PLR-Series

Low Noise D.C. Power Supply

FEATURES

- Output Voltage Rating : 20V/36V/60V
- Output Power : 360W/720W
- Low Ripple and Noise(0.5mVrms/10mArms)
- Fast Transition Recovery Time(100μs)
- Equipped Power Factor Correction Circuit for AC-input 100~240VAC
- Maximum 2 units in Series Connections or 3 units in Parallel Connections
- Select the Setting Digits for Voltage and Current(Coarse/Fine Volume Control)
- Panel Lock Function/ 3 set of Preset Function
- Output Off Timer Function(Range:1 min to 1000 hours & 59mins)
- CC Priority Function(Prevent Overshoot & Inrush Current)
- Sequence Function of PC Editing(Max.:1000 steps/Min. step Period:50ms)
- Protection : OVP, UVP, OCP, Remote Sensing(Terminal Open)
- External Analog Control Function
- PC Remote Interface Standard : RS-232
- PC Remote Interface Optional : LAN/USB,GPIB/USB,External Analog Control

GW INSTEK
Simply Reliable

GW Instek launches the new generation PLR-series programmable switching D.C. power supply. The single power output ranges are 360W and 720W. The series comprises 6 models and the voltage ranges are 20V, 36V and 60V. The PLR- series is a hybrid circuit design which incorporates front stage switching and rear stage linear architectures. The unique advantages of this design benefit from the combination of both switching and linear structures. The front stage switching structure can effectively reduce size and weight, and the rear stage linear structure can maintain lower ripple voltage, lower ripple current, and faster transient response.

The PLR-series features many functions, including three sets of user-defined Preset function; programmable automatic Output off timer function; programmable Sequence function; CV, CC priority activation functions (prevent overshoot and inrush current while output is turned on); External voltage and current output control and OVP, OCP and UVP functions. The above functions are built-in. Users do not have to pay for any extra costs.

The flexible allocation is one of the advantages of the PLR-series. For users require large output power, the PLR-series allows maximum 3 same model units in parallel connection to obtain larger output current, and maximum 2 same model units in series connection to obtain larger output voltage.

The PLR-series takes the consideration of the integration between its rack and other systems. Hence, the heat dissipation design adopts front air inlet and rear air outlet (there is no air outlet on the top, bottom, and on the both sides). The optional dedicated rack mount adapter (GRA-427) is for PLR-series to be rack mounted. Other equipment can be directly placed on top or under PLR-series to save rack space.

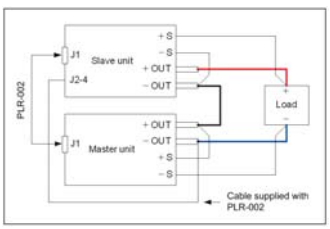
The PLR-series is equipped with RS-232 interface and also provides optional GPIB&USB (PLR-GU) and USB&LAN (PLR-LU). The program control of maximum 32 units can be realized by Local Bus no matter which interface is utilized. Additionally, the PLR-ARC interface not only provides external voltage and external resistance control but also meets the requirement of PLC control.

The PLR-series genuinely meets users' requirements of the new generation DC power supplies. The series, completely simplifying and expediting system development processes, is suitable for the R&D, design verification, and manufacturing of the semi-conductor equipment, automobile, component and communications industries.

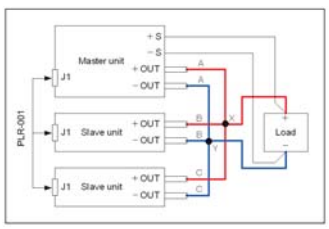
There are 6 models of the PLR-series. Model number, output voltage, output current and output power are as follows:

Function \ Model	PLR 20-18	PLR 20-36	PLR 36-10	PLR 36-20	PLR 60-6	PLR 60-12
Output Channel	1	1	1	1	1	1
Output Voltage	0 ~ 20V	0 ~ 20V	0 ~ 36V	0 ~ 36V	0 ~ 60V	0 ~ 60V
Output Current	0 ~ 18A	0 ~ 36A	0 ~ 10A	0 ~ 20A	0 ~ 6A	0 ~ 12A
Output Power	360W	720W	360W	720W	360W	720W

