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KEYPOWER PRODUCTS

DIESEL GENERSET LOAD BANK DIESEL PUMP CONTAINERIZED GENERATOR MINI EXCAVATOR AUTOMATIC TRANSFER SWITCH GASOLINE GENERATOR LIGHT TOWER

KEYPOWER®
Anytime Anywhere. Power Solutions

www.keypower.com www.loadbank.com

KEYPOWER Load Bank Operation Videos



200KW - 1400KW
load bank



10ft load bank



20ft load bank



load bank PLC



load bank
remote control



load bank tester

KEYPOWER®

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Descriptions and specifications are substantially correct at time of printing and subject to change without notice.

V2023.09

KEYPOWER®
Anytime Anywhere. Power Solutions

Load Bank Catalog

Professional Power Testing Equipment

3kW to 6000kW



25-year Professional Power Solutions
and Equipment Manufacturer



KEYPOWER

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www.loadbank.com



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website



Youtube

Index

Company Profile	02
Sales Network	04
What is a Load Bank	06
Structure of Different Power Range	08
Canopy Type Load Bank	10
Containerized Load Bank	12
Rack-mounted Load Bank	14
MHV Load Bank	15
Customized Solutions	16
Load Bank Applications	18
Generator Tester	20
Load Bank PLC	22
Troubleshoot Manual	24
Power Calculation	25



More than 25-year history

Established in 1998, KEYPOWER's China-based factory covers an area of over 66,000 square meters. We employ over 150 full-time staffs and have an annual production capacity of 5,000 units.

KEYPOWER has been founded for more than 25 years and established a global sales network covering more than 100 countries and regions. It has offices, agents, and overseas warehouses around the world, as well as strategic partnerships with many of the world's premium energy brands, making it a professional global power and energy manufacturer.

KEYPOWER is firmly committed to the brand's philosophy of "Anytime Anywhere, Power Solutions". We always base our product design and innovative ideas on producing highly reliable and high-quality products. KEYPOWER also has a strong professional technical research and development team with advanced production and assembly lines. We continue to offer a wide range of power equipments including low voltage and high voltage generators, load banks, as well as diesel dewatering pumps and hydraulic excavators. We aim to provide customized power, professional and efficient energy solutions for different projects and applications to meet the diverse demands of global customers.



Global Sales Network

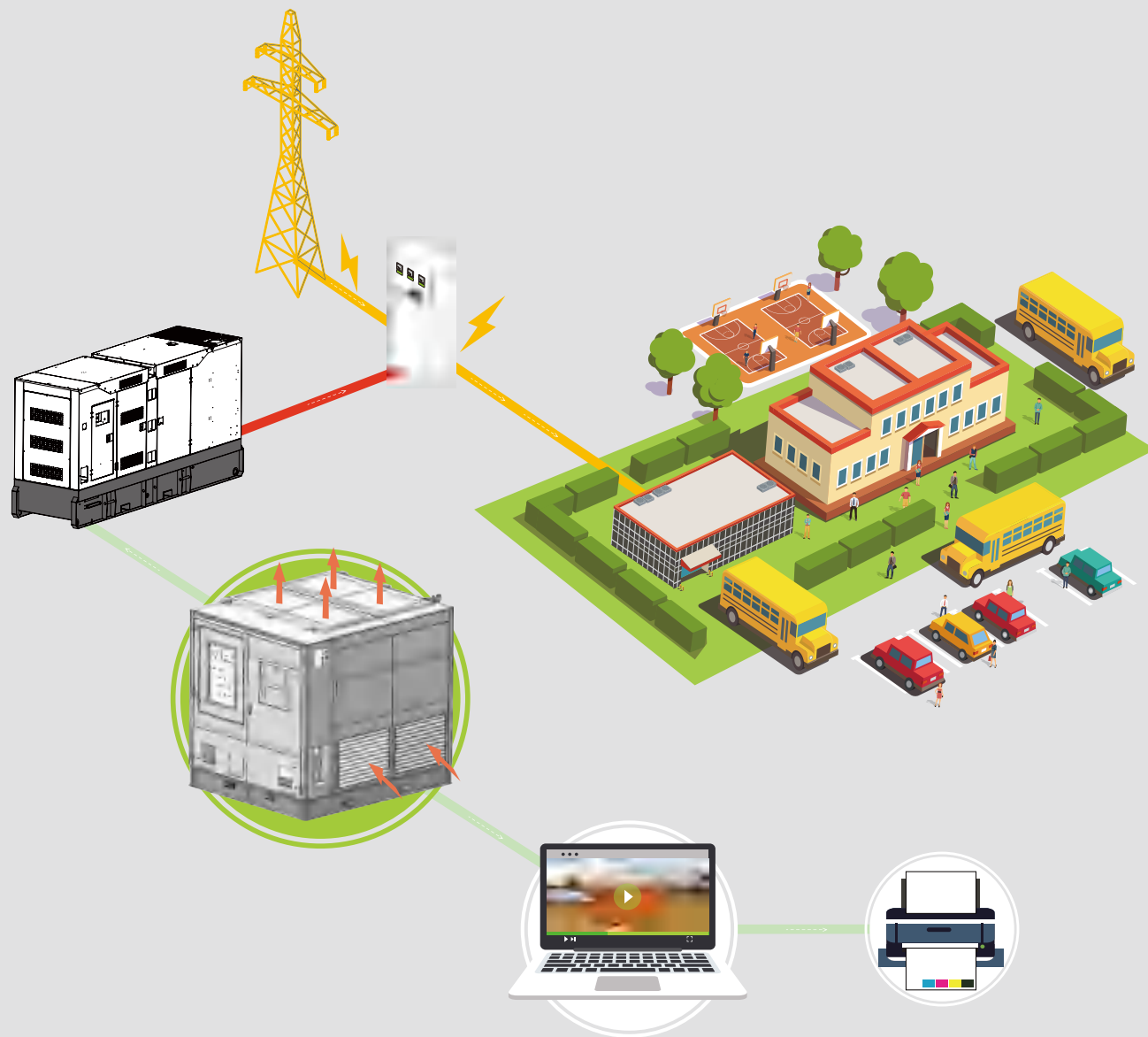
Our products are sold to more than 100 countries in the world

- Headquarter
- Global Presence



WHAT IS A LOAD BANK?

