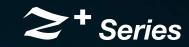
# **TDK·Lambda**





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



# 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<sup>®</sup> and LabWindows<sup>®</sup> 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:
- Foldback Mode Alarm
- Fine Control
- Remote Mode Preview Settings Output 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.

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



RS-232 RS-485 LAN IEEE













# **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**

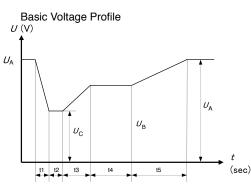
Smooth, reliable encoders enhance front panel control.

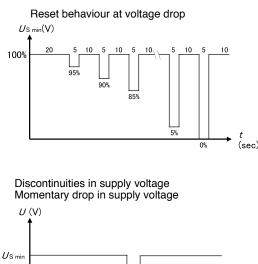
Remote analog programming is user selectable 0-5V or 0-10V.

### **RF Amplifiers and Magnets**

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

# Z<sup>+</sup> Series Sequence Programming Applications





10 10.1

ñ

# **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<sup>+</sup> 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%

# LAN Interface

- VISA & SCPI Compatible
- Address Viewable on Front Panel
- Fixed and Dynamic Addressing
- Compatible with most standard Networks

# **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

# P/N: LAN

P/N: IEEE

- TCP / UDP Socket Programming
- LAN Fault Indicators
- Auto-detects LAN Cross-over Cable
- Fast Startup

Program Current
Measure Current

Current Foldback shutdown

# *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			-		
<b>GPIB</b> Interf	face		IEEE		
Voltage Pro	ogramming Isolated	l Analog Interface	IS510		
Current Pro	ogramming Isolated	l Analog Interface	IS420		
LAN Interfa	ace		LAN		
Front pane	el output jacks (bind	ling post style, Ø 4m	ım)		
for module	es up to 60V or 24A l	Max		L	
•	el insulated output s				
for module	es up to 60V or 24A l	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	0~30 VDC	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	0~00 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<sup>+</sup>200 Series Specifications