A. SERIES AND PARALLEL CONNECTIONS (Voltage and Current Allocation Chart for Series and Parallel Operation)



Series Connection Diagram



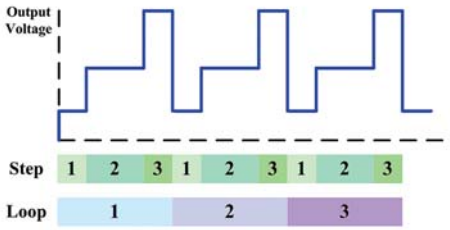
Parallel Connection Diagram

Unit \ Model	PLR 20-18	PLR 20-36	PLR 36-10	PLR 36-20	PLR 60-6	PLR 60-12
Single Unit Voltage/Current Allocation	20V/18A	20V/36A	36V/10A	36V/20A	60V/6A	60V/12A
2 units in Series Operation Voltage/Current Allocation	40V/18A	40V/36A	72V/10A	72V/20A	120V/6A	120V/12A
2 units in Paralle Operation Voltage/Current Allocation	20V/36A	20V/72A	36V/20A	36V/40A	60V/12A	60V/24A
3 units in Paralle Operation Voltage/Current Allocation	20V/54A	20V/108A	36V/30A	36V/60A	60V/18A	60V/36A

To bring up the overall output power, the PLR-series supports same model units to be arranged in series operation for the maximum 2 units or in parallel operation for maximum 3 units.

The series is very suitable for the power supply applications on D.C. power supply modules, electronic parts and components, and wafer plating equipment.

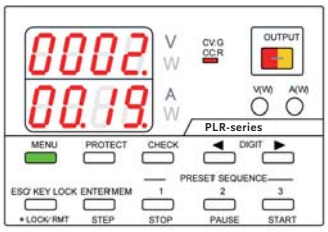
B. SEQUENCE FUNCTION



Example for the Sequence Operation

Before applying the sequence function, a series of different voltage, current and duration steps must be edited by a PC to make a sequence. CSV format, through RS-232C, LAN/USB (option) or GPIB/USB (option) interface, is transmitted to the memory of the PLR-series to sequentially execute steps consisting of voltage, current, and duration settings of the sequence. The shortest time for each step is 50ms and the maximum steps are 1000. The sequence function is to test DUT's response to the fast changing power supply that is one of the crucial verification items for electronic products' reliability tests.

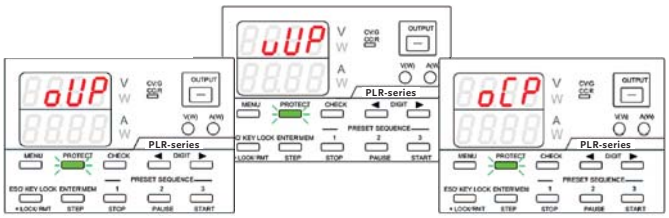
C. OUTPUT OFF TIMER FUNCTION



Counting Down From 2hr and 20mins

The output off timer function is to set the PLR-series to automatically turn off its output after a certain period of time. The shortest time setting is 1 minute. The setting range is from 1 minute to the maximum 1000 hours and 59 minutes. This function can only be activated when power supply output is being turned on.

D. OVP, OCP AND UVP FUNCTIONS



OVP (Over Voltage Protection) **UVP** (Under Voltage Protection) **OCP** (Over Current Protection)

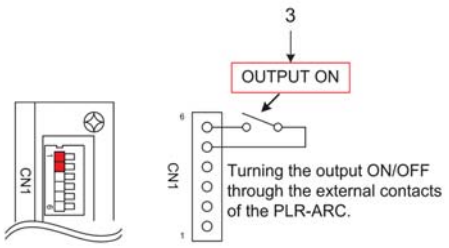
When the voltage and current outputs exceed the preset conditions of OVP and OCP, the PLR-series will be shut down so as to prevent DUT from any damages.

OCP : the setting range is 5%~110% of the rated output
OVP : the setting range is 10%~110% of the rated output
UVP : the setting range is 1V ~ 110% of the rated output

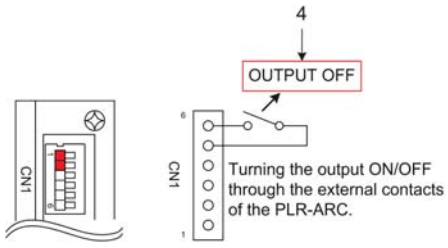
E. PRESET FUNCTION

The PLR-series provides three parameter preset function keys on the front panel and each preset memory consists of parameters of output voltage and output current settings. Users via storing frequently used voltage and current parameters from the front panel to quickly save and recall parameters.

