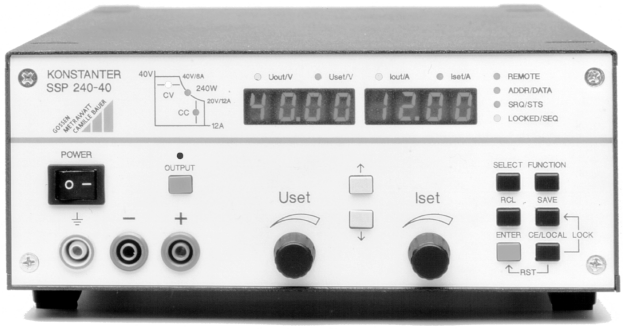
SSP KONSTANTER, Series SSP 120 / 240 / 320
Laboratory Power Supplies

3-348-843-03
3/9.99

- 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
- Minimum residual ripple
- Very good dynamic control parameters
- Addressable RS 232 interface / analog interface as standard equipment
- Optional IEEE 488 interface
- Time controlled, automatic memory recall for the generation of voltage and current sequences with up to 243 interpolation points
- Calibration procedure for menu-driven balancing
- Output ON / OFF function
- Output terminals at front and rear panels
- Master-slave operation for parallel and series connection
- Protection against overvoltage, overcurrent and excessive temperature
- Minimal power loss



QUALITY MANAGEMENT SYSTEM

DQS Certified per
DIN EN ISO 9001 Reg. no. 1262

Description

The SSP KONSTANTER series (single output system power supplies) includes programmable, voltage and current regulated DC power supplies with 120 W, 240 W or 320 W of output power.

They include a microprocessor controlled operating system and are furnished with an addressable RS 232 serial interface as standard equipment. Up to 30 instruments can thus be controlled from a single PC port.

An IEEE 488 interface can be optionally integrated. Both PC interfaces allow for complete control of all instrument functions, and support the querying of measurement values, set-up parameters and instrument conditions.

Manual adjustment of voltage and current is accomplished with two rotary pulse generators with adjustable sensitivity.

Two 4-place multifunction displays allow for the accurate read-out of measurement values (V, A, W), as well as menu-driven parameter adjustments for a multitude of additional functions such as setting range limitation, overvoltage protection, delayed overcurrent shut-down or programmable digital signal inputs and outputs.

Up to 243 settings can be stored to memory and can be recalled either individually or sequentially, e.g. for the generation of specific current or voltage sequences. The advanced circuit technology is capable of essentially load-independent response times of less than 1 ms.

The output parameters can thus be superimposed with AC signals with values up into the kHz range with the analog interface which is furnished as standard equipment.

The measuring function is equipped with an extreme value memory, limit monitoring signals and a hold function.

Applications

Electrical and electronic devices may be subjected to substantial fluctuations from the power supply depending upon where they are used, as well as ambient conditions. This is especially true where stabilization and back-up systems are not used.

A typical example is represented by automotive electrical systems during operation of the starter motor.

It is thus imperative that R&D, production and testing departments assure that electrical equipment is capable of fulfilling all required functions at any point in time under conditions of this sort.

GOSSEN-METRAWATT provides you with support in fulfilling these objectives with the SSP KONSTANTER series SSP 120 / 240 / 320.

SSP-KONSTANTERs are capable of high rates of throughput, especially where automated test systems for routing testing are concerning.
The short response time assures the most accurate possible replication of quickly changing voltage or current characteristics.

This allows for easy testing and simulation of the performance of load components dependent upon dynamic supply voltage.

The integrated calibration procedure and the included calibration report make the SSP KONSTANTER the ideal solution for use in ISO 9000 certified production facilities and test laboratories.

SSP KONSTANTER, Series SSP 120 / 240 / 320
Laboratory Power Supplies

Adjustable Functions

- Voltage and current setpoint values
- Voltage and current limit values (softlimits)
- Output ON and OFF
- Overvoltage protection – threshold
- Overcurrent protection (limiting or shut-down)
- Delay time for overcurrent shut-down
- Power-on condition
- Reset instrument parameters
- Save and recall instrument parameter settings
- Save and recall set-up sequences
- Sequence definition
- Function selection for trigger input
- Function selection for digital control outputs
- Operating parameters for measuring functions (storage of extreme values, limit value monitoring, display resolution)
- Calibration procedure
- Self-test resolution
- Operating parameters for PC interfaces (device address, SRQ masks, data rate etc.)

