

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

3-348-796-03  
7/5.15

- Very short response times thanks to BET technology (bidirectional energy transformation)
- Auto-ranging output with 120 W, 240 W or 320 W
- Output power is doubled in short-time operating range
- Remote sensing
- Minimum residual ripple
- Very good dynamic control parameters
- Output ON / OFF function
- Output terminals at front and rear panels
- Master-slave operation for parallel and series connection
- Protection against excessive temperature
- Minimal power loss
- Compact design and minimum weight



### Application

The SLP-KONSTANTER series (Single Output Laboratory Power Supplies) includes single-channel laboratory power supplies for universal use in research and development, production, training and service.

The instruments are capable of maintaining either constant voltage or constant current levels, and are deliver 120 W, 240 W or 320 W of nominal power over a wide range thanks to the auto-ranging output.

### Setpoint Configuration

Precision manual adjustment of voltage and current is accomplished with ten-turn potentiometers whose setting ranges Ulim and Ilim can be limited with the help of a screwdriver, in order to prevent inadvertent adjustment to undesirably high values.

### Display

Two large, 3½ place digital LED displays indicate the measured output voltage and output current. Furthermore, they can be switched to setpoint display as well, which is especially advantageous for current adjustment.

Control mode displays in the characteristic curve field indicate respective operating conditions.

### Outputs

Floating outputs are available at both front and rear panels. Activation or deactivation is accomplished by pressing a key, or with a signal to the integrated analog interface which is included as standard equipment.

As soon as sensor cables are connected to the terminals, the KONSTANTER is automatically switched to remote sensing.

### Housing

The quiet, temperature controlled fan prevents unnecessarily high noise levels in working areas.

The rugged metal housing is closed at both top and bottom, and is equipped with mounting feet and a tilt stand at the rear.

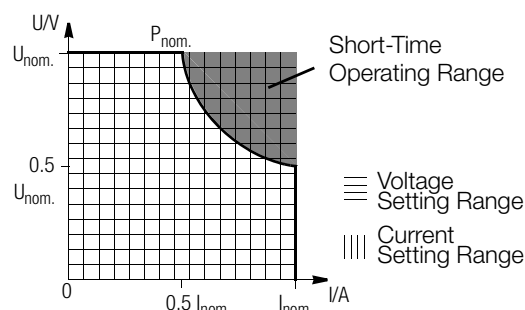
Several units can be quickly and easily fastened to one another for the creation of multi-channel units, or can be installed to a 19" rack with the appropriate mounting sets.

Only one electrical outlet is required for the supply of mains power to multi-channel units.

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

### Output Working Range



### Analog Interface

Connection 11-pole plug-in terminal strip  
 Reference potential Output negative pole  
 floating TRG input

Connector Pin Assignments:

