

# G5.RSS.54.60.2028

## Programmable Regenerative DC Source Sink

- 54 kW
- 60 V (SELV)
- 2028 A

### Features

- Bidirectional power supply
- High dynamics
- Energy regeneration
- G5.Control operating SW + API



### Key Values

|                                           |                                                             |                |
|-------------------------------------------|-------------------------------------------------------------|----------------|
| Power                                     |                                                             | 54 kW          |
| Voltage DC                                | limited by $P_{max}$                                        | 60 V           |
| Current                                   | limited by $P_{max}$                                        | -2028...2028 A |
| Autorangeing factor                       |                                                             |                |
| Figure 1                                  | $U_{max} \times I_{max} / P_{max}$                          | 2.25           |
| Master-slave / multi-device configuration |                                                             | parallel       |
| Max. number of devices in system          |                                                             | 44             |
| Max. number in parallel                   |                                                             | 44             |
| Max. number in series                     | with midpoint earthing<br>limited by output isolation to PE | 16             |
| Case                                      |                                                             | 19" / 10U      |

### AC Lineside Rating

|                                    |                                 |                                |
|------------------------------------|---------------------------------|--------------------------------|
| Mains connection type              | delta                           | 3L + PE (no neutral necessary) |
| Rated voltage                      |                                 | 3× 380...480 VAC ±10%          |
| Rated current                      | @nominal 3× 380 VAC             | 90 A <sub>rms</sub>            |
|                                    | @nominal 3× 400 VAC             | 85 A <sub>rms</sub>            |
|                                    | @nominal 3× 415 VAC             | 82 A <sub>rms</sub>            |
|                                    | @nominal 3× 440 VAC             | 78 A <sub>rms</sub>            |
|                                    | @nominal 3× 460 VAC             | 74 A <sub>rms</sub>            |
|                                    | @nominal 3× 480 VAC             | 71 A <sub>rms</sub>            |
| Rated frequency                    |                                 | 50/60 Hz                       |
| Power factor                       | @ $P_{max}$                     | 0.99                           |
| THDi                               | @90% $P_{max}$                  | ≤3%                            |
| Inrush current                     |                                 | <99 A <sub>rms</sub>           |
| Efficiency                         | $P_{max} @ U_{max}$             | 94%                            |
|                                    | $P_{max} @ I_{max}$             | 91%                            |
| Standby power                      | active/reactive<br>@400 V/50 Hz | 71 W / 3 kvar                  |
| Isolation                          | AC terminals to PE              | 900 VDC                        |
|                                    | AC to DC terminals              | 640 VDC                        |
| Input insulation test voltage      | line to case/logic              | 3100 VDC (2 s)                 |
| Protective earth conductor current | According to IEC 60990          | ≤10 mA @150 Hz                 |
| Touch current unweighted           | output ON/OFF                   | ≤1.5 mA / 5.3 mA (typ.)        |
| Touch current weighted             | output ON/OFF                   | ≤1 mA / 4.6 mA (typ.)          |
| Input filter discharge             |                                 |                                |
| to <60 V                           | L-PE / L-L                      | <10 s                          |
|                                    | with option XCD                 | <1 s                           |

### DC Operation

|                    |                                               |                                 |
|--------------------|-----------------------------------------------|---------------------------------|
| Operation modes    |                                               | source, sink, bidirectional     |
| Voltage regulation | CV                                            | 0...100% $U_{max}$              |
| Current regulation | CC                                            | -100...100% $I_{max}$           |
| Power regulation   | CP                                            | -100...-5% / 5...100% $P_{max}$ |
| Programmable load  | CR, $R_{max} @ U_{max}$ , $R_{min} @ U_{min}$ | 0.001...14.2 Ω                  |