	DEL	Z	10-20	20-10	36-6	60-3.5	100-2
1. Rated outp		 V	10-20	20-10	36	60	100-2
2. Rated outp		Â	20	10	6	3.5	2
	tput power	W	200	200	216	210	200
	DLTAGE MODE	Z	10-20	20-10	36-6	60-3.5	100-2
1. Max. Line r					of rated output voltage		
2. Max. Load r	2				of rated output voltage		1
	e (p-p, 20MHz) (*8)	mV	50	50	50	50	80
	s. 5Hz~1MHz	mV	5	6	6	7	8
	re coefficient	PPM/°C		PPM/°C from rated ou			
6. Temperat				out over 8hrs. interva			
	-up drift			0.05% of rated output	, , , , , , , , , , , , , , , , , , ,		1
	ompensation/wire	V	1	1	2	3	5
9. Up-prog. Response		mS	15	30	30	50	50
10. Down-prog. respor			12	25	30	40	50
	Time delay (*17)	mS	210	250	320	380	1200
	No load (*10) (*15)(*17)	1115	40	65	85	100	250
	No load (*10) (*16)(*17)		200	200	290	310	1100
11 Transiant	ocnonco timo	mS	Time for output volta	age to recover within (	).5% of its rated outpu	It for a load change 10	0~90% of rated out
11. Transient r	esponse time	1115	current. Output s	et-point: 10~100%, Lo	cal sense. Less than 1	mS, for models up to a	and including 100V
12. Hold-up	o time (*19)		15mSec Typical.		16mSee	c Typical.	
CONSTANT CL		Z	10-20	20-10	36-6	60-3.5	100-2
1. Max. Line r					of rated output curre		_
2. Max. Load re					of rated output curre		
	on thermal drift			n 0.05% of rated out		inutes following load	
	Hz~1MHz (*12)	mA	25	15	8	4	3
	re coefficient	PPM/°C		0PPM/°C from rated o			
6. Temperat				over 8hrs. interval foll			
7. Warm	-up drift		Less th	an +/-0.1% of rated o	utput current over 30	minutes following p	ower on.
PROTECTIVE	FUNCTIONS	Z	10-20	20-10	36-6	60-3.5	100-2
FROILCINE	PROTECTIVE FUNCTIONS			t-down when power sup			
1. Foldback	protection			cle in autostart mode or			
				n method. Reset by A			
2. Over-voltage	protection (OVP)				NABLE, or by commu		
3 Over-volt:	age trip point	V	0.5~12	1~24	2~40	5~66	5~110
4. Output under v				communication port. Prev			
4. Output under v	onage mine (OVE)			communication port. They	cites norm adjusting vour a	clow minit. Docs not ance	
				wn when nower supply	output voltage goes by	low LIVP programmin	
5. Output under volt	age protection (UVP)		Output shut-dov	wn when power supply			g. User presetable.
			Output shut-dov	cle in autostart mode or	by OUTPUT button or b	y rear panel ENABLE, or	g. User presetable.
5. Output under volt 6. Over tempera			Output shut-dov	cle in autostart mode or		y rear panel ENABLE, or	g. User presetable.
	ature protection		Output shut-dov	cle in autostart mode or	by OUTPUT button or b	y rear panel ENABLE, or	g. User presetable.
6. Over tempera	ature protection		Output shut-dov Reset by AC input recy	cle in autostart mode or	by OUTPUT button or b ectable, latched or no	y rear panel ENABLE, or n latched.	g. User presetable. by communication p
6. Over tempera 6. Ner tempera NALOG PROGRAMMING A 1. Vout voltage	ature protection		Output shut-dov Reset by AC input recy 0~100%, 0-	cle in autostart mode or User sele	by OUTPUT button or b ectable, latched or no lectable. Accuracy an	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c	g. User presetable. by communication p f rated Vout.
6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pro	Ature protection		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%,	cle in autostart mode or User sele ~5V or 0~10V, user se	by OUTPUT button or b ectable, latched or no lectable. Accuracy an electable. Accuracy a	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% o	g. User presetable. by communication p of rated Vout. f rated lout.
6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pro 3. Vout resistor	ature protection  ND MONITORING  programming ogramming (*13)		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/	cle in autostart mode or User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s	by OUTPUT button or b cctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-10	g. User presetable. by communication p of rated Vout. f rated lout. % of rated Vout.
6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pro 3. Vout resistor	Ature protection IND MONITORING Programming programming programming ogramming (*13)		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/	cle in autostart mode or User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s 10Kohm full scale, us	by OUTPUT button or b ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% o cy and linearity: +/-1% y and linearity: +/-1.	g. User presetable. by communication p of rated Vout. f rated lout. % of rated Vout. 5% of rated lout.
6. Over tempera <b>NALOG PROGRAMMING A</b> 1. Vout voltage 2. lout voltage pri 3. Vout resistor 4. lout resistor 5. Shut Off	Ature protection IND MONITORING programming programming ggramming (*13) (SO) control		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/	cle in autostart mode or User sele ~5V or 0~10V, user se 2~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use electrical Voltage: 0~0	by OUTPUT button or b ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac .6V/4~15V or dry con	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% o cy and linearity: +/-1% y and linearity: +/-1. itact, user selectable	g. User presetable. by communication p of rated Vout. f rated lout. % of rated Vout. 5% of rated lout.
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage pro- 2. lout voltage pro- 3. Vout resistor 4. lout resistor pro-	Ature protection IND MONITORING Programming (*13) programming (*13) (\$0) control at monitor (*13)		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/	cle in autostart mode or User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s '10Kohm full scale, us 10Kohm full scale, us electrical Voltage: 0~0 0~5V or 0~10	by OUTPUT button or b ectable, latched or no electable. Accuracy an electable. Accuracy er selectable. Accurac r selectable. Accurac .6V/4~15V or dry con V, user selectable. Acc	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% oi cy and linearity: +/-1. y and linearity: +/-1. ttact, user selectable curacy: +/-1%.	g. User presetable. by communication p of rated Vout. f rated lout. % of rated Vout. 5% of rated lout.
6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage pr 3. Vout resistor 4. lout resistor pr 5. Shut Off 6. Output currer 7. Output vol	ature protection  ND MONITORING  programming (*13) programming (*13) (SO) control tt monitor (*13) tage monitor		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/	cle in autostart mode or User sele ~5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm full scale, us electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10	by OUTPUT button or b ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accurac er selectable. Accurac .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1%. tact, user selectable curacy: +/-1%.	g. User presetable. by communication p of rated Vout. f rated lout. % of rated Vout. 5% of rated lout.
6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage pro 3. Vout resistor 4. lout resistor pro 5. Shut Off 6. Output currer 7. Output vol 8. Power sup	Ature protection  IND MONITORING  Programming ogramming ogramming (*13) (SO) control tt monitor (*13) tage monitor ply OK signal		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e	cle in autostart mode or User sele 5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, use 10Kohm full scale, use electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10	by OUTPUT button or b ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac V, Selectable. Ac	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1. y and linearity: +/-1. ttact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance.	g. User presetable. by communication p frated Vout. frated lout. % of rated lout. 5% of rated Vout. logic.
