

Keithley Instruments, Inc.  
 28775 Aurora Road  
 Cleveland, Ohio 44139  
 1-888-KEITHLEY  
 www.keithley.com

### 1. SPECIFICATION CONDITIONS

This document contains specifications for the Models 2200-20-5, 2200-30-5, 2200-32-3, 2200-60-2, and 2200-72-1 Programmable DC Power Supplies. Specifications are the standards against which the Models 2200-20-5, 2200-30-5, 2200-32-3, 2200-60-2, and 2200-72-1 are tested. Upon leaving the factory, the Models 2200-20-5, 2200-30-5, 2200-32-3, 2200-60-2, and 2200-72-1 meet these specifications. Typical values are nonwarranted and are provided solely as useful information.

### 2. MODEL-SPECIFIC SPECIFICATIONS

	2200-20-5	2200-30-5	2200-32-3	2200-60-2	2200-72-1
<b>DC output rating</b>					
Voltage	0 to 20 V	0 to 30 V	0 to 32 V	0 to 60 V	0 to 72 V
Current	0 to 5 A	0 to 5 A	0 to 3 A	0 to 2.5 A	0 to 1.2 A
<b>Maximum power</b>	100 W	150 W	96 W	150 W	86 W
<b>Load regulation</b>					
Voltage	< 0.01% + 2 mV	< 0.01% + 2 mV	< 0.01% + 2 mV	< 0.01% + 2 mV	< 0.01% + 2 mV
Current	< 0.05% + 0.1 mA	< 0.05% + 0.15 mA	< 0.05% + 0.1 mA	< 0.05% + 0.5 mA	< 0.05% + 0.5 mA
<b>Line regulation</b>					
Voltage	< 0.01% + 1 mV	< 0.0% + 1 mV	< 0.01% + 1 mV	< 0.01% + 2 mV	< 0.01% + 1 mV
Current	< 0.05% + 0.1 mA	< 0.05 % + 0.1 mA	< 0.05 % + 0.1 mA	< 0.05 % + 0.05 mA	< 0.05% + 0.1 mA
<b>Ripple and noise (20 Hz to 7 MHz)</b>					
Voltage	< 1 mV <sub>RMS</sub> < 3 mV <sub>Peak-Peak</sub>	< 1 mV <sub>RMS</sub> < 4 mV <sub>Peak-Peak</sub>	< 1 mV <sub>RMS</sub> < 4 mV <sub>Peak-Peak</sub>	< 1 mV <sub>RMS</sub> < 5 mV <sub>Peak-Peak</sub>	< 1 mV <sub>RMS</sub> < 3 mV <sub>Peak-Peak</sub>
Current	< 3 mA <sub>RMS</sub>	< 4 mA <sub>RMS</sub>	< 3 mA <sub>RMS</sub>	< 3 mA <sub>RMS</sub>	< 3 mA <sub>RMS</sub>
<b>Setting resolution</b>					
Voltage	1 mV	1 mV	1 mV	1 mV	1 mV
Current	0.1 mA	0.1 mA	0.1 mA	0.1 mA	0.1 mA
<b>Setting accuracy (using remote sense, 25°C ± 5°C)</b>					
Voltage	± 0.03% + 3 mV	± 0.03% + 3 mV	± 0.03% + 3 mV	± 0.03 % + 6 mV	± 0.03 % + 6 mV
Current	± 0.05% + 2 mA	± 0.05% + 2.5 mA	± 0.05% + 2 mA	± 0.05 % + 1.5 mA	± 0.05 % + 1 mA
<b>Readback resolution</b>					
Voltage	1 mV	1 mV	1 mV	1 mV	1 mV
Current	0.1 mA	0.1 mA	0.1 mA	0.1 mA	0.1 mA
<b>Readback accuracy (25 °C ± 5 °C)</b>					
Voltage	0.02% + 3 mV	0.02% + 2.5 mV	0.02% + 3 mV	0.02% + 6 mV	0.02% + 5 mV
Current	0.05% + 2 mA	0.05% + 2.5 mA	0.05% + 2 mA	0.05% + 1.5 mA	0.05% + 1 mA



