

Programmable D.C. Electronic Load



PEL-2004A



PEL-2002A



FEATURES

- * Sequence Function to do High Speed Load Simulations
- * Flexible Configuration with Mainframes and Plug-in Modules
- * Multiple Independent Load Inputs up to 8 Channels in a Mainframe
- * Parallel Connection of Inputs for Higher Load Capacity
- * Program Mode to Create Work Routines for Repetitive Tests
- * OPP/OCP/OVP/OTP/RVP/UVP Protections
- * External Channel Control/Monitoring via Analog Control Connector
- * Multiple-Interface USB Device/Host, RS-232C, and GPIB/LAN (Optional)

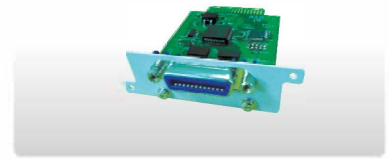
The PEL-2004A and PEL-2002A are multiple channel, programmable DC electronic loads with a modularized structure. The PEL-2000A Series is designed to meet the continuing shift toward high speed operation in today's semiconductor market. As the power supply units, DC-DC converters, and batteries that drive semiconductor circuits need to follow this shift, power supply design, quality inspection and characteristic certification using high-speed performance loads have become necessary. The PEL-2000A Series includes two types of mainframes and 4 types of load modules to accommodate users' requirements in a flexible manner. Any load module combination can be used with a mainframe to tailor a test system based on the number of channels, and the maximum load power, voltage and current of each channel. Multiple loads can be connected in parallel to provide a higher-power load to test higher power supply outputs. This flexibility significantly reduces the investment needed for future projects that have differed power requirements. PEL-2004A is a 4-slot mainframe with a master control unit to hold 4 load modules, while PEL-2002A is a 2-slot mainframe with master control unit to hold 2 load modules. When PEL-2004A is configured with 4 load modules rated at 350W each, the PEL-2000A series is able to sink up to 1.4kVA of power. For higher load capacities, mainframes can be linked together in parallel with standard MIL 20-pin connectors. A maximum of 5 mainframes, including one master and 4 slaves can be chained together to create a total load capacity of 7kW for high current and high power applications. Using 4 dual channel load modules, PEL-2004A is able to test 8 power supply outputs simultaneously. The Sequence function allows each channel to change its load sink according to a predefined sequence at a rate of up to 100 s per step. Each sequence is able to run concurrently, under the control of one clock. This is one of the most powerful features of the PEL-2000A Series as it is able to realistically simulate a multi-output power supply load. Under Dynamic mode, the load current or load resistance pulses between two preset levels at a pre-defined speed up to 25 s per step. This is often used as the standard test procedure to verify the response of a power supply to quick load changes. Most remarkably, multiple load channels can be connected in parallel to run Dynamic tests synchronously under a single clock. This Parallel Dynamic functionality gives the flexibility to perform dynamic tests for a high-power power supply without the need of another high-power load. The PEL-2000A Series includes a number of protection modes: Over Current Protection (OCP), Over Voltage Protection (OVP), Over Power Protection (OPP), Reverse Voltage Protection (RVP), and Under Voltage Protection (UVP). The protection modes are useful to protect both the load modules and the DUT(s). A buzzer can be set for when a protection has been tripped. When a protection mode has been tripped, the load unit will display an alarm and stop sinking current/voltage. When a load unit is operating in CR or CV mode, the unit may need Over Current Protection to prevent excessive current being sunk. Over Current Protection stops the load from sinking more current than its recommended limit and prevents the load from burn-out damage. Over Voltage Protection is used to limit the amount of voltage sunk. If the OVP trips, the PEL-Series load will stop sinking voltage. Over Power Protection is used when the input power exceeds the specifications of the load. When OPP is tripped, the power will cease to be sunk. Reverse Voltage Protection prevents reverse voltage damage to the PEL-2000A Series up to the specified rating. When Reverse Voltage Protection has been tripped, an alarm tone will sound until the reverse voltage is removed. Under Voltage Protection will turn off the load when the voltage drops below a set limit. The Go/NoGo function is available to monitor test results all the time. When a test result goes beyond a preset limit range, a "No Go" indication will be shown on the display and a "No Go" signal can be sent out through the D-SUB interface for external device control. This Go/NoGo function is available for CC mode, CV mode and CR mode. Under "Program" mode, 12 programs each containing 10 panel-setup memories, can be edited to create work routines for repetitive tests. After a program has been executed, the results of all test steps, along with the Go/NoGo judgments, will be shown on the screen. For external control and system configuration, the PEL series has USB and RS232 interfaces as standard and LAN as well as GPIB as an option. The LabView driver and Data Logging PC software are both supported for all the available interfaces. Each channel has an analog control/monitoring connector on the rear panel to externally turn a load on/off and to externally monitor load input current and voltage.

