

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

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



TDK·Lambda

### TDK-Lambda

#### Features Include:

- High Power Density 200W/400W/600W/800W in 2U: 3.5 Inch (89mm) height
- Wide Range Input (85-265Vac continuous)
- Active Power Factor Correction (0.99 typical)
- Output Voltage up to 650V, Current up to 5A
- Constant Voltage (CV)/(CC) Constant Current auto-crossover
- Built-in RS-232/RS-485 Interface Standard
- Global Commands for Serial RS-232/RS-485 Interface
- Auto-Re-Start / Safe-Start: user selectable
- Last-Setting Memory
- High Resolution 16 bit ADCs & DACs
- · Low Ripple & Noise
- Front Panel Lock selectable from Front Panel or Software
- · Reliable Encoders for Voltage and Current adjustment
- · Parallel Operation with Active Current Sharing, for up to six identical units
- Advanced Parallel Master / Slave. Total Current is programmed and measured via the Master
- External Analog Programming and Monitoring (user selectable 0-5V & 0-10V)
- · Reliable Modular and SMT Design
- 19" Rack Mount Capability for ATE and OEM applications
- Optional Interfaces

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

LAN

LabView® and LabWindows® drivers

• Arbitrary functions for:

Automotive or laser simulation / 4 Pre-Programmed Functions

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





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# **Front Panel Description**







- 1. AC ON/OFF Switch
- 2. Air Intake allows zero stacking for maximum system flexibility and power density.\*
- 3. Reliable encoder controls Output Voltage and power supply setting.
- 4. Volt Display shows Output Voltage and directly displays and power supply settings.
- 5. Reliable encoder controls Output Current, and power supply setting.
- 6. Current Display shows Output Current and power supply setting.
- 7. Function/Status LEDs:
- AlarmFine ControlPreview SettingsFoldback ModeRemote ModeOutput On
- 8. Pushbuttons allow flexible user configuration
- Coarse and Fine adjustment of Output Voltage/Current and Advanced Parallel Master or Slave
- Preview settings and set Voltage/Current with Output OFF, Front Panel Lockout
- · Set OVP, UVP, UVL Limits
- Set Current Foldback
- Local/Remote Mode and select Address and Baud Rate
- Output ON/OFF and Auto-Start/Safe-Start Mode
- Menu
- 9. Optional front panel insulated output sockets (Ø 4mm) for modules up to 650V: 5A Max

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<sup>\*</sup> 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<sup>+</sup> 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:
  - MALE CONNECTOR (IC 2,5/4-G-5,08, PHOENIX CONTACT).
  - FEMALE PLUG (IC 2,5/4-ST-5,08, PHOENIX CONTACT).
- 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













# **Applications**

 $Z^{\dagger}$  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**

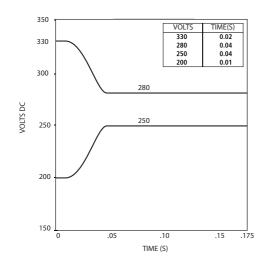
Smooth, reliable encoders enhance front panel control. Remote analog programming is user selectable 0-5V or 0-10V.

#### **RF Amplifiers and Magnets**

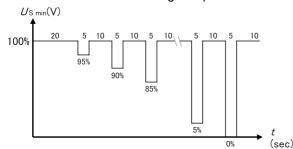
Robust design assures stable operation under a wide variety of loads. High linearity in Voltage & Current mode.

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

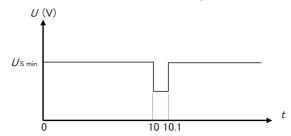
#### MILITARY STANDARD 704E Testing



#### Reset behaviour at voltage drop



#### Discontinuities in supply voltage Momentary drop in supply voltage



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

#### **Front Panel insulated Output sockets**

Up to 650V Output Module

P/N: Z\_\_--\_L2



Optional front panel insulated output sockets (Ø 4mm) for modules up to 650V: 5A 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)w





#### 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
0~160V	1.3A	2.6A	4A	5A
0~320V	0.65A	1.3A	2A	2.5A
0~650V	0.32A	0.64A	1A	1.25A
19" rack width	1/6 width	1/6 width	1/6 width	1/6 width
19" rack width	1/4 width	1/4 width	1/4 width	1/4 width





### **Programming Options (Factory Installed)**

#### **Digital Programming via IEEE Interface**

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

#### **Isolated Analog Programming**

Four Channels to Program and Monitor Voltage and Current.

Isolation allows operation with floating references in harsh electrical environments.

Choose between programming with Voltage or Current.

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

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

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

P/N: IS420

P/N: IS510

P/N: IEEE

LAN Interface P/N: LAN

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

Program Current

Measure Current

Current Foldback shutdown

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

#### **AC Cord**

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

#### **Communication Cable**

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

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

#### Serial Link Cable\*

Daisy-chain up to 31 Z<sup>+</sup> Series power supplies.

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

<sup>\*</sup> Included with power supply

# Power Supply Identification / Accessories How to order

Z	650 -	1.25-		-	
Series Name	Output Voltage (0~650V)	Output Current (0~1.25A)	Factory Options:	Output Jack	AC cord Options: Region :
			IEEE LAN		E - Europe J - Japan
			IS510 IS420	L2	U - North America I - Middle East C - China

Factory option
USB Interface built-in Standard
RS-232/RS-485 Interface built-in Standard
GPIB Interface
Voltage Programming Isolated Analog Interface
US510
Current Programming Isolated Analog Interface
LAN Interface
LAN
Front panel insulated output sockets (Ø 4mm)

Front panel insulated output sockets (Ø 4mm) for modules up to 650V or 5A Max

L2

Model	Output Voltage (VDC)	Output Current (A)	Output Power (W)
Z160-1.3		0~1.3	208
Z160-2.6	0~160 VDC	0~2.6	416
Z160-4	0~160 VDC	0~4	640
Z160-5		0~5	800
Z320-0.65	0~320 VDC	0~0.65	208
Z320-1.3		0~1.3	416
Z320-2		0~2	640
Z320-2.5		0~2.5	800
Z375-2.2	0~375VDC	0~2.2	825
Z650-0.32		0~0.32	208
Z650-0.64	0~650 VDC	0~0.64	416
Z650-1	0~030 VDC	0~1	650
Z650-1.25		0~1.25	812



