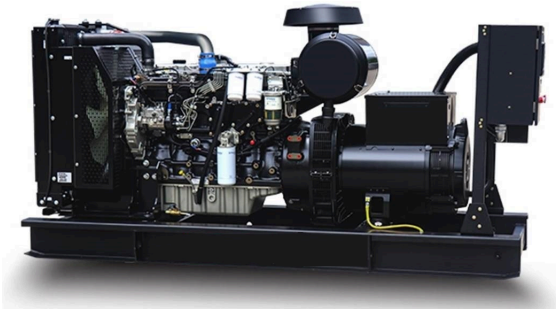
BOSSPOWERS

Fujian Tesla Power Technology

BOSS GENSETS 400KW /500KVA Diesel Engine : BS-C500

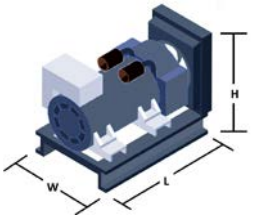


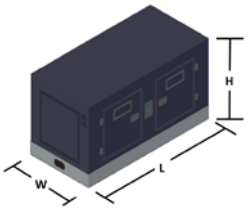
Photos and colors is only sample images

FEATURE & BENEFITS

- Maximum Power 500 kVA designed prime power at 400/230V @ 50Hz 1500rpm P.F 0.8
- 6 Cylinder 4 Cycle Turbocharged diesel Engine / Heavy duty type
- New Electronic speed control technology voltage regulation ±1% at solid state
- H Specification Insulation and four way protection system include
- Base fuel tank 8Hr, @100% load
- Low noise Level ≤85 dBA @1m. ,≤75 dBA @7m. with silencer canopy and outside lockable doors
- Wide of 4 Doors/(2 sides) easy service accessible
- N-PE type Non flammable proof material for sound attenuate / Harmless to health and living
- Base Rubber and Spring design to support and absorb vibration
- Automatic Transfer Switch (ATS) and Main Panel Microprocessor control
- Automatic battery Charger 5A & Dynamo Charger
- MCCB Circuit Breaker toggle type. Protection in circuit and load connection (std. IEC,UL)
- Exhaust with residential type and flexible tube , Heat protect by Aluminum shield
- Easy to use Digital Controller with Auto Manual start and reset alarms Easy
- Maintenance , Hand Pump and Motor Pump on same platform , Valve Drain pipe & Vent pipe.
- Energy saving by full microprocessor controller direct engine and alternator
- Generator set Standards ISO 9001,ISO14001 ,ISO45001, CE/ Manufacturer Certified
- The generator set consists of the Engine ,the Alternator unit directly Direct flexible Coupling with flange and Controller panel box are mounted on the same steel base in the H beam platform ,Flexible Mounting on to rubber / springs(vibration isolates designed)

GENSET MODEL	BS-C500
Prime power	400kW / 500kVA
Standby Power	440kW / 550kVA
Phase	3P4W
Power Factor (cos Ø)	0.8
Rate Voltage (V)	50Hz./1500RPM





DIMENSIONS AND WEIGHT:

GEN-Set	Dimension (L*W*H)	Weight
Open Type	3200mm X1380mm X2000mm	2700
Silent Type	-	-

CANOPY (Option)

Ventilation parts are designed with more principles Weather resistant and lined with sound reducing foam All metal canopy parts are double painted by power paint Panel window , Lockable doors on each side Insulated engine exhaust system Exterior Emergency Switch stop push button

CONTROL PANEL

Control & ATS Cabinet Steel plate 1.5 mm. Thickness (floor) standy type 2 layers polyester Electric powder paint with ground system

BOSSPOWERS

TECHNICAL SPECIFICATION SHEET

500KVA DIESEL GENERATOR SET

Genset Model	BS-C500		
Prime Power (kw/kva)	400 / 500	Standby Power(kw/kva)	440/550
Voltage (v)	400/230	Rated Speed (rpm)	1500
Frequency (Hz)	50	Rated Current (A)	720
Connection:	3 phase 4 wire	Power Factor:	0.8
Engine Model:	QSZ13-G3	Alternator	S5L1D-C4
Net Weight (kgs)-Open	2700	Dimensions (mm)-Open	3200X1380X2000

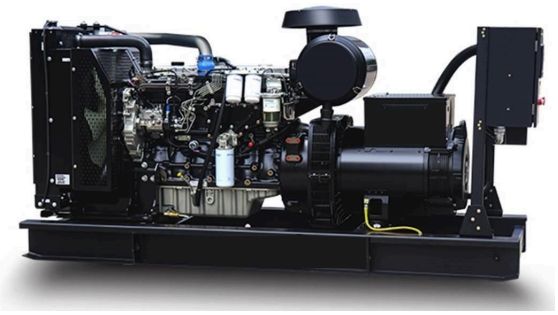
Voltage Available: 50Hz: 380-400-415V/220-230-240V; 60Hz: 220-380-416-440-480V/110-208-220-240V
Any special voltage is also available as client's request

Prime Power: comply with GB/T2820-97(eqv.ISO8528). Genset can run unlimitedly under certain power range. One hour 10% over load in every 12 running hours is allowed;

Standby Power: standby power is the limit value of maximum output for emergency use. It is off-oil power, overloading is prohibited

Standard Configuration:

- **Engine: CCEC Cummins** QSZ13-G3
- Radiator & Ventilation fan drive by Belt with metal grill safe guard protect.
- Cooling Fan with fan guard and front guard
- Alternator: Single bearing, IP23, H class
- Thermostat Valve Temperature Control
- Dry Air Filter. Dual Fuel Filter. Engine Oil Filter. Coolant Filter.
- Protection system (Overload, Over current ,Short circuit)
- Standard Control Panel; ATS for optional
- DC motor 24Vdc Start with Battery 200ah. 12Vdc(2block)
- Storage Battery and battery line, Exhaust pipe, Corrugated pipe for anti-vibration, Cone Tube, Flange, Muffler
- Electronic Governor Isochronous operation steady state ≤0.25%
- Soundproof Enclosure/Canopy for optional
- Key switch Start(manual cases controller fail)
- Automatic battery Charger 24Vdc and Dynamo 24V DC



Quality Assurance:

- **Factory Inspection**, the test items before delivery are mainly as follows:
  - ✓ Each genset shall be put into commission more than 4 hours totally. They are tested on idle load, fully load and 10% overload;
  - ✓ The noise level is tested
  - ✓ All of the meters on the control panel shall be tested
  - ✓ The appearance of the genset and all of the label and nameplate shall be checked
- **Warranty**

CE GS ISO 9001 CQC EPA&CARB CCC China

TECHNICAL SPECIFICATION SHEET

12 months or 1000 running hours from shipment date. If the quality problem arise during the warranty period, and verified the problem is caused by our genset-body instead of external or natural reasons. (Refer to all kinds of natural disaster, shipping, loading, unloading, wrong-operation, etc), we will supply the relevant spare parts free of charge for maintenance; after the warranty period, we can supply the required spare parts for you under cost prices.

G-Drive DIESEL Engine :	
Manufacturer/Model:	**CCEC Cummins** QSZ13-G3
Air Intake System:	Turbocharged,Air-Air Cooled & Water cooled
Fuel System:	Direct injection
Injection:	PT Fuel Pump, GAC electronic governor
Cylinder numbers:	6 cylinders in line , 4Stroke
Engine Speed:	1500 RPM.
Displacement:	13 L
Bore x Stroke:	130 x 163mm.
Compression Ratio:	13.9 : 1
Prime Power:	450KW / 603HP
Governing System:	Electronic
Engine Standard	
ISO 9001, ISO 3046, AS 2789, DIN 6271, BS 5514 and CE	
Exhaust System	
Exhaust Volume:	1773 L/s
Exhaust temperature:	524 ℃
Max. Allowed Back Pressure:	10 KPa
Intake System	
with Dirty Filter Element:	635
with Normal Duty Air Cleaner:	254
with Heavy Duty Air Cleaner:	381
Fuel System	
100% Load (Prime):	93 L/h
75% Load(Prime):	70L/h
50% Load (Prime):	49L/h
Lubrication System	
Oil Capacity:	78 L
Total system capacity(L):	75 L
Oil Pressure at rated speed:	207-355 kPa
Cooling system	
Coolant Capacity (Engine only):	23.1 L
Thermostat:	82-93℃
Max. Water Temperature:	345℃

TECHNICAL SPECIFICATION SHEET

Alternator Parameter: Basic Information

The alternators meet the standards of:

IEC60034, BS5000, VDE0530, NEMA MG1-32-33,IEC34-1,CSA22.2-100 ,AS1359,UL1446 and CE

Technical Data:

Manufacturer:	**Stamford** S5L1D-C4
Connection:	3 phase 4 wire, Y type
Alternator Capacity:	400kW/500kVA
Bearing numbers:	1
Power Factor:	0.8
Speed Operation:	50Hz./ 1500 RPM.
Voltage Phase:	400/230V
Protection Class:	IP23
Altitude Condition:	≤1000M
Excitation:	Brush-less, self-excitation
Insulation class :	Rotor H / Stator H
Voltage Adjustment:	±5% @ Load 0-100 %
Voltage Regulation :	±1.0% @load 0-100% PF. 0.8-1
Cooling:	Self turbine fan Build on rotor
Over Load:	>300% 10sec. (Motor Inrush current sustained)>110% @1Hr.

