance unsaturated	367	380	376	344	331	275
Xq	Quadrature-axis synchronous reactance unsaturated	187	194	192	175	169	140
T'do	No-load transient time constant	2760	2760	2870	2990	2760	2920
X'd	Direct-axis transient reactance saturated	28.7	30.9	28.9	26.1	25	20.9
T'd	Short-circuit transient time constant	254	265	260	267	245	261
X"d	Direct-axis subtransient reactance saturated	15	16.4	14.8	13.2	12.8	10.8
T"d	Subtransient time constant	23	23	22	22	13	14
X"q	Quadrature-axis subtransient reactance saturated	15.6	16.9	15.4	13.7	13.2	11.1
X0	Zero sequence reactance	2.3	2.6	2.6	2.5	2.9	2.7
X2	Negative sequence reactance saturated	15.3	16.7	15.1	13.4	13	11
Ta	Armature time constant	28	28	28	28	29	30
Other class H/480 V data							
io (A)	No-load excitation current	1.1	1.1	1.2	1.2	1.2	1.3
ic (A)	On-load excitation current	4.2	4.5	4.5	4.2	4.2	3.7
uc (V)	On-load excitation voltage	43	46	45	43	42	36
kW	No-load losses	21	21	24	28	33	36
kW	Heat dissipation	73	82	86	87	96	120

