

KLN Series Extended Range

Programmable DC Power Supply **CE**

MHz



Features

Input & Output

- Extended range output, programmable voltage, current and power.
- 3U height, output voltage from 0~80V up to 0~1500V, output current from 0~30A up to 0~540A.
Output power 5kW · 10kW · 15kW, in total 18 models available for selection.
- Simple construction allows 10 units to become a 150kW power system.
- Maximum output current up to 5400A.
- Three phase UNIVERSAL input, 3 ϕ 180~460VAC (47~63Hz).
- Active power factor correction PF > 0.95.
- Efficiency > 95%

Electrical

- User-definable output priority, Constant Voltage or Constant Current.
- Internal resistance, Solar cell and Fuel cell simulation.
- Programmable output ramp up and ramp down, protecting the device under test.
- Programmable OVP, OCP and OTP.
- Output ripple and noise are extremely low.
- User-definable power ON mode (LAST/OFF).
- 16Bit DAC for setting and 24Bit ADC for measurement.

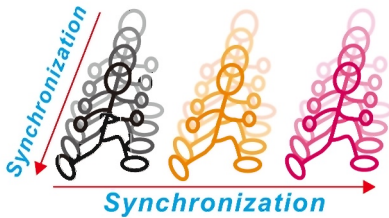
Function

- Non-gap stacking, no ventilation holes on the cover and bottom plate of the power supply.
- Uses speed controlled fan (12cm), dissipates the heat efficiently.
- Firmware can be upgraded without opening the case; unit continues to be functional even if upgrade fails.
- Safe operation with Inter-lock function.
- Large-size touchscreen, various operating modes, independent V & A encoder for quick adjustment.
- Three sets of memory locations can be stored and recalled from the front panel.
- Up to 8000 sets of programmed memory locations; combinations of V/A/W/Time can be stored (min. time 0.1mS).

Interface

- USB host port to load or save the programmed sequence.
- LAN (LXI) interface built-in.
- LAN interface response time 10mS.
- RS-422/485 baud rate 115200 bps.
- IVI-COM driver provided, SCPI commands supported.
- Multi-purposed slot for optional interfaces, USB device/GPIB/Serial Port/Isolated Analog.

Synchronization Technique



By using the patented technique “Switching Frequency Synchronization” (SFS), Modularized SystemPower (MSP) easily allows configurations as high as 150kW in a standard 35U rack.

For budgetary control, the great flexibility of MSP allows the user to build the system’s programmable DC power supply as needed, starting from a lower capacity, then extending to a higher capacity when budget is available.

Thanks to the SFS technique, the user can shut off unneeded units to save energy.

Innovative HOME key

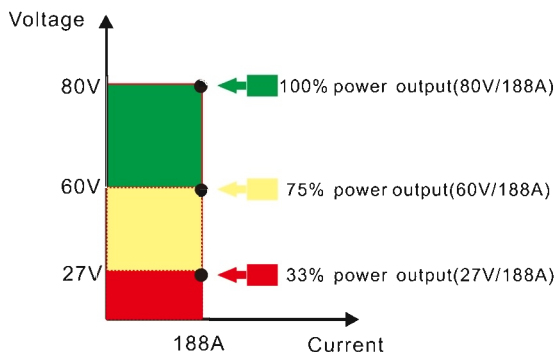
Pressing the HOME key briefly causes the display to return to the previous page. Press and hold the HOME key for 1.5 seconds to return to the main page.

A diagnostic window pops up when setting values are excessive or other erroneous operation occurs. Built-in operating instructions, user manual free. Load default function.

