DAR AL-EBDA'A
POWER GENERATORS COMPANY

dpa GENERATORS

Perkins® TECHNICAL DATA SHEET

PL350

Prime Power	Standby Power	Voltage/Ph	Hz/RPM	PF
350 kVA/280 kW	385kVA/308 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 2206A/C-E13TAG2
Alternator Make /Model	Leroy Somer TAL-046-H
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	650L
Battery	Maintenance free Lead Acid

Dimensions	Length (cm)	Width (cm)	Height (cm)	Weight (KG)
Close Type	450	160	235	3316
Open Type	365	110	221	2984

ENGINE SPECIFICATIONS

Engine Make Model	PERKINS 2206A/C-E13TAG2
No. of Cylinders	6 vertical in-line
Cycle	4 Stroke
Aspiration	Turbocharged
Cooling Method	Water cooled
Governing Type	Electronic
Governing Class	G2 - ISO 8528 Part 1
Compression Ratio	16.3:1
Displacement	12.5 L
Bore/Stroke	130 x 157 mm
Dynamic Charging Alter nator	45AMP, 24V

LUBRICATION SYSTEM

Oil Filter Type	Spin-On Full Flow
Total Oil Capacity	40 L
Oil Type	API-CH-4 or ACEA E5

AIR SYSTEM

Air Filter Type	Dry Element
Combustion Air Flow (PRP)	25.2 m³/min
Combustion Air Flow (ESP)	26.2 m³/min
Max Air Filter Intake Restriction	6.2 kPA

COOLING SYSTEM

Total Coolant Capacity (L)	51.4 L
Cooling Fan Air Flow	654 m³/ min
Radiator Fan Load	14 kW
Cooling system design	Above 50ºC
Heat Radiation to Room (PRP)	37.6 kW

Exhaust System

Muffler Type	Industrial Grade
Max. Back Pressure	10 kPa
Exhaust Gas Flow (PRP/ESP)	56.6/64.8 m³/ min
Exhaust Gas Tempera ture	< 630ºC

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 2 - Iraq - Baghdad - Khalid Ibn Al-Walid Street - Opposite the Martyrs Foundation

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POWER GENERATORS COMPANY

Perkins® TECHNICAL DATA SHEET

PL350

Perkins Engine
2206A/C-E13TAG2

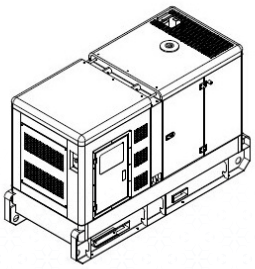
Engine Fuel System	
Recommended Fuel	Class A2 Diesel
Fuel Consumption Standby	80 L/hr
Fuel Consumption 100% PRP	71 L/hr
Fuel Consumption 75% PRP	54 L/hr
Fuel Consumption 50% PRP	37 L/hr

Leroy Somer
TAL-046-H

ALTERNATOR SPECIFICATIONS	
Alternator Make /Model	Leroy Somer TAL-046-H
AVR Model	R150
Number of Poles	4
Number of Winding Leads	6
Type of Bearing	Single Bearing
Insulation Class - Temp Rise	Cont. H - 125/40ºC
Ingress Protection Rating	IP 23
Excitation System	Self Excited
Voltage Regulation	±1%
Harmonic Coefficient THF	< 2.5%
Tel. influence TIF	< 50
Cooling air flow	0.48 m³/ Sec

DSE 7320MKII

Controller Make & Model | DeepSea 7320MKII	
Operation Mode	AMF
Display	Graphic Back-lit LCD (128x64) pixles
Ingress Protection Rating	IP65
Binary Inputs/Outputs	6 / 4
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 9005 - Powder coated
Noise Pressure level	85 dBA @ 1 to 3 m

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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2200 Series 2206A-E13TAG2 Diesel Engine – ElectropaK

349 kWm at 1500 rpm
381 kWm at 1800 rpm

The 2200 Series engine has been developed using the latest engineering techniques and builds on the strengths of the already very successful 2000 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 2206A-E13TAG range are 6 cylinder, turbocharged air-to-air charge cooled diesel engines. It's premium features provide exceptional power to weight ratio resulting in exceptional fuel consumption.

The overall performance and reliability characteristics make this the prime choice for today's power generation industry.

Economic power

- Mechanically operated unit fuel injectors with electronic control combined with carefully matched turbocharging, give excellent fuel atomisation and combustion with optimum economy
- Low emissions result from electronic control of fuel injected

Reliable power

- Developed and tested using the latest engineering techniques and finite element analysis for high reliability, low oil usage and low wear rates
- High compression ratios ensure clean rapid starting in all conditions
- Perkins global product support is designed to enhance the customer experience of owning a Perkins powered machine. We deliver this through the quality of our distribution network, extensive global coverage and a range of Perkins supported OEM partnership options. So whether you are an end-user or an equipment manufacturer our engine expertise is essential to your success

Compact, clean and efficient power

- Exceptional power to weight ratio and compact size give optimum power density for ease of installation and more cost effective transportation
- Designed to provide excellent service access for ease of maintenance

Product support

- Perkins actively pursues product support excellence by ensuring our distribution network invest in their territory – strengthening relationships and providing more value to you, our customer
- Through an 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 fingertips covering technical information, parts identification and ordering systems, all dedicated to maximising the productivity of your engine
- Throughout the entire life of a Perkins engine, we provide access to genuine OE specification parts and service. We give 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

This engine does not comply to Harmonized International Regulated Emissions Limits

Engine Speed (rev/min)	Type of Operation	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	bhp	kWm	bhp
1500	Prime Power	350	280	324	434	305	409
	Standby Power	400	320	368	493	349	469
1800	Baseload Power	400	320	373	500	349	468
	Standby Power	438	350	407	546	381	511

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1986, BS 5514/1, DIN 6271. **Derating may be required for conditions outside these; consult Perkins Engines Company Limited.**

Generator powers are typical and are based on an average alternator efficiency and a power factor (cos. θ) of 0.8. **Fuel specification:** BS 2869: Part 2 1998 Class A2 or BSEN590 or ASTM D975 Class 1D and 2D. **Lubricating oil:** 15W40 to API CI4.

Rating Definitions
Prime Power: Variable load. Unlimited hours usage with an average load factor of 70% of the published prime power rating over each 24 hour period. A 10% overload is available for 1 hour in every 12 hours of operation. **Standby Power:** Variable load. Limited to 500 hours annual usage up to 300 hours of which may be continuous running. No overload is permitted.

Perkins®
THE HEART OF EVERY GREAT MACHINE

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2200 Series 2206A-E13TAG2 Diesel Engine – ElectropaK

349 kWm at 1500 rpm
381 kWm at 1800 rpm

Standard ElectropaK specification

Air inlet
- Mounted air filter

Fuel system
- Mechanically actuated electronically controlled unit fuel injectors with full authority electronic control
- Governing to ISO 8528-5 class G2 with isochronous capability
- Replaceable 'Ecoplus' fuel filter elements with primary filter/ water separator
- Fuel cooler

Lubrication system
- Wet sump with filler and dipstick
- Full-flow replaceable 'Ecoplus' filter
- Oil cooler integral with filter header

Cooling system
- Gear-driven circulating pump
- Mounted belt-driven pusher fan
- Radiator incorporating air-to-air charge cooler, (supplied loose)
- System designed for ambients up to 50ºC

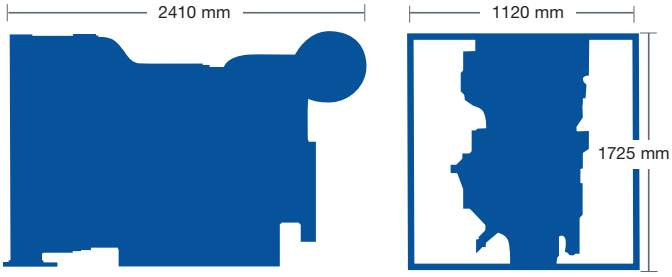
Electrical equipment
- 24 volt starter motor and 24 volt 70 amp alternator with DC output
- ECM mounted on engine with wiring looms and sensors
- 3 level engine protection system