# Z<sup>+</sup>200 Series Specifications

MODEL	Z	160-1.3 320-0.65	650-0.32	
1. Rated output voltage(*1)	V	160 320	650	
2. Rated output current (*2)	A	1.3 0.65	0.32	
3. Rated output power	W	208 208	208	
CONSTANT VOLTAGE MODE	Z	160-13 320-0.65	650-0.32	
1. Max. Line regulation (*6)		0.01% of rated output voltage	050-0.52	
2. Max. Load regulation (*7)		0.01% of rated output voltage		
3. Ripple and noise (p-p, 20MHz) (*14)	mV	100 150	250	
4. Ripple r.m.s. 5Hz~1MHz (*14)	mV	10 25	60	
5. Temperature coefficient	PPM/°C	30PPM/°C from rated output voltage, following 30	·	
6. Temperature stability		0.02% of rated Vout over 8hrs. interval following 30 minutes war		
7. Warm-up drift		Less than 0.05% of rated output voltage over 30 minut		
8. Remote sense compensation/wire 9. Up-prog. Response time, 0~Vomax.(*9)	V mS	5 5 110 170	5 170	
10. Down-prog. response time: Full load (*9)	mS	180 270	270	
No load (*10)		2 2.5	3	
11. Transient response time	mS	Time for output voltage to recover within 0.5% of its rated output output current. Output set-point: 10~100%, Local s	for a load change 10~90% of rated	
12. Hold-up time (*19)		16mSec Typical.	15mSec Typical.	
CONCTANT CURRENT 11005	-	100.12	550.005	
CONSTANT CURRENT MODE	Z	160-1.3 320-0.65	650-0.32	
1. Max. Line regulation (*6)		0.02% of rated output current	0.15% of rated outrant arrange	
Max. Load regulation (*11)     Load regulation thermal drift		0.09% of rated output current	0.15% of rated output current	
4. Ripple r.m.s. 5Hz~1MHz (*12) (*14)	mA	Less than 0.05% of rated output current over 30 minute 1.2 0.8	s following load change. 0.5	
5. Temperature coefficient	PPM/°C	1.2 U.o 100PPM/°C from rated output current, following 30		
6. Temperature coefficient		0.05% of rated lout over 8hrs. interval following 30 minutes warm-u		
7. Warm-up drift		Less than +/-0.1% of rated output current over 30 minu		
PROTECTIVE FUNCTIONS	Z	160-1.3 320-0.65	650-0.32	
1. Foldback protection		Output shut-down when power supply change mode from CV to Reset by AC input recycle in autostart mode or by OUTPUT butto communication port.		
2. Over-voltage protection (OVP)		Inverter Shut down method. Reset by AC input recycle in autostart r panel ENABLE, or by communication		
3. Over -voltage trip point	V	5~176 5~353	5~717	
4. Output under voltage limit (UVL)		Preset by front panel or communication port. Prevents from adjust in analog programming.	ng Vout below limit. Does not affect	
5. Output under voltage protection (UVP)		Output shut-down when power supply output voltage goes below UVP programming. User presetal Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication port.		
6. Over temperature protection		User selectable, latched or non latc	hed.	
ANALOG DROCDAMANING AND MONITORING				
ANALOG PROGRAMMING AND MONITORING  1. Vout voltage programming		0~100%, 0~5V or 0~10V, user selectable. Accuracy and line	priture / 0 F0/ of rated Vous	
2. lout voltage programming (*13)		0~100%, 0~5V or 0~10V, user selectable. Accuracy and line		
3. Vout resistor programming		0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and		
4. lout resistor programming (*13)		0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and		
5. Shut Off (SO) control		By electrical Voltage: 0~0.6V/4~15V or dry contact,		
6. Output current monitor (*13)		0~5V or 0~10V, user selectable. Accurac		
7. Output voltage monitor		0~5V or 0~10V, user selectable. Accurac	,	
8. Power supply OK signal		4~5V-OK, 0V-Fail. 500ohm series resis		
9. Parallel operation (*8)		Possible, up to 6 units in master/slave mode with single wire		
10. Series operation		2 identical units (with external dioc		
11. CV/CC indicator		Open collector. CC mode: On, CV mode: Off. Maximum voltage: 3		
12. Interlock (ILC) control 13. Local/Remote mode Control		Enables/Disables the PS output by dry contact (Short: On, Open: Off, Source current: less  By electrical signal or Open/Short: 0~0.6V or short: Rem		
14. Local/Remote mode Control		Open collector (shunted by 36V zener). On (0~0.6V, 10mA sink currer		
15.Trigger out		Maximum low level output =0.8V, Minimum high level output =3.8	3V, Maximum high level output =5V,	
16.Trigger in		Maximum source current =16mA, pulse =2  Maximum low level input =1.2V, Minimum high level input =3.5'	V, Maximum high level input =5V,	
		Maximum sink current =16mA, positive edge, trigger: tw =10μs	· · · · · · · · · · · · · · · · · · ·	
17. Programmed signal 1		Open collector, maximum voltage 25V,maximum sink current		
18. Programmed signal 2		Open collector, maximum voltage 25V, maximum sink current	100mA. (Shunted by 27V zener)	
EDONT DANEI				
FRONT PANEL		Multiple options with 2 Encoder	c	
		Vout/lout manual adjust	J	
		OVP/UVL/UVP manual adjust		
1 Control functions		Protection Functions - OVP, UVL, UVP, Foldbac	k, OCP, INT, SO	
1. Control functions		Communication Functions - Selection of LAN,IEEE (*	17),RS232,RS485,USB	
		Communication Functions - Selection of Bauc		
		Analog Control Functions - Selection Voltage/resistive programm		
		Analog Control Functions - Selection of Voltage/Current Monitoring 5V/	10v, Output ON/OFF, Front Panel Lock.	

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FRONT PANEL								
				Vout: 4 digits.	accuracy: 0.5% of rated output volt	age+/-1 count.		
2. Display					accuracy: 0.5% of rated output curi			
					s: FINE, MENU, PREV, PROT, REM, OU			
3. Indications					LED: PROT (OVP, UVP, OTP, FOLD, AC			
4. Function buttons					INE, MENU, PREV, PROT, REM, OUTP			
DD0 60 4444116 4410 DE44	DD 4 CV (DC0	20/405 USD 0		×4=> 1.440				
1. Vout programming accur		32/485,USB, Op	tional: IEEE(		of actual + 0.05% of rated output v	voltago		
2. lout programming accura				0.03%		70itage		
3. Vout programming accura				0.2% of rated output current				
4. lout programming resolu				0.012% of full scale 0.012% of full scale				
5. Vout readback accuracy	ILION			0.050/	of actual + 0.05% of rated output v	voltage		
6. lout readback accuracy	*12\				6 of actual +0.3% of rated output c			
7. Vout readback resolution				0.19	0.012% of full scale	irrent		
8. lout readback resolution					0.012% of full scale			
8. lout readback resolution					0.012% of full scale			
INPUT CHARACTERISTICS			Z	160-1.3	320-0.65	650-0.32		
1. Input voltage/freq. (*3)				85~2	65Vac continuous, 47~63Hz, single	phase		
2. Maximum Input current	100/200VAC	(*4) (*15)		2.64/1.30	2.64/1.30	2.64/1.30		
3. Power Factor (Typ)				>0.	99 at 100Vac, >0.98 at 200Vac,100%	load		
4. Efficiency (Typ) 100/200\	/AC (*4) (*15	)	%	79/81	79/81	79/81		
5. Inrush current 100/200V					Less than 25A			
ENVIRONMENTAL CONDIT	IONG							
ENVIRONMENTAL CONDIT	IONS			T	0.5000.1000/ land			
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					n 3000m. Derate ambient temp abo temperature, From 2000m up to 30			
CAFFTY/FMC								
SAFETY/EMC				LU 61010 1 EN610	010 1 IEC61010 1 Puilt to most III 6	00E0 1 EN600E0 1		
1. Applicable standards:		Safety		UL61010-1, EN61010-1, IEC61010-1. Built to meet UL60950-1, EN60950-1 160V≤Vout≤650V: Output,J1,J2 are Hazardous. J3,J4,USB, IEEE/ISOLATED Analog, LAN are Non Hazardous				
1. Applicable standards.		EMC		IEC/EN61326-1 (Built to meet EN55022/EN55024)				
		LIVIC			Hazardous; J3, J4, USB, LAN, IEEE/ISO			
2.Interface classification					t, J1, J2 are Hazardous; J3, J4, USB, LAN, IEE			
					Output, J1, J2, J3, J4, USB, LAN, IEEE/			
					Input-Output&J1,J2: 2970VDC/1min; Inpu			
					1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/I			
					OG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLA			
3. Withstand voltage					Output&J1,J2: 3704VDC/1min; Input-Gro			
				Output&J1,J2,-Ground: 2780VDC/	1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/I	SOLATED ANALOG :4244VDC/1min;		
				Input-J3,J	4,USB,LAN/IEEE/ISOLATED ANALOG: 4242	VDC/1min;		
				J3,J4,USB,LA1	J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.			
4. Insulation resistance	· · · · · · · · · · · · · · · · · · ·							
5. Conducted emission			IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B					
6. Radiated emission			IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A					
MECHANICAL								
1. Cooling					Forced air cooling by internal fan.			
	STA	NDARD	Kg		Less than 1.9Kg.			
2. Weight	WID	E BODY	Kg	Less than	2.4Kg. Wide body with Isolated ana	log or IEEE.		
2 Dimensions (MVHvD)	STA	NDARD	mm	H: 83, W: 70, D: 350 (e	xcluding bus bars, handles). (Ref	er to Outline drawing).		
3. Dimensions (WxHxD)	WID	E BODY	mm		excluding bus bars, handles). (Re			
4. Vibration					According to: IEC60068-2-64			
5 Shock		Treatment Treatm			: +- IFC(00(0 2 27			

5. Shock

- \*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: For parallel operation up to 4 units, 5% of total output current is required.
- For parallel operation more than 4 units, 20% of total output current is required. \*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: 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.

Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27

- \*14: Measured with 10:1 probe.
- \*15: P.S with Lan, IEEE, models decrease efficiency by 0.5% and increase input current by 0.5%. P.S with Isolated analog option decreases efficiency by 1.5% and increases input current by 1.5%.
- \*16: At rated output power.
- \*17: Max. ambient temperature for using IEEE is 45°C.



# **Z**<sup>+</sup>400 Series Specifications

MODEL	Z	160-2.6	320-1.3	650-0.64
1. Rated output voltage(*1)	V	160-2.6	320-1.3	650
2. Rated output current (*2)	A	2.6	1.3	0.64
3. Rated output power	W	416	416	416
CONSTANT VOLTAGE MODE	Z	160-2.6	320-1.3	650-0.64
1. Max. Line regulation (*6)			0.01% of rated output voltage	
2. Max. Load regulation (*7)			0.01% of rated output voltage	
3. Ripple and noise (p-p, 20MHz) (*14)	mV	100	150	250
4. Ripple r.m.s. 5Hz~1MHz (*14)	mV	10	25	60
5. Temperature coefficient	PPM/°C		ated output voltage, following 30 i	
5. Temperature stability			interval following 30 minutes warm	
7. Warm-up drift			ited output voltage over 30 minute	T
3. Remote sense compensation/wire	V	5	5	5
9. Up-prog. Response time, 0~Vomax.(*9)	mS C	80 100	150 150	150 150
10. Down-prog. response time: Full load (*9)  No load (*10)	mS S	2	2.5	3
[NO load ( 10)]			:hin 0.5% of its rated output for a load c	·
11. Transient response time	mS		set-point: 10~100%, Local sense. Less t	
12. Hold-up time (*19)			Typical.	15mSec Typical.
2.11010 up time ( 15)		Tomset	туріси.	Tomoce Typical.
CONSTANT CURRENT MODE	Z	160-2.6	320-1.3	650-0.64
1. Max. Line regulation (*6)			0.02% of rated output current	
2. Max. Load regulation (*11)			0.09% of rated output current	
3. Load regulation thermal drift		Less than 0.05% of rat	ed output current over 30 minutes	following load change.
4. Ripple r.m.s. 5Hz~1MHz (*12) (*14)	mA	1.5	1	0.6
5. Temperature coefficient	PPM/°C		rated output current, following 30	
5. Temperature stability			rval following 30 minutes warm-up	
7. Warm-up drift		Less than +/-0.1% of r	ated output current over 30 minut	es following power on.
				1
PROTECTIVE FUNCTIONS	Z	160-2.6	320-1.3	650-0.64
1. Foldback protection			ower supply change mode from CV to CC	
			mode or by OUTPUT button or by rear pa	
2. Over-voltage protection (OVP)			et by AC input recycle in autostart	
			panel ENABLE, or by communicatio	
3. Over -voltage trip point	V	5~176	5~353	5~717
4. Output under voltage limit (UVL)		, ,	port. Prevents from adjusting Vout below limit	
5. Output under voltage protection (UVP)			er supply output voltage goes below UVP mode or by OUTPUT button or by rear pa	
6. Over temperature protection			ser selectable, latched or non latch	
b. Over temperature protection			er supply output voltage goes below UVP	
5. Output under voltage protection (UVP)			mode or by OUTPUT button or by rear pa	
6. Over temperature protection			ser Selectable. Latched or non latch	
or over temperature protection		<u> </u>	ser serectusier zuterreu or morniuter	
ANALOG PROGRAMMING AND MONITORING				
1. Vout voltage programming		0~100%, 0~5V or 0~10V,	user selectable. Accuracy and linea	rity: +/-0.5% of rated Vout.
2. lout voltage programming (*13)		0~100%, 0~5V or 0~10V	, user selectable. Accuracy and line	arity: +/-1% of rated lout.
3. Vout resistor programming			cale, user selectable. Accuracy and	
4. lout resistor programming (*13)			ale, user selectable. Accuracy and I	inearity: +/-1.5% of rated lout.
			ge: 0~0.6V/4~15V or dry contact, u	
6. Output current monitor (*13)		0~5V	or 0~10V, user selectable. Accuracy	: +/-1%.
5. Output current monitor (*13) 7. Output voltage monitor		0~5V 0 0~5V 0	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy	: +/-1%. : +/-1%.
5. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal		0~5V ( 0~5V ( 4~5	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist	: +/-1%. : +/-1%. ance.
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8)		0~5V o 0~5V o 4~5 Possible, up to 6 units in m	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist uaster/slave mode with single wire	: +/-1%. : +/-1%. ance. current balance connection.
5. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation		0~5V 0 0~5V 0 4~5 Possible, up to 6 units in m 2	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist laster/slave mode with single wire identical units (with external diode	: +/-1%. : +/-1%. ance. current balance connection.
5. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator		0~5V of the control o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist laster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA
5. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 5000hm series resist laster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30 act (Short: On, Open: Off, Source current: less the	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 5000hm series resist aster/slave mode with single wire identical units (with external diode. V mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Remo	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diody V mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current)	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less th Open/Short: 0~0.6V or short: Removener). On (0~0.6V, 10mA sink current //, Minimum high level output = 3.8V	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist inaster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30 (short: 0n, 0pen: Off, Source current: less the Open/Short: 0~0.6V or short: Removemen). On (0~0.6V, 10mA sink current V, Minimum high level output = 3.8V in source current = 16mA, pulse = 20	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 tys Typical.
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist inaster/slave mode with single wire identical units (with external diode IV mode: Off. Maximum voltage: 30 (Short: 0, 0pen: Off, Source current: less the Open/Short: 0~0.6V or short: Removemen). On (0~0.6V, 10mA sink current IV, Minimum high level output = 3.8V, in source current = 16mA, pulse = 20 (V, Minimum high level input = 3.5V,	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front panete, 2~15V or open: Local max.)-Remote. Off-Local (30V max. dV, Maximum high level output =5 dus Typical. Maximum high level input =5V,
5. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out		0~5V of 4~5  Possible, up to 6 units in moderate of 0.5V of 0.	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist inaster/slave mode with single wire identical units (with external diode IV mode: Off. Maximum voltage: 30 tot (Short: 0n, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current IV, Minimum high level output =3.8V, an source current =16mA, pulse =20 V, Minimum high level input =3.5V, an positive edge, trigger: tw =10 µs r	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pane te, 2~15V or open: Local max.)-Remote. Off-Local (30V max. t/, Maximum high level output =5 t/us Typical. Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum.
5. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 5000hm series resist aster/slave mode with single wire identical units (with external diode IV mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current IV, Minimum high level output = 3.5V, in source current = 16mA, pulse = 20 V, Minimum high level input = 3.5V, positive edge, trigger: tw = 10µs r ltage 25V, maximum sink current 1	: +/-1%. : +/-1%. ance. current balance connection. ess). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan- te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 ups Typical Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener)
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6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 5000hm series resist aster/slave mode with single wire identical units (with external diode IV mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current IV, Minimum high level output = 3.5V, in source current = 16mA, pulse = 20 V, Minimum high level input = 3.5V, positive edge, trigger: tw = 10µs r ltage 25V, maximum sink current 1	: +/-1%. : +/-1%. ance. current balance connection. ess). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan- te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 ups Typical Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener)
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 5000hm series resist aster/slave mode with single wire identical units (with external diode IV mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current IV, Minimum high level output = 3.5V, in source current = 16mA, pulse = 20 V, Minimum high level input = 3.5V, positive edge, trigger: tw = 10µs r ltage 25V, maximum sink current 1	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 pus Typical. Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30 st (Short: 0n, Open: Off, Source current: less th Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current V, Minimum high level output = 3.8V in source current = 16mA, pulse = 20 V, Minimum high level input = 3.5V, v, positive edge, trigger: tw = 10 µs r ltage 25V, maximum sink current 1 ltage 25V, maximum sink current 1	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 pus Typical. Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2		0~5V of 0~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30 ox (Short: 0, Open: Off, Source current: less the Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current V, Minimum high level output = 3.8V, an source current = 16mA, pulse = 20 ox, positive edge, trigger: tw = 10 us related by the source of the series of	: +/-1%. : +/-1%. ance. current balance connection. es). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 pus Typical. Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2		O~5V of O~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diode. V mode: Off. Maximum voltage: 30 kt (Short: 0n, Open: Off, Source current: less th Open/Short: 0~0.6V or short: Removener). On (0~0.6V, 10mA sink current v, Minimum high level output = 3.8V in source current = 16mA, pulse = 20 ky, Minimum high level input = 3.5V, y, positive edge, trigger: tw = 10µs r ltage 25V, maximum sink current 1 ltage 25V, maximum sink current 1  Multiple options with 2 Encoders Vout/lout manual adjust ovP/UVL /UVP manual adjust curctions - OVP, UVL, UVP, Foldback	: +/-1%. : +/-1%. ance. current balance connection. ess). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pan te, 2~15V or open: Local max.)-Remote. Off-Local (30V max /, Maximum high level output =5 lys Typical. Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)
6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2  FRONT PANEL		O~5V of O~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diode V mode: Off. Maximum voltage: 30 act (Short: 0n, Open: Off, Source current: less th Open/Short: 0~0.6V or short: Removerer). On (0~0.6V, 10mA sink current I, Minimum high level output = 3.8V in source current = 16mA, pulse = 20 V, Minimum high level input = 3.5V, in positive edge, trigger: tw = 10 µs r ltage 25V, maximum sink current 1 OVP/UVL /UVP manual adjust overlines - OVP, UVL, UVP, Foldback unctions - Selection of LAN, IEEE (*2)	: +/-1%. : +/-1%. ance. current balance connection. ess). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pane te, 2~15V or open: Local max.)-Remote. Off-Local (30V max. /, Maximum high level output =5 /µs Typical. Maximum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)  , OCP, INT, SO 0), RS232,RS485,USB
5. Shut Off (SO) control 6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*8) 10. Series operation 11. CV/CC indicator 12. Interlock (ILC) control 13. Local/Remote mode Control 14. Local/Remote mode Indicator 15. Trigger out 16. Trigger in 17. Programmed signal 1 18. Programmed signal 2  FRONT PANEL		O~5V of O~5V o	or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy or 0~10V, user selectable. Accuracy V-OK, 0V-Fail. 500ohm series resist aster/slave mode with single wire identical units (with external diode. V mode: Off. Maximum voltage: 30 kt (Short: 0n, Open: Off, Source current: less th Open/Short: 0~0.6V or short: Removener). On (0~0.6V, 10mA sink current v, Minimum high level output = 3.8V in source current = 16mA, pulse = 20 ky, Minimum high level input = 3.5V, y, positive edge, trigger: tw = 10µs r ltage 25V, maximum sink current 1 ltage 25V, maximum sink current 1  Multiple options with 2 Encoders Vout/lout manual adjust ovP/UVL /UVP manual adjust curctions - OVP, UVL, UVP, Foldback	: +/-1%. : +/-1%. ance. current balance connection. ess). DV, maximum sink current: 10mA an 0.5mA). Ena/Dis is activated by front pane te, 2~15V or open: Local max.)-Remote. Off-Local (30V max. /, Maximum high level output =5 µs Typical. Maximum high level input =5V, ninimum, Tr/Tf =1µs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener) , OCP, INT, SO 0), RS232,RS485,USB Rate, Address