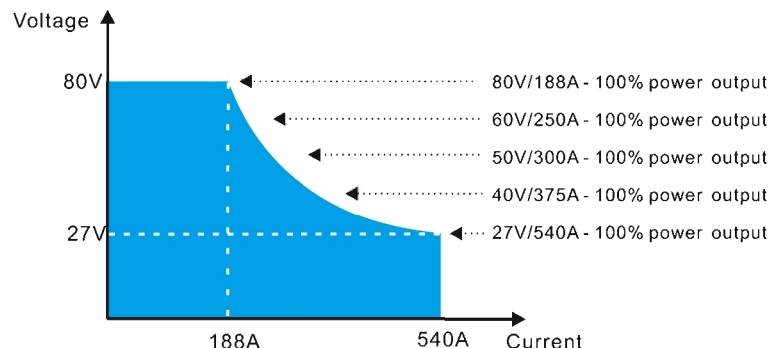


Output Characteristic

Compared with conventional designs, the KLN Extended Range Series has more flexibility, with numerous V/A combinations able to satisfy various requirements. One Extended Range model can take the place of 3 - 5 different models of conventional design.



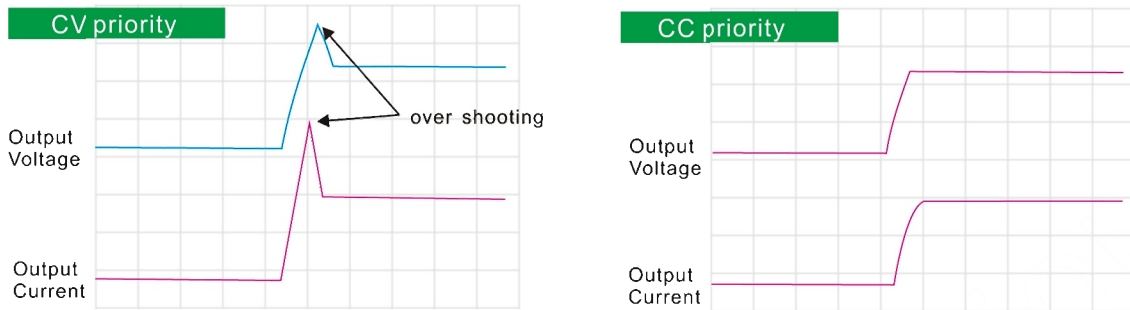
Conventional 80V/15kW power output range



KLN Extended-Range 80V/15kW power output range

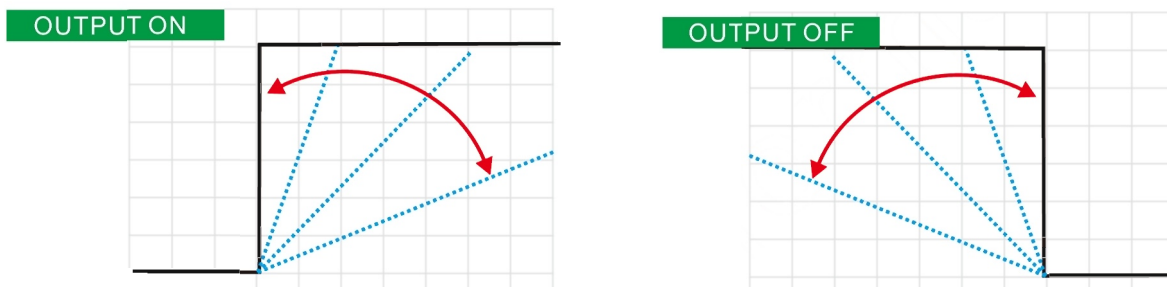
CC priority output mode

Constant Current priority output mode, eliminates overshoot when testing a capacitive load or diode.
The DC power supply is limited and constantly injects the desired current to the device under test without any spike.



Adjustable ramp up/down

Adjustable ramp up when output ON and ramp down when output OFF, time range 0.1~99.9S