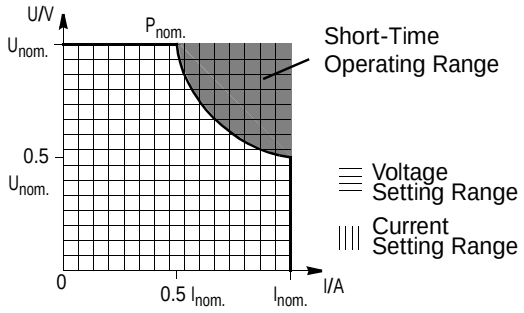
Display Functions

- Prevailing voltage, current and power measurement values
- Minimum and maximum voltage and current measurement values
- Current instrument parameter settings (individual or complete)
- Current operating condition (control type, excessive temperature, busy)
- Events (power failure, excessive temperature, overvoltage, overload, programming error)
- Memory contents
- Device identification
- Calibration date

Protection and Additional Functions

- Sensor terminals equipped with pole reversal protection and automatic activation (auto-sensing)
- Control panel operating elements can be disabled
- Overvoltage protected outputs
- Pole reversal protection at outputs
- Protection against excessive temperature
- Parameter settings memory protected with backup battery
- Master-slave link
- Inrush current limiting
- Temperature controlled fan

Output Working Range



Analog Interface

Connection	11-pin plug connector with screw clamps
Reference Potential	minus pole at output, floating TRG input

Connector Pin Assignments:

PIN	Designation	Function
1	SIG1 OUT	digital, programmable open collector outputs (max. 30 V– / 20 mA)
2	SIG2 OUT	
3	TRG IN –	digital, programmable control input (low: < 1.0 V, high: 4 ... 26 V), floating input
4	TRG IN +	
5	+15 V	auxiliary voltage: +15 V / max. 40 mA reference point connected to –output
6	AGND	
7	U_{set} –	analog, inverted voltage control input (0 ... –5 V corresponds to 0 ... $U_{nom.}$, Ri = 10 kΩ)
8	U_{set}+	analog voltage control input (0 ... +5 V corresponds to 0 ... $U_{nom.}$, Ri = 10 kΩ)
9	I_{set}+	analog current control input (0 ... +5 V corresponds to 0 ... $I_{nom.}$, Ri = 10 kΩ)
10	U-MON	output voltage measurement output (0 ... 10 V corresponds to 0 ... $U_{nom.}$, Ri = 9.8 kΩ
11	I-MON	output current measurement output 0 ... 10 V correspond to 0 ... $I_{nom.}$, Ri = 9.4 kΩ)

Addressable RS 232 Interface

Input	9-pin subminiature socket
Output	9-pin subminiature plug
Operating Mode	half-duplex, asynchronous, XON / XOFF
Data Rate	adjustable from 50 to 19,200 bits / sec.
Device Address	adjustable from 0 to 30, or UNL (un-list)
Max. Setting Rate	approx. 15 settings / sec.
Max. Measuring Rate	approx. 7 measurements / sec.

IEEE 488 Interface (optional)

The optional IEEE 488 interface is shipped as a separate component and can be easily integrated into the instrument.

Connection	24-pin IEEE 488 connector socket	
Interface Functions	SH1	SOURCE HANDSHAKE
	AH1	ACCEPTOR HANDSHAKE
	T6	TALKER
	L4	LISTENER
	SR1	SERVICE REQUEST
	RL1	REMOTE / LOCAL
	DC1	DEVICE CLEAR
	PP1	PARALLEL POLL
	DT1	DEVICE TRIGGER
	C0	NO CONTROLLER FUNCTION
	E1 / 2	OPEN COLLECTOR DRIVER
Codes / Formats	in compliance with IEEE 488.2	
Device Address	adjustable from 0 to 30, or UNL (un-list)	
Max. Setting Rate	approx. 40 settings / sec.	
Max. Meas. Rate	approx. 15 measurements / sec.	