The load bank is a professional test device designed to commission, maintain and verify various electrical power sources such as diesel generators, battery systems and UPS.



It's the best way to replicate, prove and verify the real-life demands on critical power systems.

Types of load banks



Resistive type



Capacitive type



Inductive type

1 Resistive Load Banks

A resistive load bank can be used to fully test the generator set at 100% nameplate kW rating. It will also fully load the generator cooling, fuel, and exhaust systems. Only 80% of the generator set nameplate kVA rating can be achieved when utilizing a resistive unit. The resistive load bank will provide a unity or 1 power factor (PF) load to the system under test. Resistive units are predominantly used for AC voltages, however specifically designed DC load banks are also available.

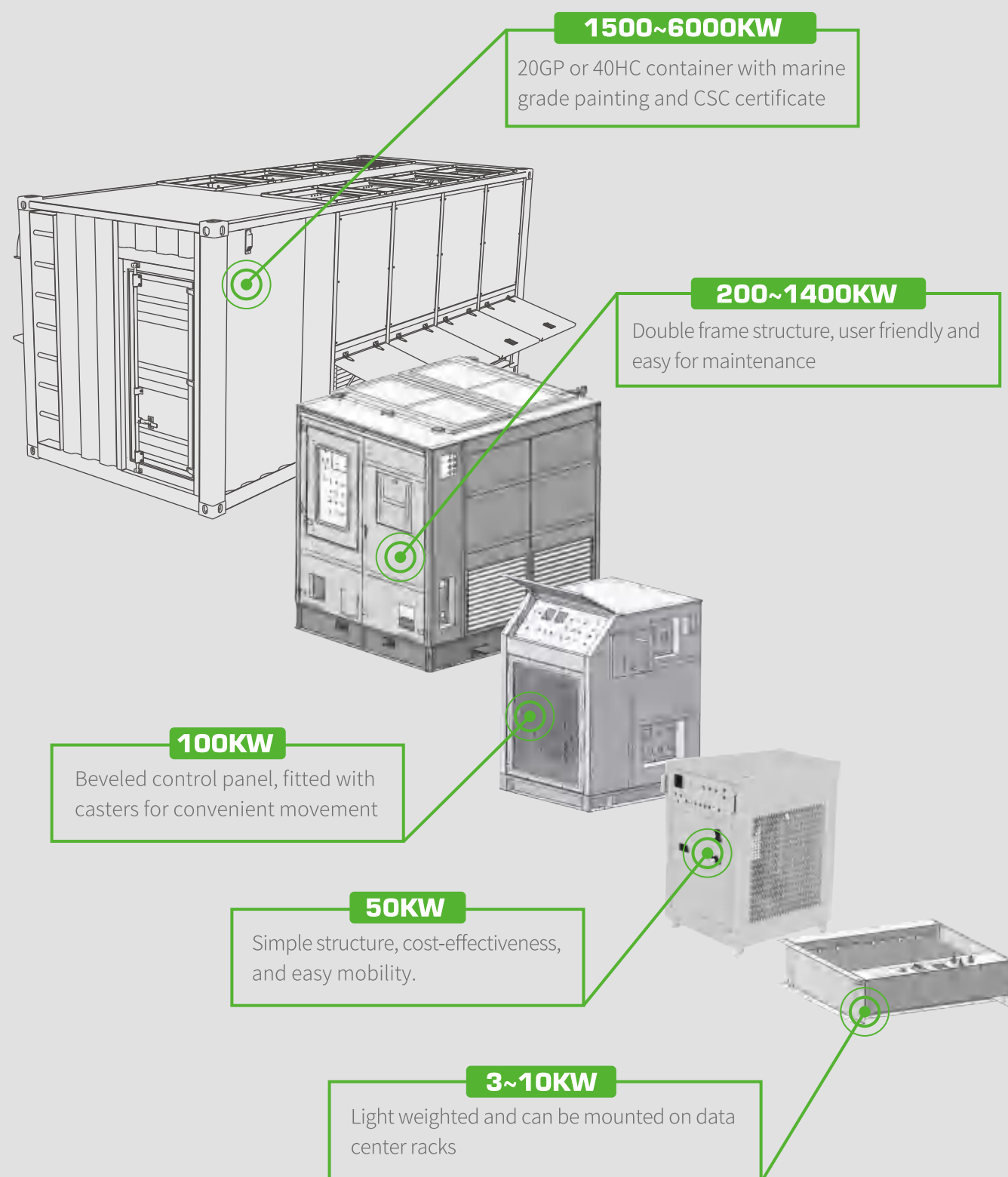
2 Capacitive Load Banks

A capacitive load bank is normally used in conjunction with a resistive unit to provide a leading power factor load test. Capacitive load banks incorporate industrial capacitors and increase the PF to above unity (leading). Capacitive load banks are rated in kilovolt-amperes reactive (kVAR).

3 Resistive Inductive (Combined) Load Banks

A combined load bank usually consists of both resistive elements and inductors that can be used to provide load testing at non-unity PF (lagging) including the capability to test the generator set fully at 100% nameplate kVA rating. Combined load banks incorporate resistors and inductors all in a single construction which can be independently switched to allow resistive only, inductive only, or varying lagging power factor testing. Combined load banks are rated in kilovolt-amperes (kVA). It's worth noting that combined load banks can consist of resistive, inductive, and capacitive also.