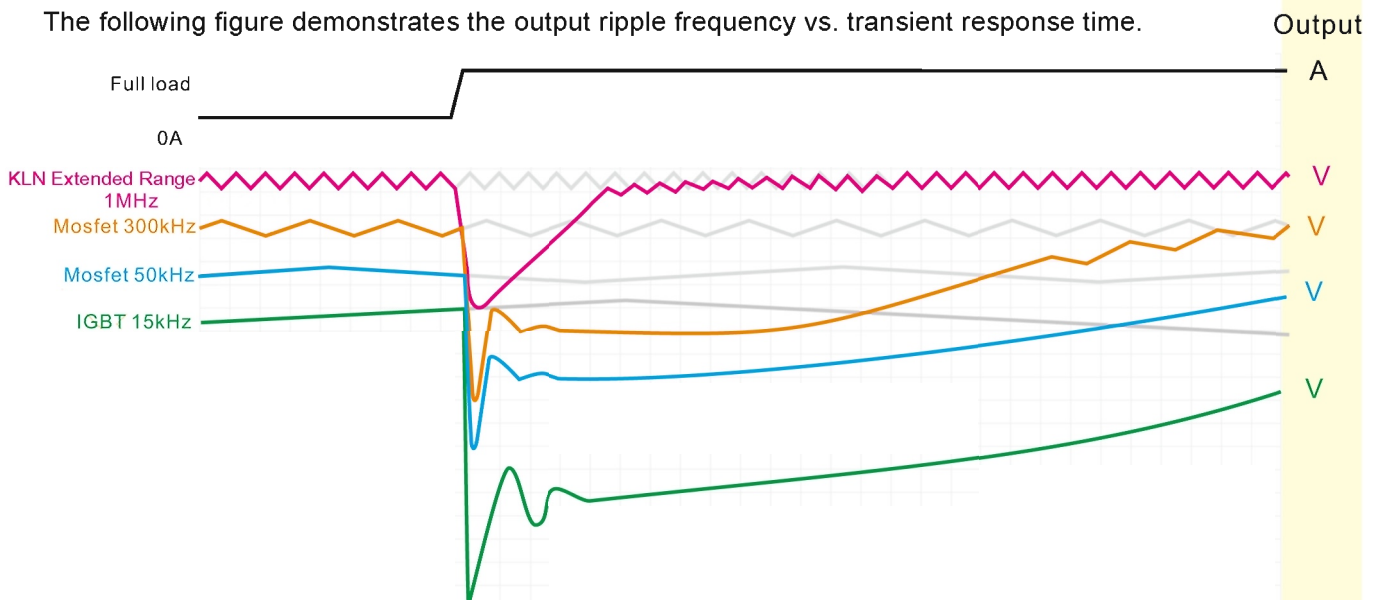


*1. Ramp down time when output off may different according to load.

Output ripple frequency

The multi-phase interleaved design increases the output ripple frequency
Higher frequency leads to faster response and lower ripple.
1MHz means the KLN Extended Range has the highest switching frequency of the programmable DC power supply industry.

The following figure demonstrates the output ripple frequency vs. transient response time.

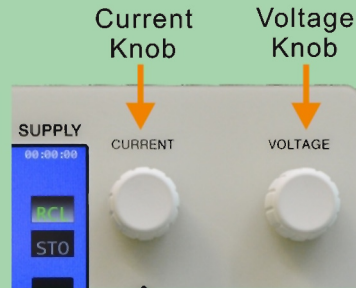


Various control & operating

1.Touchscreen



2.Independent knobs



3.MENU editing knob



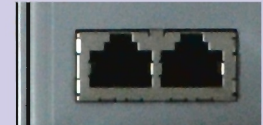
4.LXI Web browser



6.LAN



7.RS-422/RS-485



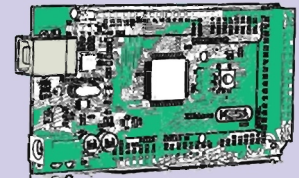
(Optional)

8.GPIB



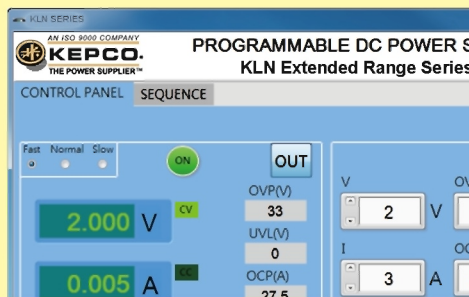
(Optional)

9.USB



(Optional)

5.PC software



10.Isolated analog 0~10V



(Optional)

