

# PLW Series

6–250 kW

## Water-Cooled Programmable DC Electronic Load

60–1000 Vdc

- Broadest Model Selection: 6kW, 9kW, 12kW, 18kW, 24kW, 36kW, Additional standard models above 36kW, up to 250kW, are available.
- Standard 60V, 120V, 400V, 600V, 800V and 1000V Voltage Ratings
- PLW Models Offer Ultra-compact Footprint and Boasts one of the industry's highest power densities, 18kW in 2U.
- Anti-condensation: Intelligent Fully-integrated Temperature Control Circuit and Solenoid Valve
- Standard LabWindows and LabVIEW Drivers and SCPI Command Set
- RoHS Compliant



10–5000 Adc

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95-240 VAC

ETHERNET   RS232

Traditional DC Electronic Load Solutions are bulky and large in size. Most are offered with standard voltage, current and power ratings. In the ATE world, rack space is a highly coveted asset and application demands are constantly diversifying with new technology development.

AMETEK Programmable Power's Sorensen Brand PLW Series "Water-cooled" DC Electronic Loads are capable of being custom-tailored to meet your specific application requirements. The PLW Series also offers a unique condensation protection design, the highest power density and current rating, as well as the widest selection of high-voltage models on the market.

### Key Features

#### Closed-case Calibration

With the eLoad line, there's no longer a need to send your electronic load back to the factory for calibration or remove dozens of screws to reach a potentiometer. Simply follow the calibration routine from the front panel and you should be back up and running in a very short period of time (some electronic test equipment needed). This will virtually eliminate downtime and eradicate the annual cost associated with shipping your eLoad back to the factory for calibration.

#### Individual FET Protection

To ensure its reliability, the PLW Series design includes individual FET protection. A programmable electronic load may contain many FETs in parallel, which can create a cascading failure if one of them was to short out. The PLW design isolates failures so other components will not be affected or stressed, increasing the system's level of protection against catastrophic failure. With individual FET protection, the MTTR is reduced and the electronic load quickly returns to full operation.

#### Ultra-low Voltage Operation

The PLW design allows the programmable electronic load to operate at voltage levels approaching 0.1V. They will typically dissipate full rated current below 1% of their maximum rated voltage. For example, a 60V unit designed to dissipate 1500A will allow the user to operate at 0.6V and still dissipate the full amount.

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PROGRAMMABLE POWER

# PLW Series : Product Selector

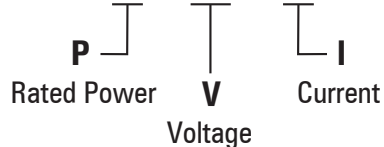
PLW Selector Guide																			
Model	VOLT	AMP	15A	25A	30A	40A	50A	75A	100A	150A	200A	300A	400A	600A	800A	1000A	1200A	1500A	
PLW6K	60V																		
	120V																		
	400V																		
	600V																		
	800V																		
	1000V																		
PLW9K	60V																		
	120V																		
	400V																		
	600V																		
	800V																		
	1000V																		
PLW12K	60V																		
	120V																		
	400V																		
	600V																		
	800V																		
	1000V																		
PLW18K	60V																		
	120V																		
	400V																		
	600V																		
	800V																		
	1000V																		
PLW24K	60V																		
	120V																		
	400V																		
	600V																		
	800V																		
	1000V																		
PLW36K	60V																		
	120V																		
	400V																		
	600V																		
	800V																		
	1000V																		