Applicable Regulations and Standards

IEC 1010-1+A1 ('92) EN 61010-1 ('93) VDE 0411-1 ('94)	Safety requirements for electrical equipment for measurement, control and laboratory use
IEC 950+A1+A2 ('93) EN 60950+A1+A2 ('93) VDE 0805+A2 ('94)	Safety requirements for data processing equipment including electric office machines
IEC 529 ('89) EN 60529 ('91) VDE 0470-1 ('92)	Protection provided by enclosures (IP codes)
EN 50081-2 ('94) VDE 0839-81-2 ('94)	Electromagnetic compatibility (EMC) Generic standard for interference immunity – industrial
EN 50082-2 ('96) VDE 0839-82-2 ('96)	Electromagnetic compatibility (EMC) Generic standard for interference immunity – industrial
IEC 68-2-6 ('90)	Vibration resistance
IEC 68-2-27 ('89)	Impact resistance
CISPR 11 ('90) EN 55011 ('91) VDE 0875-11 ('92)	Limit values and measuring procedures for transmitted interference from ISM devices
IEC 1000-4-2 ('95) EN 61000-4-2 ('95) VDE 0847-4-2 ('96)	Electrostatic discharge
IEC 1000-4-3 ('95) ENV 50140 ('95) VDE 0847-3 ('95)	Electromagnetic HF fields
IEC 1000-4-4 ('95) EN 61000-4-4 ('95) VDE 0847-4-4 ('96)	Transient interference – bursts

Auto-Sensing

If the SENSE terminals are connected to the appropriate output terminals, remote sensing is automatically activated.

Max. compensatable voltage drop: 1 V / load conductor

Control Panel Disabling

The operating elements can be disabled by pressing a key, with a command from the PC or with a signal to the trigger input in order to prevent unauthorized operation.

Output Shut-Down

The power output can be switched on and off by pressing a key, with a command from the PC or with a signal to the trigger input (no electrical isolation).

Power-On Condition

Any of the following conditions can be selected for the instrument after mains power has been switched on:

- reset = default settings (0 V, 0 A, output inactive etc.)
- recall = last settings (same as before last disconnect from mains)
- standby = last settings, except with inactive output

Overcurrent Protection)

A selection can be made between one of the following output functions for the use of current limiting:

- OCP off = continuous current limiting (UI characteristic curve)
- OCP on = output is deactivated if current limiting duration exceeds DELAY time
  DELAY time: adjustable from 0.00 to 99.99 sec.

Trigger Selection

The floating trigger input can be set up to control any one of the following functions:

- output = switch the power output on and off
- local lock = disable the control panel
- recall = step by step recall of individual settings from memory
- sequence = start / stop the SEQUENCE function
- minmax = activate and deactivate storage of extreme values to memory
- off = has no effect on instrument settings, although status query is possible via PC interface

Storage of Extreme Measurement Values

The MINMAX function automatically acquires minimum and maximum voltage and current values as they occur, and saves them to memory.

Limit Value Monitoring

This function compares prevailing voltage and/or current values with the selected limit values (HI, LO). If any of the selected limit values are violated, a message is read out to the PC interface or the digital control outputs at the analog interface.

Memory Function

The memory function allows for the storage and recall of instrument settings which are protected with a backup battery. The memory includes three storage areas:

– 10 memory locations for complete instrument settings
– 243 memory locations for the SEQUENCE function (voltage setpoint value USET, current setpoint value ISET, dwell time TSET, signal status SSET)
– 2 memory locations (HI, LO) for measuring function limit monitoring

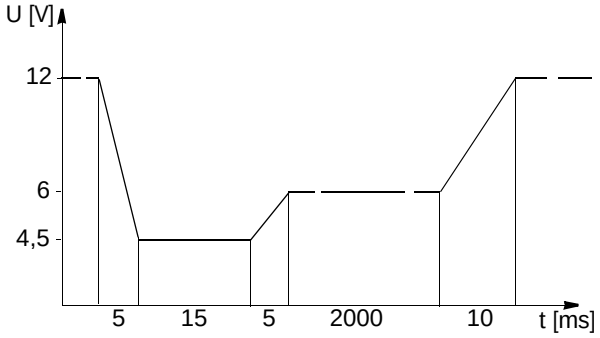
SEQUENCE Function

The SEQUENCE function allows for the automatic recall of settings which have been stored to the SEQUENCE memory.

