2+ Series

Programmable DC Power Supplies 200W/400W/600W/800W in 2U Built-in USB, RS-232 & RS-485 Interface

Optional Interface:
LAN
IEEE488.2 SCPI (GPIB) Multi-Drop
Isolated Analog Programming



TDK·Lambda

TDK-Lambda

Features Include:

- High Power Density 200W/400W/600W/800W in 2U: 3.5 Inch (89mm) height
- Wide Range Input (85-265Vac continuous)
- Active Power Factor Correction (0.99 typical)
- Output Voltage up to 100V, Current up to 72A
- Constant Voltage (CV)/(CC) Constant Current auto-crossover
- Built-in RS-232/RS-485 Interface Standard
- Global Commands for Serial RS-232/RS-485 Interface
- Auto-Re-Start / Safe-Start: user selectable
- Last-Setting Memory
- High Resolution 16 bit ADCs & DACs
- · Low Ripple & Noise
- Front Panel Lock selectable from Front Panel or Software
- · Reliable Encoders for Voltage and Current adjustment
- · Parallel Operation with Active Current Sharing, for up to six identical units
- Advanced Parallel Master / Slave. Total Current is programmed and measured via the Master
- External Analog Programming and Monitoring (user selectable 0-5V & 0-10V)
- Reliable Modular and SMT Design
- 19" Rack Mount Capability for ATE and OEM applications
- · Optional Interfaces

Isolated Analog Programming and Monitoring Interface (0-5V/0-10V & 4-20mA) IEEE 488.2 SCPI (GPIB) Multi-Drop

LAN

LabView® and LabWindows® drivers

• Arbitrary functions for:

Automotive or laser simulation / 4 Pre-Programmed Functions

- · Fast Command Processing Time
- · Output Sequencing
- Four-cell Memory Settings
- User Programmable Signal Pins
- Five Year Warranty
- Worldwide Safety Agency Approvals; CE Mark for LVD and EMC regulations





Front Panel Description







- 1. AC ON/OFF Switch
- 2. Air Intake allows zero stacking for maximum system flexibility and power density.*
- 3. Reliable encoder controls Output Voltage and power supply setting.
- 4. Volt Display shows Output Voltage and directly displays and power supply settings.
- 5. Reliable encoder controls Output Current, and power supply setting.
- 6. Current Display shows Output Current and power supply setting.
- 7. Function/Status LEDs:
- AlarmFine ControlPreview SettingsFoldback ModeRemote ModeOutput On
- 8. Pushbuttons allow flexible user configuration
- Coarse and Fine adjustment of Output Voltage/Current and Advanced Parallel Master or Slave
- Preview settings and set Voltage/Current with Output OFF, Front Panel Lockout
- · Set OVP, UVP, UVL Limits
- Set Current Foldback
- Local/Remote Mode and select Address and Baud Rate
- Output ON/OFF and Auto-Start/Safe-Start Mode
- Menu
- 9. Optional front panel output jacks (binding post style, Ø 4mm) for modules up to 60V: 24A Max 10. Optional front panel insulated output sockets (Ø 4mm) for modules up to 60V: 24A Max

^{*} Zero stacking - side-by-side mounting of 6 units in a 19" Rack

Rear Panel Description





- 1. Connector allows (Non-isolated) Analog Program and Monitor and other functions.
- 2. Remote/Local Output Voltage Sense Connections.
- 3. Signal Connector
- 4. RS-232/RS-485 INPUT Remote Serial Programming.
- 5. RS-485 OUTPUT to other Z⁺ Power Supplies.
- 6. USB Interface
- 7. Wide-Range Input 85-265VAC continuous, 47/63Hz with Active Power Factor Correction (0.99 typical) AC Input Connector: IEC320 -C16.
- 8. Exhaust air exits at the back. Allows vertical stacking of units without any separation between units
- 9. Output Connections: Rugged Busbars for 6V up to 100V.
- 10. Optional Interface Position for LAN Interface.
- 11. Optional Interface Position for GPIB Interface (shown) or Isolated Analog Interface.

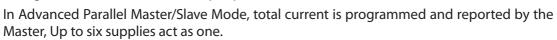


***** Power Benchtop Parallel and Series Configurations

Benchtop Power Supply

Parallel operation - Master/Slave:

Active current sharing allows up to six identical units to be connected in an auto-parallel configuration for six times the output power.





Series operation

Up to two units may be connected in series to increase the output voltage or to provide bipolar output.

Remote Programming via Built-in USB, RS-232 & RS-485 Interface

Standard Serial Interface allows daisy chain control of up to 31 power supplies on the same bus with built-in RS-232 & RS-485 Interface.

Optional Interface: LAN & IEEE488.2 SCPI (GPIB)

Multi-Drop

Allows LAN/IEEE Master to control up to 31 slaves over RS-485 daisy-chain Only the Master needs be equipped with LAN/IEEE Interface













Applications

 Z^{+} series power supplies have been designed to meet the demands of a wide variety of applications.

Test and Measurement

Built-in Last-Setting memory based on Flash Memory no battery or capacitor backup. Simplifies test design and requirements.

Built-in RS-232/RS-485 gives maximum system flexibility along with 0-5V and 0-10V, selectable analog programming.

Wide range of available inputs allows testing of many different devices.

Semiconductor Burn-in

Safe-Start mode ENABLED - to re-start at Output OFF to protect load.

Wide range input (85-265Vac) with Active Power Factor correction rides through input transients easily.

Component Test

High power density, zero stacking and single wire parallel operation, give maximum system flexibility.

Laser Diode

OVP is directly set on Voltage Display, assuring accurate protection settings.

Fast Constant Current response, no over shoot. Current Limit Fold Back assures load is protected from current surges.

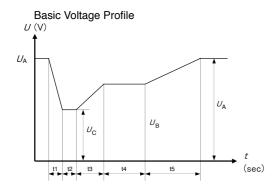
Heater Supplies

Smooth, reliable encoders enhance front panel control. Remote analog programming is user selectable 0-5V or 0-10V.

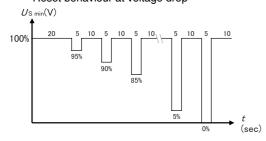
RF Amplifiers and Magnets

Robust design assures stable operation under a wide variety of loads. High linearity in Voltage & Current mode.

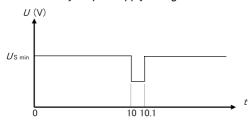
Z⁺ Series Sequence Programming Applications



Reset behaviour at voltage drop



Discontinuities in supply voltage Momentary drop in supply voltage



Options: (200W/400W/600W/800W)

Front Panel Output

Up to 60V Output Module

P/N: Z__--L

P/N: Z__--_L2





Optional front panel output jacks (binding post style, (Ø 4mm) for modules up to 60V: 24A Max -L Optional front panel insulated output sockets (Ø 4mm) for modules up to 60V: 24A Max -L2

Z⁺ Assemblies

Dual Output Housing (for 105mm) 200W/400W/600W/800W Triple Output Housing (for 70mm) 200W/400W/600W/800W P/N: Z-NL200 (same p/n for both Dual & Triple Output Housing)





19" Rack Mounted to 4.8kW

Six units (70mm) can be assembled into 19-Inch rack/2U high Four units (105mm) can be assembled into 19-Inch rack/2U high to meet your configuration requirements.

In cases where the entire rack is not occupied with power units, P/N: Z-BP for 70mm, P/N: Z-WBP for 105mm blank panels can be installed:

P/N: Z-NL100





Power Modules Table

Module Type	200W	400W	600W	800W
0~10V	20A	40A	60A	72A
0~20V	10A	20A	30A	40A
0~36V	6A	12A	18A	24A
0~60V	3.5A	7A	10A	14A
0~100V	2A	4A	6A	8A
19" rack width	1/6 width	1/6 width	1/6 width	1/6 width
19" rack width	1/4 width	1/4 width	1/4 width	1/4 width





Programming Options (Factory Installed)

Digital Programming via IEEE Interface

- IEEE 488.2 SCPI Compliant
- Program Voltage
- Measure Voltage
- Over Voltage setting and shutdown
- Error and Status Messages
- Multi-Drop
- Allows IEEE Master to control up to 31 slaves over RS-485 daisy-chain
- Only the Master needs be equipped with IEEE Interface

Isolated Analog Programming

Four Channels to Program and Monitor Voltage and Current.

