

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

Features Include:

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

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

LAN

LabView® and LabWindows® drivers

Arbitrary functions for:

Automotive or laser simulation / 4 Pre-Programmed Functions

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



Front Panel Description







- 1. AC ON/OFF Switch
- 2. Air Intake allows zero stacking for maximum system flexibility and power density.*
- 3. Reliable encoder controls Output Voltage and power supply setting.
- 4. Volt Display shows Output Voltage and directly displays and power supply settings.
- 5. Reliable encoder controls Output Current, and power supply setting.
- 6. Current Display shows Output Current and power supply setting.

Remote Mode

- 7. Function/Status LEDs:
- Alarm
 Foldback Mode
- Fine Control
- 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

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

C + 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



RS-485









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Applications

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

Test and Measurement

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

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

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

Semiconductor Burn-in

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

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

Component Test

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

Laser Diode

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

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

Heater Supplies

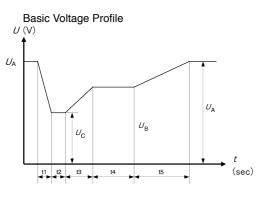
Smooth, reliable encoders enhance front panel control.

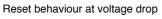
 $Remote analog \ programming \ is \ user \ selectable \ 0-5V \ or \ 0-10V.$

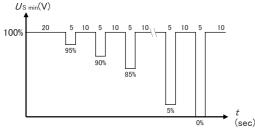
RF Amplifiers and Magnets

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

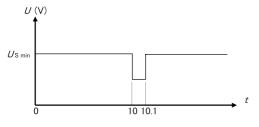
Z⁺ Series Sequence Programming Applications







Discontinuities in supply voltage Momentary drop in supply voltage



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

Front Panel Output Up to 60V Output Module

P/N: Z__-L





P/N: Z__-L2

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

Z⁺ Assemblies

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



19" Rack Mounted to 4.8kW

Six units (70mm) can be assembled into 19-Inch rack/2U high Four units (105mm) can be assembled into 19-Inch rack/2U high to meet your configuration requirements. In cases where the entire rack is not occupied with power units, P/N: Z-BP for 70mm, P/N: Z-WBP for 105mm blank panels can be installed: P/N: Z-NL100





Power Modules Table

| 200W | 400W | 600W | 800W |
|-----------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 20A | 40A | 60A | 72A |
| 10A | 20A | 30A | 40A |
| 6A | 12A | 18A | 24A |
| 3.5A | 7A | 10A | 14A |
| 2A | 4A | 6A | 8A |
| 1/6 width | 1/6 width | 1/6 width | 1/6 width |
| 1/4 width | 1/4 width | 1/4 width | 1/4 width |
| | 20A 10A 6A 3.5A 2A 1/6 width | 20A 40A 10A 20A 6A 12A 3.5A 7A 2A 4A 1/6 width 1/6 width | 20A40A60A10A20A30A6A12A18A3.5A7A10A2A4A6A1/6 width1/6 width1/6 width |

| 1/6 width | |
|-----------|-----------|
| | a / a 🔹 • |



1/4 width

Programming Options (Factory Installed)

| Digital Programming via IEEE InterfaceIEEE 488.2 SCPI Compliant | P/N: IEEE | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--|
| Program Voltage Measure Voltage Over Voltage setting and shutdown Error and Status Messages Multi-Drop Allows IEEE Master to control up to 31 slaves of Only the Master needs be equipped with IEEE | | |
| Isolated Analog Programming Four Channels to Program and Monitor Voltage a Isolation allows operation with floating reference Choose between programming with Voltage or C Connection via removable terminal block: Phoen Voltage Programming, user-selectable 0-5V of Power Supply Voltage and Current Programm Power Supply Voltage and Current Monitoring | es in harsh electrical environments. Current. nix MC1,5/8-ST-3.81. r 0-10V signal. P/N: IS510 ning Accuracy ±1% | |
| Current Programming with 4-20mA signal. Power Supply Voltage and Current Programm Power Supply Voltage and Current Monitoring | P/N: IS420 hing Accuracy ±1% | |
| LAN Interface | P/N: LAN | |

- VISA & SCPI Compatible
- Address Viewable on Front Panel
- Fixed and Dynamic Addressing
- Auto-detects LAN Cross-over Cable
 Fast Startup

• LAN Fault Indicators

• TCP / UDP Socket Programming

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

| The 202, he has easile is used to connect the porter supply to the recontroller | | | | | |
|---------------------------------------------------------------------------------|----------------------|----------------------|--|--|--|
| 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

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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 o | ption | | P/N | | |
| USB Interfa | ace built-in Standard | k | - | | |
| RS-232/RS- | -485 Interface built-i | in Standard | - | | |
| GPIB Interf | face | | IEEE | | |
| Voltage Programming Isolated Analog Interface | | IS510 | | | |
| Current Programming Isolated Analog Interface | | IS420 | | | |
| LAN Interf | ace | | LAN | | |
| Front pane | el output jacks (bind | ing 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 | | 0~18 | 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⁺200 Series Specifications