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FRONT PANEL	
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
3. Indications	 RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).
4. Function buttons	 FINE, MENU, PREV, PROT, REM, OUTPUT

PROGRAMMING AND READBACK (RS232/485,USB, Optional: IEEE(*17), LAN)						
1. Vout programming accuracy		0.05% of actual + 0.05% of rated output voltage				
2. lout programming accuracy (*13)		0.2% 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 actual + 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	160-2.6	320-1.3	650-0.64		
1. Input voltage/freq. (*3)		85~265Vac continuous, 47~63Hz, single phase				
2. Maximum Input current 100/200VAC (*4) (*15)		5/2.44	5/2.44	5/2.44		
3. Power Factor (Typ)		0.99 at 100/200Vac,100% load				
4. Efficiency (Typ) 100/200VAC (*4) (*15)	%	84/86	84/86	84/86		
5. Inrush current 100/200VAC (*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:	Safety	 UL61010-1, EN61010-1, IEC61010-1. Built to meet UL60950-1, EN60950-1 160V≤Vout≤650V: Output,J1,J2 are Hazardous. J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazardous
	EMC	 IEC/EN61326-1 (Built to meet EN55022/EN55024)
		Output floating: Output, J1, J2 are Hazardous; J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Non Hazardous
2.Interface classification		Vout≤400V, +Output grounded: Output, J1, J2 are Hazardous; J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Non Hazardous
		Vout>400V, +Output grounded: Output, J1, J2, J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Hazardous
3. Withstand voltage		 160≤Vout≤320V models: Input-Output&J1,J2: 2970VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2;-Ground: 2000VDC/1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 3200VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATED ANALOG Input-Ground: 707VDC/1min. 650V model: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2,-Ground: 2780VDC/1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.
4. Insulation resistance		 More than 100Mohm at 25°C, 70%RH.
5. Conducted emission		 IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B
6. Radiated emission		 IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A

MECHANICAL				
1. Cooling	1. Cooling		Forced air cooling by internal fan.	
2 Wainba	STANDARD		Less than 1.9Kg.	
2. Weight WIDE BODY		Kg	Less than 2.4Kg. Wide body with Isolated analog or IEEE.	
2. Dimensions (Mallad)	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-		Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27		

- \*1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.
- \*2: Minimum current is guaranteed to maximum 0.2% of rated output current.
- \*3: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).
- \*4: Ta=25°C with rated output power.
- \*5: Not including EMI filter inrush current, less than 0.2mSec 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: For parallel operation up to 4 units, 5% of total output current is required.
  For parallel operation more than 4 units, 20% of total output current is required.
- \*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: 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 10:1 probe.
  \*15: P.S with Lan, IEEE, models decrease efficiency by 0.25% and increase input current by 0.25%.
  P.S with Isolated analog option decreases efficiency by 0.75% and increases input current by 0.75%.
- \*16: At rated output power.
- \*17: Max. ambient temperature for using IEEE is 45°C.