Isolation allows operation with floating references in harsh electrical environments.

Choose between programming with Voltage or Current.

Connection via removable terminal block: Phoenix MC1,5/8-ST-3.81.

Voltage Programming, user-selectable 0-5V or 0-10V signal.
 Power Supply Voltage and Current Programming Accuracy ±1%
 Power Supply Voltage and Current Monitoring Accuracy ±1.5%

Current Programming with 4-20mA signal.
 Power Supply Voltage and Current Programming Accuracy ±1%
 Power Supply Voltage and Current Monitoring Accuracy ±1.5%

P/N: IS510

P/N: IEEE

P/N: IS420

LAN Interface P/N: LAN

- VISA & SCPI Compatible
- Address Viewable on Front Panel
- Fixed and Dynamic Addressing
- Compatible with most standard Networks
- TCP / UDP Socket Programming
- LAN Fault Indicators

Program Current

Measure Current

Current Foldback shutdown

- Auto-detects LAN Cross-over Cable
- Fast Startup

AC Cord

Region	Europe	Japan	North America	Israel
Output Power	850W	850W	850W	850W
AC Cords	10A/250Vac L=2m	15A/125Vac L=2m	13A/125Vac L=2m	10A/250Vac L=2m
Wall Plug	INT'L 7/VII	JIS C8303	NEMA 5-15P	SI-32
Power Supply	IEC320-C15	IEC320-C15	IEC320-C15	IEC320-C15
Connector				
Part Number	P/N: Z-E	P/N: Z-J	P/N : Z-U	P/N: Z-I

Communication Cable

RS-232/RS-485 Cable is used to connect the power supply to the PC Controller

Mode	RS-485	RS-232
PC Connector	DB-9F	DB-9F
Communication Cable	Shield Ground L=2m	Shield Ground L=2m
Power Supply Connector	EIA/TIA-568A (RJ-45)	EIA/TIA-568A (RJ-45)
P/N	Z/485-9	Z/232-9

Serial Link Cable*

Daisy-chain up to 31 Z⁺ Series power supplies.

Mode	Power Supply Connector	Communication Cable	P/N
RS-485	EIA/TIA-568A (RJ-45)	Shield Ground	Z/RJ45

^{*} Included with power supply

Power Supply Identification / Accessories How to order

Z	10 -	40-	-	-	
Series	Output Voltage	Output Current	Factory	Output	AC cord Options:
Name	(0~10V)	(0~40A)	Options:	Jacks	Region :
			IEEE		E - Europe
			LAN	L	J - Japan
			IS510	L2	U - North America
			IS420		I - Middle East
					C - China
Factory option			P/N		
USB Interface built-in Standard			-		
RS-232/RS-	-485 Interface built-	in Standard	-		
GPIB Interf	face		IEEE		
Voltage Pr	ogramming Isolated	l Analog Interface	IS510		
Current Programming Isolated Analog Interface			IS420		
LAN Interface			LAN		
Front panel output jacks (binding post style, Ø 4m for modules up to 60V or 24A Max			ım)	L	
Front pane	el insulated output s	ockets (Ø 4mm)			
for module	es up to 60V or 24A I	Max		L2	

Model	Output Voltage (VDC)	Output Current (A)	Output Power (W)
Z10-20		0~20	200
Z10-40	0~10 VDC	0~40	400
Z10-60	0~10 VDC	0~60	600
Z10-72		0~72	720
Z20-10		0~10	200
Z20-20	0~20 VDC	0~20	400
Z20-30	0~20 VDC	0~30	600
Z20-40		0~40	800
Z36-6		0~6	216
Z36-12	0~36 VDC	0~12	432
Z36-18		0~18	648
Z36-24		0~24	864
Z60-3.5		0~3.5	210
Z60-7	0~60 VDC	0~7	420
Z60-10	0~60 VDC	0~10	600
Z60-14		0~14	840
Z100-2		0~2	200
Z100-4	0~100VDC	0~4	400
Z100-6	0~100VDC	0~6	600
Z100-8		0~8	800



