

# 50KW PERKINS DIESEL GENERATOR



## GENERAL INFORMATION & KEY FEATURES

- **Power:** 50kW / 58kVA at 60 Hz
- **Engine:** Perkins 1104D-44TG1
- **Cylinder:** 4-cylinder, Vertical in-line
- **Cooling:** Water-cooled
- **Displacement:** 4.4 Liter
- **Bore x Stroke:** 105x127 mm
- **Voltage:** Any voltage can be customized
- **Phase:** Single phase or 3-phase options available
- **Operating Speed:** 1800 rpm
- **Noise Level:** 69 db @ 7m
- **Enclosure Type:** Silent IP-65, soundproof and weatherproof customizable enclosure
- **Controller:** DSE GenSet 6110
- **Fuel Tank:** 60 or 160 gallons, extended fuel tank capacity options
- **Dimensions:** L\*W\*H - 96 x 43 x 70 (in.)
- **Weight:** 2500 lbs.
- **Certifications:** Certified ISO:9001, ISO:17025, ISO:8258, EPA Tier 3, UL2200

# 1100 Series 1104D-44TG1 Diesel Engine – ElectropaK

63 kWm (84 hp) gross standby power @ 1800 rpm

The Perkins® 1104D turbocharged ElectropaKs are the latest addition to the 1100 Series ElectropaK range. Perkins has developed this engine in line with our customer's needs by providing the options of either electronic common rail or mechanically controlled fuel systems.

These ultra clean engines are assembled on a new high technology production line. Frequent computerized checks during the production process ensure high build quality is maintained throughout.

Perkins has produced a world-class product for their customers, engineered to give even greater levels of reliability, yet with a lower cost of ownership.



## Emissions

Certified against the requirements of U.S. EPA Tier 3 legislation for non-road mobile machinery, powered by constant speed engines (EPA 40 CFR Part 89 Tier 3).

Specification		
Number of cylinders	4 vertical in-line	
Bore and stroke	105 x 127 mm	4.1 x 5.0 in
Displacement	4.41 litres	269 in <sup>3</sup>
Aspiration	Turbocharged	
Cycle	4 stroke	
Combustion system	Direct injection	
Compression ratio	18.2:1	
Rotation	Anti-clockwise, viewed on flywheel	
Total lubricating capacity	8.4 litres	2.2 US gal
Cooling system	Water-cooled	
Total coolant capacity	16.5 litres	4.4 US gal

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THE HEART OF EVERY GREAT MACHINE

# 1100 Series 1104D-44TG1 Diesel Engine – Electropak

63 kWm (84 hp) gross standby power @ 1800 rpm

## Technical information

### Air inlet

- Mounted air filter and turbocharger

### Fuel system

- Rotary type pump
- Fuel filter

### Lubrication system

- Wet cast iron sump with filler and dipstick
- Oil filter

### Cooling system

- Belt-driven pusher fan and guards
- Mounted radiator and piping
- Water pump

### Electrical equipment

- 12 volt starter motor and 12 volt 65 amp alternator with DC output

### Flywheel and housing

- High inertia flywheel to SAE J620 size 10/11
- SAE 3 flywheel housing

### Starting aids

- Glow plugs

### Literature

- User's Handbook

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63 kWm (84 hp) gross standby power @ 1800 rpm

Speed rpm	Type of operation	Typical generator output (Net)		Engine power			
				Gross		Net	
		kVA	kWe	kWm	hp	kWm	hp
1800	Standby power	70.9	56.7	64	86	63	85

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

Generator powers are typical and are based on typical alternator efficiencies and a power factor of 0.8. **Fuel specification:** BS 2869 Class 2 or ASTM D975 D2. **Lubricating oil:** API CH4/ACEA E5.

#### Rating definitions

**Prime power:** Power available at variable load in lieu of a main power network. Overload of 10% permitted for 1 hour in every 12 hours operation.

