Datasheet ZS Series

Model	ZS506-4	
Order No.	10-002-000-04	
Voltage	60 V	
Min. input voltage	1 V	
Current	0.06 A 0.6 A 6 A 60 A	
Continuous power	500 W	
Short-time power [1]	1000 W	

Current setting	0 ... 0.06 A 0 ... 0.6 A 0 ... 6 A 0 ... 6 A
Voltage setting	0 ... 60 V
Resistance setting	33.3 Ohm ... 11111 Ohm (max. 0.06 A) 3.33 Ohm ... 1111 Ohm (max. 0.6 A) 0.33 Ohm ... 111 Ohm (max. 6 A) 0.033 Ohm ... 11.1 Ohm (max. 60 A)
Power setting [2]	0 ... 1 W 0 ... 10 W 0 ... 100 W 0 ... 1000 W
Rise/fall time [3]	60 µs
Load connections [4]	FK15
Zero-Volt option [5]	NV60
Power consumption	50 VA
Noise max. [6]	57 dB(A)
Weight	13 kg
Housing [7]	19 " - 2 HU

1) Level and duration of the peak power, see diagram on page 3
2) The setting range extends max. to the possible peak power.
3) Rise and fall times are defined of 10 % ... 90 % and 90 % ... 10 % of the maximum current. (current mode FAST, tolerance ±20 %)
4) SB4: 4 mm safety socket
BM8: M8 screw fitting
FK15: Flat copper rail 15x5 mm with 4 mm hole and M8 bolt
FK25: Flat copper rail 25x10 mm with 4 mm hole and M10 and M12 bolt
FK40: Flat copper rail 40x12 mm with 4 mm hole and M12 and M16 bolt
5) There is no reverse polarity protection with the zero-volt option.
6) Measured on the front from distance of 1 m
7) 1 HU = 44.45 mm

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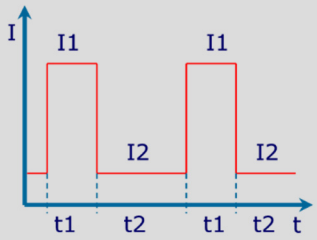
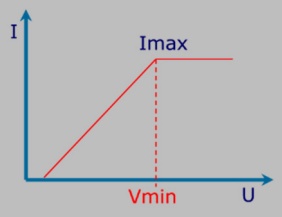
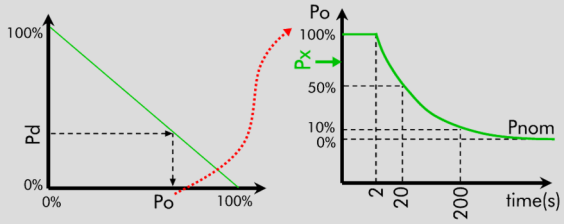
Accuracy of manual setting without preset function		
	of the setting value	of the corresponding range
Voltage	±0.2 %	±0.05 %
Current	±0.2 %	±0.05 %
Accuracy of manual setting via preset function		
	of the setting value	of the corresponding range
Voltage	±0.6 %	±0.05 %
Current	±0.6 %	±0.05 %
Resistance	±1.4 %	±0.3 % of current range
Power	±1.4 %	±0.5 %
Current protection	±1.4 %	±0.3 %
Trigger voltage	±1.4 %	±0.3 %
Accuracy of display		
	of the measured value (actual value)	of the corresponding range
Voltage	±0.2 %	±0.05 % ±1 digit
Current	±0.2 %	±0.05 % ±1 digit
Accuracy of analog control 0 ... 5 V / 0 ... 10 V for current, voltage, power		
	of the setting value	of the corresponding range
Voltage	±0.2 %	±0.1 %
Current	±0.2 %	±0.1 %
Power	±2 %	±0.5 %
Current protection*	±1 %	±0.4 %
Trigger voltage*	±1 %	±0.4 %
* only if option ZS08 is installed Input resistance of analog inputs >10 kΩ GND max. ±2 V with respect to negative load input [1]		
Accuracy of analog measurement outputs 0 ... 10 V for current, voltage, power [2]		
	of analog signal of real value	offset voltage
Voltage	±0.2 %	±15 mV
Current	±0.2 %	±15 mV
Power	±2 %	±30 mV
GND max. ±2 V with respect to negative load input [1] Minimal load 2 kΩ		
External control functions		
Via Analog I/O Interface	• Load on – off • Trigger input and output • Range switching • Operating mode switching • Remote shut-down	
Accuracy of setting Programming via data interface		
	of setting	of the corresponding range
Voltage	±0.2 %	±0.05 %
Current	±0.2 %	±0.05 %
Resistance	±1 %	±0.3 % of current range
Power	±1 %	±0.5 %
Current protection	±1 %	±0.3 %
Trigger voltage	±1 %	±0.3 %
Resolution of setting	16 Bit	
Accuracy of measurement, read out via data interface		
	of the measured value (actual value)	of the corresponding range
Voltage	±0.1 %	±0.05 %
Current	±0.2 %	±0.05 %
Resolution of meas.	18 Bit	
Sampling rate	330 ms, not triggerable	