2.1 Z⁺200 Series Specifications

				T	1	
MODEL	Z	10-20	20-10	36-6	60-3.5	100-2
1. Rated output voltage(*1)	V	10	20	36	60	100
2. Rated output current (*2)	A W	20	10	6	3.5	2
3. Rated output power	VV	200	200	216	210	200
CONSTANT VOLTAGE MODE	Z	10-20	20-10	36-6	60-3.5	100-2
1. Max. Line regulation (*6)			0.01%	of rated output voltage	ge+2mV	
2. Max. Load regulation (*7)			0.01%	of rated output voltage	ge+2mV	
3. Ripple and noise (p-p, 20MHz) (*8)	mV	50	50	50	50	80
4. Ripple r.m.s. 5Hz~1MHz	mV	5	6	6	7	8
5. Temperature coefficient	PPM/°C	30	PPM/°C from rated ou	utput voltage, followi	ng 30 minutes warm	-up.
6. Temperature stability		0.02% of rated Vo	out over 8hrs. interva	l following 30 minute	s warm-up. Constant	line, load & temp
7. Warm-up drift		Less than	0.05% of rated outpu	it voltage+2mV over	30 minutes following	power on.
8. Remote sense compensation/wire	V	1	1	2	3	5
9. Up-prog. Response time, 0~Vomax.(*9)	mS	15	30	30	50	50
10. Down-prog. response time: Full load (*9)		12	25	30	40	50
Time delay (*17)		210	250	320	380	1200
No load (*10) (*15)(*17)	mS	40	65	85	100	250
No load (*10) (*16)(*17)		200	200	290	310	1100
,			ge to recover within 0	!		
11. Transient response time	mS		et-point: 10~100%, Lo			
12. Hold-up time (*19)		15mSec Typical.			c Typical.	
12111010 0 0 01110 (12)		15mbee Typican		1011150	e typican	
CONSTANT CURRENT MODE	Z	10-20	20-10	36-6	60-3.5	100-2
1. Max. Line regulation (*6)				of rated output curre		
2. Max. Load regulation (*11)			0.01%	of rated output curre	nt+5mA	
3. Load regulation thermal drift		Less tha	n 0.05% of rated out	out current over 30 m	inutes following loa	d change.
4. Ripple r.m.s. 5Hz~1MHz (*12)	mA	25	15	8	4	3
5. Temperature coefficient	PPM/°C	100	OPPM/°C from rated o	utput current, follow	ing 30 minutes warn	n-up.
6. Temperature stability		0.05% of rated lout of	over 8hrs. interval foll	owing 30 minutes wa	arm-up. Constant line	e, load & temperat
7. Warm-up drift			an +/-0.1% of rated or			
			,			
PROTECTIVE FUNCTIONS	Z	10-20	20-10	36-6	60-3.5	100-2
1 Foldback protection			-down when power sup			
1. Foldback protection		Reset by AC input recy	cle in autostart mode or	by OUTPUT button or b	y rear panel ENABLE, or	by communication p
2.0		Inverter Shut dow	n method. Reset by A	C input recycle in aut	tostart mode or by O	UTPUT button or I
2. Over-voltage protection (OVP)			rear panel El	NABLE, or by commu	nication port.	
3. Over -voltage trip point	V	0.5~12	1~24	2~40	5~66	5~110
4. Output under voltage limit (UVL)		Preset by front panel or	communication port. Prev	ents from adjusting Vout b	pelow limit. Does not affe	ct in analog programm
5. Output under voltage protection (UVP)		Output shut-down when power supply output voltage goes below UVP programming. User presetable. Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication po				
6. Over temperature protection				ectable, latched or no		-,
or over temperature protection			030.30.0	etable, lateried of 110	- Taterieur	
IALOG PROGRAMMING AND MONITORING						
Vout voltage programming		0~100%, 0 ⁻	~5V or 0~10V, user se	lectable. Accuracy an	d linearity: +/-0.5% o	of rated Vout.
2. lout voltage programming (*13)		0~100%, 0	~5V or 0~10V, user s	electable. Accuracy a	nd linearity: +/-1% o	f rated lout.
3. Vout resistor programming		0~100%, 0~5/	10Kohm full scale, us	er selectable. Accura	cy and linearity: +/-1	% of rated Vout.
4. lout resistor programming (*13)		0~100%, 0~5/	10Kohm full scale, use	er selectable. Accurac	y and linearity: +/-1.	5% of rated lout.
5. Shut Off (SO) control		By e	lectrical Voltage: 0~0	.6V/4~15V or dry cor	tact, user selectable	logic.
6. Output current monitor (*13)			0~5V or 0~10	V, user selectable. Ac	curacy: +/-1%.	
7. Output voltage monitor			0~5V or 0~10	V, user selectable. Ac	curacv: +/-1%.	
8. Power supply OK signal				V-Fail. 500ohm serie		
9. Parallel operation (*20)		Possible. un	to 6 units in master/s			ce connection
10. Series operation		. 555161c, up		cal units (with externa		
11. CV/CC indicator		Open collector C	C mode: On, CV mod			sink current: 10m
12. Interlock (ILC) control			utput by dry contact (Short:			
13. Local/Remote mode Control			ical signal or Open/S			
14. Local/Remote mode Indicator			nted by 36V zener). Or			
15.Trigger out		iviaximum low leve	l output =0.8V, Minim			gn ievel output =
. 55				e current =16mA, pu		
16.Trigger in			vel input =1.2V, Minir			
			urrent =16mA, positi			
17. Programmed signal 1			, maximum voltage 2			
18. Programmed signal 2		Open collector	, maximum voltage 2	5V,maximum sink cu	rrent 100mA. (Shunt	ed by 27V zener)
					-	
ONT PANEL						
		7				
ļ				ple options with 2 En		
			V	out/lout manual adju	ıst	
			V	out/lout manual adju P/UVL/UVP manual ad	ust djust	
1 Control functions			V	out/lout manual adju	ust djust	
1. Control functions		Co	V	out/lout manual adju P/UVL/UVP manual ad ns - OVP, UVL,UVP, Fo	ist djust Idback, OCP, INT, SO	JSB
1. Control functions		C	V OVI Protection Functio ommunication Functi	out/lout manual adju P/UVL/UVP manual ad ns - OVP, UVL,UVP, Fo	ıst djust Idback, OCP, INT, SO N,IEEE,RS232,RS485,I	JSB
1. Control functions			V OVI Protection Functio ommunication Functi Communication Fu	out/lout manual adju P/UVL/UVP manual ad ns - OVP, UVL,UVP, Fo ions - Selection of LA inctions - Selection of	ist djust Idback, OCP, INT, SO N,IEEE,RS232,RS485,I f Baud Rate, Address	
1. Control functions		Analog Control Fu	V OVI Protection Functio ommunication Functi Communication Functions - Selection V	out/lout manual adju P/UVL/UVP manual ad ns - OVP, UVL,UVP, Fo ions - Selection of LAl Inctions - Selection of oltage/resistive progi	ist djust Idback, OCP, INT, SO N,IEEE,RS232,RS485,I f Baud Rate, Address ramming, 5V/10V, 5K	/10K programmin
		Analog Control Fu Analog Control Func	V OVI Protection Functio ommunication Functi Communication Fu Inctions - Selection Voltions - Selection of Volt	out/lout manual adju P/UVL/UVP manual ar ns - OVP, UVL,UVP, Fo ions - Selection of LAI inctions - Selection of oltage/resistive progitage/Current Monitorir	ist djust Idback, OCP, INT, SO N,IEEE,RS232,RS485,I f Baud Rate, Address ramming, 5V/10V, 5K ng 5V/10V, Output ON	/10K programmin /OFF, Front Panel Lo
Control functions 2. Display		Analog Control Fu Analog Control Func	V OVI Protection Function communication Functi Communication Fu unctions - Selection Vol tions - Selection of Vol Vout: 4 digits, accura	out/lout manual adjup/UVL/UVP manual adjup/UVL/UVP manual adjup/UVL/UVP, Foions - Selection of LAI inctions - Selection of oldage/resistive progratage/Current Monitorircy: 0.5% of rated outp	ist djust Idback, OCP, INT, SO N,IEEE,RS232,RS485,If Baud Rate, Address ramming, 5V/10V, SK ng 5V/10V, Output ON out voltage+/-1 cour	/10K programmin /OFF, Front Panel Lo t.
2. Display		Analog Control Fu Analog Control Func	V OVI Protection Functio communication Fu Communication Fu inctions - Selection V tions - Selection of Volt Vout: 4 digits, accurad	out/lout manual adjup/UVL/UVP manual adjup/UVL/UVP manual adjup/UVL/UVP, Folions - Selection of LAliontions - Selection of oltage/resistive progratage/Current Monitorincy: 0.5% of rated outguy: 0.5% outgu	ist djust Idback, OCP, INT, SO N,IEEE,RS232,RS485,I f Baud Rate, Address ramming, 5V/10V, SV ng 5V/10V, Output ON out voltage+/-1 cour out current+/-1 coun	/10K programmin /OFF, Front Panel Lo t.
		Analog Control Fu Analog Control Func	V OVI Protection Functio communication Functio Communication Fu Inctions - Selection V tions - Selection of Volt Vout: 4 digits, accurat lout: 4 digits, accurac GREEN LEDs: FINE,	out/lout manual adjup/UVL/UVP manual argums - OVP, UVL, UVP, Foions - Selection of LAi old age / Current Monitoring / O.5% of rated output/UVP, Fo.5% of rated output/UVP, PROV, PRO	ist djust djust ldback, OCP, INT, SO N,IEEE,RS232,RS485,I f Baud Rate, Address ramming, 5V/10V, 5K ng 5V/10V, Output ON out voltage+/-1 coun out current+/-1 coun EM, OUTPUT, CV, CC	/10K programmin /OFF, Front Panel Lo t.
2. Display		Analog Control Fu Analog Control Func	V OVI Protection Functio pmmunication Functio Communication Fu Inctions - Selection V Itions - Selection of Volt Vout: 4 digits, accurac Iout: 4 digits, accurac GREEN LEDs: FINE, RED LED: PR	out/lout manual adjup/UVL/UVP manual adjup/UVL/UVP manual adjup/UVL/UVP, Folions - Selection of LAliontions - Selection of oltage/resistive progratage/Current Monitorincy: 0.5% of rated outguy: 0.5% outgu	ist djust ldback, OCP, INT, SO N,IEEE,RS232,RS485,If Baud Rate, Address ramming, 5V/10V, 5K ng 5V/10V, Output ON out voltage+/-1 cour out current+/-1 coun EM, OUTPUT, CV, CC DLD, AC FAIL).	/10K programmin /OFF, Front Panel Lo t.

10



PROGRAMMING AND READBACK (RS232/485,USB, Optional: IEEE, LAN)

 0.05% of rated output voltage
 0.1% of actual +0.1% of rated output current
 0.012% of full scale
 0.012% of full scale
 0.05% of rated output voltage
 0.1% of actual +0.3% of rated output current
 0.012% of full scale
 0.012% of full scale

INPUT CHARACTERISTICS	Z	10-20	20-10	36-6	60-3.5	100-2
1. Input voltage/freq. (*3)		85~265Vac continuous, 47~63Hz, single phase				
2. Maximum Input current 100/200VAC (*4) (*18)		2.65/1.31	2.62/1.29	2.76/1.37	2.69/1.33	2.55/1.26
3. Power Factor (Typ)		>0.99 at 100Vac, >0.98 at 200Vac,100% load				
4. Efficiency (Typ) 100/200VAC (*4) (*18)	%	76/77.5	77/79	79/80.5	79/80.5	79/81
5. Inrush current 100/200VAC (*5)		Less than 15A/30A				

ENVIRONMENTAL CONDITIONS

Operating temperature		0~50°C, 100% load.
2. Storage temperature		-20~85°C
3. Operating humidity	%	20~90% RH (no condensation).
4. Storage humidity	%	10~95% RH (no condensation).
5. Altitude	C. Alaisonda	Maximum 3000m. Derate ambient temp above 2000m.
5. Aititude		Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C.