**Standby power:** Power: available at variable load in the event of a main power network failure. Maximum use 500 hours per year. No overload is permitted.

Percent of prime power	Fuel consumption at 1800 rpm g/kWh	Fuel consumption at 1800 rpm l/hr
Standby power	243	18.7
Prime power	240	16.6
75%	248	12.8
50%	260	9
25%	300	5.2

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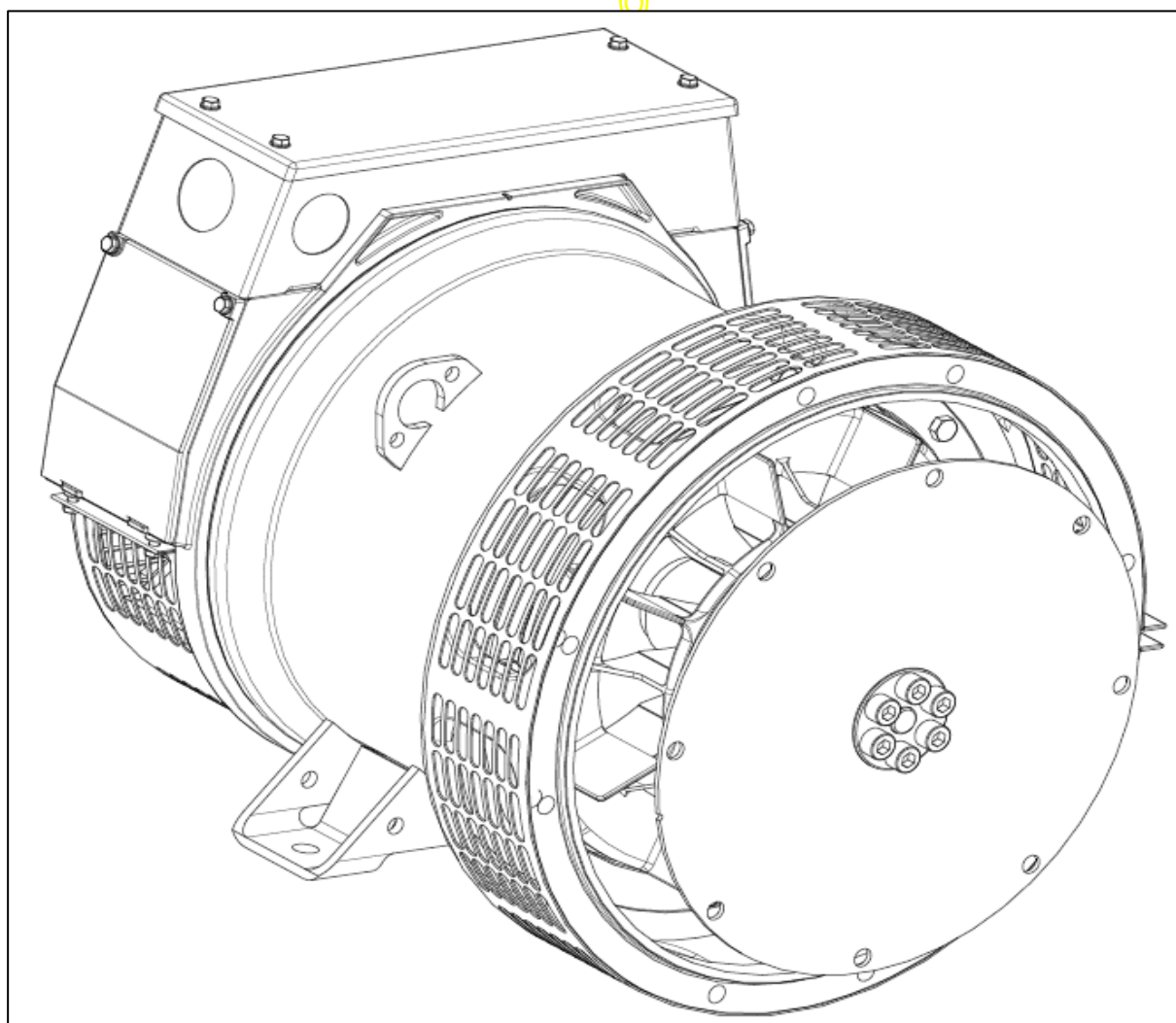