Genset Technical Data:

Voltage Setting Range:	≥±5%
Voltage Regulation: Transient	±1%
Voltage Deviation:	
--100% sudden power cut:	≤+25%
--Sudden power on	≤-20%
Voltage Stabilization Time:	
--100% sudden power cut:	≤ 6 s
--Sudden power on	≤ 6 s
Frequency Regulation: Frequency	±5%
Fluctuation Rate: Transient	≤0.5%
Frequency Deviation:	
--100% sudden power cut:	≤+12%
--Sudden power on	≤-10%
Frequency Recovery Time:	
--100% sudden power cut:	≤ 5 s
--Sudden power on	≤ 5 s

EPA&CARB

BOSSPOWERS GENERATOR

TECHNICAL SPECIFICATION SHEET

DEEPSEA DSE7320

Microprocessor Controller

- 3 phase AMF function
- Electronic microprocessor
- Software Configurable Power mode
- LCD back light Text 132 * 64 dot pixels display & LED Indicator
- Manual ,Stop,Auto, Test
- History Event log Record(250log)(C/F)
- 3 Phase Sensing
- Schedule runtime
- Silent LCD, LED Alarm
- ATS Control Command
- Battery backup memory
- RS232/485 Computer Communication port
- IP65 rating
- Setup & configuration (computer program)
- Modbus , CAN Bus Protocol Support

LCD/LED Displays Parameter

- Generator status Normal / Fail
- Status source selection supply load.
- 3Ph Main & Gen Voltage LL, LN, Current
- Diagnostics and alarm
- Gen Power Kw,Kwh ,Kva, Kvar, KVArh , PF
- Main & Gen Frequency (Hz)
- Engine/Lubricant Coolant Temperature(C/F)
- Engine Lubricant & Oil pressure (bar/Psi)
- Engine Speed operation Over/under (RPM.)
- Engine Hr. runtime & Real time clock
- Battery Voltage, current , charge & Charging Status
- Number of start
- Real time clock and timer
- Ambient Temperature C (F)
- Alternator exciter duty and governor duty

Warning & Alarm (Engine Auto Self stop And Reset able condition)

- Engine start Fail ,Running Fail
- Over / Under Oil pressure
- Over / Under Speed
- Engine Coolant over Temperature
- Over / Under voltage
- Silent LCD,LED Alarm
- Emergency Stop
- Over Crank
- Over Current(Warning)
- Over Current(Shutdown)
- Over/Under Frequency
- Overload, Short circuit(Shutdown)

Standard Configured

- Auto Main Fail: Enable
- Phase detect start : +/-10 % (1-20 Adj.)
- Engine Delay Start : 0-20 sec (1-30 Adj.)
- Cool down time: 1-5 min.(1-30 Adj.)
- Attempts start: 3-5 Times/cycles (Timer duration 7-20sec. Adj)
- Exercise: 7 Day/1Times (1-5 min.) Adj.
- Recover Time 1-3 min. Adj.
- Transfer time 1-20 min. Adj.

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STAMFORD

S5L1D-C4 Wdg.311 - Technical Data Sheet

Standards

STAMFORD industrial alternators meet the requirements of the relevant parts of the IEC EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100 and AS1359. Other standards and certifications can be considered on request.

Quality Assurance

Alternators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Excitation and Voltage Regulators

Excitation System					
AVR Type	AS440	MX341	MX321		
Voltage Regulation	± 1%	± 1%	± 0.5%		with 4% Engine Governing
AVR Power	Self-Excited	PMG	PMG		

No Load Excitation Voltage (V)	10.2 - 9.4
No Load Excitation Current (A)	0.6 - 0.5
Full Load Excitation Voltage (V)	44
Full Load Excitation Current (A)	2.6
Exciter Time Constant (seconds)	0.099

Electrical Data								
Insulation System	H							
Stator Winding	Double Layer Lap							
Winding Pitch	2/3							
Winding Leads	12							
Winding Number	311							
Number of Poles	4							
IP Rating	IP23							
RFI Suppression	BS EN 61000-6-2 & BS EN 61000-6-4,VDE 0875G, VDE 0875N. Refer to factory for others							
Waveform Distortion	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
Short Circuit Ratio	1/Xd							
Steady State X/R Ratio	12.58							
	50 Hz				60 Hz			
Telephone Interference	THF<2%				TIF<50			
Cooling Air Flow	1.12 m³/sec				1.3 m³/sec			
Voltage Star (V)	380	400	415	440	416	440	460	480
Voltage Parallel Star (V)	190	200	208	220	208	220	230	240
Voltage Series Delta (V)	220	230	240	254	240	254	266	277
kVA Base Rating (Class H) for Reactance Values (kVA)	455	500	455	450	525	550	581	594
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.31	3.28	2.77	2.44	3.82	3.58	3.46	3.25
X'd Dir. Axis Transient	0.18	0.18	0.15	0.13	0.21	0.20	0.19	0.18
X"d Dir. Axis Subtransient	0.13	0.13	0.11	0.10	0.15	0.14	0.14	0.13
Xq Quad. Axis Reactance	2.69	2.67	2.26	1.99	3.11	2.91	2.82	2.64
X"q Quad. Axis Subtransient	0.26	0.26	0.22	0.19	0.30	0.28	0.27	0.26
XL Stator Leakage Reactance	0.07	0.07	0.06	0.05	0.08	0.08	0.07	0.07
X2 Negative Sequence Reactance	0.19	0.19	0.16	0.14	0.22	0.21	0.20	0.19
X0 Zero Sequence Reactance	0.11	0.11	0.09	0.08	0.13	0.12	0.12	0.11
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	3.97	3.94	3.33	2.93	4.59	4.29	4.15	3.90
X'd Dir. Axis Transient	0.21	0.21	0.17	0.15	0.24	0.23	0.22	0.20
X"d Dir. Axis Subtransient	0.15	0.15	0.13	0.11	0.18	0.17	0.16	0.15
Xq Quad. Axis Reactance	2.77	2.75	2.32	2.05	3.20	3.00	2.90	2.72
X"q Quad. Axis Subtransient	0.31	0.31	0.26	0.23	0.36	0.34	0.33	0.31
XL Stator Leakage Reactance	0.08	0.08	0.07	0.06	0.09	0.09	0.08	0.08
Xlr Rotor Leakage Reactance	0.11	0.11	0.09	0.08	0.12	0.11	0.11	0.10
X2 Negative Sequence Reactance	0.23	0.23	0.19	0.17	0.27	0.25	0.24	0.23
X0 Zero Sequence Reactance	0.13	0.13	0.11	0.10	0.15	0.14	0.14	0.13

Time Constants (Seconds)	
T'd Transient Time Const.	0.08
T''d Sub-Transient Time Const.	0.0120
T'do O.C. Field Time Const.	2
Ta Armature Time Const.	0.0170
T''q Sub-Transient Time Const.	0.0192

Resistances in Ohms (Ω) at 22^{0}C	
Stator Winding Resistance (Ra), per phase for series connected	0.0065
Rotor Winding Resistance (Rf)	1.55
Exciter Stator Winding Resistance	17
Exciter Rotor Winding Resistance per phase	0.092
PMG Phase Resistance (Rpmg) per phase	1.91
Positive Sequence Resistance (R1)	0.0081
Negative Sequence Resistance (R2)	0.0094
Zero Sequence Resistance (R0)	0.0081

Saturation Factors	400V	480V
SG1.0	0.311	0.273
SG1.2	1.333	1.094

Mechanical Data		
Shaft and Keys	All alternator rotors are dynamically balanced to better than BS6861: Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.	
	1 Bearing	2 Bearing
SAE Adaptor	SAE 1, 0, 0.5	
Moment of Inertia	6.8928 kgm²	-
Weight Wound Stator	584kg	-
Weight Wound Rotor	502kg	-
Weight Complete Alternator	1283kg	-
Shipping weight in a Crate	1375kg	-
Packing Crate Size	166 x 87 x 124(cm)	-
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	-
Bearing Non-Drive End	BALL.6314(ISO)	-

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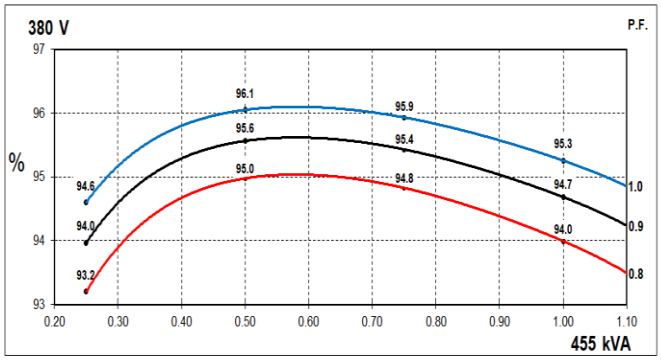
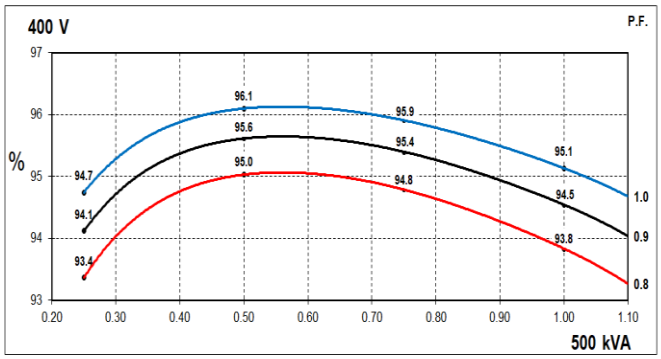
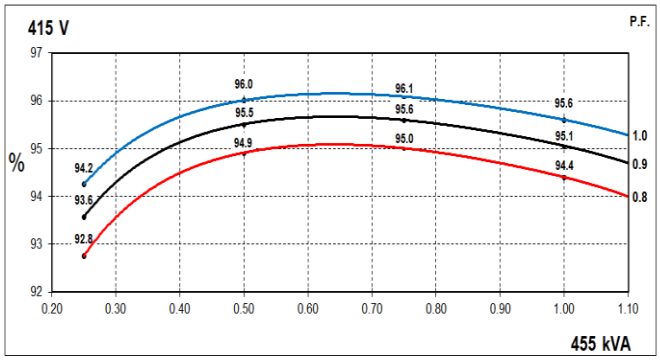
S5L1D-C4 Wdg.311