6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage pro 3. Vout resistor 4. lout resistor pro 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op	Ature protection  ND MONITORING  Programming Ogramming Ogramming (*13) (SO) control  nt monitor (*13) tage monitor ply OK signal eration (*20)		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e	cle in autostart mode or User sele 5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm full scale, us electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10 4~5V-OK, C to 6 units in master/s	by OUTPUT button or b ectable, latched or no electable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac V, Ser selectable. Ac V-Fail. 500ohm serie lave mode with singl	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance	g. User presetable. by communication p frated Vout. frated lout. % of rated Vout. 5% of rated Vout. logic.
6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage pro- 3. Vout resistor 4. lout resistor pro- 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series	Ature protection IND MONITORING Programming (*13) ogramming (*13) ogramming (*13) (SO) control tt monitor (*13) tage monitor ply OK signal erration (*20) operation		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up	cle in autostart mode or User sele 5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm	by OUTPUT button or b ectable, latched or no electable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy of V, 4 - 15V or dry con V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac V-Fail. 5000hm serie lave mode with singl cal units (with external	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% oi cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance al diodes).	g. User presetable. by communication p if rated Vout. f rated lout. % of rated Vout. 5% of rated Vout. logic. e connection.
6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage 3. Vout resistor 4. lout resistor 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC	Ature protection IND MONITORING Programming ogramming (*13) programming (*13) (SO) control nt monitor (*13) tage monitor ply OK signal eration (*20) operation indicator		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C	cle in autostart mode or User sele 5V or 0~10V, user sele 5V or 0~10V, user sele 5V or 0~10V, user sele 5V or 0~10U 5V or 0~10 5V or 0~10 10 5V or 0~10 5V or 0~10 5	by OUTPUT button or b ectable, latched or no lectable, latched or no electable. Accuracy an electable. Accuracy a er selectable. Accuracy ar selectable. Accuracy of V/4~15V or dry com V, user selectable. Ac VV-Fail. 500ohm serie lave mode with singl lave mode with singl al units (with externa e: Off. Maximum volt	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1. ttact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance al diodes). rage: 30V, maximum	g. User presetable. by communication p of rated Vout. f rated lout. % of rated lout. % of rated lout. logic. e connection. sink current: 10mA
6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage 2. lout voltage pri 3. Vout resistor 4. lout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock	Ature protection IND MONITORING programming (*13) programming (*13) (SO) control at monitor (*13) tage monitor ply OK signal eration (*20) operation indicator (ILC) control		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o	cle in autostart mode or User sele -5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm f	by OUTPUT button or b cctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy 6/V/4~15V or dry com V, user selectable. Ac V, user selectable. Ac V-Fail. 500ohm serie lave mode with singl ial units (with externa e: Off. Maximum volt On, Open: Off, Source cure	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1 y and linearity: +/-1. ttact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance i diodes). age: 30V, maximum s nt. less than 0.5mA). Ena/Di	g. User presetable. by communication p of rated Vout. f rated lout. % of rated lout. % of rated Vout. 5% of rated lout. logic. e connection. sink current: 10mA s is activated by front pa
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor 4. lout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remot	Ature protection IND MONITORING Programming (*13) programming (*13) (SO) control at monitor (*13) tage monitor ply OK signal lereration (*20) operation i.idicator (ILC) control te mode Control		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr	cle in autostart mode or User sele 5V or 0~10V, user sele 5V or 0~10V, user sele 5V or 0~10V, user se 5V or 0~10V, user se 10Kohm full scale, us 10Kohm full scale, us 10Kohm full scale, us 10Kohm full scale, us 20Kohm full scale, us 0~5V or 0~10 0~5V or 0~10 0~10 0~5V or 0~10 0~5V or 0~10 0~10 0~5V or 0~10 0~5V or 0~100~5V or 0~100~5V or 0~10 0~5V or 0~100~5V or 0~100~5V or 0~10 0~5V or 0~100~5V or 0~100~5V or 0~100~5V or 0~100~5V or 0~100~5V or 0~100~5V or 0~100	by OUTPUT button or b ectable, latched or no lectable, latched or no electable. Accuracy an electable. Accuracy ar selectable. Accurac 65/4~15V or dry com V, user selectable. Ac V, user selectable. Ac V-Fail. 5000hm serie lave mode with singl al units (with externa e: Off. Maximum volt 0n, Open: Off. Source curre hort: 0~0.6V or short:	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. s resistance. e wire current balance al diodes). age: 30V, maximum en t less than 0.5mA). Ena/Di Remote, 2~15V or or	g. User presetable. by communication p of rated Vout. f rated lout. % of rated lout. % of rated lout. logic. e connection. sink current: 10mA s is activated by front propen: Local
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor 4. lout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remot	Ature protection IND MONITORING programming (*13) programming (*13) (SO) control at monitor (*13) tage monitor ply OK signal eration (*20) operation indicator (ILC) control		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr Open collector (shut	cle in autostart mode or User sele 5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm full scale, us electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10 4~5V-0K, 0 to 6 units in master/s 2 identic C mode: On, CV mod utput by dry contact (Short rical signal or Open/S nted by 36V zener). Or	by OUTPUT button or b ectable, latched or no lectable, latched or no electable. Accuracy an electable. Accuracy ar selectable. Accurac selectable. Accurac 6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac V-Fail. 5000hm serie lave mode with singl ial units (with externa e: Off. Maximum volt On, Open: Off, Source curre hort: 0~0.6V or short: n (0~0.6V, 10mA sink co	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance a diodes). age: 30V, maximum : nt. less than 0.5mÅ). Ena/Di Remote, 2~15V or op current max.)-Remote	g. User presetable. by communication p of rated Vout. f rated lout. % of rated lout. % of rated lout. logic. e connection. sink current: 10mA s is activated by front pa pen: Local . Off-Local (30V ma
