

G5.SRC.54.1500.108

Programmable DC Power Supply



Key Values

| | | |
|---|---|-------------------------|
| Power | | 54 kW |
| Voltage DC | limited by P_{max} | 1500 V |
| Current | limited by P_{max} | 0...108 A |
| Autoranging factor | $U_{max} \times I_{max} / P_{max}$ | 3 |
| <i>Figure 1</i> | | |
| Master-slave / multi-device configuration | | series, parallel, mixed |
| Max. number of devices in system | | 44 |
| Max. number in parallel | | 44 |
| Max. number in series | with midpoint earthing limited by output isolation to PE | 2 |
| Case | | 19" / 10U |

AC Lineside Rating

| | | |
|------------------------------------|------------------------|--------------------------------|
| Mains connection type | delta | 3L + PE (no neutral necessary) |
| Rated voltage | | 3x 380...480 VAC $\pm 10\%$ |
| Rated current | @nominal 3 x 380 VAC | 87 A _{rms} |
| | @nominal 3 x 400 VAC | 83 A _{rms} |
| | @nominal 3 x 415 VAC | 80 A _{rms} |
| | @nominal 3 x 440 VAC | 75 A _{rms} |
| | @nominal 3 x 460 VAC | 72 A _{rms} |
| | @nominal 3 x 480 VAC | 69 A _{rms} |
| Rated frequency | | 50/60 Hz |
| Power factor | @ P_{max} | 0.99 |
| THDi | @90% P_{max} | $\leq 3\%$ |
| Inrush current | | <99 A _{rms} |
| Efficiency | P_{max} @ U_{max} | 96% |
| | P_{max} @ I_{max} | 95% |
| Standby power | | 71 W |
| Isolation | AC terminals to PE | 900 VDC |
| | AC to DC terminals | 1500 VDC |
| Input insulation test voltage | line to case/logic | 3100 VDC (2s) |
| Protective earth conductor current | According to IEC 60990 | ≤ 10 mA @150Hz |
| Touch current unweighted | output ON/OFF | ≤ 1 mA / 4.6 mA |
| Touch current weighted | output ON/OFF | ≤ 0.9 mA / 4.4 mA |
| Input filter discharge | | |
| <i>to <60 V</i> | L-PE / L-L | <20 s |
| | with option XCD | <1 s |

DC Operation

| | | |
|--------------------------------|--------------|----------------------|
| Operation modes | | source |
| Voltage regulation | CV | 0...100% U_{max} |
| Current regulation | CC | 0...100% I_{max} |
| Power regulation | CP | 5...100% P_{max} |
| Internal resistance simulation | programmable | 0...27778 m Ω |

DC Operation (continued)