THE HEART OF EVERY GREAT MACHINE

# STAMFORD®

**PI144D - Winding 14**

Technical Data Sheet



**PI144D**  
**WINDING 14**

CONTROL SYSTEM	STANDARD AS480 AVR (SELF EXCITED)			
VOLTAGE REGULATION	± 1.0 %			
SUSTAINED SHORT CIRCUIT	SELF EXCITED MACHINES DO NOT SUSTAIN A SHORT CIRCUIT CURRENT			
CONTROL SYSTEM	AS480 AVR WITH OPTIONAL EXCITATION BOOST SYSTEM (EBS)			
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVE (page 6)			
INSULATION SYSTEM	CLASS H			
PROTECTION	IP23			
RATED POWER FACTOR	0.8			
STATOR WINDING	DOUBLE LAYER CONCENTRIC			
WINDING PITCH	TWO THIRDS			
WINDING LEADS	12			
STATOR WDG. RESISTANCE	0.264 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED			
ROTOR WDG. RESISTANCE	0.657 Ohms at 22°C			
EXCITER STATOR RESISTANCE	18.5 Ohms at 22°C			
EXCITER ROTOR RESISTANCE	0.228 Ohms PER PHASE AT 22°C			
EBS STATOR RESISTANCE	12.9 Ohms at 22°C			
R.F.I. 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 LINEAR LOAD < 5.0%			
MAXIMUM OVERSPEED	2250 Rev/Min			
BEARING DRIVE END	BALL. 6309-2RS (ISO)			
BEARING NON-DRIVE END	BALL. 6306-2RS (ISO)			
	1 BEARING		2 BEARING	
	WITH EBS	WITHOUT EBS	WITH EBS	WITHOUT EBS
WEIGHT COMP. GENERATOR	120.5 kg	118.8 kg	123.5 kg	121.8 kg
WEIGHT WOUND STATOR	44 kg	44 kg	44 kg	44 kg
WEIGHT WOUND ROTOR	41.87 kg	40.17 kg	42.87 kg	41.17 kg
WR <sup>2</sup> INERTIA	0.156 kgm <sup>2</sup>	0.1544 kgm <sup>2</sup>	0.1562 kgm <sup>2</sup>	0.1545 kgm <sup>2</sup>
SHIPPING WEIGHTS in a crate	138 kg	136.3 kg	147 kg	145.3 kg
PACKING CRATE SIZE	71 x 51 x 67 (cm)		71 x 51 x 67 (cm)	
TELEPHONE INTERFERENCE	THF<2%		TIF<50	
COOLING AIR	0.122 m <sup>3</sup> /sec 251 cfm			
VOLTAGE SERIES STAR	380 / 220	400 / 230	416 / 240	
kVA BASE RATING FOR REACTANCE VALUES	25.0	25.0	25.0	
X <sub>d</sub> DIR. AXIS SYNCHRONOUS	2.04	1.84	1.70	
X' <sub>d</sub> DIR. AXIS TRANSIENT	0.20	0.18	0.17	
X'' <sub>d</sub> DIR. AXIS SUBTRANSIENT	0.13	0.12	0.11	
X <sub>q</sub> QUAD. AXIS REACTANCE	0.98	0.89	0.82	
X'' <sub>q</sub> QUAD. AXIS SUBTRANSIENT	0.22	0.19	0.18	
X <sub>L</sub> LEAKAGE REACTANCE	0.08	0.08	0.07	
X <sub>2</sub> NEGATIVE SEQUENCE	0.18	0.16	0.15	
X <sub>0</sub> ZERO SEQUENCE	0.08	0.08	0.07	
REACTANCES ARE SATURATED		VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED		
T <sub>d</sub> TRANSIENT TIME CONST.	0.017 s			
T'' <sub>d</sub> SUB-TRANSTIME CONST.	0.004 s			
T <sub>do</sub> O.C. FIELD TIME CONST.	0.38 s			
T <sub>a</sub> ARMATURE TIME CONST.	0.007 s			
SHORT CIRCUIT RATIO	1/X <sub>d</sub>			