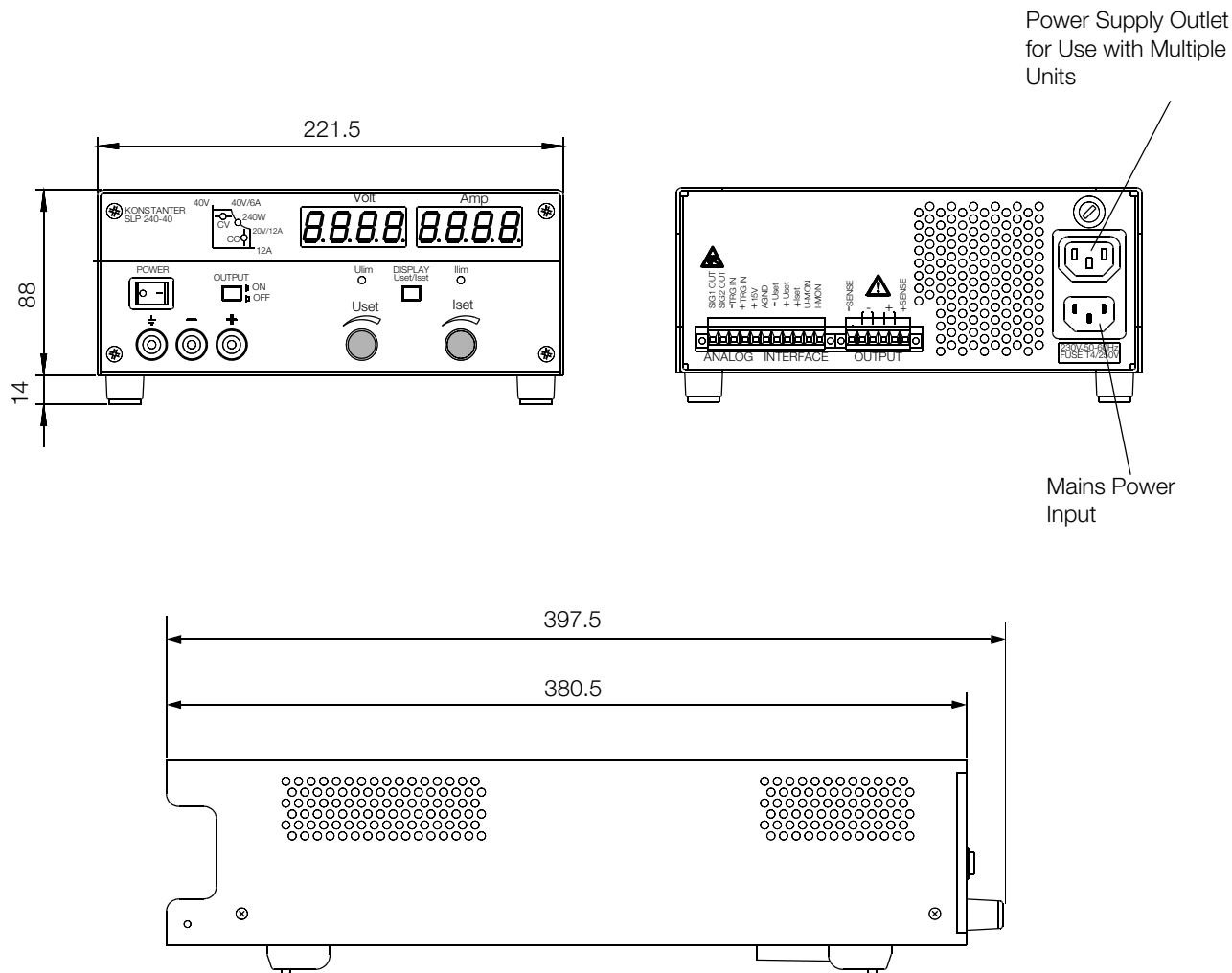
| PIN | Designation | Function                                                                                                         |
|-----|-------------|------------------------------------------------------------------------------------------------------------------|
| 1   | SIG1 OUT    | status signal output for input ON / OFF (open collector, max. 30 V – / 20 mA)                                    |
| 2   | SIG2 OUT    | status signal output control mode CV / CC (open collector, max. 30 V – / 20 mA)                                  |
| 3   | TRG IN +    | digital control input for input ON / OFF                                                                         |
| 4   | TRG IN –    | (low: < 1 V, high: 4 ... 26 V), floating input                                                                   |
| 5   | +15 V       | auxiliary voltage: +15 V / max. 40 mA                                                                            |
| 6   | AGND        | reference point connected to –output with reversible fuse                                                        |
| 7   | $U_{set} -$ | analog, inverted voltage control input (0 ... –5 V corresponds to 0 ... $U_{nom.}$ , $R_i = 10\text{ k}\Omega$ ) |
| 8   | $U_{set} +$ | analog voltage control input (0 ... +5 V corresponds to 0 ... $U_{nom.}$ , $R_i = 10\text{ k}\Omega$ )           |
| 9   | $I_{set} +$ | analog current control input (0 ... +5 V corresponds to 0 ... $I_{nom.}$ , $R_i = 10\text{ k}\Omega$ )           |
| 10  | U-MON       | output voltage measurement output (0 ... 10 V corresponds to 0 ... $U_{nom.}$ , $R_i = 9.8\text{ k}\Omega$ )     |
| 11  | I-MON       | output current measurement output (0 ... 10 V correspond to 0 ... $I_{nom.}$ , $R_i = 9.4\text{ k}\Omega$ )      |

### Applicable Regulations and Standards

|                                                                                                                                       |                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| IEC 61010-1/EN 61010-1/<br>VDE 0411-1                                                                                                 | Safety requirements for electrical equipment for measurement, control and laboratory use – General requirements |
| VDE 0160:1988 + A1:1989<br>class W1                                                                                                   | Equipment of power systems with electronic components                                                           |
| EN 60950:1992<br>VDE 0805:1990                                                                                                        | Safety of IT systems                                                                                            |
| EN 60529<br>VDE 0470 Part 1                                                                                                           | Test instruments and test procedures – Protection provided by enclosures (IP code)                              |
| IEC 68-2-6:1990                                                                                                                       | Vibration resistance                                                                                            |
| IEC 68-2-27:1989                                                                                                                      | Impact resistance                                                                                               |
| EN 61326-1:1997<br>+ A1: 1998                                                                                                         | Electromagnetic compatibility (CEM)<br>Product standard                                                         |
| EN 55022:1998 class A                                                                                                                 | Electromagnetic Compatibility (CEM)<br>Generic standard interference emission – industrial sector               |
| EN 61000-4-2:1995<br>EN 61000-4-3:1996 + A1:1998<br>EN 61000-4-4:1995<br>EN 61000-4-5:1995<br>EN 61000-4-6:1996<br>EN 61000-4-11:1994 | Electromagnetic Compatibility (CEM)<br>Generic standard interference immunity – industrial sector               |