Transient voltage variation at load inrush: 480V - 60 Hz

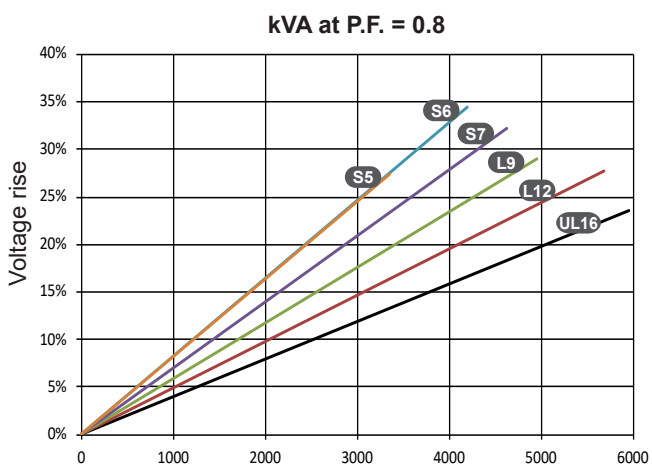






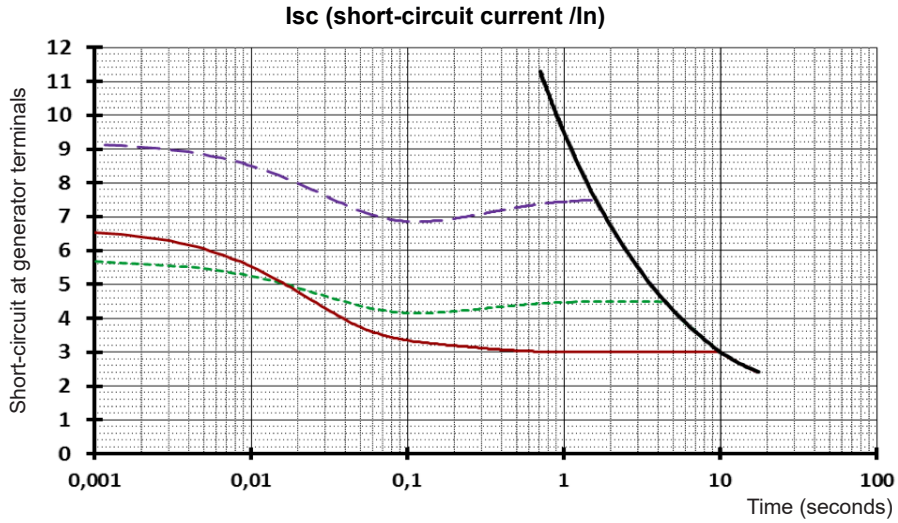


Transient voltage variation at load rejection: 480V - 60 Hz

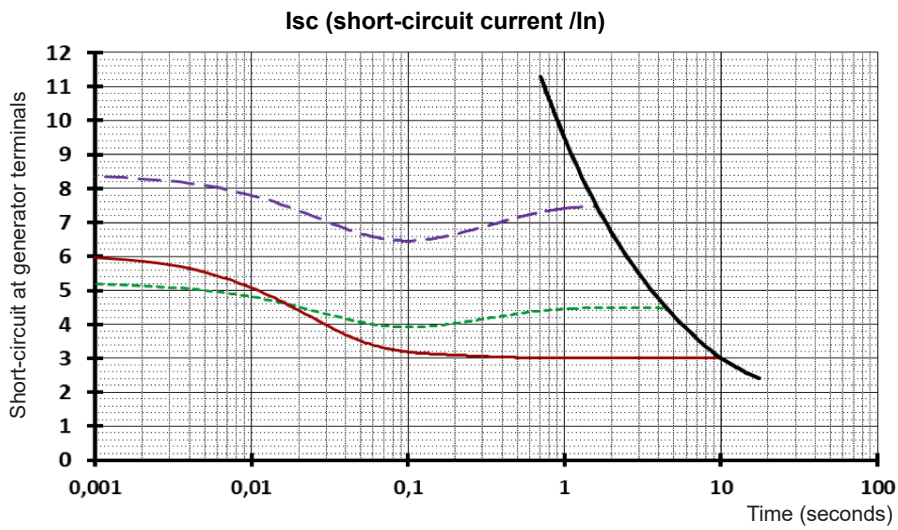


Short-circuit curves at rated speed (star connection Y)