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remoti 14. Local/Remoti	Ature protection IND MONITORING Programming (*13) programming (*13) (SO) control at monitor (*13) tage monitor ply OK signal lereration (*20) operation i.idicator (ILC) control te mode Control		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr Open collector (shut	cle in autostart mode or User sele 5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, use 10Kohm full scale, user 10Kohm fu	by OUTPUT button or b ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy er selectable. Accuracy (A) (vaser selectable. Acc V, user selectable. Acc V, user selectable. Acc V, user selectable. Acc V-Fail. 5000hm seriel lave mode with single (a) units (with externa- e: Off. Maximum volt On, Open: Off, Source curre hort: 00.6V or short: (0-0.6V, 10mA sink co num high level output	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1. ttact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance al diodes). age: 30V, maximum sint tless than 0.5mA). Ena/Di Remote, 2~15V or op current max.)-Remote t =3.8V, Maximum hi	g. User presetable. by communication p if rated Vout. f rated lout. % of rated lout. % of rated lout. logic. e connection. sink current: 10mA s is activated by front pa pen: Local . Off-Local (30V ma
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remoti 14. Local/Remoti	Ature protection IND MONITORING programming programming (*13) programming (*13) (SO) control at monitor (*13) tage monitor ply OK signal eration (*20) operation indicator (ILC) control te mode Control e mode Indicator		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ 0~100%, 0~5/ 0~100%, 0-5/ By e Dessible, up Open collector, C Enables/Disables the PS o By electr Open collector (shut Maximum low leve	cle in autostart mode or User sele 5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm full scale, us electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10 0~5V or 0~10 10 4~5V-OK, 0 to 6 units in master/s 2 identic C mode: On, CV mod utput by dry contact (Short rical signal or Open/S nted by 36V zener). Or el output =0.8V, Minin Maximum source	by OUTPUT button or b ectable, latched or no electable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy of the selectable. Accuracy (Auger selectable. Accuracy (Aug	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance a diodes). age: 30V, maximum si nt. less than 0.5mA). Ena/Di Remote, 2~15V or or current max.)-Remote t =3.8V, Maximum hi lse =20µs Typical.	g. User presetable. by communication p frated Vout. frated lout. % of rated Vout. % of rated Vout. logic. e connection. sink current: 10mA s is activated by front pr pen: Local . Off-Local (30V ma gh level output =5
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor 4. lout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remote 14. Local/Remote 15. Trig	Ature protection IND MONITORING programming programming (*13) programming (*13) (SO) control at monitor (*13) tage monitor ply OK signal eration (*20) operation indicator (ILC) control te mode Control e mode Indicator		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By elect: Open collector (shut Maximum low leve Maximum low leve	cle in autostart mode or User sele -5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm f	by OUTPUT button or b cctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy er selectable. Accuracy of V/4~15V or dry com V, user selectable. Ac V, or dry com V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac V, or dry com V,	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% oi cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance i diodes). age: 30V, maximum nt less than 0.5mA). Ena/Di Remote, 2~15V or oj current max.)-Remote t = 3.8V, Maximum hi se =20µs Typical. = 3.5V, Maximum hig	g. User presetable. by communication p of rated Vout. f rated lout. % of rated lout. % of rated lout. logic. e connection. sink current: 10mA s is activated by front pa pen: Local soff-Local (30V ma gh level output =5V, ph level input =5V,
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remoti 14. Local/Remoti 15.Trig 16.Tric	Ature protection IND MONITORING Programming Ogramming (*13) (SO) control Int monitor (*13) Itage monitor Ply OK signal Ieration (*20) Operation Indicator (ILC) control Ite mode Control Ite mode Control Ite mode Indicator Iger out Indicator Ite mode Indicator I		Output shut-dox Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr Open collector (shur Maximum low leve Maximum low leve Maximum low leve	cle in autostart mode or User sele -5V or 0~10V, user sele -5V or 0~10V, user sele -5V or 0~10V, user sele -5V or 0~10V, user sele -10Kohm full scale, us -10Kohm full scale, us -10Kohm full scale, us -0~5V or 0~10 -0~5V or 0~1	by OUTPUT button or b cctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy of V/4~15V or dry com V, user selectable. Acc V, user selectable. Acc V, user selectable. Acc V-Fail. 500ohm serie lave mode with singl cal units (with externa e: Off. Maximum volt On, Open: Off, Source curre hort: 0~0.6V or short: 1 (0~0.6V, 10mA sink or num high level output e current = 16mA, put num high level input ve edge, trigger: tw =	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance al diodes). age: 30V, maximum si age: 30V, maximum si semote, 2~15V or or current max.)-Remote t =3.8V, Maximum hi se =20µs Typical. =3.5V, Maximum hi e=3.5V, Maximum hi	g. User presetable. by communication p of rated Vout. f rated lout. % of rated lout. % of rated lout. sink current lout. logic. e connection. sink current: 10mA s is activated by front pa pen: Local . Off-Local (30V ma gh level output =5 gh level input =5V, f =1µs maximum.
6. Over tempera 6. Over tempera NALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pri 3. Vout resistor pri 4. lout resistor pri 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remoti 14. Local/Remoti 14. Local/Remoti 15.Trig 16.Tric 17. Program	Ature protection IND MONITORING Programming Ogramming (*13) (SO) control Int monitor (*13) Itage monitor Ply OK signal Ieration (*20) Operation Indicator (ILC) control Ite mode Control Ite mode Control Ite mode Indicator Iger out Indicator Ite mode Indicator I		Output shut-dov Reset by AC input recy 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr Open collector (shur Maximum low leve Maximum low leve Maximum sink k	cle in autostart mode or User sele -5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm f	by OUTPUT button or b cctable, latched or no lectable, latched or no electable. Accuracy an electable. Accuracy ar selectable. Accuracy of verselectable. Accuracy of verselectable. Accuracy verselectable. Accuracy verselec	y rear panel ENABLE, or n latched. d linearity: +/-0.5% c nd linearity: +/-1% or cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance al diodes). age: 30V, maximum ent less than 0.5mÅ). Ena/Di Remote, 2~15V or op current max.)-Remote t =3.8V, Maximum hi lse =20µs Typical. :=3.5V, Maximum hi c=10µs minimum, TrrT rrent 100mA. (Shuntz	g. User presetable. by communication pro- frated Vout. frated lout. % of rated Vout. 5% of rated Iout. logic. e connection. sink current: 10mA s is activated by front pa pen: Local . Off-Local (30V ma gh level output =5V, f =1µs maximum. ed by 27V zener)