APPROVED DOCUMENT

**PI144D**  
**Winding 14 / 0.8 Power Factor**

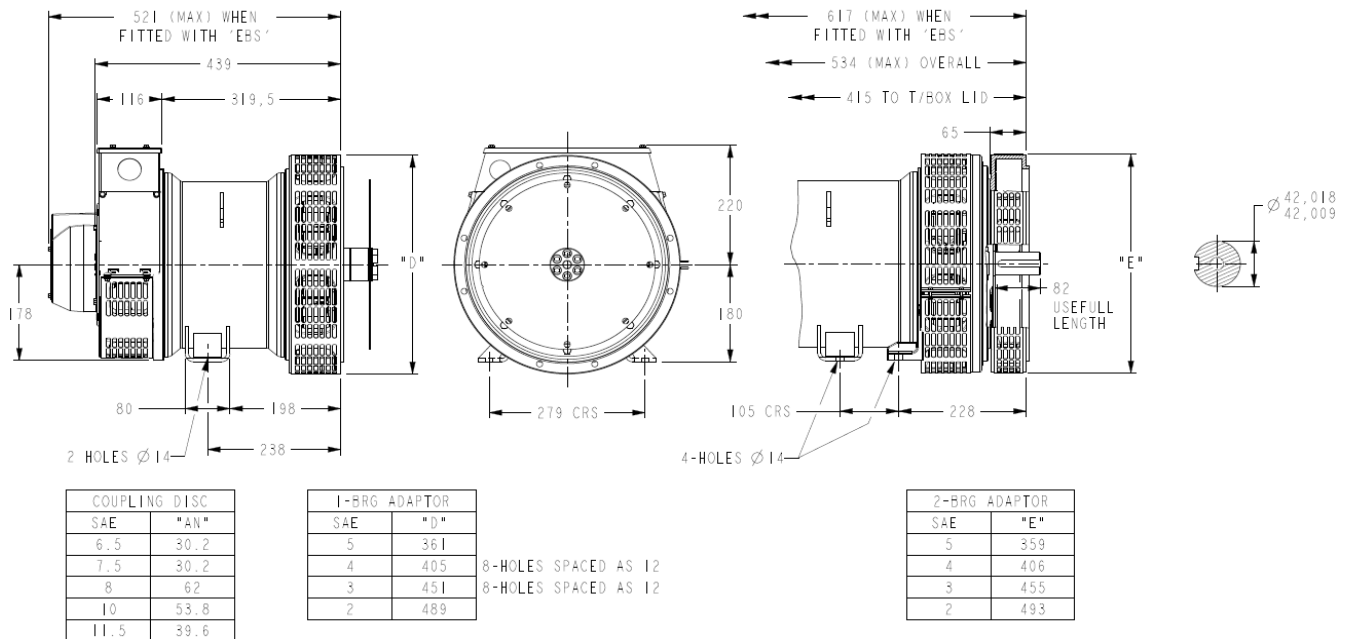
**60Hz**

**RATINGS**

Class - Temp Rise	Cont. F - 105/40°C			Cont. H - 125/40°C			Standby - 150/40°C			Standby - 163/27°C		
Series Star (V)	380	400	416	380	400	416	380	400	416	380	400	416
Parallel StarStar (V)	190	200	208	190	200	208	190	200	208	190	200	208
Series Delta (V)	220	230	240	220	230	240	220	230	240	220	230	240
kVA	22.5	22.5	22.5	25.0	25.0	25.0	26.3	26.3	26.3	27.3	27.3	27.3
kW	18.0	18.0	18.0	20.0	20.0	20.0	21.0	21.0	21.0	21.8	21.8	21.8
Efficiency (%)	86.8	87.0	87.1	86.1	86.4	86.6	85.7	86.0	86.2	85.3	85.7	86.0
kW Input	20.7	20.7	20.7	23.2	23.1	23.1	24.5	24.4	24.4	25.6	25.4	25.3

