2+ Series

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

Optional Interface:

LXI Compliant LAN
IEEE488.2 SCPI (GPIB) Multi-Drop
Isolated Analog Programming



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 75A
- 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
- Variable Fan Speed Control
- 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
- Compliant LAN
- LabView® and LabWindows® drivers
- Five Year Warranty
- Worldwide Safety Agency Approvals; CE Mark for LVD and EMC Regulations



Arbitrary functions for:

Automotive or Laser simulation / 4-6 preprogrammed functions

- · Fast command processing time
- Output Sequencing
- · Four cell memory Settings
- User Programmable signal pins.

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. Output Jacks Up to 60V output module up to 25A. Output current via front panel jacks

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 seperation between units
- 9. Output Connections: Rugged busbars for 6V up to 100V Output.
- 10. Optional Interface Position for LAN Interface (shown).
- 11. Optional Interface Position for GPIB Interface (shown).



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.

In Advanced Parallel Master/Slave Mode, total current is programmed and reported by the Master, Up to six supplies act as one.



Series operation

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

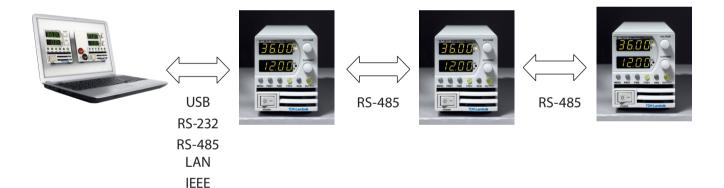
Remote Programming via Built-in USB, RS-232 & RS-485 Interface

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

Last-Setting memory based on flash memory no battery or capacitor backup. Simplifies test design and requiries

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

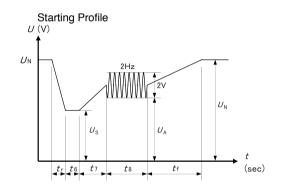
Heater Supplies

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

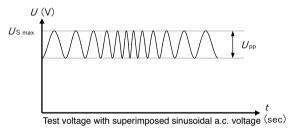
RF Amplifiers and Magnets

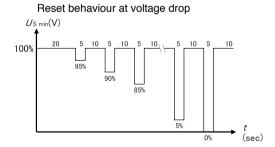
Robust design assures stable operation under a wide variety of loads. High linearity in voltage & current mode.

Z⁺ Series Sequence programming Applications: ISO 16750-2



Superimposed alternating voltage





f (Hz)
20000

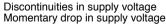
50

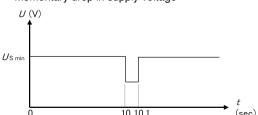
60

120

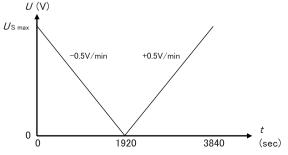
f (sec)

Frequency sweep





Slow decrease and increase of supply voltage



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

Front Panel Output Jacks

Up to 60V output module

P/N: Z - - L



Up to 25A Output current via front panel jacks

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 05mm blank panels can be installed:

P/N: Z-NL100





Power Modules Table

Module Type	200W	400W	600W	800W
0~10V	20A	40A	60A	75A
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

7

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 $\pm 1\%$ Power supply Voltage and Current Monitoring Accuracy $\pm 1.5\%$

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

Power supply Voltage and Current Hogianining Accuracy ±1.5%

LAN Interface Compliant to Class C P/N: LAN

Meets all LXI-C Requirements

Address Viewable on Front Panel

• Fixed and Dynamic Addressing

Compatible with most standard Networks

• TCP / UDP Socket Programming

- VISA & SCPI Compatible
- LAN Fault Indicators

Program Current

Measure Current

Current Foldback shutdown

• Auto-detects LAN Cross-over Cable

P/N: IEEE

P/N: IS510

• Fast Startup

AC Cord

Region	Europe	United Kingdom	North America	Middle East
Output Power	850W	850W	850W	850W
AC Cords	10A/250Vac L=2m	10A/250Vac L=2m	13A/125Vac L=2m	10A/250Vac L=2m
Wall Plug	INT'L 7/VII	BS1363	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-GB	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

Ζ 10 -40 Factory Options: AC cord Options: Output **Jacks** Region: E - Europe Series Output Output **IEEE** L GB - United Kingdom U - North America Name Voltage Current LAN (0~10V) (0~40A) IS510 I - Middle East **IS420 Factory option** P/N USB Interface built-in Standard RS-232/RS-485 Interface built-in Standard **GPIB** Interface **IEEE** Voltage Programming Isolated Analog Interface IS510 Current Programming Isolated Analog Interface **IS420** LAN Interface (Complies with LXI Class C) LAN Front Panel Output Jacks (60V or 25A max) L

Model	Output Voltage (VDC)	Output Current (A)	Output Power (W)	
Z10-20		0~20	200	Available
Z10-40	0~10 VDC	0~40	400	Available
Z10-60	0~10 VDC	0~60	600	Camain a Canan
Z10-75		0~75	750	Coming Soon
Z20-10		0~10	200	Available
Z20-20	0~20 VDC	0~20	400	Available
Z20-30	0~20 VDC	0~30	600	Camain a Canan
Z20-40		0~40	800	Coming Soon
Z36-6		0~6	216	Available
Z36-12	0~36 VDC	0~12	432	Available
Z36-18	0~36 VDC	0~18	648	Camain a Canan
Z36-24		0~24	864	Coming Soon
Z60-3.5		0~3.5	210	Available
Z60-7	0~60 VDC	0~7	420	Available
Z60-10	0~60 VDC	0~10	600	Camina Caan
Z60-14		0~14	840	Coming Soon
Z100-2		0~2	200	Available
Z100-4	0~100VDC	0~4	400	Available
Z100-6	0~100VDC	0~6	600	Camina Caan
Z100-8]	0~8	800	Coming Soon