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	2200-20-5	2200-30-5	2200-32-3	2200-60-2	2200-72-1
<b>Voltage transient response – settling time</b>					
Load change	<400 $\mu$ s to within 75 mV following a change from 0.1 A to 1 A				
Setting change	Rising	<35 ms from beginning of excursion to within 75 mV of terminal value following a change from 1 V to 11 V with a 1 A load <b>Note:</b> Specification does not include command decode time.			
	Falling	<35 ms from beginning of excursion to within 75 mV of terminal value following a change from 11 V to 1 V with a 1 A load <b>Note:</b> Specification does not include command decode time.			
<b>Overvoltage protection</b>					
Range (typical)	1 V to 19 V	1 V to 29 V	1 V to 31 V	1 V to 59 V	1 V to 71 V
Accuracy	$\pm 0.5\% + 0.5$ V	$\pm 0.5\% + 0.5$ V	$\pm 0.5\% + 0.5$ V	$\pm 0.5\% + 0.5$ V	$\pm 0.5\% + 0.5$ V
Response time (typical)	<10 ms	<10 ms	<10 ms	<10 ms	<10 ms

### 3. GENERAL SPECIFICATIONS

<b>Communications</b>	<ul style="list-style-type: none"> <li>▪ <b>USB:</b> Type B connector, USB-TMC compatible</li> <li>▪ <b> GPIB:</b> IEEE-488.2 compliant</li> </ul>
<b>Display</b>	Vacuum fluorescent display
<b>Memory</b>	40 setup memories
<b>List mode</b>	Up to seven lists can be defined, each with up to 80 steps. Each step includes a voltage limit and a current limit. For continuous sequences, each step also includes a duration.
<b>Output, sense, status, and control:</b>	Removable screw terminal block carries the following signals: <ul style="list-style-type: none"> <li>• Output channel: Duplicates the front panel outputs</li> <li>• Remote sense lines: Connection for remote sense</li> <li>• Control input: Multifunction TTL input, which can function as a trigger input, output control line, or digital input</li> <li>• Status Output: Multifunction TTL output, which can function as a fault indication or digital output</li> </ul>
<b>Floating voltage rating</b>	Up to 100 V (DC + peak AC) between protective earth (safety ground) and any output terminal
<b>Power source:</b>	<ul style="list-style-type: none"> <li>• <b>110 V AC setting:</b> 99 V RMS to 132 V RMS</li> <li>• <b>220 V AC setting:</b> 198 V RMS to 264 V RMS</li> <li>• <b>Frequency:</b> 50/60 Hz</li> <li>• <b>Power consumption:</b> 2200-20-5, 2200-32-3, 2200-72-1: 250 V AC; 2200-30-5, 2200-60-2: 350 V AC</li> </ul>



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<b>EMC</b>	<ul style="list-style-type: none"><li>• <b>European Union:</b> EMC directive</li><li>• <b>USA:</b> FCC, CFR Title 47, Part 15, Subpart B, Class A</li><li>• <b>Australia:</b> EMC Framework, demonstrated per Emission Standard AS/NZS 2064 (industrial, scientific, and medical equipment)</li></ul>
<b>Safety</b>	<ul style="list-style-type: none"><li>• <b>European Union:</b> Low voltage directive</li><li>• <b>USA:</b> Nationally recognized testing laboratory listing UL61010-1-2004</li><li>• <b>Canada:</b> CAN/CSA C22.2 No. 61010-1 2004</li></ul>
<b>Dimensions</b>	<ul style="list-style-type: none"><li>• <b>With boot:</b> 4.15 in. x 9.52 in. x 15.12 in. (106 mm high x 242 mm wide x 384 mm deep)</li><li>• <b>Without boot:</b> 3.57 in. x 8.55 in. x 14.24 in. (91 mm high x 218 mm wide x 362 mm deep)</li></ul>
<b>Shipping weight</b>	<ul style="list-style-type: none"><li>• <b>2200-20-5, 2200-32-3, 2200-72-1:</b> 19.84 lbs (9.0 kg)</li><li>• <b>2200-30-5, 2200-60-2:</b> 21.16 lbs (9.6 kg)</li></ul>
<b>Net weight</b>	<ul style="list-style-type: none"><li>• <b>2200-20-5, 2200-30-5, 2200-32-3, 2200-72-1:</b> 16.09 lbs (7.3 kg)</li><li>• <b>2200-60-2:</b> 15.43 lbs (7.0 kg)</li></ul>
<b>Environment</b>	<ul style="list-style-type: none"><li>• <b>Altitude:</b><ul style="list-style-type: none"><li>▪ <b>Operating:</b> Up to 2,000 meters above sea level</li><li>▪ <b>Storage:</b> Up to 4,000 meters above sea level</li></ul></li><li>• <b>Operating:</b> 0 °C to +40 °C, 5% to 95% relative humidity up to +40 °C</li><li>• <b>Storage:</b><ul style="list-style-type: none"><li>▪ -20 °C to +70 °C, 5% to 95% relative humidity up to +40 °C</li><li>▪ -20 °C to +70 °C, 5% to 60% relative humidity above +40 °C up to +70 °C</li></ul></li></ul>

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