## DC Operation (continued)

|                                                                                                                                              |                                                                                                                                           |                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| <b>Internal resistance simulation</b>                                                                                                        | programmable                                                                                                                              | 0...79 mΩ                       |
| <b>Min. voltage normal sink mode</b>                                                                                                         |                                                                                                                                           |                                 |
| Figure 2                                                                                                                                     | @I <sub>max</sub>                                                                                                                         | 6 V                             |
|                                                                                                                                              | @10% I <sub>max</sub>                                                                                                                     | 5.5 V                           |
| <b>Min. voltage LV sink mode</b>                                                                                                             |                                                                                                                                           |                                 |
| Figure 2                                                                                                                                     | @I <sub>max</sub>                                                                                                                         | 1 V                             |
|                                                                                                                                              | @10% I <sub>max</sub>                                                                                                                     | 0.5 V                           |
| <b>Static accuracy</b>                                                                                                                       |                                                                                                                                           |                                 |
| At 25 °C ambient temperature,<br>constant line / load conditions,<br>after 1h warm up time in voltage on state,<br>normal distribution (k=2) |                                                                                                                                           |                                 |
|                                                                                                                                              | power @I <sub>max</sub> 1 kHz Filter                                                                                                      | 0.09% FS                        |
|                                                                                                                                              | voltage                                                                                                                                   | 0.025% FS                       |
|                                                                                                                                              | voltage sense                                                                                                                             | 0.025% FS                       |
|                                                                                                                                              | current full range 1 kHz Filter @30% U <sub>max</sub>                                                                                     | 0.085% FS                       |
|                                                                                                                                              | current low range (<10% FS) 1 kHz Filter @90% U <sub>max</sub>                                                                            | 0.003% FS                       |
|                                                                                                                                              | resistance @I <sub>max</sub> 1 kHz Filter                                                                                                 | 0.085% FS                       |
| <b>HMI touchpanel meter resolution</b>                                                                                                       | programming/reading                                                                                                                       | 0.01 V<br>0.1 A                 |
| <b>Output capacitance</b>                                                                                                                    | X-capacitor LowCap<br>X-capacitor HighCap<br>Y-capacitor @DC                                                                              | 3180 μF<br>74460 μF<br>327 nF   |
| <b>Ripple, voltage</b>                                                                                                                       |                                                                                                                                           |                                 |
|                                                                                                                                              | output voltage ripple (10 Hz...3.8 MHz): V <sub>rms</sub><br>LowCap, ohmic load<br>90% P <sub>max</sub> , 90% U <sub>max</sub> , CV mode  | ≤0.15% FS                       |
|                                                                                                                                              | output voltage ripple (10 Hz...3.8 MHz): V <sub>rms</sub><br>HighCap, ohmic load<br>90% P <sub>max</sub> , 90% U <sub>max</sub> , CV mode | ≤0.15% FS                       |
| <b>Ripple, current</b>                                                                                                                       |                                                                                                                                           |                                 |
|                                                                                                                                              | output Current ripple (10 Hz...3.8 MHz): A <sub>rms</sub><br>LowCap, ohmic load<br>90% P <sub>max</sub> , CC mode                         | ≤0.02% FS @38% I <sub>max</sub> |
| <b>Noise</b>                                                                                                                                 |                                                                                                                                           |                                 |
|                                                                                                                                              | noise (4.1 kHz...3.8 MHz): V <sub>pp</sub><br>LowCap, ohmic load<br>90% P <sub>max</sub> , 90% U <sub>max</sub> , CV mode                 | ≤0.7% FS                        |
|                                                                                                                                              | noise (4.1 kHz...3.8 MHz): V <sub>pp</sub><br>HighCap, ohmic load<br>90% P <sub>max</sub> , 90% U <sub>max</sub> , CV mode                | ≤0.6% FS                        |
| <b>Stability/drift</b>                                                                                                                       |                                                                                                                                           |                                 |
| 8h, after 1h warm up time in output on state,<br>at constant line input, load and temp. conditions                                           |                                                                                                                                           |                                 |
|                                                                                                                                              | voltage                                                                                                                                   | ≤0.01% FS                       |
|                                                                                                                                              | voltage sense                                                                                                                             | ≤0.01% FS                       |
|                                                                                                                                              | current                                                                                                                                   | ≤0.01% FS                       |
| <b>Temperature coefficient</b>                                                                                                               |                                                                                                                                           |                                 |
| At constant line and load conditions                                                                                                         |                                                                                                                                           |                                 |
|                                                                                                                                              | voltage                                                                                                                                   | ≤0.005% FS/°C                   |
|                                                                                                                                              | voltage sense                                                                                                                             | ≤0.007% FS/°C                   |
|                                                                                                                                              | current                                                                                                                                   | ≤0.005% FS/°C                   |
| <b>Rise/fall time (10...90% of step)</b>                                                                                                     |                                                                                                                                           |                                 |
| Voltage set-value step, const. ohmic load,<br>LowCap                                                                                         |                                                                                                                                           |                                 |
|                                                                                                                                              | voltage step (0...90% U <sub>max</sub> / 90% P <sub>max</sub> )                                                                           | ≤220 μs                         |
|                                                                                                                                              | voltage step (0...33% U <sub>max</sub> / 30% P <sub>max</sub> )                                                                           | ≤170 μs                         |
| <b>Rise/fall time (10...90% of step)</b>                                                                                                     |                                                                                                                                           |                                 |
| Current set-value step, const. voltage,<br>LowCap                                                                                            |                                                                                                                                           |                                 |
|                                                                                                                                              | current step (-90...90% I <sub>max</sub> , @33% U <sub>max</sub> )<br>10...90% of step @low inductance                                    | 60 μs                           |
|                                                                                                                                              | current step (-90...-10% I <sub>max</sub> , @33% U <sub>max</sub> )<br>10...90% of step @low inductance                                   | 60 μs                           |
|                                                                                                                                              | current step (10...90% I <sub>max</sub> , @33% U <sub>max</sub> )<br>10...90% of step @low inductance                                     | 60 μs                           |
| <b>Transient response time</b>                                                                                                               |                                                                                                                                           |                                 |
| Load step, ohmic load, HighCap                                                                                                               |                                                                                                                                           |                                 |
|                                                                                                                                              | CV, recovery within 2% set voltage<br>0...90% P <sub>max</sub> @90% U <sub>max</sub>                                                      | 50 μs                           |