The SEQUENCE function includes the following parameters:

– START = memory location start address
– STOP = memory location stop address
– REPETITION = number of sequence repetitions (1 to 255, or 0 for continuous repetition)
– TSET = dwell time specific to the memory location (10 ms to 99.99 s)
– TDEF = dwell time independent of the memory location (10 ms to 99.99 s)
– Additional pause, abort, restart

Applications Example:
Generation of a voltage sequence in accordance with DIN 40 839 (automotive electrical system voltage while starting the engine)



Programmable Control Outputs

The analog interface is equipped with two digital control outputs for reading out status messages to external monitoring systems, for switching external components on and off or for the creation of links.

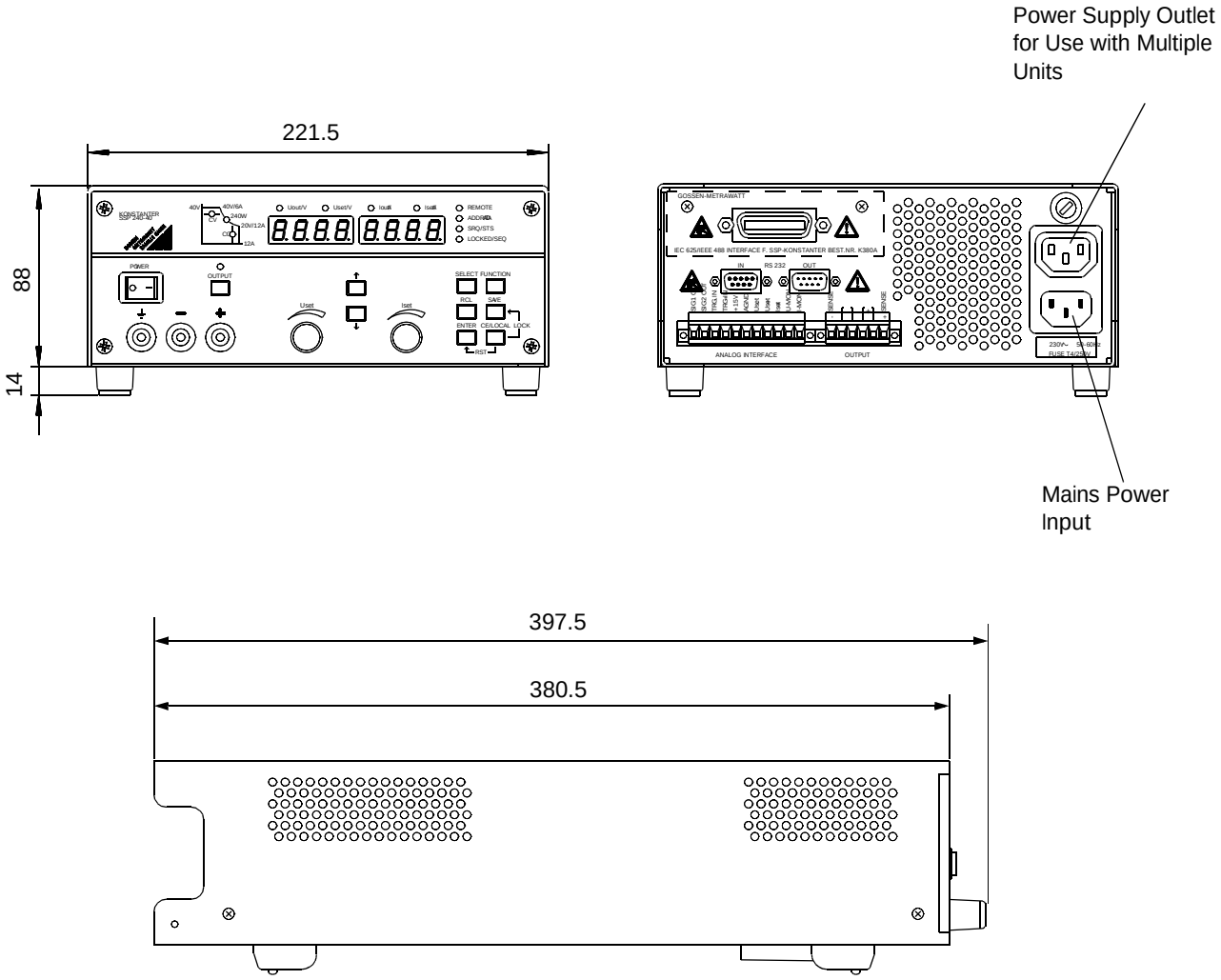
The status of the outputs can be directly defined, or can be set in accordance with the following instrument conditions:

– Output ON / OFF
– Voltage / current regulation
– Running / completed SEQUENCE function
– SSET signal status specific to the SEQUENCE step
– Measuring function limit monitoring

Calibration Procedure

The integrated calibration procedure allows for re-adjustment of setting tolerances and measuring accuracy without opening the instrument. Output parameters including voltage and current offset and upper range value, which are automatically adjusted one after the other and measured with an external precision multimeter, can be entered with the keypad or via the PC interface. The processor permanently stores these data for the correction of internal D-A and A-D converters.

Dimensional Drawing (benchtop instrument)



All dimensions in mm

SSP KONSTANTER, Series SSP 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)		SSP 120-20	SSP 120-40	SSP 120-80
Type		32 N 20 RU 10 P	32 N 40 RU 6 P	32 N 80 RU 3 P
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 Tu ≤ 40° C	max. 120 W	max. 120 W	max. 120 W
	Short-Time Rating for t < 90 s / Tu ≤ 25° C	max. 200 W	max. 240 W	max. 240 W
	Current Derating at Tu > 40° C	– 0.25 A / K	– 0.15 A / K	– 0.07 A / K
Output Operating Characteristics				
Setting Resolution [display (< 10.00 / ≥ 10.00), remote]	Voltage Current	5 mV / 10 mV, 5 mV 2.5 mA	10 mV 2 mA	20 mV 1 mA
Overall Setting Tolerance at 23 ± 5° C including System Deviation for Load / Line	Voltage Current	0.15% + 30 mV 0.4% + 35 mA	0.15% + 40 mV 0.5% + 20 mA	0.15% + 80 mV 0.5% + 10 mA
Static System Deviation [1] at 100% Load Variation [1]	Voltage Current	15 mV 20 mA	10 mV 10 mA	10 mV 10 mA
Static System Deviation [1] at 10% Line Voltage Variation [1]	Voltage Current	5 mV 8 mA	5 mV 5 mA	5 mV 5 mA
Residual Ripple [1]	Voltage (10 Hz ... 10 MHz) Current (10 Hz ... 1 MHz)	10 mV_{rms} 25 mA_{rms}	10 mV_{rms} 20 mA_{rms}	10 mV_{rms} 10 mA_{rms}
Common-Mode Interference (10 Hz ... 1 MHz)		0.5 mA_{rms}	0.5 mA_{rms}	0.5 mA_{rms}
Settling Time (voltage) with Sudden Load Variations of 10 to 90% $I_{nom.}$	Tolerance Δ I = 80%	40 mV 200 µs	80 mV 200 µs	160 mV 200 µs
Under and Overshooting with Sudden Load Variations of 50 A / ms	Δ I = 80%	400 mV	400 mV	800 mV
Response Time (voltage) with Setpoint Change 0 → 100% with Setpoint Change 100% → 0	Tolerance Open-Circuit / Nominal Load Open-Circuit / Nominal Load	40 mV 1 ms / 1 ms 1 ms / 1 ms	80 mV 1 ms / 1 ms 1 ms / 1 ms	160 mV 4 ms / 4 ms 4 ms / 4 ms
Response Time (current) with Setpoint Change 0 → 100% with Setpoint Change 100% → 0	Tolerance Short-Circuit / Nominal Load Short-Circuit / Nominal Load	100 mA < 5 ms / < 5 ms < 5 ms / < 5 ms	60 mA < 5 ms / < 5 ms < 5 ms / < 5 ms	30 mA < 10 ms / < 10 ms < 10 ms / < 10 ms
Measurement Value Display (4-place)				
Measuring Resolution [display (< 10.00 / ≥ 10.00), query]	Voltage Current Power	2 mV / 10 mV, 2 mV 1 mA, 1 mA 0.1 W, 0.1 W	10 mV, 4 mV 1 mA, 0.6 mA 0.1 W, 0.1 W	10 mV, 8 mV 1 mA, 0.5 mA 0.1 W, 0.1 W
Measuring Accuracy at 23 ± 5° C for Values > 0.1% of Nominal Value	Voltage Current Power	0.15% + 30 mV 0.4% + 25 mA 0.55% + 0.5 W	0.15% + 40 mV 0.5% + 15 mA 0.65% + 0.6 W	0.15% + 80 mV 0.5% + 10 mA 0.65% + 0.8 W
Protective Functions				
Output Overvoltage Protection, Threshold	Setting Range Setting Resolution Setting Tolerance	0 ... 25 V 0.1 V 2% + 0.2 V	0 ... 50 V 0.2 V 2% + 0.4 V	0 ... 100 V 0.4 V 2% + 0.8 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 [1]	Line Voltage	230 V~ +10 / –15% 47 ... 63 Hz	230 V~ +10 / –15% 47 ... 63 Hz	230 V~ +10 / –15% 47 ... 63 Hz
Power Consumption	at Nominal Load in Standby Mode at max. Short-Time Power	280 VA, 180 W 45 VA, 15 W 450 VA	280 VA, 170 W 45 VA, 15 W 550 VA	280 VA, 170 W 45 VA, 15 W 550 VA
Efficiency	at Nominal Load	> 67%	> 70%	> 70%
Switching Frequency	Typical	200 kHz	200 kHz	200 kHz
Article Number		K320A	K321A	K322A