SAFFTY/FMC

SAFETY/EMC			
1. Applicable standards: Safety			UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1 10V≤Vout≤60V: Output,J1,J2,J3,J4,USB,LAN,IEEE/ISOLATED Analog are Non Hazardous Vout=100V:Output,J1,J2 are Hazardous J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazardous
	EMC		IEC/EN61326-1 (Built to meet EN55022/EN55024)
2. Withstand voltage			10≤Vout≤36V models: Input-Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG-Ground: 707VDC/1min. 60V,100V models: Input-Output&J1,J2: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED Analog: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 1910VDC/1min; Output&J1,J2-Ground: 1380VDC/1min. J3, J4, USB/LAN/IEEE/ISOLATED ANALOG - Ground: 707VDC/1min;
3. Insulation resistance	3. Insulation resistance		More than 100Mohm at 25°C, 70%RH.
4. Conducted emission			IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B
5. Radiated emission			IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A

MECHANICAL

MECHANICAL			
1. Cooling			Forced air cooling by internal fan.
2. Weight	STANDARD K		Less than 1.9Kg.
2. Weight	WIDE BODY	Kg	Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE.
3 Dimensions (MALID)	3 Discossion (M. H. D) STANDARD		H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).
3. Dimensions (WxHxD)	WIDE BODY	mm	H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).
4. Vibration			According to: IEC60068-2-64
5. Shock			Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27

NOTES:

- *1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
- *2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- *3: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).
- *4: Ta=25°C with rated output power.
- *5: Not including EMI filter inrush current, less than 0.2mSec at cold start Ta=25°C
- *6: At 85~132Vac or 170~265VAC, constant load.
- *7: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense.
- *8: Measured with JEITA RC-9131A (1:1) probe.
- *9: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load.
- *10: From 90% to 10% of Rated Output Voltage.
 *11: For load voltage change, equal to the unit voltage rating, constant input voltage.
- *12: For 10V model the ripple is measured at 2V to rated output voltage and rated output current. For other models, the ripple is measured at 10~100%
 - of rated output voltage and rated output current.
- *13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.
- *14: Measured with JEITA RC-9131A (1:1) probe.
- *15: For cases where the time interval between each down programming is longer than Td (time delay).
- *16: For cases where the time interval between each down programming is shorter than Td (time delay).
- *17: Td typical Minimum time between consecutive down programming cycles.
- *18: PS with Lan, IEEE, models decrease efficiency by 0.5% and increase input current by 0.5%. PS with Isolated analog option decreases efficiency by 1.5% and increases input current by 1.5%.
- *19: At rated output power.
- *20: For Parallel operation more than 2 units 5% of total output current is requierd.



2.2 Z⁺400 Series Specifications

	MODEL	7	10.40	20.20	26 12	60.7	100.4
1 Rate	ed output voltage(*1)	Z V	10-40 10	20-20	36-12 36	60-7 60	100-4 100
	ed output current (*2)	A	40	20	12	7	4
	ated output power	W	400	400	432	420	400
CONST	TANT VOLTAGE MODE	Z	10-40	20-20	36-12	60-7	100-4
	x. Line regulation (*6)		10-40		of rated output voltage		100-4
	k. Load regulation (*7)				of rated output voltage		
	nd noise (p-p, 20MHz) (*8)	mV	50	50	50	50	80
	pple r.m.s. 5Hz~1MHz	mV	5	6	6	7	8
5. Ten	nperature coefficient	PPM/°C	30	PPM/°C from rated ou	ıtput voltage, followi	ng 30 minutes warm-	up.
	emperature stability			out over 8hrs. interval			
	7. Warm-up drift		î e	0.05% of rated outpu		1	
	sense compensation/wire	V	1	1	2	3	5
	desponse time, 0~Vomax.(*9)	mS	15	30	30	50	50
10. Down-prog	response time: Full load (*9) Time delay (*17)		10 210	10 250	15 320	30 380	50 1200
	No load (*10) (*15) (*17)	mS	40	65	85	100	250
	No load (*10) (*16) (*17)		200	200	290	310	1100
				age to recover within (
11. Tra	ansient response time	mS		et-point: 10~100%, Lo			
12.	Hold-up time (*19)		15mSec Typical.			Typical.	
	TANT CURRENT MODE	Z		20.20		60-7	100.4
			10-40	20-20	36-12 of rated output curre		100-4
	x. Line regulation (*6) . Load regulation (*11)				of rated output currer		
	regulation thermal drift		l ess tha	n 0.05% of rated outp			change.
	e r.m.s. 5Hz~1MHz (*12)	mA	70	40	15	8	3
	nperature coefficient	PPM/°C		OPPM/°C from rated o			
	emperature stability			over 8hrs. interval foll			_
	7. Warm-up drift			an +/-0.1% of rated or			
DDOT	TECTIVE FUNCTIONS	Z	10-40	20-20	36-12	60-7	100-4
FROI	ECTIVE FONCTIONS			ut-down when power sup			
1. F	oldback protection		Reset by AC input rec	ycle in autostart mode or	by OUTPUT button or by	rear panel ENABLE, or by	communication port.
2. Over-v	voltage protection (OVP)		Inverter Shut dow	n method. Reset by A rear panel El	C input recycle in aut NABLE, or by commui		JIPUI button or by
3. Ove	er - voltage trip point	V	0.5~12	1~24	2~40	5~66	5~110
4. Output	under voltage limit (UVL)		Preset by front panel or communication port. Prevents from adjusting Vout below limit. Does not affect in analog programming.				
5. Output un	der voltage protection (UVP)		Output shut-down when power supply output voltage goes below UVP programming. User presetable. Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication port.				
6. Over	temperature protection			User Sele	ctable. Latched or no	n latched	
ANALOG PROGRAM	MING AND MONITORING						
	voltage programming		0~100%, 0 [,]	~5V or 0~10V, user se	lectable. Accuracy an	d linearity: +/-0.5% o	f rated Vout.
	ltage programming (*13)			0~5V or 0~10V, user s			
	resistor programming		0~100%, 0~5/	10Kohm full scale, us	er selectable. Accurac	y and linearity: +/-19	6 of rated Vout.
4. lout res	istor programming (*13)		0~100%, 0~5/	10Kohm full scale, use	er selectable. Accurac	y and linearity: +/-1.5	% of rated lout.
	nut Off (SO) control		By e	lectrical Voltage: 0~0			ogic.
	ıt current monitor (*13)				V, user selectable. Ac		
	tput voltage monitor		0~5V or 0~10V, user selectable. Accuracy: +/-1%.				
	wer supply OK signal		5	4~5V-OK, 0	V-Fail. 500ohm serie	s resistance.	
	rallel operation (*21)		Possible, up	to 6 units in master/s			e connection.
). Series operation I. CV/CC indicator		Open collected C		al units (with externa		ink current: 10 A
	nterlock (ILC) control			C mode: On, CV mode output by dry contact (Short:			
	I/Remote mode Control			rical signal or Open/SI			
	/Remote mode Indicator			nted by 36V zener). Or			
17. LOCAL				l output =0.8V, Minim			
	15.Trigger out				e current =16mA, pul		,
			Maximum low le				h level input =5V,
	16.Trigger in		Maximum low level input =1.2V, Minimum high level input =3.5V, Maximum high level input =5V, Maximum sink current =16mA, positive edge, trigger: tw =10μs minimum, Tr/Tf =1μs maximum.				
17. P	rogrammed signal 1		Open collector	, maximum voltage 2	5V, maximum sink cu	rrent 100mA. (Shunte	ed by 27V zener)
18. P	rogrammed signal 2		Open collector	, maximum voltage 2	5V, maximum sink cu	rrent 100mA. (Shunte	ed by 27V zener)
FRONT PANEL							
THORTTARLE				Multin	ole options with 2 End	roders	,
	1. Control functions				out/lout manual adju		
					V/UVL /UVP manual a		
					ns - OVP, UVL, UVP, Fo		,
1.			Com	munication Function:			5,USB
					nctions - Selection of		
			Analog Control Fu	unctions - Selection V			10K programming
			Analog Control Func	tions - Selection of Volt	age/Current Monitorin	ng 5V/10V, Output ON/	OFF, Front Panel Lock
	2. Display			Vout: 4 digits, accurad			
	2. <i>Ο</i> ιορίας			lout: 4 digits, accurac			
	3. Indications				MENU, PREV, PROT, R		
					OT (OVP, UVP, OTP, FC		
1 4.	Function buttons		I	FINE, ME	NU, PREV, PROT, REM	, OUTPUT	