	 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, 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
5. mulcations	 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, LAN)

riodramming and Readback (R3232/483,03b, C	prional. ILLL, I					
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	10-20	20-10	36-6	60-3.5	100-2
1 Input voltage/freg (*3)		85~265Vac continuous 47~63Hz single phase				

1. Input voltage/freq. (*3)			85~265Vac o	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 10	0Vac, >0.98 at 200Va	c,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

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

SAFET T/EIVIC			
1. Applicable standards:	ble 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

1. Co	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 (W/vHvD)	3 Dimensions (Multure) STANDARD		H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).		
3. Dimensions (WxHxD) WIDE BODY mm		mm	H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing).		
4. Vibration			According to: IEC60068-2-64		
C Charle			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<sup>+</sup>400 Series Specifications

MODEL	Z	10-40	20-20	36-12	60-7	100-4
1. Rated output voltage(*1)	V	10	20	36	60	100
2. Rated output current (*2)	A	40	20	12	7	4
3. Rated output power	W	400	400	432	420	400
CONSTANT VOLTAGE MODE	Z	10-40	20-20	36-12	60-7	100-4
1. Max. Line regulation (*6)		10-40		of rated output voltac		100-4
2. Max. Load regulation (*7)		0.01% of rated output voltage+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		PPM/°C from rated ou	tput voltage, followi	ng 30 minutes warm	n-up.
6. Temperature stability			out over 8hrs. interval			
7. Warm-up drift		Less than	0.05% of rated output	t voltage+2mV over 3	30 minutes following	g 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)		10	10	15	30	50
Time delay (*17)	mS	210	250	320	380	1200
No load (*10) (*15) (*17)	1115	40	65	85	100	250
No load (*10) (*16) (*17)		200	200	290	310	1100
11. Transient response time	mS		age to recover within ( et-point: 10~100%, Lo			
12. Hold-up time (*19)		15mSec Typical.		16mSec	Typical.	
CONSTANT CURRENT MODE	Z	10-40	20-20	36-12	60-7	100-4
1. Max. Line regulation (*6)		10-40		of rated output currer		100-4
2. Max. Load regulation (*11)				of rated output currer		
3. Load regulation thermal drift		Less tha	an 0.05% of rated outp			d change
4. Ripple r.m.s. 5Hz~1MHz (*12)	mA	70	40	15	8	3
5. Temperature coefficient	PPM/°C		0PPM/°C from rated o		-	
6. Temperature stability			over 8hrs. interval foll			
7. Warm-up drift			an +/-0.1% of rated or			
•	-			•		
PROTECTIVE FUNCTIONS	Z	10-40	20-20	36-12	60-7	100-4
1. Foldback protection		Output shut-down when power supply change mode from CV to CC or CC to CV. User presetable. Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication por				
2. Over-voltage protection (OVP)		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.				
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 pane	el or communication ir	oort. Prevents from a analog programmin		limit. Does not af
5. Output under voltage protection (UVP)			n when power supply o /cle in autostart mode or			
6. Over temperature protection			User Sele	ctable. Latched or no	n latched	
ALOG PROGRAMMING AND MONITORING						
1. Vout voltage programming		0~100% 0	~5V or 0~10V, user se	ectable Accuracy and	d linearity: ±/-0.5%	of rated Vout
2. lout voltage programming (*13)			0~5V or 0~10V, user s			
3. Vout resistor programming			10Kohm full scale, us			
4. lout resistor programming (*13)			10Kohm full scale, use			
5. Shut Off (SO) control			electrical Voltage: 0~0			
6. Output current monitor (*13)				V, user selectable. Ac		2
7. Output voltage monitor				V, user selectable. Ac		
8. Power supply OK signal			4~5V-OK, 0	V-Fail. 500ohm series	s resistance.	
9. Parallel operation (*21)		Possible, up	to 6 units in master/s			ce connection.
10. Series operation				al units (with externa		
11. CV/CC indicator			C mode: On, CV mod	: Off. Maximum volt	age: 30V, maximum	
12. Interlock (ILC) control		Open collector. CC mode: On, CV mode: Off. Maximum voltage: 30V, maximum sink current: 10mA Enables/Disables the PS output by dry contact (Short: On, Open: Off, Source current: less than 0.5mA). Ena/Dis is activated by front pane				
				ort. 0~0 6V or short.	Remote, 2~15V or c	pen: Local
13. Local/Remote mode Control				By electrical signal or Open/Short: 0~0.6V or short: Remote, 2~15V or open: Local           Open collector (shunted by 36V zener). On (0~0.6V, 10mA sink current max.)-Remote. Off-Local (30V max           Maximum low level output =0.8V, Minimum high level output =3.8V, Maximum high level output =5.8V, Maximum high level		
13. Local/Remote mode Control 14. Local/Remote mode Indicator		Open collector (shu	nted by 36V zener). Or el output =0.8V, Minim	(0~0.6V, 10mA sink c um high level outpu	urrent max.)-Remote t =3.8V, Maximum h	e. Off-Local (30V m
13. Local/Remote mode Control 14. Local/Remote mode Indicator 15.Trigger out		Open collector (shu Maximum low leve Maximum low le	nted by 36V zener). Or l output =0.8V, Minim Maximum sourc vel input =1.2V, Minir	(0~0.6V, 10mA sink c um high level outpur current =16mA, pul num high level input	urrent max.)-Remote t =3.8V, Maximum h se =20µs Typical. =3.5V, Maximum hi	e. Off-Local (30V m igh level output = gh level input =5\
13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in		Open collector (shu Maximum low leve Maximum low le Maximum sink c	nted by 36V zener). Or el output =0.8V, Minim Maximum sourc evel input =1.2V, Minir current =16mA, positi	(0~0.6V, 10mA sink c um high level outpur e current =16mA, pul num high level input ve edge, trigger: tw =	urrent max.)-Remote t =3.8V, Maximum h lse =20µs Typical. =3.5V, Maximum hi =10µs minimum, Tr/T	e. Off-Local (30V m igh level output = gh level input =5\ f =1µs maximum
13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1		Open collector (shui Maximum low leve Maximum low le Maximum low le Maximum sink c Open collector,	nted by 36V zener). Or el output =0.8V, Minim Maximum sourc evel input =1.2V, Minir current =16mA, positi ; maximum voltage 2.	(0~0.6V, 10mA sink c um high level output e current =16mA, pul num high level input /e edge, trigger: tw = iV, maximum sink cur	urrent max.)-Remote t =3.8V, Maximum h lse =20μs Typical. =3.5V, Maximum hi =10μs minimum, Tr/1 rrent 100mA. (Shunt	e. Off-Local (30V m igh level output = gh level input =5\ f =1μs maximum. ed by 27V zener)
13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in		Open collector (shui Maximum low leve Maximum low le Maximum low le Maximum sink c Open collector,	nted by 36V zener). Or el output =0.8V, Minim Maximum sourc evel input =1.2V, Minir current =16mA, positi	(0~0.6V, 10mA sink c um high level output e current =16mA, pul num high level input /e edge, trigger: tw = iV, maximum sink cur	urrent max.)-Remote t =3.8V, Maximum h lse =20μs Typical. =3.5V, Maximum hi =10μs minimum, Tr/1 rrent 100mA. (Shunt	e. Off-Local (30V m igh level output = gh level input =5\ f =1μs maximum. ed by 27V zener)
13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1		Open collector (shui Maximum low leve Maximum low le Maximum low le Maximum sink c Open collector,	nted by 36V zener). Or el output =0.8V, Minim Maximum sourc vel input =1.2V, Minir current =16mA, positi , maximum voltage 2 , maximum voltage 2	(0~0.6V, 10mA sink c um high level outpu e current =16mA, pul hum high level input re edge, trigger: tw = iV, maximum sink cu iV, maximum sink cu	urrent max.)-Remote t =3.8V, Maximum h lse =20µs Typical. =3.5V, Maximum hi =10µs minimum, Tr/1 rrent 100mA. (Shunt rrent 100mA. (Shunt	e. Off-Local (30V m igh level output = gh level input =5\ f =1μs maximum. ed by 27V zener)
13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2		Open collector (shui Maximum low leve Maximum low le Maximum low le Maximum sink c Open collector,	nted by 36V zener). Or el output =0.8V, Minim Maximum source evel input =1.2V, Minir current =16mA, positi , maximum voltage 2 , maximum voltage 2 Multij	(0~0.6V, 10mA sink c um high level output e current =16mA, pul num high level input /e edge, trigger: tw = iV, maximum sink cur	urrent max.)-Remote t =3.8V, Maximum h ise =20µs Typical. =3.5V, Maximum hi :10µs minimum, Tr/T rrent 100mA. (Shunt rrent 100mA. (Shunt coders	b. Off-Local (30V m. igh level output = gh level input =5V $f = 1 \mu s$ maximum. ied by 27V zener)

	 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 (*20), 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
5. indications	 RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).
4. Function buttons	 FINE, MENU, PREV, PROT, REM, OUTPUT

#### PROGRAMMING AND READBACK (R\$232/485.USB, Optional: IEEE(\*20), I AN)

TROUNAMIMING AND READBACK (13232/403,030, 000		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

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.
5. Altitude		Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C.

