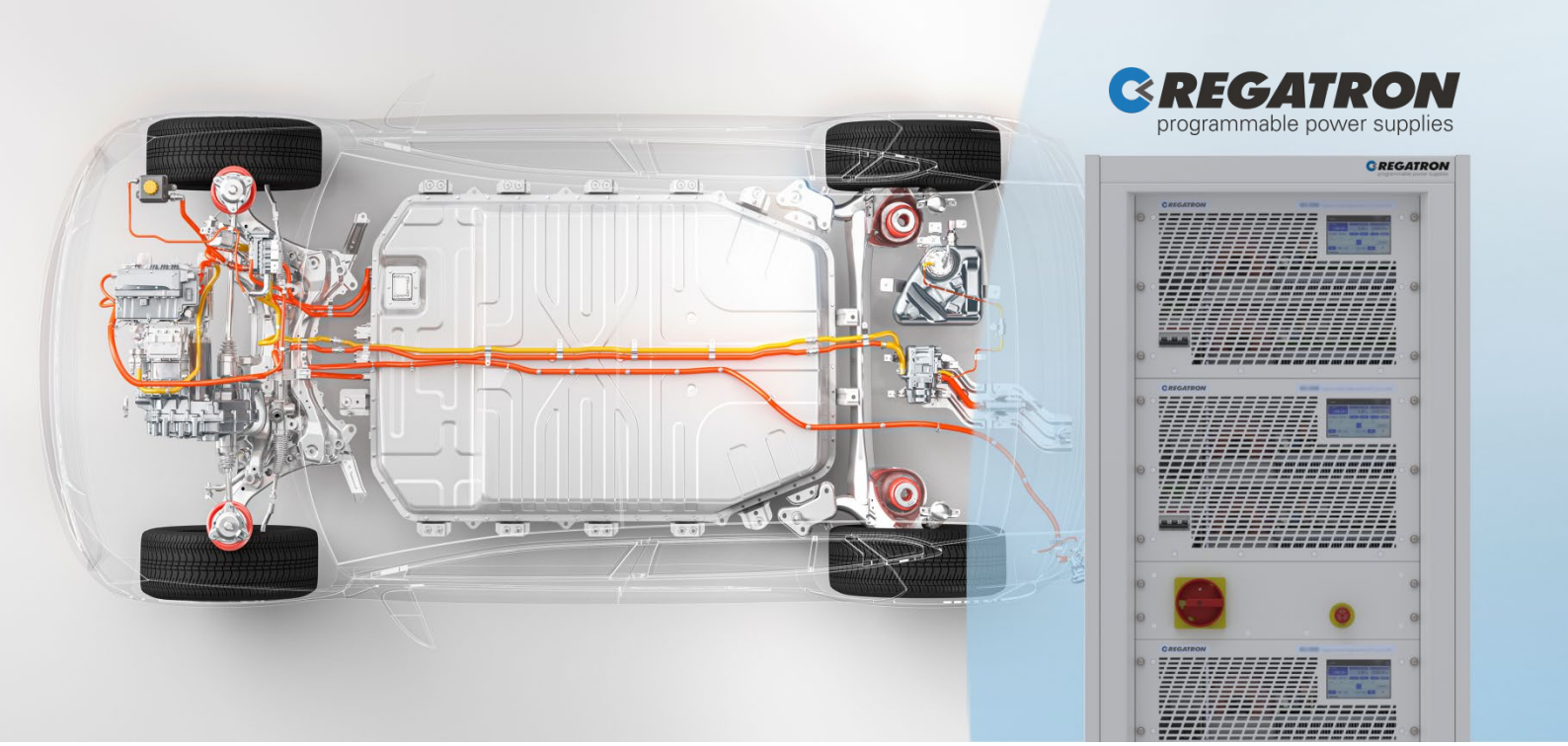

G5.DT Drivetrain Tester Series

The G5.DT series is bidirectional regenerative. It was developed specifically for testing DC components of the electrical drive train or DC components of other parts of the vehicle's electrical system. It is suitable for use in laboratories and on test benches. The modular and finely graded G5.DT series is characterized by highly dynamic response times, adjustable filter time constants, and a wide current-voltage range with an auto-ranging factor 3. The power supplies are equipped with a powerful CAN multi-protocol interface (1 kHz, 16 bit) and optionally offer test bench relevant safety functions such as PL e according to EN ISO 13849, insulation monitoring as well as automatic discharge on the load side in case of a shutdown.