# PLW Series : Product Specifications

General							
Models	Power (W)	Voltage (Vdc)	Current (A dc)	CR Low (min) $\Omega$	CR High (max) $\Omega$	VMIN at IMAX	Size (Height, Depth)
PLW6K-60-1000	6000	60	1000	0.0150	60	0.9	2U, 27.5"D
PLW6K-120-600	6000	120	600	0.0125	200	1.5	2U, 27.5"D
PLW6K-400-300	6000	400	300	0.0090	1333.3	3.6	2U, 27.5"D
PLW6K-600-200	6000	600	200	0.0200	3000	12	2U, 27.5"D
PLW6K-800-25	6000	800	25	0.0075	32000	6	2U, 27.5"D
PLW6K-1000-25	6000	1000	25	0.0060	40000	6	2U, 27.5"D
PLW9K-60-1500	9000	60	1500	0.0150	40	0.9	2U, 27.5"D
PLW9K-120-1000	9000	120	1000	0.0125	120	1.5	2U, 27.5"D
PLW9K-400-400	9000	400	400	0.0090	1000	3.6	2U, 27.5"D
PLW9K-600-300	9000	600	300	0.0200	2000	12	2U, 27.5"D
PLW9K-800-40	9000	800	40	0.0075	20000	6	2U, 27.5"D
PLW9K-1000-40	9000	1000	40	0.0060	25000	6	2U, 27.5"D
PLW12K-60-1500	12000	60	1500	0.0125	40	0.75	2U, 27.5"D
PLW12K-120-1200	12000	120	1200	0.0130	100	1.56	2U, 27.5"D
PLW12K-400-600	12000	400	600	0.0090	666.6	3.6	2U, 27.5"D
PLW12K-600-400	12000	600	400	0.0200	1500	12	2U, 27.5"D
PLW12K-800-50	12000	800	50	0.0075	16000	6	2U, 27.5"D
PLW12K-1000-50	12000	1000	50	0.0060	20000	6	2U, 27.5"D
PLW18K-60-1500	18000	60	1500	0.0100	40	0.6	2U, 27.5"D
PLW18K-120-1500	18000	120	1500	0.0125	80	1.5	2U, 27.5"D
PLW18K-400-800	18000	400	800	0.0090	500	3.6	2U, 27.5"D
PLW18K-600-600	18000	600	600	0.0200	1000	12	2U, 27.5"D
PLW18K-800-75	18000	800	75	0.0075	10666.6	6	2U, 27.5"D
PLW18K-1000-75	18000	1000	75	0.0060	13333.3	6	2U, 27.5"D
PLW24K-60-1500	24000	60	1500	0.0075	40	0.45	4U, 27.5"D
PLW24K-120-1500	24000	120	1500	0.0100	80	1.2	4U, 27.5"D
PLW24K-400-1200	24000	400	1200	0.0090	333.3	3.6	4U, 27.5"D
PLW24K-600-800	24000	600	800	0.0200	750	12	4U, 27.5"D
PLW24K-800-100	24000	800	100	0.0075	8000	6	4U, 27.5"D
PLW24K-1000-100	24000	1000	100	0.0060	10000	6	4U, 27.5"D
PLW36K-60-1500	36000	60	1500	0.0075	40	0.45	4U, 27.5"D
PLW36K-120-1500	36000	120	1500	0.0075	80	0.9	4U, 27.5"D
PLW36K-400-1500	36000	400	1500	0.0083	266.6	3.3	4U, 27.5"D
PLW36K-600-1000	36000	600	1000	0.0167	600	10	4U, 27.5"D
PLW36K-800-150	36000	800	150	0.0075	5333.3	6	4U, 27.5"D
PLW36K-1000-150	36000	1000	150	0.0060	6666.6	6	4U, 27.5"D

Note: Higher power available. Please contact the factory.

## PLW XX - YY - ZZ - Option



"E" = Ethernet / USB  
 "I" = Isolated Analog Programming  
 "UL" = Ultra-Low Range

