# Series 2380

# Programmable DC Electronic Loads


- 200W, 250W, and 750W models
- Supports up to 500V or 60A
- Constant current (CC),constant voltage (CV), constant resistance (CR), and constant power (CP) operating modes
- LED simulated load test mode
- Readback voltage and current resolution down to 0.1mV/0.01mA
- Dynamic mode with cycle rate up to 25kHz
- Voltage rise and fall time measurement
- Current monitor function
- List mode
- Battery test mode
- Built-in GPIB,USB, and RS-232 interfaces

Series 2380 programmable DC electronic loads can sink a wide range of voltages and currents. The 200W Model 2380-500-15 can accept up to 500V or 15A. The 250W Model 2380-120-60 can accept up to 120V or 60A. The 750W Model 2380- 500 30 can accept up to 500V or 30A. These single-output, stand-alone electronic loads are cost-effective and self-contained.

### Multiple Operating Modes

These DC electronic loads can operate in constant current (CC), constant voltage (CV), constant resistance (CR), or constant power (CP) mode. They can also be configured to provide a dynamically changing load to the DC source with load switching times as fast as 25kHz. Versatile internal, external, and remote triggering options allow synchronizing the dynamic load behavior with other events.

### Comprehensive Protection

Protection functions built into Series 2380 DC electronic loads ensure the reliability and safety of all tests. These functions include over temperature protection (OTP), over voltage protection (OVP), over current protection (OCP), over power protection (OPP), and local/remote reverse voltage (LRV/RRV) protection. A power-on system self-test ensures the instrument is operating properly.

### Full Complement of Settings and Controls

To maximize testing efficiency, you can save test parameters into any one of 100 memory locations for quick recall. All load parameters, such as voltage, current, slew rate, and dynamic mode time intervals, can be set using the front panel controls or programmed remotely. A numeric keypad and rotary knob allow entering settings quickly and setting parameters to their full resolution easily. USB-TMC, GPIB and RS-232 interfaces are built in for remote control and communication. A current monitor interface simplifies monitoring input current waveforms by providing a connection for an oscilloscope.

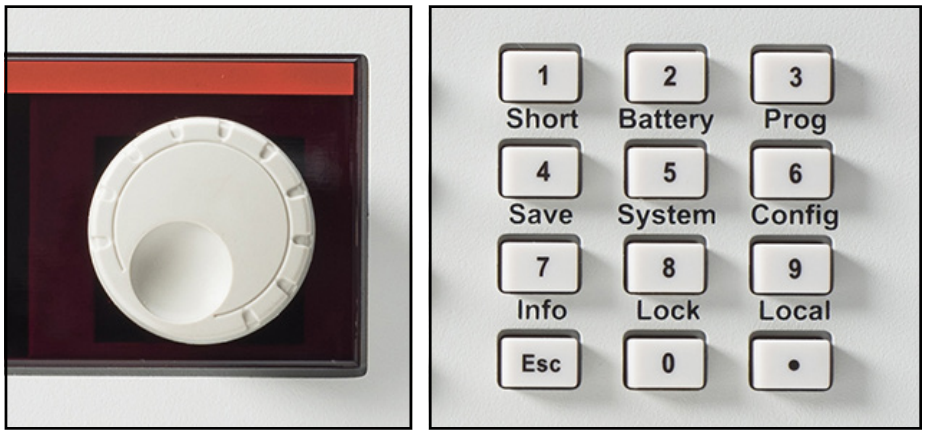



**Figure 1. Use either the rotary knob or the keypad to quickly enter settings and set parameter values using all the available resolution.**



GREENTEST® TECHNOLOGIES

# 2380

# Programmable DC Electronic Loads

## Ordering Information

2380-500-15
Programmable DC Electronic Load, 500V, 15A, 200W

2380-120-60
Programmable DC Electronic Load, 120V, 60A, 250W

2380-500-30
Programmable DC Electronic Load, 500V, 30A, 750W

2380J-500-15
Programmable DC Electronic Load, 500V, 15A, 200W-Japan only

2380J-120-60
Programmable DC Electronic Load, 120V, 60A, 250W-Japan only

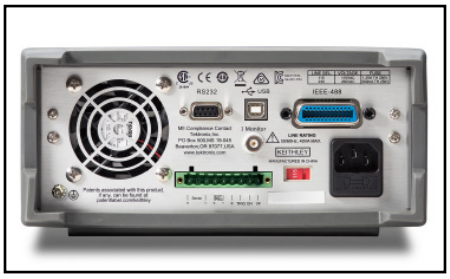
2380J-500-30
Programmable DC Electronic Load, 500V, 30A, 750W-Japan only