Structure of Different Power Range



Resistive						Optional	
Model	Three phase testing capacity	Single phase testing capacity	Power factor	Dimensions (mm)	Weight (kg)	Inductive Lagging power factor	Capacitive Leading power factor
KPLB-100	100 KW	22 KW	1.0	960*1150*1510	350	0.8	0.9 or 0.95
KPLB-200	200 KW	44 KW	1.0	1560*1310*1650	840	0.8	0.9 or 0.95
KPLB-300	300 KW	66 KW	1.0	1690*1440*1750	1085	0.8	0.9 or 0.95
KPLB-400	400 KW	88 KW	1.0	1900*1600*1900	1350	0.8	0.9 or 0.95
KPLB-500	500 KW	110 KW	1.0	1900*1600*1900	1400	0.8	0.9 or 0.95
KPLB-600	600 KW	132 KW	1.0	2100*1730*2000	1600	0.8	0.9 or 0.95
KPLB-700	700 KW	154 KW	1.0	2100*1730*2000	1800	0.8	0.9 or 0.95
KPLB-800	800 KW	176 KW	1.0	2400*2030*2200	2020	0.8	0.9 or 0.95
KPLB-900	900 KW	198 KW	1.0	2400*2030*2200	2150	0.8	0.9 or 0.95
KPLB-1000	1000 KW	220 KW	1.0	2400*2030*2200	2275	0.8	0.9 or 0.95
KPLB-1100	1100 KW	242 KW	1.0	3500*2270*2150	2800	0.8	0.9 or 0.95
KPLB-1200	1200 KW	264 KW	1.0	3500*2270*2150	2900	0.8	0.9 or 0.95
KPLB-1300	1300 KW	286 KW	1.0	3500*2270*2150	3070	0.8	0.9 or 0.95
KPLB-1400	1400 KW	308 KW	1.0	3500*2270*2150	3150	0.8	0.9 or 0.95
KPLB-1500	1500 KW	330 KW	1.0	3500*2270*2150	3250	0.8	0.9 or 0.95
KPLB-1600	1600 KW	352 KW	1.0	6058*2438*2591	5800	0.8	0.9 or 0.95
KPLB-1700	1700 KW	374 KW	1.0	6058*2438*2591	5900	0.8	0.9 or 0.95
KPLB-1800	1800 KW	396 KW	1.0	6058*2438*2591	6000	0.8	0.9 or 0.95
KPLB-1900	1900 KW	418 KW	1.0	6058*2438*2591	6100	0.8	0.9 or 0.95
KPLB-2000	2000 KW	440 KW	1.0	6058*2438*2591	7450	0.8	0.9 or 0.95
KPLB-2100	2100 KW	462 KW	1.0	6058*2438*2591	7500	0.8	0.9 or 0.95
KPLB-2200	2200 KW	484 KW	1.0	6058*2438*2591	7600	0.8	0.9 or 0.95
KPLB-2300	2300 KW	506 KW	1.0	6058*2438*2591	7760	0.8	0.9 or 0.95
KPLB-2400	2400 KW	528 KW	1.0	6058*2438*2591	7860	0.8	0.9 or 0.95
KPLB-2500	2500 KW	550 KW	1.0	6058*2438*2591	8100	0.8	0.9 or 0.95
KPLB-2600	2600 KW	572 KW	1.0	6058*2438*2591	8250	0.8	0.9 or 0.95
KPLB-2700	2700 KW	594 KW	1.0	6058*2438*2591	8500	0.8	0.9 or 0.95
KPLB-2800	2800 KW	616 KW	1.0	6058*2438*2591	9000	0.8	0.9 or 0.95
KPLB-2900	2900 KW	638 KW	1.0	6058*2438*2591	9500	0.8	0.9 or 0.95
KPLB-3000	3000 KW	660 KW	1.0	6058*2438*2591	10500	0.8	0.9 or 0.95
KPLB-3500	3500 KW	770 KW	1.0	12192*2438*2896	12000	0.8	0.9 or 0.95
KPLB-4000	4000 KW	880 KW	1.0	12192*2438*2896	14500	0.8	0.9 or 0.95
KPLB-4500	4500 KW	990 KW	1.0	12192*2438*2896	16500	0.8	0.9 or 0.95
KPLB-5000	5000 KW	1100 KW	1.0	12192*2438*2896	17500	0.8	0.9 or 0.95
KPLB-5500	5500 KW	1210 KW	1.0	12192*2438*2896	18500	0.8	0.9 or 0.95
KPLB-6000	6000 KW	1320 KW	1.0	12192*2438*2896	20000	0.8	0.9 or 0.95

*Frequency: 50/60 Hz; *Voltage range: AC 110-690V; *Duty: Continuous; *Cooling system: Industrial grade axle fans;
*Discharged air direction: horizontal for 100 kw, vertical for larger models; *Discharged air direction: horizontal for 100 kw, vertical for larger models;
*Control power phase: Single-phase, two-wire for 500 kw and below; three-phase, four-wire for larger models