Flywheel and housing
- High inertia flywheel to SAE J620 size 14
- SAE 1 flywheel housing

Mountings
- Front engine mounting bracket

Literature
- User's Handbook and Parts Manual

Optional equipment
- 110 volt/240 volt immersion heater
- Additional speed sensor
- Temperature and pressure sensors for gauges
- Air filter rain hood
- Twin starters/facility for second starter
- Tool kit



Fuel Consumption (based on net power)				
Engine Speed	1500 rev/min		1800 rev/min	
	g/kWh	l/hr	g/kWh	l/hr
Standby Power	195	80	193	87
110% of Prime Power	195	77	195	88
100% of Prime Power	196	71	196	81
75% of Prime Power	198	54	199	62
50% of Prime Power	203	37	205	43

General data

Number of cylinders 6
Cylinder arrangement ..... Vertical in-line
Cycle ..... 4 stroke
Induction system ..... Turbocharged and air-to-air charge cooled
Combustion system ..... Direct injection
Cooling system ..... Water-cooled
Bore and stroke ..... 130 x 157 mm
Displacement ..... 12.5 litres
Compression ratio 16.3:1
Direction of rotation ..... Anti-clockwise, viewed on flywheel
Total lubrication system capacity ..... 40 litres
Total coolant capacity ..... 51,4 litres
Total dry weight ..... 1478 kg
Dimensions – Length ..... 2410 mm
Width ..... 1120 mm
Height ..... 1725 mm

Final weight and dimensions will depend on completed specification

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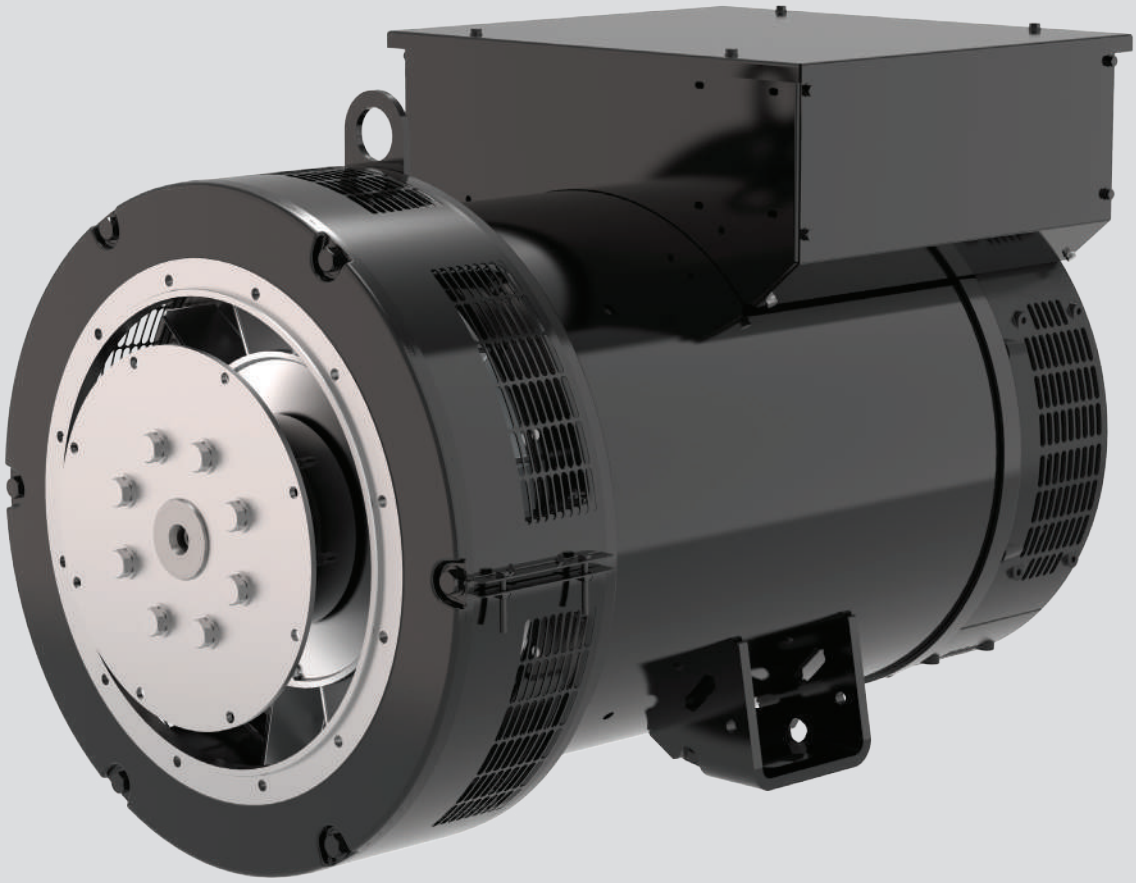
Perkins®
THE HEART OF EVERY GREAT MACHINE



TAL 046

Low Voltage Alternator - 4 pole

230 to 365 kVA - 50 Hz / 288 to 438 kVA - 60 Hz
Electrical and mechanical data

LEROY-SOMER™

Nidec
All for dreams

Adapted to needs

The TAL alternator range is designed to meet the needs of general applications such as prime power and stand-by.

Compliant with international standards

The TAL range complies with international standards and regulations: IEC 60034 and dérivative.
The range is designed, manufactured and marketed in an ISO 9001 and 14001 environment.

Electrical design

- Class H insulation
- Shunt excitation
- Low voltage winding:
  Three-phase 50 Hz: 380V - 400V - 415V - 440V / 220V - 230V - 240V
  60 Hz: 380V - 416V - 440V - 480V / 220V - 208V - 240V
- 6-terminal plates in 6-wire version or suitable for 12-wire option
- Optimized performance
- Complies with EN 61000-6-3, EN 61000-6-2, EN 55011, group 1 class B for European zone (EC marking)

Robust design

- Compact and rugged assembly to withstand engine vibrations
- Steel frame
- Cast iron flanges and shields
- Single bearing design to be suitable with most diesel engines
- Sealed for life bearing
- Direction of rotation: clockwise and counterclockwise without derating

Excitation and regulation system suited to the application

	Excitation system				Regulation options		
	AVR	**SHUNT**	**AREP+** (option)	**PMG** (option)	**$UL_{C/US}$**	**Remote voltage potentiometer**	**C.T. for paralleling**
Three-phase 6-wire	**R150**	Standard				√	
	R180		Standard	Standard		√	√
	D350	Option	Option	Option	√	√	√
Three-phase 12-wire*	**R150**	Standard				√	
	R250	Option			√	√	
	R180		Standard	Standard		√	√
	D350	Option	Option	Option	√	√	√

√ : Possible option *with larger terminal box

Compact terminal box

- Easy access to AVR and terminals
- Standard terminal box with possibility of mounting measurement CTs
- Possibility of current transformer for parallel operation

Environment and protection

- IP Code IP 23
- Standard winding protection for non-harsh environments with relative humidity ≤ 95%

Available options

- Three-phase 12-wire with 9-terminal plates
- AREP+ or PMG excitation
- ULc/us
- Customized painting
- Space heaters
- Droop kit for alternator paralleling
- Stator sensors
- Winding 8 optimized for three-phase 380V / 416 V - 60 Hz
- Winding protection for harsh environments and relative humidity greater than 95% (system 2 - 4): for TAL 046 H apply a derating coefficient of 0.97

TAL 046 - 230 to 365 kVA - 50 Hz / 288 to 438 kVA - 60 Hz

General characteristics

Insulation class	H	Excitation system 6-wire	SHUNT	AREP+ / PMG
Winding pitch	2/3 (wind.6S - 6-wire / wind.6 - 12-wire)	AVR type	R150	R180
Number of wires	6-wire (12-wire option)	Excitation system 12-wire (option)	SHUNT	AREP+ / PMG
Protection	IP 23	AVR type	R150	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 1 %	
Overspeed	2250 R.P.M.	Total Harmonic Distortion THD (**) in no-load	< 2.5 %	
Air flow (m^3/s)	0.48	Total Harmonic Distortion THD (**) in linear load	< 5 %	
Air flow (m^3/s)	0.58	Waveform: NEMA = TIF (**)	< 50	
AREP+ Short-circuit current = 2.7 In: 5 second		Waveform: I.E.C. = THF (**)	< 2%	