## Accessories Supplied

Quick Start Guide
Documentation CD
Power cord

## APPLICATIONS

- Environmental test, stress test, and accelerated life testing for AC/DC power sources and DC/DC modules
- LED lighting drivers and high power component testing
- Automotive electronics testing
- Battery research and discharge testing
- Production test



**Model 2380-500-15 rear panel**


**Model 2380-500-15 front view showing the safety covers on the input terminals.**


**Model 2380-500-30 rear panel**

## ACCESSORIES AVAILABLE

| | |
|---|---|
| 2380-001 | 9-pin Rear Panel Mating Connector |
| 2380-002 | DUT Connection Protective Cover |
| 7007-2 | Double-Shielded Premium IEEE-488 Interface Cable, 2m (6.5 ft) |
| KP-CL-488LPA | IEEE-488.2 Interface Board for the PCI Bus |
| USB-B-1 | USB Cable, Type A Connector to Type B Connector, 1m (3.3 ft) |

### RACK MOUNT KITS FOR THE 2380-500-15 AND THE 2380-120-60

| | |
|---|---|
| 4299-7 | Universal Fixed Rack Mount Kit |
| RMU2U | Fixed Rack Mount Kit |
| 386759800 | RMU2U Rack Mount Cosmetic Filler Panel |

### RACK MOUNT KIT FOR THE 2380-500-30

| | |
|---|---|
| 2380-RM | Full-Rack-Width Instrument Fixed Rack Mount Kit |

## SERVICES AVAILABLE

Model Number*-1-EW
3-year factory warranty from date of shipment extended 1 additional year

Model Number*-5Y-EW
3-year factory warranty from date of shipment extended to 5 years

C/Model Number*-3Y-STD
KeithleyCare 3 YR STD Calibration Plan

C/Model Number*-3Y-DAT
KeithleyCare 3 YR Calibration w/Data Plan

C/Model Number*-5Y-STD
KeithleyCare 5 YR STD Calibration Plan

C/Model Number*-5Y-DAT
KeithleyCare 5 YR Calibration w/Data Plan

* Replace the specific power supply model number in place of Model Number to generate the appropriate model number for a service item. Example for a 2380-500-15, a 1-year extended warranty model number would be 2380-500-15-EW.