Z*200 SERIES SPECIFICATIONS	Z	10-20	20-10	36-6	60-3.5	100-2
Rated output voltage(*1)	V	10-20	20-10	36	60	100-2
Rated output current (*2)	A	20.00	10.00	6.00	3.50	2.00
Rated output power	W	200	200	216	210	200
ONSTANT VOLTAGE MODE	V	10-20	20-10	36-6	60-3.5	100-2
Max. Line regulation (*6)		0.01% of rated output volt		30-0	00-5.5	100-2
Max. Load regulation (*7)		0.01% of rated output volt				
Ripple and noise (p-p, 20MHz) (*8)	mV	50	50	50	50	80
Ripple r.m.s. 5Hz~1MHz	mV	5	6	6	7	8
Temperature coefficient Temperature stability	PPM/°C		out voltage, following 30 m		tling land 0 tamp	
Warm-up drift			Bhrs interval following 30 m output voltage+2mV over 3			
Remote sense compensation/wire	V	1	1	2	3	5
Up-prog. Response time, 0~Vomax.(*9)	mS	15	30	30	50	50
). Down-prog.response time: Full load (*9)	mS	10	25	30	40	50
Time delay (*17)		210	250	320	380	1200
No load (*10) (*15)(*17) No load (*10) (*16)(*17)		35 190	65 200	85 290	100 310	250 900
NO 1084 (10) (10) (17)			recover within 0.5% of its			500
. Transient response time	mS	output current. Output se	t-point: 10~100%, Local set up to and including 100V		ange to 20% of facea	
2. Hold-up time		15mSec Typical.	16mSec Typical. Rated ou	tput power		
ONICTANT CURRENT !						4
DNSTANT CURRENT MODE Max. Line regulation (*6)	V 	10-20 0.01% of rated output curr	20-10	36-6	60-3.5	100-2
Max. Load regulation (*6) Max. Load regulation (*11)		0.01% of rated output cur				
Load regulation thermal drift			output current over 30 minu	utes following load change	2.	
Ripple r.m.s. 5Hz~1MHz (*12)	mA	25	15	8	4	3
Temperature coefficient	PPM/°C	100PPM/°C from rated out	tput current, following 30 n	ninutes warm-up.		
Temperature stability			hrs. interval following 30 m			
Warm-up drift		Less uldii +/-U.1% Of rated	output current over 30 mi	riutes iollowing power on.		
ROTECTIVE FUNCTIONS	V	10-20	20-10	36-6	60-3.5	100-2
			power supply change mod			
Foldback protection		Reset by AC input recycle	in autostart mode or by Ol	JT button or by rear panel	ENABLE, or by communica	
Over-voltage protection (OVP)			od. Reset by AC input recyc	le in autostart mode or by	OUT button or by rear par	nel ENABLE, or by
Over -voltage trip point	V	communication port. 0.5-12	1~24	2~40	5~66	5~110
Over -voltage trip point Output under voltage limit (UVL)			mmunication port. Preven			
			power supply output volta			
Output under voltage protection (UVP)		or by OUT button or by rea	ar panel ENABLE, or by com			
Over temperature protection				•		
2.2. Imperature protection		oser selectable, lateried of	non latched.			
		Josef selectable, lateried of	r non latched.			
NALOG PROGRAMMING AND MONITORING				nd linearity: +/-0.5% of rate	ed Vout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming		0~100%, 0~5V or 0~10V, u	r non latched. Iser selectable. Accuracy ar Iser selectable. Accuracy ar			
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full	iser selectable. Accuracy ar iser selectable. Accuracy ar I scale, user selectable. Acc	nd linearity: +/-1% of rated uracy and linearity: +/-1%	lout. of rated Vout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming (*13) Vout resistor programming (*13)		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full	iser selectable. Accuracy ar iser selectable. Accuracy ar I scale, user selectable. Acci I scale, user selectable. Acci	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.5%	lout. of rated Vout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming (*13) Vout resistor programming lout vesistor programming (*13) Shut-off (SO) control	 	0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0	iser selectable. Accuracy ar iser selectable. Accuracy ar I scale, user selectable. Acci I scale, user selectable. Acc 6V/2~15V or dry contact, u	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.5%	lout. of rated Vout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming (*13) Vout resistor programming (*13) Shut-off (SO) control Output current monitor (*13)	 	0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.x 0~5V or 0~10V, user select	user selectable. Accuracy ar user selectable. Accuracy ar I scale, user selectable. Acc I scale, user selectable. Acc bV/2~15V or dry contact, u table. Accuracy: +/-1%.	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.5%	lout. of rated Vout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0 0~5V or 0~10V, user select 0~5V or 0~10V, user select	user selectable. Accuracy ar user selectable. Accuracy ar I scale, user selectable. Acc I scale, user selectable. Acc 6V/2~15V or dry contact, u table. Accuracy: +/-1%. table. Accuracy: +/-1%.	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.5%	lout. of rated Vout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming lout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0 0~5V or 0~10V, user select 0~5V or 0~10V, user select 4~5V-OK, 0V-Fail. 500ohm	user selectable. Accuracy ar user selectable. Accuracy ar scale, user selectable. Acci scale, user selectable. Acci SV/2~15V or dry contact, u table. Accuracy: +/-1%. table. Accuracy: +/-1%. series resistance.	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.59 ser selectable logic.	lout. of rated Vout. % of rated lout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal Parallel operation		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0 0~5V or 0~10V, user select 0~5V or 0~10V, user select 4~5V-OK, 0V-Fail. 500ohm	user selectable. Accuracy ar user selectable. Accuracy ar I scale, user selectable. Acci I scale, user selectable. Acci I scale, user selectable. Acci I stale. Accuracy: +/-1%. table. Accuracy: +/-1%. In series resistance.	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.59 ser selectable logic.	lout. of rated Vout. % of rated lout.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming lout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal Parallel operation . Series operation . CV/CC indicator		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.3 0~5V or 0~10V, user select 0~5V or 0~10V, user select 4~5V-OK, 0V-Fail. 500ohm Possible, up to 6 units in ma 2 identical units (with exte	user selectable. Accuracy ar user selectable. Accuracy ar I scale, user selectable. Acc I scale, user selectable. Acc 6V/2~15V or dry contact, u table. Accuracy: +/-1%. a series resistance. seter/slave mode with single ernal diodes). On, CV mode: Off. Maximu	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.59 ser selectable logic. wire current balance conne	l lout. of rated Vout. % of rated lout. ction.	
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming lout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal Parallel operation D. Series operation LCV/CC indicator E. Interlock (ILC) control		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0 0~5V or 0~10V, user select 4~5V-OK, 0V-Fail. 500ohm Possible, up to 6 units in ma 2 identical units (with exte Open collector. CC mode: Enables/Disables the PS outpul	user selectable. Accuracy ar user selectable. Accuracy ar scale, user selectable. Acci scale, user selectable. Acci scale, user selectable. Acci styl/2~15V or dry contact, ut table. Accuracy: +/~1%. table. Accuracy: +/~1%. on series resistance. ster/slave mode with single gernal diodes). On, CV mode: Off. Maximut ty dry contact (Short: On, Ope	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.59 ser selectable logic. wire current balance conne im voltage: 30V, maximum n: Off, Source current: less than	l lout. of rated Vout. % of rated lout. ction. sink current: 10mA 0.5mA). Ena/Dis is activated by	front panel.
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NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13) Vout resistor programming (*13) Vout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal Parallel operation D. Series operation CV/CC indicator Lotal/Remote mode Control Local/Remote mode Indicator		0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full 89 electrical Voltage: 0~0.x 0~5V or 0~10V, user select 0~5V or 0~10V, user select 4~5V-OK, 0V-Fail. 500ohm 2 identical units (with exte Open collector. CC mode: Enables/Disables the PS output By electrical signal or Ope Open collector (shunted b	user selectable. Accuracy ar user selectable. Accuracy ar I scale, user selectable. Acc I scale, user selectable. Acc I scale, user selectable. Acc I scale. Accuracy: +/-1%. table. Accuracy: +/-1%. a series resistance. sster/slave mode with single ernal diodes). On, CV mode: Off. Maximu. t by dry contact (Short: On, Ope n/Short: O-Os Vor short: R sy 36V zener). On (O-Os.Of.)	nd linearity: +/-1% of rated uracy and linearity: +/-1% uracy and linearity: +/-1.59 ser selectable logic. wire current balance conne um voltage: 30V, maximum n. Off, Source current: less than emote, 2~-15V or open: Lo- 0mA sink current max.)-Re	lout. of rated Vout. 6 of rated lout. ction. sink current: 10mA 0.5ma). Ena/Dis is activated by cal).
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Z⁺200 SERIES SPECIFICATIONS

INPUT CHARACTERISTICS	V	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 (*18)		2.65/1.29	2.61/1.27	2.75/1.35	2.67/1.31	2.53/1.24
3. Power Factor (Typ)		0.99 at 100/200Vac, 100% load				
4. Efficiency (Typ) 100/200VAC (*4) (*18)	%	75/78	76/78	78/80	78/80	79/81
5. Inrush current (*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		Maximum 3000m. Derate ambient temp above 2000m.
5. Altitude		Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C.