(*) 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 / 40 °C					Continuous / 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.**				**1 ph.**	**3 ph.**				**1 ph.**	**3 ph.**				**1 ph.**	**3 ph.**				**1 ph.**
Y		380V	400V	415V	440V		380V	400V	415V	440V		380V	400V	415V	440V		380V	400V	415V	440V	
Δ		220V	230V	240V		230V	220V	230V	240V		230V	220V	230V	240V		230V	220V	230V	240V		230V
YY (*)			200V		220V			200V		220V			200V		220V			200V		220V	
ΔΔ (*)						230V					230V					230V					230V
TAL 046 C	kVA	230	**230**	230	219	138	209	**209**	209	199	126	244	**244**	244	232	146	253	**253**	253	241	152
	kW	*184*	*184*	*184*	*175*	*110*	*167*	*167*	*167*	*159*	*101*	*195*	*195*	*195*	*186*	*117*	*202*	*202*	*202*	*193*	*122*
TAL 046 D	kVA	240	**250**	250	238	150	218	**228**	228	217	137	254	**265**	265	252	159	264	**275**	275	262	165
	kW	*192*	*200*	*200*	*190*	*120*	*174*	*182*	*182*	*174*	*110*	*203*	*212*	*212*	*202*	*127*	*211*	*220*	*220*	*210*	*132*
TAL 046 E	kVA	275	**275**	275	261	165	250	**250**	250	238	150	292	**292**	292	277	175	303	**303**	303	287	182
	kW	*220*	*220*	*220*	*209*	*132*	*200*	*200*	*200*	*190*	*120*	*234*	*234*	*234*	*222*	*140*	*242*	*242*	*242*	*230*	*146*
TAL 046 F	kVA	290	**300**	300	285	180	264	**273**	273	259	164	307	**318**	318	302	191	319	**330**	330	314	198
	kW	*232*	*240*	*240*	*228*	*144*	*211*	*218*	*218*	*207*	*131*	*246*	*254*	*254*	*242*	*153*	*255*	*264*	*264*	*251*	*158*
TAL 046 G	kVA	325	**325**	325	309	195	296	**296**	296	281	177	345	**345**	345	328	207	360	**360**	360	340	215
	kW	*260*	*260*	*260*	*247*	*156*	*237*	*237*	*237*	*225*	*142*	*276*	*276*	*276*	*262*	*166*	*288*	*288*	*288*	*272*	*172*
TAL 046 H	kVA	350	**365**	365	347	210	318	**332**	332	316	191	371	**387**	387	368	223	385	**400**	400	382	231
	kW	*280*	*292*	*292*	*278*	*168*	*254*	*266*	*266*	*253*	*153*	*297*	*310*	*310*	*294*	*178*	*308*	*320*	*320*	*306*	*185*

(*) 12-wire option

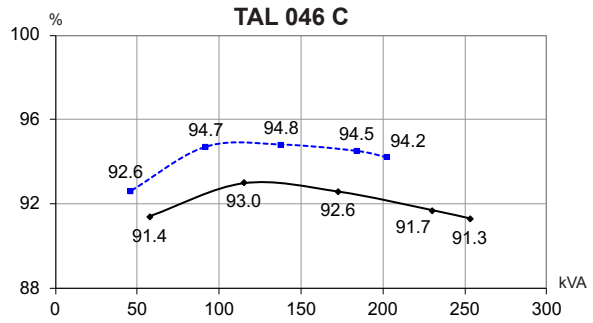
Ratings 60 Hz - 1800 R.P.M.

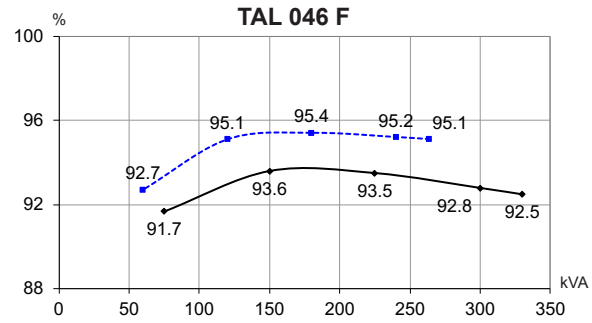
kVA / kW - P.F. = 0.8

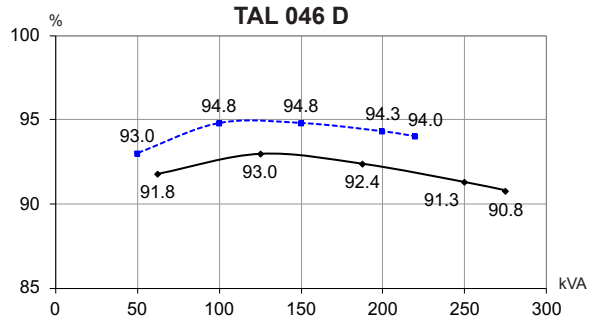
Duty / T° C		Continuous / 40 °C					Continuous / 40 °C					Stand-by / 40 °C					Stand-by / 27 °C				
Class / T° K		H / 125° K					F / 105° K					H / 150° K					H / 163° K				
Phase		**3 ph.**				**1 ph.**	**3 ph.**				**1 ph.**	**3 ph.**				**1 ph.**	**3 ph.**				**1 ph.**
Y		380V	416V	440V	480V		380V	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	
ΔΔ (*)						240V					240V					240V					240V
TAL 046 C	kVA	226	250	262	**288**	152	206	228	238	**262**	138	240	265	278	**305**	161	250	275	288	**316**	167
	kW	*181*	*200*	*210*	*230*	*122*	*165*	*182*	*190*	*210*	*110*	*192*	*212*	*222*	*244*	*129*	*200*	*220*	*230*	*253*	*134*
TAL 046 D	kVA	245	265	280	**313**	165	223	241	255	**285**	150	260	281	297	**332**	175	270	292	308	**344**	182
	kW	*196*	*212*	*224*	*250*	*132*	*178*	*193*	*204*	*228*	*120*	*208*	*225*	*238*	*266*	*140*	*216*	*234*	*246*	*275*	*146*
TAL 046 E	kVA	275	300	315	**344**	182	250	273	287	**313**	166	292	318	334	**365**	193	303	330	347	**378**	200
	kW	*220*	*240*	*252*	*275*	*146*	*200*	*218*	*230*	*250*	*133*	*234*	*254*	*267*	*292*	*154*	*242*	*264*	*278*	*302*	*160*
TAL 046 F	kVA	290	315	340	**360**	200	264	287	309	**328**	182	307	334	360	**382**	212	320	347	374	**400**	220
	kW	*232*	*252*	*272*	*288*	*160*	*211*	*230*	*247*	*262*	*146*	*246*	*267*	*288*	*306*	*170*	*256*	*278*	*299*	*320*	*176*
TAL 046 G	kVA	315	345	365	**406**	215	287	314	332	**369**	196	334	366	387	**430**	228	347	380	402	**447**	237
	kW	*252*	*276*	*292*	*325*	*172*	*230*	*251*	*266*	*295*	*157*	*267*	*293*	*310*	*344*	*182*	*278*	*304*	*322*	*358*	*190*
TAL 046 H	kVA	345	375	400	**438**	231	314	341	364	**399**	210	366	398	424	**464**	245	380	413	440	**480**	254
	kW	*276*	*300*	*320*	*350*	*185*	*251*	*273*	*291*	*319*	*168*	*293*	*318*	*339*	*371*	*196*	*304*	*330*	*352*	*384*	*203*