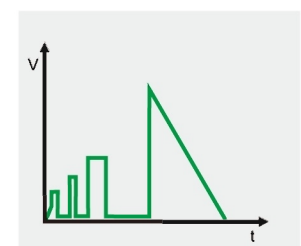
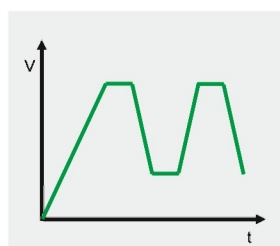
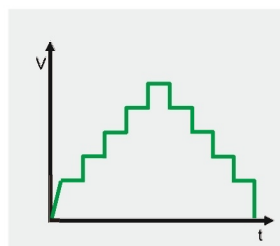
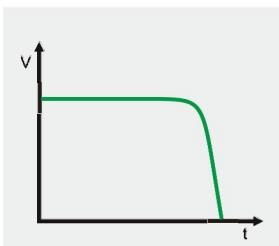
11.Isolated analog 10kΩ



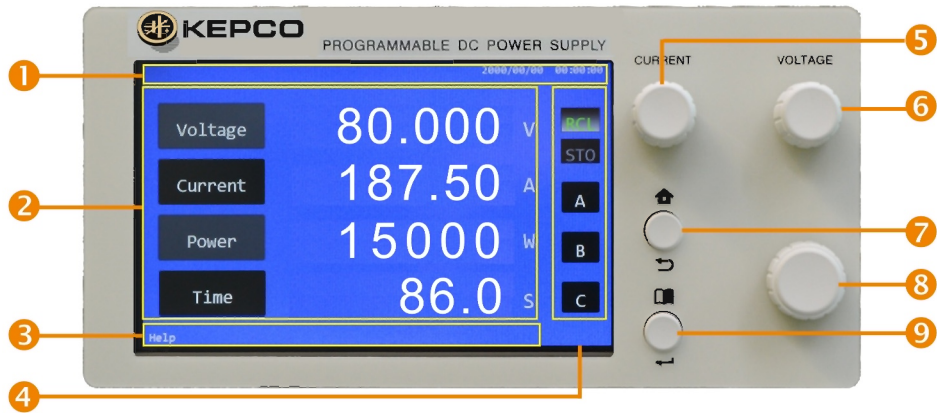
(Optional)

Sequence

Sequence provides up to 8000 sets of memories for programming various of output waveform.



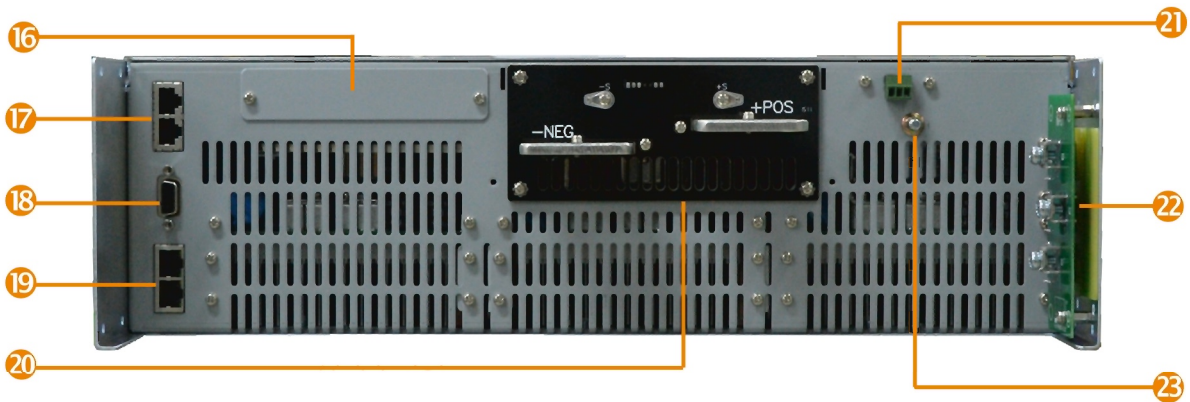
Control Panel



Front view



Rear view



Function Description

Control Panel

1. Status area
2. Main function area
3. Auxiliary function area
4. Three sets memories
5. Current knob
6. Voltage knob
7. Return/Home key
8. MENU editing knob
9. Enter/MENU key