SAFETY/EMC					
1. Applicable standards: Safety EMC			UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1		
			IEC61326-1 (Built to meet EN55022/EN55024)		
2. Withstand voltage			Vout < 36V models: Input-Output, Communiction PORTS and connector J3: 4242VDC 1 min, Input-Ground: 2828VDC 1 min., 60V,100V models: Input-Output: 4242VDC 1 min, Input-Communiction PORTS and J3: 4242VDC 1 min, Hazard. Output-Communiction PORTS and J3:1910VDC 1 min, Output-Ground: 1380VDC 1 min, Input-Ground: 2828VDC 1 min.		
3. Insulation resistance			More than 100Mohm at 25°C, 70%RH.		
4. Conducted emmision			EN55022B, FCC part 15-B, VCCI-B		
5. Radiated emission			EN55022B, FCC part 15-B, VCCI-B		

MECHANICAL		
1. Cooling		Forced air cooling by internal fan.
2. Weight		Less than 1.9Kg. Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE.
3. Dimensions (WxHxD)	mm	H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing). H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).
5. Shock		Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC600068-2-27 According to: IEC60068-2-64

- 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 (±20%) Minimum time between consecutive down programming cycles.
 *18: PS with isolated analog option decreases efficiancy by 1% and increases input current by 1 %



Z ⁺ 400 SERIES SPECIFICATIONS						
MODEL	Z	10-40	20-20	36-12	60-7	100-4
. Rated output voltage(*1)	V	10	20	36	60	100
. Rated output current (*2)	Α	40	20	12	7	4
. Rated output power	W	400	400	432	420	400
CONSTANT VOLTAGE MODE	V	10-40	20-20	36-12	60-7	100-4
. Max. Line regulation (*6)		0.01% of rated output volt	tage+2mV			
. Max. Load regulation (*7)		0.01% of rated output volt				
. Ripple and noise (p-p, 20MHz) (*8)	mV	50	50	50	50	80
. Ripple r.m.s. 5Hz~1MHz	mV	5	6	6	7	8
5. Temperature coefficient	PPM/°C		put voltage, following 30 m			
. Temperature stability				ninutes warm-up. Constant li		
. Warm-up drift				0 minutes following power of		
. Remote sense compensation/wire	V	1	1	2	3	5
. Up-prog. Response time, 0~Vomax.(*9)	mS	15	30	30	50	50
0. Down-prog.response time: Full load (*9)	mS	10	10	15	30	50
Time delay (*17)	-	210	250	320	380	1200
No load (*10) (*15) (*17)		35	65	85	100	250
No load (*10) (*16) (*17)		190	200	290	310	1100
	_			rated output for a load chan	ge 10~90% of rated	
1. Transient response time	mS		et-point: 10~100%, Local ser	nse.		
			s up to and including 100V			
2. Hold-up time		15mSec Typical.	16mSec Typical. Rated ou	tput power.		
		T	T			1
ONSTANT CURRENT MODE	V	10-40	20-20	36-12	60-7	100-4
. Max. Line regulation (*6)		0.01% of rated output cur				
. Max. Load regulation (*11)		0.01% of rated output cur				
. Load regulation thermal drift				utes following load change.		T
. Ripple r.m.s. 5Hz~1MHz (*12)	mA	70	40	15	8	3
. Temperature coefficient	PPM/°C		tput current, following 30 n			
. Temperature stability				ninutes warm-up. Constant li	ne, load & temperature.	
. Warm-up drift		Less than +/-0.1% of rated	d output current over 30 mi	nutes following power on.		
ROTECTIVE FUNCTIONS	V	10-40	20-20	36-12	60-7	100-4
Foldback protection				e from CV to CC or CC to CV.		
1 oldback protection				JT button or by rear panel EN		
. Over-voltage protection (OVP)		Inverter Shut down metho	od. Reset by AC input recyc	le in autostart mode or by O	UT button or by rear pane	el ENABLE,
. Over-voltage protection (OVI)		or by communication port	t			
. Over - voltage trip point	V	0.5-12	1~24	2~40	5~66	5~110
. Output under voltage limit (UVL)		Preset by front panel or co	ommunication port. Preven	ts from adjusting Vout belov	v limit. Does not affect in	analog programming
. Output under voltage protection (UVP)		Output shut-down when i	power supply output voltage	ge goes below UVP program	ming.	
. Output under voltage protection (ovr)		Reset by AC input recycle	in autostart mode or by Ol	JT button or by rear panel EN	IABLE, or by communicat	ion port."
Vout voltage programming lout voltage programming (*13)				nd linearity: +/-0.5% of rated nd linearity: +/-1% of rated lo		
3. Vout resistor programming		0~100%, 0~5/10Kohm ful	I scale, user selectable. Acci	uracy and linearity: +/-1% of	rated Vout.	
l. lout resistor programming (*13)				uracy and linearity: +/-1.5%	of rated lout.	
i. Shut-off (SO) control			.6V/2~15V or dry contact, us	ser selectable logic.		
6. Output current monitor (*13)		0~5V or 0~10V, user select				
'. Output voltage monitor		0~5V or 0~10V, user select				
s. Power supply OK signal		4~5V-OK, 0V-Fail. 500ohm				
. Parallel operation				gle wire current balance con	nection.	
0. Series operation		2 identical units (with exte		lı anı :	1	
1. CV/CC indicator				ım voltage: 30V, maximum si		
2. Interlock (ILC) control				n, Open: Off, Source current: I		activated by front pan
3. Local/Remote mode Control		, , ,		emote, 2~15V or open: Local		
4. Local/Remote mode Indicator				0mA sink current max.)-Rem		
5. Trigger out				vel output = 2V, maximum so		
6. Trigger in				nput votage = 2.0V, Maximum sinl		n positive edge trigger
7. Programmed signal 1				k current 100mA. (Shunted b		
8. Programmed signal 2		Upen collector, maximum	voitage 25V,maximum sinl	k current 100mA. (Shunted b	y Z/V zener)	
RONT PANEL		Transaction of the second				
. Control functions		Mutiple options with 2 En	coders			
		Vout/lout manual adjust				
		OVP/UVL /UVP manual ad		INT CO		
			P, UVL, UVP, Foldback, OCP,			
			s - Selection of LAN,IEEE,RS			-
			s - Selection of Baud Rate, A		101/ :	
				e programming, 5V/10V, 5K/		l·
Dienlay				ent Monitoring 5V/10V, Outp	out ON/OFF, Front Panel L	UCK.
. Display			.5% of rated output voltage			
Indications			5% of rated output current-			
. Indications			, PREV, PROT, REM/LOC,OUT	I UN/UFF , CV, CC		
		RED LED's: ALRM (OVP,UVF		-		
		FINE, MENU, PREV, PROT, F	REM/LOC, OUT ON/OFF			
. Function buttons			REM/LOC, OUT ON/OFF			
. Function buttons ROGRAMMING AND READBACK (RS232/485,USB, Op		E, LAN)				
. Function buttons ROGRAMMING AND READBACK (RS232/485,USB, Op . Vout programming accuracy	 otional: IEE	E, LAN) 0.05% of rated output volt	tage			
Function buttons ROGRAMMING AND READBACK (RS232/485,USB, Op Vout programming accuracy Lout programming accuracy (*13)	otional: IEE	E, LAN) 0.05% of rated output volt 0.1% of actual +0.1% of ra	tage			
Function buttons ROGRAMMING AND READBACK (RS232/485,USB, Op Vout programming accuracy Lout programming accuracy (*13) Vout programming resolution	otional: IEE	E, LAN) 0.05% of rated output volt 0.1% of actual +0.1% of ra 0.012% of full scale	tage			
Function buttons ROGRAMMING AND READBACK (RS232/485,USB, Op. Vout programming accuracy (*13) Vout programming resolution Lout programming resolution	otional: IEE	E, LAN) 0.05% of rated output volt 0.1% of actual +0.1% of ra 0.012% of full scale 0.012% of full scale	tage ated output current			
Function buttons ROGRAMMING AND READBACK (RS232/485,USB, Op. Vout programming accuracy Lout programming accuracy (*13) Vout programming resolution Lout programming resolution Vout readback accuracy	otional: IEE	E, LAN) 0.05% of rated output volt 0.1% of actual +0.1% of ra 0.012% of full scale 0.012% of full scale 0.05% of rated output vol	tage sted output current			
ROGRAMMING AND READBACK (RS232/485,USB, Op. Vout programming accuracy Lout programming accuracy (*13) Vout programming resolution Lout programming resolution Vout readback accuracy Lout predaback accuracy Lout readback accuracy	otional: IEE	E, LAN) 0.05% of rated output volt 0.1% of actual +0.1% of ra 0.012% of full scale 0.012% of full scale 0.05% of rated output volt 0.1% of actual +0.3% of ra	tage sted output current			
4. Function buttons PROGRAMMING AND READBACK (RS232/485,USB, Op 1. Vout programming accuracy 2. lout programming accuracy (*13) 3. Vout programming resolution 4. lout programming resolution 5. Vout readback accuracy 6. lout readback accuracy (*13) 7. Vout readback resolution 8. lout readback resolution	otional: IEE	E, LAN) 0.05% of rated output volt 0.1% of actual +0.1% of ra 0.012% of full scale 0.012% of full scale 0.05% of rated output vol	tage sted output current			