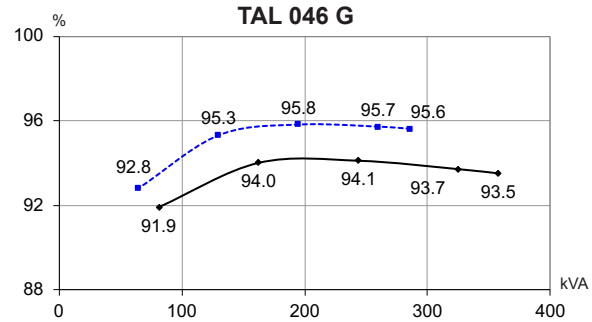
(*) 12-wire option

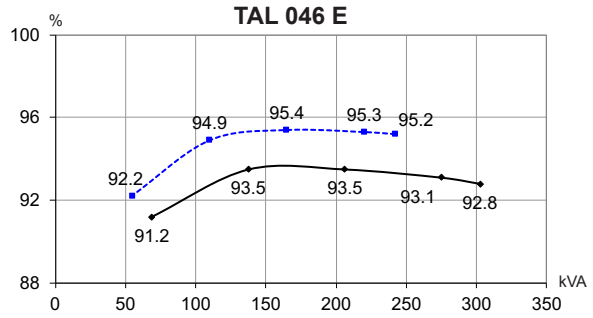
Efficiencies 400 V - 50 Hz (— P.F.: 0.8) (····· P.F.: 1)

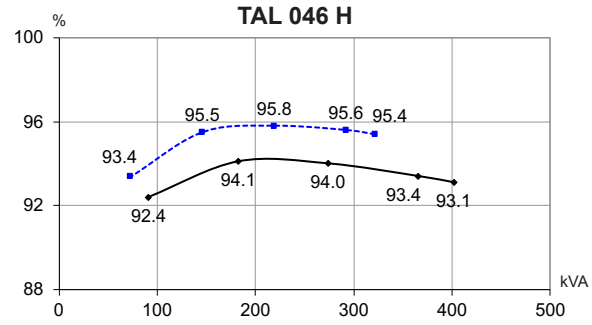












Reactances (%). Time constants (ms) - Class H / 400 V

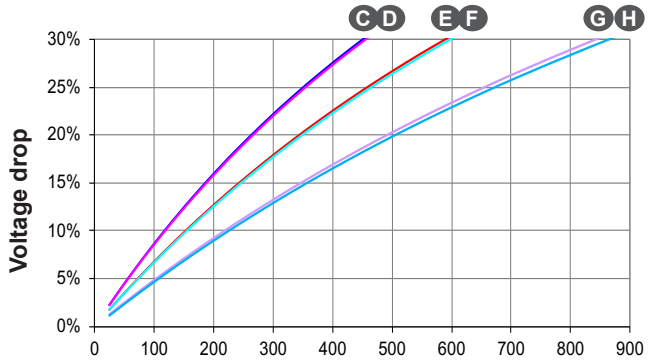
		C	D	E	F	G	H
Kcc	Short-circuit ratio	0.37	0.34	0.49	0.45	0.48	0.43
Xd	Direct-axis synchro. reactance unsaturated	340	370	278	303	270	303
Xq	Quadrature-axis synchro. reactance unsaturated	173	188	142	154	137	154
T'do	No-load transient time constant	1983	1983	2049	2049	2093	2093
X'd	Direct-axis transient reactance saturated	17.1	18.6	13.5	14.8	12.9	14.5
T'd	Short-circuit transient time constant	100	100	100	100	100	100
X"d	Direct-axis subtransient reactance saturated	13.7	14.9	10.8	11.8	10.3	11.6
T"d	Subtransient time constant	10	10	10	10	10	10
X"q	Quadrature-axis subtransient reactance saturated	17.4	18.9	13.5	14.7	12.6	14.2
Xo	Zero sequence reactance	0.71	0.77	0.56	0.61	0.53	0.6
X2	Negative sequence reactance saturated	15.58	16.94	12.19	13.3	11.49	12.9
Ta	Armature time constant	15	15	15	15	15	15

Other class H / 400 V data

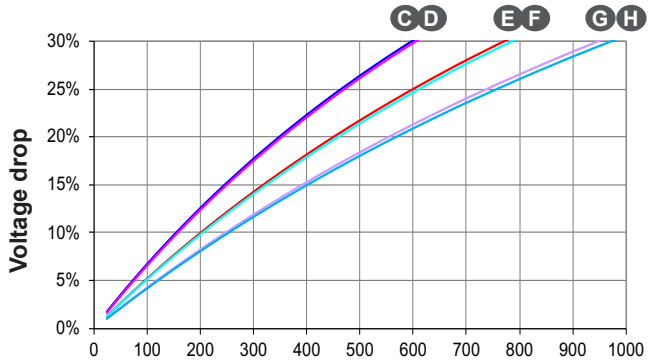
io (A)	No-load excitation current SHUNT/AREP+	1.01	1.01	1.14	1.14	1.06	1.06
ic (A)	On-load excitation current SHUNT/AREP+	3.84	4.14	3.5	3.76	3.3	3.63
uc (V)	On-load excitation voltage SHUNT/AREP+	37.4	40.2	40.6	43.5	38.2	41.9
ms	Response time (ΔU = 20% transient)	500	500	500	500	500	500
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) SHUNT*	372	371	496	495	742	741
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) AREP+*	524	525	687	688	856	854
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 $_{LAG}$	18	19.1	16.7	17.7	14.2	15.4
%	Transient ΔU (on-load 4/4) AREP+ - P.F.: 0.8 $_{LAG}$	14.2	15	13.3	14.1	12.8	13.9
W	No-load losses	3299	3299	4328	4328	4750	4750
W	Heat dissipation	16579	18888	16242	18374	17367	20482

* P.F. = 0.6

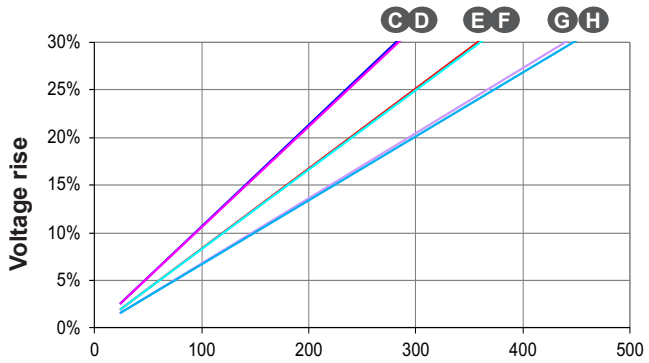
Transient voltage variation 400 V - 50 Hz



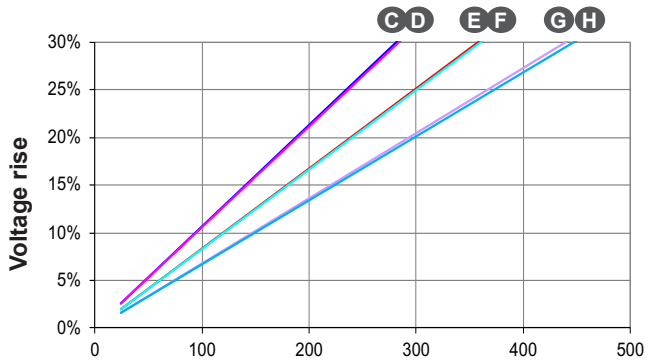
Phase loading (SHUNT) - kVA at P.F. = 0.8



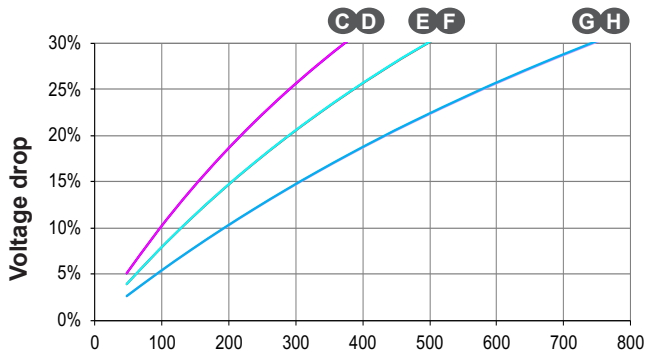
Phase loading (AREP+) - kVA at P.F. = 0.8