# SLP KONSTANTER Series SLP 120 / 240 / 320 Laboratory Power Supplies

## Dimensional Drawing (benchtop instrument)



All dimensions in mm

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

### Characteristic Values, 120 W Series

Unless otherwise indicated, all entries represent maximum values and are valid within an operating temperature range of 0 to 50° C, the nominal power range and a line voltage range of 230 V ± 10% after a warm-up period of 30 minutes.

| Description (abbreviated designation)                                                                                                               |                                                                       | SLP 120-20                         | SLP 120-40                         | SLP 120-80                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Type                                                                                                                                                |                                                                       | 32 N 20 R 10                       | 32 N 40 R 6                        | 32 N 80 R 3                        |
| Nominal Output Data                                                                                                                                 | Voltage Setting Range                                                 | 0 ... 20 V                         | 0 ... 40 V                         | 0 ... 80 V                         |
|                                                                                                                                                     | Current Setting Range                                                 | 0 ... 10 A                         | 0 ... 6 A                          | 0 ... 3 A                          |
|                                                                                                                                                     | Continuous Power at $T_u \leq 40^\circ \text{C}$                      | max. 120 W                         | max. 120 W                         | max. 120 W                         |
|                                                                                                                                                     | Short-Time Rating for $t < 90 \text{ s} / T_u \leq 25^\circ \text{C}$ | max. 200 W                         | max. 240 W                         | max. 240 W                         |
|                                                                                                                                                     | Current Derating at $T_u > 40^\circ \text{C}$                         | – 0.25 A / K                       | – 0.15 A / K                       | – 0.07 A / K                       |
| Output Operating Characteristics                                                                                                                    |                                                                       |                                    |                                    |                                    |
| Overall Setting Tolerance at $23 \pm 5^\circ \text{C}$<br>with Reference to 3½ Place Setpoint Display<br>including System Deviation for Load / Line | Voltage                                                               | 0.2 % + 50 mV                      | 0.2 % + 150 mV                     | 0.2 % + 250 mV                     |
|                                                                                                                                                     | Current                                                               | 0.5 % + 45 mA                      | 0.5 % + 35 mA                      | 0.5 % + 20 mA                      |
| Static System Deviation <sup>1)</sup><br>at 100% Load Variation <sup>1)</sup>                                                                       | Voltage                                                               | 15 mV                              | 10 mV                              | 10 mV                              |
|                                                                                                                                                     | Current                                                               | 20 mA                              | 10 mA                              | 10 mA                              |
| Static System Deviation <sup>1)</sup><br>at 10% Line Voltage Variation <sup>1)</sup>                                                                | Voltage                                                               | 5 mV                               | 5 mV                               | 5 mV                               |
|                                                                                                                                                     | Current                                                               | 8 mA                               | 5 mA                               | 5 mA                               |
| Residual Ripple <sup>1)</sup>                                                                                                                       | Voltage (10 Hz ... 10 MHz)                                            | 10 mV <sub>eff</sub>               | 10 mV <sub>eff</sub>               | 10 mV <sub>eff</sub>               |
|                                                                                                                                                     | Current (10 Hz ... 1 MHz)                                             | 25 mA <sub>eff</sub>               | 20 mA <sub>eff</sub>               | 10 mA <sub>eff</sub>               |
| Common-Mode Interference (10 Hz ... 1 MHz)                                                                                                          |                                                                       | 0.5 mA <sub>eff</sub>              | 0.5 mA <sub>eff</sub>              | 0.5 mA <sub>eff</sub>              |
| Settling Time (voltage)<br>with Sudden Load Variations of 10 to 90% $I_{\text{nom}}$ .                                                              | Tolerance                                                             | 40 mV                              | 80 mV                              | 80 mV                              |
|                                                                                                                                                     | $\Delta I = 80\%$                                                     | 200 µs                             | 200 µs                             | 200 µs                             |
| Under and Overshooting with<br>Sudden Load Variations of 50 A / ms                                                                                  |                                                                       | 400 mV                             | 400 mV                             | 800 mV                             |
| Response Time (voltage)<br>with Setpoint Change 0 → 100%<br>with Setpoint Change 100% → 0                                                           | Tolerance                                                             | 40 mV                              | 80 mV                              | 160 mV                             |
