



Rechargeable Battery

The test solution of High Voltage Device

GW INSTEK
Simply Reliable

800V PEL-3000H series

The PEL-3000H programmable DC Electronic load provide three current ranges and have voltage monitor BNC terminals on the front panel. The PEL-3000H series, a single-channel, programmable D.C. electronic load with 800V and 0.84A/ μ s current Slew Rate, is ideal for the test of the high voltage devices such as the EV & HEV in-vehicle chargers, DC/DC converters or high-voltage batteries.



175W PEL-3021H
350W PEL-3041H



1050W PEL-3111H



2100W PEL-3211H Booster

Features

- Operating voltage (DC): 0~800V
- Operating Mode : C.C / C.V / C.R / C.P / CC+CV / CR+CV / CP+CV
- Parallel Connection of Inputs for Higher Capacity (Max : 9,450W)
- Support of High Slew Rate:Max. 0.84A/ μ s
- Run Program Function (GO/NO GO Test)
- Sequence Function for High Efficient Load Simulations
- Dynamic(Switching) Function: 1Hz ~20kHz
- Soft Start Function:Off / On(1~200ms, Res: 1ms)
- Adjustable OCP / OVP / OPP / UVP Setting
- Short Circuit Function
- Timer function : Elapsed Time of load on
- Cut Off Time(Auto Load Off Timer) : 1s to 999h 59min 59s or Off
- External Channel Control / Monitoring via Analog Control Connector
- Setup Memories: 100 sets
- 3.5 Inch TFT LCD Display
- Multi Interface : USB 2.0 Device / Host , RS-232 , GPIB (Optional)



3150W PEL-3322H	5250W PEL-3533H	7350W PEL-3744H	9450W PEL-3955H	2100W PEL-3212H	3150W PEL-3323H	4200W PEL-3424H	5250W PEL-3535H
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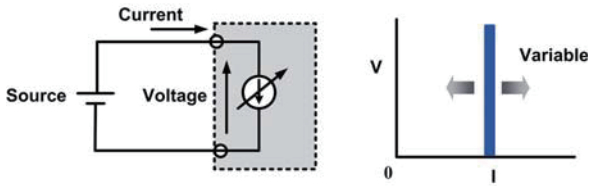
PEL-3000H series

Model	Power	CC mode*	CV mode*	CR mode*	CP mode*
PEL-3021H	175W	0A ~ 8.75A	5V ~ 800V	1.75S ~ 30 μ S (571m Ω ~ 33.3k Ω)	17.5W ~ 175W
PEL-3041H	350W	0A ~ 17.5A	5V ~ 800V	3.5S ~ 60 μ S (285m Ω ~ 16.6k Ω)	35W ~ 350W
PEL-3111H	1050W	0A ~ 52.5A	5V ~ 800V	10.5S ~ 180 μ S (95.2m Ω ~ 5.55k Ω)	105W ~ 1050W
PEL-3211H	2100W Booster	0A ~ 105A	5V ~ 800V	21S ~ 360 μ S(95.2m Ω ~ 2.777k Ω)	210W ~ 2100W
PEL-3212H	2100W	0A~105A	5V ~ 800V	21S~360 μ S(47.619m Ω ~2.778k Ω)	210W~2100W
PEL-3323H	3150W	0~157.5A	5V ~ 800V	31.5S~540 μ S(31.746m Ω ~1.85185k Ω)	315W~3150W
PEL-3424H	4200W	0~210A	5V ~ 800V	42S~0.72mS(23.8095m Ω ~1.3889k Ω)	420W~4200W
PEL-3535H	5250W	0~262.5A	5V ~ 800V	52.5S~0.9mS(19.0476m Ω ~1.1111k Ω)	525W~5250W
PEL-3322H	3150W	0~157.5A	5V ~ 800V	31.5S~540 μ S(31.746m Ω ~1.85185k Ω)	315W~3150W
PEL-3533H	5250W	0~262.5A	5V ~ 800V	52.5S~0.9mS(19.0476m Ω ~1.1111k Ω)	525W~5250W
PEL-3744H	7350W	0~367.5A	5V ~ 800V	73.5S~1.26mS(13.6054m Ω ~793.651 Ω)	735W~7350W
PEL-3955H	9450W	0~472.5A	5V ~ 800V	94.5S~1.26mS(10.582m Ω ~617.284 Ω)	945W~9450W