PROGRAMMING AND READBACK (RS232/485,USB, Optional: IEEE(*20), LAN)

1. Vout programming accuracy	 0.05% of rated output voltage
2. lout programming accuracy (*13)	 0.1% of actual +0.1% of rated output current
3. Vout programming resolution	 0.012% of full scale
4. lout programming resolution	 0.012% of full scale
5. Vout readback accuracy	 0.05% of rated output voltage
6. lout readback accuracy (*13)	 0.1% of actual +0.3% of rated output current
7. Vout readback resolution	 0.012% of full scale
8. lout readback resolution	 0.012% of full scale

INPUT CHARACTERISTICS	Z	10-40	20-20	36-12	60-7	100-4
1. Input voltage/freq. (*3)			85~265Vac	continuous, 47~63Hz,	single phase	
2. Maximum Input current 100/200VAC (*4) (*18)		5.05/2.47	4.98/2.45	5.25/2.57	5.10/2.50	4.80/2.37
3. Power Factor (Typ)			0.99	at 100/200Vac, 100%	load	
4. Efficiency (Typ) 100/200VAC (*4) (*18)	%	80/82	81/83	83/85	83/85	84/86
5. Inrush current (*5)				Less than 25A		

ENVIRONMENTAL CONDITIONS

Operating temperature		0~50°C, 100% load.
2. Storage temperature		-20~85°C
3. Operating humidity	%	20~90% RH (no condensation).
4. Storage humidity	%	10~95% RH (no condensation).
5. Altitude		Maximum 3000m. Derate ambient temp above 2000m.
		Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C.

CAEETV/EMC

SAFETY/EMC		
1. Applicable standards:	Safety	 UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1 10V≤Vout≤60V: Output,J1,J2,J3,J4,USB,LAN,IEEE/ISOLATED Analog are Non Hazardous Vout=100V:Output,J1,J2 are Hazardous J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazardous
	EMC	 IEC/EN61326-1 (Built to meet EN55022/EN55024)
2. Withstand voltage		 10≤Vout≤36V models: Input-Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG-Ground: 707VDC/1min. 60V,100V models: Input-Output&J1,J2: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED Analog: 4242VDC/1min; Input-Ground: 2828VDC/1min; Output&J1,J2-Ground: 1380VDC/1min; Output&J1,J2-Ground: 1380VDC/1min. J3, J4, USB/LAN/IEEE/ISOLATED ANALOG - Ground: 707VDC/1min;
3. Insulation resistance		 More than 100Mohm at 25°C, 70%RH.
4. Conducted emission		 IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B
5. Radiated emission		 IEC/EN61326-1 Industrial Location - A. FCC part 15-A. VCCI-A

MECHANICAL

MECHANICAL			
1. Cooling			Forced air cooling by internal fan
2 Weight	3 Weight STANDARD		Less than 1.9Kg.
2. Weight WIDE BODY		Kg	Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE
3. Dimensions (WxHxD) STANDARD WIDE BODY		mm	H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing)
		mm	H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing)
4. Vibration			According to: IEC60068-2-64
5. Shock			Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27

- *1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
- *2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- *3: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).
- *4: Ta=25°C with rated output power.
- *5: Not including EMI filter inrush current, less than 0.2mSec.
- *6: At 85~132Vac or 170~265VAC, constant load.
- *7: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense.
- *8: Measured with JEITA RC-9131A (1:1) probe.
- *9: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load.
- *10: From 90% to 10% of Rated Output Voltage.
- *11: For load voltage change, equal to the unit voltage rating, constant input voltage.
- *12: For 10V model the ripple is measured at 2V to rated output voltage and rated output current. For other models, the ripple is measured at 10~100%
 - of rated output voltage and rated output current.
- *13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift. *14: Measured with JEITA RC-9131A (1:1) probe.
- *15: For cases where the time interval between each down programming is longer than Td (time delay).
- *16: For cases where the time interval between each down programming is shorter than Td (Time delay).
- *17: Td typical Minimum time between consecutive down programming cycles.
- *18: PS with Lan, IEEE, models decrease efficiency by 0.25% and increase input current by 0.25%. PS with Isolated analog option decreases efficiency by 0.75% and increases input current by 0.75%.
- *19: At rated output power.
- *20: Max. ambient temperature for using IEEE is 45°C
- *21: For Parallel operation more than 2 units 5% of total output current is requierd.



2.3 Z⁺600 Series Specifications

	25	-	10.50	20.20	26.40	60.40	100 6
	DEL	Z	10-60	20-30	36-18	60-10	100-6
-	out voltage(*1)	V	10	20	36	60	100
	ut current (*2)	Α	60	30	18	10	6
3. Rated ou	itput power	W	600	600	648	600	600
			r	T	r	r	,
	OLTAGE MODE	Z	10-60	20-30	36-18	60-10	100-6
1. Max. Line r	egulation (*6)			0.01%	of rated output voltag	ge+2mV	
2. Max. Load i	regulation (*7)			0.01%	of rated output voltag	ge+2mV	
3. Ripple and noise	e (p-p, 20MHz) (*8)	mV	50	50	50	50	80
4. Ripple r.m.	.s. 5Hz~1MHz	mV	5	5	5	12	15
	ire coefficient	PPM/°C	30	PPM/°C from rated ou	itput voltage, followi	ng 30 minutes warm-	up.
	ture stability			out over 8hrs. interva			
	ı-up drift			0.05% of rated outpu			
	ompensation/wire	V	1	1	2	3	5
	e time, 0~Vomax.(*9)	mS	50	50	50	50	100
10. Down-prog. respo		1113	25	25	25	25	80
To: Down prog. respo	Time delay (*17)		285	425	450	570	1370
	No load (*10) (*15)(*17)	mS	65	110	155	175	375
	No load (*10) (*16)(*17)		280	470	470	500	1200
	No load (*10) (*16)(*17)						
11. Transient	response time	mS		age to recover within (
12 11 11	(*10)		i i	et-point: 10~100%, Lo	cai sense. Less than Tr		na including 100v
12. Hold-u	p time (*18)		15mSec	Typical.		20mSec Typical.	
	JRRENT MODE	Z	10-60	20-30	36-18	60-10	100-6
	egulation (*6)				of rated output curre		
	egulation (*11)				of rated output curre		
	ion thermal drift		Less tha	in 0.15% of rated out	out current over 30 m	inutes following load	change.
4. Ripple r.m.s. 5	5Hz~1MHz (*12)	mA	150	75	25	8	5
5. Temperatu	ıre coefficient	PPM/°C		OPPM/°C from rated o			
6. Temperat	ture stability		0.05% of rated lout	over 8hrs. interval foll	owing 30 minutes wa	rm-up. Constant line	, load & temperature.
7. Warm	n-up drift		10V Model: Less than +/-0.3% of rated output current over 30 minutes following power on. 20V, 36V Model: Less than +/-0.15% of rated output current over 30 minutes following power on. 60V, 100V Models: Less than +/-0.1% of rated output current over 30 minutes following power on			owing power on.	
PROTECTIVE	FUNCTIONS	Z	10-60	20-30	36-18	60-10	100-6
1. Foldback	protection			own when power supp cle in autostart mode or			
2. Over-voltage	protection (OVP)		Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication p Inverter Shut down method. Reset by AC input recycle in autostart mode or by OUTPUT button or b rear panel ENABLE, or by communication port.			JTPUT button or by	
3. Over -volta	age trip point	V	0.5~12	1~24	2~40	5~66	5~110
	voltage limit (UVL)		Preset by front panel or	communication port. Prev	ents from adjusting Vout b	elow limit. Does not affect	in analog programming.
5. Output under voltage protection (UVP)			Output shut-down when power supply output voltage goes below UVP programming. User presetable. Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication p				g. User presetable.
6. Over temperature protection					ctable. Latched or no		·
ANALOG PROGRAMMING A							
	programming		,	~5V or 0~10V, user se			
	ogramming (*13)		0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-1% of rated lout. 0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1% of rated Vout.				
	r programming						
	ogramming (*13)			10Kohm full scale, use			
	(SO) control		By 6	electrical Voltage: 0~0			ogic.
	nt monitor (*13)				V, user selectable. Ac		
	ltage monitor				V, user selectable. Ac		
	ply OK signal						
	9. Parallel operation (*20)		Possible, up	to 6 units in master/s			e connection.
	operation				al units (with externa		
11. CV/CC	indicator			C mode: On, CV mod			
	(ILC) control		Enables/Disables the PS output by dry contact (Short: On, Open: Off, Source current: less than 0.5mA). Ena/Dis is activated by front panel.				
		rical signal or Open/S					
14. Local/Remot	e mode Indicator		Open collector (shu	nted by 36V zener). Or	n (0~0.6V, 10mA sink c	urrent max.)-Remote.	Off-Local (30V max.).
15.Trig	15.Trigger out		Maximum low leve	l output =0.8V, Minin Maximum sourc	num high level outpu e current =16mA, pul		gh level output =5V,
16.Triç	gger in			evel input =1.2V, Minir current =16mA, positi	num high level input	=3.5V, Maximum hig	
17. Program	med signal 1			, maximum voltage 2			
	med signal 2						
18. Programmed signal 2 Open collector, maximum voltage 25V, maximum sink current 100mA. (Shunted by 27V zener)				,			