| | DEL | Z | 10-20 | 20-10 | 36-6 | 60-3.5 | 100-2 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | out voltage(*1) | V | 10 | 20 | 36 | 60 | 100 |
| | ut current (*2) | Α | 20 | 10 | 6 | 3.5 | 2 |
| 3. Rated ou | Itput power | W | 200 | 200 | 216 | 210 | 200 |
| CONSTANT V | OLTAGE MODE | Z | 10-20 | 20-10 | 36-6 | 60-3.5 | 100-2 |
| | egulation (*6) | | | | of rated output voltad | | |
| | regulation (*7) | | | | of rated output voltad | | |
| | e (p-p, 20MHz) (*8) | mV | 50 | 50 | 50 | 50 | 80 |
| 4. Ripple r.m. | .s. 5Hz~1MHz | mV | 5 | 6 | 6 | 7 | 8 |
| 5. Temperatu | ire coefficient | PPM/°C | 30 | PPM/°C from rated or | utput voltage, followi | ng 30 minutes warm | -up. |
| 6. Temperat | ture stability | | 0.02% of rated V | out over 8hrs. interva | l following 30 minute | s warm-up. Constant | line, load & temp. |
| 7. Warm | -up drift | | Less than | 0.05% of rated output | it voltage+2mV over | 30 minutes following | power on. |
| | ompensation/wire | V | 1 | 1 | 2 | 3 | 5 |
| | e time, 0~Vomax.(*9) | mS | 15 | 30 | 30 | 50 | 50 |
| 10. Down-prog. respo | | | 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 Transient | response time | mS | | age to recover within (| | | |
| | | 1115 | | et-point: 10~100%, Lo | | | nd including 100\ |
| 12. Hold-u | p time (*19) | | 15mSec Typical. | | 16mSe | Typical. | |
| CONSTANT O | JRRENT MODE | Z | 10-20 | 20-10 | 36-6 | 60-3.5 | 100-2 |
| | regulation (*6) | | 10-20 | | of rated output curre | | 100-2 |
| | egulation (*11) | | | | of rated output curre | | |
| | ion thermal drift | | Loss the | in 0.05% of rated out | | | change |
| | 5Hz~1MHz (*12) | mA | 25 | 15 | 8 | | 3 |
| | ire coefficient | PPM/°C | | 0PPM/°C from rated o | - | ing 30 minutes warm | |
| | ture stability | | | over 8hrs. interval foll | | | |
| | -up drift | | | an +/-0.1% of rated of | | | |
| DROTECTIVE | | 7 | 10.20 | 20-10 | 36-6 | 60-3.5 | 100-2 |
| PROTECTIVE | FUNCTIONS | Z | 10-20 Output chut | l 20-10 t-down when power sup | | | |
| 1. Foldback | <pre>c protection</pre> | | | cle in autostart mode or | | | |
| 2.0 k | (0)(0) | | | n method. Reset by A | | | |
| 2. Over-voltage | protection (OVP) | | | | NABLE, or by commu | | |
| 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 affec | t in analog programm |
| E. Output underweit | | | Output shut-dov | vn when power supply | output voltage goes be | elow UVP programming | g. User presetable. |
| 5. Output under voltage protection (UVP) | | | | do in autostart modo or | by OUTPUT button or b | v rear panel FNABLE, or l | by communication r |
| 5. Output under Volt | age protection (UVP) | | Reset by AC input recy | Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communica User selectable, latched or non latched. | | | by communication p |
| · . | age protection (UVP) ature protection | | Reset by AC input recy | | | | |
| 6. Over tempera | ature protection | | Reset by AC input recy | | | | |
| 6. Over tempera | ature protection | | | User sele | ctable, latched or no | n latched. | |
| 6. Over tempera IALOG PROGRAMMING A 1. Vout voltage | ature protection AND MONITORING e programming | | 0~100%, 0- | User sele ~5V or 0~10V, user se | ectable, latched or no | n latched. d linearity: +/-0.5% o | f rated Vout. |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr | ature protection AND MONITORING e programming ogramming (*13) | | 0~100%, 0 0~100%, (| User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s | ectable, latched or no lectable. Accuracy an electable. Accuracy a | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of | f rated Vout. Frated lout. |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr 3. Vout resistor | ature protection AND MONITORING e programming ogramming (*13) r programming | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s (10Kohm full scale, us | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-1% | f rated Vout. Frated lout. % of rated Vout. |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr 3. Vout resistor 4. lout resistor pr | ature protection AND MONITORING e programming ogramming (*13) ogramming (*13) | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of :y and linearity: +/-1.5 y and linearity: +/-1.5 | f rated Vout. Frated lout. % of rated Vout. 5% of rated lout. |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 5. Shut Off | ature protection AND MONITORING e programming ogramming (*13) r programming | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm full scale, use 10Kohm full scale, use | ctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accurac r selectable. Accurac .6V/4~15V or dry cor | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-1.5 y and linearity: +/-1.5 tact, user selectable | f rated Vout. Frated 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 | ature protection IND MONITORING e programming (*13) r programming (*13) ogramming (*13) (SO) control nt monitor (*13) | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use electrical Voltage: 0~0 0~5V or 0~10 | ctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac .6V/4~15V or dry cor V, user selectable. Ac | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of :y and linearity: +/-1. y and linearity: +/-1. tact, user selectable curacy: +/-1%. | f rated Vout. Frated 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 e programming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use 10Kohm full scale, user 10Kohm full | ctable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accurac r selectable. Accurac .6V/4~15V or dry cor | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-1% y and linearity: +/-1.5 ttact, user selectable curacy: +/-1%. curacy: +/-1%. | f rated Vout. Frated lout. % of rated Vout. 5% of rated lout. |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr 3. Vout resistor 4. lout resistor pr 5. Shut Off 6. Output curren 7. Output vol 8. Power sup | ature protection IND MONITORING e programming ogramming ogramming (*13) (SO) control nt monitor (*13) ltage monitor uply OK signal | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac 6.0V/4~15V or dry cor W, user selectable. Ac W, user selectable. Ac W, soar selectable. Ac W, soar selectable. Ac | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y and linearity: +/-1% y and linearity: +/-1.5 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. | f rated Vout. f rated lout. % of rated Vout. % of rated lout. logic. |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr 3. Vout resistor 4. lout resistor pr 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op | ature protection ND MONITORING e programming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor uply OK signal peration (*20) | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e | User sele ~5V or 0~10V, user sele C-5V or 0~10V, user sele (10Kohm full scale, use 10Kohm full scale, user 10Kohm full scal | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac .6V/4~15V or dry cor W, user selectable. Ac W, user selectable. Ac W, user selectable. Ac W-Fail. 5000hm serie lave mode with singl | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balanc | f rated Vout. f rated lout. % of rated Vout. % of rated lout. logic. |
| 6. Over tempera 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr 3. Vout resistor 4. lout resistor pr 5. Shut Off 6. Output vol 8. Power sup 9. Parallel op 10. Series | Ature protection AND MONITORING Programming ogramming (*13) ogramming (*13) (SO) control nt monitor (*13) Itage monitor ply OK signal peration (*20) operation | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up | User sele ~5V or 0~10V, user se >-5V or 0~10V, user s '10Kohm full scale, us lectrical Voltage: 00 0~5V or 0~10 0~5V or 0~10 4~5V-0K, C to 6 units in master/s 2 identic | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy of V, 4~15V or dry cor V, user selectable. Ac V, user selectable. Ac VV-Fail. 5000hm serie lave mode with singl cal units (with externa | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-19 y and linearity: +/-1.5 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance of diodes). | f rated Vout. f rated lout. % of rated Vout. % of rated lout. logic. e connection. |
| 6. Over tempera 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC | ature protection ND MONITORING e programming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor uply OK signal peration (*20) | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C | User sele ~5V or 0~10V, user sele C-5V or 0~10V, user sele (10Kohm full scale, use 10Kohm full scale, user 10Kohm full scal | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy c.6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac VV-Fail. 5000hm serie lave mode with singl al units (with externa e: Off. Maximum volt | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-1% y and linearity: +/-1.5 ttact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balanc al diodes). age: 30V, maximum s | f rated Vout. f rated lout. % of rated Vout. i% of rated lout. logic. e connection. sink current: 10m/ |
| 6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 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 e programming (*13) r programming (*13) (SO) control nt monitor (*13) (tage monitor piply OK signal beration c molection c indicator c (ILC) control | | 0~100%, 0 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o | User sele ~5V or 0~10V, user sel >-5V or 0~10V, user sel 10Kohm full scale, use 10Kohm full scale, use 10Kohm full scale, use 10Cohm full scale, | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy ar selectable. Accuracy .6V/4~15V or dry cor V, user selectable. Ac V, user selectable. Ac VV-Fail. 5000hm serie lave mode with singl .al units (with externa e: Off. Maximum volt 0n, Open: Off, Source curre | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-1% y and linearity: +/-1.5 ttact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance a diodes). age: 30V, maximum s nt: less than 0.5mA). Ena/Di | f rated Vout. Frated lout. % of rated Vout. i% of rated lout. logic. e connection. sink current: 10m/ s is activated by front p |
| 6. Over tempera 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage pr 3. Vout resistor 4. lout resistor pr 5. Shut Off 6. Output currer 7. Output vol 8. Power sup 9. Parallel op 10. Series 11. CV/CC 12. Interlock 13. Local/Remo | ature protection IND MONITORING e programming ogramming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor ply OK signal peration cindicator (ILC) control te mode Control | | 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 | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, us 10Kohm ful | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accurac 1.6V/4~15V or dry cor V, user selectable. Ac V, user selectable. Ac V, user selectable. Ac 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: | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of cy and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance il diodes). age: 30V, maximum s t. less than 0.5mÅ). Ena/Dir Remote, 2~15V or op | f rated Vout. Frated lout. 6 of rated Vout. 96 of rated lout. logic. e connection. sink current: 10m/ s is activated by front p pen: Local |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 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 ogramming ogramming (*13) (SO) control Int monitor (*13) (SO) control Int monitor (*13) Itage monitor opply OK signal operation Cindicator Ci | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electt Open collector (shui | User sele ~5V or 0~10V, user se 0~5V or 0~10V, user se 10Kohm full scale, use 10Kohm full scale, user 10Kohm full scale, use | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy selectable. Accuracy (6V/4~15V or dry cor W, user selectable. Ac W-Fail. 500ohm serie lave mode with singl al units (with externa e: Off. Maximum volt On, Open: Off, Source curre hort: 0~0.6V or short: n (0~0.6V, 10mA sink of | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y and linearity: +/-1% y and linearity: +/-1% tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balanc l diodes). age: 30V, maximum s nt: less than 0.5mA). Ena/Dir Remote, 2~15V or o current max.)-Remote | f rated Vout. Frated lout. 6 of rated Vout. 9 of rated lout. logic. e connection. sink current: 10m/ sis activated by front p pen: Local . Off-Local (30V m |
| 6. Over tempera ALOG PROGRAMMING A 1. Vout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 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 e programming ogramming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor ply OK signal peration cindicator (ILC) control te mode Control | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS o By electt Open collector (shui | User sele ~5V or 0~10V, user se 2~5V or 0~10V, user se 2~5V or 0~10V, user se 10Kohm full scale, us 10Kohm fu | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy selectable. Accuracy (6V/4~15V or dry cor W, user selectable. Ac W-Fail. 500ohm serie lave mode with singl al units (with externa e: Off. Maximum volt On, Open: Off, Source curre hort: 0~0.6V or short: n (0~0.6V, 10mA sink of | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y and linearity: +/-1% y and linearity: +/-1.5 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance il diodes). age: 30V, maximum s nt: less than 0.5mA). Ena/Dir Remote, 2~15V or op urrent max.)-Remote t =3.8V, Maximum hi | f rated Vout. Frated lout. 6 of rated Vout. 9 of rated lout. logic. e connection. sink current: 10m/ sis activated by front p pen: Local . Off-Local (30V m |
| 6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 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 14. Local/Remot | ature protection IND MONITORING e programming ogramming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor ply OK signal beration (*20) operation c indicator c (ILC) control te mode Control e mode Indicator uger out | | 0~100%, 0 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 | User sele ~5V or 0~10V, user sele 2~5V or 0~10V, user sel 10Kohm full scale, use 10Kohm full scale | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy er selectable. Accuracy of W, user selectable. Ac V, user selectable. Ac V, user selectable. Ac 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, 10mA sink on 10~0.6V, 10mA sink on um high level outpu e current =16mA, pu | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y 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 s nt. less than 0.5mA). Ena/Dir Remote, 2~15V or op urrent max.)-Remote t =3.8V, Maximum hi lse =20 µs Typical. | f rated Vout. frated lout. % of rated Vout. % of rated lout. logic. e connection. sink current: 10m/ is activated by front p pen: Local . Off-Local (30V m. gh level output =: |
| 6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 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 14. Local/Remot 15. Trig | ature protection IND MONITORING programming ogramming ogramming (*13) (SO) control Int monitor (*13) (SO) control Int monitor (*13) Itage monitor opply OK signal operation Cindicator Ci | | 0~100%, 0 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 (shu Maximum low leve Maximum low leve | User sele ~5V or 0~10V, user sele >-5V or 0~10V, user sel 10Kohm full scale, use 10Kohm full scale | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy er selectable. Accuracy of V, 4~15V or dry cor V, user selectable. Ac VV,4~15V or dry cor V, user selectable. Ac VV-Fail. 5000hm serie lave mode with singl cal units (with externa e: Off. Maximum volt On, Open: Off, Source curre hort: O~0.6V or short: n (0~0.6V, 10mA sink on hom high level output e current =16mA, put mum high level input | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y and linearity: +/-1% y and linearity: +/-1.5 tact, user selectable curacy: +/-1%. s resistance. e wire current balance age: 30V, maximum s nt: less than 0.5mA). Ena/Di Remote, 2~15V or og current max.)-Remote t = 3.8V, Maximum hi lse = 20µs Typical. = 3.5V, Maximum hig | f rated Vout. f rated lout. % of rated Vout. % of rated lout. logic. e connection. ink current: 10m/ is activated by front poen: Local . Off-Local (30V mi gh level output =5V, h level input =5V, |
| 6. Over tempera 6. Over tempera 1. Vout voltage 2. lout voltage 2. lout voltage 3. Vout resistor 4. lout resistor pr 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 14. Local/Remot 15.Trig 16.Trig | ature protection IND MONITORING e programming ogramming (*13) r programming (*13) (SO) control nt monitor (*13) Itage monitor ply OK signal beration (*20) operation c indicator c (ILC) control te mode Control e mode Indicator uger out | | O~100%, 0 O~100%, 0 O~100%, 0~5/ O~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 | User sele ~5V or 0~10V, user sele 2~5V or 0~10V, user sel 10Kohm full scale, use 10Kohm full scale | ectable, latched or no lectable. Accuracy an electable. Accuracy a er selectable. Accuracy er selectable. Accuracy of V/4~15V or dry cor V, user selectable. Ac V/4~15V or dry cor V, user selectable. Ac V/-Fail. 5000hm serie lave mode with singl cal units (with externa e: Off. Maximum volt On, Open: Off, Source curre hort: 0~0.6V or on short: n (0~0.6V, 10m short: n (0~0.6V, 10m short: n um high level output e current =16mA, pu mum high level input ve edge, trigger: tw = | n latched. d linearity: +/-0.5% o nd linearity: +/-1% of y and linearity: +/-1% y and linearity: +/-1.5 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance il diodes). age: 30V, maximum se it.less than 0.5mA). Ena/Di Remote, 2~15V or og current max.)-Remote t = 3.8V, Maximum hi se = 20µs Typical. = 3.5V, Maximum hig 10µs minimum, Tr/Ti | f rated Vout. f rated lout. % of rated Vout. % of rated lout. logic. e connection. sink current: 10m/ s activated by front p pen: Local . Off-Local (30V m. gh level output =: h level input =:5V f =1 µs maximum. |