# **Z**<sup>+</sup>600 Series Specifications

OUTPUT RATING		Z	160-4	320-2	650-1		
1.Rated output voltage (*1)		V	160	320	650		
2.Rated output current (*2)		Α	4.0	2.0	1.00		
3.Rated output power at 100≤Vin≤265Va	c, Ta ≤ 50°c	W	640	640	650		
CONSTANT VOLTAGE MODE		Z	160-4	320-2	650-1		
1. Max. Line regulation (*6)				0.01% of rated output voltage			
2. Max. Load regulation (*7)							
3. Ripple and noise (p-p, 20MHz) (*14) (*	17)	mV	100	150	250		
4. Ripple r.m.s. 5Hz~1MHz (*14) (*17)		mV	10	30	60		
5. Temperature coefficient		PPM/°C	30PPM/°C from ra	ted output voltage, following 30	minutes warm-up.		
6. Temperature stability			0.02% of rated Vout over 8hrs. in	terval following 30 minutes warn	n-up. Constant line, load & temp.		
7. Warm-up drift			Less than 0.05% of rate	ed output voltage over 30 minute	es following power on.		
8. Remote sense compensation/wire		V	5	5	5		
9. Up-prog. Response time, 0~Vomax.(*9)	)	mS	55	75	75		
10. Down-prog. response time:	Full load (*9)	mS	65	85	85		
rorsemi progresponse inici	No load (*10)	S	2	2.5	3		
11. Transient response time	110 1000 ( 10)	mS	Time for output voltage to recove		or a load change 10~90% of rated		
12. Hold-up time (*15)			16mSec T	Typical	14mSec Typical.		
12.11οια-αρ απε (-13)			ı ıomsec i	ypicul.	14mbec typical.		
CONSTANT CURRENT MODE	ı	Z	160-4	320-2	650.1		
			100-4		650-1		
1. Max. Line regulation (*6)				0.02% of rated output current			
2. Max. Load regulation (*11)			Leader come f	0.09% of rated output current	fallender lag delter er		
3. Load regulation thermal drift				d output current over 30 minutes	rollowing load change.		
4. Ripple r.m.s. 5Hz~1MHz (*12) (*14)		mA	2	1.5	1		
5. Temperature coefficient		PPM/°C		ated output current, following 30			
6. Temperature stability			0.05% of rated lout over 8hrs. interv				
7. Warm-up drift			Less than +/-0.1% of ra	ted output current over 30 minut	es following power on.		
PROTECTIVE FUNCTIONS		Z	160-4 320-2 650-1				
1. Foldback protection			Output shut-down when power supply change mode from CV to CC or CC to CV. User pre- Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABI communication port.				
2. Over-voltage protection (OVP)		Inverter Shut down method. Reset by AC input recycle in autostart mode or by OUTPUT button or by panel ENABLE, or by communication port.					
3. Over -voltage trip point		V	5~176	5~353	5~717		
			Preset by front panel or communic		g Vout below limit. Does not affect		
Output under voltage limit (UVL)      Output under voltage protection (UVP)	in analog programming.  Output shut-down when power supply output voltage goes below UVP programming. User proction (UVP)  Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE.				JVP programming. User presetable.		
6. Over temperature protection			llse	communication port. er selectable, latched or non latch	ed		
or over temperature protection				is selectable, laterica of from later			
ANALOG PROGRAMMING AND MONITO	RING						
1. Vout voltage programming				ser selectable. Accuracy and linea			
2. lout voltage programming (*13)			0~100%, 0~5V or 0~10V,	user selectable. Accuracy and line	arity: +/-1% of rated lout.		
3. Vout resistor programming				ale, user selectable. Accuracy and			
4. lout resistor programming (*13)				le, user selectable. Accuracy and			
5. Shut Off (SO) control			By electrical Voltage	e: 0~0.6V/4~15V or dry contact, u	ser selectable logic.		
6. Output current monitor (*13)			0~5V or	0~10V, user selectable. Accuracy	: +/-1%.		
7. Output voltage monitor			0~5V or	0~10V, user selectable. Accuracy	: +/-1%.		
8. Power supply OK signal			4~5V-OK, 0V-Fail. 500ohm series resistance.				
9. Parallel operation (*8)			Possible, up to 6 units in master/slave mode with single wire current balance connection				
10. Series operation				dentical units (with external diod			
11. CV/CC indicator				mode: Off. Maximum voltage: 3			
12. Interlock (ILC) control			Enables/Disables the PS output by dry contact				
13. Local/Remote mode Control			1 / /	pen/Short: 0~0.6V or short: Remo			
14. Local/Remote mode Indicator			, , ,				
15.Trigger out			Open collector (shunted by 36V zener). On (0~0.6V, 10mA sink current max.)-Remote. Off-Local (30V Maximum low level output =0.8V, Minimum high level output =3.8V, Maximum high level output				
1			Maximum source current =16mA, pulse =20µs Typical.  Maximum low level input =1.2V, Minimum high level input =3.5V, Maximum high level input = Maximum sink current =16mA, positive edge, trigger: tw =10µs minimum, Tr/Tf =1µs maximum				
16.Trigger in			Maximum low level input =1.2V,	Minimum high level input =3.5V	Maximum high level input =5V,		
16.Trigger in			Maximum low level input =1.2V, Maximum sink current =16mA,	Minimum high level input =3.5V positive edge, trigger: tw =10µs ı	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum.		
16. Trigger in 17. Programmed signal 1			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs ı age 25V,maximum sink current 1	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener)		
16.Trigger in			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs ı	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener)		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs ı age 25V,maximum sink current 1	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener)		
16. Trigger in 17. Programmed signal 1			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs ı age 25V,maximum sink current 1 age 25V,maximum sink current 1	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs is age 25V,maximum sink current 1 age 25V,maximum sink current 1 Multiple options with 2 Encoders	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs is age 25V,maximum sink current 1 age 25V,maximum sink current 1 Multiple options with 2 Encoders Vout/lout manual adjust	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt	Minimum high level input =3.5V positive edge, trigger: tw =10µs I: age 25V,maximum sink current 1 age 25V,maximum sink current 1  Multiple options with 2 Encoders Vout/lout manual adjust OVP/UVL/UVP manual adjust	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum. 00mA. (Shunted by 27V zener) 00mA. (Shunted by 27V zener)		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2  FRONT PANEL			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt  Protection Fu	Minimum high level input =3.5V positive edge, trigger: tw =10µs I: age 25V,maximum sink current 1 age 25V,maximum sink current 1  Multiple options with 2 Encoders Vout/lout manual adjust OVP/UVL/UVP manual adjust Inctions - OVP, UVL,UVP, Foldback	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum.  00mA. (Shunted by 27V zener)  00mA. (Shunted by 27V zener)		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt  Protection Fu Communication Fur	Minimum high level input =3.5V positive edge, trigger: tw =10µs I: age 25V,maximum sink current 1 age 25V,maximum sink current 1  Multiple options with 2 Encoders Vout/lout manual adjust OVP/UVL/UVP manual adjust inctions - OVP, UVL, UVP, Foldback actions - Selection of LAN, IEEE (*1	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum.  00mA. (Shunted by 27V zener)  00mA. (Shunted by 27V zener)  , OCP, INT, SO 7),RS232,RS485,USB		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2  FRONT PANEL			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt  Protection Fu Communication Fur Communication	Minimum high level input =3.5V positive edge, trigger: tw =10µs is age 25V,maximum sink current 1 age 25V,maximum sink current 1 age 25V,maximum sink current 1 Multiple options with 2 Encoders Vout/lout manual adjust OVP/UVL/UVP manual adjust inctions - OVP, UVL,UVP, Foldback actions - Selection of Baud	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum.  00mA. (Shunted by 27V zener)  00mA. (Shunted by 27V zener)  , OCP, INT, SO  7),RS232,RS485,USB  Rate, Address		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2  FRONT PANEL			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt  Protection Fu Communication Fur Communication Sur	Minimum high level input = 3.5V positive edge, trigger: tw = 10µs is age 25V,maximum sink current 1 age 25V,maximum sink current 1 age 25V,maximum sink current 1 Multiple options with 2 Encoders Vout/lout manual adjust OVP/UVL/UVP manual adjust inctions - OVP, UVL,UVP, Foldback inctions - Selection of LAN,IEEE (*1 ion Functions - Selection of Baud tion Voltage/resistive programmi	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum.  00mA. (Shunted by 27V zener)  00mA. (Shunted by 27V zener)  , OCP, INT, SO 7),RS232,RS485,USB Rate, Address ng, 5V/10V, 5K/10K programming		
16.Trigger in 17. Programmed signal 1 18. Programmed signal 2  FRONT PANEL			Maximum low level input =1.2V, Maximum sink current =16mA, Open collector, maximum volt Open collector, maximum volt  Protection Fu Communication Fur Communication	Minimum high level input = 3.5V positive edge, trigger: tw = 10µs is age 25V,maximum sink current 1 age 25V,maximum sink current 1 age 25V,maximum sink current 1 Multiple options with 2 Encoders Vout/lout manual adjust OVP/UVL/UVP manual adjust inctions - OVP, UVL,UVP, Foldback inctions - Selection of LAN,IEEE (*1 ion Functions - Selection of Baud tion Voltage/resistive programmi	Maximum high level input =5V, ninimum, Tr/Tf =1μs maximum.  00mA. (Shunted by 27V zener)  00mA. (Shunted by 27V zener)  , OCP, INT, SO 7),RS232,RS485,USB Rate, Address ng, 5V/10V, 5K/10K programming		



