G5.BAS Battery Simulator Series

The G5.BAS series is bidirectional regenerative. It was developed specifically for the simulation of energy storage devices and batteries and is suitable for use in laboratories and on test benches. The modular and finely graded G5.BAS series is characterized by highly dynamic response times and a wide current-voltage range with an auto-ranging factor 3. The power supplies are equipped with the powerful application software BatSim and reproduce the electrochemical and electrical properties of different battery types in charge and discharge mode realistically and in real time. This is done on the basis of battery models that can be configured easily and conveniently.

Device Types

Voltage V	Power kW	Current A	Height U	Order Code
*0...80	9	-338...338	4	G5.BAS.9.80.338
*0...80	18	-676...676	4	G5.BAS.18.80.676
*0...80	27	-1014...1014	7	G5.BAS.27.80.1014
*0...80	36	-1352...1352	7	G5.BAS.36.80.1352
*0...80	45	-1690...1690	10	G5.BAS.45.80.1690
*0...80	54	-2028...2028	10	G5.BAS.54.80.2028
0...160	18	-338...338	4	G5.BAS.18.160.338
0...160	36	-676...676	7	G5.BAS.36.160.676
0...160	54	-1014...1014	10	G5.BAS.54.160.1014
0...240	27	-338...338	7	G5.BAS.27.240.338
0...240	54	-676...676	10	G5.BAS.54.240.676
0...320	36	-338...338	7	G5.BAS.36.320.338
0...500	9	-54...54	4	G5.BAS.9.500.54
0...500	18	-108...108	4	G5.BAS.18.500.108
0...500	27	-162...162	7	G5.BAS.27.500.162
0...500	36	-216...216	7	G5.BAS.36.500.216
0...500	45	-270...270	10	G5.BAS.45.500.270
0...500	54	-324...324	10	G5.BAS.54.500.324
0...1000	18	-54...54	4	G5.BAS.18.1000.54
0...1000	36	-108...108	7	G5.BAS.36.1000.108
0...1000	54	-162...162	10	G5.BAS.54.1000.162
0...1500	27	-54...54	7	G5.BAS.27.1500.54
0...1500	54	-108...108	10	G5.BAS.54.1500.108

*also as 60 V SELV version for single or parallel operation available, order code example: G5.BAS.9.**60**.338

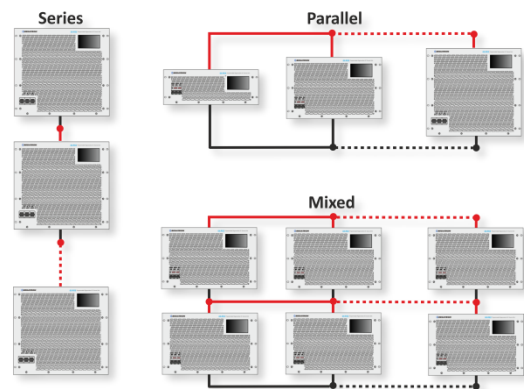## Modular and Easy Scalable Systems

Figure 1: Modular concept for easy power and voltage increase by parallel, series, and mixed operation. The parallel configuration allows even an operation of different power levels, e.g., 18, 36, and 54 kW modules, in one system.

The output of an individual power supply is in the range from 0...9 kW to 0...2000+ kW, up to 3000 VDC. The advantageous modularity of REGATRON power supply solutions allows the system to be easily adapted to ever changing test requirements. It is possible to reconfigure between parallel, series, and mixed operation.

Moreover the system can be expanded with additional power supply units or to be split into smaller units.

Whether for single devices or powerful multi-device multi-unit systems, REGATRON also offers turnkey cabinet solutions or project specific system integration according to customer specifications.

Therefore, the purchase of a REGATRON power supply is a solid investment for the future.

Battery Simulation Features

The G5.BAS series realistically and dynamically simulates both the electro-chemical and electrical properties of a battery type in charge and discharge mode. Other features include high data resolution and options for meeting high safety standards for operators. The real-time computing process of the application software BatSim perfectly matches the internal timing of the DC power supply. Therefore, an optimum computing rate is achieved leading to very short response times even in cases of steep changes in charge/discharge currents. Each battery type reacts in a specific manner to charge and discharge currents in terms of state of charge, cell voltage, ohmic and parametric losses, and polarization effects. These dependencies are considered by specific mathe-matical models used in the REGATRON BatSim software / firmware. The operator can fine tune the model with several well-defined parameters to adjust the simulation to a user's requirement.

Features such as adjustable controller settings and the integrated powerful 8-channel digital scope assist the user to quickly and easily achieve optimal system behavior for a special application requirement. The G5.BAS series also offers the possibility to store, edit and recall any device configuration on board the power supply.

