

SM CREATIVE
ELECTRONICS LTD

PROGRAMMABLE DC CONVERTERS

OUTPUT POWER RANGE: 1.5 kW – 10 kW

High-accuracy programmable power conversion platform for laboratory, test & measurement, industrial processes and demanding applications

Model No. SM-N35522-360-160

Alpha Programmable Converters

Highest accuracy for laboratory and industrial applications

Product Overview

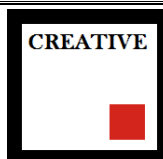
The Alpha programmable converter family combines high accuracy, high stability, fast digital control, low ripple and noise, flexible control modes and extensive protection functions. This datasheet is configured for the 1.5 kW–10 kW output-power range.



Key Feature	Specification
Output Power	1.5 kW – 10 kW
Maximum Output Voltage	Up to 1000 V
Maximum Output Current	Up to 300 A
Polarity	Unipolar; bipolar option with polarity reversal switch
Efficiency	93.5%
Control Modes	CC, CV, CP, Hybrid CCV, Function Generator; Analog Voltage/Current optional
Power Factor	PFC = 1 for high-power configurations >5 kW; PFC = 0.9 below 5 kW
Control Bandwidth	50 kHz (20 μ s)
Local Interface	Very high contrast and resolution, 7-inch touch screen display

1. Electrical Specifications

Parameter	Specification
Output Power	1.5 kW – 10 kW
Maximum Output Voltage	1000 V
Maximum Output Current	300 A
Current Adjustment	0.5–100%
Voltage Adjustment	0.5–100%



Ripple & Noise	10 mVpp @ 1 mVrms, BW 20 MHz*
Switching Frequency	100 kHz (200 kHz output)
Output Insulation	1000 V
Input Voltage	110–480 V
Input Frequency	50–60 Hz
Input Filter	Active
Harmonic Distortion	THD 3%
Maximum AC Current	32 Arms
Inrush Current	Soft start; no inrush current with active PFC Vienna

2. Regulation, Accuracy & Stability

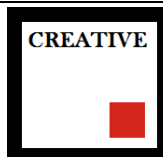
Parameter	Specification
CV Temperature Stability	10 ppm/°C; 70 ppm/°C for Vout >100 V
CV Long-Term Stability	0.004% F.S. over 8 h, after 30 min warm-up
CV Line Regulation	0.01% F.S.; 0.005% F.S. with active PFC Vienna
CV Load Regulation	0.02% F.S. at 0.5–100% load
CV Accuracy	0.02% with active PFC Vienna
CC Temperature Stability	75 ppm/°C after 30 min warm-up
CC Long-Term Stability	0.006% F.S. over 8 h, after 30 min warm-up
CC Line Regulation	0.01% F.S.; 0.005% F.S. with active PFC Vienna
CC Load Regulation	0.01% FS (0.5–100% load)
CC Accuracy	0.06% with active PFC Vienna
Voltage Readback	0.004%; 15-bit resolution
Current Readback	0.001%; 23-bit resolution

3. Control & Operating Modes

Function	Specification
Constant Current (CC)	Standard
Constant Voltage (CV)	Standard
Constant Power (CP)	Standard
Hybrid CCV	Standard
Function Generator	Programmable curves up to 50 Hz
Analog Voltage	0–10 V trigger, optional
Analog Current	0–10 V trigger, optional
Programmable Ramp	0.001 A/s to 3000 A/s or step response
Loop Adjustment	Predefined PIDs and manual user adjustment
Closed-Loop Bandwidth	50 kHz (20 µs)
Remote Sensing	Voltage-drop compensation >2 V
SOA / Autoranging	Automatic or manual voltage/current/power limiting

4. Interface & Communication

Interface	Specification
Display	Very high contrast and resolution, 7-inch touch screen display



Operating System	Android (Linux based)
Ports	3 USB, 1 HDMI, 1 ETHERNET, 1 Wi-Fi , Optional- RS485, RS232 as per request
Digital Protocols	MODBUS TCP/IP, TANGO, EPICS
Control Software	EPowerSys control software
Data Storage	16 GB internal database; >30 years
Real-Time Accuracy	Accuracy displayed in % for present load

5. Protection, Interlocks & Safety

Function	Specification
Input Interlock	1 hardware interlock standard; additional interlocks optional
Input Interlocks	Up to 4 total
Output Interlocks	Up to 3 optional: 1 solid-state fast, 2 mechanical relay
Interlock Isolation	Optoisolated / relay, 1000 V insulation
Thermal Protection	Warning at 85°C; stop interlock at 90°C for applicable monitored sections
Ground Leakage Monitoring	20 mA to 40 nA, optional
Ground Insulation	1000 V when floating
Freewheeling Diode	300 A, optional

6. Mechanical & Environmental Specifications

Parameter	Specification
Dimensions	Full system- 19" Rack and module Width ½ 19-inch rack, standard height 4U (size can be customized as per request to meet 3U); ≈15 kg for 10 kW
Weight	Approximately 15 kg for 12 kW configuration
Operating Temperature	0–55°C
Humidity	95% RH, non-condensing
MTBF	≥150,000 h
Cooling	Forced air or water cooling
Fan Control	Dynamic control by power consumption or internal temperature
Airflow Monitoring	Optional anemometer; warning below 7 m/s
Output Connection	Gold-plated copper busbars; 10 mm × 10 mm

7. Applications

- Test & Measurement Systems
- Laboratory Power and Research Equipment
- Industrial Processes
- Medical Imaging and Treatment Systems
- Renewable Energy Systems



8. Output Power Configurations

Series	Rated Output Power
Alpha 1.5 kW	1.5 kW
Alpha 3 kW	3 kW
Alpha 5 kW	5 kW
Alpha 7.5 kW	7.5 kW
Alpha 10 kW	10 kW

9. Optional Modules

- External 0–10 V Trigger
- Additional Input / Output Interlocks
- Precision Ground Current Monitoring
- Power Lock
- 300 A Freewheeling Diode
- Active Temperature Monitoring and Dynamic Cooling
- Internal Airflow Monitoring
- Floating / Ground Output Reference by Software

■ Power Flow screen

Shows all status control information unified on a single screen