Z ⁺ 400 SERIES SPECIFICATIONS						
INPUT CHARACTERISTICS	V	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 (*18)		5.05/2.5	4.98/2.43	5.25/2.60	5.10/2.50	4.80/2.35
3. Power Factor (Typ)			0	.99 at 100/200Vac, 100% loa	ıd	
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		
1. 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.

SAFETY/EMC	,	
1. Applicable standards:		 UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1
1. Applicable standards:	EMC	 IEC61326-1 (Built to meet EN55022/EN55024)
2. Withstand voltage		 Vout≤36V models: Input- Output,Communiction PORTS and connector J3: 4242VDC 1min, Input-Ground: 2828VDC 1min, 60V,100V models: Input-Output: 4242VDC 1min, Input-Communiction PORTS and J3: 4242VDC 1min, Hazard. Output- Communiction PORTS and J3:1910VDC 1min, Output-Ground: 1380VDC 1min, Input-Ground: 2828VDC 1min.
3. Insulation resistance	'	 More than 100Mohm at 25°C, 70%RH.
4. Conducted emmision		 EN55022B, FCC part 15-B, VCCI-B
5. Radiated emission		 EN55022B, FCC part 15-B, VCCI-B

MECHANICAL			
1. Cooling			Forced air cooling by internal fan
2. Weight	STANDARD	Kg	Less than 1.9Kg.
	WIDE BODY	Kg	Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE
3. Dimensions (WxHxD)	STANDARD	mm	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 JETA 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 JETA 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 efficiancy by 1% and increases input current by 1 %