14



FRONT PANEL

THOMTTANLE		
		Multiple options with 2 Encoders
		Vout/lout manual adjust
		OVP/UVL /UVP manual adjust
1. Control functions		Protection Functions - OVP, UVL, UVP, Foldback, OCP, INT, SO
1. Control functions		Communication Functions - Selection of LAN,IEEE (*19), RS232,RS485,USB
		Communication Functions - Selection of Baud Rate, Address
		Analog Control Functions - Selection Voltage/resistive programming, 5V/10V, 5K/10K programming
		Analog Control Functions - Selection of Voltage/Current Monitoring 5V/10V, Output ON/OFF, Front Panel Lock.
2. Display		Vout: 4 digits, accuracy: 0.5% of rated output voltage+/-1 count.
2. Display		lout: 4 digits, accuracy: 0.5% of rated output current+/-1 count.
3. Indications		GREEN LEDs: FINE, MENU, PREV, PROT, REM, OUTPUT, CV, CC
		RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).
4. Function buttons		FINE, MENU, PREV, PROT, REM, OUTPUT

PROGRAMMING AND READBACK (RS232/485,USB, Optional: IEEE(*19), LAN)

1. Vout programming accuracy	 0.05% of rated output voltage
2. lout programming accuracy (*13)	 0.1% of actual +0.1% of rated output current
3. Vout programming resolution	 0.012% of full scale
4. lout programming resolution	 0.012% of full scale
5. Vout readback accuracy	 0.05% of rated output voltage
6. lout readback accuracy (*13)	 0.1% of actual +0.3% of rated output current
7. Vout readback resolution	 0.012% of full scale
8. lout readback resolution	 0.012% of full scale

INPUT CHARACTERISTICS		10-72	20-40	36-24	60-14	100-8
1. Input voltage/freq. (*3)			85~265Vac	continuous, 47~63Hz, s	single phase	
2. Maximum Input current 100/200VAC		8.9/4.40	9.60/4.70	9.40/4.60	10.00/4.90	9.05/4.60
3. Power Factor (Typ)			0.9	9 at 100/200Vac, 100%	load	
4. Efficiency (Typ) 100/200VAC (*4)	7.	81/83	84/86	85/87	85/87	85/87
5. Inrush current (*5)				Less than 25A		

ENVIRONMENTAL CONDITIONS

ENVIRONMENTAL CONDITIONS		
1. Operating temperature		0~50°C, 100% load.
2. Storage temperature		-20~85°C
3. Operating humidity	7.	20~90% RH (no condensation).
4. Storage humidity	7.	10~95% RH (no condensation).
5. Altitude		Maximum 3000m. Derate ambient temp above 2000m. Operating: Maximum ambient temperature. From 2000m up to 3000m Ambient temperature 40°C

SAFETY/EMC

SAFETY/EMIC					
1. Applicable standards:			UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1 10V≤Vout≤60V: Output,J1,J2,J3,J4,USB,LAN,IEEE/ISOLATED Analog are Non Hazardous Vout=100V:Output,J1,J2 are Hazardous J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazardous		
			· · · · · · · · · · · · · · · · · · ·		
	EMC		IEC61326-1 (Built to meet EN55022/EN55024)		
	2. Withstand voltage		10≤Vout≤36V models: Input-Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-Ground: 2828VDC/1min.		
			Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG-Ground: 1000VDC/1min.		
2. Withstar			60V,100V models: Input-Output&J1,J2: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED Analog: 4242VDC/1min; Input-Ground: 2828VDC/1min.		
			Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG :1910VDC/1min; Output&J1,J2-Ground: 1380VDC/1min.		
			J3, J4, USB/LAN/IEEE/ISOLATED ANALOG - Ground: 1000VDC/1min;		
3. Insulation	3. Insulation resistance		More than 100Mohm at 25℃, 70%RH.		
4. Conducte	4. Conducted emission		IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B		
5. Radiated	5. Radiated emission		IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A		
5. Radiated emission			EN55022B, FCC part 15-B, VCCI-B		

MECHANICAL

MECHANICAL			
1. Cooling			Forced air cooling by internal fan.
12 Weight	STANDARD	Kg	Less than 2.5Kg.
	WIDE BODY		Less than 3.0Kg. Wide body with Isolated analog or Binding post or IEEE.
13 Dimensions (WyHyD)	STANDARD	ma ma	H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).
	WIDE BODY	mm	H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).
4. Vibration			According to:IEC60068-2-64
5. Shock			Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC600068-2-27

- *1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
 *2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- *3: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).
- *4: Ta=25°C with rated output power.
 *5: Not including EMI filter inrush current, less than 0.2mSec.
 *6: At 85~132Vac or 170~265VAC, constant load.
- *7: From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense. *8: Measured with JEITA RC-9131A (1:1) probe.
- *9: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load.

- *10: From 90% to 10% of Rated Output Voltage.
 *11: For load voltage change, equal to the unit voltage rating, constant input voltage.
 *12: For 10V model the ripple is measured at 2V to rated output voltage and rated output current. For other models, the ripple is measured at 10~100%
- of rated output voltage and rated output current.

 *13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.
- *14: Measured with JEITA RC-9131A (1:1) probe.
- *15: For cases where the time interval between each down programming is longer than Td (time delay).
 *16: For cases where the time interval between each down programming is shorter than Td (time delay).
 *17: Td typical (±20%) Minimum time between consecutive down programming cycles.
- *18: PS with isolated analog option decreases efficiency by 0.5% and increases input current by 0.5% *19: For Parallel operation more than 2 units 5% of toatal output current is requierd.