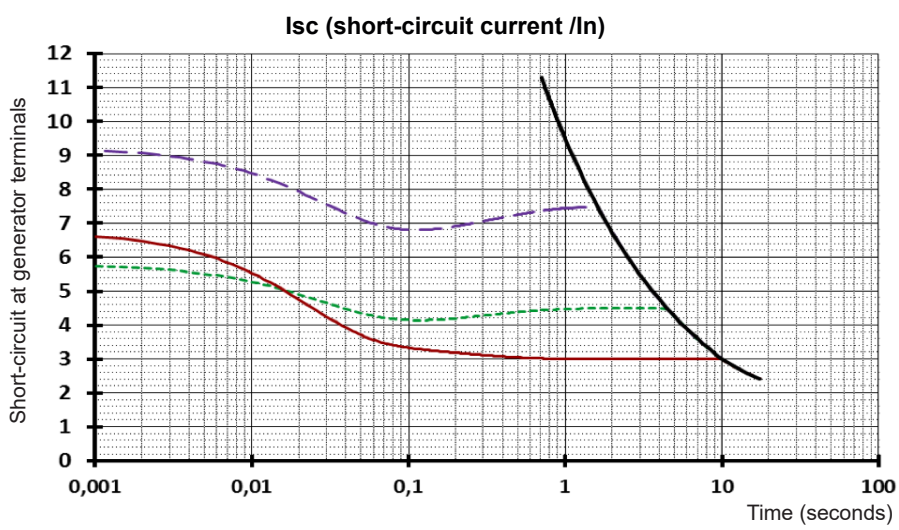
LSA 52.3 S5



LSA 52.3 S6



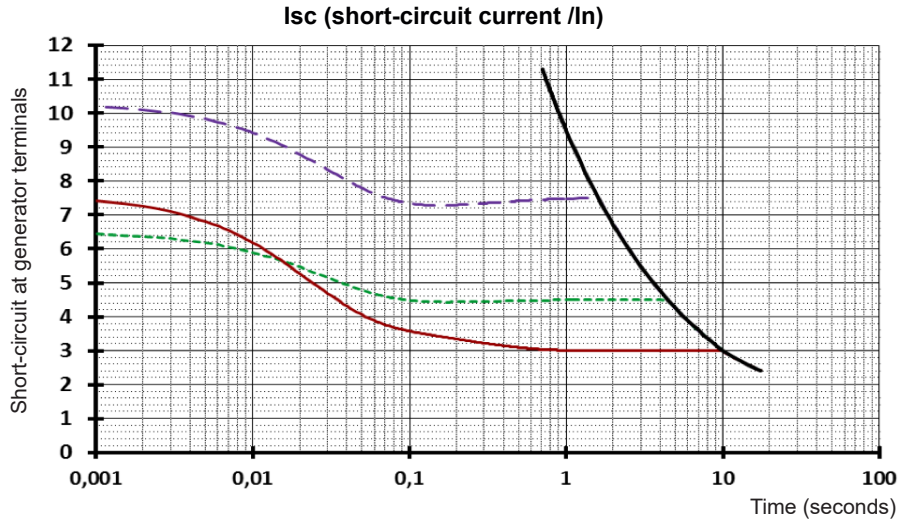
LSA 52.3 S7



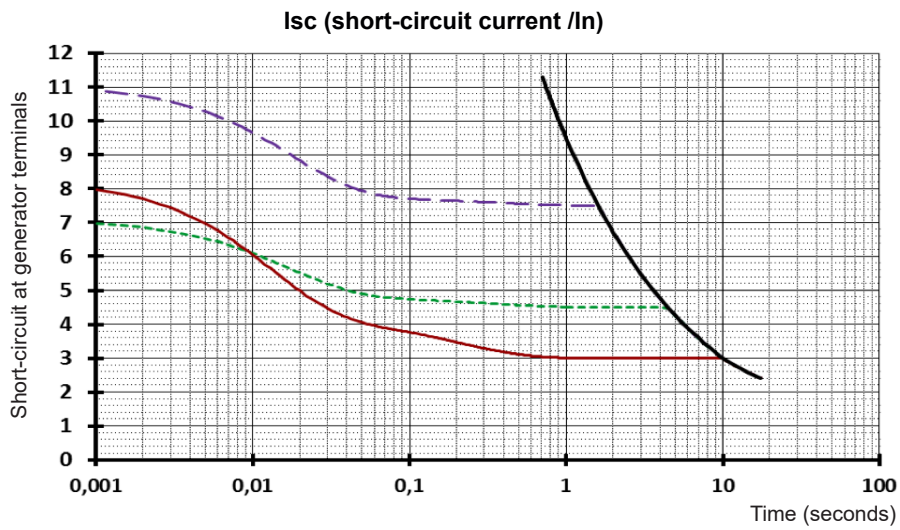
- Symetrical phase to neutral short-circuit
- Symetrical two-phase short-circuit
- Symetrical three-phase short-circuit
- Thermal limit curve

Short-circuit curves at rated speed (star connection Y)