KEY POWER Canopy Type Load Bank

1

Double
frame
structure



2

Easy
maintenance



3

User-friendly



Detailed Features

CONTROL PANEL

Lovato®
multi-function
meter

304
Stainless
Steel

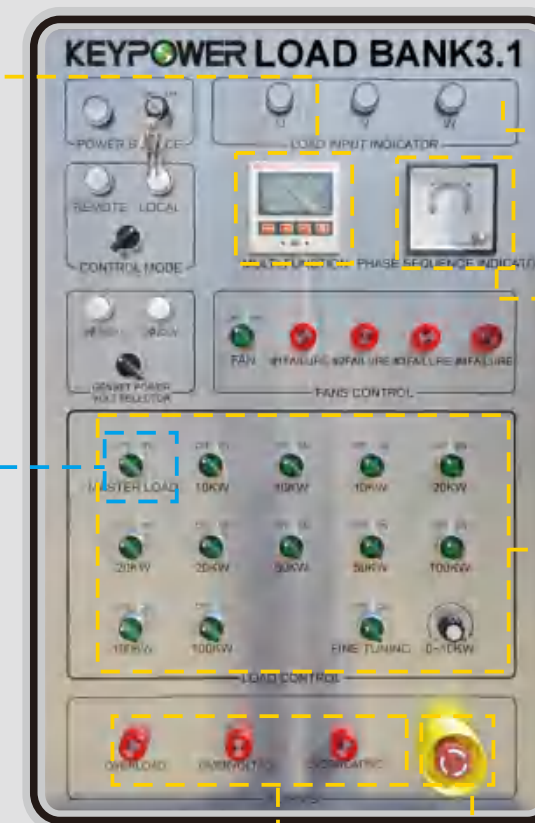
Phase
sequence
indicator

Siemens®
load switches

Single
step load

Load bank
protections

Emergency
stop

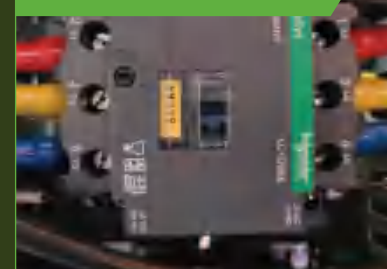


Renowned Brand Components

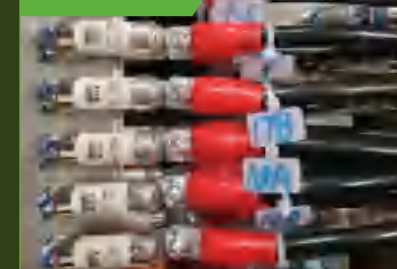
304 Stainless Steel Resistors



Schneider® Contactors



Miro® Fuse



Lovato® Multifunction Meter



ABB® Circuit Breaker



Siemens® Knobs



KEY POWER

Containerized Type Load Bank



- 1

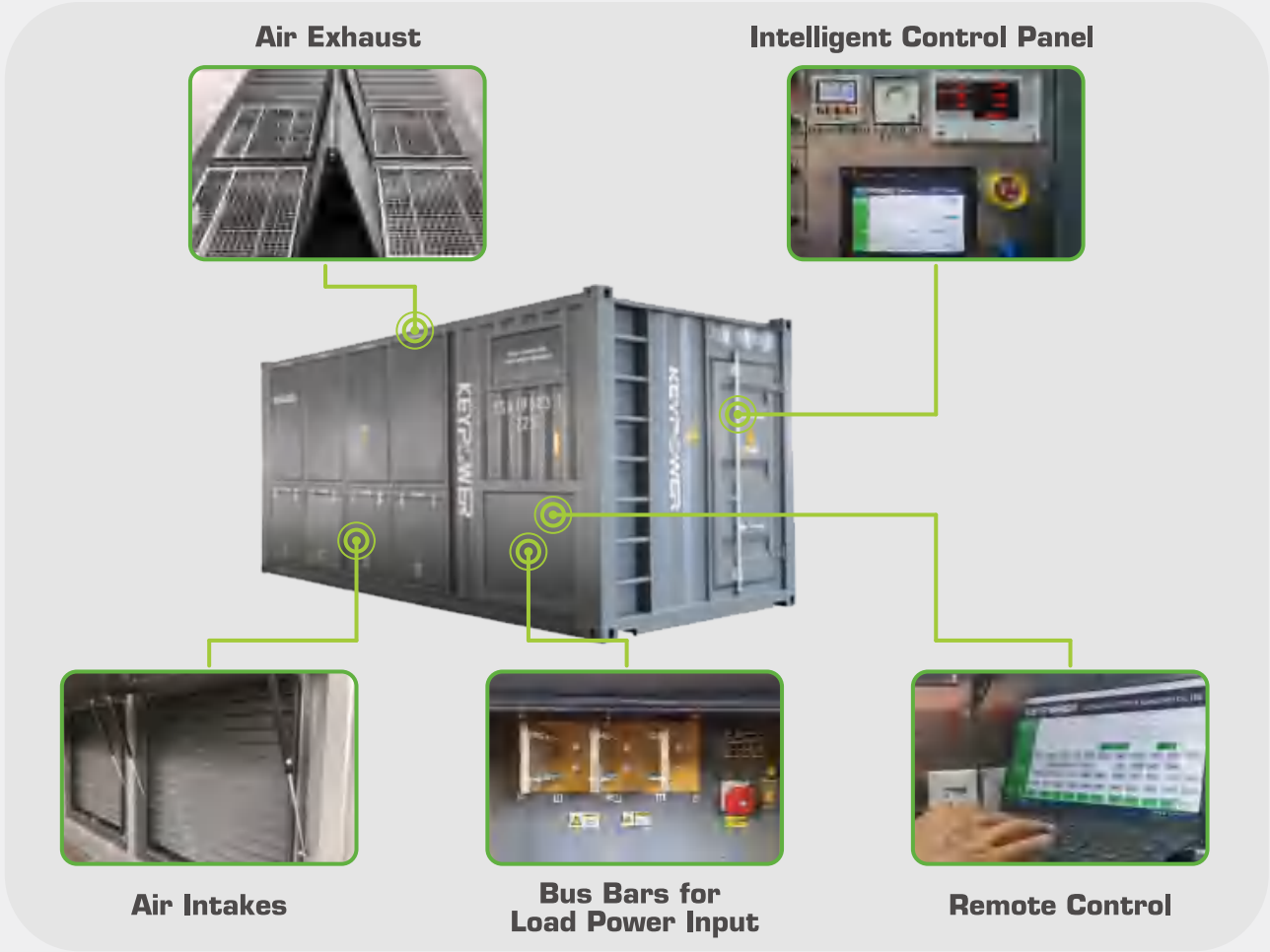
CSC certificate
- 2

Independent resistors compartment
- 3

Marine grade painting



Features of containerized load bank





KEY POWER
Rack-mounted
Load Bank



KEY POWER
MHV Load Bank
690V~20KV

Technical Specifications					
Model	KPLB-3	KPLB-5	KPLB-6	KPLB-8	KPLB-10
Testing capacity	0-3KW	0-5KW	0-6KW	0-8KW	0-10KW
Type of Load	Resistive type, PF=1.0				
Work mode	Continuous work				
Control mode	Manual control				
Load control	Circuit breaker				
Loading accuracy	±5%				
Cooling system	Forced air cooling, air intake from front, hot air discharge at the rear.				
Enclosure protection class	IP20				
Control power voltage	Single phase				
Rated testing voltage	110V~690V				
Rated frequency	50/60HZ				

Technical Specifications					
Model	KPLB-1000	KPLB-1500	KPLB-2000	KPLB-2500	KPLB-3000
Testing capacity	0-1000KW	0-1500KW	0-2000KW	0-2500KW	0-3000KW
Type of load	Resistive / Inductive / Capacitive, PF=0~1.0 adjustable				
Duty	Continuous				
Control mode	Intelligent / Remote control				
Cooling system	Industrial grade axial fan				
Phase	Three phase				
Rated testing voltage	690V~20KV				
Rated frequency	50/60HZ				
Dimension (L*W*H)(mm)	6058*2436*2591			12192*2438*2896	
Weight (kg)	5000	5800	6800	8000	9500