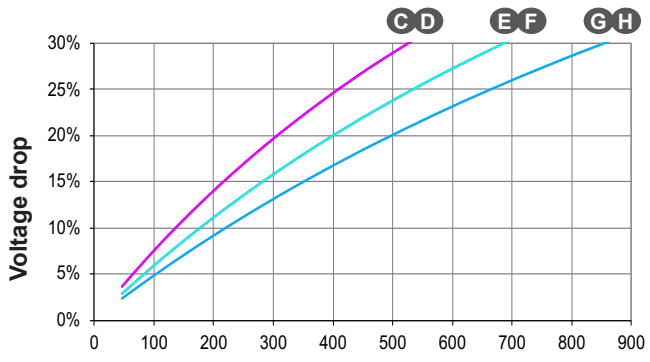
Load shedding (SHUNT) - kVA at P.F. = 0.8



Load shedding (AREP+) - kVA at P.F. = 0.8



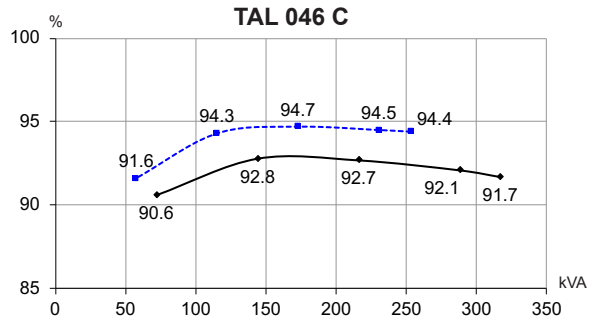
Motor starting (SHUNT)
Locked rotor kVA at P.F. = 0.6

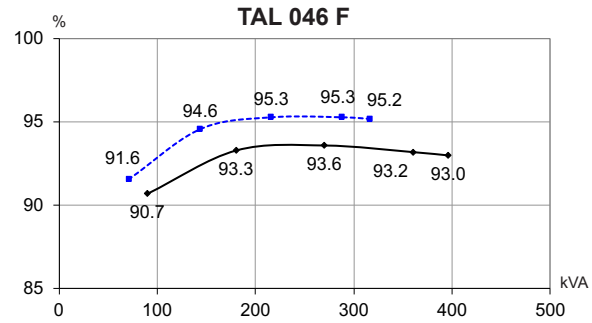


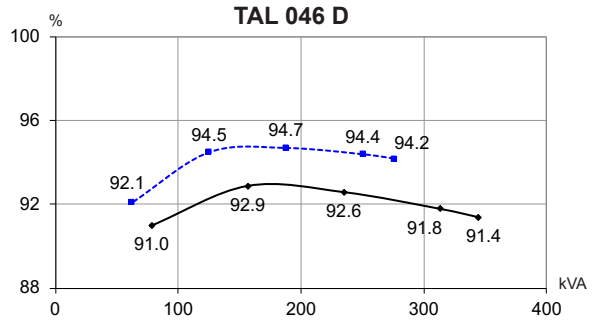
Motor starting (AREP+)
Locked rotor kVA at P.F. = 0.6

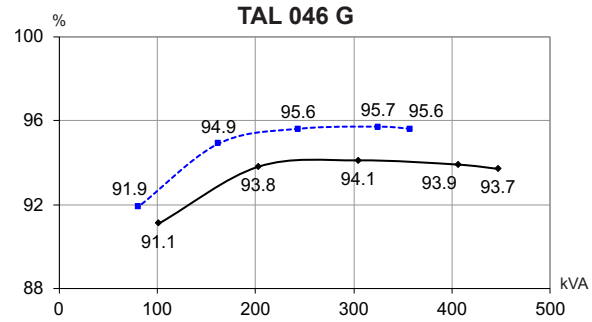
- For a starting P.F. other than 0.6, the starting kVA must be multiplied by K = Sine P.F. / 0.8
- For voltages other than 400V (Y), 230V (Δ) at 50 Hz, then kVA must be multiplied by $(400/U)^2$ or $(230/U)^2$.
- Transient performance of the PMG option, consult us.

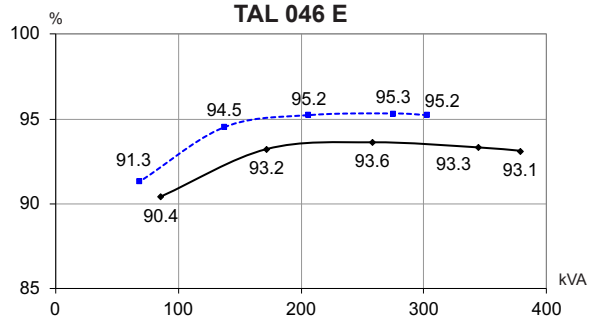
Efficiencies 480 V - 60 Hz (— P.F.: 0.8) (····· P.F.: 1)

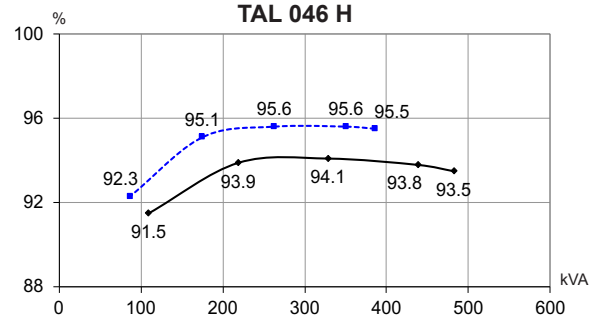












Reactances (%). Time constants (ms) - Class H / 480 V

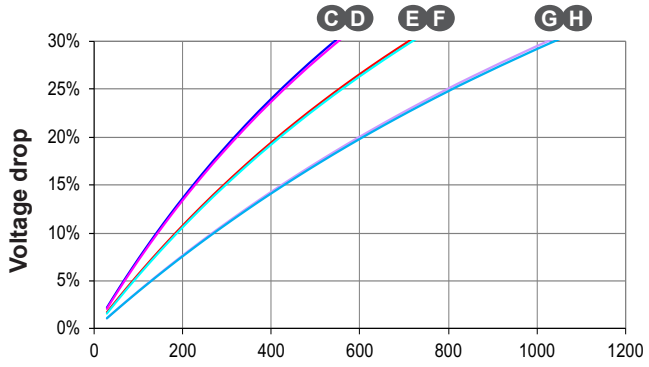
		C	D	E	F	G	H
Kcc	Short-circuit ratio	0.36	0.33	0.47	0.45	0.46	0.43
Xd	Direct-axis synchro. reactance unsaturated	355	386	290	303	281	303
Xq	Quadrature-axis synchro. reactance unsaturated	181	197	148	154	143	154
T'do	No-load transient time constant	1983	1983	2049	2049	2093	2093
X'd	Direct-axis transient reactance saturated	17.9	19.4	14.1	14.8	13.4	14.5
T'd	Short-circuit transient time constant	100	100	100	100	100	100
X"d	Direct-axis subtransient reactance saturated	14.3	15.5	11.3	11.8	10.7	11.6
T"d	Subtransient time constant	10	10	10	10	10	10
X"q	Quadrature-axis subtransient reactance saturated	18.1	19.7	14	14.7	13.1	14.2
Xo	Zero sequence reactance	0.74	0.81	0.59	0.61	0.56	0.6
X2	Negative sequence reactance saturated	16.26	17.67	12.71	13.3	11.96	12.9
Ta	Armature time constant	15	15	15	15	15	15