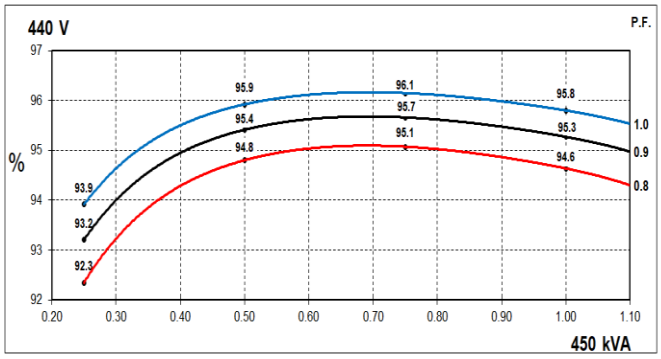
THREE PHASE EFFICIENCY CURVES

50Hz

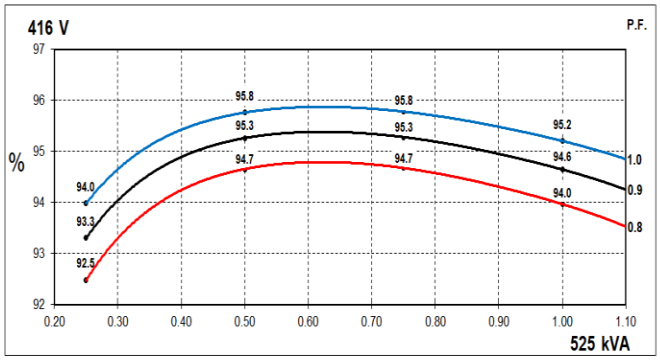


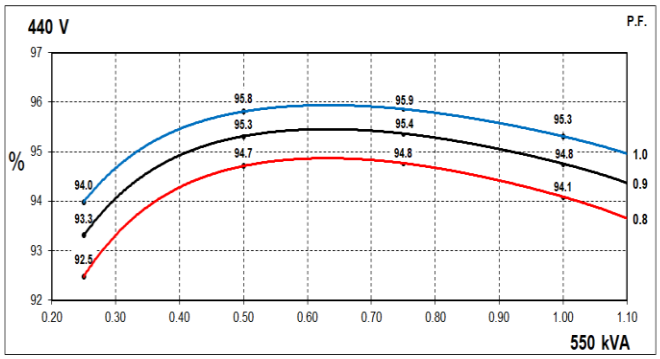


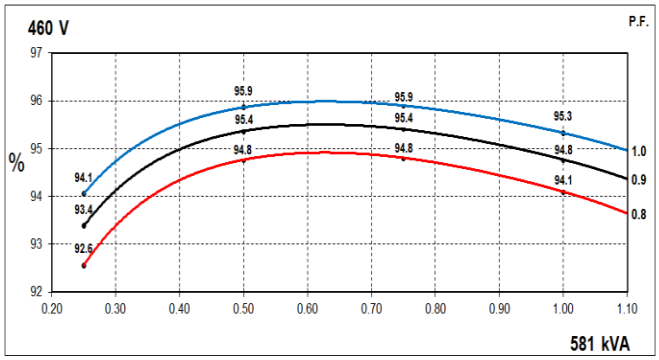


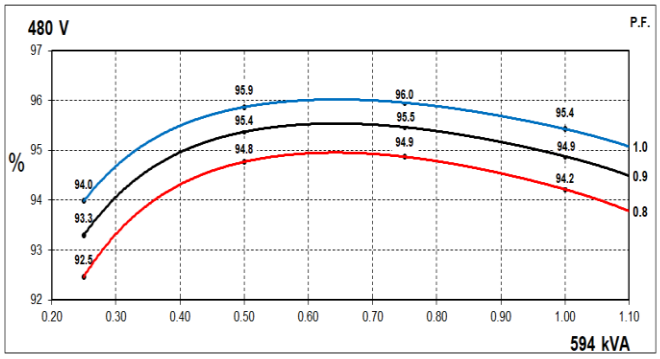


60Hz



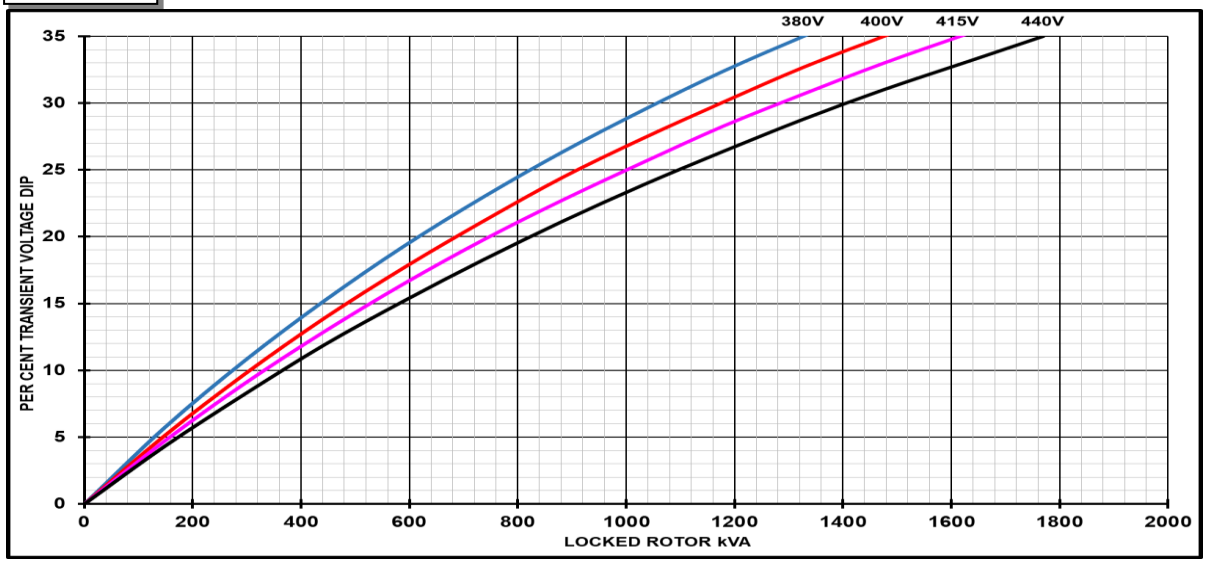




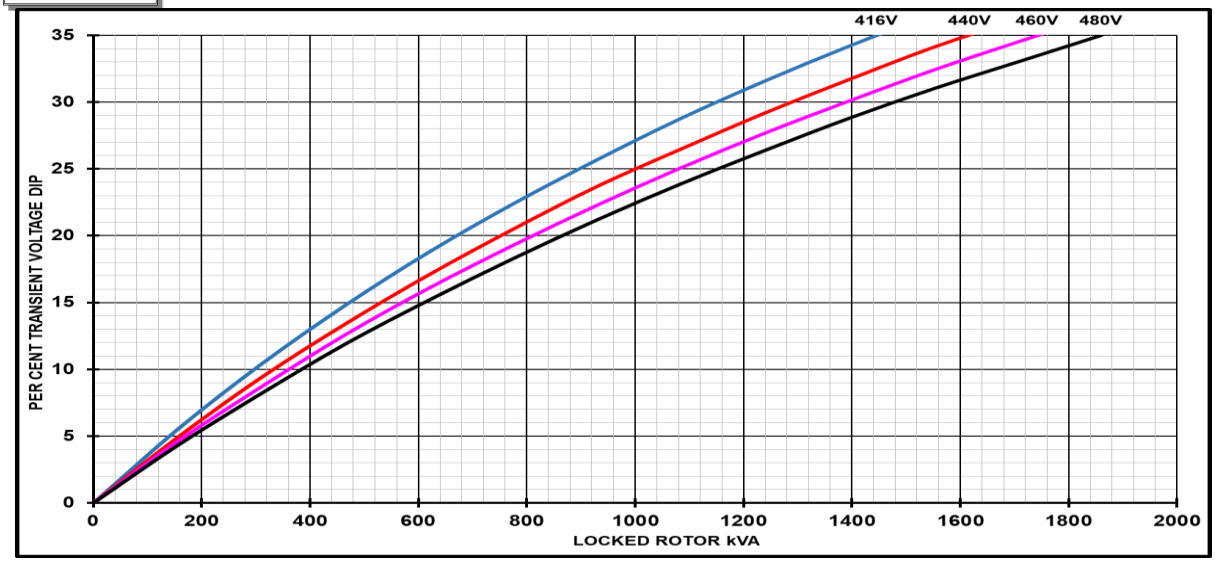


Locked Rotor Motor Starting Curves - Separately Excited

50Hz



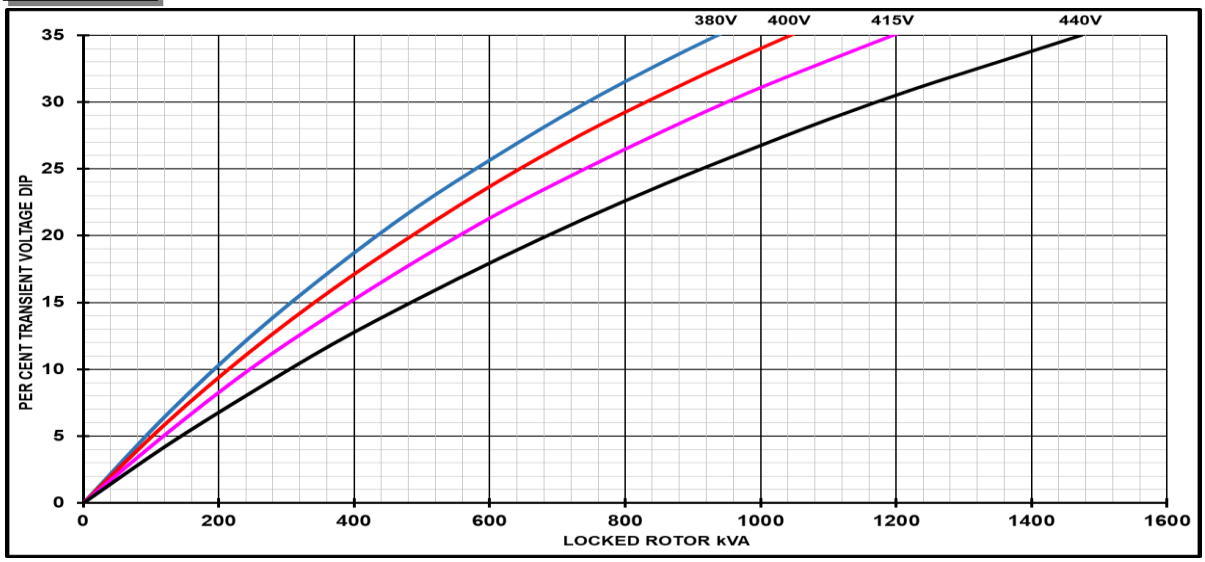
60Hz



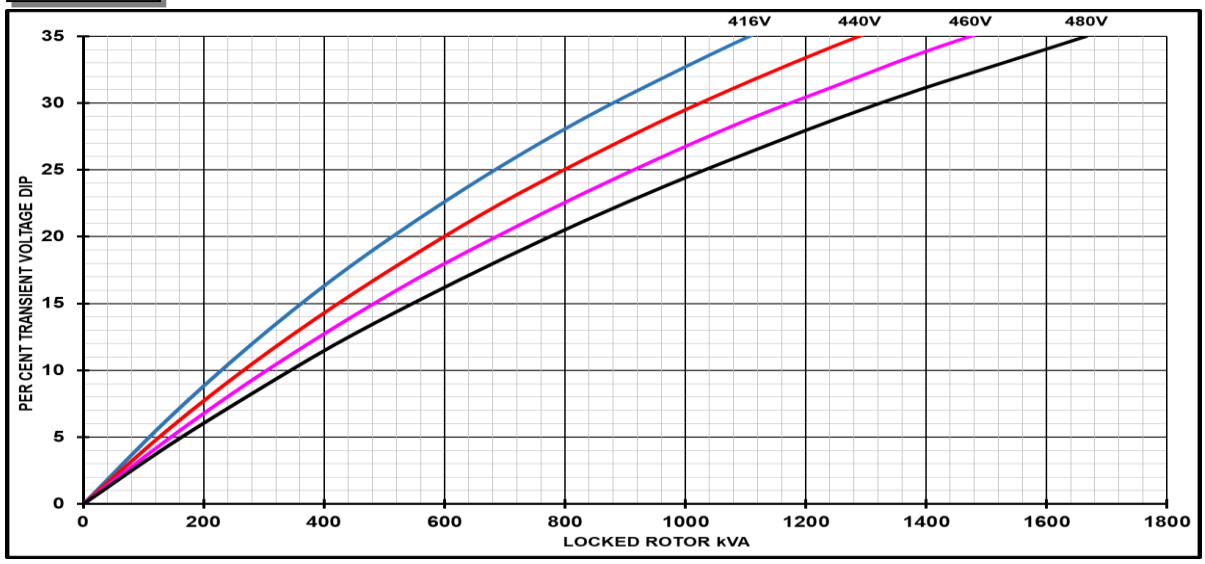
Transient Voltage Dip Scaling Factor		Transient Voltage Rise Scaling Factor
PF	Factor	For voltage rise multiply voltage dip by 1.25
< 0.5	1	
0.5	0.97	
0.6	0.93	
0.7	0.9	
0.8	0.85	
0.9	0.83	

Locked Rotor Motor Starting Curves - Self Excited

50Hz