#### SAFETY/EMC

I. 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.
		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
	,	EMC

#### MECHANICAL

1. Co	1. Cooling -		Forced air cooling by internal fan
2 Woight	STANDARD	Kg	Less than 1.9Kg.
2. Weight	2. Weight WIDE BODY		Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE
2 Dimensions (WedlerD)	STANDARD 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.
  \*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<sup>+</sup>600 Series Specifications

MO		7	10.00	20.20	26.10	(0.10	100 €
	DEL out voltage(*1)	Z	10-60 10	20-30 20	36-18 36	60-10 60	100-6 100
	out current (*2)	A	60	30	18	10	6
		W	600	600	648	600	600
5. Rated OL	Itput power	VV	600	600	040	000	000
CONSTANT V	OLTAGE MODE	Z	10-60	20-30	36-18	60-10	100-6
1. Max. Line r	egulation (*6)			0.01%	of rated output voltage	ge+2mV	
2. Max. Load I	regulation (*7)			0.01%	of rated output voltage	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
5. Temperatu	ire coefficient	PPM/°C	30	PPM/°C from rated ou	utput voltage, followi	ng 30 minutes warm	-up.
6. Temperat	ture stability		0.05% of rated Vo	out over 8hrs. interva	l following 30 minute	s warm-up. Constant	line, load & temp.
7. Warm	n-up drift		Less than	0.05% of rated outpu	it voltage+2mV over	30 minutes following	power on.
8. Remote sense c	ompensation/wire	V	1	1	2	3	5
9. Up-prog. Respons	e time, 0~Vomax.(*9)	mS	50	50	50	50	100
10. Down-prog. respo	nse time: Full load (*9)		25	25	25	25	80
	Time delay (*17)	mS	285	425	450	570	1370
	No load (*10) (*15)(*17)	1115	65	110	155	175	375
	No load (*10) (*16)(*17)		280	470	470	500	1200
11 Transient	response time	mS		age to recover within (			
				et-point: 10~100%, Lo	cal sense. Less than 1r	nS, for models up to a	nd 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		
2. Max. Load r	egulation (*11)			0.01%	of rated output curre	nt+5mA	
	ion thermal drift		Less tha	n 0.15% of rated out	put current over 30 m	inutes following load	
4. Ripple r.m.s. 5	5Hz~1MHz (*12)	mA	150	75	25	8	5
	ire coefficient	PPM/°C		)PPM/°C from rated o			
6. Temperat	ture stability		0.05% of rated lout of	over 8hrs. interval foll	owing 30 minutes wa	arm-up. Constant line	, load & temperatur
7. Warm	n-up drift		20V, 36V Model:	ess than +/-0.3% of ra Less than +/-0.15% o s: Less than +/-0.1% o	f rated output curren	t over 30 minutes fol	lowing power on.
PROTECTIVE	FUNCTIONS	Z	10-60	20-30	36-18	60-10	100-6
1. Foldback	<pre>c protection</pre>			own when power supp cle in autostart mode or			
2. Over-voltage	protection (OVP)		Inverter Shut dow	n method. Reset by A rear panel El	C input recycle in aut NABLE, or by commu		UTPUT button or by
3. Over -volta	age trip point	V	0.5~12	1~24	2~40	5~66	5~110
4. Output under v	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 volt	age protection (UVP)			n when power supply cle in autostart mode or			
6. Over tempera	ature protection			User Sele	ctable. Latched or no	n latched.	
ANALOG PROGRAMMING A	AND MONITORING						
	e programming			~5V or 0~10V, user se			
2. lout voltage pr	ogramming (*13)			0∼5V or 0∼10V, user s			
3. Vout resisto	r programming			10Kohm full scale, us			
4. lout resistor pr	ogramming (*13)		0~100%, 0~5/	10Kohm full scale, use	er selectable. Accurac	y and linearity: +/-1.5	5% of rated lout.
	(SO) control		By e	lectrical Voltage: 0~0			logic.
	nt monitor (*13)				V, user selectable. Ac		
	Itage monitor				V, user selectable. Ac		
	ply OK signal			,	V-Fail. 500ohm series		
	peration (*20)		Possible, up	to 6 units in master/s			e connection.
	operation				al units (with externa		
	C indicator ( (ILC) control			C mode: On, CV mod PS output by dry cont	act (Short: On, Open: O	Off, Source current: les	
	te mode Control		Du alacte	ical signal or Open/S	activated by front pan		aen: Local
	e mode Indicator			nted by 36V zener). Or			
				l output =0.8V, Minin			
	ger out			Maximum sourc			
	gger in		Maximum sink o	<u>urrent =16mA, positi</u>	ve edge, trigger: tw =	10µs minimum, Tr/T	f =1µs maximum.
	med signal 1			, maximum voltage 2			
18. Programmed signal 2 Open collector, maximum voltage 25V, maximum sink current 100mA. (Shunted by 27V zener)							

#### FRONT PANEL

	 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
5. 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(\*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

int of chanterEnsities		1072	20 10	50 24	00 14	100.0
1. Input voltage/freq. (*3)		85~265Vac continuous, 47~63Hz, 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% l	oad	
4. Efficiency (Typ) 100/200VAC (*4)	X.	81/83	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	χ.	20~90% RH (no condensation).
4. Storage humidity	1	10~95% RH (no condensation).
C 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

		UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN60950-1		
Safety		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)		
		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. Withstand voltage		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 resistance		More than 100Mohm at 25°C, 70%RH.		
4. Conducted emission		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		
5. Radiated emission		EN55022B, FCC part 15-B, VCCI-B		
6	EMC voltage sistance mission	EMC voltage sistance mission mission		

#### MECHANICAL

1. Cooling			Forced air cooling by internal fan.		
2 Waight	STANDARD		Less than 2.5Kg.		
2. Weight	WIDE BODY	Kg	Less than 3.0Kg. Wide body with Isolated analog or Binding post or IEEE.		
	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: 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.
\*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 cated output voltage and rated output current.