|                                                                                                                                                     | Open-Circuit / Nominal Load                                           | 1 ms / 1 ms                        | 1 ms / 1 ms                        | 4 ms / 4ms                         |
|                                                                                                                                                     | Open-Circuit / Nominal Load                                           | 1 ms / 1 ms                        | 1 ms / 1 ms                        | 4 ms / 4ms                         |
| Response Time (current)<br>with Setpoint Change 0 → 100%<br>with Setpoint Change 100% → 0                                                           | Tolerance                                                             | 100 mA                             | 60 mA                              | 30 mA                              |
|                                                                                                                                                     | Short-Circuit / Nominal Load                                          | < 5 ms / < 5 ms                    | < 5 ms / < 5 ms                    | < 10 ms / < 10 ms                  |
|                                                                                                                                                     | Short-Circuit / Nominal Load                                          | < 5 ms / < 5 ms                    | < 5 ms / < 5 ms                    | < 10 ms / < 10 ms                  |
| Measurement Value Display (3½ place)                                                                                                                |                                                                       |                                    |                                    |                                    |
| Measuring Resolution                                                                                                                                | Voltage                                                               | 10 mV                              | 100 mV                             | 100 mV                             |
|                                                                                                                                                     | Current                                                               | 10 mA                              | 10 mA                              | 10 mA                              |
| Measuring Accuracy at $23 \pm 5^\circ \text{C}$<br>with Reference to the respective Measurement Value                                               | Voltage                                                               | 0.15 % + 25 mV                     | 0.2 % + 120 mV                     | 0.2 % + 150 mV                     |
|                                                                                                                                                     | Current                                                               | 0.5 % + 30 mA                      | 0.5 % + 25 mA                      | 0.5 % + 20 mA                      |
| Protective Functions                                                                                                                                |                                                                       |                                    |                                    |                                    |
| Output Overvoltage Protection                                                                                                                       | Threshold                                                             | 25 ± 1 V                           | 50 ± 2 V                           | 100 ± 4 V                          |
| Protection against Pole Reversal – Load Capacity                                                                                                    | Continuous                                                            | 10 A                               | 6 A                                | 3 A                                |
| Reverse Voltage Resistance                                                                                                                          | Continuous                                                            | 40 V                               | 80 V                               | 100 V                              |
| General                                                                                                                                             |                                                                       |                                    |                                    |                                    |
| Power Supply <sup>1)</sup>                                                                                                                          | at Nominal Load<br>in Standby Mode                                    | 230 V~ +10 / –15 %<br>47 ... 63 Hz | 230 V~ +10 / –15 %<br>47 ... 63 Hz | 230 V~ +10 / –15 %<br>47 ... 63 Hz |
|                                                                                                                                                     | at max. Short-Time Power                                              | 280 VA; 180 W                      | 280 VA; 150 W                      | 280 VA; 170 W                      |
| Power Consumption                                                                                                                                   | at Nominal Load                                                       | 45 VA; 15 W                        | 45 VA; 15 W                        | 45 VA; 15 W                        |
|                                                                                                                                                     | Typical                                                               | 450 VA                             | 500 VA                             | 500 VA                             |
| Efficiency                                                                                                                                          | at Nominal Load<br>in Standby Mode                                    | > 70 %                             | > 80 %                             | > 80 %                             |
| Switching Frequency                                                                                                                                 | at max. Short-Time Power                                              | 200 kHz                            | 200 kHz                            | 200 kHz                            |
| Article Number                                                                                                                                      |                                                                       | K220A                              | K221A                              | K222A                              |

1) Indicated values are increased by a factor of approximately 1.2 within a mains input voltage range of –10% to –15%.