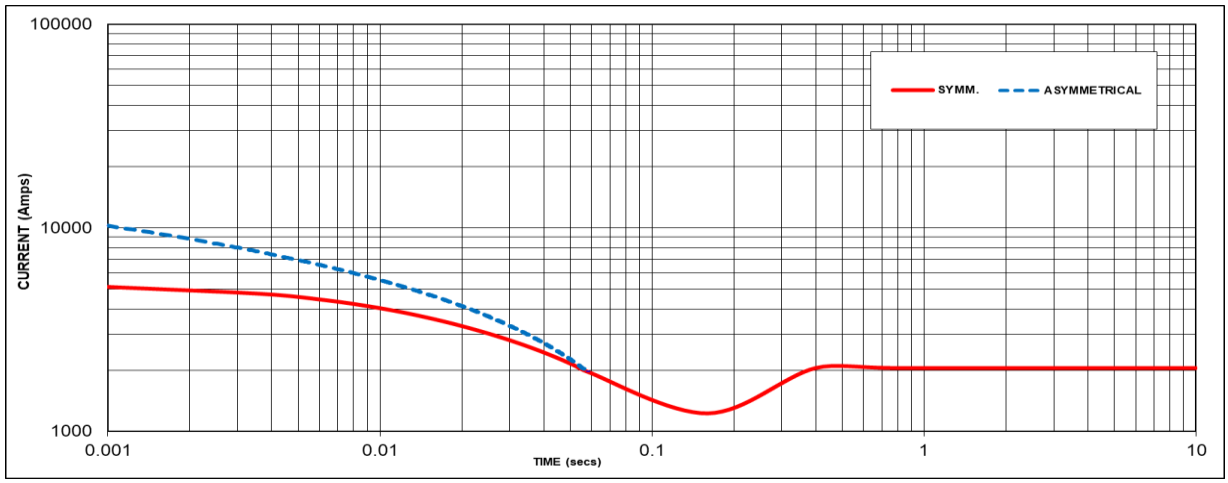
60Hz



Transient Voltage Dip Scaling Factor		Transient Voltage Rise Scaling Factor
PF	Factor	For voltage rise multiply voltage dip by 1.25
< 0.5	1	
0.5	0.97	
0.6	0.93	
0.7	0.9	
0.8	0.85	
0.9	0.83	

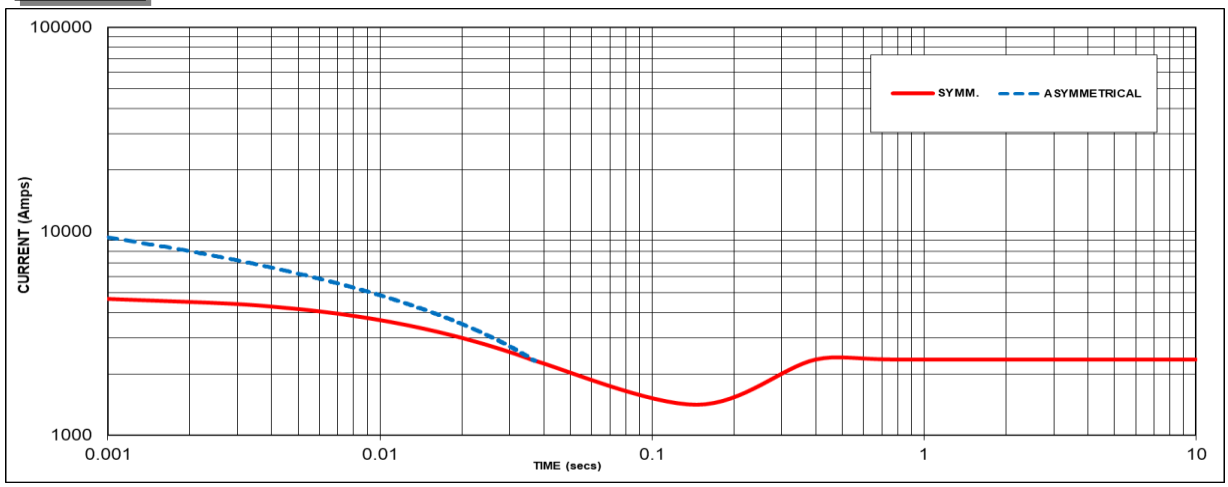
Three-phase Short Circuit Decrement Curve - Separately Excited

50Hz



Sustained Short Circuit = 2050 Amps

60Hz



Sustained Short Circuit = 2350 Amps

Note 1
The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380V	X 1.00	416V	X 1.00
400V	X 1.05	440V	X 1.06
415V	X 1.09	460V	X 1.10
440V	X 1.16	480V	X 1.15

The sustained current value is constant irrespective of voltage level

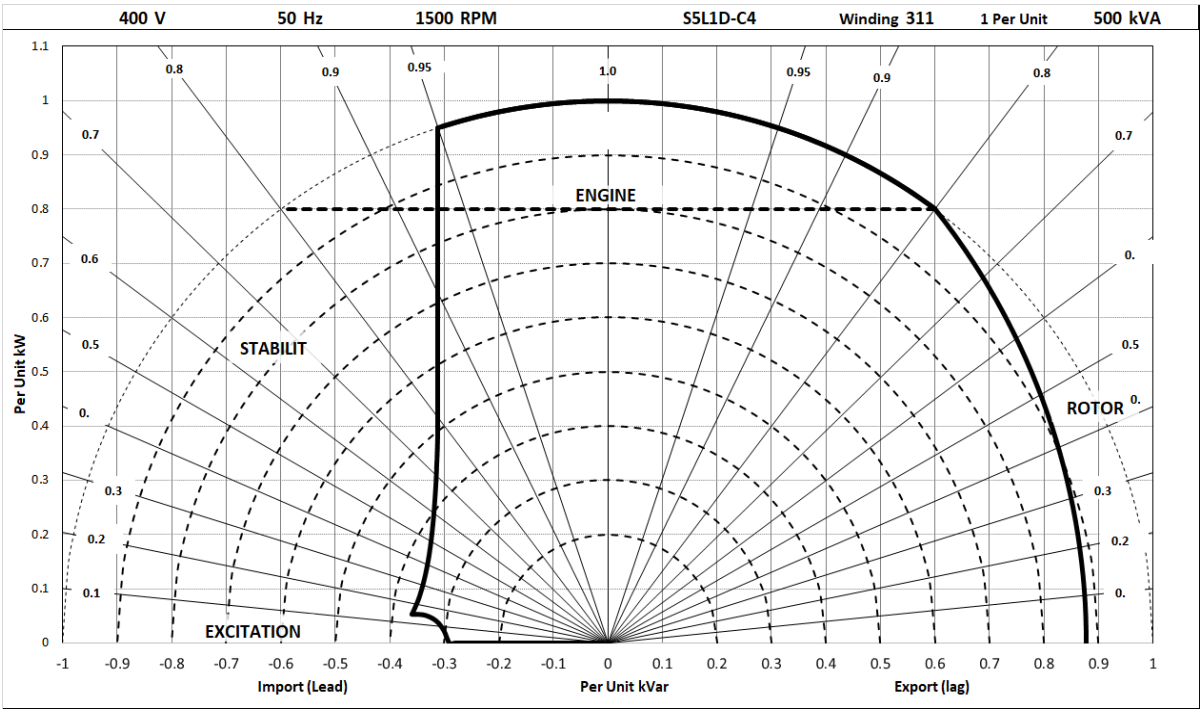
Note 2
The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