Other class H / 480 V data

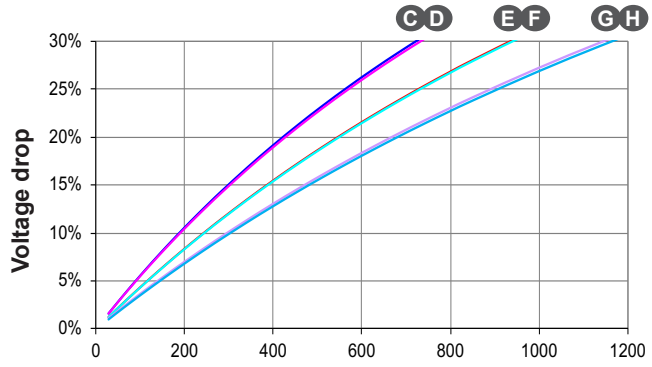
io (A)	No-load excitation current SHUNT/AREP+	1.01	1.01	1.14	1.14	1.06	1.06
ic (A)	On-load excitation current SHUNT/AREP+	3.91	4.21	3.56	3.69	3.35	3.56
uc (V)	On-load excitation voltage SHUNT/AREP+	38.3	41.1	41.5	43	38.9	41.3
ms	Response time (ΔU = 20% transient)	500	500	500	500	500	500
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) SHUNT*	446	448	594	593	888	889
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) AREP+*	627	629	828	826	1024	1025
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 $_{LAG}$	18.5	19.6	17.2	17.7	14.6	15.4
%	Transient ΔU (on-load 4/4) AREP+ - P.F.: 0.8 $_{LAG}$	14.6	15.5	13.7	14.1	13.2	13.9
W	No-load losses	4960	4960	6365	6365	6978	6978
W	Heat dissipation	19692	22264	19530	20731	20941	23137

* P.F. = 0.6

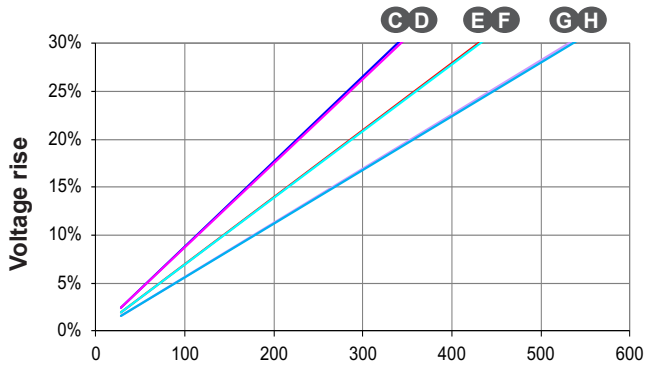
Transient voltage variation 480 V - 60 Hz



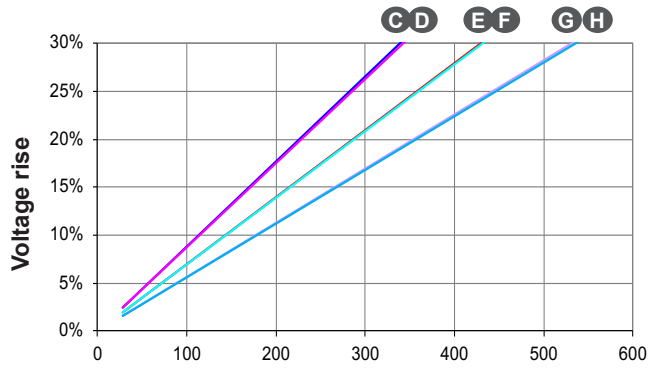
Phase loading (SHUNT) - kVA at P.F. = 0.8



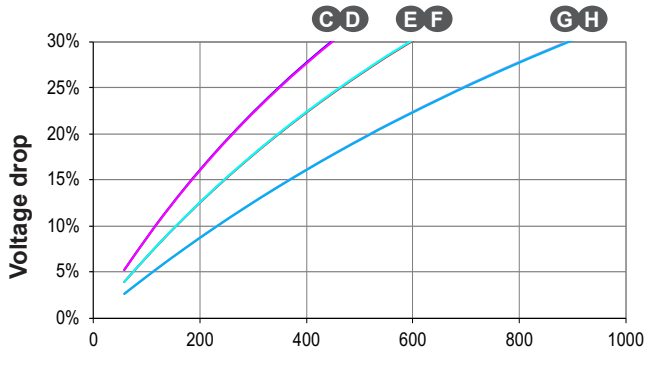
Phase loading (AREP+) - kVA at P.F. = 0.8



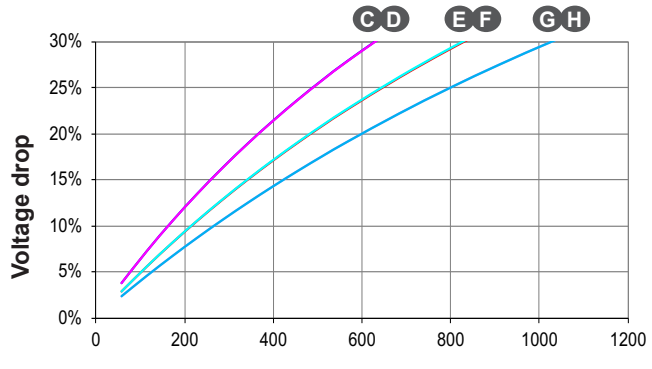
Load shedding (SHUNT) - kVA at P.F. = 0.8



Load shedding (AREP+) - kVA at P.F. = 0.8



Motor starting (SHUNT)
Locked rotor kVA at P.F. = 0.6



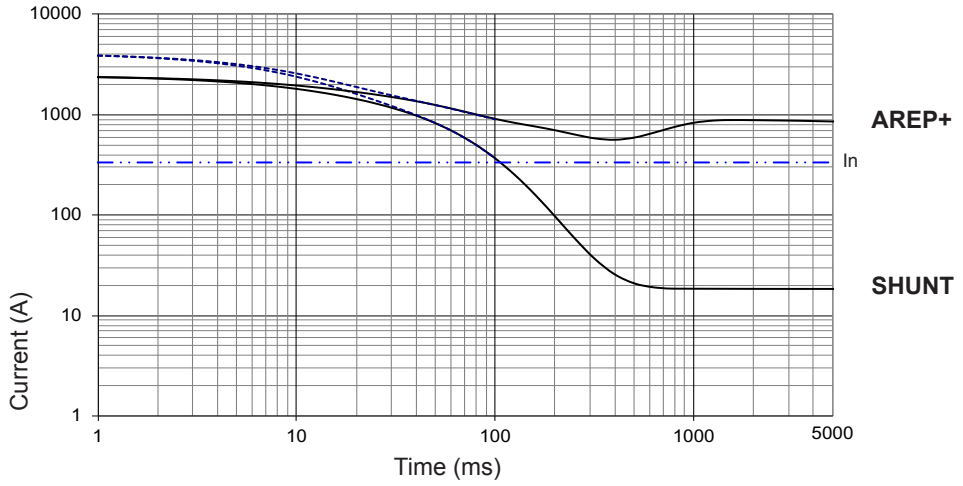
Motor starting (AREP+)
Locked rotor kVA at P.F. = 0.6

- For a starting P.F. other than 0.6, the starting kVA must be multiplied by K = Sine P.F. / 0.8
- 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 $(240/U)^2$.
- Transient performance of the PMG option, consult us.