# PLW Series : Product Specifications

Constant Resistance Mode						
Models	CRH Range		CRM Range		CRL Range	
	Rmin	Rmax	Rmin	Rmax	Rmin	Rmax
PLW6K-60-1000	0.6	60	0.06	15	0.0009	0.06
PLW6K-120-600	2.0	200	0.20	50	0.0025	0.20
PLW6K-400-300	13.3	1333.3	1.33	333.3	0.0120	1.33
PLW6K-600-200	30.0	3000	3.00	750	0.0600	3.00
PLW6K-800-25	320.0	32000	32.00	8000	0.2400	32.00
PLW6K-1000-25	400.0	40000	40.00	10000	0.2400	40.00
PLW9K-60-1500	0.4	40	0.04	10	0.0006	0.04
PLW9K-120-1000	1.2	120	0.12	30	0.0015	0.12
PLW9K-400-400	10.0	1000	1.00	250	0.0090	1.00
PLW9K-600-300	20.0	2000	2.00	500	0.0400	2.00
PLW9K-800-40	200.0	20000	20.00	5000	0.1500	20.00
PLW9K-1000-40	250.0	25000	25.00	6250	0.1500	25.00
PLW12K-60-1500	0.4	40	0.04	10	0.0005	0.04
PLW12K-120-1200	1.0	100	0.10	25	0.0013	0.10
PLW12K-400-600	6.7	666.6	0.67	166.6	0.0060	0.67
PLW12K-600-400	15.0	1500	1.50	375	0.0300	1.50
PLW12K-800-50	160.0	16000	16.00	4000	0.1200	16.00
PLW12K-1000-50	200.0	20000	20.00	5000	0.1200	20.00
PLW18K-60-1500	0.4	40	0.04	10	0.0004	0.04
PLW18K-120-1500	0.8	80	0.08	20	0.0010	0.08
PLW18K-400-800	5.0	500	0.50	125	0.0045	0.50
PLW18K-600-600	10.0	1000	1.00	250	0.0200	1.00
PLW18K-800-75	106.7	10666.6	10.67	2666.6	0.0800	10.67
PLW18K-1000-75	133.3	13333.3	13.33	3333.3	0.0800	13.33
PLW24K-60-1500	0.4	40	0.04	10	0.0003	0.04
PLW24K-120-1500	0.8	80	0.08	20	0.0008	0.08
PLW24K-400-1200	3.3	333.3	0.33	83.3	0.0030	0.33
PLW24K-600-800	7.5	750	0.75	187.5	0.0150	0.75
PLW24K-800-100	80.0	8000	8.00	2000	0.0600	8.00
PLW24K-1000-100	100.0	10000	10.00	2500	0.0600	10.00
PLW36K-60-1500	0.4	40	0.04	10	0.0003	0.04
PLW36K-120-1500	0.8	80	0.08	20	0.0006	0.08
PLW36K-400-1500	2.7	266.6	0.27	66.6	0.0022	0.27
PLW36K-600-1000	6.0	600	0.60	150	0.0100	0.60
PLW36K-800-150	53.3	5333.3	5.33	1333.3	0.0400	5.33
PLW36K-1000-150	66.7	6666.6	6.67	1666.6	0.0400	6.67

## Constant Resistance Mode

Transient Time Range : CRM / CRH	Same As CC Mode
Transient Time Range : CRL	Same As CV Mode
Temperature Coefficient : CRM / H	300 ppm / °C of Minimum Resistance
Temperature Coefficient : CRL	300 ppm / °C of Maximum Resistance

## Constant Resistance Mode - Program : CR Resolution\*2 - 1/16000 Of Rated Value

\*1 All Mode Specification measure by 25°C room temperature unless otherwise specified  
 \*2 Transient Mode Specification must be x2

Constant Voltage Mode	
CVHigh Range	(0-V) V
CVMedium Range	0 - ( V / 2 ) V
CVLow Range	0 - ( / 10 ) V
Temp Coefficient	100 ppm / °C of Rated Voltage
Transient Time Range	
Fast Band(default, Osc1)	0.500 ~ 51.19 ms
Slow Band(Osc2, Osc3)	0.500 ~ 511.9 ms
CV Resolutions*2	1/16000 of rated voltage
CV Accuracy*2 (CVH, CVM, CVL)	0.05% +/- (0.1% x Vmax) V
Display Specifications	
CV Resolution	1/16000 of Rated Voltage
CV Accuracy (CVH, CVM, CCL)	0.05% +/- (0.1% x V) V
Constant Power Mode	
CPHigh Range	(0-P) W
CPMedium Range	0 - (P/2) W @ DC input current ≤ (I/2) A
CPLow Range	0 - (P/10) W @ DC input current ≤ (I/10) A
Transient Time Range	Same as CC Mode
Temperature Coefficient	300 ppm / °C of Rated Power
Constant Power Mode : Program	
CPHigh Accuracy*2	1.00% +/- (Px0.5%) W @ input current > (I/20) A, input voltage > (V/10) V
CPMedium Range	1.00% +/- (Px0.5%) W @ input current > (I/100) A, input voltage > (V/10) V
CPLow Range	1.00% +/- (Px0.5%) W @ input current > (I/1000) A, input voltage > (V/5) V
Program	CP Resolution*2 1/16000 of Rated Power
Constant Current Mode	
CCHigh Range	0 - I A
CCMedium Range	0 - (I/2) A
CCLow Range	0 - (I/10) A
Transient Time Range	
Fast Band (default, Osc1)	0.050 ~ 51.19 ms
Slow Band (Osc2, Osc3)	0.500 ~ 511.9 ms
Temperature Coefficient	100 ppm / °C of Rated Current
Constant Current Mode : Program	
CC Resolution*2	1/16000 of rated current
CCHigh Accuracy*2 LHM	0.05% +/- (Ix0.1%) A
Constant Resistance Mode	
Transient Time Range : CRM / CRH	Same As CC Mode
Transient Time Range : CRL	Same As CV Mode
Temperature Coefficient : CRM / H	300 ppm / °C of Minimum Resistance
Temperature Coefficient : CRL	300 ppm / °C of Maximum Resistance
Constant Resistance Mode - Program	
CR Resolution*2	1/16000 of rated value