| | | |
|--|---|--|
| Static accuracy | | |
| <i>At 25° ambient temperature, constant line / load conditions, after 1h warm up time in voltage on state, normal distribution (k=2)</i> | | |
| | power @ I_{max} 1 kHz Filter | 0.03% FS |
| | voltage | 0.016% FS |
| | voltage sense | 0.016% FS |
| | current full range 1 kHz Filter | 0.025% FS |
| | current low range (-10%...10% FS) 1 kHz Filter | 0.003% FS |
| | resistance @ I_{max} 1 kHz Filter | 0.03% FS |
| HMI touchpanel meter resolution | | |
| | programming/reading | 0.1 V 0.01 A |
| Output capacitance | | |
| | X-capacitor LowCap | 8 μ F |
| | X-capacitor HighCap | 148 μ F |
| | Y-capacitor @DC | 219 nF |
| Ripple, voltage | | |
| | output voltage ripple (<1 MHz): V_{rms} LowCap, ohmic load 90% P_{max} , 90% U_{max} , CV mode | $\leq 0.03\%$ FS |
| | output voltage ripple (<1 MHz): V_{rms} HighCap, ohmic load 90% P_{max} , 90% U_{max} , CV mode | $\leq 0.02\%$ FS |
| Ripple, current | | |
| | output Current ripple (<1 MHz): A_{rms} LowCap, ohmic load 90% P_{max} , 90% I_{max} , CC mode | $\leq 0.05\%$ FS |
| Noise | | |
| | noise (20 kHz...20 MHz): V_{pp} LowCap, ohmic load 90% P_{max} , 90% U_{max} , CV mode | $\leq 0.15\%$ FS |
| | noise (20 kHz...20 MHz): V_{pp} HighCap, ohmic load 90% P_{max} , 90% U_{max} , CV mode | $\leq 0.1\%$ FS |
| Stability/drift | | |
| <i>8h, after 1h warm up time in voltage on state, at constant line input, load and temp. conditions</i> | | |
| | voltage | $\leq 0.01\%$ FS |
| | voltage sense | $\leq 0.01\%$ FS |
| | current | $\leq 0.01\%$ FS |
| Temperature coefficient | | |
| <i>At constant line and load conditions</i> | | |
| | voltage | $\leq 0.005\%$ FS/ $^{\circ}$ C |
| | voltage sense | $\leq 0.007\%$ FS/ $^{\circ}$ C |
| | current | $\leq 0.005\%$ FS/ $^{\circ}$ C |
| Rise/fall time (10...90% of step) | | |
| <i>Voltage set-value step, const. R load, LowCap</i> | | |
| | voltage step (0...90% U_{max} / 90% P_{max}) | $\leq 170 \mu$ s |
| Rise/fall time (10...90% of step) | | |
| <i>Current set-value step, const. voltage, LowCap</i> | | |
| | current step (10...90% I_{max} , @33% U_{max}) 10...90% of step / settling time | 20 μ s / 70 μ s |
| Transient response time | | |
| <i>Load step, ohmic load, HighCap</i> | | |
| | CV, recovery within 0.5% set voltage 0...90% P_{max} @90% U_{max} | $\leq 120 \mu$ s |
| Transient response time | | |
| <i>Load step, ohmic load, LowCap</i> | | |
| | CC, recovery within 2% of set current 45...90% P_{max} @90% I_{max} | $\leq 290 \mu$ s |
| Voltage drop | | |
| <i>while load switching on HighCap mode</i> | | |
| | 45...90% P_{max} @90% U_{max} | $\leq 0.7\%$ FS |
| Voltage overshoot | | |
| <i>while load switching off HighCap mode</i> | | |
| | 90...45% P_{max} @90% U_{max} | $\leq 0.7\%$ FS |
| Pulsating load | | |
| <i>max. load ripple current sine max. amplitude</i> | | |
| | HighCap | 30% I_{max} @3 kHz 26% I_{max} @ ≥ 5 kHz |
| | LowCap | 46% I_{max} @3 kHz 17% I_{max} @ ≥ 5 kHz |

DC Operation (continued)

| | | |
|---|---|---|
| Max. ripple <i>DC+ to PE / DC- to PE</i> | max. allowed ripple V_{rms} ≤ 1 kHz: $1050 V_{rms}$ > 1 kHz: $((1.26 \times 10^6)/f+5) V_{rms}$ | ≤ 1 kHz: $1050 V_{rms}$ 2 kHz: $630 V_{rms}$ 5 kHz: $250 V_{rms}$ 10 kHz: $130 V_{rms}$ 20 kHz: $65 V_{rms}$ 50 kHz: $30 V_{rms}$ 80 kHz: $20 V_{rms}$ |
| Protection | OVP (over voltage protection) OCP (over current protection) OPP (over power protection) OTP (over temperature protection) | programmable programmable programmable ✓ |
| Output discharge <i>to <60V</i> | active discharge enabled active discharge disabled | <1 s <90 s |
| Small signal modulation <i>Voltage Controller LowCap mode</i> | frequency CV, CC max. output voltage rms sine @10 kHz attenuation @5 kHz / 10 kHz op. point: 90% U_{nom} + 5% U_{nom} ampl. phase lag analog input to voltage out | 0...10 kHz 0...5% FS -0.4 dB / -6 dB 130 μ s |
| Small signal modulation <i>Current controller LowCap mode</i> | max. output amplitude current @10 kHz attenuation @5 kHz / 10 kHz op. point: 90% I_{nom} + 5% I_{nom} ampl. phase lag analog input to current out | 0...5% FS -1.8 dB / -3.8 dB 110 μ s |
| Sense voltage compensation | | Programmable Uout + Udrop limited by $U_{out,max}$ |
| Sense input impedance | @operation @output off no RPP or RPP closed @output off and activated "disconnect output measurement at voltage-off" feature | 1812 k Ω 1812 k Ω >10 M Ω |
| Ballast resistor DC power port | @output off no RPP or RPP closed @output off RPP, disconnect output measurement at voltage-off deactivated @output off RPP, disconnect output measurement at voltage-off activated | 112 k Ω 1812 k Ω >10 M Ω |
| Resistance | DC+/DC- output to PE X713 jumper inserted DC+/DC- output to PE X713 jumper removed | 22 M Ω open |
| Output isolation | DC+/DC- output to PE | 1500 VDC |
| Output insulation test voltage | output to case/logic | 3400 VDC (2s) |