FRONT PANEL

| 1. Control functions | Multiple options with 2 Encoders |
|----------------------|-----------------------------------------------------------------------------------------------------------------|
| | Vout/lout manual adjust |
| | OVP/UVL/UVP manual adjust |
| | Protection Functions - OVP, UVL, UVP, Foldback, OCP, INT, SO |
| | 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. 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, LAN)

| 1 HOGHAMMING AND READDACK (N3232/405,050, 001 | Ional. IEEE, | | | | | |
|------------------------------------------------|--------------|---------------------------------------------------|-------------|-----------------------|-------------|-------|
| 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 | | | | 100-2 |
| 1. Input voltage/freq. (*3) | | 85~265Vac continuous, 47~63Hz, single phase | | | | |
| 2. Maximum Input current 100/200VAC (*4) (*18) | | 2.65/1.31 2.62/1.29 2.76/1.37 2.69/1.33 2.55/1.26 | | | 2.55/1.26 | |
| 3. Power Factor (Typ) | | | >0.99 at 10 | 00Vac, >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)

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. Derate ambient temp above 2000m. |
| 5. Annude | | Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C. |

Less than 15A/30A

SAFETY/EMC

| 1. Applicable standards: | UL61010-1, EN61010-1, IEC61010-1. Design to meet UL60950-1, EN6095 Safety 10V≤Vout≤60V: Output,J1,J2,J3,J4,USB,LAN,IEEE/ISOLATED Analog are Non H Vout=100V:Output,J1,J2 are Hazardous J3,J4,USB, IEEE/ISOLATED Analog LAN are EN4C | | | | | | |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| | 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/IEEE/ISOLATED ANALOG-Ground: 707VDC/1min. 60V,100V models: Input-Output&J1,J2: 4242VDC/1min; Input-J3,J4,USB,LAN/IEEE/ISOLATED Analog: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2- J3,J4,USB,LAN/IEEE/ISOLATED ANALOG :1910VDC/1min; Output&J1,J2-Ground: 1380VDC/1min. J3, J4, USB/LAN/IEEE/ISOLATED ANALOG - Ground: 707VDC/1min; | | | | |
| 3. Insulation resistance | 3. Insulation resistance | | More than 100Mohm at 25°C, 70%RH. | | | | |
| 4. Conducted emission | | | IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B | | | | |
| 5. Radiated emission | | | IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A | | | | |

MECHANICAL

| 1. Cooling | | | Forced air cooling by internal fan. |
|-----------------------|-----------------------------------------|--|----------------------------------------------------------------------------------|
| 2 Weinht | 2. Weight STANDARD Kg WIDE BODY Kg L | | Less than 1.9Kg. |
| 2. weight | | | Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE. |
| | | | H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing). |
| 3. Dimensions (WXHXD) | | | H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing). |
| 4. Vibration | | | According to: IEC60068-2-64 |
| 5. SI | hock | | 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: From 90% to 10% of Rated Output Voltage.
*11: For load voltage change, equal to the unit voltage rating, constant input voltage.
*12: For 10V model the ripple is measured at 2V to rated output voltage and rated output current. For other models, the ripple is measured at 10~100%

of rated output voltage and rated output current.

*13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift. *14: Measured with JEITA RC-9131A (1:1) probe.

*15: For cases where the time interval between each down programming is longer than Td (time delay).

*16: For cases where the time interval between each down programming is shorter than Td (time delay).

*17: Td typical Minimum time between consecutive down programming cycles.

 *18: PS with Lan, IEEE, models decrease efficiency by 0.5% and increase input current by 0.5%.
 PS with Isolated analog option decreases efficiency by 1.5% and increases input current by 1.5%. *19: At rated output power.

*20: For Parallel operation more than 2 units 5% of total output current is requierd.