FRONT PANEL	
2 Disaless	 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.
2.1.15.33	 GREEN LEDs: FINE, MENU, PREV, PROT, REM, OUTPUT, CV, CC
3. Indications	 RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).
4. Function buttons	 FINE, MENU, PREV, PROT, REM, OUTPUT
Indications     Function buttons	

. Vout programming accuracy		0.05% of actual + 0.05% of rated output voltage				
2. lout programming accuracy (*13)		0.2% 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 actual + 0.05% of rated output v	/oltage		
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	160-4	320-2	650-1		
1. Input voltage/freq. (*3)		85~26	55Vac continuous, 47~63Hz, single	phase		
2. Maximum Input current 100/200VAC (*4)		7.5/3.7	7.5/3.7	7.6/3.75		
3. Power Factor (Typ)		>0.9	9 at 100Vac, >0.98 at 200Vac,100%	load		
4. Efficiency (Typ) 100/200VAC (*4)	%	86.5/88.5	87/88.5	86.5/88.5		
5. Inrush current 100/200VAC (*5)		Less than 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			
1. Applicable standards:	Safety		UL61010-1, EN61010-1, IEC61010-1. Built to meet UL60950-1, EN60950-1 160V≤Vout≤650V: Output,J1,J2 are Hazardous. J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazardous
	EMC		IEC/EN61326-1 (Built to meet EN55022/EN55024)
			Output floating: Output, J1, J2 are Hazardous; J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Non Hazardous
2.Interface classification			Vout≤400V, +Output grounded: Output, J1, J2 are Hazardous; J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Non Hazardous
			Vout>400V, +Output grounded: Output, J1, J2, J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Hazardous
			160≤Vout≤320V models: Input-Output&J1,J2: 2970VDC/1min; Input-Ground: 2828VDC/1min.
			Output&J1,J2,-Ground: 2000VDC/1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG:3200VDC/1min;
			Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.
3. Withstand voltage	3. Withstand voltage		650V model: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min.
			Output&J1,J2,-Ground: 2780VDC/1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG :4244VDC/1min;
			Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min;
			J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.
4. Insulation resistance			More than 100Mohm at 25°C, 70%RH.
5. Conducted emission			IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B
6. Radiated emission			IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A

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

- \*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 For Parallel operation up to 4 units, 5% of total output current is required.
  - For Parallel operation more than 4 units, 20% of total output current is requierd.
- \*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: 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 10:1 probe.
- \*15:At rated output power.
- \*16 Max. ambient temperature for using IEEE is 45°C. \*17: start in low ambient temp. (0°C), 1 min. warm up is required



12. Hold-up time (\*15)

# Z<sup>+</sup>800 Series Specifications

OUTPUT RATING	Z	160-5	320-2.5	375-2.2	650-1.25
1.Rated output voltage (*1)	V	160	320	375	650
2.Rated output current (*2) at 100≤Vin≤265Vac, Ta ≤ 50°c Rated output current (*2) at 85≤Vin<100Vac, Ta ≤ 40°c		5.0	2.5	2.2	1.25
	A	5.0	2.5	2.2	1.25
Rated output current (*2) at 85≤Vin<100Vac, 40°c < Ta ≤ 50°c		4.7	2.35	2.0	1.15
3.Rated output power at 100≤Vin≤265Vac, Ta ≤ 50°c Rated output power at 85≤Vin<100Vac, Ta ≤ 40°c	W	800	800	825	812.5
		800	800	825	812.5
Rated output power at 85≤Vin<100Vac, 40°c < Ta ≤ 50°c		752	752	750	747.5

CONSTANT VOLTAGE MODE		Z	160-5 320-2.5 375-2.2 650-1.2			
1. Max. Line regulation (*6)			0.01% of rated output voltage			
2. Max. Load regulation (*7)			0.01% of rated output voltage			
3. Ripple and noise (p-p, 20MHz) (*14) (**	17)	mV	100	150	150	250
4. Ripple r.m.s. 5Hz~1MHz (*14) (*17)		mV	10	30	30	60
5. Temperature coefficient		PPM/°C	30PPM/°C from rated output voltage, following 30 minutes warm-up.			
6. Temperature stability			0.02% of rated Vout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temp.			
7. Warm-up drift			Less than 0.05% of rated output voltage over 30 minutes following power on.			
8. Remote sense compensation/wire		V	5	5	5	5
9. Up-prog. Response time, 0~Vomax.(*9)		mS	45	55	55	55
10. Down-prog. response time:	Full load (*9)	mS	55 65 65 65			65
	No load (*10)	S	2	2.5	2.5	3
11. Transient response time mS				e to recover within 0.5% of urrent. Output set-point: 1		

CONSTANT CURRENT MODE	Z	160-5	320-2.5	375-2.2	650-1.25	
1. Max. Line regulation (*6)		0.02% of rated output current				
2. Max. Load regulation (*11)		0.09% of rated output current				
3. Load regulation thermal drift		Less than 0.05% of rated output current over 30 minutes following load change.				
4. Ripple r.m.s. 5Hz~1MHz (*12) (*14)	mA	2 1.5 1.5 1				
5. Temperature coefficient	PPM/°C	100PPM/°C from rated output current, following 30 minutes warm-up.				
6. Temperature stability		0.05% of rated lout over 8hrs. interval following 30 minutes warm-up. Constant line, load & temperature.				
7. Warm-up drift		Less than +/	-0.1% of rated output curre	ent over 30 minutes followi	ing power on.	

13msec Typical.

11.5msec Typical.

PROTECTIVE FUNCTIONS	Z	160-5	320-2.5	375-2.2	650-1.25
		Output shut-down when power supply change mode from CV to CC or CC to CV. User presetable.			
1. Foldback protection		nesce by he input recycle in autostart mode or by oon or button by real paner			ar panel ENABLE, or by
			communic	ation port.	
2. Over-voltage protection (OVP)		Inverter Shut down method	od. Reset by AC input recyc panel ENABLE, or by	le in autostart mode or by communication port.	OUTPUT button or by read
3. Over -voltage trip point	V	5~176	5~353	5~413	5~717
4. Output under voltage limit (UVL)		Preset by front panel or communication port. Prevents from adjusting Vout below limit. Does no in analog programming.		elow limit. Does not affect	
5. Output under voltage protection (UVP)		Output shut-down when power supply output voltage goes below UVP programming. User presetable.  Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication port.			
6. Over temperature protection		User selectable, latched or non latched.			