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

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)		SSP 240-20	SSP 240-40	SSP 240-80
Type		32 N 20 RU 20 P	32 N 40 RU 12 P	32 N 80 RU 6 P
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 Tu ≤ 40° C	max. 240 W	max. 240 W	max. 240 W
	Short-Time Rating for t < 90 s / Tu ≤ 25° C	max. 400 W	max. 480 W	max. 480 W
	Current Derating at Tu > 40° C	– 0.5 A / K	– 0.3 A / K	– 0.15 A / K
Output Operating Characteristics				
Setting Resolution [display (< 10.00 / ≥ 10.00), remote]	Voltage Current	5 mV / 10 mV, 5 mV 5 mA / 10 mA, 5 mA	10 mV 3.33 mA / 10 mA, 3.33 mA	20 mV 2 mA
Overall Setting Tolerance at 23 ± 5° C including System Deviation for Load / Line	Voltage Current	0.15% + 40 mV 0.5% + 70 mA	0.15% + 45 mV 0.5% + 45 mA	0.15% + 80 mV 0.5% + 25 mA
Static System Deviation [1] at 100% Load Variation [1]	Voltage Current	25 mV 30 mA	18 mV 30 mA	18 mV 15 mA
Static System Deviation [1] at 10% Line Voltage Variation [1]	Voltage Current	5 mV 8 mA	5 mV 8 mA	5 mV 5 mA
Residual Ripple [1]	Voltage (10 Hz ... 10 MHz) Current (10 Hz ... 1 MHz)	15 mV_{rms} 50 mA_{rms}	15 mV_{rms} 25 mA_{rms}	15 mV_{rms} 20 mA_{rms}
Common-Mode Interference (10 Hz ... 1 MHz)		0.5 mA_{rms}	0.5 mA_{rms}	0.5 mA_{rms}
Settling Time (voltage) with Sudden Load Variations of 10 to 90% $I_{nom.}$	Tolerance Δ I = 80%	40 mV 400 µs	80 mV 200 µs	160 mV 200 µs
Under and Overshooting with Sudden Load Variations of 50 A / ms	Δ I = 80%	400 mV	400 mV	800 mV
Response Time (voltage) with Setpoint Change 0 → 100% with Setpoint Change 100% → 0	Tolerance Open-Circuit / Nominal Load Open-Circuit / Nominal Load	40 mV 1 ms / 1 ms 1 ms / 1 ms	80 mV 1 ms / 1 ms 1 ms / 1 ms	160 mV 4 ms / 4 ms 4 ms / 4 ms
Response Time (current) with Setpoint Change 0 → 100% with Setpoint Change 100% → 0	Tolerance Short-Circuit / Nominal Load Short-Circuit / Nominal Load	200 mA < 5 ms / < 5 ms < 5 ms / < 5 ms	120 mA < 5 ms / < 5 ms < 5 ms / < 5 ms	60 mA < 10 ms / < 10 ms < 10 ms / < 10 ms
Measurement Value Display (4-place)				
Measuring Resolution [display (< 10.00 / ≥ 10.00), query]	Voltage Current Power	2 mV / 10 mV, 2 mV 2 mA, 10 mA, 2 mA	10 mV, 4 mV 2 mA / 10 mA, 1.2 mA	10 mV, 8 mV 1 mA, 0.6 mA
Measuring Accuracy at 23 ± 5° C for Values > 0.1% of Nominal Value	Voltage Current Power	0.15% + 40 mV 0.5% + 70 mA 0.65% + 1.4 W	0.15% + 40 mV 0.5% + 25 mA 0.65% + 1 W	0.15% + 80 mV 0.5% + 15 mA 0.65% + 1.2 W
Protective Functions				
Output Overvoltage Protection, Threshold	Setting Range Setting Resolution Setting Tolerance	0 ... 25 V 0.1 V 2% + 0.2 V	0 ... 50 V 0.2 V 2% + 0.4 V	0 ... 100 V 0.4 V 2% + 0.8 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 [1]	Line Voltage	230 V~ +10 / –15% 47 ... 63 Hz	230 V~ +10 / –15% 47 ... 63 Hz	230 V~ +10 / –15% 47 ... 63 Hz
Power Consumption	at Nominal Load in Standby Mode at max. Short-Time Power	550 VA, 360 W 45 VA, 15 W 900 VA	550 VA, 340 W 45 VA, 15 W 1050 VA	550 VA, 340 W 45 VA, 15 W 1050 VA
Efficiency	at Nominal Load	> 67%	> 70%	> 70%
Switching Frequency	Typical	200 kHz	200 kHz	200 kHz
Article Number		K330A	K331A	K332A