Device Types

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

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

Modular and Easily Scalable Systems

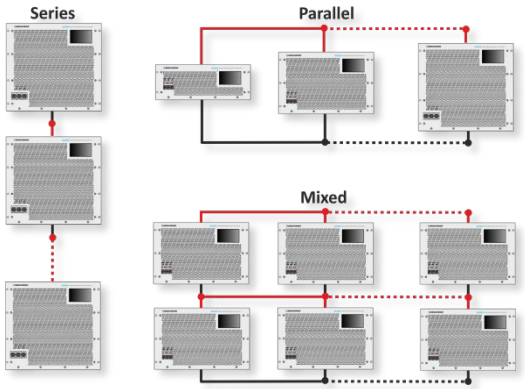

Figure 1: Modular concept for easy power and voltage increase by parallel, series, and mixed operation. The parallel configuration allows even an operation of devices with different output power, e.g., 18, 36, and 54 kW modules, in one system

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 may be split into smaller units.

Whether for single devices or powerful multi-device 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.

Drivetrain-Component Testing Features

The G5.DT series for testing electrical components of the drivetrain has a high functional range and extraordinary dynamics with an optimized output filter stage for this application. Furthermore, extensive safety options are available.

- Emergency stop circuit with PL e according to EN ISO 13849
- Integration of insulation monitoring device into the safety circuit and the CANmp interface
- Discharge of residual energy from rotating loads by the additional DC discharge unit (DDU) after shutdown of the test bench
- Simplified and safe operation thanks to pre-programmed overvoltage protection and digital fuses with immediate and I2t triggering. Different protection levels for different DUTs are either programmed by the user's automation test system via various interfaces or activated manually by digital input signals or even more conveniently wired to different switch positions

Various features such as switchable filter time constants and adjustable controller settings as well as 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.DT series also offers the possibility to store, edit, and recall any device configuration on board the power supply. Thanks to these properties, REGATRON drivetrain testers are used worldwide in test benches of all well-known automobile manufacturers, suppliers, research and testing institutes.

General Dynamic Data

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

Accuracy

The G5.DT series has an exceptional voltage accuracy of 0.01…0.02% FS. The current accuracy is in the range of 0.03…0.09% FS depending on the model. There is even an additional high-resolution current measurement 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 in CV
Gi	internal conductance simulation in CC

Interfaces

Ethernet and USB

To connect with:

- G5.Control, the operating and maintenance software
- API .NET programming, e.g., by LabView, Python, Matlab
- WebAPI (REST) interface via the optional HMI or RCU

I/O port

The I/O interface features analog and digital signals used for set and actual values or operating states. Integrated into the user's control system it is possible to set dynamically changing limits, to use enable signals, or trigger in- or outputs. The possibility to activate up to 4 user-defined parameter sets using digital inputs means that the system can be adapted to different EUTs. For example, predefined digital fuses and voltage limits can be set.

CAN Interface

The CAN multi-protocol (CANmp) interface has a 1 kHz data rate, a 16-bit resolution, and is adaptable to any proprietary CAN bus. In addition, it supports dbc file handling.

Integrated Safety Relay ISR

Integrated safety relay for increased emergency stop reliability, supporting performance level PL c / PL e according to EN ISO 13849.

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	94…95%, depending on model

Options

Software and Controls

HMI / RCU

The HMI built into the front panel allows comprehensive and convenient operation of the power supply via touch display or the WebAPI (REST) interface.
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 2: Intuitive control by HMI touch display. Everything you need at a glance.

EtherCAT Interface

The EtherCAT slave interface (ECAT) supports configuration by ESI file and communicates in a 1 kHz cycle. It transmits the entire process data in the same cycle, i.e. commands, actual states, and actual values. Acyclic communication via mailbox for device configuration is also possible.