Models of the following battery types are available for configuration: Li-ion, lead-acid, NiMH, and NiCd.
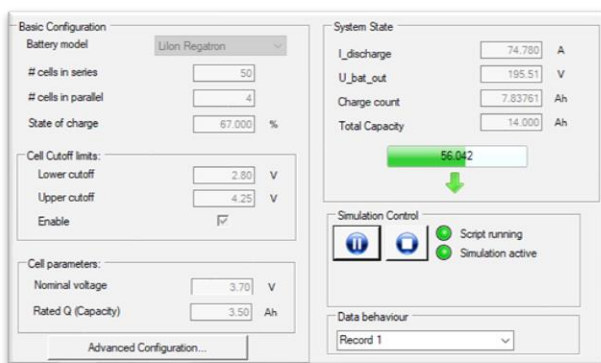

Figure 2: BATSim configuration – a few clicks away from the required battery simulation.

General Dynamic Data

rise/fall time set-value step	voltage 0…90% current -90…90%	150…220 µs 35…70 µs
response time load step	CV, recovery within 0.5% set value	50…290 µs

Accuracy

The G5.BAS series has an exceptional voltage accuracy of 0.01…0.02% FS. The current accuracy is in the range of 0.025…0.085% FS depending on the model. There is even an additional high-resolution current measure-ment range from -10 to 10% FS with an accuracy of better than 0.005% FS.

Control Modes

CV   constant voltage
CC   constant current
CP   constant power
CR   constant resistance
Ri   internal resistance simulation

Interfaces

Ethernet and USB
To connect with:
- G5.Control the operating and maintenance software
- BatSim the application software for battery simulation
- API .NET programming, e.g., by LabView, Python, Matlab, or REST interface

I/O port
Interface featuring analog and digital signals used for set and actual values or operating states.

Grid Connection

The wide-band AC input accepts all common AC grid systems and has an active power factor correction.

AC Grid   380…480 VAC ±10% at 50/60 Hz
PF   0.99
Efficiency   91…96%, depending on model

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Options

Software and Control

HMI / RCU

The HMI built into the front panel allows comprehensive and convenient operation of the power supply via touch display.

With the remote control unit (RCU) it is possible to control the device or system from a distant location in the same manner as with the HMI.

Figure 3: Intuitive control by HMI touch display. Everything you need at a glance.

User Safety

- Integrated safety relay (ISR) for increased emergency stop reliability supporting performance level PL c / PL e according to EN ISO 13849
- Discharge of AC filter (XCD), mandatory for mobile use of the device. XCD ensures a discharge time of the AC filter <1 s as required by EN 62477-1
- Based on the 80 V models, also a 60 V SELV version is available
- Various terminal protection covers

The different protective covers are designed for integration into 19" rack systems or for use as a tabletop device.

The cover for cabinet integration provides protection against accidental contact, whereas the cover for the tabletop version requires a touchproof protection in accordance with standard EN 62477-1.

Voltage V	Power kW	DC-cover acc. contact	DC-cover touchproof	AC-cover touchproof	Tabletop use allowed	Order Code
60...160	≤18	●		○	✓	G5.PAC.DCAC.1
60...320	≥27	●	—	—	—	
500...1000	≤18		●	○	✓	G5.PAC.AC.1
500...1500	≥27		●	○	✓	G5.PAC.AC.2

●   included
○   optional, mandatory for tabletop use

Rack-Integrated System Solutions

- Mobile rack solutions up to IP54
- Insulation monitoring: remote activation of the insulation measurement, actual insulation value and warning/error status are provided by optional HMI
- Easy reconfiguration between parallel, series, and mixed operation

Figure 4: REGATRON's rack-integrated turn-key system solutions, e.g., 72 kW (left) and 162 kW (right) power levels. Various types of AC/DC connectors and cables allow for comfortable handling. Third-party product integration and numerous safety options are additional features.

Environmental Conditions

Front-panel-mounted air filter (AirFilter), recommended for use in dusty environments.

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Important Features of the G5.BAS Series

Technology

- Technologically advanced, fast switching, compact 19-inch power supplies
- High control dynamics in the 100...200 µs range – even at higher power levels up to 2000+ kW
- Exceptional accuracy and an additional high-resolution measurement range
- Wide current-voltage range with an auto-ranging factor 3
- CV, CC, CP, CR, and Ri-Sim control modes
- Regenerative and highly efficient, resulting in significant reduction of energy consumption and heat dissipation

System Control and Options

- Operating software, extended analysis, parameterization options, and calibration
- Application software with visualization, programming, and data logger
- Powerful application programming interfaces (APIs)

System Capability

- Modular and easy scalable systems
- Parallel, series, and mixed operation with a digital high-speed bus
- Simple multi-unit configuration with the operating software
- Easy rack mounting
- Optional safety features such as 2-channel safety interface and insulation monitoring
- Turn-key cabinet solutions or project-specific system integration according to customer specification

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

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

Regatron AG	Regatron Inc.
Feldmuehlestrasse 50	100 Overlook Center, 2nd Floor
9400 Rorschach	Princeton, NJ 08540
SWITZERLAND	USA
sales@regatron.com	inquiries@us.regatron.com
www.regatron.com	www.us.regatron.com

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Class: Public

REGATRON DC & AC Power Supplies: Modular · Precisely Engineered · Technologically Advanced

NEW
Low Voltage / High Current Models

50+ years of innovation since 1969