**APPROVED**

**DIMENSIONS**



# DSE6110/20 MKIII

## AUTO START & AUTO MAINS (UTILITY) FAILURE CONTROL MODULES



DSE6110 MKIII



DSE6120 MKIII

### KEY FEATURES

- 4-line back-lit LCD text display
- Multiple display languages
- Five-key menu navigation
- LCD alarm indication
- Customisable power-up text and screen images.
- DSENet® expansion compatibility
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB communications
- Front panel configuration with PIN protection
- Power save mode
- 3-phase generator sensing and protection
- 3-phase mains (utility) sensing and protection (DSE6120 MKIII only)
- Automatic load transfer control (DSE6120 MKIII only)
- Generator current and power monitoring (kW, kvar, kVA, pf)
- Mains (utility) current and power monitoring (kW, kvar, kVA, pf) (DSE6120 MKIII only)
- kW overload alarm
- Over current protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- 6 configurable DC outputs
- 4 configurable analogue/digital inputs
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs
- 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 level alarms
- 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 optional gasket) offers increased resistance to water ingress
- Configurable CAN read & transmitted information.
- 1 alternative configuration.

### KEY BENEFITS

- Automatically transfers between mains (utility) and generator (DSE6120 MKIII 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 up to 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

260 mA at 12 V, 150 mA at 24 V

#### MAXIMUM STANDBY CURRENT

145 mA at 12 V, 85 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 & D

Configurable as:  
Negative switching digital input  
0 V to 10 V sensor  
4 mA to 20 mA sensor  
Resistive sensor

#### ANALOGUE INPUTS B & C

Configurable as:  
Negative switching digital input  
Resistive sensor

#### OUTPUTS

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

**AUXILIARY OUTPUTS C, D, E, F, G & H**  
2 A DC at supply voltage

#### DIMENSIONS

**OVERALL**  
216 mm x 158 mm x 43 mm  
8.5" x 6.2" x 1.5"

#### PANEL CUT-OUT

184 mm x 137 mm  
7.2" x 5.3"

#### MAXIMUM PANEL THICKNESS

8 mm  
0.3"

#### STORAGE TEMPERATURE RANGE

-40°C to +85°C  
-40 °F to +185 °F

#### OPERATING TEMPERATURE RANGE

**NON-HEATED DISPLAY VARIANT**  
-30°C to +70°C  
-22 °F to +158 °F

#### HEATED DISPLAY VARIANT

-40 °C to +70 °C  
-40 °F to +158 °F

#### OPTIONAL PARTS

PART	PART NUMBER
IP65 Gasket	020-521

### RELATED MATERIALS

TITLE	PART NO.
DSE6110 MKIII & DSE6120 MKIII Installation Instructions	053-240
DSE6110 MKIII & DSE6120 MKIII Operator Manual	057-289
DSE6110 MKIII & DSE6120 MKIII Configuration Suite PC Manual	057-290

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# DSE6110/20 MKIII

## AUTO START & AUTO MAINS (UTILITY) FAILURE CONTROL MODULES

The DSE6110 MKIII is an Auto Start Control Module and the DSE6120 MKIII 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 and remote PC.

The DSE6120 MKIII will also monitor the mains (utility) supply. The modules include USB connection and 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.