## DC Operation (continued)

|                                                                                  |                                                                                                                                                                  |                                                                                                                                                                                |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transient response time</b><br><i>Load step, ohmic load, HighCap</i>          | CV, recovery within 0.5% set voltage<br>45...90% $P_{max}$ @90% $U_{max}$                                                                                        | $\leq 230 \mu s$                                                                                                                                                               |
| <b>Transient response time</b><br><i>Load step, ohmic load, LowCap</i>           | CC, recovery within 2% of set current<br>45...90% $P_{max}$ @90% $I_{max}$                                                                                       | $\leq 320 \mu s$                                                                                                                                                               |
| <b>Voltage drop</b><br><i>while load switching on<br/>HighCap mode</i>           | -90...90% $P_{max}$ @90% $U_{max}$<br>@rate 675 A/100 $\mu s$<br>45...90% $P_{max}$ @90% $U_{max}$<br>@rate 675 A/100 $\mu s$                                    | 4 V<br>8.5 V                                                                                                                                                                   |
| <b>Voltage overshoot</b><br><i>while load switching off<br/>HighCap mode</i>     | 90...90% $P_{max}$ @90% $U_{max}$<br>@rate 675 A/100 $\mu s$<br>90...45% $P_{max}$ @90% $U_{max}$<br>@rate 675 A/100 $\mu s$                                     | 4 V<br>8.5 V                                                                                                                                                                   |
| <b>Pulsating load</b><br><i>max. load ripple current sine<br/>max. amplitude</i> | allowed ripple @ worst case @ 30% $U_{max}$<br><br>@10 kHz / 30% $U_{max}$                                                                                       | HighCap 3% $I_{max}$ @8 kHz<br>LowCap 10% $I_{max}$ @8 kHz<br>HighCap 3% $I_{max}$<br>LowCap 11% $I_{max}$                                                                     |
| <b>Max. ripple</b><br><i>DC+ to PE / DC- to PE</i>                               | max. allowed ripple $V_{rms}$<br>$\leq 2.8$ kHz: 450 $V_{rms}$<br>>2.8 kHz: $((1.26 \times 10^6)/f+5) V_{rms}$                                                   | $\leq 1$ kHz: 450 $V_{rms}$<br>2.8 kHz: 450 $V_{rms}$<br>5 kHz: 250 $V_{rms}$<br>10 kHz: 130 $V_{rms}$<br>20 kHz: 65 $V_{rms}$<br>50 kHz: 30 $V_{rms}$<br>80 kHz: 20 $V_{rms}$ |
| <b>Protection</b>                                                                | OVP (over voltage protection)<br>OCP (over current protection)<br>OPP (over power protection)<br>OTP (over temperature protection)                               | programmable<br>programmable<br>programmable<br>✓                                                                                                                              |
| <b>Output discharge</b><br><i>to &lt;60V</i>                                     | active discharge enabled<br>active discharge disabled                                                                                                            | <1 s<br><60 s                                                                                                                                                                  |
| <b>Small signal modulation</b>                                                   | frequency CV, CC                                                                                                                                                 | 0...10 kHz                                                                                                                                                                     |
| <b>Small signal modulation</b><br><i>Voltage Controller LowCap mode</i>          | modulation range $V_{rms}$ sine @10 kHz<br>attenuation @5 kHz / 10 kHz<br>op. point: 90% $U_{nom}$ + 5% $U_{nom}$ ampl.<br>phase lag analog input to voltage out | 0...5% FS<br>0.4 dB / 5.6 dB<br>130 $\mu s$                                                                                                                                    |
| <b>Small signal modulation</b><br><i>Current controller LowCap mode</i>          | modulation range $A_{rms}$ sine @10 kHz<br>attenuation @5 kHz / 10 kHz<br>op. point: 90% $I_{nom}$ + 5% $I_{nom}$ ampl.<br>phase lag analog input to current out | 0...5% FS<br>-3.4 dB / 5.9 dB<br>145 $\mu s$                                                                                                                                   |
| <b>Sense voltage compensation</b>                                                |                                                                                                                                                                  | programmable<br>$U_{out} + U_{drop}$ limited by $U_{out max}$                                                                                                                  |
| <b>Sense input impedance</b>                                                     | @operation<br>@output off<br>@output off<br>"measurement at voltage-off" disabled                                                                                | 196 k $\Omega$<br>196 k $\Omega$<br>open                                                                                                                                       |
| <b>Ballast resistor DC power port</b>                                            | @output off<br>no RPP or RPP closed                                                                                                                              | 443 $\Omega$                                                                                                                                                                   |
| <b>Resistance</b>                                                                | DC+/DC- output to PE<br>X713 jumper inserted<br>DC+/DC- output to PE<br>X713 jumper removed                                                                      | 9.5 M $\Omega$<br>open                                                                                                                                                         |
| <b>Absolute maximum ratings</b>                                                  | Voltage                                                                                                                                                          | 88 VDC                                                                                                                                                                         |
| <b>Output insulation test voltage</b>                                            | output to case/logic                                                                                                                                             | 1090 VDC (2 s)                                                                                                                                                                 |