Z ⁺ 600 SERIES SPECIFICATIONS						
ODEL	Z	10-60	20-30	36-18	60-10	100-6
Rated output voltage(*1)	V	10	20	36	60	100
Rated output current (*2)	A	60	30	18	10	6
Rated output power	W	600	600	648	600	600
ONSTANT VOLTAGE MODE	V	10-60	20-30	36-18	60-10	100-6
Max. Line regulation (*6)		0.01% of rated output volt		30-16	00-10	100-0
Max. Load regulation (*7)		0.01% of rated output volt				
Ripple and noise (p-p, 20MHz) (*8)	mV	75	75	75	75	100
Ripple r.m.s. 5Hz~1MHz	mV	6.25	6.25	6.25	6.25	10
Temperature coefficient	PPM/°C	30PPM/°C from rated outp	out voltage, following 30 m	inutes warm-up.		
Temperature stability			hrs interval following 30 m			
Warm-up drift			utput voltage+2mV over 3			
Remote sense compensation/wire	V	1	1	2	3	5
. Up-prog. Response time, 0~Vomax.(*9)	mS	15	30	30	50	50
0. Down-prog.response time: Full load (*9)	mS	10 260	30 310	30 400	50 475	50 1500
Time delay (*17) No load (*10) (*15) (*17)		40	80	100	120	250
No load (*10) (*17)	mS	190	200	290	310	900
1. Transient response time	mS	Time for output voltage to output current. Output se	recover within 0.5% of its t-point: 10~100%, Local ser	rated output for a load cha		700
2. Hold-up time		Less than 1mS, for models 16mSec Typical. Rated ou	up to and including 100V tput power.			
ONSTANT CUIDDENT MODE	V	10.60	20.20	26 10	60.10	100 (
ONSTANT CURRENT MODE Max. Line regulation (*6)	V	10-60 0.01% of rated output curr	20-30	36-18	60-10	100-6
. Max. Line regulation (*6) . Max. Load regulation (*11)		0.01% of rated output cur				
. Load regulation (11)			utput current over 30 minu	ites following load change		
. Ripple r.m.s. 5Hz~1MHz (*12)	mA	75	45	22	12	4.5
. Temperature coefficient	PPM/°C	-	put current, following 30 n			
. Temperature stability			hrs. interval following 30 m		line, load & temperature.	
Warm-up drift			output current over 30 mi	nutes following power on.		
ROTECTIVE FUNCTIONS	V	10-60	20-30	36-18	60-10	100-6
Foldback protection			oower supply change mode			
. гогараск рготестоп		Reset by AC input recycle	in autostart mode or by OL	IT button or by rear panel E	NABLE, or by communica	ation port.
Over-voltage protection (OVP)		Inverter Shut down methor by communication port	od. Reset by AC input recycl t.	e in autostart mode or by (OUT button or by rear par	nel ENABLE,
. Over -voltage trip point	V	0.5-12	1~24	2~40	5~66	5~110
Output under voltage limit (UVL)		Preset by front panel or co	mmunication port. Preven	ts from adjusting Vout belo	w limit. Does not affect in	n analog programming.
Output under voltage protection (UVP)		Output chut down whon				
. Output under voltage protection (ovr)			oower supply output voltag in autostart mode or by OU			ation port.
			in autostart mode or by OU			ation port.
Over temperature protection		Reset by AC input recycle	in autostart mode or by OU			ation port.
Over temperature protection NALOG PROGRAMMING AND MONITORING		Reset by AC input recycle User selectable, latched or	in autostart mode or by OU non latched.	T button or by rear panel E	NABLE, or by communica	ation port.
Over temperature protection NALOG PROGRAMMING AND MONITORING Vout voltage programming		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u	in autostart mode or by OU	T button or by rear panel E	NABLE, or by communica	ation port.
Over temperature protection NALOG PROGRAMMING AND MONITORING Vout voltage programming Lout voltage programming (*13)		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u	in autostart mode or by OU non latched. Iser selectable. Accuracy an	IT button or by rear panel E ad linearity: +/-0.5% of rated id linearity: +/-1% of rated	:NABLE, or by communica d Vout. lout.	ation port.
. Over temperature protection NALOG PROGRAMMING AND MONITORING . Vout voltage programming . lout voltage programming . Vout resistor programming . lout resistor programming . lout resistor programming		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full	in autostart mode or by OU non latched. Isser selectable. Accuracy an iser selectable. Accuracy ar iscale, user selectable. Accu	IT button or by rear panel E ad linearity: +/-0.5% of rated d linearity: +/-1% of rated uracy and linearity: +/-1% or uracy and linearity: +/-1.5%	NABLE, or by communicated by the state of th	ation port.
. Over temperature protection NALOG PROGRAMMING AND MONITORING . Vout voltage programming . lout voltage programming (*13) . Vout resistor programming . lout resistor programming (*13) . Shut-off (SO) control		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, U 0~100%, 0~5V or 0~10V, U 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0	in autostart mode or by OU non latched. Isser selectable. Accuracy ar isser selectable. Accuracy ar iscale, user selectable. Accu iscale, user selectable. Accuracy iscale, user selectable. Accuracy	IT button or by rear panel E ad linearity: +/-0.5% of rated d linearity: +/-1% of rated uracy and linearity: +/-1% or uracy and linearity: +/-1.5%	NABLE, or by communicated by the state of th	ation port.
. Over temperature protection NALOG PROGRAMMING AND MONITORING . Vout voltage programming . lout voltage programming (*13) . Vout resistor programming . lout resistor programming (*13) . Shut-off (SO) control . Output current monitor (*13)		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0. 0~5V or 0~10V, user select	in autostart mode or by OU non latched. Isser selectable. Accuracy an isser selectable. Accuracy an iscale, user selectable. Accu iscale, user selectable. Accu iscale, accuracy: +/-1%.	IT button or by rear panel E ad linearity: +/-0.5% of rated d linearity: +/-1% of rated uracy and linearity: +/-1% or uracy and linearity: +/-1.5%	NABLE, or by communicated by the state of th	ation port.
. Over temperature protection .NALOG PROGRAMMING AND MONITORING .Vout voltage programming .lout voltage programming (*13) .Vout resistor programming .lout resistor programming (*13) .Shut-off (SO) control .Output current monitor (*13) .Output output current monitor	 	Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full 0~5V or 0~10V, user select 0~5V or 0~10V, user select	in autostart mode or by OU roon latched. Isser selectable. Accuracy an isser selectable. Accuracy an iscale, user selectable. Accu iscale, user selectable. Accu iscale, user selectable. Accuracy: +/-196. itable. Accuracy: +/-196.	IT button or by rear panel E ad linearity: +/-0.5% of rated d linearity: +/-1% of rated uracy and linearity: +/-1% or uracy and linearity: +/-1.5%	NABLE, or by communicated by the state of th	ation port.
Over temperature protection NALOG PROGRAMMING AND MONITORING Vout voltage programming Lout voltage programming Lout resistor programming Lout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0 0~5V or 0~10V, user select 0~5V or 0~10V, user select 4~5V-OK, 0V-Fail. 500ohm	in autostart mode or by OU non latched. Isser selectable. Accuracy an isser selectable. Accuracy an iscale, user selectable. Acci iscale, user selectable. Acci iscale, user selectable. Acci iscale, accuracy: +/-1%. itable. Accuracy: +/-1%. is series resistance.	In button or by rear panel E ad linearity: +/-0.5% of rated di linearity: +/-1% of rated uracy and linearity: +/-1% c uracy and linearity: +/-1.5% ser selectable logic.	NABLE, or by communica d Vout. lout. of rated Vout. of rated lout.	ation port.
Over temperature protection NALOG PROGRAMMING AND MONITORING Vout voltage programming Lout voltage programming Lout resistor programming Lout resistor programming Lout resistor programming (*13) Shut-off (SO) control Output current monitor (*13) Output voltage monitor Power supply OK signal Parallel operation		Reset by AC input recycle User selectable, latched or 0~100%, 0~5V or 0~10V, u 0~100%, 0~5V or 0~10V, u 0~100%, 0~5/10Kohm full By electrical Voltage: 0~0.0 0~5V or 0~10V, user select 0~5V or 0~10V, user select 4~5V~0K, 0V-Fail. 500ohm Possible, up to 6 units in n	in autostart mode or by OU roon latched. Isser selectable. Accuracy ar isser selectable. Accuracy ar iscale, user selectable. Acci iscale, user selectable. Acci iscale, user selectable. Acci iscale, Accuracy: +/-196. able. Accuracy: +/-196. is series resistance. in series resistance.	In button or by rear panel E ad linearity: +/-0.5% of rated di linearity: +/-1% of rated uracy and linearity: +/-1% c uracy and linearity: +/-1.5% ser selectable logic.	NABLE, or by communica d Vout. lout. of rated Vout. of rated lout.	ation port.
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Z ⁺ 600 SERIES SPECIFICATIONS						
INPUT CHARACTERISTICS	V	10-60	20-30	36-18	60-10	100-6
1.Input voltage/freq. (*3)			85~265Va	ic continuous, 47~63Hz, sin	gle phase	
2.Maximum Input current 100/200VAC		7.4/3.6	7.24/3.53	7.73/3.77	7.15/3.50	7.15/3.50
3.Power Factor (Typ)			0.	.99 at 100/200Vac, 100% loa	ad	
4.Efficiency (Typ) 100/200VAC (*4)	%	82/84	84/86	85/87	85/87	85/87
5.Inrush current (*5)				Less than 25A		

ENVIRONMENTAL CONDITIONS		
1.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.