F. EXTERNAL ANALOG CONTROL FUNCTION



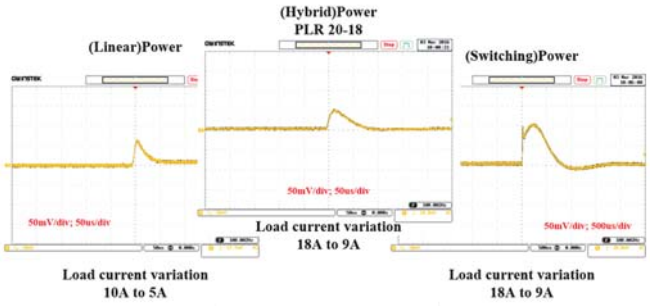
Turning the Output on by External Analog Control Interface



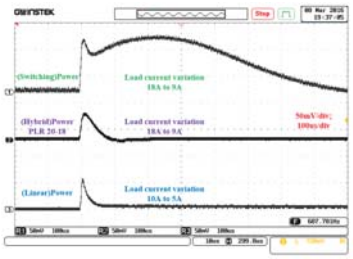
Turning the Output Off by External Analog Control Interface

The rear panel of the PLR-series features analog control terminal which controls output voltage and current values through external voltage or resistance. The on and off of power supply output or main power disconnection can also be executed via external analog control interface. The above diagrams show the typical external analog control connection methods. For more connection information, please refer to the user manual.

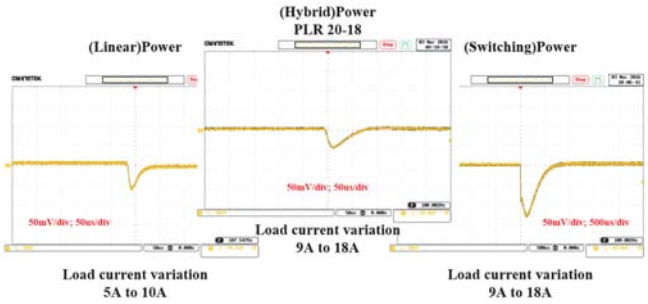
G. COMPARISONS ON TRANSIENT RECOVERY TIME CHARACTERISTICS



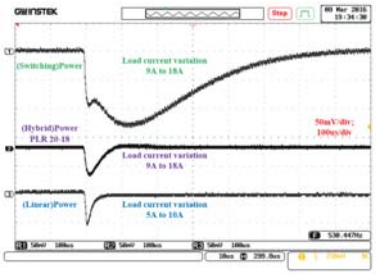
Comparison for Recovery Time (Vo = 20V)



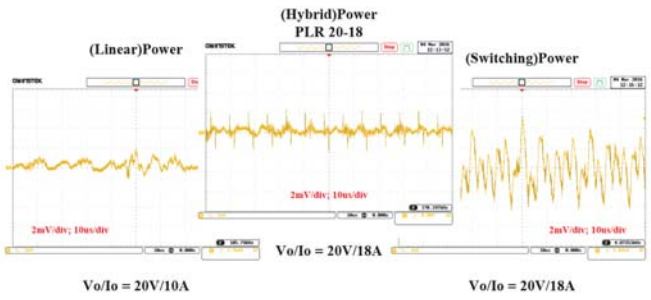
Current Falling Comparison



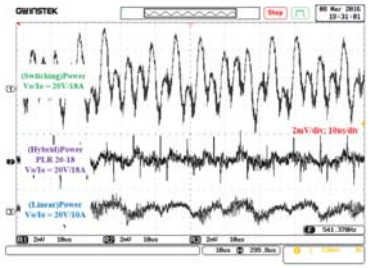
Comparison for Recovery Time (Vo = 20V)



Current Rising Comparison



Ripple Comparison for Rating Power Output (Bandwidth : 1MHz)

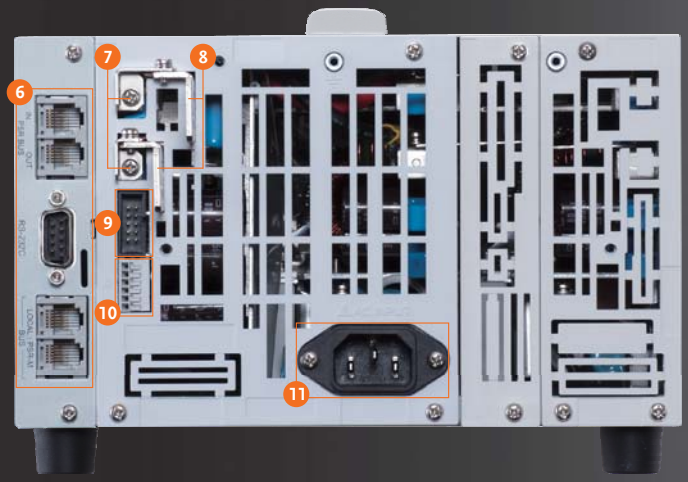


Ripple Comparison for Rating Power Output

The PLR-series has a fast transient recovery capability, which is ideal for applications of large load current changes. The above diagrams show the actual comparative results of transient response time under different techniques.