Solutions for outdoor installation

1) 100KW to 1400KW

- IP54 for electrical parts
- Automatic electrical top covers

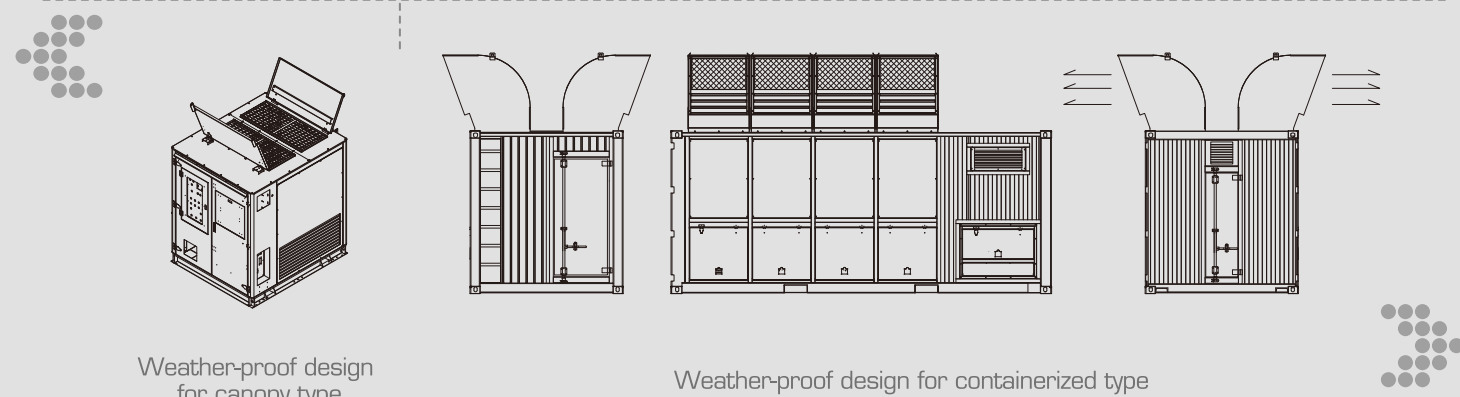


2) Above 1500kW

- IP54 for electrical parts
- Ventilation ducts

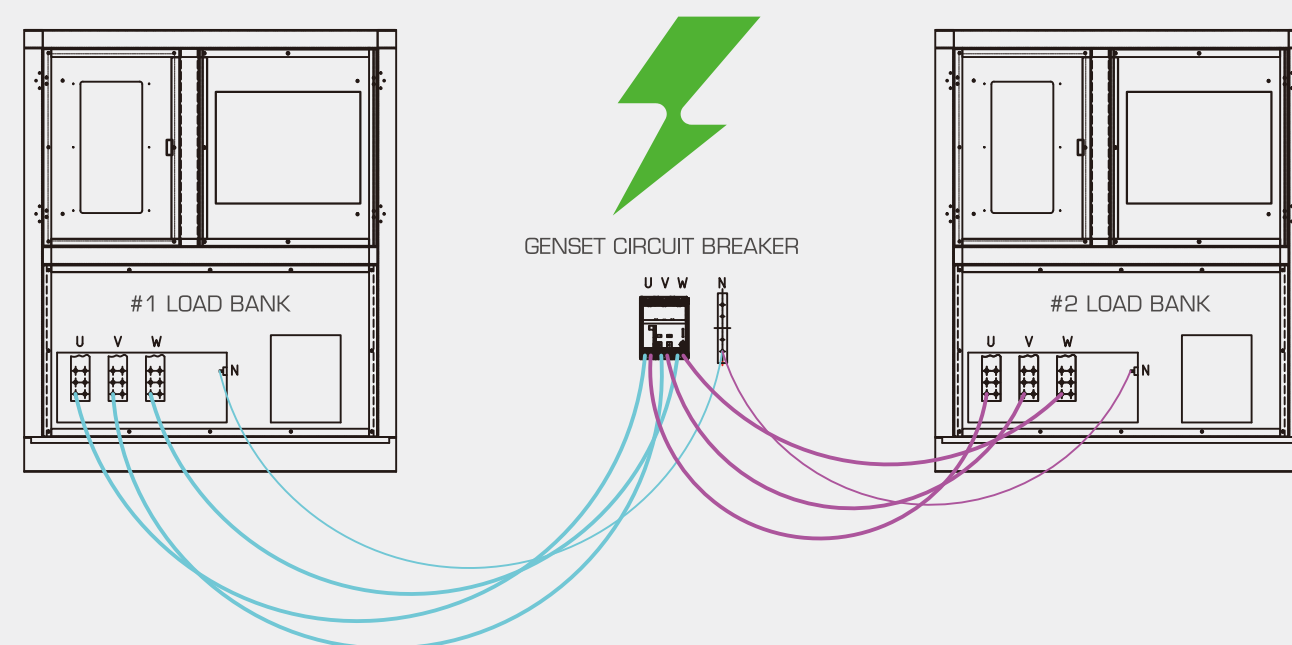


Multiple load banks can be paralleled to test larger capacity gensets



Applications

- Generator Set
- UPS Systems
- Battery Banks
- Military Power Supply
- Weapon Power Supply System
- Aircraft Power Source
- New Energy Power Source
- Manufacturers & End-users of Generator Set
- Vessel & Offshore Platform
- Oil, Mining, and Metallurgy
- Military & Aerospace
- Data center, Telecom & Communication Operators
- Power Plant, Nuclear Power Plant
- Medical System
- Railway
- Research Institute, University & Schools



Requirements:

1. Select load cables of suitable size according to the load.
2. Use 2.5 mm² cable to connect from generator neutral point to load bank neutral point.
3. Equally distribute the load among multiple units of load banks.