SCPI Interface

SCPI, Standard Commands for Programmable Instruments, are ASCII strings, which are sent to the device over TCP/IP using the LAN socket. They can perform set operations or query operations.

DC Discharge Unit DDU

A DDU with 18, 27, 36, or 54 kW matched to the device output voltage, enables the safe discharge of any stored energy in the system in the event of an emergency stop, an error of the power supply, or after a DC-off command. The DDU is fully controlled and monitored by the connected G5.DT device and starts discharging after the shutdown of the test bench and stops five seconds later or when the maximum energy amount of the resistor is exceeded. The G5.DT device can be restarted as soon as the energy counter has reached the average power level of the resistor.

Device Voltage V	Max Discharge Power kW	Max Dissipated Energy kJ	Mean Power kW	Resistance Ω	Order Code
80	≥18	36	2	0.34	G5.DDU.18.[voltage]
160				1.36	
500				13.5	
1000				54.0	
80	≥27	54	3	0.23	G5.DDU.27.[voltage]
240				2.04	
500				9.0	
1500				81.0	
80	≥36	72	4	0.17	G5.DDU.36.[voltage]
160				0.68	
320				2.72	
500				6.75	
1000				27.0	
160	≥54	108	6	0.45	G5.DDU.54.[voltage]
240				1.02	
500				4.5	
1000				18.0	
1500				40.5	

Technical characteristics of the G5.DDU:

- Mounted in 19” / 3 U housing
- Maximum discharge power reached at nominal device voltage
- Operation with single devices or multi-device systems in parallel configuration
- Logic of trigger events and discharge duration can be ordered upon request
- Switch-on delay typically at 50 msec
- Requires relay contact and digital input of I/O interface

The DDU products listed above are available along with Regatron's turnkey cabinet solutions. For other discharge specifications, please contact Regatron to discuss your requirements.

User Safety

- Discharging of the AC filter (XCD), is mandatory when using the device with a plug connection. 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 touch-proof protection in accordance with standard EN 62477-1.

Voltage V	Power kW	DC-cover acc. contact	DC-cover touch-proof	AC-cover touch-proof	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

Environmental Conditions

- Front-panel-mounted air filter (AirFilter), recommended for use in dusty environments and with IP20 cabinets
- Higher degree of protection up to IP54 available on cabinet level
- Liquid cooling of the G5 devices at system level as shown in Figure 4. The Regatron solution allows to take the entire dissipated heat of the power supply out of the test bench and reuse it as process heat in the facility if possible

Rack-Integrated System Solutions

- Mobile rack solutions on castors up to 162 kW
- IP54 protection for air or liquid-cooled systems
- Third-party product integration and numerous safety options
- Insulation monitoring: remote activation of the insulation measurement, actual insulation value and warning/error status are provided by the CANmp interface or by optional display
- DC discharge unit (DDU): offers a discharge of the DC load side at voltage off, emergency stop, or error state. Remote activation is supported by the CANmp interface
- Easy reconfiguration between parallel, series, and mixed operation

Figure 3: REGATRON's rack-integrated turn-key system solutions for various power levels e.g. 72 kW (left) and 162 kW (right). Various types of AC/DC connectors and cables allow for comfortable handling.

Figure 4: REGATRON's liquid-cooled system solutions up to IP54 with various power levels e.g. 54…162 kW (left) and 216…324 kW (right). The remote control unit RCU, indicator lights, emergency stop button, and main switch allow the user to operate the system on the enclosure's front door.

Important Features of the G5.DT 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 current measurement range
- Wide current-voltage range with an auto-ranging factor 3
- CV, CC, CP, CR, and Ri/Gi-Sim control modes
- Regenerative and highly efficient, resulting in a significant reduction of energy consumption and heat dissipation

System Control and Options

- Operating software for extended analysis, parameterization options, and calibration
- Powerful application programming interfaces (APIs)

System Capability

- Modular and easily scalable systems
- Parallel, series, and mixed operation with a digital high-speed bus
- Simple multi-device configuration supported by the operating software
- Easy rack mounting
- Liquid cooled systems in IP54 available
- Optional safety features such as 2-channel safety interface, insulation monitoring, and active DC discharge function
- 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 your local sales partner.

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

50+ years of innovation since 1969