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

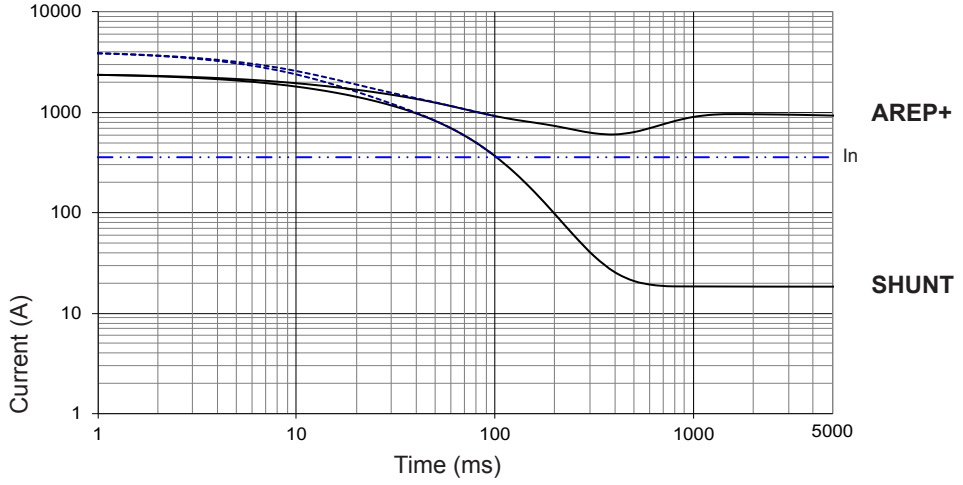
TAL 046 C

Symmetrical ——
Asymmetrical - - -



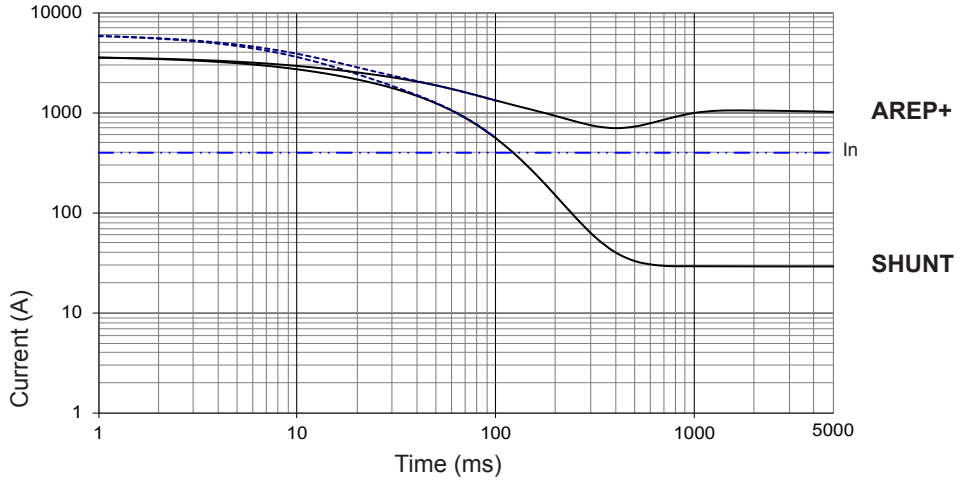
TAL 046 D

Symmetrical ——
Asymmetrical - - -



TAL 046 E

Symmetrical ——
Asymmetrical - - -

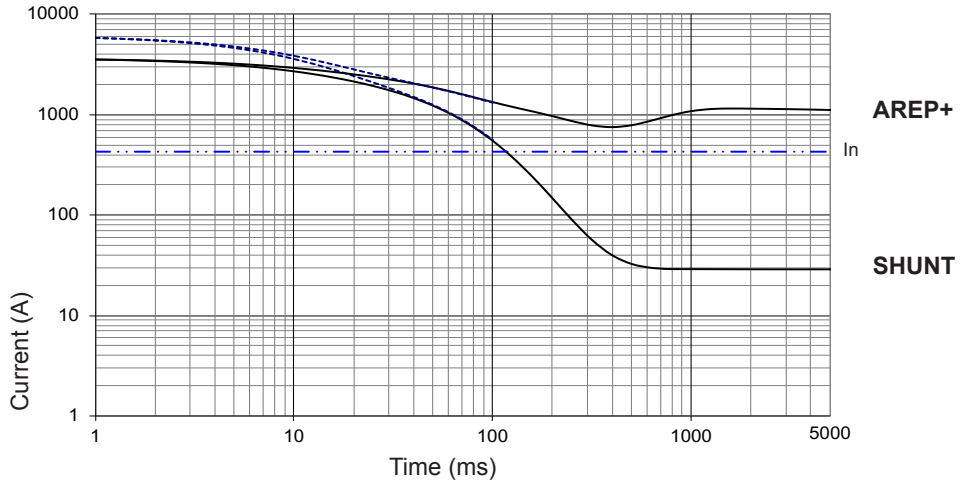


Influence due to connection
For (Δ) connection, use the following multiplication factor:
- Current value x 1.732.