Various

| | | |
|---|--------------------------------|---|
| Case dimensions <i>Figure 3</i> | H x W x D without terminals | 445 x 483 x 672 [mm] 17 1/2" x 19" x 26 1/2" |
| Weight | | 121 kg |
| AC terminals | | screw terminals for 6...35 mm ² wires d \leq 8.5 mm |
| DC terminals | | output bars for M8 bolts |
| Communication interface | speed depending on bus load | Ethernet (max. 800 x 16 bit/s), USB (max. 450 x 16 bit/s) |
| Enclosure | rating | IP20 |
| Option cards | # of free slots | 2 |

Analog Inputs

| | | |
|------------------------------|------------|---|
| Number of inputs | | 4 |
| Resolution | | 16 Bit |
| Sampling rate | | 48 kS/s |
| Input voltage range | selectable | -10...10 V; -5...5 V; 0...5 V; 0...10 V |
| Accuracy | | bipolar range: $\pm 0.1\%$, unipolar range: $\pm 0.2\%$ |
| Input impedance | | 1 M Ω |
| Absolut max. input voltage | | ± 30 VDC |
| Input filter | | 2nd order low pass filter, cutoff frequency: 15 kHz |
| Delay analog in to power out | | 89 μ s |
| Temperature coefficient | | 0.02% FS/ $^{\circ}$ C |

Analog Outputs

| | | |
|-------------------------------|---------------------|---|
| Number of outputs | | 4 |
| Resolution | | 16 Bit |
| Update rate | | 48 kS/s |
| Settling time | | 10 μ s |
| Output voltage range | selectable | -10...10 V; -5...5 V; 0...5 V; 0...10 V |
| Accuracy | | $\pm 0.2\%$ |
| Output impedance | | 0.5 Ω |
| Max. output current | short-circuit proof | 20 mA |
| Delay power out to analog out | | 42 μ s |
| Temperature coefficient | | 0.02% FS/ $^{\circ}$ C |

Digital I/O

| | | |
|--|---|---|
| Number of digital inputs/outputs | programmable (each can be used as input or output) | 6 |
| Output voltage supplied for digital I/O | | 24 VDC (-15%/+20%) |
| Digital input characteristic | | IEC 61131-2 Type 1 |
| Digital input filter | | 3.2 ms (10 μ s, 1 ms, and 10 ms factory configurable) |
| Max. voltage digital inputs | | 30 VDC |
| Sampling rate digital inputs | | 1 kS/s |
| Digital output type | | high-side switch |
| Load type | | ohmic, inductive, lamp load |
| Max. total output current (all channels) | | 0.65 A |
| Max output current per channel | short-circuit proof | 0.625 A |
| Digital output switching time | | T _{ON} : 64...120 μ s, T _{OFF} : 90...170 μ s |
| Update rate digital outputs | | 1 kS/s |

Relay Outputs

| | | |
|-------------------------|--|-----------------------------|
| Number of relay outputs | | 2 x SPST (NO), 1 x SPDT |
| Load type | | ohmic, inductive, lamp load |
| Max. switching voltage | | 30 VDC |
| Max. switching current | | SPST: 3 A, SPDT: 1 A |
| Switching time | | typ. 20 ms |

Ambient

| | | |
|--|---|--|
| Operating altitude | above sea level above 1000 m, slight temp. derating possible | ≤ 2000 m |
| Operating temperature | with continuous input current $> 68 A_{rms}$ with airfilter | -5...50 $^{\circ}$ C -5...40 $^{\circ}$ C -5...40 $^{\circ}$ C |
| Storage temperature | | -25...70 $^{\circ}$ C |
| Installation | IEC 60721-3-3 | indoor, air-conditioned in 19" switch cabinet |
| Orientation | storage, installation, operation | upright |
| Relative humidity | non-condensing | 0...95% |
| Vibration | IEC 60068-2-6 | Test Fc |
| Cooling | | direct forced air, front to back |
| Acoustic noise level 1 m dist. front (typ.) | 90% P _{max} , 90% I _{max} @25 $^{\circ}$ C ambient | ≤ 54 dB |