2.2 Z⁺400 Series Specifications

| | MODEL | Z | 10-40 | 20-20 | 36-12 | 60-7 | 100-4 | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 1. Rate | ed output voltage(*1) | V | 10 | 20 | 36 | 60 | 100 | | |
| 2. Rate | ed output current (*2) | A | 40 | 20 | 12 | 7 | 4 | | |
| 3. Ra | ated output power | W | 400 | 400 | 432 | 420 | 400 | | |
| CONST | ANT VOLTAGE MODE | Z | 10-40 | 20-20 | 36-12 | 60-7 | 100-4 | | |
| | (. Line regulation (*6) | | 10-40 | | | | 100-4 | | |
| | . Load regulation (*7) | | 0.01% of rated output voltage+2mV 0.01% of rated output voltage+2mV | | | | | | |
| | nd noise (p-p, 20MHz) (*8) | | 50 | 50 | 50 | 50 | 90 | | |
| | | mV mV | 5 | 6 | | 50 | 80 | | |
| 4. Ripple r.m.s. 5Hz~1MHz 5. Temperature coefficient | | | | | 6 Itaut valtaga fallowi | | | | |
| | | PPM/°C | | PPM/°C from rated ou | | | | | |
| | mperature stability | | | out over 8hrs. interval | | | | | |
| | 7. Warm-up drift | V | 1 | 0.05% of rated outpu | | | | | |
| | sense compensation/wire | | 1 | 1 | 2 | 3 | 5 | | |
| | esponse 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) | | 40 | 65 | 85 | 100 | 250 | | |
| | No load (*10) (*16) (*17) | | 200 | 200 | 290 | 310 | 1100 | | |
| 11. Tra | nsient response time | mS | current. Output s | age to recover within (et-point: 10~100%, Lo | cal sense. Less than 1r | nS, for models up to a | | | |
| 12.1 | Hold-up time (*19) | | 15mSec Typical. | | 16mSee | Typical. | | | |
| CONST | ANT CURRENT MODE | Z | 10-40 | 20-20 | 36-12 | 60-7 | 100-4 | | |
| | . Line regulation (*6) | | 10-40 | | of rated output curre | | 100-4 | | |
| | | | | | of rated output current | | | | |
| | Load regulation (*11) | | Lassella | | | | | | |
| | regulation thermal drift | | | in 0.05% of rated outp | | <u> </u> | | | |
| | r.m.s. 5Hz~1MHz (*12) | mA | 70 | 40 | 15 | 8 | 3 | | |
| | nperature coefficient | PPM/°C | | 0PPM/°C from rated o | | | | | |
| | mperature stability | | | over 8hrs. interval foll | | | | | |
| 7 | 7. Warm-up drift | | Less that | an +/-0.1% of rated or | utput current over 30 | minutes following p | ower on. | | |
| PROT | ECTIVE FUNCTIONS | Z | 10-40 | 20-20 | 36-12 | 60-7 | 100-4 | | |
| | oldback protection | | | ut-down when power sup cycle in autostart mode or | ply change mode from C | | | | |
| 2. Over-v | oltage protection (OVP) | | | n method. Reset by A | | ostart mode or by O | | | |
| 3 016 | er - voltage trip point | V | 0.5~12 | 1~24 | 2~40 | 5~66 | 5~110 | | |
| | <u> </u> | | | el or communication | | | | | |
| 4. Output | under voltage limit (UVL) | | | ir | analog programmin | g. | | | |
| • | der voltage protection (UVP) | | | n when power supply o cle in autostart mode or | by OUTPUT button or by | rear panel ENABLE, or | | | |
| 6. Over t | emperature protection | | | User Sele | ctable. Latched or no | n latched | | | |
| IALOG PROGRAM | MING AND MONITORING | | | | | | | | |
| | | | | | | | | | |
| 1. VOUL | voltage programming | | 0~100% 0 | ~5V or 0~10V user se | lectable Accuracy an | d linearity: +/-0.5% (| of rated Vout | | |
| | voltage programming tage programming (*13) | | | ~5V or 0~10V, user se | | | | | |
| 2. lout volt | tage programming (*13) | | 0~100%, 0 | 0~5V or 0~10V, user s | electable. Accuracy a | nd linearity: +/-1% o | f rated lout. | | |
| 2. lout volt 3. Vout | tage programming (*13) resistor programming | | 0~100%, 0 0~100%, 0~5/ | 0~5V or 0~10V, user s 10Kohm full scale, us | electable. Accuracy a er selectable. Accurac | nd linearity: +/-1% o cy and linearity: +/-1 | f rated lout. % of rated Vout. | | |
| 2. lout vol 3. Vout 4. lout resi | tage programming (*13) resistor programming istor programming (*13) | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use | electable. Accuracy a er selectable. Accurac er selectable. Accurac | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1. | f rated lout. % of rated Vout. 5% of rated lout. | | |
| 2. lout volt 3. Vout 4. lout resi 5. Sh | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | 2~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use electrical Voltage: 0~0 | electable. Accuracy a er selectable. Accurac er selectable. Accurac .6V/4~15V or dry con | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1. tact, user selectable | f rated lout. % of rated Vout. 5% of rated lout. | | |
| 2. lout volt 3. Vout 4. lout resi 5. Sh 6. Outpu | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control t current monitor (*13) | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use electrical Voltage: 0~0 0~5V or 0~10 | electable. Accuracy a er selectable. Accurac er selectable. Accurac .6V/4~15V or dry con V, user selectable. Ac | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1. tact, user selectable curacy: +/-1%. | f rated lout. % of rated Vout. 5% of rated lout. | | |
| 2. lout volt 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control it current monitor (*13) cput voltage monitor | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ | 0~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, us electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10 | electable. Accuracy a er selectable. Accurac er selectable. Accurac .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1. tact, user selectable curacy: +/-1%. curacy: +/-1%. | f rated lout. % of rated Vout. 5% of rated lout. | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control t current monitor (*13) put voltage monitor wer supply OK signal | | 0~100%, (0~100%, 0~5/ 0~100%, 0~5/ By e | D~5V or 0~10V, user s (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 | electable. Accuracy a er selectable. Accurace er selectable. Accurace .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac V-Fail. 500ohm serie | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1. tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. | f rated lout. % of rated Vout. 5% of rated lout. logic. | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control t current monitor (*13) put voltage monitor wer supply OK signal allel operation (*21) | | 0~100%, (0~100%, 0~5/ 0~100%, 0~5/ By e | D~5V or 0~10V, user s '10Kohm full scale, us 10Kohm full scale, use electrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~0 4~5V-OK, C to 6 units in master/s | electable. Accuracy a er selectable. Accuracy r selectable. Accuracy .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac V-Fail. 500ohm serie lave mode with single | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance | f rated lout. % of rated Vout. 5% of rated lout. logic. | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. | tage programming (*13) resistor programming istor programming (*13) ut Off (SO) control t current monitor (*13) put voltage monitor wer supply OK signal allel operation (*21) . Series operation | | 0~100%, (0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up | 0~5V or 0~10V, user s '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 2 identic | electable. Accuracy a er selectable. Accuracy r selectable. Accuracy .6V/4~15V or dry con V, user selectable. Ac V, user selectable. Ac V-Fail. 500ohm serie lave mode with single al units (with externa | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1. tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance I diodes). | f rated lout. % of rated Vout. 5% of rated lout. logic. te connection. | | |
| 2. lout voli 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. 11 | tage programming (*13) resistor programming istor programming (*13) ut Off (SO) control t current monitor (*13) rput voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator | | 0~100%, (0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C | 0~5V or 0~10V, user s '10Kohm full scale, us 10Kohm full scale, us lectrical Voltage: 0~0 0~5V or 0~10 0~5V or 0~10 4~5V-0K, C to 6 units in master/s 2 identic C mode: On, CV mod | electable. Accuracy a er selectable. Accuracy er selectable. Accuracy 6.0//4~15V or dry con V, user selectable. Ac V, user selectable. Ac V-Fail. 500ohm serie lave mode with single al units (with externa e: Off. Maximum volt | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance l diodes). age: 30V, maximum | f rated lout. % of rated Vout. 5% of rated lout. logic. e connection. sink current: 10mA | | |
| 2. lout voli 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. 11 12. In | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control t current monitor (*13) rput voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator tterlock (ILC) control | | 0~100%, (0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS c | 0~5V or 0~10V, user s '10Kohm full scale, us 10Kohm full scale, us lectrical Voltage: 00 0~5V or 0~10 0~5V or 0~10 4~5V-0K, C to 6 units in master/s 2 identic C mode: On, CV mod output by dry contact (Short: | electable. Accuracy a er selectable. Accuracy er selectable. Accuracy 6.0/.4~15V or dry con V, user selectable. Ac V-Fail. 5000hm serie lave mode with single al units (with externa e: Off. Maximum volt On, Open: Off, Source curre | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance l diodes). age: 30V, maximum nt: less than 0.5mA). Ena/Di | f rated lout. % of rated Vout. 5% of rated lout. logic. ee connection. sink current: 10mA s is activated by front pane | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. 11 12. In 13. Local | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control it current monitor (*13) rput voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator iterlock (ILC) control /Remote mode Control | | 0~100%, (0~100%, 0~5/ 0~100%, 0-5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr | D~5V or 0~10V, user s 10Kohm full scale, us 10Kohm full scale, use 10Kohm full scale, user 10Kohm | electable. Accuracy a er selectable. Accuracy r selectable. Accuracy .6V/4~15V or dry conv V, user selectable. Acc V, user selectable. Acv V-Fail. 500ohm serie lave mode with single al units (with externa e: Off. Maximum volt 0, Open: Off, Source curre nort: 0~0.6V or short: | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance l diodes). age: 30V, maximum ti less than 0.5mÅ). Ena/Di Remote, 2~15V or o | f rated lout. % of rated Vout. 5% of rated lout. logic. e connection. sink current: 10mA s is activated by front pan pen: Local | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. 11 12. In 13. Local | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control t current monitor (*13) rput voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator tterlock (ILC) control | | 0~100%, (0~100%, 0~5/ 0~100%, 0-5/ By e Possible, up Open collector. C Enables/Disables the PS o By electt Open collector (shu | D~5V or 0~10V, user s 10Kohm full scale, use 10Kohm full scale, use 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 output by dry contact (Short: rical signal or Open/S) nted by 36V zener). Or | electable. Accuracy a er selectable. Accuracy r selectable. Accuracy .6V/4~15V or dry con V, user selectable. Acc V, user selectable. Ac V-Fail. 500ohm serie lave mode with single al units (with externa e: Off. Maximum volt On, Open: Off, Source curren onct: 0~0.6V or short: n (0~0.6V, 10mA sink co | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current baland l diodes). age: 30V, maximum nt: less than 0.5mA). Ena/Di Remote, 2~15V or o urrent max.)-Remote | f rated lout. % of rated Vout. 5% of rated lout. logic. ee connection. sink current: 10mA s is activated by front pan pen: Local . Off-Local (30V max | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pow 9. Par 10. 11. 12. In 13. Local 14. Local | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control it current monitor (*13) rput voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator iterlock (ILC) control /Remote mode Control | | 0~100%, (0~100%, 0~5/ 0~100%, 0-5/ By e Possible, up Open collector. C Enables/Disables the PS o By electt Open collector (shu | D~5V or 0~10V, user s 10Kohm full scale, use 10Kohm full scale, user 10Kohm | electable. Accuracy a er selectable. Accuracy r selectable. Accuracy 6V/4~15V or dry con V, user selectable. Acc V, user selectable. Acc V-Fail. 500ohm seriel lave mode with single al units (with externa e: Off. Maximum volt On, Open: Off, Source curren on; O-0.6V or short: on (0-0.6V, 10m A sink co num high level output | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance l diodes). age: 30V, maximum nt: less than 0.5mA). Ena/Di Remote, 2~15V or o urrent max.)-Remote t =3.8V, Maximum h | f rated lout. % of rated Vout. 5% of rated lout. logic. ee connection. sink current: 10mA s is activated by front pan pen: Local . Off-Local (30V max | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pow 9. Par 10. 11. 12. In 13. Local 14. Local | tage programming (*13) resistor programming istor programming (*13) ust Off (SO) control t current monitor (*13) put voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator terlock (ILC) control /Remote mode Control /Remote mode Indicator | | 0~100%, (0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS c By electr Open collector (shu Maximum low leve Maximum low leve | D~5V or 0~10V, user s '10Kohm full scale, us 10Kohm full scale, us | electable. Accuracy a er selectable. Accuracy er selectable. Accuracy for selectable. Accuracy (AV/4~15V or dry con V, user selectable. Ac V-Fail. 500ohm serie lave mode with single al units (with externa e: Off. Maximum volt On, Open: Off, Source curren nort: O~0.6V or short: n (0~0.6V, 10mA sink or num high level outpu e current =16mA, pul num high level input | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance l diodes). age: 30V, maximum nt: less than 0.5mA). Ena/Di Remote, 2~15V or o urrent max.)-Remote t = 3.8V, Maximum h se =20µs Typical. | f rated lout. % of rated Vout. 5% of rated lout. logic. ee connection. sink current: 10mA sis activated by front pane pen: Local . Off-Local (30V max igh level output =5V, gh level input =5V, | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. 11 12. ln 13. Local 14. Local/ | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control it current monitor (*13) iput voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator iterlock (ILC) control /Remote mode Control /Remote mode Indicator 15.Trigger out | | 0~100%, 0 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up Open collector. C Enables/Disables the PS c By electr Open collector (shu Maximum low leve Maximum low leve | D~5V or 0~10V, user s 10Kohm full scale, use 10Kohm | electable. Accuracy a er selectable. Accuracy er selectable. Accuracy er selectable. Accuracy (50/4~15V or dry conv (V, user selectable. Acc (V-Fail. 500ohm serie lave mode with single al units (with externa e: Off. Maximum volt On, Open: Off, Source curren nort: 0~0.6V or short: n (0~0.6V, 10mA sink or num high level output e current = 16mA, pui mum high level input ve edge, trigger: tw = | nd linearity: +/-1% o cy and linearity: +/-1 y and linearity: +/-1 tact, user selectable curacy: +/-1%. curacy: +/-1%. s resistance. e wire current balance l diodes). age: 30V, maximum age: 30V, maximum ti less than 0.5mA). Ena/Di Remote, 2~15V or o urrent max.)-Remote t =3.8V, Maximum hi se =20µs Typical. =3.5V, Maximum hi :10µs minimum, Tr/T | f rated lout. % of rated Vout. 5% of rated Vout. logic. e connection. sink current: 10mA is activated by front pane pen: Local . Off-Local (30V max igh level output =5V gh level input =5V, f =1µs maximum. | | |
| 2. lout vol 3. Vout 4. lout resi 5. Sh 6. Outpu 7. Out 8. Pov 9. Par 10. 11 12. In 13. Local 14. Local/ 17. Pr | tage programming (*13) resistor programming istor programming (*13) nut Off (SO) control t current monitor (*13) put voltage monitor wer supply OK signal allel operation (*21) . Series operation . CV/CC indicator terlock (ILC) control /Remote mode Control /Remote mode Indicator 15.Trigger out | | 0~100%, (0~100%, 0~5/ 0~100%, 0-5/ By e Possible, up Open collector. C Enables/Disables the PS o By electr Open collector (shu Maximum low leve Maximum low leve Maximum low leve | D~5V or 0~10V, user s '10Kohm full scale, us 10Kohm full scale, us | electable. Accuracy a er selectable. Accuracy er selectable. Accuracy er selectable. Accuracy 6V/4~15V or dry conv V, user selectable. Accv V-Fail. 5000hm serie lave mode with single al units (with externa e: Off. Maximum volt On, Open: Off, Source curne nort: O~0.6V or short: n (0~0.6V, 10mA sink co num high level output ve edge, trigger: tw = 5V, maximum sink cu | 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 l diodes). age: 30V, maximum ht less than 0.5mÅ). Ena/Di Remote, 2~15V or o urrent max.)-Remote t =3.8V, Maximum hi se =20µs Typical. =3.5V, Maximum hi =3.5V, Maximum hi =10µs minimum, Tr/T rrent 100mA. (Shunt | f rated lout. % of rated Vout. 5% of rated lout. logic. e connection. sink current: 10mA sis activated by front pan pen: Local . Off-Local (30V max igh level output =5V, f =1µs maximum. ed by 27V zener) | | |