SAFETY/EMC		
1 A - - - - - - - - - - -	Safety	 UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1
1.Applicable standards:	EMC	 IEC61326-1 (Built to meet EN55022/EN55024)
2.Withstand voltage		 Vout≤36V models: Input-Output,Communiction PORTS and connector J3: 4242VDC 1min, Input-Ground: 2828VDC 1min., 60V,100V models: Input-Output: 4242VDC 1min, Input-Communiction PORTS and J3: 4242VDC 1min, Hazard. Output-Communiction PORTS and J3:1910VDC 1min, Output-Ground: 1380VDC 1min, Input-Ground: 2828VDC 1min.
3.Insulation resistance		 More than 100Mohm at 25°C, 70%RH.
4.Conducted emmision		 EN55022B, FCC part 15-B, VCCI-B
5.Radiated emission		 EN55022B, FCC part 15-B, VCCI-B

MECHANICAL			
1.Cooling			Forced air cooling by internal fan.
2 W-:	STANDARD	Kg	Less than 2.5Kg.
2.Weight	WIDE BODY	Kg	Less than 3.0Kg. Wide body with Isolated analog or Binding post or IEEE.
3.Dimensions (WxHxD)	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: IEC600068-2-27

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. *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 JETA 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.
- 11: 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.
- *14: Measured with JEHA 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 efficiancy by 1% and increases input current by 1 %