Front Panel

10. Power switch
11. Power ON indicator
12. LAN/Remote indicator
13. USB port
14. Output ON/OFF key
15. Output ON/OFF indicator

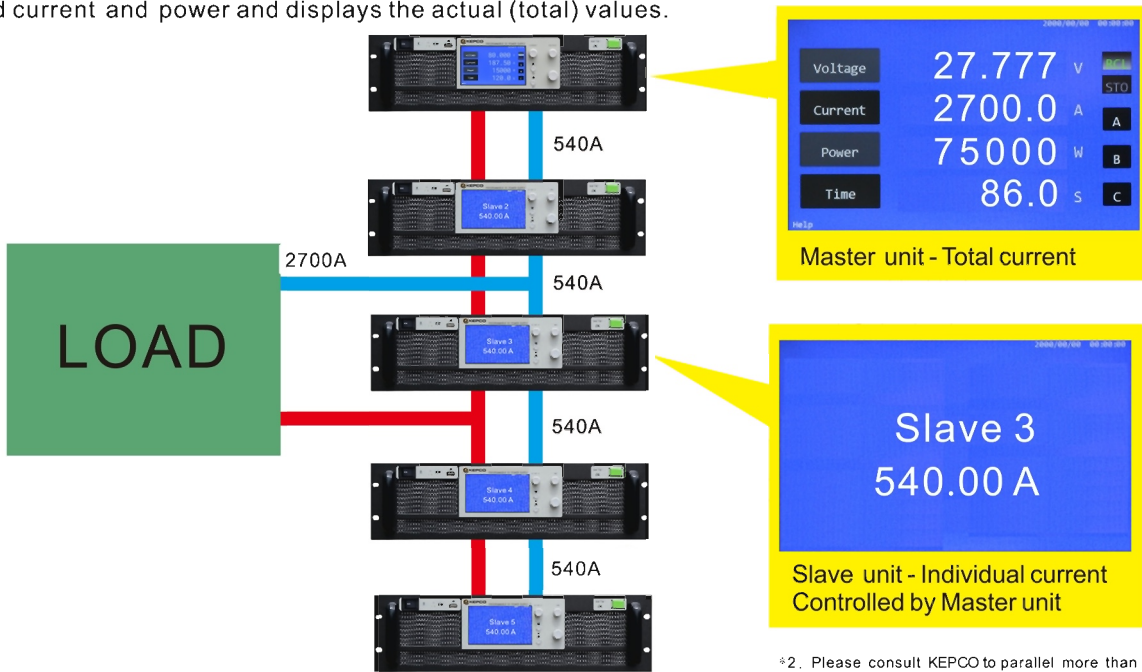
Rear Panel

16. Slot for optional interfaces
17. Synchronization connector
18. I/O connector
19. LAN (LXI) connector
20. Output terminals^(*)
21. Current share
22. Input terminals
23. Earth grounding

