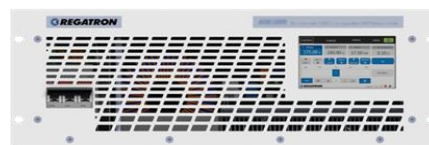


G5.SRC.9.500.54

Programmable DC Power Supply



Key Values

Power		9 kW
Voltage DC	limited by P_{max}	500 V
Current	limited by P_{max}	0...54 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	6
Case		19" / 4U

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	15 A _{rms}
	@nominal 3 x 400 VAC	14 A _{rms}
	@nominal 3 x 415 VAC	14 A _{rms}
	@nominal 3 x 440 VAC	13 A _{rms}
	@nominal 3 x 460 VAC	12 A _{rms}
	@nominal 3 x 480 VAC	12 A _{rms}
Rated frequency		50 / 60 Hz
Power factor	@ P_{max}	0.99
THDi	@90% P_{max}	$\leq 3\%$
Inrush current		33 A _{max rms}
Efficiency	P_{max} @ U_{max}	96%
	P_{max} @ I_{max}	95%
Standby power		27 W
Isolation	AC terminals to PE	900 VDC
	AC to DC terminals	1500 VDC
Input insulation test voltage	line to case/logic	1500 VDC
Protective earth conductor current	According to IEC 60990	< 7 mA @ 50 Hz
Touch current unweighted	output ON/OFF	≤ 1.7 mA / 2.6 mA
Touch current weighted	output ON/OFF	≤ 0.7 mA / 2.5 mA
Input filter discharge	L-PE / L-L	< 20 s
<i>to < 60 V</i>	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...18519 m Ω
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	0.01% FS
	voltage sense	0.01% FS
	current full range 1 kHz Filter	0.025% FS

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>	current low range (-10%...10% FS) 1 kHz Filter	0.003% FS
	resistance @ I _{max} 1 kHz Filter	0.025% FS
HMI touchpanel meter resolution	programming/reading	0.01 V 0.01 A
	X-capacitor LowCap	12 µF
Output capacitance	X-capacitor HighCap	222 µF
	Y-capacitor @DC	125 nF
Ripple, voltage	output voltage ripple (<1 MHz): V _{rms} LowCap, ohmic load 90% P _{max} , 90% U _{max} CV mode	≤0.06% FS
	output voltage ripple (<1 MHz): V _{rms} HighCap, ohmic load 90% P _{max} , 90% U _{max} CV mode	≤0.02% FS
	output Current ripple (<1 MHz): A _{rms} LowCap, ohmic load 90% P _{max} , 90% I _{max} CC mode	≤0.15% FS
	noise (20 kHz...20 MHz): V _{pp} LowCap, ohmic load 90% P _{max} , 90% U _{max} CV mode	≤0.4% FS
Noise	noise (20 kHz...20 MHz): V _{pp} HighCap, ohmic load 90% P _{max} , 90% U _{max} CV mode	≤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	≤0.01% FS
	voltage sense	≤0.01% FS
	current	≤0.01% FS
Temperature coefficient <i>At constant line and load conditions</i>	voltage	≤0.005% FS/°C
	voltage sense	≤0.007% FS/°C
	current	≤0.005% FS/°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})	≤180 µs
	current step (10...90% I _{max} , @33% U _{max}) 10...90% of step / settling time	20 µs / 70 µs
Transient response time <i>Load step, ohmic load, HighCap</i>	CV, recovery within 0.5% set voltage 0...90% P _{max} @90% U _{max}	≤160 µs
Transient response time <i>Load step, ohmic load, LowCap</i>	CC, recovery within 2% of set current 45...90% P _{max} @90% I _{max}	≤250 µs
Voltage drop <i>while load switching on HighCap mode</i>	45...90% P _{max} @90% U _{max}	≤0.6% FS
Voltage overshoot <i>while load switching off HighCap mode</i>	90...45% P _{max} @90% U _{max}	≤0.5% 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 <60 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 -0.2 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 -2 dB / -3.7 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	632 k Ω 632 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	70 k Ω 632 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	178 x 483 x 672 [mm] 7" x 19" x 26 1/2"
Weight		40 kg
AC terminals		screw terminals for 6...25 mm ² wires
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		-5...50 $^{\circ}$ C
	with airfilter	-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	90% P _{max} , 90% I _{max} 1 m dist. front (typ.)	@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
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Standards

Protection Class	EN 62477-1	1
Degree of pollution	EN 60664-1	2
Overvoltage category	mains input, EN 60664-1 other interfaces	3 2
Area of application		industrial
Approval		CE Marking
EN 62477-1:2012	Low Voltage Directive 2014/35/EU	✓
EN 61010-1:2010	Low Voltage Directive 2014/35/EU	✓
EN ISO 13849-1:2015	w/o ISR with ISR 2-channel with ISR 2-channel and external safety relay	- PL c 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

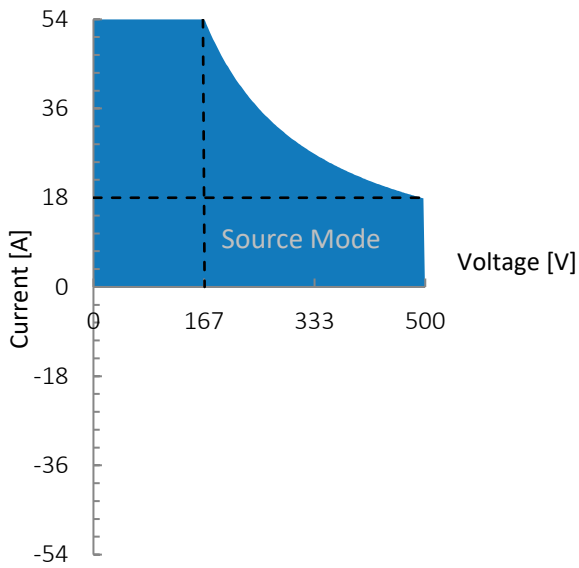


Figure 1: G5.SRC.9.500.54, voltage/current operating area.

Dimensions

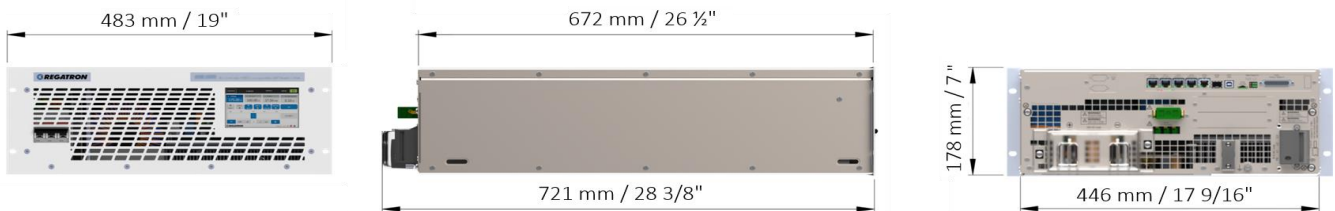


Figure 3: Front, right hand side and rear view. 19-inch module with 4 units in height.

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.

For detailed technical information, contact REGATRON or your local sales partner.

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Class: Project specific use only

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