500kW load bank for generator testing in Middle-East



3000kW load bank for Cummins generator commissioning in Philippines



100kW load bank for rental company use in Australia



300-1200kW Load bank use in Thailand for rental company



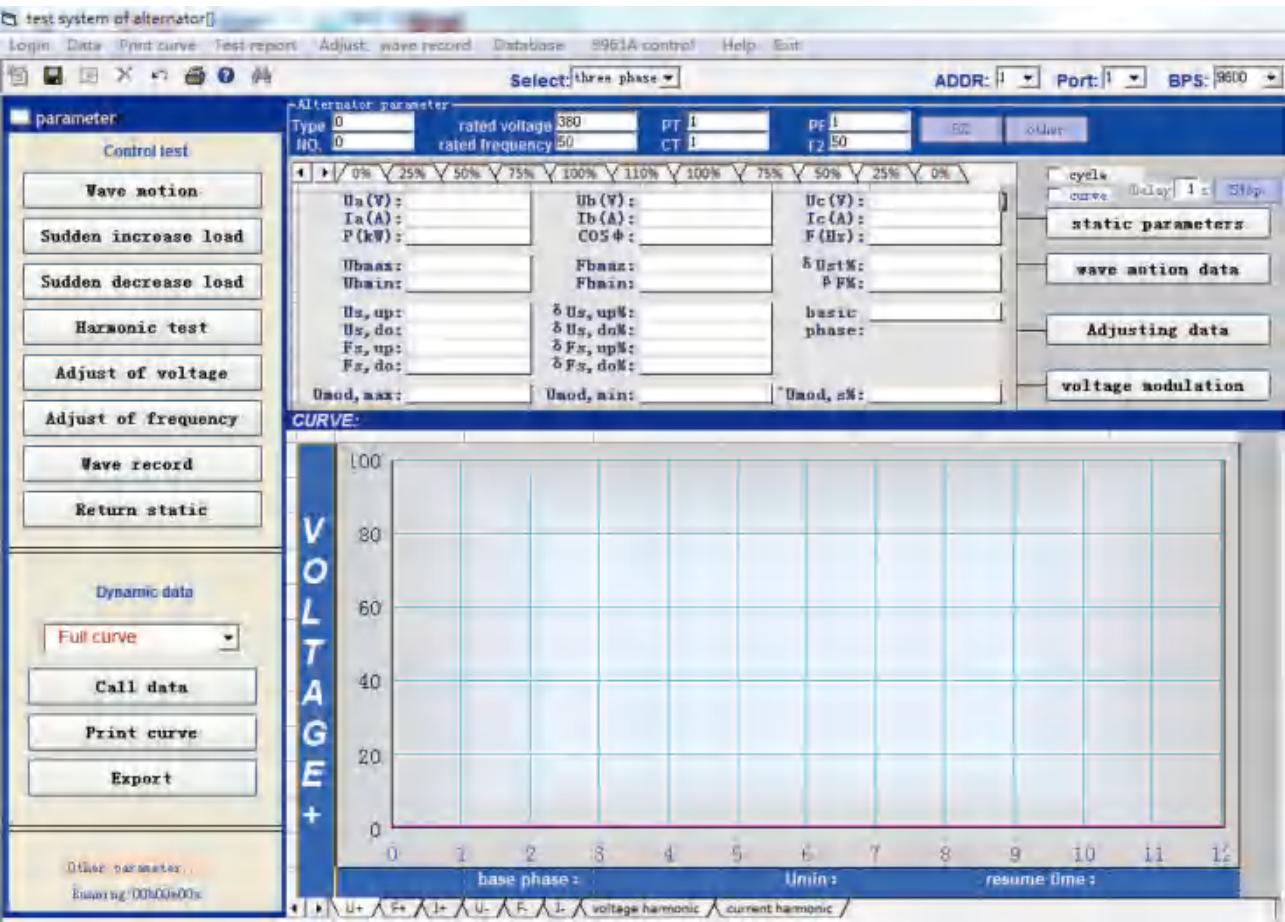
2000kW Load Bank for data center in Thailand