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<sup>+</sup>800 Series Specifications

	MODEL	Z	10-72	20-40	36-24	60-14	100-8
1. R	lated output voltage(*1)	V	10	20	36	60	100
2 Dated output	Vin ≥ 100Vac, Ta ≤ 50°C	Α	72	40	24	14	8
2. Rated output current (*2)(*21)	$85Vac \le Vin < 100Vac, Ta \le 40^{\circ}C$	Α	72	40	24	14	8
	85Vac ≤ Vin < 100Vac, 40°C < Ta ≤ 50°C	Α	66	36	20	12.5	7.5
3. Rated output	Vin ≥ 100Vac, Ta ≤ 50°C	W	720	800	864	840	800
bower	$85Vac \le Vin < 100Vac, Ta \le 40^{\circ}C$	W	720	800	864	840	800
power	85Vac $\leq$ Vin $<$ 100Vac, 40°C $<$ Ta $\leq$ 50°C	W	660	720	720	750	750
CON	ISTANT VOLTAGE MODE	Z	10-72	20-40	36-24	60-14	100-8
1. N	Nax. Line regulation (*6)			0.01% 0	of rated output voltage	ge+2mV	
	lax. Load regulation (*7)				of rated output voltage		
	and noise (p-p, 20MHz) (*8)	mV	50	50	50	60	80
	Ripple r.m.s. 5Hz~1MHz	mV	5	5	5	12	15
	Temperature coefficient	PPM/°C		PPM/°C from rated ou			
6.	. Temperature stability			out over 8hrs. interval			
	7. Warm-up drift			0.05% of rated output			1
	te sense compensation/wire	V	1	1	2	3	5
	J. Response time, 0~Vomax.(*9)	mS	50	50	50	50	100
10. Down-pro	og. response time: Full load (*9)		25	25	25	25	80
	Time delay (*17)	mS	285	425	450	570	1370
	No load (*10) (*15) (*17)		65	110	155	175	375
	No load (*10) (*16) (*17)		280	470	470	500	1200
11.1	Transient response time	mS		age to recover within ( set-point: 10~100%, Lo			
1	2. Hold-up time (*18)		currenti o utput s		Typical. Rated output		in a menual ing root
CON	ISTANT CURRENT MODE	Z	10-72	20-40	36-24	60-14	100-8
	Max. Line regulation (*6)		10-72		of rated output curre		100-0
	ax. Load regulation (*11)				of rated output curre		
2.101			Eor 10\/clos	s than 0.15% of rated			load change
3. Loa	ad regulation thermal drift			Less than 0.1% of rate			
4. Ripi	ple r.m.s. 5Hz~1MHz (*12)	mA	180	100	31	28	12
	lemperature coefficient	PPM/°C		0PPM/°C from rated o	utput current, follow	ing 30 minutes warm	-up.
	. Temperature stability			over 8hrs. interval foll			
	7. Warm-up drift			nan +/-0.3%, 20V mod		%, 36V~100 models: L	
		-	10.70				100.0
PR	OTECTIVE FUNCTIONS	Z	10-72	20-40	36-24	60-14	100-8
1	. Foldback protection		Reset by AC input recy	own when power supp ycle in autostart mode or	by OUTPUT button or by	y rear panel ENABLE, or b	by communication p
2. Ove	er-voltage protection (OVP)		Inverter Shut dow	n method. Reset by A rear panel El	C input recycle in aut NABLE, or by commu		JTPUT button or
3. C	Over - voltage trip point	V	0.5~12	1~24	2~40	5~66	5~110
4. Outp	ut under voltage limit (UVL)		Preset by front pan	el or communication ir	port. Prevents from a analog programmir		limit. Does not afl
5 Output	under voltage protection (UVP)			when power supply o	output voltage goes b	elow UVP programmi	
•			Reset by AC input recy	cle in autostart mode or			by communication p
6. Ove	er temperature protection			User Sele	ctable. Latched or no	on latched	
	MMING AND MONITORING						
	but voltage programming		0~100% 0	~5V or 0~10V, user se	lectable Accuracy an	d linearity: ±/-0.5% o	frated Vout
	voltage programming (*13)			0~5V or 0~10V, user s			
	but resistor programming			10Kohm full scale, us			
	resistor programming (*13)			10Kohm full scale, use			
	. Shut Off (SO) control			electrical Voltage: 0~0			
	tput current monitor (*13)				V, user selectable. Ac		logic.
	Dutput voltage monitor				V, user selectable. Ac		
	Power supply OK signal				V-Fail. 500ohm serie		
	Parallel operation (*20)		Possible un	to 6 units in master/s			e connection
	10. Series operation		i ossioic, up		al units (with externa		e connection.
	11. CV/CC indicator		Open collector (	C mode: On, CV mode			ink current <sup>,</sup> 10m
				PS output by dry cont			
	l. Interlock (ILC) control			is	activated by front par	nel.	
	cal/Remote mode Control			rical signal or Open/S			
14. Loc	cal/Remote mode Indicator			nted by 36V zener). Or			
	15.Trigger out			el output =0.8V, Minin Maximum sourc			
	16.Trigger in		Maximum source current =16mA, pulse =20µs Typical. 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	7. Programmed signal 1			<u>current =16mA, posit</u> , maximum voltage 2			
	3. Programmed signal 2			r, maximum voltage 2			
				,			
RONT PANEL	,		1				
					ole options with 2 En		
			1	V	out/lout manual adju	ist	

	 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.