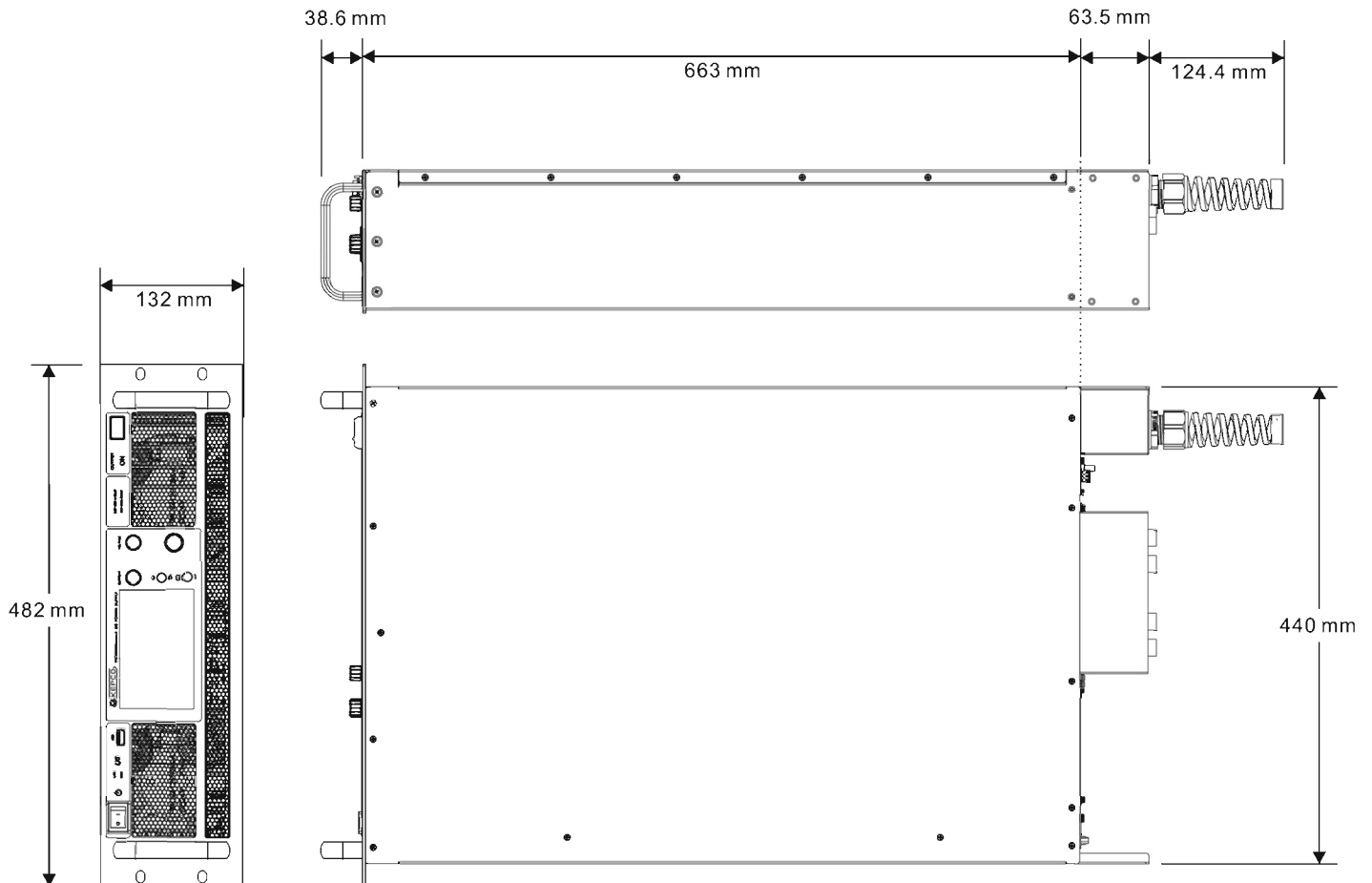
*3: The terminals may be different, depending on model.

Parallel Operation

When configuring several units as Master-Slave in parallel operation, the master unit automatically detects the numbers of slave units in the system while powering on. Then the master unit accepts the settings of the extended current and power and displays the actual (total) values.