* High range

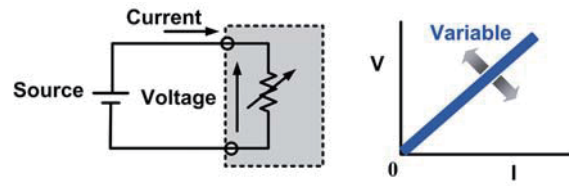
B. OPERATING MODE

CC Mode



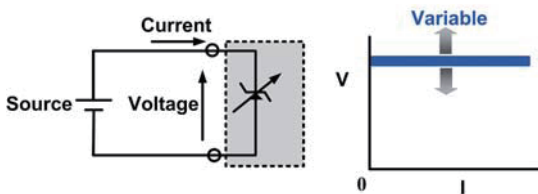
Under constant current(CC) mode, the unit will sink the amount of current users has set.

CR Mode



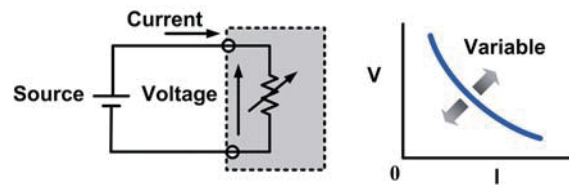
Under Constant Resistance(CR) Mode, the unit will maintain a constant resistive load by varying the current. CR mode uses Ω or S ($1/\Omega$) for the setting units.

CV Mode



Under constant voltage(CV) mode, the unit will maintain a set voltage level regardless of the input current changing.

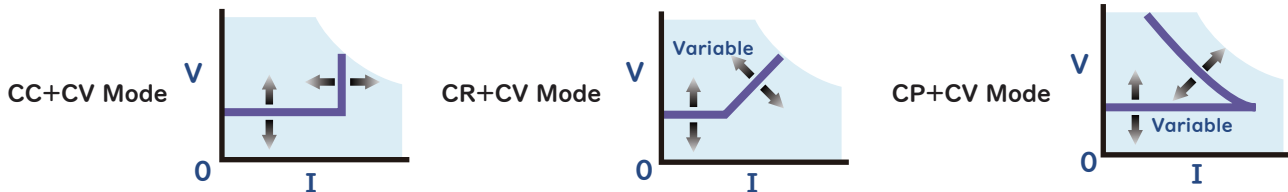
CP Mode



Under constant power(CP) mode, the unit will maintain a set power level regardless of the input voltage. When input voltage changes, the unit responds by changing the current load to maintain the set power level accordingly ($I=P/V$).

+CV Mode

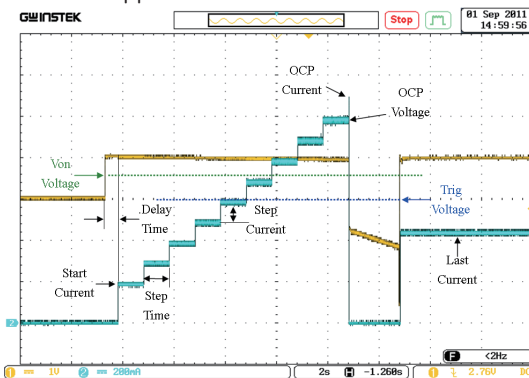
+CV mode can be selected under CC, CR or CP mode. When +CV mode function is turned on and PEL sinks more current than the maximum current of a power device under test, it will automatically switch to CV mode. It is because the current sunk is the maximum current of the power device. Therefore, the power device will switch to CC mode and PEL will switch to CV mode to limit electronic load from sinking the total current of a power device so as to prevent power device under test from damaging. The PEL will turn to a very high impedance and will cease current sink operation, once the voltage of power device is lower than the set voltage under +CV mode.