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.
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
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 (*13)			0.1% of act	ual +0.1% of rated ou	tput 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 vo	ltage	
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
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/		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

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. 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	A	72	40	24	14	8
Rated output current at 85≤Vin<100Vac	A	66 36 20 12.5 7.		7.5		

#### SAFETY/EMC

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		IEC/EN61326-1 (Built to meet EN55022/EN55024)		
2. Withstand voltage	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/IEEF/ISOLATED ANALOG-Ground: 707VDC/1min. 60V,100V models: Input-Output&J1,J2: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEF/ISOLATED ANALOG : 1910VDC/1min; Input-Ground: 2828VDC/1min. Output & J1,J2- J3,J4,USB,LAN/IEEF/ISOLATED ANALOG : 1910VDC/1min; Output&J1,J2-Ground: 1380VDC/1min. J3, J4, USB/LAN/IEEF/ISOLATED ANALOG - Ground: 707VDC/1min;		
3. Insulation resistance	3. Insulation resistance		3. Insulation resistance		More than 100Mohm at 25°C, 70%RH.
4. Conducted emission	4. Conducted emission		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		

#### ΜΕCHANICAL

1. Co	1. Cooling		Forced air cooling by internal fan		
2 Weight 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		
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		

#### NOTES:

- Minimum voltage is guaranteed to maximum 0.1% of rated output voltage. \*1:
- \*2: 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). \*3:
- \*4: 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. \*5:
- \*6:
- 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. \*7:
- \*8:
- From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load. \*9:

- \*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 \*12: For Toy model the ripple is measured at 2v to rated output voltage and rated output current.
  \*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 integral between each down programming is longer than Td (time delay).

- \*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

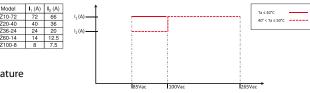
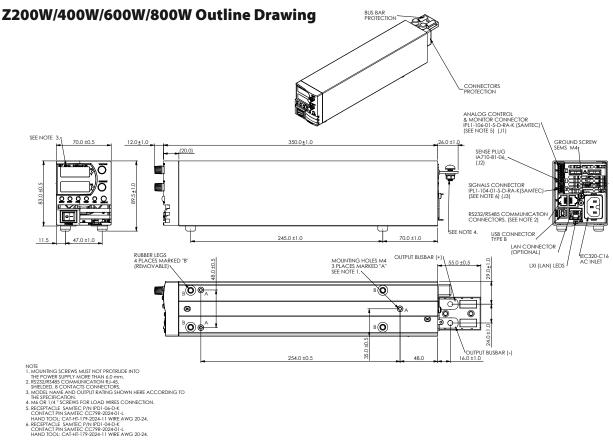
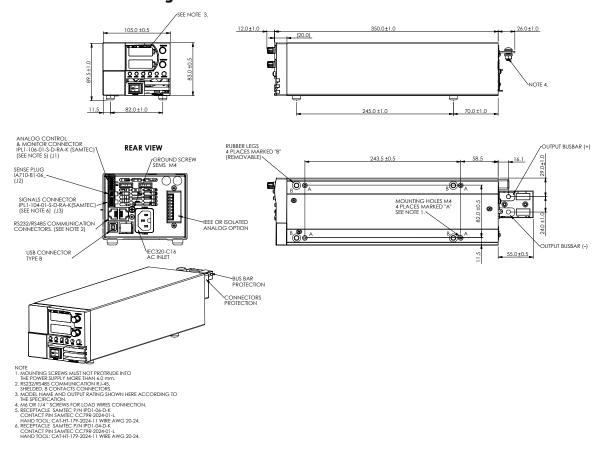


Fig. 2-1: Z<sup>+</sup>800 Rated Output Current Vs. Line Voltage and Ambient Temperature

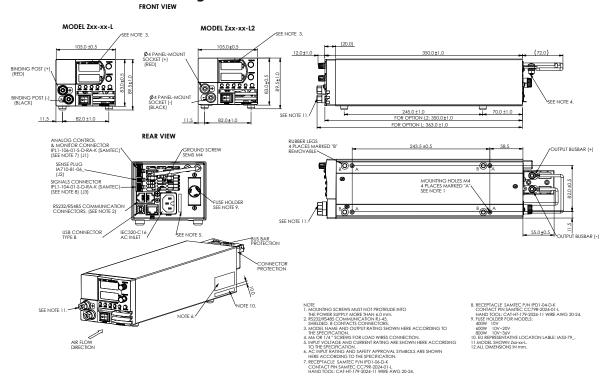


### Z200W/400W/600W/800W Optional IEEE, Isolated Analog Interface Outline Drawing



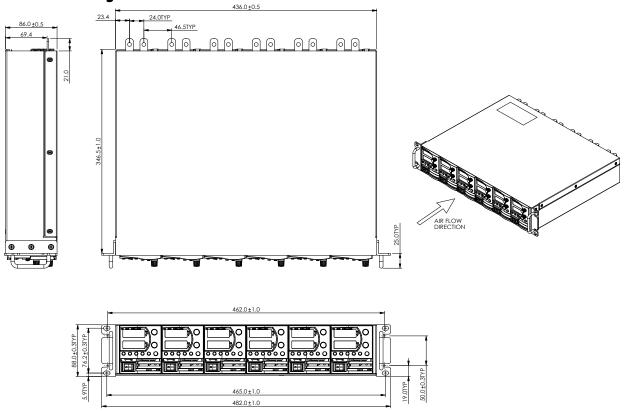


# **TDK·Lambda**



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

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



# Deutschlands größter B2B-Onlineshop für Mess- und Prüftechnik.



- > Eine unschlagbare Auswahl namhafter Hersteller
- > Hohe Lagerkapazität und kurze Wege
- Bundesweite Lieferung und schnelle Zustellung meist innerhalb eines Tages
- > Mehrere tausend Mess- und Prüfgeräte
- > Tagesaktuelle Preise und Promotions
- > Warenkorbrabatt bei Online-Bestellung
- > Versandkostenfrei ab € 50,-
- > Dokumenten-Download u. v. m.