## Specifications

### Model 2380-500-15/2380J-500-15

| | | Low Range | High Range |
|---|---|---|---|
| Rated Value (0°–40°C) | Input Voltage | 0–500 V | 0–500 V |
| | Input Current | 0–3 A | 0–15 A |
| | Input Power | 200 W | 200 W |
| | Min. Operating Voltage | 0.6 V at 3 A (maximum 0.9 V) | 4.5 V at 15 A |
| Constant Voltage Mode | Range | 0.1–50 V | 0.1– 500 V |
| | Resolution | 1 mV | 10 mV |
| | Accuracy | ±(0.05% + 0.025% FS) | ±(0.05% + 0.025% FS) |
| Constant Current Mode | Range | 0–3 A | 0–15 A |
| | Resolution | 0.1 mA | 1 mA |
| | Accuracy | ±(0.05% + 0.05% FS) | ±(0.05% + 0.05% FS) |
| Constant Resistance Mode [1] | Range | 0.3 Ω–10 Ω | 10 Ω–7.5 kΩ |
| | Resolution | 0.001 Ω | 0.1 Ω |
| | Accuracy [2] | 0.01% + 0.08 S | 0.01% + 0.0008 S |
| Constant Power Mode [3] | Range | 200 W | 200 W |
| | Resolution | 10 mW | 10 mW |
| | Accuracy | 0.1% + 0.1% FS | 0.1% + 0.1% FS |
| **Dynamic Mode** | | | |
| CC Mode | T1 & T2 | 20 µs–3600 s; Res: 1 µs | 20 µs–3600 s; Res: 1 µs |
| | Accuracy | 5 µs ± 100 ppm | 5 µs ± 100 ppm |
| | Ascending/ Descending Slope [4] | 0.0001–0.1 A/µs | 0.001–1 A/µs |
| | Minimum Rise Time [5] | ~10 µs | ~10 µs |
| **Measuring Range** | | | |
| Readback Voltage | Range | 0–50 V | 0–500 V |
| | Resolution | 1 mV | 10 mV |
| | Accuracy | ±(0.025% + 0.025% FS) | ±(0.025% + 0.025% FS) |
| Readback Current | Range | 0–3 A | 0–15 A |
| | Resolution | 0.01 mA | 0.1 mA |
| | Accuracy | ±(0.05% + 0.05% FS) | ±(0.05% + 0.05% FS) |
| Readback Power | Range | 200 W | 200 W |
| | Resolution | 10 mW | 10 mW |
| | Accuracy | ±(0.1% + 0.1% FS) | ±(0.1% + 0.1% FS) |
| **Protection Range** | | | |
| Overpower Protection | | ~210 W | ~210 W |
| Overcurrent Protection | | ~3.3 A | ~16.5 A |
| Overvoltage Protection | | ~530 V | ~530 V |
| Over Temperature Protection | | ~85°C | ~85°C |
| **Specification** | | | |
| Short Circuit | Current (CC) | ~3.3 / 3 A | ~16.5 / 15 A |
| | Voltage (CV) | ~0 V | ~0 V |
| | Resistance (CR) | ~300 mΩ | ~300 mΩ |
| Input Terminal Impedance | | ~1 MΩ | ~1 MΩ |
| Dimensions | | 214.81mm × 104.24mm × 397.03mm | |

### Model 2380-120-60/2380J-120-60

| | | Low Range | High Range |
|---|---|---|---|
| Rated Value (0°–40°C) | Input Voltage | 0–120 V | 0–120 V |
| | Input Current | 0–6 A | 0–60 A |
| | Input Power | 250 W | 250 W |
| | Min. Operating Voltage | 0.18 V at 6 A | 1.8 V at 60 A |
| Constant Voltage Mode | Range | 0–18 V | 0–120 V |
| | Resolution | 1 mV | 10 mV |
| | Accuracy | ±(0.05% + 0.025% FS) | ±(0.05% + 0.025% FS) |
| Constant Current Mode | Range | 0–6 A | 0–60 A |
| | Resolution | 0.1 mA | 1 mA |
| | Accuracy | ±(0.05% + 0.1% FS) | ±(0.05% + 0.1% FS) |
| Constant Resistance Mode [1] | Range | 0.05 Ω–10 Ω | 10 Ω–7.5 kΩ |
| | Resolution | 0.001 Ω | 0.1 Ω |
| | Accuracy [2] | 0.01% + 0.08 S | 0.01% + 0.0008 S |
| Constant Power Mode [3] | Range | 250 W | 250 W |
| | Resolution | 10 mW | 10 mW |
| | Accuracy | 0.2% + 0.2% FS | 0.2% + 0.2% FS |
| **Dynamic Mode** | | | |
| CC Mode | T1 & T2 | 20 µs–3600 s; Res: 1 µs | 20 µs–3600 s; Res: 1 µs |
| | Accuracy | 5 µs ± 100 ppm | 5 µs ± 100 ppm |
| | Ascending/ Descending Slope [4] | 0.0001–0.25 A/µs | 0.001–2.5 A/µs |
| | Minimum Rise Time [5] | ~20 µs | ~20 µs |
| **Measuring Range** | | | |
| Readback Voltage | Range | 0–18 V | 0–120 V |
| | Resolution | 0.1 mV | 1 mV |
| | Accuracy | ±(0.025% + 0.025% FS) | ±(0.025% + 0.025% FS) |
| Readback Current | Range | 0–6 A | 0–60 A |
| | Resolution | 0.1 mA | 1 mA |
| | Accuracy | ±(0.05% + 0.1% FS) | ±(0.05% + 0.1% FS) |
| Readback Power | Range | 250 W | 250 W |
| | Resolution | 10m W | 10m W |
| | Accuracy | ±(0.2% + 0.2% FS) | ±(0.2% + 0.2% FS) |
| **Protection Range** | | | |
| Overpower Protection | | ~260 W | ~260 W |
| Overcurrent Protection | | ~6.6 A | ~66 A |
| Overvoltage Protection | | ~130 V | ~130 V |
| Over Temperature Protection | | ~85°C | ~85°C |
| **Specification** | | | |
| Short Circuit | Current (CC) | ~6.6 / 6 A | ~66 / 60 A |
| | Voltage (CV) | 0 V | 0 V |
| | Resistance (CR) | ~30 mΩ | ~30 mΩ |
| Input Terminal Impedance | | ~300 kΩ | ~300 kΩ |
| Dimensions | | 214.81mm ×104.24mm × 397.03mm | |