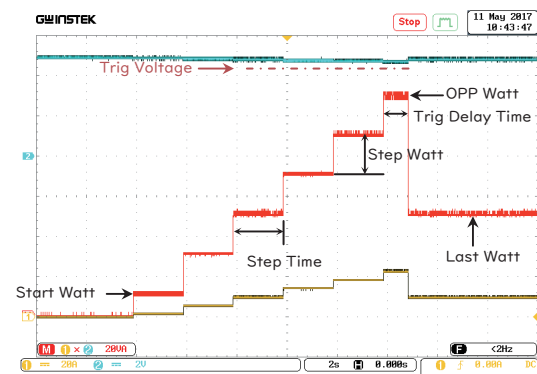
The automatic OCP test and OPP test function for power supply products

The PEL has the automatic OCP test and automatic OPP test function. These function can test the OCP and OPP of power supply products.

This test will test to see when the over current protection of a power supply is tripped and return the measurements for the voltage and current when the over current protection was tripped.

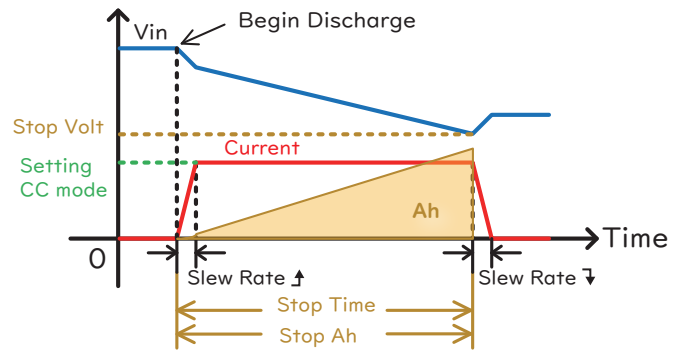


The OPP test function creates an automatic test to test the OPP of power supply products. This test will test to see when the over power



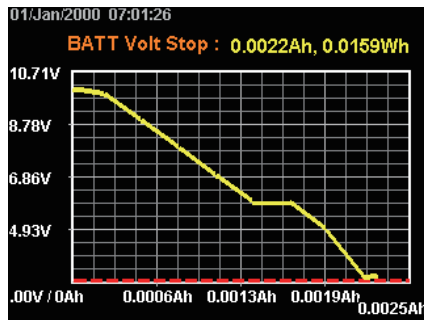
BATT Test Automation

The BATT test function creates an automatic test to test the discharge of Battery products. The test will discharge in a fixed mode (CC, CR, CP) and will end after a defined stop point (stop voltage, stop time, stop AH) has been detected. The information about discharge test (discharge time, battery AH, battery WH) can be finally seen on the panel. The PEL-3000(H) also has a user-defined cutoff setting in the event that the Battery test fails. The diagram below shows an example of the BATT Test Automation function:



Save Data

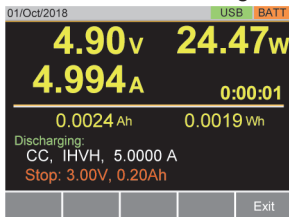
When the Battery stop voltage, stop time or stop AH was tripped. TEST Result can view the test result waveform. Test results can be saved in a USB flash drive as the waveform image and data log (CSV).