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

SSP KONSTANTER, Series SSP 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)		SSP 320-32		
Type		32 N 32 RU 18 P		
Nominal Output Data	Voltage Setting Range	0 ... 32 V		
	Current Setting Range	0 ... 18 A		
	Continuous Power at Tu ≤ 40° C	max. 320 W		
	Short-Time Rating for t < 90 s / Tu ≤ 25° C	max. 480 W		
	Current Derating at Tu > 40° C	– 0.5 A / K		
Output Operating Characteristics				
Setting Resolution [display (< 10.00 / ≥ 10.00), remote]	Voltage Current	10 mV 5 mA / 10 mA, 5 mA		
Overall Setting Tolerance at 23 ± 5° C including System Deviation for Load / Line	Voltage Current	0.15% + 50 mV 0.5% + 70 mA		
Static System Deviation [1] at 100% Load Variation [1]	Voltage Current	30 mV 40 mA		
Static System Deviation [1] at 10% Line Voltage Variation [1]	Voltage Current	10 mV 20 mA		
Residual Ripple [1]	Voltage (10 Hz ... 10 MHz) Current (10 Hz ... 1 MHz)	30 mV_{rms} 50 mA_{rms}		
Common-Mode Interference (10 Hz ... 1 MHz)		0.5 mA_{rms}		
Settling Time (voltage) with Sudden Load Variations of 10 to 90% $I_{nom.}$	Tolerance Δ I = 80%	64 mV 200 µs		
Under and Overshooting with Sudden Load Variations of 50 A / ms	Δ I = 80%	400 mV		
Response Time (voltage) with Setpoint Change 0 → 100% with Setpoint Change 100% → 0	Tolerance Open-Circuit / Nominal Load Open-Circuit / Nominal Load	64 mV 1 ms / 1 ms 1 ms / 1 ms		
Response Time (current) with Setpoint Change 0 → 100% with Setpoint Change 100% → 0	Tolerance Short-Circuit / Nominal Load Short-Circuit / Nominal Load	180 mA < 5 ms / < 5 ms < 5 ms / < 5 ms		
Measurement Value Display (4-place)				
Measuring Resolution [display (< 10.00 / ≥ 10.00), query]	Voltage Current Power	10 mV, 4 mV 2 mA, 10 mA, 2 mA 0.1 W, 0.1 W		
Measuring Accuracy at 23 ± 5° C for Values > 0.1% of Nominal Value	Voltage Current Power	0.15% + 40 mV 0.5% + 70 mA 0.65% + 1.4 W		
Protective Functions				
Output Overvoltage Protection, Threshold	Setting Range Setting Resolution Setting Tolerance	0 ... 40 V 0.2 V 2% + 0.4 V		
Protection against Pole Reversal – Load Capacity	Continuous	18 A		
Reverse Voltage Resistance	Continuous	64 V		
General				
Power Supply [1]	Line Voltage	230 V~ +10 / –15% 47 ... 63 Hz		
Power Consumption	at Nominal Load in Standby Mode at max. Short-Time Power	660 VA, 460 W 50 VA, 15 W		
Efficiency	at Nominal Load	> 70%		
Switching Frequency	Typical	200 kHz		
Article Number		K334A		