| - Multiple options with 2 Encoders - Vout/lout manual adjust - OVP/UVL /UVP manual adjust - Protection Functions - OVP, UVL, UVP, Foldback, OCP, INT, SO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| - OVP/UVL /UVP manual adjust |
| |
| - Protection Functions - OVP, UVL, UVP, Foldback, OCP, INT, SO |
| |
| 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 |
| 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). |
| - 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 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 vo | ltage | | |
| 6. lout readback accuracy (*13) | | | 0.1% of act | ual +0.3% of rated ou | tput 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

| Environmentae 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. Annude | | Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C. | | | | |

SAFETY/EMC

| 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) | | | |
| | 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; | | | |
| | More than 100Mohm at 25°C, 70%RH. | | | |
| | IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B | | | |
| | IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A | | | |
| | EMC | | | |

MECHANICAL

| 1. Cooling | | | Forced air cooling by internal fan | | |
|------------------------------------|------------------------|----|---------------------------------------------------------------------------------|--|--|
| STANDARD STANDARD | | Kg | Less than 1.9Kg. | | |
| 2. Weight | 2. Weight WIDE BODY Kg | | Less than 2.4Kg. Wide body with Isolated analog or Binding post or IEEE | | |
| 3 Dimensions (W/vHvD) | 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 | | |
| 5. SI | hock | | Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27 | | |

NOTES:

*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.

^{*1:} Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.