Z ⁺ 800 SERIES SPECIFICATIONS						
MODEL	Z	10-75	20-40	36-24	60-14	100-8
. Rated output voltage(*1)	V	10-75	20-40	36	60	100-8
. Rated output current (*2)	A	75	40	24	14	8
. Rated output power	W	750	800	864	840	800
ONSTANT VOLTAGE MODE	1				- 1/	
. Max. Line regulation (*6)				% of rated output voltage-		
. Max. Load regulation (*7) . Ripple and noise (p-p, 20MHz) (*8)	mV	75	75	% of rated output voltage-	-2mv 75	100
Ripple r.m.s. 5Hz~1MHz	mV	6.25	6.25	6.25	6.25	10
Temperature coefficient	PPM/°C		tput voltage, following 3			
. Temperature stability		0.02% of rated Vout ove	r 8hrs interval following 3	30 minutes warm-up. Const	ant line, load & temp.	
. Warm-up drift		Less than 0.05% of rated	l output voltage+2mV ov	er 30 minutes following po		
Remote sense compensation/wire	V	1	1	2	3	5
. Up-prog. Response time, 0~Vomax.(*9) 0. Down-prog.response time: Full load (*4)	mS mS	15 10	30 30	30 30	50 50	50 50
Time delay (*17)	1113	260	310	400	475	1500
No load (*10) (*15) (*17)	mS	35	65	85	100	250
No load (*10) (*16) (*17)		190	200	290	310	900
		Time for output voltage	to recover within 0.5% o	f its rated output for a load	change 10~90% of rate	d
1. Transient response time	mS		set-point: 10~100%, Loca			
			els up to and including 10	00V		
2. Hold-up time		16mSec Typical. Rated o	output power.			
ONSTANT CURRENT MODE						
ONSTANT CURRENT MODE . Max. Line regulation (*6)		0.01% of rated output co	urrent+2m∆			
. Max. Line regulation (*6) . Max. Load regulation (*11)		0.01% of rated output co				
. Load regulation (11)				ninutes following load char	nge.	
. Ripple r.m.s. 5Hz~1MHz (*12)	mA	75	45	22	12	4.5
. Temperature coefficient	PPM/°C		utput current, following	30 minutes warm-up.		
. Temperature stability				0 minutes warm-up. Const		iture.
. Warm-up drift		Less than +/-0.1% of rate	ed output current over 30	minutes following power of	on.	
ROTECTIVE FUNCTIONS	ı	0		1 (()), ()	67.11	
. Foldback protection				node from CV to CC or CC to , OUT button or by rear par		unication port
. Over-voltage protection (OVP)				ostart mode or by OUT button or b		
. Over-voltage trip point	V	0.5-12	1~24	2~40	5~66	5~110
Output under voltage limit (UVL)				from adjusting Vout below lin		
· O. to to a dominate of the control		Output shut-down when	n power supply output v	oltage goes below UVP prog	gramming.	
. Output under voltage protection (UVP)		Reset by AC input recycl	e in autostart mode or b	OUT button or by rear pan	iel ENABLE, or by comm	nunication port.
NALOG PROGRAMMING AND MONITORING Vout voltage programming lout voltage programming (*13)		0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5/10Kohm f	', user selectable. Accurac ull scale, user selectable.	y and linearity: +/-0.5% of r y and linearity: +/-1% of rat Accuracy and linearity: +/-1	ed lout. % of rated Vout.	
NALOG PROGRAMMING AND MONITORING .Vout voltage programming .lout voltage programming .lout resistor programming .lout resistor programming .lout resistor programming .lout resistor programming .Shut-off (SO) control .Output current monitor (*13) .Output voltage monitor .Power supply OK signal .Parallel operation 0. Series operation 1. CV/CC indicator 2. Interlock (ILC) control 3. Local/Remote mode Control 4. Local/Remote mode Indicator 5. Trigger out		0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5/10Kohm f 0~100%, 0~5/10Kohm f 0~100%, 0~5/10Kohm f sy electrical Voltage: 0~ 0~5V or 0~10V, user sele 0~5V or 0~10V, user sele 4~5V-OK, 0V-Fail. 500ot Possible, up to 6 units in 2 identical units (with e Open collector. CC mod Enables/Disables the PS or By electrical signal or Og Open collector (shuntee Maximum low level out)	, user selectable. Accuracy, user selectable. Accuracy ull scale, user selectable. Ull scale, user selectable. O.6V/2~15V or dry contactable. Accuracy: +/-1%. ectable. Accuracy: +/-1%. ectable. Accuracy: +/-1%. en series resistance. master/slave mode with ternal diodes). ec On, CV mode: Off. Maxiput by dry contact (Short: ben/Short: 0~0.6V or shot by 36V zener). On (0~0.00 out = 0.8V, Minimum high	y and linearity: +/-1% of rat Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 tt, user selectable logic. single wire current balance imum voltage: 30V, maximi On, Open: Off, Source current: tt: Remote, 2~15V or open: iV, 10mA sink current max.)	ed lout. % of rated Vout5% of rated lout5% of rated lout	/ max.). nA, minimum pulse = 1
NALOG PROGRAMMING AND MONITORING .Vout voltage programming .lout voltage programming .lout resistor programming (*13) .Vout resistor programming (*13) .Shut-off (SO) control .Coutput current monitor (*13) .Output voltage monitor .Power supply OK signal .Parallel operation 0. Series operation 1. CV/CC indicator 2. Interlock (ILC) control 3. Local/Remote mode Control 4. Local/Remote mode Indicator 5. Trigger out 6. Trigger in		0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5/10Kohm f 0~100%, 0~5/10Kohm f By electrical Voltage: 0~ 0~5V or 0~10V, user sele 0~5V or 0~10V, user sele 4~5V-OK, 0V-Fail. 500of Possible, up to 6 units in 2 identical units (with expendiculation) Open collector. CC mode Enables/Disables the PS ot By electrical signal or Op Open collector (shunted Maximum low level out) Maximum low level out) Maximum low level input volt	, user selectable. Accurac, user selectable. Accurac, user selectable. Accuracull scale, user selectable. Ull scale, user selectable. O.6V/2~15V or dry contaectable. Accuracy: +/-1%. etable. Accuracy: +/-1%. etable. Accuracy: +/-1%. etable. Accuracy: +/-1%. et series resistance. master/slave mode with ternal diodes). et On, CV mode: Off. Maxtput by dry contact (Short: pen/Short: 0~0.6V or sho I by 36V zener). On (0~0.0 uput = 0.8V, Minimum high level gage = 0.8V, Minimum high level	y and linearity: +/-1% of rat Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 tt, user selectable logic. single wire current balance imum voltage: 30V, maximi On, Open: Off, Source current: tt. Remote, 2~15V or open: 1 5V, 10mA sink current max.) In level output = 2V, maximi input votage = 2.0V, Maximum sir	ed lout. % of rated Vout5% of rated lout. connection. m sink current: 10mA less than 0.5mA). Ena/Dis Local -Remote. Off-Local (30V um source current = 8m k current = 8mA, 4uS minimum	/ max.). nA, minimum pulse = 1
INALOG PROGRAMMING AND MONITORING .Vout voltage programming .lout voltage programming .lout resistor programming .Shut-off (SO) control .Output current monitor (*13) .Output voltage monitor .Power supply OK signal .Parallel operation 0. Series operation 1. CV/CC indicator 2. Interlock (ILC) control 3. Local/Remote mode Control 4. Local/Remote mode Indicator 5. Trigger out 6. Trigger out 6. Trigger in 7. Programmed signal 1		0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5/10Kohm f 0~100%, 0~5/10Kohm f By electrical Voltage: 0~ 0~5V or 0~10V, user sele 0~5V or 0~10V, user sele 4~5V-OK, 0V-Fail. 5000f Possible, up to 6 units in 2 identical units (with extended to the collector. CC mode Enables/Disables the PS or By electrical signal or Op Open collector (shunted Maximum low level out Maximum low level input volt Open collector, maximu	, user selectable. Accuracy, user selectable. Accuracy, user selectable. Accuracy ull scale, user selectable. Under Sectable. Accuracy: +/-1%. Letable. Letabl	y and linearity: +/-1% of rat Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 tt, user selectable logic. single wire current balance imum voltage: 30V, maximi On, Open: Off, Source current: tt: Remote, 2~15V or open: iV, 10mA sink current max.)	ed lout. % of rated Vout5% of rated lout5% of rated lout. connection	/ max.). nA, minimum pulse = 1
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. Power supply OK signal . Parallel operation 0. Series operation 1. CV/CC indicator 2. Interlock (ILC) control 3. Local/Remote mode Control 4. Local/Remote mode Indicator 5. Trigger out 6. Trigger in 7. Programmed signal 1 8. Programmed signal 2 RONT PANEL Control functions 6. Lipida of the control of the c		0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5/10Kohm f 0~100%, 0~5/10Kohm f 0~100%, 0~5/10Kohm f Sy electrial Voltage: 0~ 0~5V or 0~10V, user sele 0~5V or 0~10V, user sele 4~5V-OK, 0V-Fail. 5000r Possible, up to 6 units in 2 identical units (with extension of the possible of the possib	, user selectable. Accuracy, user selectable. Accuracy, user selectable. Accuracy ull scale, user selectable. Ull scale, user selectable. Ull scale, user selectable. O.6V/2~15V or dry contactable. Accuracy: +/-19c. etable. Acc	y and linearity: +/-1% of rat Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 t. t. user selectable logic. single wire current balance imum voltage: 30V, maximi On, Open: Off, Source current: t: Remote, 2~15V or open: 5V, 10mA sink current max.) nlevel output = 2V, maximi input votage = 2.0V, Maximum sink current 100mA. (Shun sink current 100mA. (Shun sink current 100mA. (Shun sink current 100mA. (Shun sink current 100mA.)	ed lout. % of rated Vout5% of rated lout5% of rated lout. e connection. um sink current: 10mA less than 0.5mA). Ena/Dis Local -Remote. Off-Local (30v um source current = 8m k current = 8mA, 4uS minimit ted by 27V zener) ted by 27V zener) ted by 27V zener)	/ max.). nA, minimum pulse = 1 um positive edge trigger
INALOG PROGRAMMING AND MONITORING .Vout voltage programming .lout voltage programming .lout resistor programming .Vout programming .Vout programming .Vout voltage monitor .Power supply OK signal .Parallel operation .Series operation .CV/CC indicator .Interlock (ILC) control .Local/Remote mode Control .Local/Remote mode Indicator .Trigger out .Trigger in .Programmed signal 1 .Programmed signal 2 RONT PANEL .Control functions .Function buttons .Function buttons .Function buttons .Function programming accuracy .Jout programming accuracy .Vout programming resolution .Lout programming resolution .Lout programming resolution		0~100%, 0~5V or 0~10V 0~100%, 0~5V or 0~10V 0~100%, 0~5/10Kohm f 0~10V, user sele 0~5V or 0~10V, user sele 0~5V or 0~10V, user sele 1~5V-OK, 0V-Fail. 500ot 0~5V-OK, 0V-Fail. 500	, user selectable. Accuracy, user selectable. Accuracy, user selectable. Accuracy ull scale, user selectable. Ull scale, user selectable. Ull scale, user selectable. O.6V/2~15V or dry contactable. Accuracy: +/-19c. etable. Acc	y and linearity: +/-1% of rat Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 Accuracy and linearity: +/-1 t. t. user selectable logic. single wire current balance imum voltage: 30V, maximi On, Open: Off, Source current: t: Remote, 2~15V or open: 5V, 10mA sink current max.) nlevel output = 2V, maximi input votage = 2.0V, Maximum sink current 100mA. (Shun sink current 100mA. (Shun sink current 100mA. (Shun sink current 100mA. (Shun sink current 100mA.)	ed lout. % of rated Vout5% of rated lout5% of rated lout. e connection. um sink current: 10mA less than 0.5mA). Ena/Dis Local -Remote. Off-Local (30v um source current = 8m k current = 8mA, 4uS minimit ted by 27V zener) ted by 27V zener) ted by 27V zener)	/ max.). nA, minimum pulse = 1 um positive edge trigger

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Z*800 SERIES SPECIFICATIONS

INPUT CHARACTERISTICS		10-75	20-40	36-24	60-14	100-8
1.Input voltage/freq. (*3)			85~265Va	c continuous, 47~63Hz, sir	ngle phase	
2.Maximum Input current 100/200VAC		9.25/4.50	9.65/4.70	10.30/5.02	10.00/4.90	9.5/4.65
3.Power Factor (Typ)			0.	.99 at 100/200Vac, 100% lo	ad	
4.Efficiency (Typ) 100/200VAC (*4)	7.	80/82	82/84	84/85	83/85	84/86
5.Inrush current (*5)				Less than 25A		

ENVIRONMENTAL CONDITIONS

1.Operating temperature		0~50℃, 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.
5.Aititude		Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C.