**NOTES***

1. The voltage/current input is no less than 10% FS (FS indicates the full scale). Accuracy is defined as: % of reading + % of full scale.
2. The range of read-back resistance is between (1/(1/R + (1/R)*0.01% + 0.08)Ω and 1/(1/R–(1/R)*0.01%–0.08))Ω.
3. The voltage/current input is no less than 10% FS.
4. Ascending/descending slope: 10%–90% current ascending slope from 0 to maximum current.
5. Minimum rise time: 10%–90% current rise time.

*Specifications are subject to change without notice.

# 2380 Programmable DC Electronic Loads

## Model 2380-500-30/2380J-500-30

| | | Low Range | High Range |
|---|---|---|---|
| Rated Value (0°–40°C) | Input Voltage | 0–500 V | 0–500 V |
| | Input Current | 0–3 A | 0–30 A |
| | Input Power | 750 W | 750 W |
| | Min. Operating Voltage | 0.36 V / 3 A | 3.6 V / 30 A |
| Constant Voltage Mode | Range | 0–50 V | 0–500 V |
| | Resolution | 1 mV | 10 mV |
| | Accuracy | ±(0.025% + 0.05% FS) | ±(0.025% + 0.05% FS) |
| Constant Current Mode | Range | 0–3 A | 0–30 A |
| | Resolution | 0.1 mA | 1 mA |
| | Accuracy | ±(0.05% + 0.05% FS) | ±(0.05% + 0.05% FS) |
| Constant Resistance Mode [1] | Range | 0.15 Ω–10 Ω | 10 Ω–7.5 kΩ |
| | Resolution | 0.001 Ω | 0.1Ω |
| | Accuracy [2] | 0.01% + 0.08 S | 0.01% + 0.0008 S |
| Constant Power Mode [3] | Range | 750 W | 750 W |
| | Resolution | 10 mW | 10 mW |
| | Accuracy | 0.2% + 0.2% FS | 0.2% + 0.2% FS |
| **Dynamic Mode** | | | |
| CC Mode | T1 & T2 | 20 µs–3600 s; Res: 1 µs | 20 µs–3600 s; Res: 1 µs |
| | Accuracy | 5 µs ± 100 ppm | 5 µs ± 100 ppm |
| | Ascending/ Descending Slope [4] | 0.0001–0.1 A/µs | 0.001–1 A/µs |
| | Minimum Rise Time [5] | ~20 µs | ~20 µs |
| **Measuring Range** | | | |
| Readback Voltage | Range | 0–50 V | 0–500 V |
| | Resolution | 1 mV | 10 mV |
| | Accuracy | ±(0.025% + 0.025% FS) | ±(0.025% + 0.025% FS) |
| Readback Current | Range | 0–3 A | 0–30 A |
| | Resolution | 0.1 mA | 1 mA |
| | Accuracy | ±(0.05% + 0.05% FS) | ±(0.05% + 0.05% FS) |
| Readback Power | Range | 750 W | 750 W |
| | Resolution | 10 mW | 10 mW |
| | Accuracy | ±(0.2% + 0.2% FS) | ±(0.2% + 0.2% FS) |
| **Protection Range** | | | |
| Overpower Protection | | ~760 W | ~760 W |
| Overcurrent Protection | | ~3.3 A | ~33 A |
| Overvoltage Protection | | ~530 V | ~530 V |
| Over Temperature Protection | | ~85°C | ~85°C |
| **Specification** | | | |
| Short Circuit | Current (CC) | ~3.3 / 3 A | ~3.3 / 30 A |
| | Voltage (CV) | 0 V | 0 V |
| | Resistance (CR) | ~120 mΩ | ~120 mΩ |
| Input Terminal Impedance | | 1 MΩ | 1 MΩ |
| Dimensions | | 482mm × 131.4mm × 580mm | |