Ambient (continued)

| | | |
|--|---|--------|
| Acoustic noise level <i>1 m dist. front (typ.)</i> | 90% P _{max} , 90% I _{max} @40 °C ambient | ≤71 dB |
|--|---|--------|

Standards

| | | |
|----------------------------------|---|------------|
| Protection Class | EN 62477-1 | 1 |
| Degree of pollution | EN 60664-1 | 2 |
| Overvoltage category | mains input, EN 60664-1 | 3 |
| | other interfaces | 2 |
| Area of application | | industrial |
| Approval | | CE Marking |
| EN 62477-1:2012 | Low Voltage Directive 2014/35/EU | ✓ |
| EN ISO 13849-1:2015 | w/o ISR | - |
| | with ISR 2-channel | PL c |
| | with ISR 2-channel and external safety relay | PL e |
| EN 61000-6-4:2007 A1:2011 | Directive 2014/30/EU EMC emission (industrial) | ✓ |
| EN 61000-6-2:2005 | Directive 2014/30/EU EMC immunity (industrial) | ✓ |
| EN 61326-1:2013 | Directive 2014/30/EU EMC industrial level A | ✓ |
| EN IEC 63000:2018 | RoHS Directive | ✓ |

Operating area

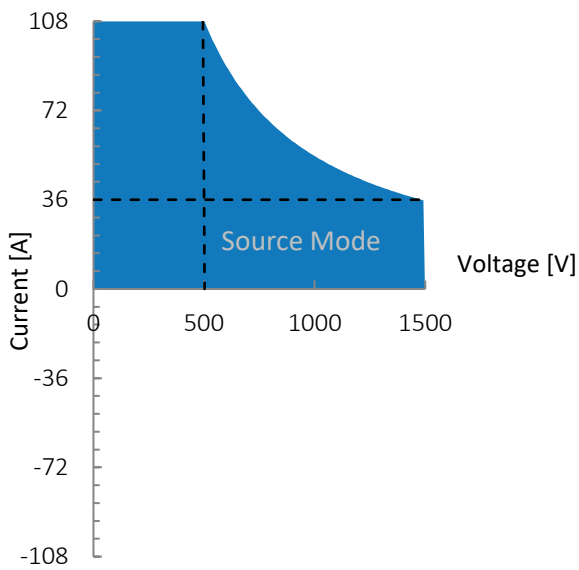


Figure 1: G5.SRC.54.1500.108, voltage/current operating area.

Dimensions

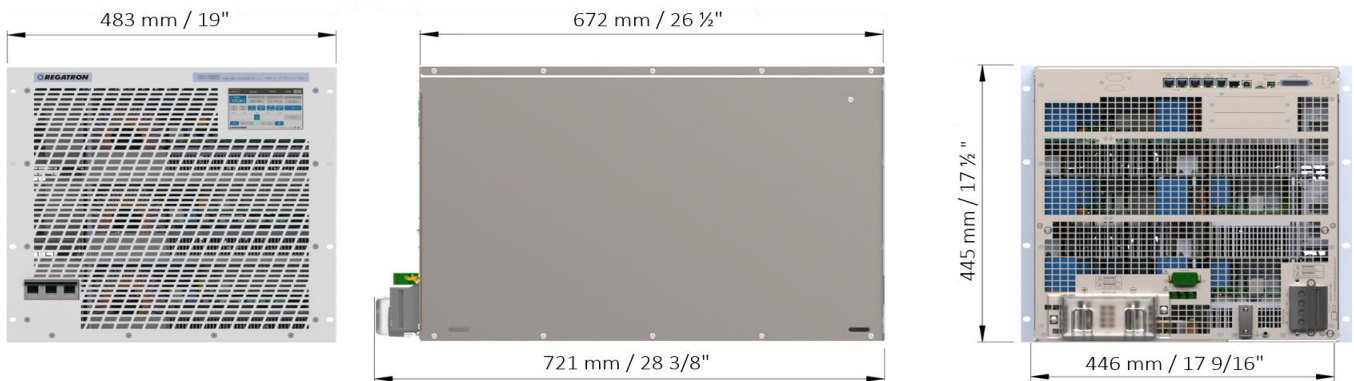


Figure 3: Front, right hand side and rear view. 19-inch module with 10 units in height.

For further information to included features see related product description <PD_G5.SRC....> on www.regatron.com

This product is developed, produced and tested according to ISO 9001 by REGATRON.

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All product specifications and information contained herein are subject to change without notice.

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