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

### Characteristic Values, 240 W Series

Unless otherwise indicated, all entries represent maximum values and are valid within an operating temperature range of 0 to 50° C, the nominal power range and a line voltage range of 230 V ± 10% after a warm-up period of 30 minutes.

| Description (abbreviated designation)                                                                                                               |                                                                       | SLP 240-20            | SLP 240-40            | SLP 240-80            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|
| Type                                                                                                                                                |                                                                       | 32 N 20 R 20          | 32 N 40 R 12          | 32 N 80 R 6           |
| Nominal Output Data                                                                                                                                 | Voltage Setting Range                                                 | 0 ... 20 V            | 0 ... 40 V            | 0 ... 80 V            |
|                                                                                                                                                     | Current Setting Range                                                 | 0 ... 20 A            | 0 ... 12 A            | 0 ... 6 A             |
|                                                                                                                                                     | Continuous Power at $T_u \leq 40^\circ \text{C}$                      | max. 240 W            | max. 240 W            | max. 240 W            |
|                                                                                                                                                     | Short-Time Rating for $t < 90 \text{ s} / T_u \leq 25^\circ \text{C}$ | max. 320 W            | max. 360 W            | max. 360 W            |
|                                                                                                                                                     | Current Derating at $T_u > 40^\circ \text{C}$                         | – 0.5 A / K           | – 0.3 A / K           | – 0.15 A / K          |
| Output Operating Characteristics                                                                                                                    |                                                                       |                       |                       |                       |
| Overall Setting Tolerance at $23 \pm 5^\circ \text{C}$<br>with Reference to 3½ Place Setpoint Display<br>including System Deviation for Load / Line | Voltage                                                               | 0.2 % + 100 mV        | 0.2 % + 150 mV        | 0.2 % + 250 mV        |
|                                                                                                                                                     | Current                                                               | 0.5 % + 55 mA         | 0.5 % + 45 mA         | 0.5 % + 35 mA         |
| Static System Deviation <sup>1)</sup><br>at 100% Load Variation <sup>1)</sup>                                                                       | Voltage                                                               | 25 mV                 | 18 mV                 | 18 mV                 |
|                                                                                                                                                     | Current                                                               | 30 mA                 | 30 mA                 | 15 mA                 |
| Static System Deviation <sup>1)</sup><br>at 10% Line Voltage Variation <sup>1)</sup>                                                                | Voltage                                                               | 5 mV                  | 5 mV                  | 5 mV                  |
|                                                                                                                                                     | Current                                                               | 8 mA                  | 8 mA                  | 5 mA                  |
| Residual Ripple <sup>1)</sup>                                                                                                                       | Voltage (10 Hz ... 10 MHz)                                            | 15 mV <sub>eff</sub>  | 15 mV <sub>eff</sub>  | 15 mV <sub>eff</sub>  |
|                                                                                                                                                     | Current (10 Hz ... 1 MHz)                                             | 50 mA <sub>eff</sub>  | 25 mA <sub>eff</sub>  | 20 mA <sub>eff</sub>  |
| Common-Mode Interference (10 Hz ... 1 MHz)                                                                                                          |                                                                       | 0.5 mA <sub>eff</sub> | 0.5 mA <sub>eff</sub> | 0.5 mA <sub>eff</sub> |
| Settling Time (voltage)<br>with Sudden Load Variations of 10 to 90% $I_{\text{nom}}$ .                                                              | Tolerance                                                             | 40 mV                 | 80 mV                 | 160 mV                |
|                                                                                                                                                     | $\Delta I = 80\%$                                                     | 400 µs                | 200 µs                | 200 µs                |
| Under and Overshooting with<br>Sudden Load Variations of 50 A / ms                                                                                  |                                                                       | 400 mV                | 400 mV                | 800 mV                |
| Response Time (voltage)<br>with Setpoint Change 0 → 100%<br>with Setpoint Change 100% → 0                                                           | Tolerance                                                             | 40 mV                 | 80 mV                 | 160 mV                |