ANALOG PROGRAMMING AND MONITORING	
1. Vout voltage programming	 0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.5% of rated Vout.
2. lout voltage programming (*13)	 0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-1% of rated lout.
3. Vout resistor programming	 0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1% of rated Vout.
4. lout resistor programming (*13)	 0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1.5% of rated lout.
5. Shut Off (SO) control	 By electrical Voltage: 0~0.6V/4~15V or dry contact, user selectable logic.
6. Output current monitor (*13)	 0~5V or 0~10V, user selectable. Accuracy: +/-1%.
7. Output voltage monitor	 0~5V or 0~10V, user selectable. Accuracy: +/-1%.
8. Power supply OK signal	 4~5V-OK, 0V-Fail. 500ohm series resistance.
9. Parallel operation (*8)	 Possible, up to 6 units in master/slave mode with single wire current balance connection.
10. Series operation	 2 identical units (with external diodes). 650VDC MAX. From chassis to ground
11. CV/CC indicator	 Open collector. CC mode: On, CV mode: Off. Maximum voltage: 30V, maximum sink current: 10mA
12. Interlock (ILC) control	 Enables/Disables the PS output by dry contact (Short: On, Open: Off, Source current: less than 0.5mA). Ena/Dis is activated by front panel.
13. Local/Remote mode Control	 By electrical signal or Open/Short: 0~0.6V or short: Remote, 2~15V or open: Local
14. Local/Remote mode Indicator	 Open collector (shunted by 36V zener). On (0~0.6V, 10mA sink current max.)-Remote. Off-Local (30V max.).
15.Trigger out	 Maximum low level output =0.8V, Minimum high level output =3.8V, Maximum high level output =5V,  Maximum source current =16mA, pulse =20µs Typical.
16.Trigger in	 Maximum low level input =1.2V, Minimum high level input =3.5V, Maximum high level input =5V,
	Maximum sink current =16mA, positive edge, trigger: tw =10μs minimum, Tr/Tf =1μs maximum.
17. Programmed signal 1	 Open collector, maximum voltage 25V, maximum sink current 100mA. (Shunted by 27V zener)
18. Programmed signal 2	 Open collector, maximum voltage 25V, maximum sink current 100mA. (Shunted by 27V zener)