TDK·Lambda _____

2.3 Z⁺600 Series Specifications

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| MODEL | Z | 10-60 | 20-30 | 36-18 | 60-10 | 100-6 | | |
| 1. Rated output voltage(*1) | | 10 | 20 | 36 | 60 10 | 100 | | |
| 2. Rated output current (*2) | A W | 60 | 30 600 | 18 648 | 600 | 6 600 | | |
| 3. Rated output power | VV | 600 | 600 | 048 | 600 | 600 | | |
| CONSTANT VOLTAGE MODE | Z | 10-60 | 20-30 | 36-18 | 60-10 | 100-6 | | |
| 1. Max. Line regulation (*6) | | | 0.01% (| of rated output voltad | ge+2mV | | | |
| 2. Max. Load regulation (*7) | | | 0.01% (| of rated output voltad | ge+2mV | | | |
| 3. Ripple and noise (p-p, 20MHz) (*8) | mV | 50 | 50 | 50 | 50 | 80 | | |
| 4. Ripple r.m.s. 5Hz~1MHz | mV | 5 | 5 | 5 | 12 | 15 | | |
| 5. Temperature coefficient | PPM/°C | 30 | PPM/°C from rated ou | utput voltage, followi | ng 30 minutes warm | -up. | | |
| 6. Temperature stability | | | out over 8hrs. interva | | | | | |
| 7. Warm-up drift | | Less than | 0.05% of rated output | it voltage+2mV over | 30 minutes following | power on. | | |
| 8. Remote sense compensation/wire | V | 1 | 1 | 2 | 3 | 5 | | |
| 9. Up-prog. Response time, 0~Vomax.(*9) | mS | 50 | 50 | 50 | 50 | 100 | | |
| 10. Down-prog. 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. Transient response time | mS | | age to recover within (| | | | | |
| | 1115 | current. Output s | et-point: 10~100%, Lo | cal sense. Less than 1 | mS, for models up to a | nd including 100V | | |
| 12. Hold-up time (*18) | | 15mSec | c Typical. | | 20mSec Typical. | | | |
| | 7 | 10.00 | 20.20 | 26.10 | 60.10 | 100.6 | | |
| CONSTANT CURRENT MODE | Z | 10-60 | 20-30 | 36-18 | 60-10 | 100-6 | | |
| 1. Max. Line regulation (*6) | | | | of rated output curre | | | | |
| 2. Max. Load regulation (*11) | | | | of rated output curre | | Laboration and | | |
| 3. Load regulation thermal drift | | | an 0.15% of rated outp | T | inutes following load | | | |
| 4. Ripple r.m.s. 5Hz~1MHz (*12) | mA | 150 | 75 | 25 | 8 | 5 | | |
| 5. Temperature coefficient | PPM/°C | | 0PPM/°C from rated o | | | | | |
| 6. Temperature stability | | | over 8hrs. interval foll | ¥ | | | | |
| 7. Warm-up drift | | 20V, 36V Model: | 10V Model: Less than +/-0.3% of rated output current over 30 minutes following power on. 20V, 36V Model: Less than +/-0.15% of rated output current over 30 minutes following power on. 60V, 100V Models: Less than +/-0.1% of rated output current over 30 minutes following power on. | | | | | |
| | | | | | | | | |
| PROTECTIVE FUNCTIONS | Z | 10-60 | 20-30 | 36-18 | 60-10 | 100-6 | | |
| PROTECTIVE FUNCTIONS 1. Foldback protection | Z | Output shut-de | own when power supp | bly change mode from | CV to CC or CC to CV. | User presetable. | | |
| | | Output shut-de Reset by AC input recy | own when power supp cle in autostart mode or | ly change mode from by OUTPUT button or b | CV to CC or CC to CV. y rear panel ENABLE, or | User presetable. by communication por | | |
| | | Output shut-de Reset by AC input recy | own when power supp cle in autostart mode or n method. Reset by A | ly change mode from by OUTPUT button or b C input recycle in aut | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by O | User presetable. by communication por | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) | | Output shut-de Reset by AC input recy Inverter Shut dow | own when power supp cle in autostart mode or n method. Reset by A rear panel El | ly change mode from by OUTPUT button or b C input recycle in aut NABLE, or by commu | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by O nication port. | User presetable. by communication por UTPUT button or by | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over -voltage trip point | | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 | ly change mode from by OUTPUT button or b C input recycle in aut NABLE, or by commu 2~40 | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by O nication port. 5~66 | User presetable. by communication por UTPUT button or by 5~110 | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) | V | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel ou Output shut-dow | own when power supp rcle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply | ly change mode from by OUTPUT button or b C input recycle in aut NABLE, or by commu 2~40 ents from adjusting Vout b putput voltage goes b | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by Ol nication port. 5~66 below limit. Does not affect elow UVP programmir | User presetable. by communication por UTPUT button or by 5~110 in analog programming. ng. User presetable. | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over -voltage trip point 4. Output under voltage limit (UVL) | V | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel ou Output shut-dow | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply cle in autostart mode or | ly change mode from by OUTPUT button or b C input recycle in aut NABLE, or by commu 2~40 ents from adjusting Vout b putput voltage goes b | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by Of nication port. 5~66 elow limit. Does not affect elow UVP programmir y rear panel ENABLE, or | User presetable. by communication por UTPUT button or by 5~110 in analog programming. ng. User presetable. | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over -voltage trip point 4. Output under voltage limit (UVL) 5. Output under voltage protection (UVP) 6. Over temperature protection | V | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel ou Output shut-dow | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply cle in autostart mode or | ly change mode from by OUTPUT button or b C input recycle in aut VABLE, or by commu 2~40 ents from adjusting Vout b output voltage goes b by OUTPUT button or b | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by Of nication port. 5~66 elow limit. Does not affect elow UVP programmir y rear panel ENABLE, or | User presetable. by communication por UTPUT button or by 5~110 in analog programming. ng. User presetable. | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over-voltage trip point 4. Output under voltage limit (UVL) 5. Output under voltage protection (UVP) 6. Over temperature protection NALOG PROGRAMMING AND MONITORING | V | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel o Output shut-dow Reset by AC input recy | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply cle in autostart mode or User Sele | ly change mode from by OUTPUT button or b C input recycle in aut VABLE, or by commu 2~40 ents from adjusting Vout b output voltage goes b by OUTPUT button or b ctable. Latched or nc | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by Of nication port. 5~66 ledow limit. Does not affect elow UVP programmir y rear panel ENABLE, or n latched. | User presetable. by communication por UTPUT button or by 5~110 in analog programming. ng. User presetable. by communication por | | |
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| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over -voltage trip point 4. Output under voltage limit (UVL) 5. Output under voltage protection (UVP) 6. Over temperature protection NALOG PROGRAMMING AND MONITORING 1. Vout voltage programming 2. lout voltage programming (*13) | V | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel or Output shut-dow Reset by AC input recy 0~100%, 0 0~100%, 0 | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply cle in autostart mode or User Sele ~5V or 0~10V, user se 0~5V or 0~10V, user se | ly change mode from by OUTPUT button or b C input recycle in aut VABLE, or by commu 2~40 ents from adjusting Vout b output voltage goes b by OUTPUT button or b ctable. Latched or no lectable. Accuracy an electable. Accuracy a | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by OI nication port. 5~66 elow limit. Does not affect elow UVP programmin y rear panel ENABLE, or on latched. d linearity: +/-0.5% o nd linearity: +/-1% oi | User presetable. by communication por UTPUT button or by 5~110 in analog programming. og. User presetable. by communication por frated Vout. frated lout. | | |
| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over -voltage trip point 4. Output under voltage limit (UVL) 5. Output under voltage protection (UVP) 6. Over temperature protection NALOG PROGRAMMING AND MONITORING 1. Vout voltage programming 2. lout voltage programming (*13) 3. Vout resistor programming | V | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel or Output shut-dow Reset by AC input recy 0~100%, 0 0~100%, 0~5/ | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply - cle in autostart mode or User Sele ~5V or 0~10V, user se 0~5V or 0~10V, user se 2~5V or 0~10V, user se | ly change mode from by OUTPUT button or b C input recycle in aut VABLE, or by commu 2~40 ents from adjusting Vout b output voltage goes b by OUTPUT button or b ctable. Latched or nc lectable. Accuracy an electable. Accuracy a er selectable. Accuracy | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by OI nication port. 5~66 elow UMP programmir y rear panel ENABLE, or on latched. d linearity: +/-0.5% o nd linearity: +/-1% oi cy and linearity: +/-1% | User presetable. by communication por UTPUT button or by 5~110 in analog programming. ng. User presetable. by communication por frated Vout. frated lout. % of rated Vout. | | |
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| 1. Foldback protection 2. Over-voltage protection (OVP) 3. Over -voltage trip point 4. Output under voltage limit (UVL) 5. Output under voltage protection (UVP) 6. Over temperature protection ANALOG PROGRAMMING AND MONITORING 1. Vout voltage programming 2. lout voltage programming 4. lout resistor programming 4. lout resistor programming 4. lout resistor programming 5. Shut Off (SO) control 6. Output current monitor (*13) 7. Output voltage monitor 8. Power supply OK signal 9. Parallel operation (*20) 10. Series operation | V - | Output shut-de Reset by AC input recy Inverter Shut dow 0.5~12 Preset by front panel or Output shut-dow Reset by AC input recy 0~100%, 0~5/ 0~100%, 0~5/ 0~100%, 0~5/ By e Possible, up | own when power supp cle in autostart mode or n method. Reset by A rear panel El 1~24 r communication port. Prev n when power supply cle in autostart mode or User Sele ~5V or 0~10V, user se 2~5V or 0~10V, user se 2~5V or 0~10V, user se 2~5V or 0~10V, user se 20~5V or 0~10V, user se 20~5V or 0~10V, user se 20~5V or 0~10V, user se 20~5V or 0~100 0~5V or 0~10 0~5V or 0~10 | ly change mode from by OUTPUT button or b C input recycle in aut VABLE, or by commu 2~40 ents from adjusting Vout L output voltage goes b by OUTPUT button or b ctable. Latched or nc lectable. Accuracy an electable. Accuracy a er selectable. Accuracy ar selectable. Accuracy r selectable. Accuracy of V/4~15V or dry cor V, user selectable. Ac V, user selectable. Ac | CV to CC or CC to CV. y rear panel ENABLE, or tostart mode or by OI nication port. 5~66 selow limit. Does not affect elow UVP programmir y rear panel ENABLE, or on latched. d linearity: +/-0.5% of nd linearity: +/-1% of cy and linearity: +/-1% tact, user selectable curacy: +/-1%. s resistance. e wire current balance al diodes). | User presetable. by communication por UTPUT button or by 5~110 in analog programming. ng. User presetable. by communication por of rated Vout. frated lout. % of rated lout. % of rated lout. logic. e connection. | | |
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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 programmin | | | | |
| | Analog Control Functions - Selection of Voltage/Current Monitoring 5V/10V, Output ON/OFF, Front Panel Lo | | | | |
| 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 act | ual +0.3% of rated ou | tput 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 | | | | | | |

| INFUT CHARACTERISTICS | | 10-72 | 20-40 | 50-24 | 00-14 | 100-6 |
|-------------------------------------|----|---------------------------------------------|-----------|-----------|------------|-----------|
| 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) | | 0.99 at 100/200Vac, 100% load | | | | |
| 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℃ |
| 3. Operating humidity | X. | 20~90% RH (no condensation). |
| 4. Storage humidity | 1. | 10~95% RH (no condensation). |
| 5. Altitude | | Maximum 3000m. Derate ambient temp above 2000m. |
| 5. Altitude | | Operating: Maximum ambient temperature, From 2000m up to 3000m Ambient temperature 40°C. |

SAFETY/EMC

| 1. Applicable standards: | e 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 | | IEC61326-1 (Built to meet EN55022/EN55024) | | | |
| 2. Withstar | 2. Withstand voltage | | 10≤Vout≤36V models: Input-Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output&J1,J2,J3,J4,USB,LAN/IEEE/ISOLATED ANALOG-Ground: 1000VDC/1min; 60V,100V models: Input-Output&I1,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; Output&J1,J2-Ground: 1380VDC/1min. | | | |
| 3. Insulation | n 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 | d emission | | IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A | | | |
| 5. Radiated | d emission | | EN55022B, FCC part 15-B, VCCI-B | | | |

MECHANICAL

| 1. Cooling | | | Forced air cooling by internal fan. | | |
|-----------------------|-----------|----|----------------------------------------------------------------------------------|--|--|
| 2. Weight | STANDARD | Ka | Less than 2.5Kg. | | |
| z. weight | WIDE BODY | Kg | Less than 3.0Kg. Wide body with Isolated analog or Binding post or IEEE. | | |
| 3. Dimensions (WxHxD) | STANDARD | mm | H: 83, W: 70, D: 350 (excluding bus bars, handles). (Refer to Outline drawing). | | |
| S. Dimensions (WXHXD) | WIDE BODY | | H: 83, W: 105, D: 350 (excluding bus bars, handles). (Refer to Outline drawing). | | |
| 4. Vibration | | | According to:IEC60068-2-64 | | |
| 5. Shock | 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.