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

Ambient Conditions

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

Power Supply

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

Output

Connectors	
Output	front panel: 2 ea. 4 mm safety jacks rear panel: 6-pin plug-in terminal strip
Sensors	rear panel: incl. in output plug connector
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 I for output and interfaces
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~)

Electromagnetic Compatibility (EMC)

Interference Emission	EN 50081-2: 1994 VDE 0839-81-2: 1994
Limit Values and Measuring Procedures for Transmitted Interference from ISM Devices	CISPR 11: 1990 EN 55011: 1991 VDE 0875-11: 1992
Interference Immunity	EN 50082-2: 1996 VDE 0839-82-2: 1996
Electrostatic Discharge	IEC 1000-4-2: 1995 EN 61000-4-2: 1995 VDE 0847-4-2: 1996 severity level 2 for contact discharge, severity level 3 for atmospheric discharge
Electromagnetic HF Fields	IEC 1000-4-3: 1995 ENV 50140: 1995 VDE 0847-3: 1995 10 V / m, no influence
Transient Interference – Bursts	IEC 1000-4-4: 1995 EN 61000-4-4: 1995 VDE 0847-4-4: 1996 severity level 3

Mechanical Design

Protection	IP 20 for housing, as well as mains, output and analog interface terminals, IP 00 for PC interfaces in accordance with IEC 529: 1989 EN 60529: 1991 VDE 0470-1: 1992
Type	benchtop instrument, suitable for rack mounting
Dimensions (W x H x D)	benchtop unit: 221.5 x 102 x 397.5 mm 19" rack unit: ½19" x 2 standard height units x 400 mm
Weight	benchtop unit: approx. 2.8 kg IEEE 488 interface (option): approx. 0.1 kg

SSP KONSTANTER, Series SSP 120 / 240 / 320
Laboratory Power Supplies

Accessories

Mounting

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. 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
RS 232 Bus Cable, 0.4 meters long	For cascading the RS 232 data line when several series SSP 120 / 240 / 320 instruments are mechanically connected to a single multi-channel unit. (extension cable, 9-pin socket / 9-pin plug)	K931B
RS 232 Bus Cable, 2 meters long	For connecting an instrument to an RS 232 interface. (extension cable, 9-pin socket / 9-pin plug)	GTZ 3241 000 R0001
IEEE / IEEE Bus Cable, 2 meters long	For connecting an instrument to the IEEE 488 bus system	K931A

Software

Type	Designation	Article No.
K930D	LabView, device driver for SSP SSP 120, 240, 320 SSP 500, 1000, 2000, 3000	K930D
K930E	LabWindows / CVI, device driver for SSP SSP 120, 240, 320 SSP 500, 1000, 2000, 3000	K930E
K930F	HPVEE / VXI PnP, device driver for SSP SSP 120, 240, 320 SSP 500, 1000, 2000, 3000	K930F

Order Information

Description (abbreviated designation)	Article No.
SSP 120-20	K320A
SSP 120-40	K321A
SSP 120-80	K322A
SSP 240-20	K330A
SSP 240-40	K331A
SSP 240-80	K332A
SSP 320-32	K334A
IEEE 488 Interface for SSP KONSTANTER	K380A

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