## Various

|                                    |                                |                                                                      |
|------------------------------------|--------------------------------|----------------------------------------------------------------------|
| Case dimensions<br><i>Figure 3</i> | H × W × D<br>without terminals | 445 × 483 × 673 mm<br>17 1/2" × 19" × 26 1/2"                        |
| Weight                             |                                | 132 kg / 291 lbs                                                     |
| AC terminals                       | screw terminals                | 6...35 mm <sup>2</sup> (AWG 10...2) wires<br>d ≤ 8.5 mm (11/16")     |
| DC terminals                       |                                | output bars for M12 bolts (adapter for additional M12 bolt included) |
| Communication interface            | speed depending on bus load    | Ethernet (max. 800 × 16 bit/s),<br>USB (max. 450 × 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: ±0.1%,<br>unipolar range: ±0.2%         |
| Input impedance              |            | 1 MΩ (typ.)                                            |
| Absolut max. input voltage   |            | ±30 VDC                                                |
| Input filter                 |            | 2nd order low pass filter,<br>cutoff frequency: 15 kHz |
| Delay analog in to power out |            | 89 μs (typ.)                                           |
| Temperature coefficient      |            | 0.02% FS/°C                                            |

## Analog Outputs

|                               |                     |                                         |
|-------------------------------|---------------------|-----------------------------------------|
| Number of outputs             |                     | 4                                       |
| Resolution                    |                     | 16 Bit                                  |
| Update rate                   |                     | 48 kS/s                                 |
| Settling time                 |                     | 10 μs (typ.)                            |
| Output voltage range          | selectable          | -10...10 V; -5...5 V; 0...5 V; 0...10 V |
| Accuracy                      |                     | ±0.2%                                   |
| Output impedance              |                     | 0.5 Ω (typ.)                            |
| Max. output current           | short-circuit proof | 20 mA                                   |
| Delay power out to analog out |                     | 42 μs (typ.)                            |
| Temperature coefficient       |                     | 0.02% FS/°C                             |

## Digital I/O

|                                         |                                                       |                                                               |
|-----------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|
| Number of digital inputs/outputs        | programmable<br>(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 μs, 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 <sub>ON</sub> : 64...120 μs, T <sub>OFF</sub> : 90...170 μs |
| 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          |  | 20 ms (typ.)                |