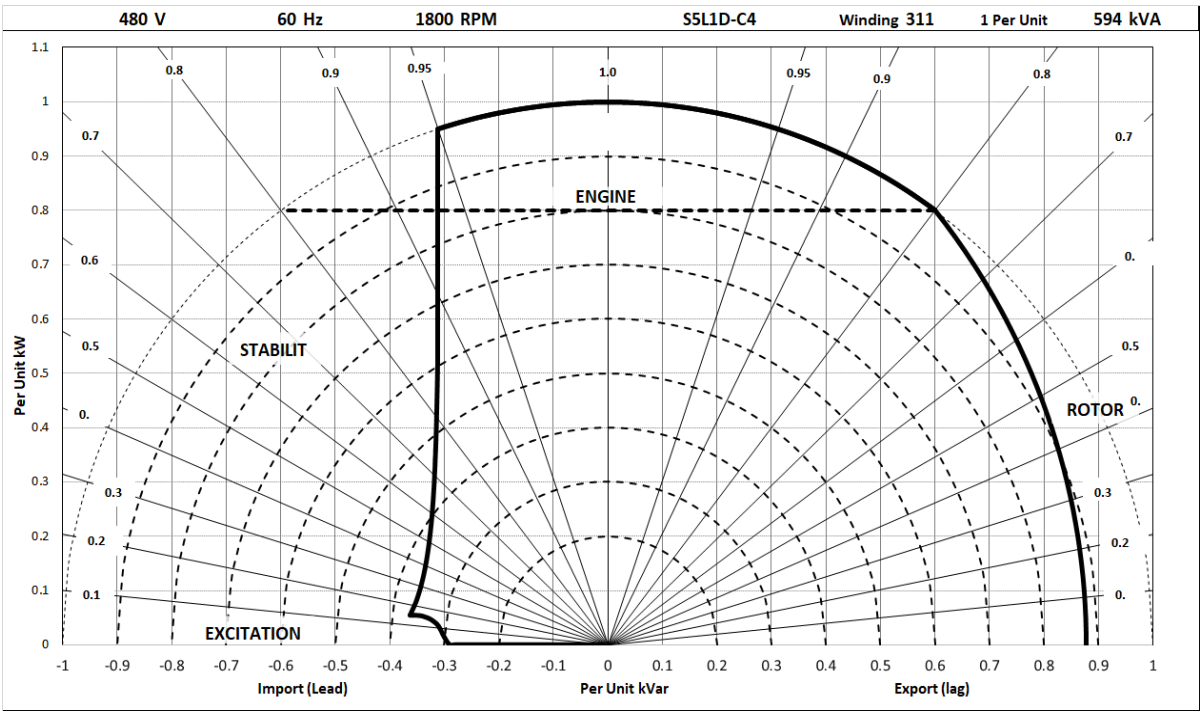
Note 3 All other times are unchanged
Curves are drawn for Star connection under no-load excitation at rated speeds. For other connection (where applicable) the following multipliers should be applied to current values as shown :
Parallel Star = Curve current value X 2
Series Delta = Curve current value X 1.732

Typical Alternator Operating Charts

400V/50Hz



480V/60Hz



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RATINGS AT 0.8 POWER FACTOR

	Class - Temp Rise	Standby - 163/27°C				Standby - 150/40°C				Cont. H - 125/40°C				Cont. F - 105/40°C			
50 Hz	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	500	520	500	495	478	512	478	478	455	500	455	450	400	445	400	400
	kW	400	416	400	396	382	410	382	382	364	400	364	360	320	356	320	320
	Efficiency (%)	93.5	93.6	94.0	94.3	93.8	93.7	94.2	94.4	94.0	93.8	94.4	94.6	94.5	94.3	94.8	94.9
	kW Input	428	444	425	420	408	437	406	405	387	426	386	380	339	377	338	337

60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	569	600	631	644	550	581	613	625	525	550	581	594	481	500	531	538
	kW	455	480	505	515	440	465	490	500	420	440	465	475	385	400	425	430
	Efficiency (%)	93.6	93.7	93.7	93.9	93.8	93.9	93.9	94.0	94.0	94.1	94.1	94.2	94.3	94.4	94.4	94.5
	kW Input	486	512	539	549	469	495	522	532	447	468	494	504	408	424	450	455

De-Rates

All values tabulated above are subject to the following reductions:

- % when air inlet filters are fitted
- % for every 500 meters by which the operating altitude exceeds 1000 meters above mean sea level
- % for every 5°C by which the operational ambient temperature exceeds 40°C @ Class H temperature rise (please refer to applications for ambient temperature de-rates at other temperature rise classes)
- or any other operating conditions impacting the cooling circuit please refer to applications

Note: Requirement for operating in an ambient exceeding 60°C and altitude exceeding 4000 meters (for <690V) or 1500 meters (for >690V) must be referred to applications.

Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (http://stamford-avk.com/)

Note: Continuous development of our products means that the information contained in our data sheets can change without notice, and specifications should always be confirmed with Cummins Generator Technologies prior to purchase.

Dongfeng Cummins
Techical Operations

Engine Model： QSZ13-G3

Curve and Datasheet：FR20322

Rev02

Date of Issue: 2011/01

Dongfeng Cummins Engine Co.,Ltd

Generator Engine Performance Data

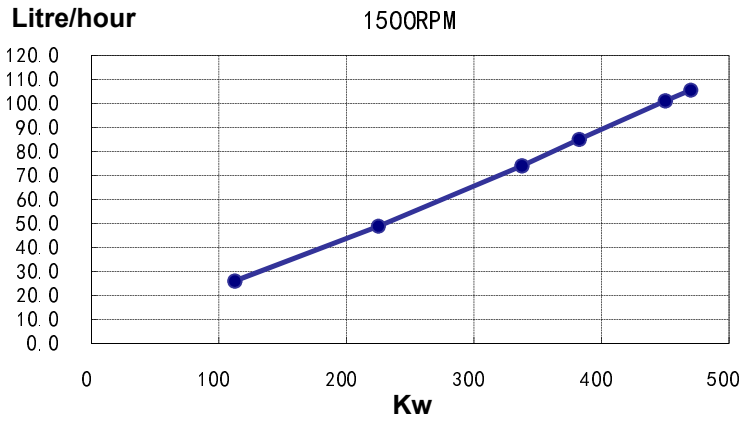
FR20322	@	1500RPM

Engine Model: QSZ13-G3

Engine Model: QSZ13-G3
CPL: 3690
Compression Ratio: 17:1
Engine Configuration: D0C3004GX03
Bore: 130 mm
Displacement: 13.0 L
Stroke: 163 mm
Cylinders: 6
Governor Regulation: ≤1%
Aspiration: Turbocharged & Charge Air Cooled
Emission Certification: MEP STAGE II
Fuel System: XPI

Engine Speed	Standby Power		Prime Power		Continuous Powe	
RPM	kW	HP	Kw	HP	kW	HP
1500	**470**	630	**450**	603	**383**	513

Engine Performance Data @ 1500 RPM				
OUTPUT POWER			FUEL CONSUMPTION	
%	Kw	HP	g/kW.h	L/h
STANDBY POWER				
100	**470**	630	193	105.5
PRIME POWER				
100	**450**	603	193	101.0
75	**338**	452	189	74.0
50	**225**	302	187	48.8
25	**113**	151	199	26.0
Continuous Power				
100	**383**	513	191	85.0



Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with GB/T18297 conditions of 100kPa barometric pressure [80 m altitude], 25°C inlet air temperature, and 1 kPa water vapor pressure with No.0 diesel fuel.
The engine may be operated without changing the fuel setting up to 5200 m altitude.