Outline Diagram

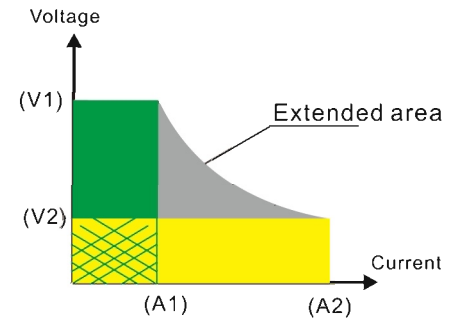


Specification

Model	Ripple		Line regulation		Load regulation		Response time(S)				Size	Input Power (Max.) (VA)
	CV	CC	CV	CC	CV	CC	Full Load UP	Full Load Down	No Load Down	Remote Sense (V)		
	mV rms	mA rms	±0.01% f.s+ mV	±0.03% f.s+ mA	±0.03% f.s+ mV	±0.08% f.s+ mA						
KLN 80-180E	16	85	8	45	10	135	0.03	0.08	30	5	3U	6000
KLN 250-60E	50	57	25	15	62.5	45	0.03	0.08	30	5	3U	6000
KLN 350-42E	60	51	35	10.5	87.5	31.5	0.03	0.08	30	5	3U	6000
KLN 500-30E	70	48	50	7.5	125	22.5	0.03	0.08	10	5	3U	6000
KLN 650-23E	170	16	75	5.8	163	17.3	0.03	0.08	10	5	3U	6000
KLN 80-360E	25	170	8	90	10	270	0.03	0.08	30	5	3U	12000
KLN 250-120E	50	38	25	30	62.5	90	0.03	0.08	30	5	3U	12000
KLN 350-84E	60	34	35	21	87.5	63	0.03	0.08	30	5	3U	12000
KLN 500-60E	70	32	50	15	125	45	0.03	0.08	10	5	3U	12000
KLN 650-46E	170	32	75	11.5	163	34.5	0.03	0.08	10	5	3U	12000
KLN 1000-30E	350	22	100	7.5	250	22.5	0.03	0.08	10	5	3U	12000
KLN 80-540E	25	255	8	135	10	405	0.03	0.08	30	5	3U	18000
KLN 250-180E	50	57	25	45	62.5	135	0.03	0.08	30	5	3U	18000
KLN 350-126E	60	51	35	31.5	87.5	94.5	0.03	0.08	30	5	3U	18000
KLN 500-90E	70	48	50	22.5	125	67.5	0.03	0.08	10	5	3U	18000
KLN 650-69E	170	48	75	17.3	163	51.75	0.03	0.08	10	5	3U	18000
KLN 1050-42E	350	35	105	10.5	263	31.5	0.03	0.08	10	5	3U	18000
KLN 1500-30E	400	26	150	7.5	375	22.5	0.03	0.08	10	5	3U	18000

Maximum Voltage V.S. Maximum Current Table

Model	(V1)		(A1)	(A2)	(V2)
	MAX POWER (W)	RATED VOLTAGE (V)	MAX CURRENT(A) FOR RATED VOLTAGE*4	RATED CURRENT (A)	MAX VOLTAGE(V) FOR RATED CURRENT*4
	KLN 80-180E	5000	80	60	180
KLN 250-60E	5000	250	20	60	83.3
KLN 350-42E	5000	350	14	42	119
KLN 500-30E	5000	500	10	30	166.7
KLN 650-23E	5000	650	7.7	23	217.4
KLN 80-360E	10000	80	120	360	27.8
KLN 250-120E	10000	250	40	120	83.3
KLN 350-84E	10000	350	28	84	119
KLN 500-60E	10000	500	20	60	166.7
KLN 650-46E	10000	650	15.4	46	217.4
KLN 1000-30E	10000	1000	10	30	333.3
KLN 80-540E	15000	80	180	540	27.8
KLN 250-180E	15000	250	60	180	83.3
KLN 350-126E	15000	350	42	126	119
KLN 500-90E	15000	500	30	90	166.7
KLN 650-69E	15000	650	23	69	217.4
KLN 1050-42E	15000	1050	14.3	42	357
KLN 1500-30E	15000	1500	10	30	500



*4. Conventional output range :
 $V1 \times A1 = \text{Rated power}$
 $V2 \times A2 = \text{Rated power}$
 Wide range output :
 The grey area is the extended area.
 Constant power technique enables the DC power supply to be operated under Conventional + Extended area of above diagram.