# PLW Series : Product Specifications

External Programming Mode	
Monitor Output Signal	0-10 Volts output for 0 to full scale value
VMON Accuracy	0.10% +/- (Vx0.1%) V
IMON Accuracy	0.10% +/- (Ix0.1%) A
Analog Program	0~10 Volts Input yields 0 -- selected full scale loading in all modes
Accuracy	Same As Internal ± 0.1% Rating
Input Impedance	200 k Ω ± 1 %
BandWidth(-3dB)	Limited By Internal Transient Time
Remote Interface	GPIB / RS-232 / ETHERNET / USB
Programmable Protection	
Power (OPP)	
Range	(Px1.05/800) ~ (Px1.05) W
Resolution	(Px1.05/8000) W
Accuracy	0.50% +/- (P x 21 / 8000) W
Voltage (OVP)	
Range	(Vx1.05/1600) ~ (Vx1.05) V
Resolution	(Vx1.05/16000) V
Accuracy	0.20% +/- (Vx1.05/800) V
Current (OCP)	
Range	(Ix1.05/1600) ~ (Ix1.05) A
Resolution	(Ix1.05/16000) A
Accuracy	0.20% +/- (Ix1.05/800) A
Under Voltage Lockout (UVL)	
Mode	Input On / Continuous
Range	((V/4000*3) ~ Vmax) V
Resolution	(V/4000) V
Accuracy	2.50% +/- (V/800) V
Anti-Oscillation	Default/ Osc1/ Osc2/ Osc3/ Disable
Protection	
Over Power (OP)	(Px1.05) +/- (Px0.02) W
Over Voltage (OV)	(Vx1.05) +/- (Vx0.02) V
Over Current (OC)	(Ix1.1) +/- (Ix1.1x0.01/1.05) A
Over Temp (OTP)	50.00 +/- 5.000 °C
Reverse Max Current (RCP)	(Ix1.1) A
Short Max Current	(Ix1.02) A
Remote Inhibit (RI)	Short
Fault Indicator	SPDT Relay (30Vdc/0.5A or 125Vac/0.25A)
General	
AC Input	95~240 Vac 48~62 Hz
Derating for higher temperatures	(-)1.67% Rated Power / °C
Operating Temperature	5 °C ~ 40 °C
Fluid	
Valve	Normal closed
Flow Rate (Pmax)	>= 1.5~9.0 GPM @ 15 °C Fluid In
Derating for higher temperatures	-3% Rated Power / °C
Pressure	< 80 PSI
Pipe Size	1/2" NPT Female (<=24kW models, 3/4" for higher power)
Decondensation	Valve thermal control
Transient Mode	
Frequency Range	0.100 - 10,000 Hz
Duty Range	1.000 - 100.0%
Transient Time Accuracy	10.0% +/- 50% of Min Time
Dielectric Strength	
Primary Circuit To Chassis	1500 Vac for 1 min
Primary Circuit To Load Terminal	1500 Vac for 1 min
Load Terminal To Chassis	1500 Vdc for 1 min

# PLW Series : Operational Curves

6–250 kW