Dongfeng Cummins Engine Co.,Ltd

Generator Engine Performance Data			Engine Model	QSZ13-G3
FR20322	@	1500RPM		

GENERAL ENGINE DATA

Approximate Engine Weight - Dry:	- kg	1195
Approximate Engine Weight - Wet:	- kg	1260
Compression Ratio:		17:1
Fire Order:		1-5-3-6-2-4
Center of Gravity		
from front face of block:	- mm	519
above crankshaft centerline:	- mm	201

ENGINE MOUNTING

Maximum static mounting surface bending moment		
Rear face of block:	- N.m	1356

LUBRICATION SYSTEM

Oil pressure @ idle - minimum:	- kPa	89.6
Total system capacity (standard pan):	- L	45.42
Maximum lube oil flow to all accessories:	- L/min	7.57
Typical oil pressure range - warm engine:	- kPa	207 - 355

AIR INTAKE SYSTEM

Charge air cooler pipe size normally acceptable::	- mm	110
Maximum temperature rise between ambient air and engine air inlet:	- ℃	11.1
Maximum intake air restriction (heavy duty air cleaner):		
dirty filter:	- kPa	6.2
clean filter:	- kPa	2.5

Exhaust System

Max. back pressure imposed by complete exhaust system:	- kPa	13
Maximum allowable static bending moment at exhaust outlet flange:	- N-m	27
Exhaust pipe size normally acceptable:	- mm	130

FUEL SYSTEM

Maximum fuel drain restriction (total head) before (or without) check valve:		
	- kPa	27
Minimum fuel tank venting requirement:	- L/s	0.2
Maximum fuel inlet temperature:	- ℃	71
Maximum heat rejection to return fuel	- kW	5.36
Maximum design fuel flow:	- kg/hr	204

Dongfeng Cummins Engine Co.,Ltd				
Generator Engine Performance Data			Engine Model	QSZ13-G3
FR20322	@	1500RPM		

Cold Start Performancee

Minimum ambient temperature for unaided cold start:	- ℃	-15
Minimum ambient temperature for aided cold start:	- ℃	-30

Cooling System

Coolant Capacity	- L	23.1
Engine coolant circuit thermostat opening temperature:	- ℃	82
Engine coolant circuit thermostat fully open temperature:	- ℃	94
Maximum coolant pressure(exclusive of pressure cap; closed thermostat at maximum no load speed):	- kPa	407
Maximum coolant temperature - engine out:	- ℃	102
Maximum deaeration time:	- mins	25
Minimum operating block coolant temperature:	- ℃	71
Minimum fill rate (low level alarm required for most engines):	- litre/mi	19
Maximum coolant expansion space (% total system capacity):	- %	10
Minimum coolant expansion space (% total system capacity):	- %	6
Minimum pressure cap rating at sea level:	- kPa	103
Maximum coolant temperature for engine protection controls:	- ℃	107
Maximum allowable pressure drop across charge air cooler and OEM CAC piping (CACDP):	- kPa	10.1

Electrical System

System voltage:	- V	24
Minimum battery capacity-cold soak at -18 C (0 F) or above Engine only (de-clutched load) cold cranking amperes:	- CCA	900

EMISSIONS

Gaseous Emissions per GB 20891-2007, at 1500rpm：

- Weight-Specific Nox:	- g/kW.h	5.341
- Weight-Specific HC:	- g/kW.h	0.124
- Weight-Specific CO:	- g/kW.h	0.393
- Weight-Specific Particulates:	- g/kW.h	0.026

Dongfeng Cummins Engine Co.,Ltd

Generator Engine Performance Data			Engine Model	QSZ13-G3
FR20322	@	1500RPM		

Fuel Rating Option used for these Data: FR20322

	Standby Power	Prime Power
Governed Engine Speed: ..... -RPM	1500	1500
Gross Engine Power Output: ..... -kW	**470**	**450**
Torque: ..... -N.m	2992	2865
Friction Horsepower: ..... -kW	42	37
Piston Speed: ..... -m/s	8.15	8.15
Engine Water Flow to Engine: ..... -litre/sec.	6.8	6.5
Intake Air Flow: ..... -kg/min	35. 8	35
Exhaust Gas Temperature: ..... -kg/min	37. 3	36. 45
Exhaust Gas Flow: ..... -℃	547	530
Radiated Heat to Ambient:..... -kW	111	104
Heat Rejection to Coolant:..... -kW	172	155
Turbocharger Compressor Outlet Pressure: .. -kPa	264	250
Turbocharger Compressor Outlet Temperatur - ℃	207	198

ALL DATA CERTIFIED WITHIN 5%

TBD = To Be Decided N/A = Not Applicable N.A. = Not Available

All data is subject to change without notice, sorry for inform.

Dongfeng Cummins Engine Co., Ltd.

DSEGenset

DSE7310/20

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

FEATURES

The DSE7310 is an Auto Start Control Module and the DSE7320 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 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 and dual mutual standby (DSE7310 only) to reduce engine wear.

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 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

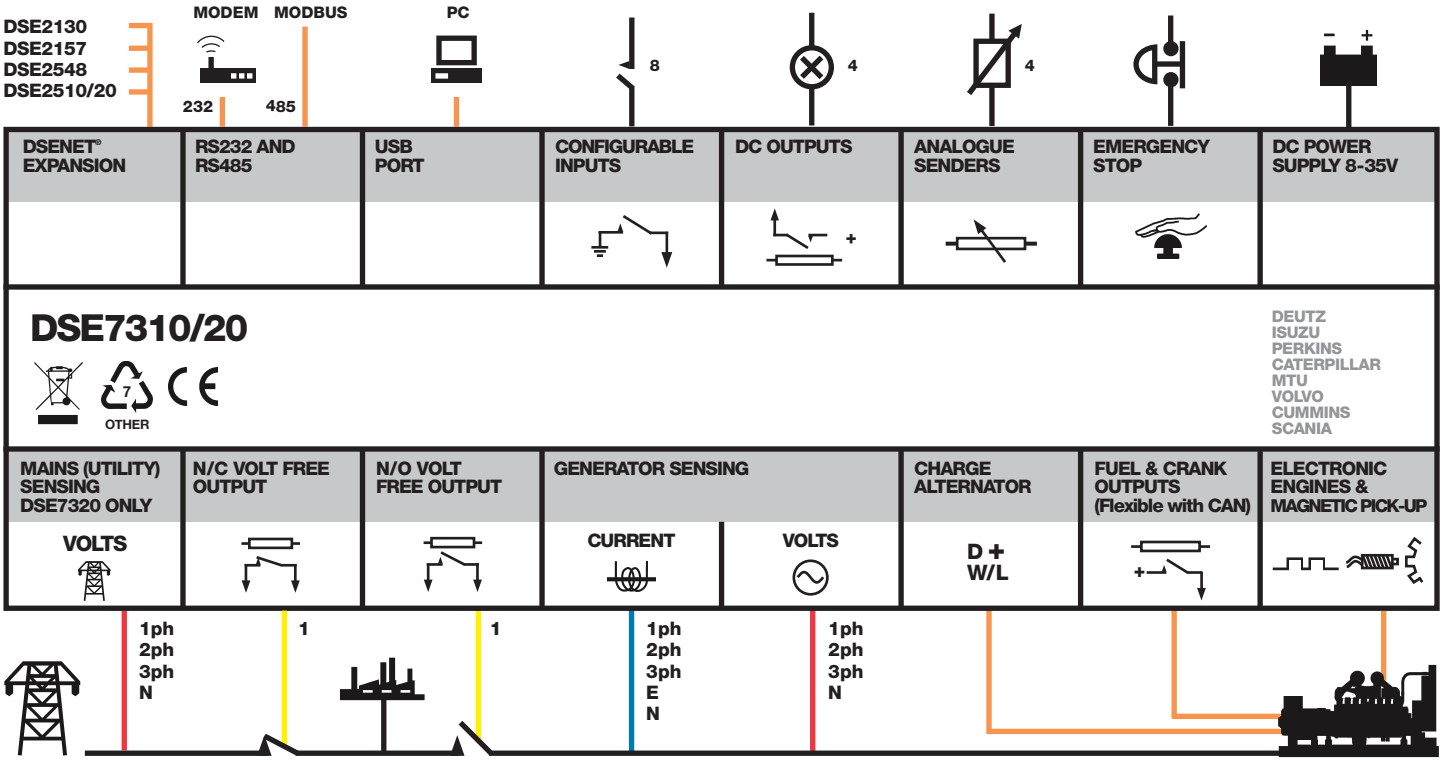
VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz @ +/-7.5 mm,
8 Hz to 500 Hz @ 2 gn

HUMIDITY
BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C @ 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C @ 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



ISSUE 6

DSEGenset

DSE7310/20

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

FEATURES

DSE7310

DSE7320

KEY FEATURES

- 4-Line back-lit LCD text display
- Five key menu navigation
- Front panel editing with PIN protection
- Customisable status screens
- Power save mode
- Support for up to three remote display units
- 9 configurable inputs
- 8 configurable outputs
- Flexible sender inputs
- Configurable timers and alarms
- 3 configurable maintenance alarms
- Multiple date and time scheduler
- Configurable event log (250)
- CAN engine support
- Integral PLC editor
- Easy access diagnostic page
- CAN and Magnetic Pick-up/Alt. sensing
- Fuel usage monitor and low fuel alarms
- Charge alternator failure alarm
- Manual speed control (on compatible CAN engines)
- Manual fuel pump control
- Engine exerciser
- “Protections disabled” feature
- kW & kV Ar protection
- Reverse power (kW & kV Ar) protection
- LED and LCD alarm indication
- Power monitoring (kW h, kV Ar, kV A h, kV Ar h)
- Load switching (load shedding and dummy load outputs)
- Automatic load transfer (DSE7320)
- Unbalanced load protection
- Independent Earth Fault trip
- True dual mutual standby with load balancing timer (DSE7310 only)
- USB connectivity
- Backed up real time clock
- Fully configurable via DSE Configuration Suite PC software
- Configurable display languages
- Remote SCADA monitoring via DSE Configuration Suite PC software
- User selectable RS232 and RS485 communications
- Configurable Gencomm pages
- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- Additional display screens to help with modem diagnostics
- Idle control for starting & stopping.
- DSENet® expansion compatible
- Heated display option available

KEY BENEFITS

- 132 x 64 pixel ratio display for clarity
- Real-time clock provides accurate event logging
- Multiple date and time scheduler
- Set maintenance periods can be configured to maintain optimum engine performance
- Ethernet communications (via DSE855 module), provides advanced remote monitoring
- Modules can be integrated into building management systems (BMS)
- Increased input and output expansion capability via DSENet®
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- PLC editor allows user configurable functions to meet specific application requirements