2.4 Z⁺800 Series Specifications

	MODEL	Z	10-72	20-40	36-24	60-14	100-8
1.0-	ated output voltage(*1)	V	10-72	20-40	36	60	100-8
1. No		-	72	40			
2. Rated output	Vin ≥ 100Vac, Ta ≤ 50°C	A			24	14	8
current (*2)(*21)	85Vac ≤ Vin < 100Vac, Ta ≤ 40°C	A	72	40	24	14	8
. ,, ,	85Vac ≤ Vin < 100Vac, 40°C < Ta ≤ 50°C	A	66	36	20	12.5	7.5
3. Rated output	Vin ≥ 100Vac, Ta ≤ 50°C	W	720	800	864	840	800
power	85Vac ≤ Vin < 100Vac, Ta ≤ 40°C	W	720	800	864	840	800
p	85Vac ≤ Vin < 100Vac, 40°C < Ta ≤ 50°C	W	660	720	720	750	750
CON	CTANT VOLTACE MODE	7	10.72	20.40	26.24	60.14	100.0
	STANT VOLTAGE MODE	Z	10-72	20-40	36-24	60-14	100-8
	lax. Line regulation (*6)				of rated output voltage		
	ax. Load regulation (*7)				of rated output voltag		T
	and noise (p-p, 20MHz) (*8)	mV	50	50	50	60	80
4. R	lipple r.m.s. 5Hz~1MHz	mV	5	5	5	12	15
5. Te	emperature coefficient	PPM/°C	30	PPM/°C from rated ou	itput voltage, followi	ng 30 minutes warm-	up.
6.	Temperature stability		0.05% of rated V	out over 8hrs. interval	following 30 minute	s warm-up. Constant	line, load & temp.
	7. Warm-up drift		Less than	0.05% of rated outpu	t voltage+2mV over :	30 minutes following	power on.
8 Remot	te sense compensation/wire	V	1	1	2	3	5
	Response time, 0~Vomax.(*9)	mS	50	50	50	50	100
	og. response time: Full load (*9)	1113	25	25	25	25	80
TO. DOWN-pro	Time delay (*17)		285	425	450	570	1370
		mS					
	No load (*10) (*15) (*17)		65	110	155	175	375
	No load (*10) (*16) (*17)		280	470	470	500	1200
11 T	ransient response time	mS		age to recover within (
	ransient response time	1113	current. Output s	set-point: 10~100%, Lo			nd including 100V
12	2. Hold-up time (*18)			10mSec	Typical. Rated outpu	it power.	
				,			
CON	STANT CURRENT MODE	Z	10-72	20-40	36-24	60-14	100-8
1. M	lax. Line regulation (*6)			0.01%	of rated output curre	nt+2mA	
	ax. Load regulation (*11)				of rated output curre		
			For 10V: Les	s than 0.15% of rated			load change.
3. Load	d regulation thermal drift			: Less than 0.1% of rat			
4 Rinn	ole r.m.s. 5Hz~1MHz (*12)	mA	180	100	31	28	12
	emperature coefficient	PPM/°C		0PPM/°C from rated o			
	Temperature stability			over 8hrs. interval foll			
0.	Temperature stability						
	7. Warm-up drift		10V model: Less tr	nan +/-0.3%, 20V mod			ess than +/-0.1% of
				rated output curre	nt over 30 minutes fo	ollowing power on.	
DDC	OTECTIVE ELINICATIONS	7	10.72	20.40	26.24	60.14	100.0
PRO	OTECTIVE FUNCTIONS	Z	10-72	20-40	36-24	60-14	100-8
1	Foldback protection			wn when power supp			
	Totaback protection		Reset by AC input recy	ycle in autostart mode or	by OUTPUT button or by	rear panel ENABLE, or b	y communication port.
2.0	(0)(0)		Inverter Shut dow	n method. Reset by A	C input recycle in aut	ostart mode or by Ol	JTPUT button or by
2. Over	r-voltage protection (OVP)			rear panel El	NABLE, or by commu	nication port.	•
3.0	ver - voltage trip point	V	0.5~12	1~24	2~40	5~66	5~110
				el or communication			
4. Outpu	ut under voltage limit (UVL)		Treser by from pair		analog programmin		iiiii. Does not aneet
			Output shut-down	n when power supply o			ag Hear procetable
5. Output u	inder voltage protection (UVP)			rcle in autostart mode or			
6 Ove	r temperature protection		Nescriby Ne input recy				by communication port
6. Over temperature protection User Selectable. Latched or non latched							
ANALOG PROGRAMMING AND MONITORING							
1. Vo.	ut voltage programming		0~100%, 0-	~5V or 0~10V, user se	lectable. Accuracy an	d linearity: +/-0.5% o	f rated Vout.
	roltage programming (*13)			0~5V or 0~10V, user s			
	ut resistor programming			/10Kohm full scale, us			
	esistor programming (*13)			10Kohm full scale, use			
			_				
	Shut Off (SO) control		I By €	electrical Voltage: 0~0			ogić.
	put current monitor (*13)				V, user selectable. Ac		
	Output voltage monitor				V, user selectable. Ac		
	ower supply OK signal				V-Fail. 500ohm serie		
	Parallel operation (*20)		Possible, up	to 6 units in master/s			e connection.
	10. Series operation				al units (with externa		
	11. CV/CC indicator		Open collector. C	C mode: On, CV mode	e: Off. Maximum volt	age: 30V, maximum s	ink current: 10mA
12	Interlock (ILC) control		Enables/Disables the	PS output by dry cont	act (Short: On, Open: 0	Off, Source current: less	than 0.5mA). Ena/Di
					activated by front pan		
	cal/Remote mode Control			rical signal or Open/Sl			
14. Loca	al/Remote mode Indicator		Open collector (shu	nted by 36V zener). Or	n (0~0.6V, 10mA sink c	urrent max.)-Remote.	Off-Local (30V max.).
	15 Trigger out			el output =0.8V, Minin			
	15.Trigger out			Maximum source	e current =16mA, pul	se =20us Typical.	•
	16.Trigger in			evel input =1.2V, Minii	mum high level input	=3.5V, Maximum high	
				current =16mA, positi			
17.	Programmed signal 1		Open collector	, maximum voltage 2	5V, maximum sink cu	rrent 100mA. (Shunte	d by 27V zener)
18.	Programmed signal 2		Open collector	, maximum voltage 2	5V, maximum sink cu	rrent 100mA. (Shunte	d by 27V zener)
FRONT PANEL							
				Multin	ole options with 2 En	coders	
					out/lout manual adju		
					/UVL/UVP manual adju		
	1. Control functions				ns - OVP, UVL, UVP, Fo		
			Com	munication Function	s - Selection of LAN,IE	RS232,RS48, (*19)	5,USB
				Communication Fu	nctions - Selection of	Baud Rate, Address	
			Analog Control Fi	unctions - Selection V	oltage/resistive progr	amming, 5V/10V, 5K/	10K programming
				tions - Selection of Volt			
			L'anaiog Contion FullCi	aona aciection on voil	age/ Carretti MOHILOH	ig 5 v / 10 v , Output OIV/	OLI, LIGHT AHEI LOCK

_____ 16 -



FRONT PANEL

	2. Display		Vout: 4 digits, accuracy: 0.5% of rated output voltage+/-1 count.				
			lout: 4 digits, accuracy: 0.5% of rated output current+/-1 count.				
	2		GREEN LEDs: FINE, MENU, PREV, PROT, REM, OUTPUT, CV, CC				
	3. Indications		RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).				
4. Function buttons			FINE, MENU, PREV, PROT, REM, OUTPUT				

PROGRAMMING AND READBACK (RS232/485,USB, Optional: IEEE(*20), LAN)

1. Vout programming accuracy		0.05% of rated output voltage				
2. lout programming accuracy (*1	3)	0.1% of actual +0.1% of rated output current				
3. Vout programming resolution		0.012% of full scale				
4. lout programming resolution		0.012% of full scale				
5. Vout readback accuracy		0.05% of rated output voltage				
6. lout readback accuracy (*13)		0.1% of actual +0.3% of rated output current				
7. Vout readback resolution		0.012% of full scale				
8. lout readback resolution		0.012% of full scale				
INPUT CHARACTERISTICS	Z	10-72	20-40	36-24	60-14	100-8