## Ambient

|                                                |                                                                                                                                  |                                                            |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Operating altitude                             | above sea level<br>above 1000 m, slight temp. derating possible                                                                  | ≤2000 m                                                    |
| Operating temperature                          | with airfilter                                                                                                                   | -5...40 °C<br>-5...30 °C                                   |
| Storage temperature                            |                                                                                                                                  | -25...70 °C                                                |
| Installation                                   | IEC 60721-3-3                                                                                                                    | indoor, air-conditioned<br>in protected 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<br>1 m dist. front (typ.) | 90% P <sub>max</sub> , 90% I <sub>max</sub><br>@ 25 °C ambient<br>90% P <sub>max</sub> , 90% I <sub>max</sub><br>@ 40 °C ambient | ≤54 dB<br>≤71 dB                                           |

## Standards

|                                                       |                                                                                                                          |                               |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Protection class                                      | EN 62477-1                                                                                                               | 1                             |
| Degree of pollution                                   | EN 60664-1                                                                                                               | 2                             |
| Overvoltage category                                  | mains input, EN 60664-1 / EN 62477-1<br>other interfaces                                                                 | III<br>2                      |
| Area of application                                   |                                                                                                                          | industrial                    |
| Approval                                              |                                                                                                                          | CE Marking, UKCA              |
| EN 62477-1:2012<br>+ A11:2014 + A1:2017 + A12:2021    | Low Voltage Directive 2014/35/EU                                                                                         | ✓                             |
| BS EN 62477-1:2012<br>+ A11:2014 + A1:2017 + A12:2021 | Electrical Equipment (Safety) Regulations 2016                                                                           | ✓                             |
| EN 61010-1:2010                                       | Low Voltage Directive 2014/35/EU                                                                                         | ✓                             |
| BS EN 61010-1:2010                                    | Electrical Equipment (Safety) Regulations 2016                                                                           | ✓                             |
| EN ISO 13849-1:2015                                   | w/o ISR<br>with ISR 2-channel<br>with ISR 2-channel and<br>external safety relay                                         | -<br>up to PL c<br>up to PL e |
| EN 61000-6-4:2007 A1:2011 / EN61000-6-4:2019          | Directive 2014/30/EU<br>EMC emission (industrial)                                                                        | ✓                             |
| BS EN 61000-6-4:2007 A1:2011 /<br>BS EN61000-6-4:2019 | Electromagnetic Compatibility Regulations 2016<br>EMC emission (industrial)                                              | ✓                             |
| EN 61000-6-2:2005 / EN 61000-6-2:2019                 | Directive 2014/30/EU<br>EMC immunity (industrial)                                                                        | ✓                             |
| BS EN 61000-6-2:2005 / BS EN 61000-6-2:2019           | Electromagnetic Compatibility Regulations 2016<br>EMC immunity (industrial)                                              | ✓                             |
| EN 61000-3-11:2017                                    | Electromagnetic compatibility (EMC). Part 3-11<br>Equipment rated ≤75A                                                   | ✓                             |
| BS EN 61000-3-11:2017                                 | Electromagnetic compatibility (EMC). Part 3-11<br>Equipment rated ≤75A                                                   | ✓                             |
| EN 61000-3-12:2011                                    | Electromagnetic compatibility (EMC) – Part 3-12<br>Equipment rated > 16 A and ≤75 A                                      | ✓                             |
| BS EN 61000-3-12:2011                                 | Electromagnetic compatibility (EMC) – Part 3-12<br>Equipment rated > 16 A and ≤75 A                                      | ✓                             |
| EN 61326-1:2013                                       | Directive 2014/30/EU<br>EMC industrial level A                                                                           | ✓                             |
| BS EN 61326-1:2013                                    | Electromagnetic Compatibility Regulations 2016<br>EMC industrial level A                                                 | ✓                             |
| EN IEC 63000:2018                                     | RoHS Directive                                                                                                           | ✓                             |
| BS EN IEC 63000:2018                                  | The Restriction of the Use of Certain Hazardous<br>Substances in Electrical and Electronic Equipment<br>Regulations 2012 | ✓                             |
| EMV-ILA 01-03b                                        | Emission 9...150 kHz<br>test stand area                                                                                  | ✓                             |

## Operating area

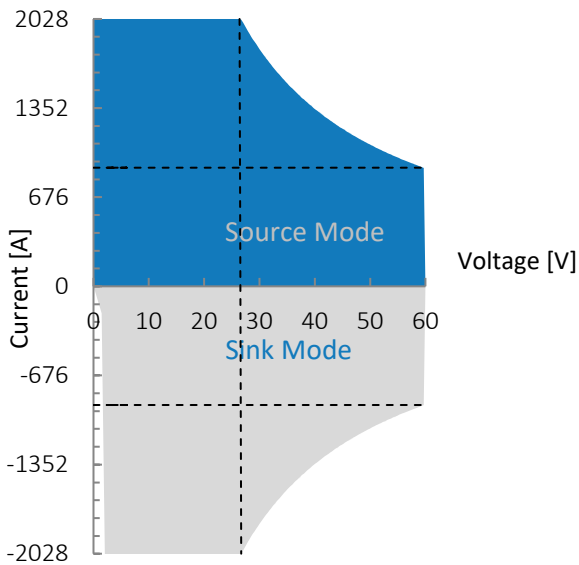


Figure 1: G5.RSS.54.60.2028, voltage / current operating area.