RELATED MATERIALS

TITLE	PART NO’S
DSE7310 Installation Instructions	053-028
DSE7320 Installation Instructions	053-029
DSE7200/7300 Quick Start Guide	057-101
DSE7200/7300 Operator Manual	057-074
DSE7200/7300 Configuration Suite PC Manual	057-077

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8 V to 35 V Continuous

CRANKING DROPOUTS
Able to survive 0 V for 50 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
340 mA at 12 V, 160 mA at 24 V

MAXIMUM STANDBY CURRENT
160 mA at 12 V, 80 mA at 24 V

CHARGE FAIL/EXCITATION RANGE
0 V to 35 V

MAINS (UTILITY) DSE7320 ONLY

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

OUTPUTS

OUTPUT A (FUEL)
15 A DC at supply voltage

OUTPUT B (START)
15 A DC at supply voltage

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

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

GENERATOR

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 PICK UP

VOLTAGE RANGE
+/- 0.5 V to 70 V

FREQUENCY RANGE
10,000 Hz (max)

DIMENSIONS

OVERALL
240 mm x 181 mm x 42 mm
9.4” x 7.1” x 1.6”

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

MAXIMUM PANEL THICKNESS
8 mm
0.3”

OPERATING TEMPERATURE RANGE
-30°C to +70°C

STORAGE TEMPERATURE RANGE
-40°C to +80°C

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EMAIL sales@deepseausa.com **WEBSITE** www.deepseausa.com

Registered in England & Wales No.01319649
VAT No.316923457

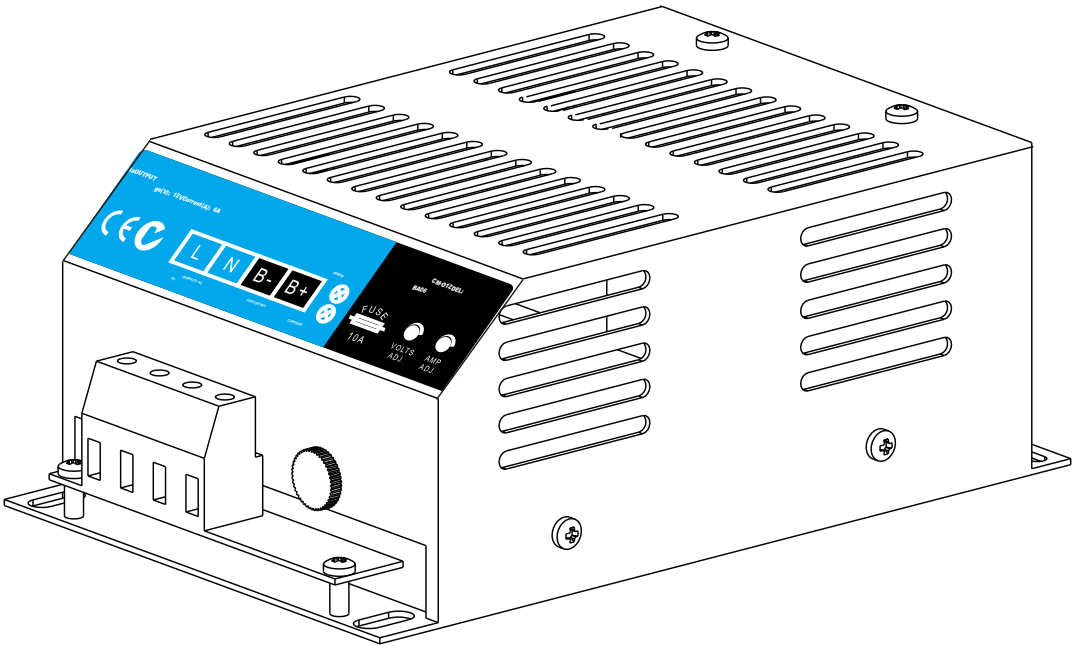
055-051/10/11 (13) US

BOSSPOWERS
GENERATOR

BAC SERIE

BATTERY CHARGER

PRODUCT INSTRUCTION



Fujian Boss Electrical Machinery Co., Ltd.

▶ OVERVIEW

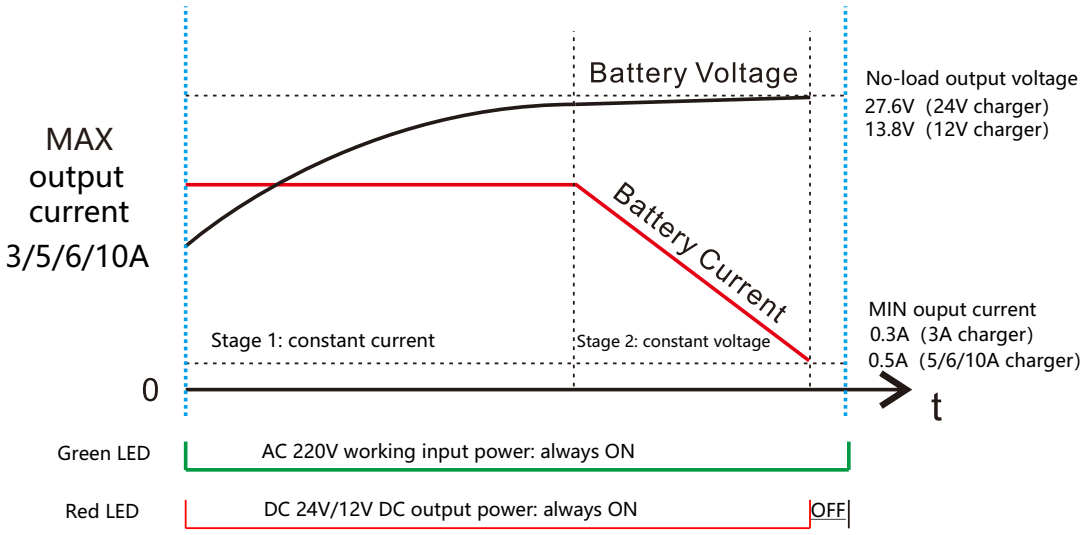
BAC series switch b5attery chargers use the latest switch power. devices. Designed according to the charge characteristics of the .

lead-acid battery for starting generators, BAC chargers are suitable for the long time supplement charge (floating charge) of the lead-acid battery. The maximum charging current is 6A for 12V and 10A for 24V.

▶ PERFORMANCE FEATURES

1. Designed in switch power structure solid state. Wide range of the input voltage. Small volume,light weight and high efficiency.
2. Automatic charge using the 2-stage charging method(i.e., constant current first and then constant voltage). The process
   is in full accordance with the battery charging characteristics, and can prevent overcharging of lead-acid battery and maximize battery life.
3. Have protection functions for short-circuit and reverse connection.
4. Charging voltage and current can be regulated by potentiometer on site.
5. LED status display: AC power indication, charging indication
6. Horizontal instillation. Easy to install.

▶ CHARGING PRINCIPLE



Charging Curve

BAC chargers use 2-stage charging method which is in accordance with the battery charging characteristics. When the battery voltage is under the threshold, the charging current is constant. When the battery voltage is higher than the threshold, the charging current decreases as the battery voltage rises. When the charging current reaches the set value, the charger turns into the floating charging mode. At this time,charging current decreases gradually and the battery voltage rises gradually to the set value. When the charging current is lower than 0.3A(0.5A for 24V 5A), the battery is basically fully charged (the charging indication LED turns OFF) Afterwards, the charging current only offsets the self-discharging of the battery and the long time charging does no harm to the battery. The charger can maintain the battery in a full state and ensure the battery life.

▶ SPECIFICATIONS

SPECIFICATION TABLE

Category	Items	12V	24V
Model	BAC	BAC-1206	BAC-2403/2405/2410
Input	Nominal input voltage	AC（100～240）V	
	Max input voltage	AC（90～305）V	
	Frequency	50Hz/60Hz	
	Max input current	2.5A	2.5A/2.5A/4A
	Efficiency	>85%	
Output	Charging current	4A～6A，error±2%	2A～3A/5A/10A，error±2%
	Factory charging current	6A	3A/5A/10A
	Max output power	135W	135W/135W/290W
	Min output voltage	7.5V	
	No-load output voltage	13.8V，error±1%	27.6V，error±1%
	No-load consumption	<3W	
Insulation	Insulation resistance	When between input and output, output and shell are both DC500V 1min, the insulation resistance RL≥50MΩ	
	Insulation voltage	When between input and output, output and shell are both AC1500V 50Hz 1min, the leakage current IL≤3.5mA	
Working conditions	Working temperature	(-30～55)℃	
	Storage temperature	(-40～85)℃	
	Working humidity	10%RH～95%RH(no condensation)	
Structure	Weight	0.65kg	0.65/0.65/1.15kg
	Dimensions(L*W*H mm)	143*96*55(3A/5A/6A); 205*146*55(10A);	

▶ CONFIGURATION

●Voltage regulation

When regulating voltage on site, it is needed to disconnect the battery from the charger. Measure the charger output voltage while regulating the voltage potentiometer (VOLT) until the appropriate value is reached.

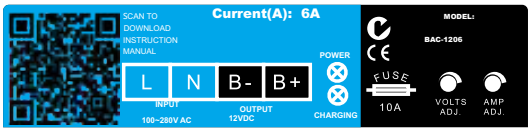
●Current regulation

Connect the output to the battery. Measure the charging current when the charging voltage is not higher than 25.0V (12.5V). Regulate the current potentiometer (AMP) to set the appropriate charging current.

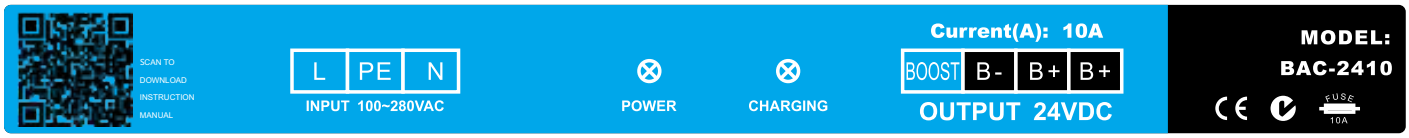
The output current can also be estimated according to the current potentiometer scale.