SPECIFICATIONS

	PEL-2020A		PEL-2030A		
CHANNEL POWER RANGE	L/R 100W Low	L/R 100W High	Left 30W N/A	Right 250W Low	Right 250W High
CURRENT VOLTAGE	0-2A 0-80V	0-20A 0-80V	0-5A 0-80V	0-4A 0-80V	0-40A 0-80V
MIN. OPERATING VOLTAGE (DC)(Typ.)	0.4V at 2A 0.2V at 1A	0.8V at 20A 0.4V at 10A	0.8V at 5A 0.4V at 2.5A	0.4V at 4A 0.2V at 2A	0.8V at 40A 0.4V at 20A
STATIC MODE					
CONSTANT CURRENT MODE					
Operating Range	0-2A	0-20A	0-5A	0-4A	0-40A
Setting Range	0-2.04A	0-20.4A	0-5.1A	0-4.08A	0-40.8A
Resolution	0.1mA	1mA	0.125mA	0.1mA	1mA
Accuracy	±(0.1%set + 0.1% FS)	±(0.1%set + 0.2% FS)	±(0.1%set + 0.1% FS)	±(0.1%set + 0.1% FS)	±(0.1%set + 0.2% FS)
CONSTANT RESISTANCE MODE					
Operating Range	0.075Ω-300Ω(100W/16V) 3.75Ω-15K(100W/80V)	0.3Ω-1.2KΩ(30W/16V) 15Ω-60K(30W/80V)	0.0375Ω-150Ω(250W/16V) 1.875Ω-7.5K(250W/80V)	0.0375Ω-150Ω(250W/16V) 1.875Ω-7.5K(250W/80V)	0.0375Ω-150Ω(250W/16V) 1.875Ω-7.5K(250W/80V)
Setting Range	0.075Ω-300Ω(100W/16V) 3.75Ω-15K(100W/80V)	0.3Ω-1.2KΩ(30W/16V) 15Ω-60K(30W/80V)	0.0375Ω-150Ω(250W/16V) 1.875Ω-7.5K(250W/80V)	0.0375Ω-150Ω(250W/16V) 1.875Ω-7.5K(250W/80V)	0.0375Ω-150Ω(250W/16V) 1.875Ω-7.5K(250W/80V)
Resolution	0.333ms(100W/16V) 6.667μs(100W/80V)	83.333μs(30W/16V) 1.666μs(30W/80V)	83.333μs(30W/16V) 1.666μs(30W/80V)	0.666ms(250W/16V) 13.333μs(250W/80V)	0.666ms(250W/16V) 13.333μs(250W/80V)
Accuracy (with ≥2.5V at input)	300Ω: ±(0.2%set+0.1s) 15KΩ: ±(0.1%set+0.01s)	1.2KΩ: ±(0.2%set+0.1s) 60KΩ: ±(0.1%set+0.01s)	1.2KΩ: ±(0.2%set+0.1s) 60KΩ: ±(0.1%set+0.01s)	150Ω: ±(0.2%set+0.1s) 7.5KΩ: ±(0.1%set+0.01s)	150Ω: ±(0.2%set+0.1s) 7.5KΩ: ±(0.1%set+0.01s)
CONSTANT VOLTAGE+ CONSTANT CURRENT MODE					
Operating Range	1-80V				
Setting Range	0-81.6V				
Resolution	2mV				
Accuracy	±(0.05%set + 0.1% FS)				
Current Setting Range	0-20A		0-5A	0-40A	
Resolution	1mA		0.125mA	1mA	
Accuracy	±(0.1%set + 0.2% FS)				