SAFETY/EMC

D/ 11 = 1 1/ = 1110		
1.Applicable standards:	SAFETY	 UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1
1.Applicable standards:	EMC	 IEC61326-1 (Built to meet EN55022/EN55024)
		Vout≤36V models: Input- Output, Communiction PORTS and connector J3: 4242VDC 1min, Input-Ground: 2828VDC 1min., 60V,100V
2.Withstand voltage		 models: Input-Output: 4242VDC 1min, Input- Communiction PORTS and J3: 4242VDC 1min, Hazard.
		Output- Communiction PORTS and J3:1910VDC 1min, Output-Ground: 1380VDC 1min, Input-Ground: 2828VDC 1min.
		Output-SELV:1910VDC 1min, Hazard. Output-Ground: 1380VDC 1min, Input-Ground: 2288VDC 1min.
3.Insulation resistance		 More than 100Mohm at 25°C, 70%RH.
4.Conducted emmision		 EN55022B, FCC part 15-B, VCCI-B
5.Radiated emission		 EN55022B, FCC part 15-B, VCCI-B

MECHANICAL

1.Cooling			Forced air cooling by internal fan.
2.Weight	STANDARD	Kg	Less than 2.5Kg.
	WIDE BODY		Less than 3.0Kg. Wide body with Isolated analog or Binding post or IEEE.
3.Dimensions (WxHxD)	STANDARD	mm	H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).
	WIDE BODY		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

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.
- *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.

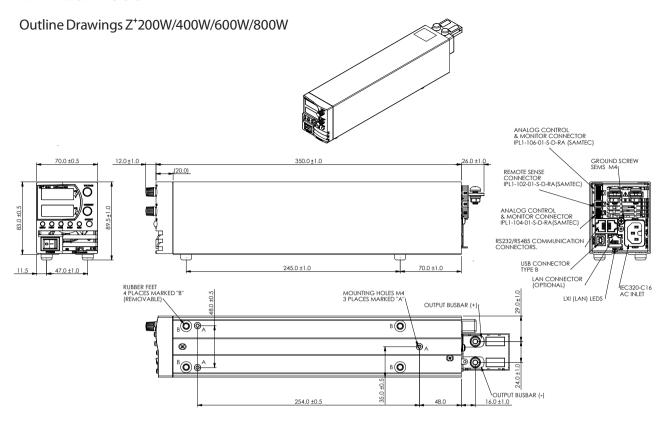
 *8: Measured with JEITA RC-9131A (1:1) probe.
- *9: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load.
 *10: From 90% to 10% of Rated Output Voltage.
 *11: For load voltage change, equal to the unit voltage rating, constant input voltage.

- *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.

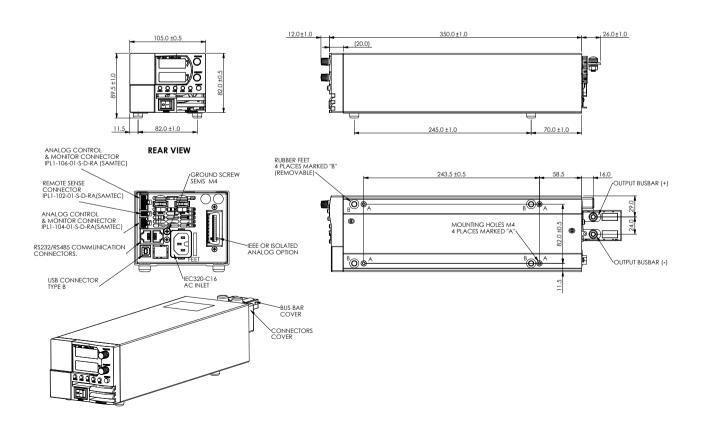
 *13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.
- *14: Measured with JEITA RC-9131A (1:1) probe.
- *15: For cases where the time interval between each down programming is longer than Td (time delay).
- *15: Tot cases where the time interval between each down programming is longer than Td (time delay).

 *17: Td typical (±20%) Minimum time between consecutive down programming cycles.
- *18: PS with isolated analog option decreases efficiancy by 1% and increases input current by 1 %



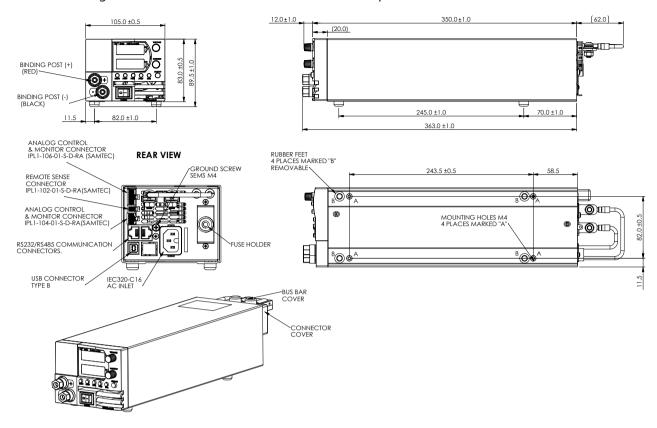


Z⁺200W/400W/600W/800W Optional IEEE, Isolated Analog Interface

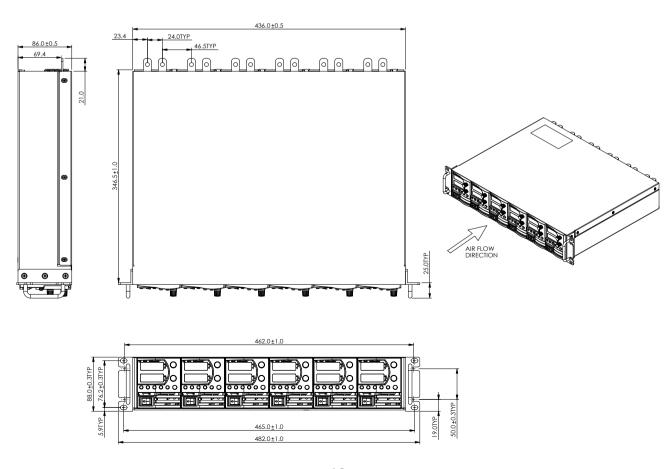




Outline Drawings Z⁺200W/400W/600W/800W Front Panel Output Jacks



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



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