Accuracy of measurement, read out via data interface Option ZS13		
	of the measured value (actual value)	of the corresponding range
Voltage	±0.15 %	±0.07 %
Current	±0.3 %	±0.07 %
Resolution of meas.	13 Bit	
Sampling rate	minimal 200 µs (into memory), triggerable	
Dynamics		
2 currents and 2 times can be set independently		
Time ranges	100 ms	1000 ms
	of the setting value	of the corresponding range
Accuracy of time setting	±1.4 %	±0.5 %
Input		
Input resistance	>50 kΩ when load input is off	
Input capacity	approx. 2µF / 1,000 W	
Parallel operation	Up to 3 devices in Master-Slave mode (hardware-controlled)	
Minimum voltage (see above)		
Permissible operating voltage: negative load input - housing		
Standard **With ZS06 option**	125 V DC 500 V DC [3]	
Power		
Rated power	up to T_A = 21 °C	
Derating	-1.2 % / °C for T_A > 21 °C	
Overload capacity	see above (short-time power)	



The max. possible overload Po depends on the temperature of the device and therefore on the previous consumed continuous power Pd.
The possible overload duration depends on the value of the overload Px

Protection	
Protective devices	• Over-current and over-power protection • Over-voltage protection up to 110% of rated voltage [4] • Reverse polarity protection with diode up to rated current [5] • Over-temperature cut-off • Transient protection

[1] 500 V with option ZS06
[2] At units with 3 and 4 setting ranges the power-proportional measurement signal is related to the selected setting range.
[3] Apart from Zero-Volt option
[4] 101 % with 800 V and 1200 V devices
[5] No reverse polarity protection with Zero-Volt option

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Operating conditions	
Operating temperature	5 °C … 40 °C
Cooling	Variable-controlled fans
Noise	See above
Supply voltage	115/230 V~ ±10 %, 50 … 60 Hz
Housing	
Dimensions, weight	See above
Color:	
Front panel	RAL7032 (pebble grey)
Side panels, top	RAL7037 (stone grey)
Safety and EMC	
Electrical Safety	DIN EN 61010-1
EMC, CE marking	DIN EN 61326-1 DIN EN 61000-3-2 DIN EN 61000-3-3
Warranty	
Warranty	2 years

Software tools	
H&H ZS Tools	• Load Control • Data Acquisition • Waveform Editor • Basic Communication Tool • MPP Tracking • Battery Test free download from our website
Specifications	
The specified accuracies refer to an ambient temperature of 25 °C ± 5 °C. The specified accuracies are valid when the unit is connected to undisturbed voltages. (Ripple and noise < 0.1 %). At voltages with higher disturbance values the accuracy can change for the worse.	

Available Options

Data Interfaces	
Option (Order-No.)	**Description**
ZS01 [1] (52-130-001-10)	RS-232 + USB Interface
ZS02 [1] (52-123-001-10)	GPIB + RS-232 + USB Interface
ZS03 [2] (52-200-001-10)	GPIB Interface extension, ZS01 required
ZS04-M [2] (52-400-001-10)	System Interface with cable connection for ZS ZS01 or ZS02 required
ZS04-S [1] (52-400-002-10)	System Interface with cable connection for ZS ZS01 and ZS02 are not installed
ZS05-M [2] (52-400-003-10)	System Interface Fiber Optic for ZS ZS01 or ZS02 required
ZS05-S [1] (52-400-004-10)	System Interface Fiber Optic for ZS ZS01 and ZS02 are not installed
ZS13-15 [1] (54-500-001-10)	Data Acquisition Tool - Fast data logging - MPP tracking - Battery capacity test - Exponential starting processes ZS01 or ZS02 required
ZS15 [2] (52-500-001-10)	Ethernet-RS-232 converter ZS01 or ZS02 required
Hardware expansions	
ZS06 [2] (53-100-001-10)	Galvanically isolated Analog I/O Interface
ZS07 [2] (54-001-000-10)	Power I/O Board 8 relay contacts 1x ON, 8 logic inputs ZS01 or ZS02 required
ZS08 [2] (53-200-000-10)	Analog I/O Extension Board (isolated) Analog setting of trigger voltage and current limitation
ZS09 [2] (64-400-000-10)	Heavy-load castors for devices from 5HU
ZS12 [1] (on request)	Zero-Volt option, see above if a Zero-Volt option is available
ZS16 [2] (54-002-000-10)	Temperature Interface Board (0-100 °C) incl. temperature sensor NiCr-Ni class 1 (type K) ZS01 or ZS02 required, ZS13 required
Calibration	
Quality Certificate	Is delivered as standard for every device and confirms that the device is within the stated technical specifications of the manufacturer when delivered.
FCC-N-ZSxx [1] (65-001-000-10)	Factory Calibration Certificate for **new** devices, which documents the traceability to national standards. The FCC meets the requirements according to DIN EN ISO 9000ff
FCC-ZSxx [1] (65-002-000-10)	Factory Calibration Certificate, which documents the traceability to national standards. The FCC meets the requirements according to DIN EN ISO 9000ff

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Subject to technical modifications

[1] Can only be retrofitted or produced by H&H

[2] Can be retrofitted at any time