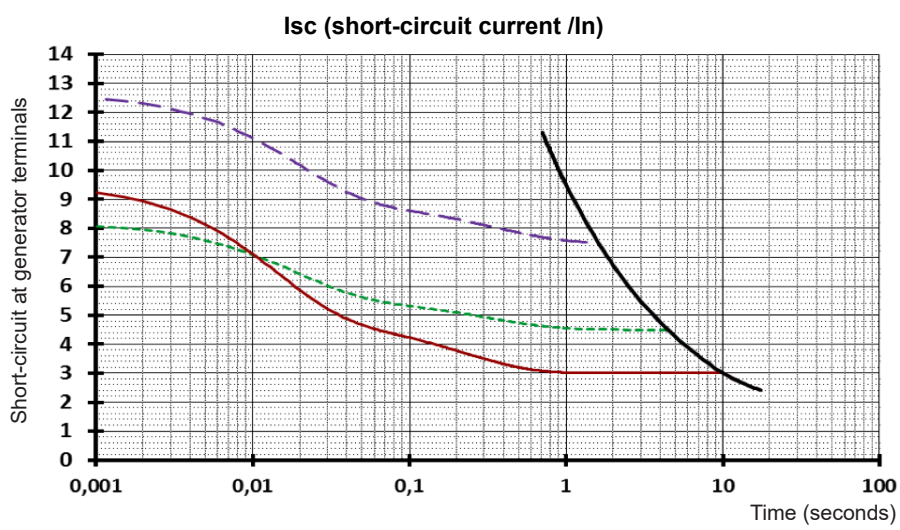
LSA 52.3 L9



LSA 52.3 L12

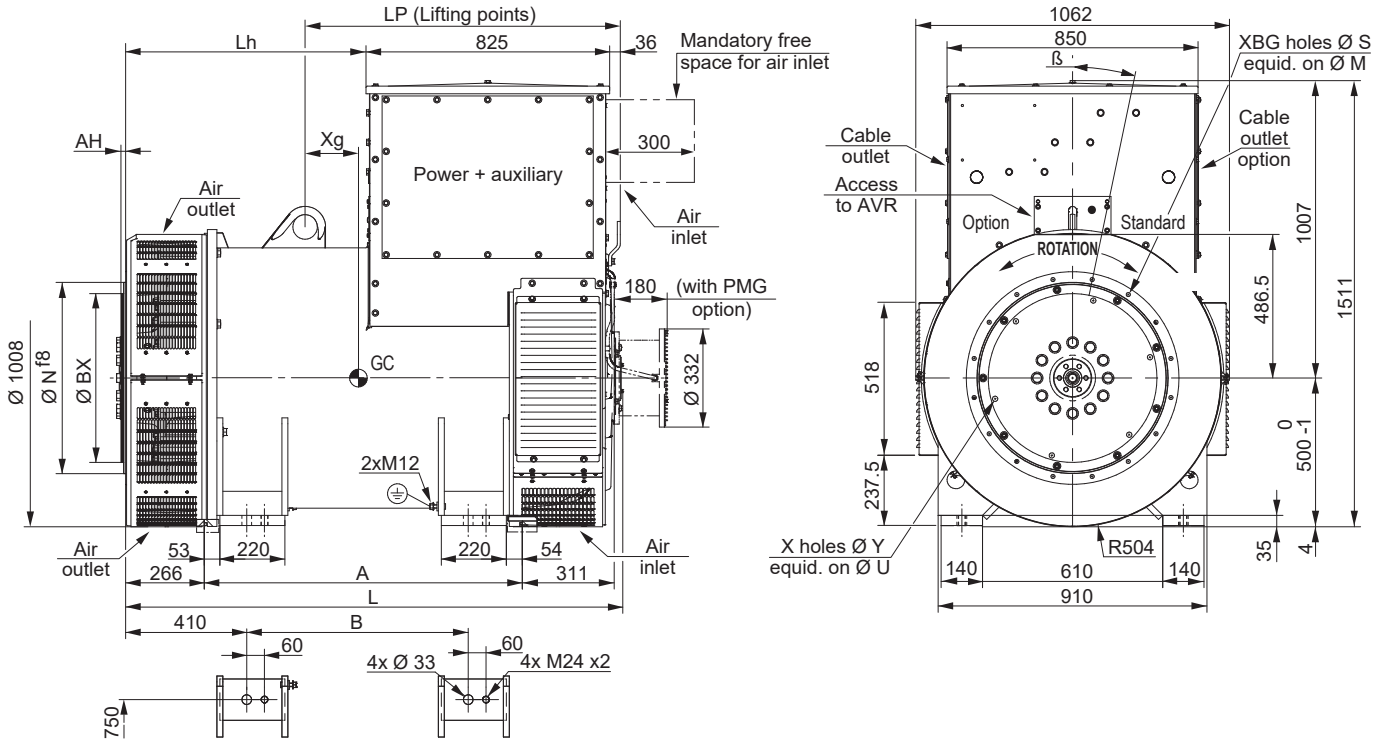


LSA 52.3 UL16



- Symetrical phase to neutral short-circuit
- Symetrical two-phase short-circuit
- Symetrical three-phase short-circuit
- Thermal limit curve

Single-bearing dimensions



Dimensions (mm) and weight (kg)							
Type	L	B	A	Lh	LP	Xg*	Weight*
LSA 52.3 S5/S6	1683	750	1077	814	1067.5	175	3748
LSA 52.3 S7	1683	750	1077	814	1067.5	194	3996
LSA 52.3 L9	1883	950	1277	1014	1067.5	64	4446
LSA 52.3 L12	1883	950	1277	1014	1067.5	106	4944
LSA 52.3 UL16	2033	1100	1427	1164	1412.5	389	5751