APPLICATIONS

Generator Tester



- Professional generator tester installed on canopy type load bank

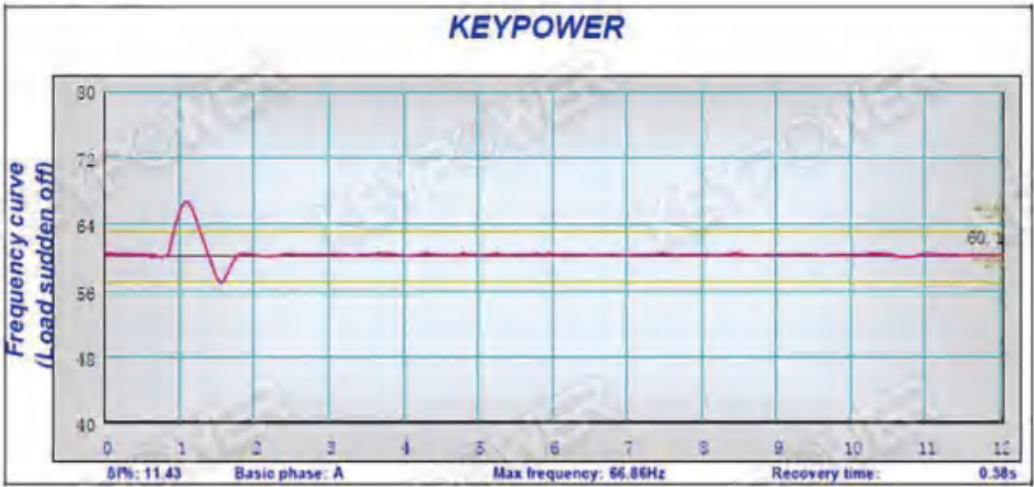


- Generator tester software interface

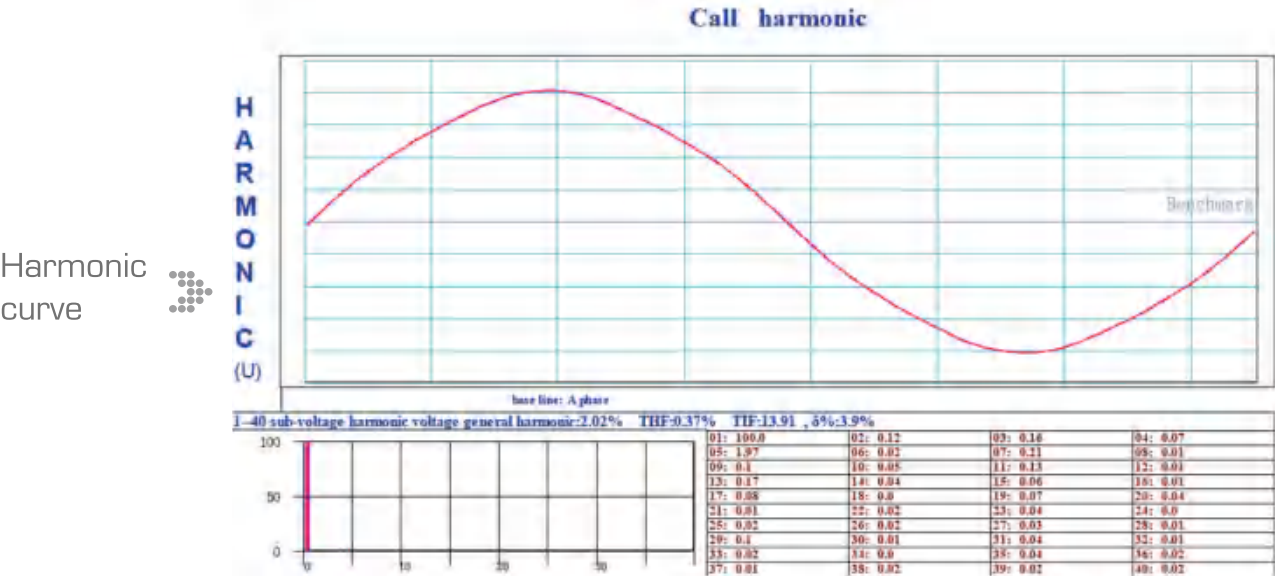
Power Analysis Data Logging

Test report

Test report of generator set's steady performance									
Model: 896/F2-2000					Date of test: 2017-11-07		Location: 17-26-28		
(A) Technical specification									
1. Set type	Set No.	Set No.	Set No.	Set No.	Set No.	Set No.	Set No.	Set No.	Set No.
Rated frequency	50Hz	Set No.	127/230V	Set No.	Set No.	Set No.	Set No.	Set No.	Set No.
Engine type	Engine No.	Engine No.	Engine No.	Engine No.	Engine No.	Engine No.	Engine No.	Engine No.	Engine No.
Generator type	Gen No.	Gen No.	Gen No.	Gen No.	Gen No.	Gen No.	Gen No.	Gen No.	Gen No.
(B) Check item									
1. Insulation resistance	50%	Insulation resistance	50%	Insulation resistance	50%	Insulation resistance	50%	Insulation resistance	50%
2. Test of insulation resistance	between	Insulation resistance	between	Insulation resistance	between	Insulation resistance	between	Insulation resistance	between
Insulation resistance	between	Insulation resistance	between	Insulation resistance	between	Insulation resistance	between	Insulation resistance	between
3. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
4. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
5. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
6. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
7. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
8. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
9. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
10. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
11. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
12. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
13. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
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21. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
22. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
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30. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
31. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
32. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
33. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
34. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
35. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
36. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
37. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
38. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
39. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check
40. Check every induction equipment's work condition of pump system	check	check	check	check	check	check	check	check	check