*9: From 10% to 90% or 90% to 10% of Rated Output Voltage, with rated resistive load.

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

of rated output voltage and rated output current. *13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift.

*14: Measured with JEITA RC-9131A (1:1) probe.

*15: For cases where the time interval between each down programming is longer than Td (time delay).
*16: For cases where the time interval between each down programming is shorter than Td (time delay).
*17: Td typical (±20%) Minimum time between consecutive down programming cycles.
*18: FS 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.

^{*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.

2.4 Z⁺800 Series Specifications

| Z V A A W W W W Z V M V PPM/°C C Z Z Z Z | 0.05% of rated V/ Less than 1 50 25 285 65 280 Time for output volt current. Output solt current Output solt 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of 1000 | 0.01% c 50 5 5 5 5 5 5 5 5 5 5 6 6 7 5 6 7 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 | following 30 minute it voltage+2mV over : 2 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer output current over 3 ed output current over 3 31 | ge+2mV 60 12 ng 30 minutes warm- swarm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | line, load & temp. power on. 5 100 80 1370 375 1200 ∼90% of rated outpund including 100V 100-8 load change. ing load change. 12 |
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| A A A A W W W W Z mV mV mV mV mV mV mV mV mV mV mV mV mV | 72 72 66 720 720 660 10-72 50 5 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output s 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of 100 0.05% of rated lout of 100 | 40 40 36 800 800 720 20-40 0.01% 0 50 5 20-40 0.05% of rated outpu 1 50 25 425 425 110 470 age to recover within (set-point: 10~100%, [0.01% 0 st han 0.15% of rated 0.01% of rated 0.01% of rated 100 \$ | 24 24 20 864 864 36-24 of rated output voltace of rated output voltace of rated output voltace frated output voltace 50 5 1 following 30 minute 1 voltage+2mV over : 2 50 25 450 155 450 155 470 0.5% of its rated output cal sense. Less than 1 n Typical. Rated output 36-24 of rated output current over 3 450 155 470 0.5% of its rated output cal sense. Less than 1 n Typical. Rated output 36-24 of rated output current over 3 450 31 | 14 14 12.5 840 840 750 60-14 ge+2mV 60 12 ng 30 minutes warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 ns, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 8 8 7.5 800 800 750 100-8 100-8 100 90% of rated output of including 100V ~90% of rated output nd including 100V 100-8 100-8 1370 375 1200 |
| A A W W W Z mV mV PPM/°C V mS mS mS Z Z mA PPM/°C | 72 66 720 720 660 10-72 50 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 40 36 800 720 20-40 0.01% of 0.01% of 50 50 50 50 50 50 50 50 50 50 | 24 20 864 864 720 of rated output voltac of rated output voltac of rated output voltac of rated output voltac following 30 minute t voltage, following 30 minute 36-24 of its rated output 36-24 of rated output current output current over 3 ed output current over 3 a1 | 14 12.5 840 750 60-14 ge+2mV 60 12 ng 30 minutes warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 ns, for models up to a t power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 8 7.5 800 800 750 100-8 80 15 up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpu nd including 100V ~90% of rated outpu nd including 100V |
| A W W Z mV mV PPM/°C V MS mS mS Z Z Z Z | 66 720 720 660 10-72 50 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output sol current. Output sol current. Output sol 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of 1000 0.05% of rated lout of 10000 | 36 800 800 720 20-40 0.01% of 50 5 0PPM/°C from rated outout 1 50 25 425 110 470 age to recover within (set-point: 10~100%, Loc 10mSec 20-40 0.01% of rated 4. Less than 0.15% of rated or 100 0PPM/°C from rated or | 20 864 864 720 36-24 of rated output voltac of rated output voltac of rated output voltac 50 5 100wing 30 minute t voltage, followin following 30 minute t voltage+2mV over 3 50 25 450 155 470 0.5% of its rated output cal sense. Less than 1 m Typical. Rated output 36-24 of rated output current output current over 3 ed output current over 3 ed output current over 3 15 15 15 15 15 15 15 15 15 15 | 12.5 840 840 750 60-14 ge+2mV 60 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 ns, for models up to a t power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 7.5 800 800 750 100-8 80 15 -up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpu nd including 100V -00 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 1370 1200 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 100-8 |
| W W W Z mV mV PPM/°C mS mS mS Z Z mA PPM/°C | 720 720 660 10-72 50 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output solt current. Output sol current. Out | 800 800 800 720 20-40 0.01% (0.01% (0.01% (50 5 0.01% (0.01% (50 50 50 0.05% of rated output 1 50 25 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of rated 4: Less than 0.1% of rated 100 0PPM/°C from rated output | 864 864 720 36-24 of rated output voltag of rated output voltag 50 15 160lowing 30 minute t voltage+2mV over 3 50 25 450 155 470 .5% of its rated output cal sense. Less than 1n Typical. Rated output current over 3 of rated output current over 3 output current over 3 atd output current over 3 31 | 840 840 750 60-14 ge+2mV ge+2mV 60 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 ns, for models up to a tt power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 800 800 750 100-8 80 15 -up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpund including 100V ~90% of rated outpund including 100V |
| W W Z mV mV PPM/°C W mS mS mS Z Z Z Z mA PPM/°C | 720 660 10-72 50 5 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output solt current. Output solt 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of 1000 1005% of rated lout of 1000 1000 | 800 720 0.01% of 0.01% of 50 5 PPM/°C from rated ou 0.05% of rated output 1 50 25 425 110 25 425 110 470 age to recover within (10mSec 20-40 0.01% of rated 4: Less than 0.15% of rated 100 0PPM/°C from rated ou | 864 720 36-24 of rated output voltag 50 51 1010xing 30 minute 2 50 25 450 155 470 5% of its rated output 36-24 of rated output current over 3 ed output current over 3 31 | 840 750 60-14 ge+2mV 60 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 30 50 25 570 175 500 t for a load change 10 ns, for models up to a ut power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 800 750 100-8 80 15 up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpund including 100V ~90% of rated outpund including 100V |
| W Z mV PPM/°C V mS mS mS Z Z Z R PPM/°C | 660 10-72 50 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 720 20-40 0.01% of 50 5 PPPM/°C from rated outout over 8hrs. interval 0.05% of rated output 1 50 25 425 110 470 age to recover within 0 10mSec 20-40 0.01% of rated \$t Less than 0.1% of rated 100 0PPM/°C from rated output | 720 36-24 of rated output voltage of rated output voltage 50 5 utput voltage, followin following 30 minute t voltage+2mV over 3 2 50 25 450 155 470 0.5% of its rated output cal sense. Less than 1 r Typical. Rated output 36-24 of rated output current over 3 ed output current over 3 ed output current over 3 ed output current over 3 1 1 1 1 1 1 1 1 1 1 1 1 1 | 750 60-14 ge+2mV 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 ns, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 750 100-8 80 15 up. line, load & temp. power on. 5 100 80 1370 375 1200 h~90% of rated outpund including 100V 100-8 load change. ing load change. 12 |
| Z mV mV PPM/°C V mS mS mS Z Z Z mA PPM/°C | 10-72 50 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 10.05% of rated lout i | 20-40 0.01% (0.01% (50 5 25 2000 over 8hrs. interval 0.05% of rated output 1 50 25 425 425 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of rated 4: Less than 0.15% of rated 100 00PPM/°C from rated o | 36-24 of rated output voltac of rated output voltac 50 50 51 following 30 minute it voltage, following following 30 minute it voltage+2mV over 3 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1 m Typical. Rated output current output current over 3 sed output current over 3 an 3 | 60-14 ge+2mV 60 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 350 25 570 175 500 t for a load change 10 ns, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 100-8 80 15 up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpind including 100V 100-8 load change. ing load change. 12 |
| mV mV PPM/°C W mS mS mS Z mA PPM/°C | 50 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of | 0.01% 0 0.01% 0 50 5 PPPM/°C from rated output 1 0.05% of rated output 1 50 25 425 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% 0 st than 0.15% of rated t Less than 0.15% of rated 100 0PPM/°C from rated o | of rated output voltag of rated output voltag 50 5 itput voltage, followin following 30 minute it voltage+2mV over : 2 50 25 450 155 470 5,5% of its rated output cal sense. Less than 1 n Typical. Rated output 36-24 of rated output current output current over 3 ed output current over 3 ed output current over 3 15 15 15 15 15 15 15 15 15 15 | ge+2mV ge+2mV 60 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 mS, for models up to a it power. 60-14 mt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 80 15 up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpund including 100V 100-8 100-8 100-8 100-8 100-8 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 100-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-100 1000-10 |