## X-axis zoom source-sink @low voltage

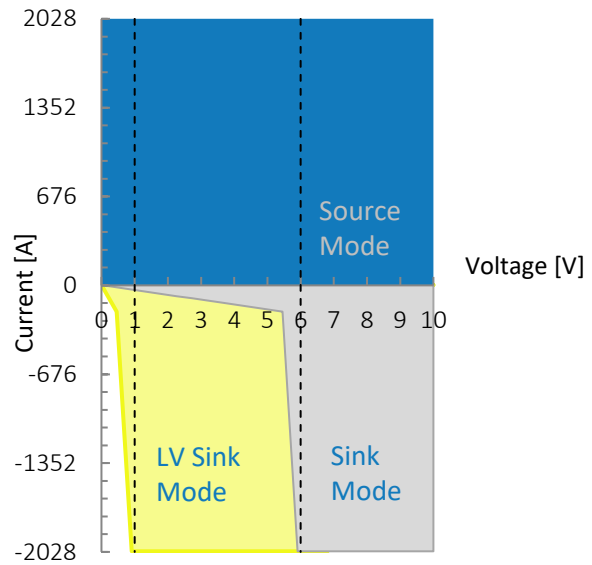


Figure 2: Normal sink mode in grey area down to 5.5(6) V.  
To use the LV Sink mode (yellow area), the upper voltage limit has to be lowered,  
- to 2 V for sink down to 0.5(1) V (yellow area)  
- to 26 V or higher for sink down to 5.5(6) V (grey area)  
- any other value between 2 V and 26 V  
will lead to a minimum sink voltage between 0.5(1) V and 5.5(6) V.

## Dimensions

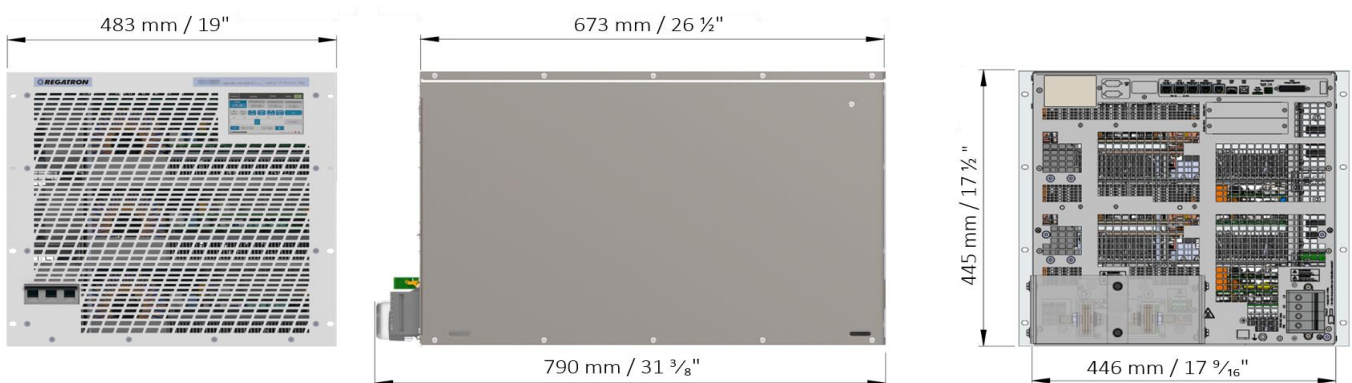


Figure 3: Front, right hand side and rear view. 19-inch module with 10 units in height.  
Add 130 mm / 5 1/8" to case depth for protective cover

For further information to included features see related product description <PD\_G5.RSS....> on [www.regatron.com](http://www.regatron.com)  
This product is developed, produced and tested according to ISO 9001 by REGATRON.

For detailed technical information, contact your local sales partner:

**HEIDEN**  
COMPETENCE IN POWER

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