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

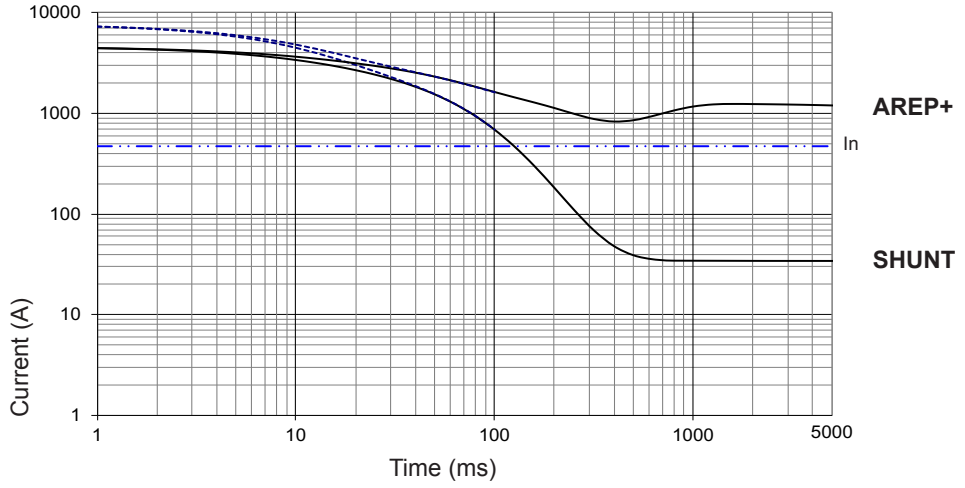
TAL 046 F

Symmetrical ——
Asymmetrical - - -



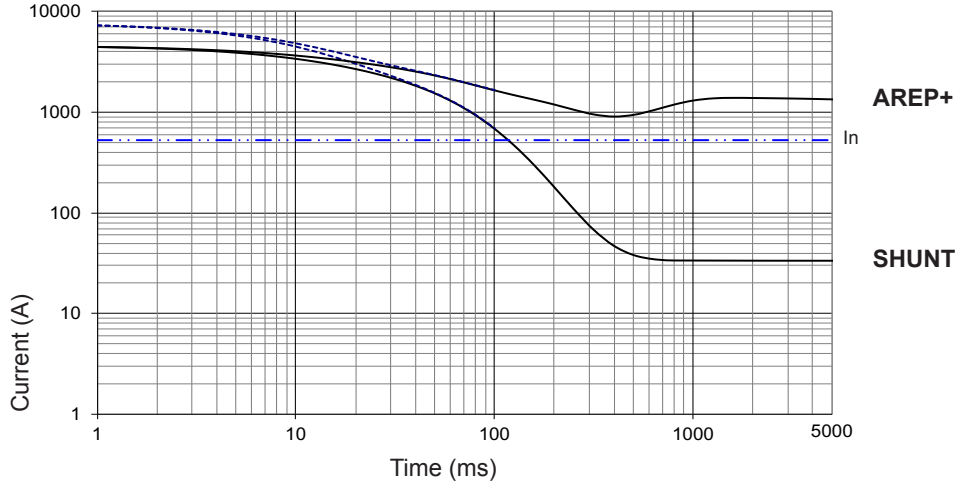
TAL 046 G

Symmetrical ——
Asymmetrical - - -



TAL 046 H

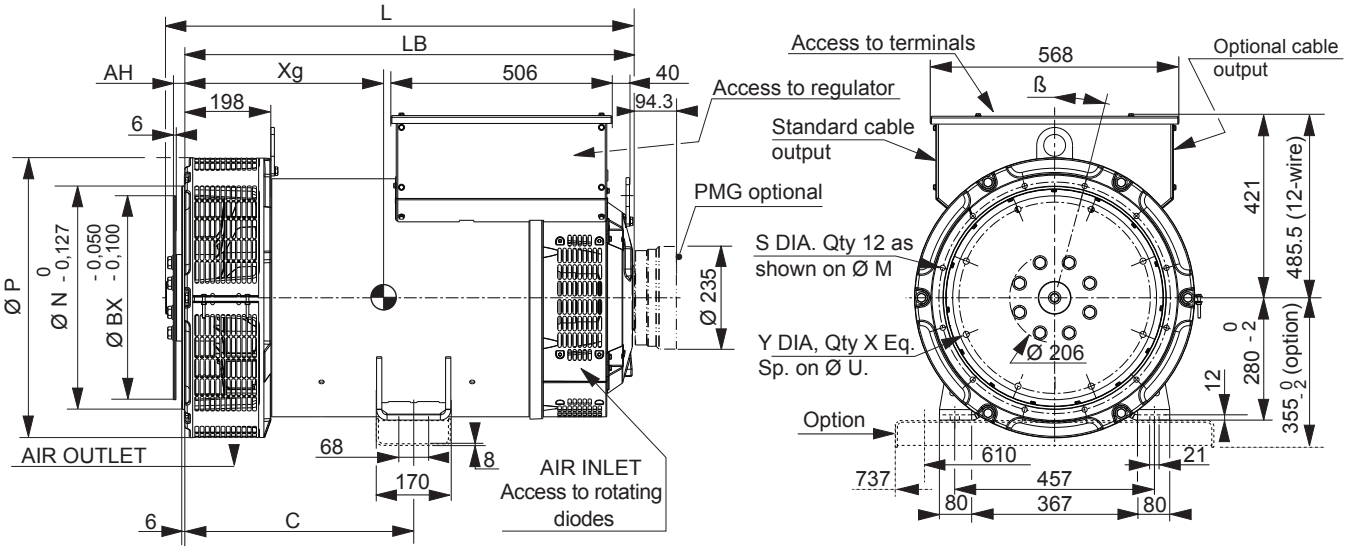
Symmetrical ——
Asymmetrical - - -



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		1.5	

Single bearing general arrangement



Dimensions (mm) and weight					
Type	L without PMG max.	LB max.	Xg	C	Weight (kg)
TAL 046 C	944**/935	892	423	429	674
TAL 046 D	944**/935	892	423	429	682
TAL 046 E	989**/980	937	445	429	754
TAL 046 F	989**/980	937	445	429	754
TAL 046 G*	1084**/1075	1032	493	525	888
TAL 046 H*	1084**/1075	1032	493	525	888

Coupling			
Flex plate	11 1/2	14	18
Flange S.A.E 3	X		
Flange S.A.E 2	X		
Flange S.A.E 1	X	X	
Flange S.A.E 1/2		X	
Flange S.A.E 0		X	X

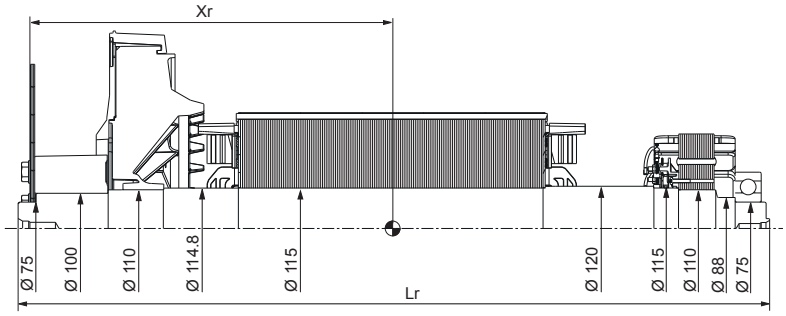
* Shaft height = 355 mm optional
** Dimensions with SAE 11 1/2

Flange (mm)					
S.A.E.	P	N	M	S	ß °
3	641	409.575	428.625	11	15°
2	641	447.675	466.725	11	15°
1	641	511.175	530.225	12	15°
1/2	713	584.2	619.125	14	15°
0	713	647.7	679.45	14	11° 15'

Flex plate (mm)					
S.A.E.	BX	U	X	Y	AH
11 1/2	352.42	333.38	8	11	39.6
14	466.72	438.15	8	14	25.4
18* **	571.5	542.92	6	17	15.7

*** Option

Torsional 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. 11 ½				S.A.E. 14			
Type	Xr	Lr	M	J	Xr	Lr	M	J
TAL 046 C	420	923	255	2.64	408	923	256	2.8
TAL 046 D	420	923	255	2.64	408	923	256	2.8
TAL 046 E	460	968	304	3.28	448	968	305	3.44
TAL 046 F	460	968	304	3.28	448	968	305	3.44
TAL 046 G	508	1063	358	3.97	497	1063	359	4.13
TAL 046 H	508	1063	358	3.97	497	1063	359	4.13

NOTE : Dimensions are for information only and may be subject to modifications. The torsional analysis of the transmission is imperative. All values are available upon request.

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- LCD alarm indication
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- 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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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

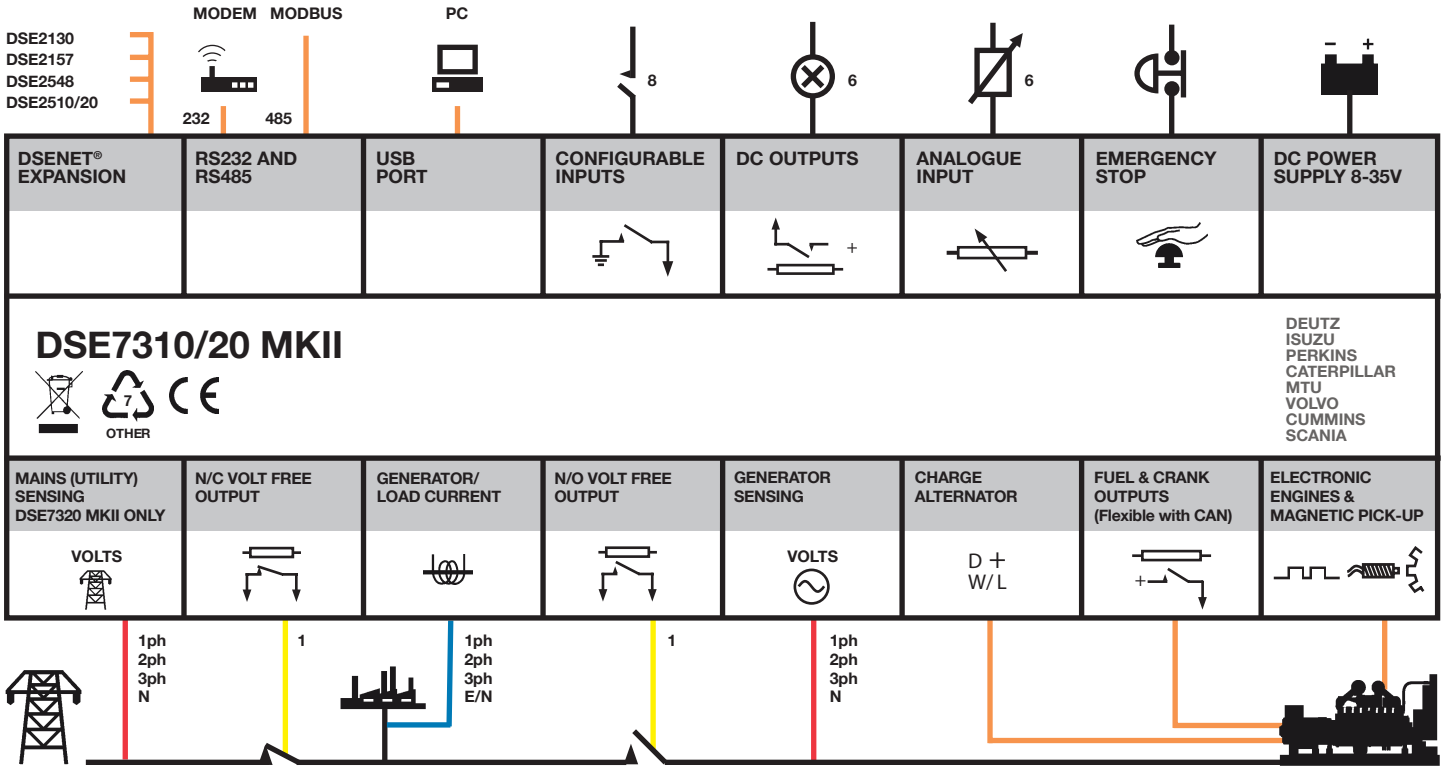
VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz at +/-7.5 mm,
8 Hz to 500 Hz at 2 gn

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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