PANEL INTRODUCTION

CE | GPIB | USB | RS-232 | Analog Control | LAN



1. Operation Panel
2. Rotary Encoder
3. Power Switch
4. Front Output Terminals
5. Grill
6. Std. : RS-232C
   Opt. : PLR-GU/PLR-LU/
   PLR-ARC
7. Remote Sensing Terminals
8. Output Terminals
9. J1 Connector
10. J2 Connector
11. AC Inlet

H. FEATURE COMPARISONS

Operation	Linear Type Power Supply	PLR-series (Hybrid)	Switching Type Power Supply
Ripple & Noise for CV	0.35mVrms(Typ.) ◎	≦ 0.5mVrms ◎	7mVrms(Typ.) △
Ripple & Noise for CC	< 2mArms(Typ.) ◎	5mArms ◎	72mArms(Typ.) △
Recovery Time	< 50μs(Typ.) ◎	≦ 100μs ◎	1ms(Typ.) △
Series & Parallel Operation	–	✓	✓
External Analog Control Interface	–	Opt.	Std.
Interfaces	Std. : RS-232/GPIB	Std. : RS-232/Local bus Opt. : LAN/USB or GPIB/USB	Std. : USB/LAN Opt. : USB to GPIB, USB to RS-232
Power	200W	360W	360W
Dimensions (mm)	230(W) × 140(H) × 380(D) △	140(W) × 124(H) × 364(D) ○	71(W) × 124(H) × 350(D) ◎
Weight	10 kg △	5.2 kg ○	3 kg ◎
CE Certificate	✓	✓	✓