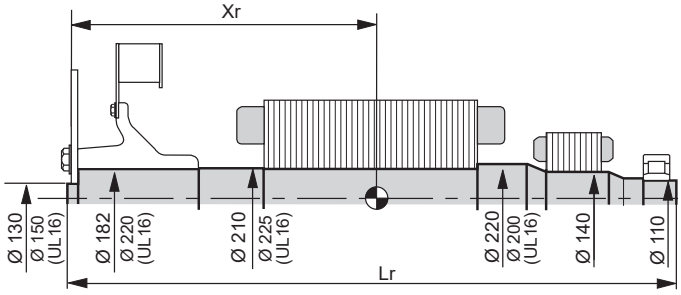
* Values for S.A.E. 0/18

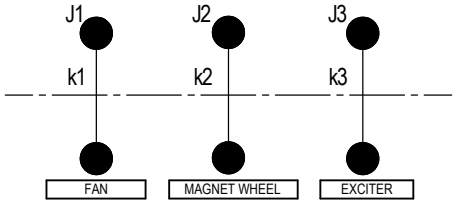
Coupling		
Flange S.A.E.	**0**	**00**
Flex plate S.A.E. **24**		X
Flex plate S.A.E. **21**		X
Flex plate S.A.E. **18**	X	X

Flange (mm)					
S.A.E.	N	M	XBG	S	β°
0	647.7	679.5	16	14	11°15'
00	787.4	850.9	16	14	11°15'

Flex plate (mm)					
S.A.E.	BX	U	X	Y	AH
24	733.4	692.1	12	21	0
21	673.1	641.3	12	18	0
18	571.5	542.9	6	18	15.8