|                                                                                                                                                     | Open-Circuit / Nominal Load                                           | 1 ms / 1 ms           | 1 ms / 1 ms           | 4 ms / 4ms            |
|                                                                                                                                                     | Open-Circuit / Nominal Load                                           | 1 ms / 1 ms           | 1 ms / 1 ms           | 4 ms / 4ms            |
| Response Time (current)<br>with Setpoint Change 0 → 100%<br>with Setpoint Change 100% → 0                                                           | Tolerance                                                             | 200 mA                | 120 mA                | 60 mA                 |
|                                                                                                                                                     | Short-Circuit / Nominal Load                                          | < 5 ms / < 5 ms       | < 5 ms / < 5 ms       | < 10 ms / < 10 ms     |
|                                                                                                                                                     | Short-Circuit / Nominal Load                                          | < 5 ms / < 5 ms       | < 5 ms / < 5 ms       | < 10 ms / < 10 ms     |
| Measurement Value Display (3½ place)                                                                                                                |                                                                       |                       |                       |                       |
| Measuring Resolution                                                                                                                                | Voltage                                                               | 10 mV                 | 100 mV                | 100 mV                |
|                                                                                                                                                     | Current                                                               | 10 mA                 | 10 mA                 | 10 mA                 |
| Measuring Accuracy at $23 \pm 5^\circ \text{C}$<br>with Reference to the respective Measurement Value                                               | Voltage                                                               | 0.2 % + 50 mV         | 0.2 % + 120 mV        | 0.2 % + 120 mV        |
|                                                                                                                                                     | Current                                                               | 0.5 % + 25 mA         | 0.5 % + 30 mA         | 0.5 % + 25 mA         |
| Protective Functions                                                                                                                                |                                                                       |                       |                       |                       |
| Output Overvoltage Protection                                                                                                                       | Threshold                                                             | 25 ± 1 V              | 50 ± 2 V              | 100 ± 4 V             |
| Protection against Pole Reversal – Load Capacity                                                                                                    | Continuous                                                            | 20 A                  | 12 A                  | 6 A                   |
| Reverse Voltage Resistance                                                                                                                          | Continuous                                                            | 40 V                  | 80 V                  | 100 V                 |
| General                                                                                                                                             |                                                                       |                       |                       |                       |
| Power Supply <sup>1)</sup>                                                                                                                          | at Nominal Load                                                       | 230 V~ +10 / –15 %    | 230 V~ +10 / –15 %    | 230 V~ +10 / –15 %    |
|                                                                                                                                                     | in Standby Mode                                                       | 47 ... 63 Hz          | 47 ... 63 Hz          | 47 ... 63 Hz          |
| Power Consumption                                                                                                                                   | at max. Short-Time Power                                              | 510 VA; 350 W         | 500 VA; 340 W         | 500 VA; 340 W         |
|                                                                                                                                                     | at Nominal Load                                                       | 45 VA; 15 W           | 45 VA; 15 W           | 45 VA; 15 W           |
|                                                                                                                                                     | Typical                                                               | 620 VA                | 690 VA                | 690 VA                |
| Efficiency                                                                                                                                          | at Nominal Load                                                       | > 68 %                | > 70 %                | > 70 %                |
| Switching Frequency                                                                                                                                 | in Standby Mode<br>at max. Short-Time Power                           | 200 kHz               | 200 kHz               | 200 kHz               |
| Article Number                                                                                                                                      |                                                                       | K230A                 | K231A                 | K232A                 |