INPUT CHARACTERISTICS	Z	10-72	20-40	36-24	60-14	100-8
1. Input voltage/freq. (*3)		85~265Vac continuous, 47~63Hz, single phase				
2. Maximum Input current 100/200VAC (*4)		9.00/4.45	9.65/4.75	10.30/5.10	10.00/4.95	9.50/4.7
3. Power Factor (Typ)		0.99 at 100Vac, 100% load / 0.98 at 200Vac, 100% load				
4. Efficiency (Typ) 100/200VAC (*4)		81/83	84/86	85/87	85/87	85/87
5. Inrush current (*5)				Less than 30A		

ENVIRONMENTAL CONDITIONS

ERVIRONMENTAL CONDITIONS						
Operating temperature		0~50°C, 100% load.				
2. Storage temperature		-20~85°C				
3. Operating humidity	%	% 20~90% RH (no condensation).				
4. Storage humidity	%	% 10~95% RH (no condensation).				
5. Altitude		Maximum 3000m. F	Maximum 3000m. From 2000m up to 3000m, max. Ambient temperature 40°C and rated output current according to the table below:			
	Z	10-72	20-40	36-24	60-14	100-8
Rated output current at 100≤Vin≤265Vac	Α	72	40	24	14	8
Rated output current at 85≤Vin<100Vac	Α	66	36	20	12.5	7.5

SAFETY/EMC

SAFET T/EIVIC		
1. Applicable standards:	Safety	 UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1 10V≤Vout≤60V: Output,J1,J2,J3,J4,USB,LAN,IEEE/ISOLATED Analog are Non Hazardous Vout=100V:Output,J1,J2 are Hazardous J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazardous
	EMC	 IEC/EN61326-1 (Built to meet EN55022/EN55024)
2. Withstand voltage		 10≤Vout≤36V models: Input-Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG-Ground: 707VDC/1min. 60V,100V models: Input-Output&J1,J2: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED Analog: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output & J1,J2-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 1910VDC/1min; Output&J1,J2-Ground: 1380VDC/1min. J3, J4, USB/LAN/IEEE/ISOLATED ANALOG - Ground: 707VDC/1min;
3. Insulation resistance		 More than 100Mohm at 25°C, 70%RH.
4. Conducted emission		 IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B
5. Radiated emission		 IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A

MECHANICAL

MECHANICAL					
1. Cooling			Forced air cooling by internal fan		
STANDARD		Kg	Less than 2.1Kg.		
2. Weight	WIDE BODY	Kg	Less than 2.6Kg. Wide body with Isolated analog or Binding post or IEEE		
2 0: (W II 0)	STANDARD	mm	H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing)		
3. Dimensions (WxHxD) WIDE BODY		mm	H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing)		
4. Vibration			According to: IEC60068-2-64		
5. Shock			Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27		

NOTES:

- *1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
- Minimum current is guaranteed to maximum 0.2% of rated output current.
- For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).
- Ta=25°C with rated output power.
- Not including EMI filter inrush current, less than 0.2mSec.
- At 85~132Vac or 170~265VAC, constant load.
- From No-Load to Full-Load, constant input voltage. Measured at the sensing point in Remote Sense. Measured with JEITA RC-9131A (1:1) probe.
- From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load.
- *10: From 90% to 10% of Rated Output Voltage.
- *11: For load voltage change, equal to the unit voltage rating, constant input voltage.
- *12: For 10V model the ripple is measured at 2V to rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current.
- *13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift. *14: Measured with JEITA RC-9131A (1:1) probe.

- *15: For cases where the time interval between each down programming is longer than Td (time delay). *16: For cases where the time interval between each down programming is shorter than Td (Time delay).
- *17: Td typical Minimum time between consecutive down programming cycles.
- *18: At rated output power.
- *19: Max. ambient temperature for using IEEE is 45°C
- *20: For Parallel operation more than 2 units 5% of toatal output current is requierd.
- *21: Refer to Fig.2-1 below

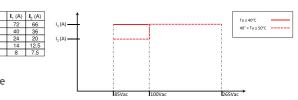
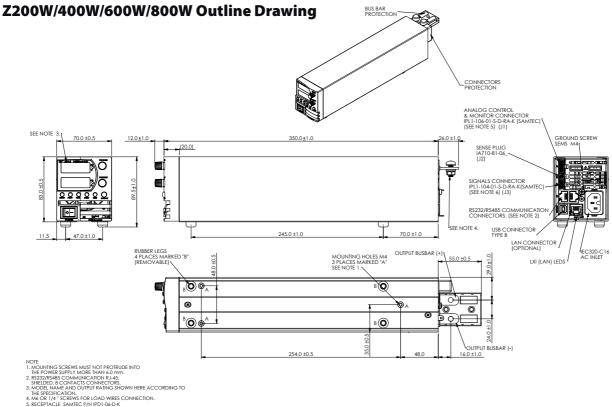
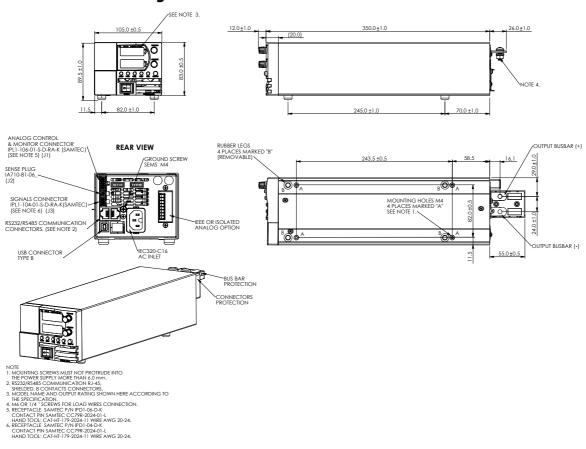


Fig. 2-1: Z⁺800 Rated Output Current Vs. Line Voltage and Ambient Temperature





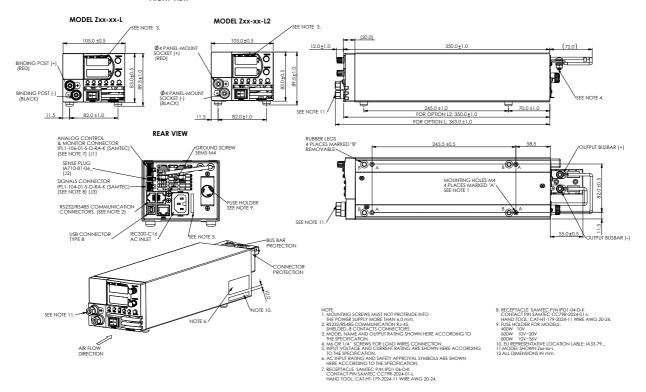
Z200W/400W/600W/800W Optional IEEE, Isolated Analog **Interface Outline Drawing**



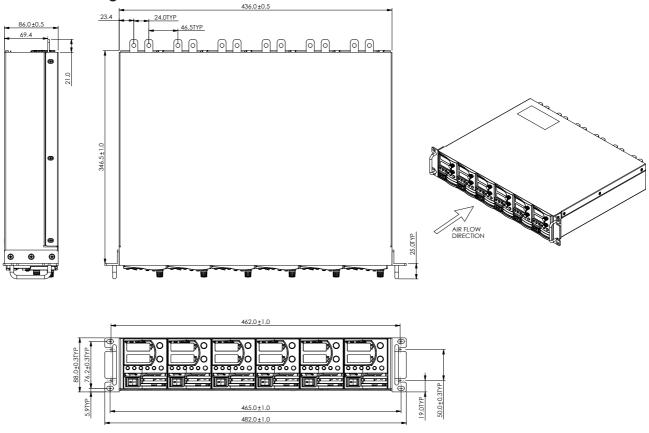


Z200W/400W/600W/800W Front Panel Output Binding Post/Socket Outline Drawing L/L2

FRONT VIEW



19" Rack Housing for Z*200W/400W/600W/800W



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