Torsional analysis data



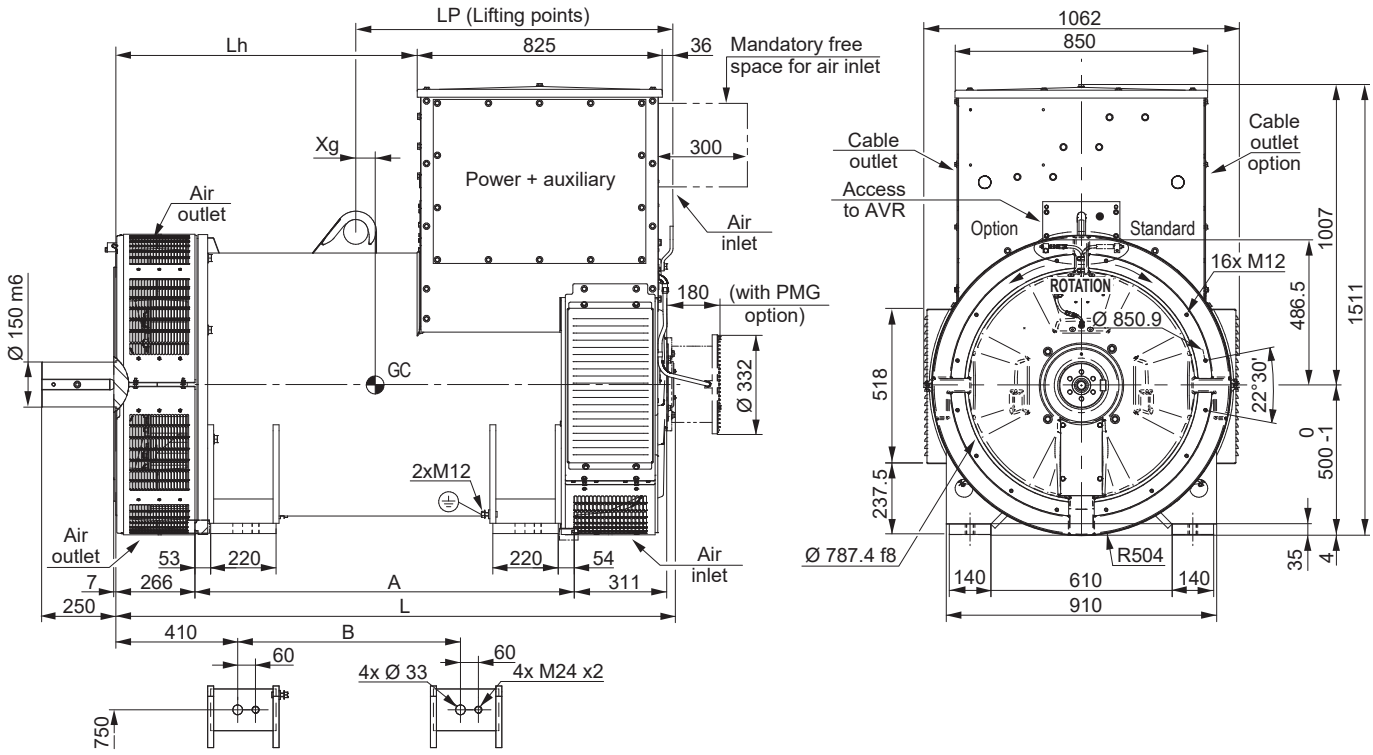


Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm²) : (4J = MD²)								
Flex plate	S.A.E. 18				S.A.E. 21			
Type	Xr	Lr	M	J	Xr	Lr	M	J
LSA 52.3 S5/S6	718	1689	1408	42.2	702	1689	1412	43.1
LSA 52.3 S7	741	1689	1501	45.7	725	1689	1505	46.6
LSA 52.3 L9	810	1889	1693	51	794	1889	1697	51.9
LSA 52.3 L12	859	1889	1879	58.1	843	1889	1883	59
LSA 52.3 UL16	954	2039	2188	68.5	937	2039	2192	69.4

Type	S.A.E.	Torsional rigidity					
		[Nm/rad]			(kg.m²)		
		k1	k2	k3	J1	J2	J3
S5/S6	18	5.47 10E7	2.98 10E7	1.60 10E7	9.5	31.1	1.5
	21	6.66 10E7	2.98 10E7	1.60 10E7	10.4	31.1	1.5
S7	18	5.47 10E7	2.92 10E7	1.68 10E7	9.5	34.7	1.4
	21	6.66 10E7	2.92 10E7	1.68 10E7	10.4	34.7	1.4
L9	18	5.47 10E7	2.83 10E7	1.52 10E7	9.5	40	1.6
	21	6.66 10E7	2.83 10E7	1.52 10E7	10.4	40	1.6
L12	18	5.47 10E7	2.71 10E7	1.67 10E7	9.5	47.2	1.4
	21	6.66 10E7	2.71 10E7	1.67 10E7	10.4	47.2	1.4
UL16	18	5.47 10E7	2.56 10E7	1.68 10E7	9.5	57.6	1.4
	21	6.66 10E7	2.56 10E7	1.68 10E7	10.4	57.6	1.4

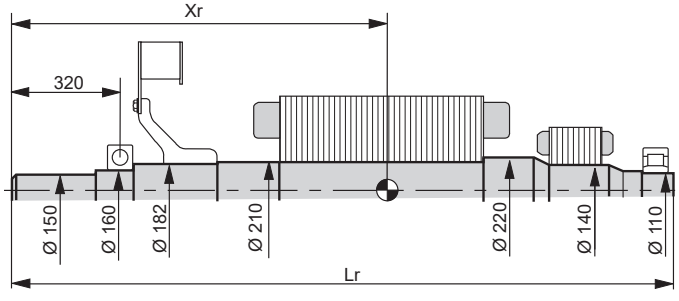
NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D drawings can be downloaded from the Nidec Power website, 3D drawing files are available upon request.
The torsional analysis of the transmission is imperative. All values are available upon request.

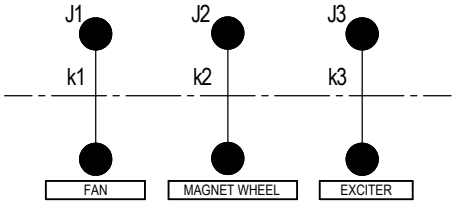
Two-bearing dimensions



Dimensions (mm) and weight (kg)							
Type	L	B	A	Lh	LP	Xg	Weight
LSA 52.3 S5/S6	1683	750	1077	814	1067.5	179	3742
LSA 52.3 S7	1683	750	1077	814	1067.5	197	3990
LSA 52.3 L9	1883	950	1277	1014	1067.5	68	4441
LSA 52.3 L12	1883	950	1277	1014	1067.5	109	4939
LSA 52.3 UL16	2033	1100	1427	1164	1412	392	5691

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 52.3 S5/S6	977.3	1917	1357	40.5
LSA 52.3 S7	999.9	1917	1450	44
LSA 52.3 L9	1069.1	2117	1642	49.4
LSA 52.3 L12	1116.4	2117	1827	56.5
LSA 52.3 UL16	1204.1	2267	2114	66.6

Torsional rigidity					
[Nm/rad]			(kg.m²)		
k1	k2	k3	J1	J2	J3
1.79 E+7	3.79 E+7	1.60 E+7	7.8	31.1	1.5
1.79 E+7	3.68 E+7	1.68 E+7	7.8	34.7	1.5
1.79 E+7	3.54 E+7	1.51 E+7	7.8	40	1.6
1.79 E+7	3.36 E+7	1.67 E+7	7.8	47.2	1.5
1.79 E+7	3.13 E+7	1.32 E+7	7.8	57.5	1.3

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

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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

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Deep Sea Electronics Plc maintains a policy of continuous development and reserves the right to change the details shown on this data sheet without prior notice. The contents are intended for guidance only.