CONSTANT POWER MODE Operating Range* Setting Range Resolution Accuracy	1~10W 0~10.2W 1mW ±(0.5%set + 0.5%F.S)	1~100W 0~102W 10mW ±(0.5%set + 0.5%F.S)	1~30W 0~30.6W 1mW ±(0.5%set + 0.5%F.S)	1~25W 0~25.5W 1mW ±(0.5%set + 0.5%F.S)	1~250W 0~255W 10mW ±(0.5%set + 0.5%F.S)
DYNAMIC MODE					
T1&T2 Accuracy	0.025ms~10ms/Res:1μs 10ms~30s/Res:1ms 1μs/1ms ± 100ppm			0.025ms~10ms/Res:1μs 10ms~30s/Res:1ms 1μs/1ms ± 100ppm	
CONSTANT CURRENT MODE Slew Rate (±10%set+15μs) Slew Rate Resolution Slew Rate Accuracy of Setting Current Setting Range Current Resolution Current Accuracy	0.32~80mA/μs 0.32mA/μs ±(10%+15μs) 0~2A 0.1mA ±0.4% FS	32~800mA/μs 3.2mA/μs ±(10%+15μs) 0~20A 1mA ±0.4% FS	0.8~200mA/μs 0.8mA/μs ±(10%+15μs) 0~5A 0.125mA ±0.4% FS	0.64~160mA/μs 0.64mA/μs ±(10%+15μs) 0~4A 0.1mA ±0.4% FS	64~1600mA/μs 6.4mA/μs ±(10%+15μs) 0~40A 1mA ±0.4% FS
CONSTANT RESISTANCE MODE Slew Rate Slew Rate Resolution Slew Rate Accuracy of setting	0.32~80mA/μs 0.32mA/μs ±(10%+15μs)	32~800mA/μs 3.2mA/μs ±(10%+15μs)	0.8~200mA/μs 0.8mA/μs ±(10%+15μs)	0.64~160mA/μs 0.64mA/μs ±(10%+15μs)	64~1600mA/μs 6.4mA/μs ±(10%+15μs)
Resistance Setting Range	0.075Ω~300KΩ(100W/16V) 3.75Ω~15K(100W/80V)	0.3Ω~1.2KΩ(30W/16V) 15Ω~60K(30W/80V)	0.0375Ω~150KΩ(250W/16V) 1.875Ω~7.5K(250W/80V)	0.0375Ω~150KΩ(250W/16V) 1.875Ω~7.5K(250W/80V)	0.0375Ω~150KΩ(250W/16V) 1.875Ω~7.5K(250W/80V)
Resistance Resolution	0.333ms(100W/16V) 6.667μs(100W/80V)	83.333μs(30W/16V) 1.666μs(30W/80V)	0.666ms(250W/16V) 13.333μs(250W/80V)	0.666ms(250W/16V) 13.333μs(250W/80V)	0.666ms(250W/16V) 13.333μs(250W/80V)
Resistance Resolution	300Ω:±(0.5%set+0.1s) 15KΩ:±(0.5%set+0.01s)	1.2KΩ:±(0.5%set+0.1s) 60KΩ:±(0.5%set+0.01s)	150Ω:±(0.5%set+0.1s) 7.5KΩ:±(0.5%set+0.01s)	150Ω:±(0.5%set+0.1s) 7.5KΩ:±(0.5%set+0.01s)	150Ω:±(0.5%set+0.1s) 7.5KΩ:±(0.5%set+0.01s)
MEASUREMENT					
VOLTAGE READBACK Range Resolution Accuracy	0~16V 0.32mV ±(0.025%set + 0.025% FS)	0~80V 1.6mV	0~16V,0~80V 0.32mV,1.6mV	0~16V 0.32mV	0~80V 1.6mV
CURRENT READBACK Range Resolution Accuracy	0~2A 0.04mA ±(0.05%set + 0.05% FS)	0~20A 0.4mA	0~5A 0.1mA	0~4A 0.08mA	0~40A 0.8mA
POWER READBACK Range Accuracy	0~10W ±(0.1%set + 0.1% FS*)	0~100W	0~30W	0~25W	0~250W
*1 : Power FS=Vrange FS x Irange FS					
PROTECTION					
OVER POWER PROTECTION Range Resolution Accuracy	1~102W 0.5W ±(2%set+0.25% FS)		1~30.6W 0.15W ±(2%set+0.25% FS)		1~255W 1.25W ±(2%set+0.25% FS)
OVER CURRENT PROTECTION Range Resolution Accuracy	0~20.4A 0.05A ±(2%set+0.25% FS)		0~5.1A 0.0125A ±(2%set+0.25% FS)		0~40.8A 0.1A ±(2%set+0.25% FS)
OVER VOLTAGE PROTECTION Range Resolution Accuracy Over Temperature Protection	1~81.6V 0.2V ±(2%set+0.25% FS) ≒ 85℃		1~81.6V 0.2V ±(2%set+0.25% FS) ≒ 85℃		1~81.6V 0.2V ±(2%set+0.25% FS) ≒ 85℃
RATED POWER PROTECTION Value Accuracy	110W ±(2%set)		33W ±(2%set)		275W ±(2%set)
GENERAL					
SHORT CIRCUIT Current(CC) Voltage(CV) Resistance(CR)	≒ 2.2/2A 0V ≒ 3.75Ω	≒ 22/20A 0V ≒ 0.075Ω	≒ 5.5/5A 0V ≒ 15Ω, ≒ 0.3Ω	≒ 4.4/4A 0V ≒ 1.875Ω	≒ 44/40A 0V ≒ 0.0375Ω
INPUT RESISTANCE(LOAD OFF)	500KΩ(Typical)				
POWER SOURCE	AC100V ~ 230V ± 10% ; 50Hz / 60Hz ± 2Hz				
WEIGHT	Approx. 3.8 kg				
DIMENSIONS & WEIGHT (PEL-2002A)	272(W) x 200(H) x 581(D) mm ; Approx. 17.1kg(full modules)				
DIMENSIONS & WEIGHT (PEL-2004A)	435(W) x 200(H) x 581(D) mm ; Approx. 28.4kg(full modules)				

PEL-001 GPIB Card



PEL-002 Rack Mount Kit



PEL-003 Panel Cover



PEL-016 LAN Card