## General

**Memory Capacity:** 100 sets of measurements and selectable parameters.

**Signal Connections:**

**Front Panel:** Input: Stud and threaded knob terminals for lug connectors (200W and 250W versions).

**Rear Panel:**

**Input:** Terrminal Bars (750W version).

**Current Monitor Output:** BNC.

**Remote Sense, Analog Input, External Trigger, Voltage Fault:** 9-pin terminal block.

**Communications:**

**USB:** USB2.0 device, type B, USB-TMC compliant.

**RS-232:** DB-9 connector.

**GPIB:** IEEE-488.2 compliant.

**Cooling Method:** Fan.

**Fan Speed vs. Internal temperature:**

| Temperature | 40°C | 50°C | 70°C | 85°C |
|---|---|---|---|---|
| Fan status | First gear | Second gear | Third gear | Temperature protection (OH) and load is shut off. |

**Power Source:**

**AC Input:** Switchable between 120VAC nominal and 240VAC nominal.

**"J" versions:** 100VAC, nominal.

**Frequency:** 50/60Hz.

**Power Consumption:**

**2380-500-15:** 40VA.

**2380-120-60:** 40VA.

**2380-500-30:** 150VA.

**EMC:** Conforms to European Union EMC Directive.

**Safety:**

**Canadian Certification:** CSA listed to UL Std. No. 61010-1(3rd Edition) and Can/CSA-C22.2 No. 61010-1-12.

**European Union Compliance:** Conforms to European Union Low Voltage Directive.

**Environment:**

**Altitude:** Operating: 2000m, (6562 ft) above sea level.

**Temperature and Relative Humidity:**

**Operating:** 0° to 40°C full accuracy with 80% relative humidity at up to 35°C, non-condensing.

**Storage:** –20° to 70°C, 10% to 85% relative humidity up to 40°C, 5% to 60% relative humidity above 40°C.

**Net Weight:**

**200W/250W Model:** 4.65kg.

**750W Model:** 24.95kg.

**Shipping Weight:**

**200W/250W Model:** 7kg.

**750W Model:** 31.75kg.

**Recommended calibration frequency:** 1 time/year.

**Warranty:** 3 years.

**NOTES***

1. The voltage/current input is no less than 10% FS (FS indicates the full scale). Accuracy is defined as: % of reading + % of full scale.
2. The range of read-back resistance is between (1/(1/R + (1/R)*0.01% + 0.08)Ω and 1/(1/R–(1/R)*0.01%–0.08))Ω.
3. The voltage/current input is no less than 10% FS.
4. Ascending/descending slope: 10%–90% current ascending slope from 0 to maximum current.
5. Minimum rise time: 10%–90% current rise time.

*Specifications are subject to change without notice.

广州总部：广州市番禺区陈边村金欧大道83号江潮创意园A栋208室
深圳分公司：深圳市龙华区龙华街道 油松社区东环一路1号耀丰通工业园1-2栋2栋607
南宁分公司：广西自由贸易试验区南宁片区五象大道401号五象航洋城1号楼3519号
广州分公司：广州市南沙区凤凰大道89号中国铁建·凤凰广场B栋1201房
电话：020-2204 2442
传真：020-8067 2851
邮箱：Sales@greentest.com.cn
官网：www.greentest.com.cn

GREENTEST® TECHNOLOGIES

微信视频号 绿测科技订阅号 绿测工场服务号