▶ OPERATION INSTRUCTIONS

BAC-1206、BAC-2403、BAC-2405



BAC-2410



1. Connect AC 220V to terminals L and N. BVR multi wire copper wires are recommended. Wires for 3A/5A/6A chargers should be no thinner than 1mm2 ; wires for 10A chargers should be no thinner than 1.5mm2 .
2. Connect terminal B+ to “+”of battery; connect terminal B- to “-”of battery. BVR multi wire copper wires are recommended. Wires for 3A/5A/6A chargers should be no thinner than 1.5mm²; wires for 10A chargers should be no thinner than 2.5mm².
3. POWER：green indicator of power status. On when charger works normally.
4. CHARGING：red indicator of charge status. On when the charge current is larger than 0.3A (0.5A).
5. VOLT：regulator potentiometer of charging voltage.
6. AMP： regulator potentiometer of charging current.
7. The output FUSE is 10A. The fuse will burn out if the output is wired reversely. At this time, there is no output voltage. After correcting the output wiring and replacing the fuse, the charger can work normally.
8. Steps of fuse replacement:

8.1. Use a screwdriver to press in slightly and screw counterclockwise a little. Then pull the fuse out.(unsuitable operation or excessive force may damage the fuse holder)

8.2. Insert the new fuse into the fuse holder. Use a screwdriver to press in slightly and screw clockwise a little.

Note:

1.The internal output of the charger is connected to diode and current limiting circuit. The charger can be used in parallel with the charging generator on the engine.
It is not necessary to disconnect the charger when starting.

2.When used on generator sets, it is recommended to connect the charging to the battery terminal separately, because a voltage drop will be generated on the charging cable due to the high charging current, which can affect the sensor sampling accuracy.

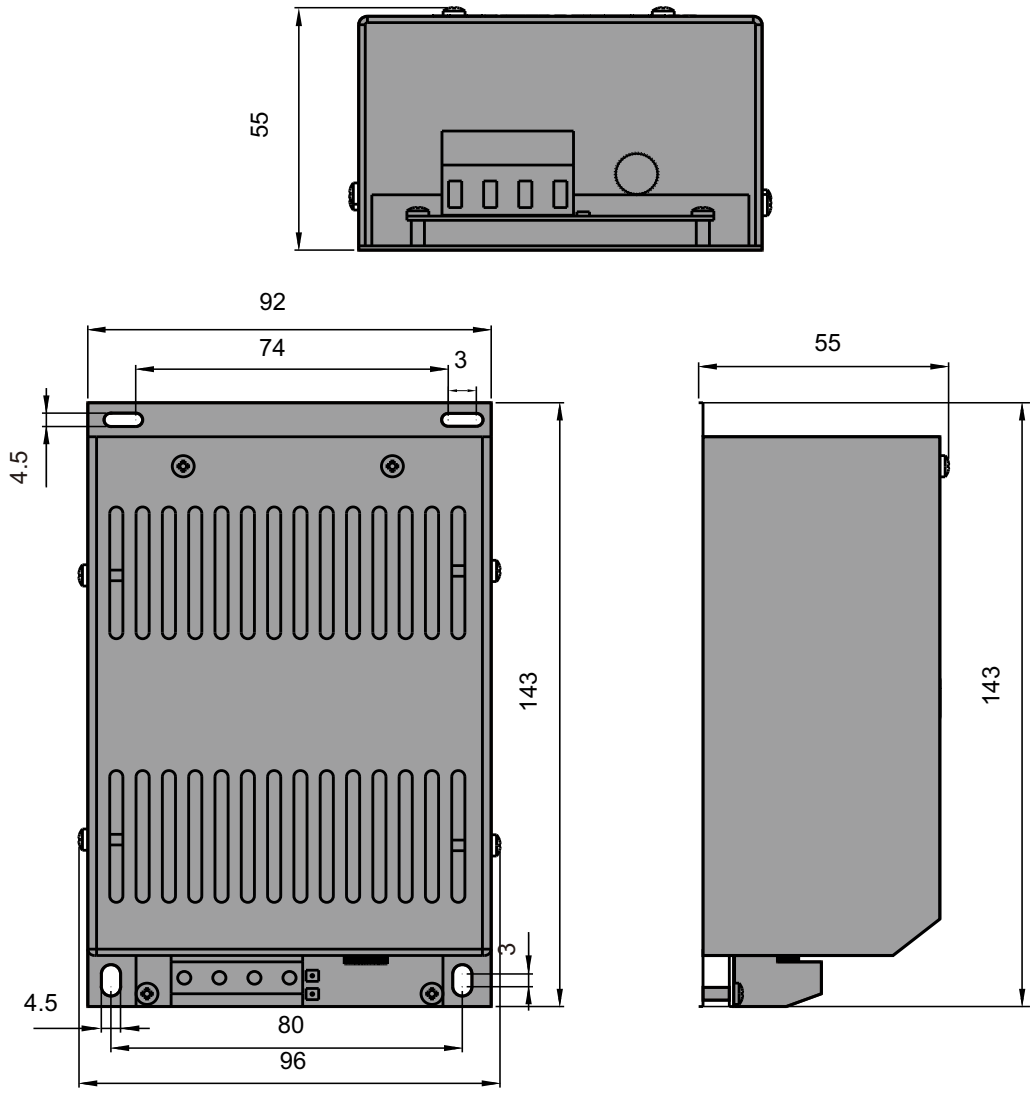
▶ MODEL SELECTION

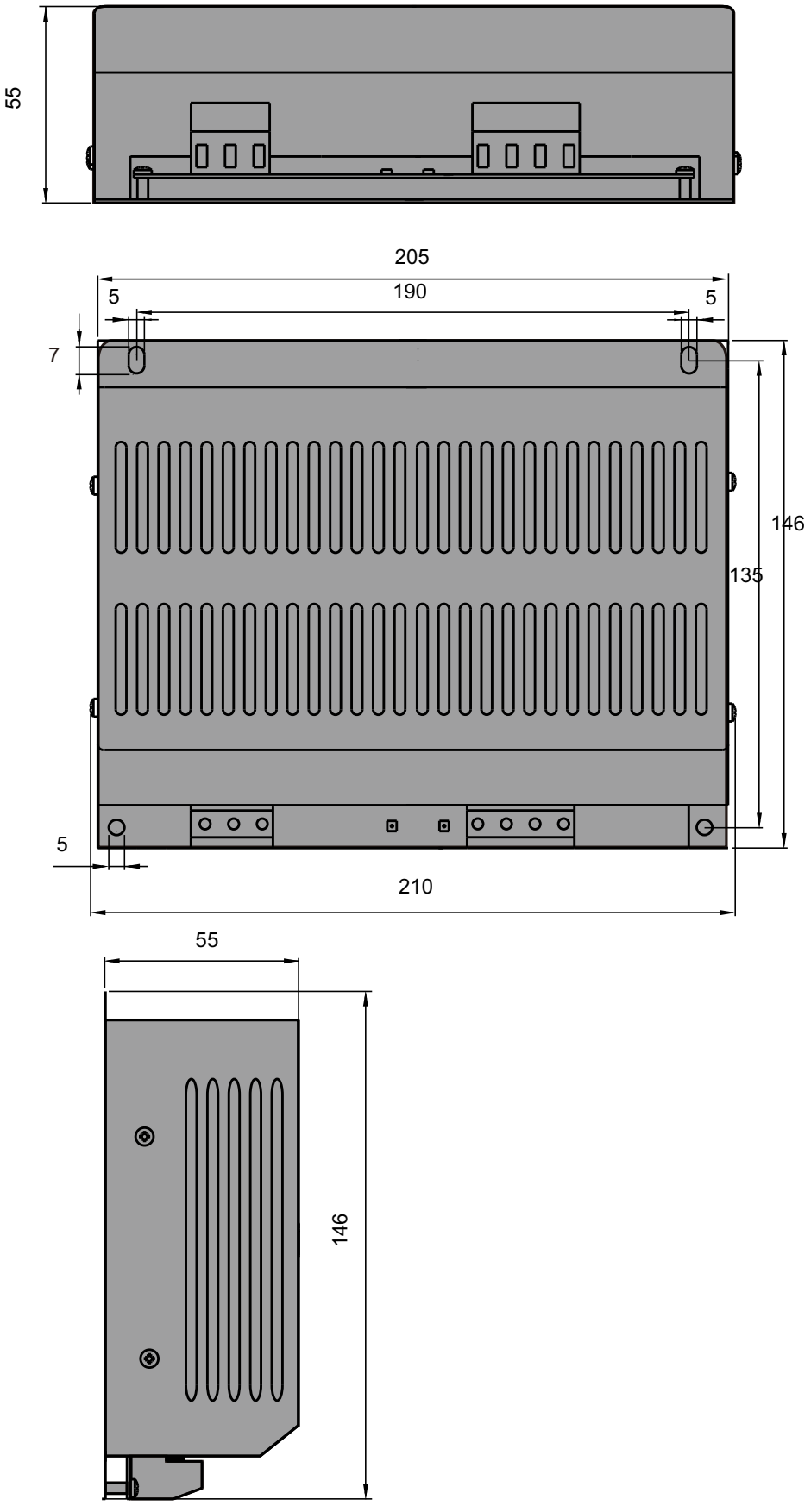
When ordering, select the model according to the installation method and the voltageas the chart below.

Model	Installation	Battery Type	Rated Output Current
BAC-1206	Horizontal	12V	6A
BAC-2403	Horizontal	24V	3A
BAC-2405	Horizontal	24V	5A
BAC-2410	Horizontal	24V	5A

▶OUTLINE AND INSTALLATION DIMENSIONS

BAC-1206、BAC-2403、BAC-2405




55
205
190
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7
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210
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146