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055-203/12/20 (2) US

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

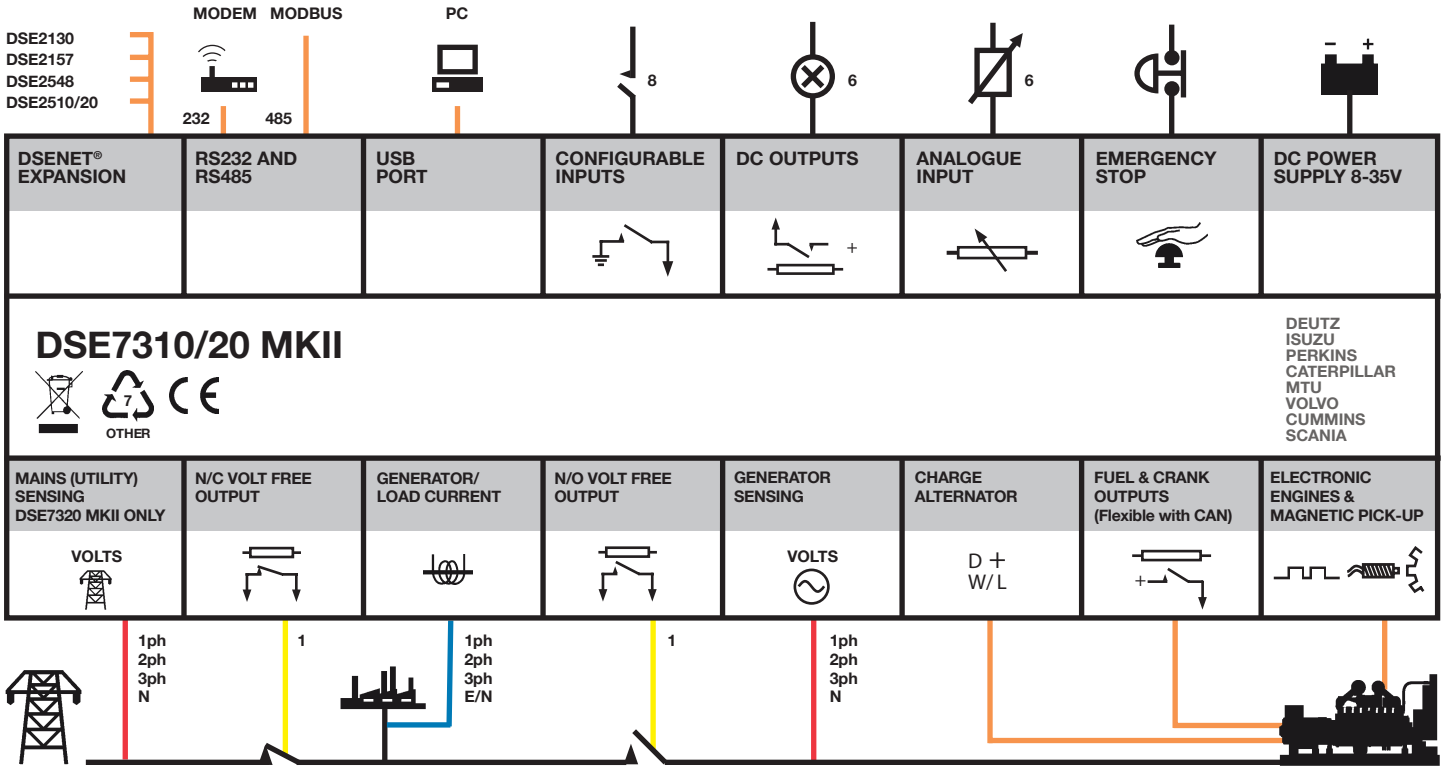
VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz at +/-7.5 mm,
8 Hz to 500 Hz at 2 gn

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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