	A	B	C	D	E	F	G
1	<< BATT TEST >>						
2	< PARAMETER OF BATT TEST >			PEL-3XXX	v1.31.003		
3	BATT No.:		1				
4	(1) Memo:						
5	(2) Mode:	CC					
6	(3) Range:	IHVH					
7	(4) Set CC:	1.000 A					
8	(5) Stop Volt:	3.00 V					
9	(6) Stop Time:	0 h	0 m	10 s			
10	(7) Stop AH:	0.20 Ah					
11							
12	< TEST RESULTS >						
13	Start Time:	2000/1/ 07:01					
14	End Time:	2000/1/ 07:01					
15	(1) Test Length:	0 h	0 m	8 s			
16	(2) Recorder Length:	0 h	0 m	8 s			
17	(3) Stop Condition:	Under VOLT					
18	(4) DATA LIST(S):	Timebase(sec):	1 s				
19	No	VOLT(V)	CURR(A)	POWER(WAH)	WH		
20	0	10.01	0.002	0.00002	0	0	
21	1	9.84	0.998	9.82032	0.0002	0.0024	
22	2	8.85	0.998	8.89218	0.0005	0.005	
23	3	7.85	0.998	7.8343	0.0008	0.0074	
24	4	6.85	0.998	6.84628	0.0011	0.0096	
25	5	5.87	0.998	5.85826	0.0014	0.0115	
26	6	5.85	0.998	5.8383	0.0016	0.0131	
27	7	4.86	0.998	4.85028	0.0019	0.0145	
28	8	2.86	0.998	2.85428	0.0022	0.0157	
29							

Example:

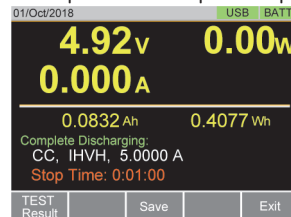
BATT Function running



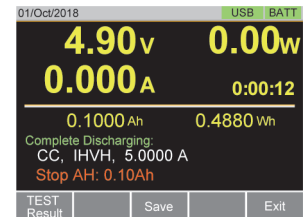
Results: Battery stop Voltage or stop time or stop AH tripped



Battery stop Voltage



Battery stop time



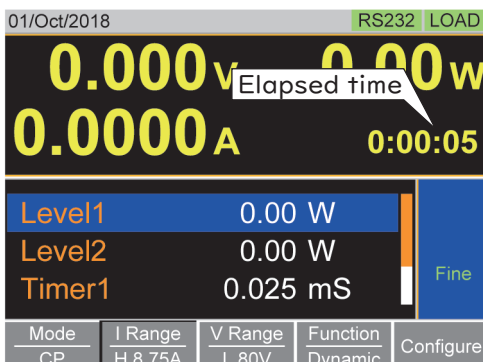
Battery stop AH tripped

Timer Functions

PEL is equipped with two types of count time function that counts elapsed time from load on to off and cutoff time function that automatically loads off after a set time. The cutoff time function displays the voltage level when the load is off on the popup screen.

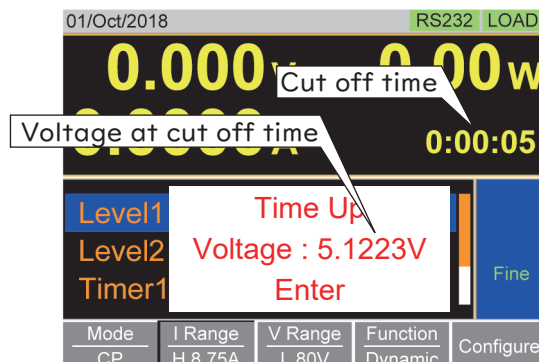
Count Time

When Count Time is set to on, it will count the elapsed time from when the load was turned on to when it was turned off.



Cut Off Time

The Cut Off Time function will turn the load off after a set-amount of time. After the load has been turned off, a popup screen will display the voltage level when the load was turned off.