KLN Extended Range Internal Resistance Range Table

5kW models	Internal R range	10kW models	Internal R range	15kW models	Internal R range
KLN 80-180E	0~444mΩ	KLN 80-360E	0~222mΩ	KLN 80-540E	0~148mΩ
KLN 250-60E	0~4.17Ω	KLN 250-120E	0~2.08Ω	KLN 250-180E	0~1.39Ω
KLN 350-42E	0~8.33Ω	KLN 350-84E	0~4.17Ω	KLN 350-126E	0~2.78Ω
KLN 500-30E	0~16.7Ω	KLN 500-60E	0~8.33Ω	KLN 500-90E	0~5.56Ω
KLN 650-23E	0~28.3Ω	KLN 650-46E	0~14.1Ω	KLN 650-69E	0~9.42Ω
		KLN 1000-30E	0~33.3Ω	KLN 1050-42E	0~25.0Ω
				KLN 1500-30E	0~50.0Ω

General Specification

Display resolution	Voltage : 5 digits , Current : 5 digits
Display Accuracy	Voltage : $\pm(0.1\%$ of rated + 2 digits), Current: $\pm(0.2\%$ of rated + 2 digits)
Programming accuracy	Voltage : $\pm(0.1\%$ of rated + 2 digits), Current: $\pm(0.2\%$ of rated + 2 digits)
Measurement accuracy	Voltage : $\pm(0.1\%$ of rated + 2 digits), Current: $\pm(0.2\%$ of rated + 2 digits)
Temp. Coefficient	100ppm/°C of rated output voltage, after 30 minutes warm-up 100ppm/°C of rated output current, after 30 minutes warm-up
Adjustable range	Voltage : 0% ~ 105% of rated Current : 0% ~ 105% of rated
Command response time	<10ms (LXI interface , After received)
Transient response time	80V \leq 1.5ms ; 250V~650V \leq 2ms ; 1000V~1500V \leq 3ms (output voltage recover within 1% of rated value when load changes from 10% to 90%)
Output ramp up time	Adjustable range 0.1~99.9 sec.(^{*6})
Output ramp down time	Adjustable range 0.1~99.9 sec.(^{*6})
Store/Recall function	3 (operating in front panel)
Maximum step number	8000 steps
Step time adjustable range	0.00 sec ~ 99999hours
Nominal input rating	5kW model : 200~415Vac 50/60Hz 3 ϕ 3W 10kW model : 200~415Vac 50/60Hz 3 ϕ 3W 15kW model : 200~415Vac 50/60Hz 3 ϕ 3W or 480Vac 50/60Hz 3 ϕ 4W
Input voltage range(Max)	5kW model : 180~460Vac 45~65Hz 3 ϕ 3W 10kW model : 180~460Vac 45~65Hz 3 ϕ 3W 15kW model : 180~460Vac 45~65Hz 3 ϕ 3W or 430~530Vac 45~65Hz 3 ϕ 4W
Input Current (Max.) (Input 3P400V)	5kW model : 8.5A 10kW model : 17A 15kW model : 26A
Inrush current	5kW model : 30A 10kW model : 60A 15kW model : 90A
Efficiency (MIN)	90% (At input 400V 3-phase, Rated voltage, Rated current)
Power Factor	0.95 typ.
Protective functions	Programmable OVP (adjustable 0~110%), Programmable OCP (adjustable 0~110%), OTP, SOURCE POWER FAIL
Withstand voltage	Primary - Chassis : 2500VDC 1minute Primary – Secondary : 2500VDC 1minute Secondary - Chassis : \pm 300 V from ground for ALL models. This means that you cannot ground the + output terminal of units rated higher than 300 V.
Output polarity: floating	Capable of Negative ground or Positive ground
Cooling	Forced air by speed controlled fan
Noise	50 ~ 70 dB(A) (Different by type and load)
Weight	5kw : approx 66lbs (30kG) 10kw : approx 82lbs (37kG) 15kw : approx 102lbs (46kG)
Operating environment	Indoor use
Operating temperature	0~40°C
Operating humidity	30%~80% RH(no condensation) Max 80% RH up to 30°C, linear decrease to 50% RH at 40°C
Operating Altitude	Up to 6562ft (2000m)
Store environment	Temperature : -20~70°C ; Humidity : 10%~80% RH(no condensation)
EMI and safety certifications	CE Mark- full compliance with LVD and EMC directives

Note 1 : All specifications are subject to change without notice.

Note 2 : Programming time = Command response time + Output response time. The output response time is different in different models, from 40ms ~ 200ms.

*6 : Actual ramp down time will be different in different models.