- 16 -

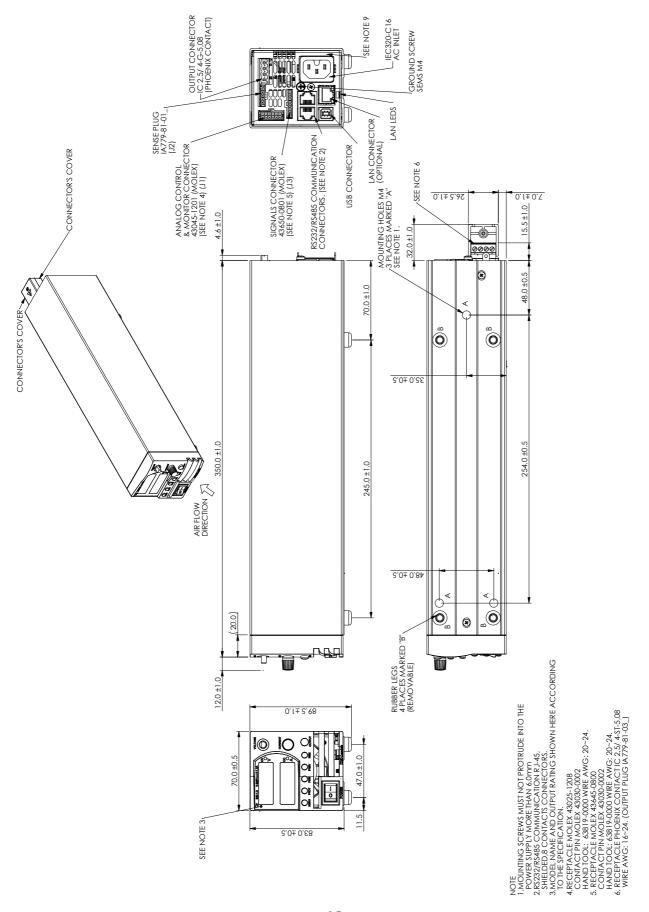


FRONT PANEL							
THOMTTANEE					Multiple options with 2 Encoders		
Control functions     Display     Indications			Vout/lout manual adjust				
			OVP/UVL/UVP manual adjust				
			Pr	rotection Functions - OVP, UVL, UVP, Foldback, OCP, INT, SO			
			Communication Functions - Selection of LAN, IEEE (*16), 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				
			Vout: 4 digits, accuracy: 0.5% of rated output voltage+/-1 count.				
			lout: 4 digits, accuracy: 0.5% of rated output current+/-1 count.				
			GREEN LEDs: FINE, MENU, PREV, PROT, REM, OUTPUT, CV, CC RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).				
4. Function buttons			RED LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL).  FINE, MENU, PREV, PROT, REM, OUTPUT				
					TINE, WEND, THEY, THOY, NEW, COTT OF		
PROGRAMMING AND READ		32/485,USB, O	1	(*16), LAN)	0.050/ 6 0.050/ 6		
1. Vout programming accura				0.05% of actual + 0.05% of rated output voltage			
2. lout programming accura				0.2% of rated output current			
Vout programming resolution     In out programming resolution			0.012% of full scale 0.012% of full scale				
tout programming resolution     Vout readback accuracy			0.012% of Tuli scale 0.05% of actual + 0.05% of rated output voltage				
6. lout readback accuracy (*	*13)			0.1% of actual +0.05% of rated output voltage			
7. Vout readback resolution			0.012% of full scale				
8. lout readback resolution				0.012% of full scale			
INPUT CHARACTERISTICS			Z	160-5	320-2.5 375-2.2 650-1.25		
1. Input voltage/freg. (*3)				1003	85~265Vac continuous, 47~63Hz, single phase		
2. Maximum Input current 1	100/200VAC	(*4)		9.35/4.61	9.35/4.59 9.58/4.7 9.44/4.64		
3. Power Factor (Typ)		,		7.657.1151	0.99 at 100Vac, 0.98 at 200Vac, 100% load		
4. Efficiency (Typ) 100/200V	'AC (*4)		%	86.5/88.5 86.5/89 87.5/89.5 87/89			
5. Inrush current 100/200VA	AC (*5)				Less than 30A		
END/IDONIMENTAL CONDITI	IONIC						
1 Operating temperature	IONS				0~50°C, 100% load.		
Operating temperature     Storage temperature				-20~85°C			
3. Operating humidity			%	20~90% RH (no condensation).			
4. Storage humidity			%	10~95% RH (no condensation).			
,				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	111.64046	A FAIGURE A INCOME A D. III.		
1 Applicable standards		Safety			0-1, EN61010-1, IEC61010-1. Built to meet UL60950-1, EN60950-1 ut,J1,J2 are Hazardous. J3,J4,USB, IEEE/ISOLATED Analog ,LAN are Non Hazard		
1. Applicable standards:		EMC		100 v 2 v 0 u (2000 v . O u (p)	IEC/EN61326-1 (Built to meet EN55022/EN55024)		
2.Interface classification		-		Output floating: Output	, J1, J2 are Hazardous; J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Non Hazardo		
			Vout≤400V, +Output grounded: Output, J1, J2 are Hazardous; J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Non Hazardous				
					ounded: Output, J1, J2, J3, J4, USB, LAN, IEEE/ISOLATED ANALOG are Hazardo		
				160≤Vouts320V models: Input-Output&J1,J2: 2970VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2,-Ground: 2000VDC/1min; Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG:3200VDC/1min;			
2 Withstand voltage				Input-J3,J4,USB,LAN/IEEE/ISOL 375≤Vout≤650V model:	_ATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min.		
3. Withstand voltage				Input-J3,J4,USB,LAN/IEEE/ISOL 375≤Vout≤650V model: Outpu	LATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min. tt&J1,J2,-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC;		
3. Withstand voltage				Input-J3,J4,USB,LAN/IEEE/ISOL 375≤Vout≤650V model: Outpu	LATED ANALOG: 4242VDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&11,12: Input-Output&11,12: 3704VDC/1min; Input-Ground: 2828VDC/1min. t&11,12,-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC; ttput&11,12-13,14,USB,LAN/IEEE/ISOLATED ANALOG:4244VDC/1min;		
J				Input-J3,J4,USB,LAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	LATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/SOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min. rt&J1,J2-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC; tsput&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; ts,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.		
4. Insulation resistance				Input-J3,J4,USB,LAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	ATED ANALOG: 424YDC/1 min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&1,J2: Input-Output&1,J2: ATOAVDC/1min; Input-Ground: 2828VDC/1 min. t82J,J2, Ground: 2154VDC/1 min for 375VDC, 2780VDC/1 min for 65VDC; ttput&1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1 min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 424VDC/1 min; J,J4,USB,LAN/IEEE/ISOLATED ANALOG: 424VDC/1 min; More than 100Mohm at 25°C, 70%RH.		
Insulation resistance     Conducted emission				Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	ATED ANALOG: 424YDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r  Input-Output&01,12: Input-Output&01,12: 3704VDC/1min; Input-Ground: 2828VDC/1min.  t&01,12,-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC;  ttput&01,12- 13,14,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min;  Input-13,14,USB,LAN/IEEE/ISOLATED ANALOG: 424VDC/1min;  JJ4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.  More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B		
4. Insulation resistance				Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	ATED ANALOG: 424YDC/1 min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&1,J2: Input-Output&1,J2: ATOAVDC/1min; Input-Ground: 2828VDC/1 min. t82J,J2, Ground: 2154VDC/1 min for 375VDC, 2780VDC/1 min for 65VDC; ttput&1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1 min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 424VDC/1 min; J,J4,USB,LAN/IEEE/ISOLATED ANALOG: 424VDC/1 min; More than 100Mohm at 25°C, 70%RH.		
4. Insulation resistance 5. Conducted emission 6. Radiated emission				Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	ATED ANALOG: 424YDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r  Input-Output&01,12: Input-Output&01,12: 3704VDC/1min; Input-Ground: 2828VDC/1min.  t&01,12,-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC;  ttput&01,12- 13,14,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min;  Input-13,14,USB,LAN/IEEE/ISOLATED ANALOG: 424VDC/1min;  JJ4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.  More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B		
4. Insulation resistance 5. Conducted emission 6. Radiated emission  MECHANICAL				Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	ATED ANALOG: 4242VDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&11,12: Input-Output&11,12: Input-Output&11,12: 1704VDC/1min; Input-Ground: 2828VDC/1min. tkg11,12,-Ground: 2828VDC/1min for 65VDC; tkg11,12-13,14,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-13,14,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; JA,USB,LAN/IEEE/ISOLATDE ANALOG input-Ground: 707VDC/1min.  More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B  C/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A		
4. Insulation resistance 5. Conducted emission 6. Radiated emission  MECHANICAL 1. Cooling	STA	NDARD		Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou	ATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: Input-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min.  More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B  C/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A  Forced air cooling by internal fan.		
4. Insulation resistance 5. Conducted emission 6. Radiated emission  MECHANICAL		NDARD E BODY	   Kg	Input-13, j4, USB, LAN/IEEE/ISOL 375 ≤ Vout ≤ 650V model: Outpu Ou	ATED ANALOG: 424YDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min. 1821,JJ2-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC; Itput&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; IJ4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min. More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B  C/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A  Forced air cooling by internal fan.  Less than 2Kg		
4. Insulation resistance 5. Conducted emission 6. Radiated emission  MECHANICAL 1. Cooling 2. Weight	WID	NDARD E BODY NDARD		Input-13, j4, USB, LAN/IEEE/ISOL 375 ≤ Vout ≤ 650V model: Outpu Ou J3	ATED ANALOG: 4242VDC/1min; J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: Input-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: Nove-Output&J1,J2: J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min.  More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B  C/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A  Forced air cooling by internal fan.		
4. Insulation resistance 5. Conducted emission 6. Radiated emission  MECHANICAL 1. Cooling	WID STA	E BODY	   Kg	Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou J3 IEC	ATED ANALOG: 424YDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min. 1821,JJ2-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC; 1tput&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B  C/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A  Forced air cooling by internal fan.  Less than 2Kg  Less than 2.5Kg. Wide body with isolated analog or IEEE		
4. Insulation resistance 5. Conducted emission 6. Radiated emission  MECHANICAL 1. Cooling 2. Weight	WID STA	E BODY NDARD	  Kg Kg mm	Input-J3, j4, USB, iAN/IEEE/ISOL 375≤Vout≤650V model: Outpu Ou J3 IEC	ATED ANALOG: 424VDC/1min; 13,14,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1r Input-Output&J1,J2: Input-Output&J1,J2: 3704VDC/1min; Input-Ground: 2828VDC/1min. 1821,1J2-Ground:2154VDC/1min for 375VDC, 2780VDC/1min for 65VDC; 1tput&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4244VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATDE ANALOG Input-Ground: 707VDC/1min.  More than 100Mohm at 25°C, 70%RH.  C/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B  C/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A  Forced air cooling by internal fan.  Less than 2Kg  Less than 2.5Kg. Wide body with isolated analog or IEEE , D: 350 (excluding bus bars, handles). (Refer to Outline drawing).		

- \*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 For Parallel operation up to 4 units, 5% of total output current is required.
- For Parallel operation more than 4 units, 20% of total output current is requierd. \*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.

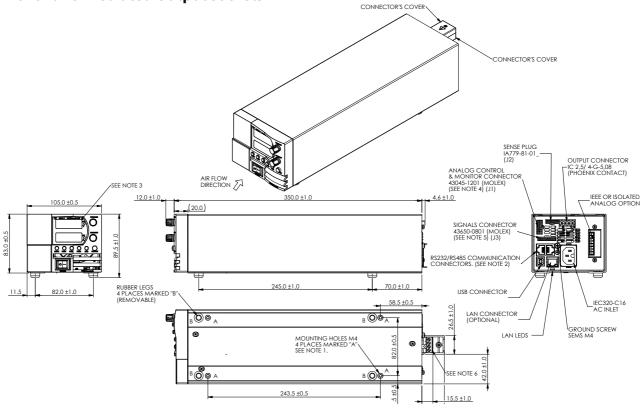
- \*11: For load voltage change, equal to the unit voltage rating, constant input voltage.
  \*12: Ripple is measured at 10~100% of rated output voltage and rated output current.
  \*13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.
- \*14: Measured with 10:1 probe.
- \*15:At rated output power.
- \*16 Max. ambient temperature for using IEEE is 45°C.
- \*17: start in low ambient temp. (0°C), 1 min. warm up is required

### 2.6 Z200W/400W/600W/800W Outline Drawing

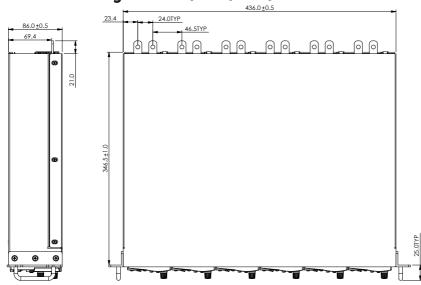


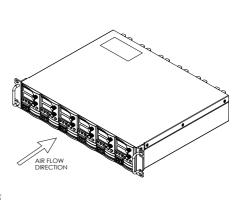


# 2.7 Z200W/400W/600W/800W Optional IEEE, Isolated Analog Interface, Front Panel insulated Output sockets

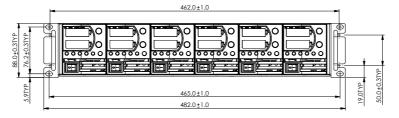


### 19" Rack Housing for Z<sup>+</sup>200W/400W/600W/800W





SCREWS MUST NOT PROTRUDE INTO THE
PLY MORE THAN 6.0mm
5 COMMUNIC ATION R1-45,
COMMUNIC ATION R1-45,
ME AND QUIFUT RATING SHOWN HERE ACCORDING
JIFICATION,
IN MOLEX 43030-0002
L: 63819-0000 WIRE AWG: 20-24,
LE MOLEX 43645-0800
JIN MOLEX 43030-0002
L: 3819-0000 WIRE AWG: 20-24,
LE PHOENIX CONTACTI IC 2.5/ 4-51-5.08
LE PHOENIX CONTACTI IC 2.5/ 4-51-5.08
LE PHOENIX CONTACTI IC 2.5/ 4-51-5.08



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