◎ : Excellent ○ : Good △ : Bad

SPECIFICATIONS

	PLR 20-18	PLR 20-36	PLR 36-10	PLR 36-20	PLR 60-6	PLR 60-12
OUTPUT RATING						
Voltage	0V ~ 20V	0V ~ 20V	0V ~ 36V	0V ~ 36V	0V ~ 60V	0V ~ 60V
Current	0 ~ 18A	0 ~ 36A	0 ~ 10A	0 ~ 20A	0 ~ 6A	0 ~ 12A
Power	360W	720W	360W	720W	360W	720W
REGULATION (CV)						
Load	3mA	3mA	3.8mA	3.8mA	5mA	5mA
Line	2mA	2mA	2.8mA	2.8mA	4mA	4mA
REGULATION (CC)						
Load	5mA	5mA	5mA	5mA	5mA	5mA
Line	5mA	10mA	1mA	5mA	1mA	5mA
RIPPLE & NOISE (Noise Bandwidth=20MHz ; Ripple Bandwidth = 1MHz)						
CV p-p	30mVp-p	30mVp-p	30mVp-p	30mVp-p	30mVp-p	30mVp-p
CV rms	0.5mVrms	0.5mVrms	0.5mVrms	0.5mVrms	0.5mVrms	0.5mVrms
CC rms	10mArms	10mArms	5mArms	10mArms	5mArms	5mArms
READBACK ACCURACY (23°C±5°C, after 30 mins warm-up)						
Voltage	± (0.1%rdg+2digits)		± (0.1%rdg+2digits)		± (0.1%rdg+2digits)	
Current	± (0.5%rdg+2digits)		± (0.5%rdg+2digits)		± (0.5%rdg+2digits)	
Power	± (0.7%rdg+1.5%F.S.)		± (0.7%rdg+1.5%F.S.)		± (0.7%rdg+1.5%F.S.)	
SETTING ACCURACY (23°C±5°C, after 30 mins warm-up)						
Voltage	± (0.5%SET+0.5%F.S.)		± (0.5%SET+0.5%F.S.)		± (0.5%SET+0.5%F.S.)	
Current	± (1%SET+1%F.S.)		± (1%SET+1%F.S.)		± (1%SET+1%F.S.)	
RESPONSE TIME						
Raise Time (Output voltage: 10%→90%FS)	50ms/50ms: No load/Rated load		50ms/50ms: No load/Rated load		50ms/50ms: No load/Rated load	
Fall Time(Full load) (Output voltage: 90%→10%FS)	50ms		50ms		150ms	
Fall Time(No load) (Output voltage: 90%→10%FS)	250ms		250ms		600ms	
Load Transient Recover Time (Load change from 50 to 100%)	100 μs		100 μs		100 μs	
SETTING RESOLUTION						
Voltage	10mV		10mV		10mV	
Current	10mA		10mA		10mA	
MEASUREMENT RESOLUTION						
Voltage	10mV		10mV		10mV	
Current	10mA		10mA		10mA	
SERIES AND PARALLEL CAPABILITY						
Parallel Operation	Up to 3 units		Up to 3 units		Up to 3 units	
Series Operation	Up to 2 units		Up to 2 units		Up to 2 units	
PPROTECTION FUNCTION						
OVP	Set range : 10% to 110% F.S. Set resolution: 10 times the minimum display resolution Activated when the output voltage exceeds the set OVP value : Hardware detection					
OCP	Set range : 5% to 110% F.S. Set resolution: 10 times of minimum display resolution Activated when the output current exceeds set OCP value : Software detection					
UVP	Set range : -1V to 110% F.S. Set resolution: 10 times the minimum display resolution Activated when the output voltage falls below the set UVP value : Software detection					
ENVIRONMENT CONDITION						
Operation Temp.	0°C ~ 40°C					
Storage Temp.	−20°C ~ 60°C					
Operating Humidity	30% ~ 85% RH (No dew condensation)					
Storage Humidity	20% ~ 85% RH (No dew condensation)					
READ BACK TEMP. COEFFICIENT						
Voltage	±100ppm/°C					
Current	±100ppm/°C					
OTHER						
Power Consumption	570VA	1100VA	520VA	1050VA	510VA	1000VA
Power Factor	0.99	0.99	0.99	0.99	0.99	0.99
Cooling Method	Forced cooling : Fan speed proportionate to the temperature of the internal heat sink					
Power Source	Single-phase 100VAC to 240VAC, 50Hz to 60Hz					
Interface	Standard : RS-232C ; Optional : LAN/USB, GPIB/USB, External Analog Control					
Analog Control	Yes					
Dimension & Weight	139.5 (H) x 140(W) x 415.5(D); Approx. 5.2kg	139.5 (H) x 210(W) x 415.5(D); Approx. 7.5kg	139.5 (H) x 140(W) x 415.5(D); Approx. 5.2kg	139.5 (H) x 210(W) x 415.5(D); Approx. 7.5kg	139.5 (H) x 140(W) x 415.5(D); Approx. 5.2kg	139.5 (H) x 210(W) x 415.5(D); Approx. 7.5kg

Specifications subject to change without notice. PLR-SeriesGD1BH

ORDERING INFORMATION

PLR 20-18 (0~20V/0~18A/360W) Low Noise DC Power Supply
PLR 20-36 (0~20V/0~36A/720W) Low Noise DC Power Supply
PLR 36-10 (0~36V/0~10A/360W) Low Noise DC Power Supply
PLR 36-20 (0~36V/0~20A/720W) Low Noise DC Power Supply
PLR 60-6 (0~60V/0~6A/360W) Low Noise DC Power Supply
PLR 60-12 (0~60V/0~12A/720W) Low Noise DC Power Supply

ACCESSORIES

User Manual(CD) x 1, Power Cable x 1, Rear Output Terminal Cover x 1, Bolt set x 1(Hexagon head bolt P-3 x 2, Flat washer x 2, Hexagon nut x 2), Output grounding cable x 1, M4 Small Screw Washer x 1, M3 Small Screw Washer x 1, M3 Large Screw Washer x 2

OPTIONAL ACCESSORIES

PLR-GU	GPIB/USB Interface Card	**GTL-246**	USB Cable (1.2m)
PLR-LU	LAN/USB Interface Card	**GTL-248**	GPIB Cable (2.0m)
PLR-ARC	External Analog Control Interface Card	**GTL-251**	GPIB-USB-HS (High-Speed)
PLR-001	Parallel Connection Signal Cable(2~3 units)	**GRJ-1101**	Modular Cable (0.5m)
PLR-002	Series Connection Signal Cable	**GRJ-1102**	Modular Cable (1.5m)
GRA-427	Rack Mount Adaptor (EIA+JIS)		

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