1) Indicated values are increased by a factor of approximately 1.2 within a mains input voltage range of –10% to –15%.

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

### Characteristic Values, 320 W Series

Unless otherwise indicated, all entries represent maximum values and are valid within an operating temperature range of 0 to 50° C, the nominal power range and a line voltage range of 230 V ± 10% after a warm-up period of 30 minutes.

| Description (abbreviated designation)                                                                                                               |                                                                       | SLP 320-32                         |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------|--|--|
| Type                                                                                                                                                |                                                                       | 32 N 32 R 18                       |  |  |
| Nominal Output Data                                                                                                                                 | Voltage Setting Range                                                 | 0 ... 32 V                         |  |  |
|                                                                                                                                                     | Current Setting Range                                                 | 0 ... 18 A                         |  |  |
|                                                                                                                                                     | Continuous Power at $T_u \leq 40^\circ \text{C}$                      | max. 320 W                         |  |  |
|                                                                                                                                                     | Short-Time Rating for $t < 90 \text{ s} / T_u \leq 25^\circ \text{C}$ | max. 430 W                         |  |  |
|                                                                                                                                                     | Current Derating at $T_u > 40^\circ \text{C}$                         | – 0.5 A / K                        |  |  |
| Output Operating Characteristics                                                                                                                    |                                                                       |                                    |  |  |
| Overall Setting Tolerance at $23 \pm 5^\circ \text{C}$<br>with Reference to 3½ Place Setpoint Display<br>including System Deviation for Load / Line | Voltage                                                               | 0.2 % + 150 mV                     |  |  |
|                                                                                                                                                     | Current                                                               | 0.5 % + 50 mA                      |  |  |
| Static System Deviation <sup>1)</sup><br>at 100% Load Variation <sup>1)</sup>                                                                       | Voltage                                                               | 30 mV                              |  |  |
|                                                                                                                                                     | Current                                                               | 40 mA                              |  |  |
| Static System Deviation <sup>1)</sup><br>at 10% Line Voltage Variation <sup>1)</sup>                                                                | Voltage                                                               | 10 mV                              |  |  |
|                                                                                                                                                     | Current                                                               | 20 mA                              |  |  |
| Residual Ripple <sup>1)</sup>                                                                                                                       | Voltage (10 Hz ... 10 MHz)                                            | 30 mV <sub>eff</sub>               |  |  |
|                                                                                                                                                     | Current (10 Hz ... 1 MHz)                                             | 50 mA <sub>eff</sub>               |  |  |
| Common-Mode Interference (10 Hz ... 1 MHz)                                                                                                          |                                                                       | 0.5 mA <sub>eff</sub>              |  |  |
| Settling Time (voltage)<br>with Sudden Load Variations of 10 to 90% $I_{\text{nom}}$ .                                                              | Tolerance                                                             | 64 mV                              |  |  |
|                                                                                                                                                     | $\Delta I = 80\%$                                                     | 200 µs                             |  |  |
| Under and Overshooting with<br>Sudden Load Variations of 50 A / ms                                                                                  | $\Delta I = 80\%$                                                     | 400 mV                             |  |  |
|                                                                                                                                                     |                                                                       |                                    |  |  |
| Response Time (voltage)<br>with Setpoint Change 0 → 100%<br>with Setpoint Change 100% → 0                                                           | Tolerance                                                             | 64 mV                              |  |  |
|                                                                                                                                                     | Open-Circuit / Nominal Load                                           | 1 ms / 1 ms                        |  |  |
| Response Time (current)<br>with Setpoint Change 0 → 100%<br>with Setpoint Change 100% → 0                                                           | Tolerance                                                             | 180 mA                             |  |  |
|                                                                                                                                                     | Short-Circuit / Nominal Load                                          | < 5 ms / < 5 ms                    |  |  |
| Measurement Value Display (3½ place)                                                                                                                |                                                                       |                                    |  |  |
| Measuring Resolution                                                                                                                                | Voltage                                                               | 100 mV                             |  |  |
|                                                                                                                                                     | Current                                                               | 10 mA                              |  |  |
| Measuring Accuracy at $23 \pm 5^\circ \text{C}$<br>with Reference to the respective Measurement Value                                               | Voltage                                                               | 0.2 % + 120 mV                     |  |  |
|                                                                                                                                                     | Current                                                               | 0.5 % + 40 mA                      |  |  |
| Protective Functions                                                                                                                                |                                                                       |                                    |  |  |
| Output Overvoltage Protection                                                                                                                       | Threshold                                                             | 40 ± 1 V                           |  |  |
| Protection against Pole Reversal – Load Capacity                                                                                                    | Continuous                                                            | 20 A                               |  |  |
| Reverse Voltage Resistance                                                                                                                          | Continuous                                                            | 64 V                               |  |  |
| General                                                                                                                                             |                                                                       |                                    |  |  |
| Power Supply <sup>1)</sup>                                                                                                                          | at Nominal Load<br>in Standby Mode                                    | 230 V~ +10 / –15 %<br>47 ... 63 Hz |  |  |
|                                                                                                                                                     | at max. Short-Time Power                                              | 650 VA; 460 W                      |  |  |
| Power Consumption                                                                                                                                   | at Nominal Load                                                       | 50 VA; 15 W                        |  |  |
|                                                                                                                                                     | Typical                                                               | 770 VA                             |  |  |
| Efficiency                                                                                                                                          | at Nominal Load                                                       | > 69 %                             |  |  |
| Switching Frequency                                                                                                                                 | in Standby Mode<br>at max. Short-Time Power                           | 200 kHz                            |  |  |
| Article Number                                                                                                                                      |                                                                       | K234A                              |  |  |

<sup>1)</sup> Indicated values are increased by a factor of approximately 1.2 within a mains input voltage range of –10% to –15%.

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

### Ambient Conditions

|                      |                                                                                  |
|----------------------|----------------------------------------------------------------------------------|
| Vibration Resistance | IEC 68-2-6: 1990<br>10 ... 55 Hz, 0.3 mm, 1 oct. / min.<br>3 x 30 min.           |
| Impact Resistance    | IEC 68-2-27: 1989<br>15 gr., 11 ms, semi-sinusoidal,<br>3 x 6 impacts            |
| Temperature Range    | operation: 0 ... 50° C at > 40° C current<br>derating<br>storage: -25 ... +75° C |
| Humidity             | operation: ≤ 75% relative humidity,<br>no condensation allowed                   |
| Cooling              | with built-in fan<br>air intake: side panel<br>air outlet: rear panel            |