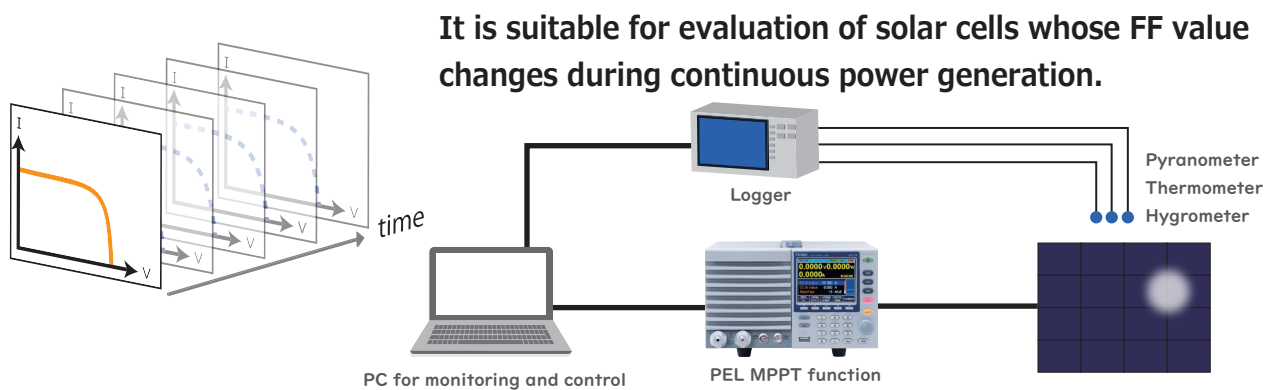


MPPT(Maximum Power Point Tracking) function

PEL-3000/3000H series can execute the MPPT function.

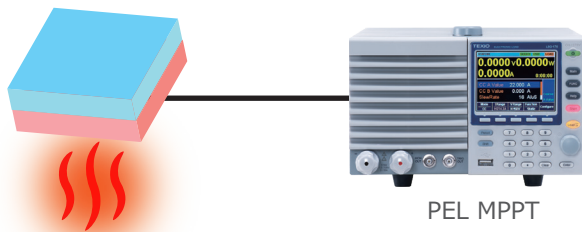
During MPPT operation, it is possible to perform I-V trace by periodic sweep operation.

Combined with a pseudo-sunlight source, it is possible to acquire IV characteristic data under various conditions.

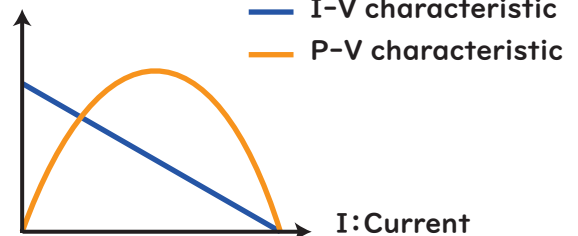


MPPT function of PEL Supports for thermoelectric generation modules

Thermoelectric generation device



V: Voltage/ P: Power



I-V characteristic of the thermoelectric module.



MPPT Function



MPPT test pattern	Up to 12 items can be registered
Mode	CV, CC
Range	6 items (ILVL, IMVL, IHVL, ILVH, IMVH, IHVH)
Response	CV: Slow, Fast CC: 1, 1/2, 1/5, 1/10
Sweep Range	CV: Value, Percent CC: Value
Start V	0V~Maximum voltage within the range (CV only)
End V	0V~Maximum voltage within the range (CV only)
Step V	0V~1/2 of the maximum voltage within the range (CV only)
Start C	0A~Maximum current within the range (CC only)
End C	0A~Maximum current within the range (CC only)
Step C	0A~1/2 of the maximum current within the range (CC only)
Step Time	0.01~50s

MPPT function of PEL can be used for thermoelectric generation devices (thermoelectric elements) that generate electricity by utilizing temperature difference developed by energy harvesting, or factory waste heat utilization. In the case of solar cells, the device continues to follow the maximum power point voltage with CV operation (constant voltage operation). Since the thermoelectric generation device is a voltage source, the device follows the maximum power current point with CC operation (constant current operation). MPPT function of PEL can work both operations.