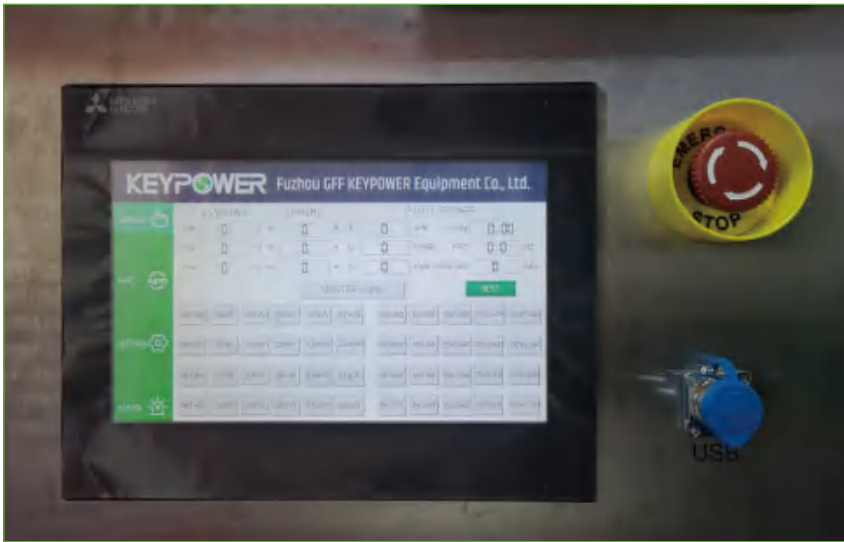


Frequency and voltage curves



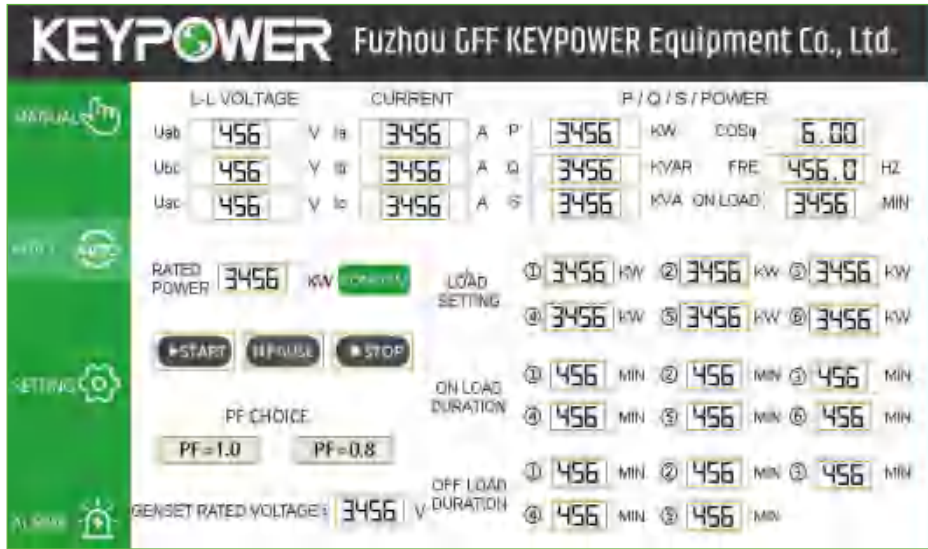
Harmonic curve

PLC for Remote and Intelligent Control



Mitsubishi[®] HMI

Intelligent control system with Mitsubishi[®] PLC



Intelligent Control Interface

Remote and Intelligent Control Technical Specifications	
PLC Model	MITSUBISHI FX3U
I/O points (addresses)	Max.total 384 (with remote I/O) Address range Max.256 direct addressing andmax.256 network I/O
Program memory	64,000 steps RAM (internal), exchangeable FL-ROM for easy program exchange
Cycle period	0.065μs /basic instruction
Number of instructions	27 sequence instructions, 2 step ladder instructions, 209 applied instructions
Programming language	Step ladder, instruction list, SFC and IEC61131-3 languages using GX IEC Developer
Program execution	Cyclical execution, refresh mode processing
Internal relays	7680
Special relays	512
State relays	4096
Timer	512
Counter	235
High-speed counter	8 points 1 phase (6 points max. 100 kHz, 2 points max. 10 kHz); 2 points 2 phase max. 50 kHz
Real-time clock	Year, month, day, hour, minute, second, weekday
Data register	8000
File register	32768
Index register	16
Special register	512
Pointer	4096
Nestings	8
Interrupt Inputs	6
Communication options	Ethernet (TCP/UDP)

HMI Model		MITSUBISHI GS2110-WTBD
Display section	Display device	TFT color LCD
	Screen size	10"
	Resolution	800 x 480 dots
	Display size (W x H) mm (inch)	222 x 132.5 (8.74 x 5.22) (Horizontal format)
	Number of characters	16-dot standard font: 50 chars. x 30 lines (2-byte) (Horizontal format)
	Display color	65536 colors
Touch panel	Backlight	LED (not replaceable) Backlight off/screen saving time can be set
	Type	Analog resistive film
	Type	Minimum 2 x 2 dots (per key)
	Simultaneous press	Simultaneous press prohibited (only 1 point can be pressed)
Memory	Life	1 million times (operating force 0.98N or less)
	C drive	Flash memory (internal) (9MB), for storing project data, OS Life (No. of writings) 100000 times
Ext. Dimensions (W x H x D) mm (inch)		272 x 214 x 56 (10.71 x 8.43 x 2.21)
Weight (Excl. Mounting Brackets) (kg)		1.3

KEYPOWER Load Bank Troubleshoot Manual			
No.	Fault Phenomenon	Possible Causes	Methods for Troubleshooting
1	Turn the POWER SOURCE knob to ON, but the power indicator light does not turn on	The power indicator light or the knob switch is damaged	Use a multimeter to diagnose the fault and replace the components
2	Control power failure alarm	Control power supply phase loss or reverse phase sequence	Recheck the control power supply wiring for any possible errors
3	Maintenance door open alarm	The maintenance room door has been opened	Close the maintenance room door and lock it
4	Fans failure alarm	The fans for cooling the resistors are experiencing overload, short circuit, or phase loss	Check if the fan is damaged or phase loss of the fan's power, and reset the motor circuit breaker.
5	Overheating alarm	The resistor inside the chamber is overheating	Reduce or turn off the load and allow the fan to continue running to cool down the load bank sufficiently
6	Low airflow alarm	The air intake cover panel is not open, the fan is not running or the pressure sampling hose on the pressure protection relay has come off.	Open the intake cover panel, check the fan starts rotating when the fan switch is pressed, and ensure that the pressure sampling hose on the pressure protection relay is tightly attached
7	Overload alarm	The power load of the load bank exceeds limit value	Reduce the load appropriately until the alarm stops
8	Overvoltage alarm	The line voltage on the load bank exceeds the limit value	Lower the line voltage of the test power supply appropriately until the alarm stops
9	Touch screen is not functioning	Damaged switching power supply or the circuit breaker is tripped or damaged	Use a multimeter to measure if there is AC 220-240V voltage at the input and output terminals of the circuit breaker associated with the power supply, to determine if the circuit breaker is functioning properly. And using the multimeter to measure if there is a DC 24V voltage output at the output terminals of the power supply, to determine if the switching power supply is working correctly.
10	The cooling fan in the maintenance room is not functioning	The circuit breaker of the fan is tripped or the fan is damaged	The fan works together with big fans in the the resistor's chamber. Determine whether the circuit breaker or the small fan is damaged, and replace it.
11	Unable to load in manual mode	There are other alarm faults, a malfunctioning circuit breaker in the control circuit or incorrect control mode selection	Confirm that the control mode selection is correct, verify that the control circuit breaker is functioning properly, and ensure there are no fans failure or overheating alarms. If any alarms are present, first resolve it and reset.
12	The computer is unable to control the Loadbank in remote control mode.	Control mode selection error, communication failure or poor contact of network cable connector	Confirm that the control mode is in remote control mode, ensure that the network cable is properly connected, and restart the computer before attempting to connect again.
13	The LED light cannot be turned on	The circuit breaker of the light is tripped, damaged light switch or LED light	Reset the circuit breaker of the LED light and ensure that the switch is functioning properly. If both of these are normal and there is AC 220-240V power supply at the LED light socket, then the LED light is faulty and needs to be replaced

Power Calculation

KW - kilowatts
KVA - kilo volt-amperes
PF - power factor
KVAR - kilo volt-amperes reactive

$KW = KVA \times PF$ $KVA = \frac{KW}{PF}$

$PF = \frac{KW}{KVA}$ $KVAR = \sqrt{(KVA^2 - KW^2)}$

The KW rating of the engine-generator set is dependent on the horsepower rating of the prime mover and the electrical rating of the generator.

The KVA rating of the generator is dependent on the current rating of the generator.

Voltage Derating

Load banks are designed to provide a specific capacity at a rated voltage. They cannot be operated at a voltage higher than their rating without risking damage to the load bank. However, the load bank can be operated at lower voltages.

1 Single-voltage Load bank derating is calculated as follows

$$\frac{\text{Applied Voltage}^2}{\text{Rated Voltage}^2} = D$$

D x Rated Capacity = Reduced Rating

2 Multi-voltage load bank derating is calculated as follows

1. When applied voltage is higher than rated voltage $\div \sqrt{3}$

$$\frac{\text{Applied Voltage}^2}{\text{Rated Voltage}^2} = D$$

D x Rated Capacity = Reduced Rating

2. When applied voltage is lower than rated voltage $\div \sqrt{3}$

$$\frac{\text{Applied Voltage}^2}{(\text{Rated Voltage} \div \sqrt{3})^2} = D$$

D x Rated Capacity = Reduced Rating