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 at +/-7.5 mm,  
8 Hz to 500 Hz at 2 gn

#### HUMIDITY

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

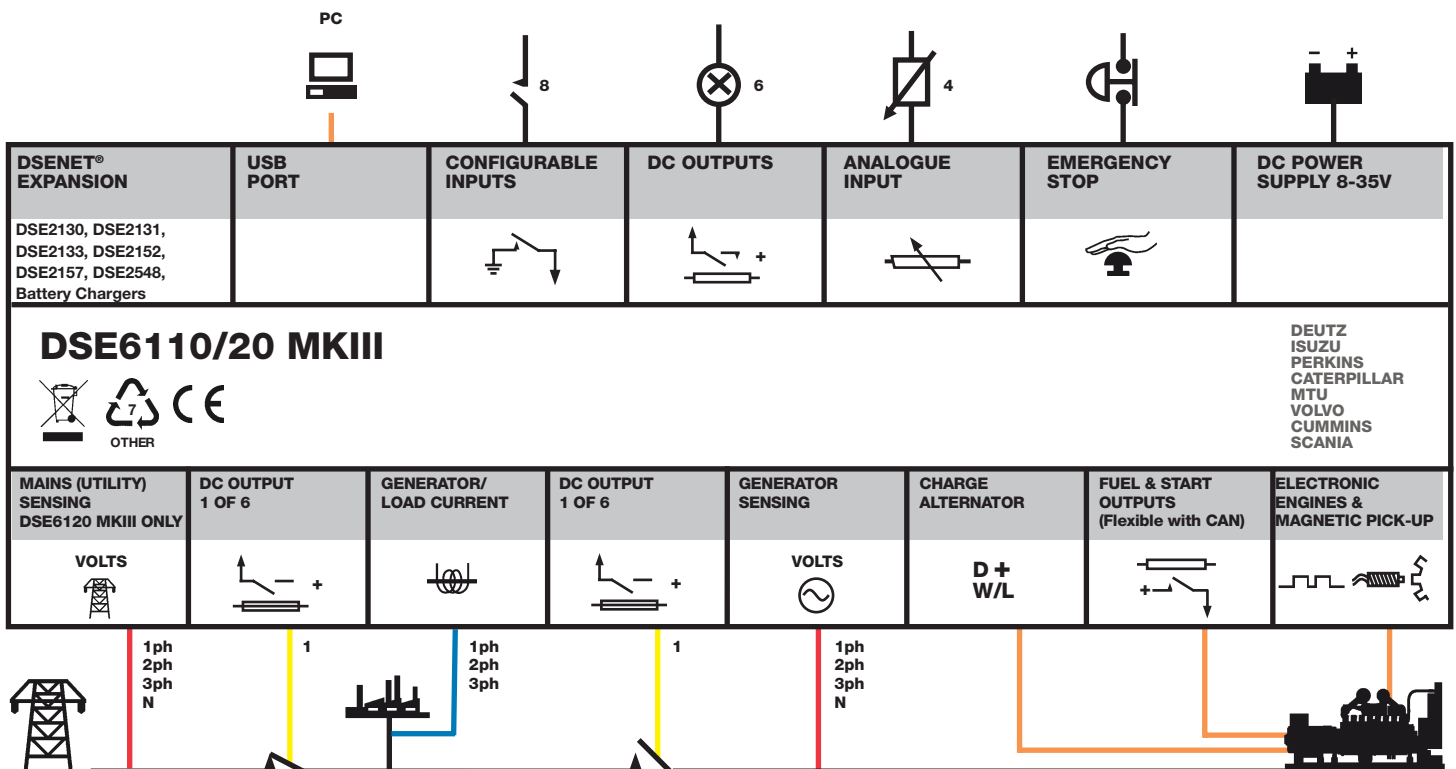
#### SHOCK

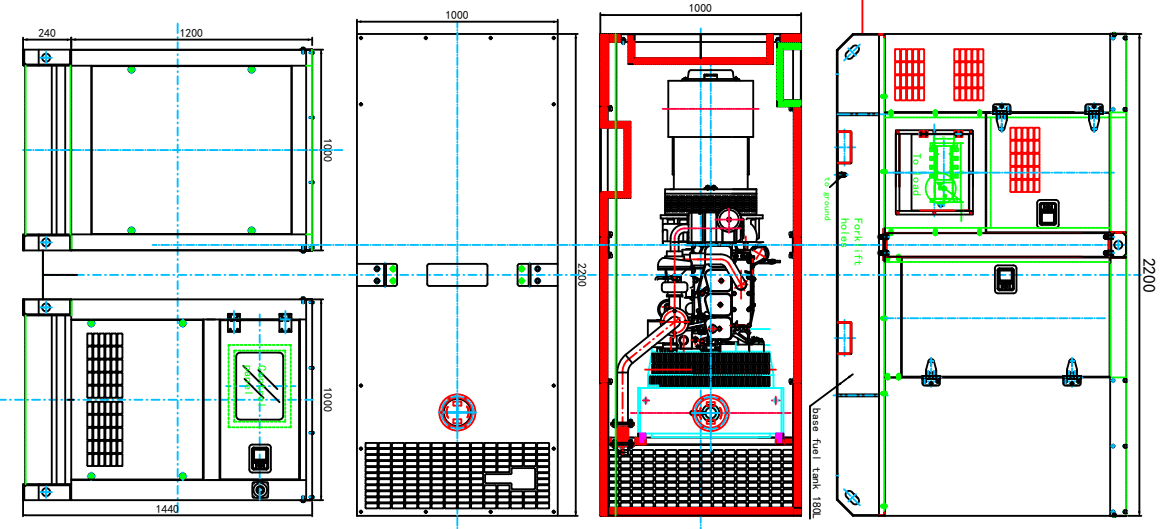
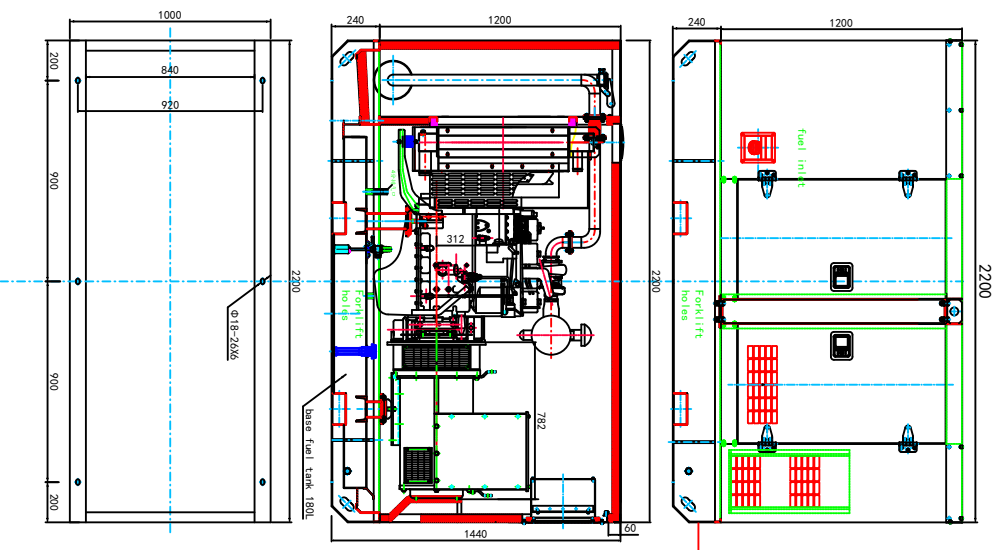
BS EN 60068-2-27  
Three shocks in each of three major axes  
15 gn in 11 ms

#### DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

BS EN 60529  
IP65 - Front of module when installed into the control panel with the optional sealing gasket.

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





This is a design proposal diagram for reference only  
 There may be slight adjustments during production,  
 subject to actual conditions

Canopy drawing for 30Kw Diesel Generator