### Power Supply

|                   |                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------|
| Connectors        | In: 10 A IEC inlet plug connector<br>Out: 10 A IEC inlet socket connector,<br>no switch, no fuse |
| Line Voltage      | 230 V~, +10 / -15%, 47 ... 63 Hz                                                                 |
| Power Consumption | see Characteristic Values                                                                        |
| Inrush Current    | max. 50 A <sub>s</sub>                                                                           |
| Mains Fusing      | 1 ea. T 4 A / 250 V (6.3 x 32 mm, UL)<br>internal: 1 ea. T 5 A / 250 V (5 x 20 mm)               |

### Output

|                  |                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connectors       |                                                                                                                                                              |
| Output           | front panel: 2 ea. 4 mm safety jacks<br>rear panel: 6-pin plug-in terminal strip                                                                             |
| Sensor           | rear panel: 6-pin plug-in terminal strip                                                                                                                     |
| Regulator        | primary switched-mode regulator with BET                                                                                                                     |
| Operating Modes  | adjustable constant voltage / constant current source with automatic sharp transition                                                                        |
| Output Isolation | floating output with "protective separation" from the mains inlet, max. allowable potential output-ground: 120 V, capacitance output-ground (housing): 60 nF |

### Electrical Safety

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| Safety Class          | I                                                |
| Overvoltage Category: | II for mains inlet<br>I for output and interface |
| Contamination Level   | 2                                                |
| Earth Leakage Current | typ. 2.5 mA                                      |
| Electrical Isolation  | test voltage                                     |
| Mains / Output-PE     | 1.35 kV~                                         |
| Mains-Output          | 2.7 kV~ (type test: 3.7 kV~7 kV~)                |

### Electromagnetic Compatibility CEM

|                       |                                                                                                                                                                                                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product standard      | EN 61326-1:1997 + A1: 1998                                                                                                                                                                           |
| Interference Emission | EN 55022:1998 class A                                                                                                                                                                                |
| Interference Immunity | EN 61000-4-2:1995 Feature A<br>EN 61000-4-3:1996 + A1:1998<br>Feature B<br>EN 61000-4-4:1995 Feature B<br>EN 61000-4-5:1995 Feature B<br>EN 61000-4-6:1996 Feature B<br>EN 61000-4-11:1994 Feature B |

### Mechanical Design

|                           |                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------|
| Protection                | IP 20 for housing in accordance with<br>IEC 529: 1989<br>EN 60529: 1991<br>VDE 0470-1: 1992        |
| Type                      | benchtop instrument,<br>suitable for rack mounting                                                 |
| Dimensions<br>(W x H x D) | benchtop unit: 221.5 x 102 x 397.5 mm<br>19" rack unit: ½19" x 2 standard height<br>units x 400 mm |
| Weight                    | approx. 2.8 kg                                                                                     |

# SLP KONSTANTER Series SLP 120 / 240 / 320

## Laboratory Power Supplies

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### Scope of delivery

- SLP KONSTANTER 32 N
- Mains power cable with earthing contact plug
- Operating instructions (printed)

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### Accessories

| Description                         | Comment                                                                                                                                                                                                                                                             | Article No. |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 19" Adapter, 1 x 32 N               | Required for mounting 1 type 32 N ... instrument to a 19" rack                                                                                                                                                                                                      | K990A       |
| 19" Adapter, 2 x 32 N               | Required for mounting 2 type 32 N ... instruments to a 19" rack                                                                                                                                                                                                     | K990B       |
| Mains Jumper Cable, 0.4 meters long | The cable is equipped with one 10 A inlet connector plug and one 10 A inlet connector socket.<br>Used for cascading mains power when several instruments are mechanically connected to a single multi-channel unit. The system thus requires only one mains outlet. | K991A       |

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### Order Information

| Description (Abbreviated Designation) | Type         | Article No |
|---------------------------------------|--------------|------------|
| Konstanter SLP 120-20                 | 32 N 20 R 10 | K220A*     |
| Konstanter SLP 120-40                 | 32 N 40 R 6  | K221A*     |
| Konstanter SLP 120-80                 | 32 N 80 R 3  | K222A*     |
| Konstanter SLP 240-20                 | 32 N 20 R 20 | K230A*     |
| Konstanter SLP 240-40                 | 32 N 40 R 12 | K231A*     |
| Konstanter SLP 240-80                 | 32 N 80 R 6  | K232A*     |
| Konstanter SLP 320-32                 | 32 N 32 R 1  | K234A*     |

115 V variant available with appendix -S001

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