| mV pPM/°C V mS mS mS Z Z mA PPM/°C | 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output volt current. Output solt current. Output solt | 0.01% c 50 5 5 5 5 5 5 5 5 5 5 5 5 5 | of rated output voltad 50 5 itput voltage, followii following 30 minute it voltage+2mV over 3 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated output 36-24 of rated output curren output current over 3 ed output current over 3 31 | ge+2mV 60 12 ng 30 minutes warm- swarm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 15 -up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpund including 100V 100-8 load change. ing load change. 12 |
| mV mV PPM/°C V mS mS mS Z Z PPM/°C | 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output volt current. Output solt current. Output solt | 50 5 DPPM/°C from rated ou out over 8hrs. interval 0.05% of rated output 1 50 25 425 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of rated t: Less than 0.15% of rated 100 0PPM/°C from rated o | 50 5 itput voltage, followin following 30 minute it voltage+2mV over 3 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer output current over 3 ed output current over 3 31 | 60 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 15 -up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outpr nd including 100V 100-8 load change. ing load change. 12 |
| mV PPM/°C V W mS mS Z Z MA PPM/°C | 5 30 0.05% of rated V Less than 1 50 25 285 65 280 Time for output volt current. Output volt current. Output solt current. Output solt | 5 PPM/°C from rated ou out over 8hrs. interval 0.05% of rated outpu 1 50 25 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of st han 0.15% of rated 4: Less than 0.1% of rated 100 0PPM/°C from rated o | 5 ttput voltage, followin following 30 minute it voltage+2mV over : 2 50 25 450 155 470 0.5% of its rated output cal sense. Less than 1n Typical. Rated output 36-24 of rated output current output current over 3 ed output current over 3 31 | 12 ng 30 minutes warm- s warm-up. Constant 30 minutes following 3 50 25 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 15 -up. line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
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| V mS mS Z <u>Z</u> <u>Z</u> | 0.05% of rated V/ Less than 1 50 25 285 65 280 Time for output volt current. Output solt current Output solt 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of 1000 | Out over 8hrs. interval 0.05% of rated output 1 50 25 425 110 470 age to recover within (10mSec 20-40 0.01% of rated * than 0.15% of rated * Less than 0.1% of rated 100 0PPM/°C from rated o | following 30 minute it voltage+2mV over : 2 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer output current over 3 ed output current over 3 31 | s warm-up. Constant 30 minutes following 350 25 570 175 500 t for a load change 10 mS, for models up to a it power. 60-14 mt+2mA mt+2mA 1t+5mA 30 minutes following er 30 minutes following 28 | line, load & temp. power on. 5 100 80 1370 375 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
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| V mS mS Z <u>mA</u> PPM/℃ | 1 50 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout i | 1 50 25 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% (0.01% of rate t Less than 0.1% of rate 100 0PPM/°C from rated o | 2 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer or fated output currer output current over 3 ed output current over 31 | 3 50 25 570 175 500 t for a load change 10 mS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 5 100 80 1370 375 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
| mS mS mS Z <u>mA</u> PPM/°C | 50 25 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of | 50 25 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of s than 0.15% of rated 4: Less than 0.1% of rated 100 0PPM/°C from rated o | 50 25 450 155 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer or fated output curren output current over 31 | 50 25 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 100 80 1370 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
| mS Z PPM/°C | 25 285 65 280 Time for output volt current. Output sol current. Output sol 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of | 25 425 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of s than 0.15% of rated 4: Less than 0.1% of rate 100 0PPM/°C from rated o | 25 450 155 470 5% of its rated outpu cal sense. Less than 1r Typical. Rated output 36-24 of rated output curren of rated output current output current over 31 | 25 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 80 1370 375 1200 ~90% of rated outp nd including 100V 100-8 100-8 load change. ing load change. 12 |
| mS | 285 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 425 110 470 age to recover within (set-point: 10~100%, (c 10mSec 20-40 0.01% of s than 0.15% of rated (: Less than 0.1% of rated 100 0PPM/°C from rated o | 450 155 470 2.5% of its rated outpu cal sense. Less than 1r Typical. Rated output 36-24 of rated output currer of rated output currer output current over 3 ed output current over 31 | 570 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 1370 375 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
| mS | 65 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 10 0.05% of rated lout i | 110 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% (0.01% of rated t: Less than 0.1% of rated 100 0PPM/°C from rated o | 155 470 .5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer of rated output currer output current over 3 ed output current over 31 | 175 500 t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 80 minutes following er 30 minutes following 28 | 375 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
| Z mA PPM/°C | 280 Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 470 age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% (0.01% (0.15% of rated 4: Less than 0.15% of rated 100 0PPM/°C from rated o | 470 0.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output curren of rated output current output current over 3 ed output current over 31 | 500 t for a load change 10 n5, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | 1200 ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
| Z mA PPM/°C | Time for output volt current. Output s 10-72 For 10V: Les For 20V ~ 100V 180 0.05% of rated lout of | age to recover within (set-point: 10~100%, Lo 10mSec 20-40 0.01% of s than 0.15% of rated t Less than 0.1% of rate 100 0PPM/°C from rated o | 2.5% of its rated outpu cal sense. Less than 1r Typical. Rated outpu 36-24 of rated output currer of rated output curren output current over 3 ed output current over 31 | t for a load change 10 nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | ~90% of rated outp nd including 100V 100-8 load change. ing load change. 12 |
| Z mA PPM/°C | Current. Output s | et-point: 10~100%, Lo 10mSec 20-40 0.01% of s than 0.15% of rated Less than 0.1% of rated 100 0PPM/°C from rated o | cal sense. Less than 1r Typical. Rated output 36-24 of rated output curren of rated output curren output current over ed output current over 31 | nS, for models up to a it power. 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes following 28 | Ind including 100V |
| Z mA PPM/°C | For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 20-40 0.01% 0 is than 0.15% of rated /: Less than 0.1% of rat 100 0PPM/°C from rated o | 36-24 of rated output currer of rated output currer output current over and output current over 31 | 60-14 nt+2mA nt+5mA 30 minutes following er 30 minutes followi 28 | load change. ing load change. 12 |
| mA PPM/°C | For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 0.01% 0.01% s than 0.15% of rated /: Less than 0.1% of rat 100 0PPM/°C from rated o | of rated output currer of rated output currer output current over 3 ted output current ov 31 | nt+2mA nt+5mA 30 minutes following er 30 minutes followi 28 | load change. ing load change. 12 |
| mA PPM/°C | For 10V: Les For 20V ~ 100V 180 0.05% of rated lout | 0.01% 0.01% s than 0.15% of rated /: Less than 0.1% of rat 100 0PPM/°C from rated o | of rated output currer of rated output currer output current over 3 ted output current ov 31 | nt+2mA nt+5mA 30 minutes following er 30 minutes followi 28 | load change. ing load change. 12 |
| mA PPM/°C | For 20V ~ 100V 180 0.05% of rated lout | 0.01% (is than 0.15% of rated : Less than 0.1% of rat 100 0PPM/°C from rated o | of rated output curren output current over 3 ted output current ov 31 | nt+5mA 30 minutes following er 30 minutes followi 28 | ing load change. |
| PPM/°C | For 20V ~ 100V 180 0.05% of rated lout | is than 0.15% of rated /: Less than 0.1% of rat 100 0PPM/°C from rated o | output current over a ted output current ov 31 | 80 minutes following er 30 minutes followi 28 | ing load change. |
| mA PPM/°C | For 20V ~ 100V 180 0.05% of rated lout | /: Less than 0.1% of rat 100 0PPM/°C from rated o | ted output current ov 31 | er 30 minutes followi 28 | ing load change. |
| PPM/°C | 180 10 0.05% of rated lout | 100 0PPM/°C from rated o | 31 | 28 | 12 |
| PPM/°C | 10 0.05% of rated lout | 0PPM/°C from rated o | | | |
| | 0.05% of rated lout | | | | -up. |
| | | | owing 30 minutes wa | | |
| | | han +/-0.3%, 20V mod rated output curre | el: Less than +/-0.15% ent over 30 minutes fo | | .ess than +/-0.1% of |
| Z | 10-72 | 20-40 | 36-24 | 60-14 | 100-8 |
| | | own when power supp ycle in autostart mode or | | | |
| | Inverter Shut dow | n method. Reset by A rear panel El | C input recycle in aut NABLE, or by commur | | JTPUT button or by |
| V | 0.5~12 | 1~24 | 2~40 | 5~66 | 5~110 |
| | | ir | n analog programmin | ig. | |
| | Output shut-down when power supply output voltage goes below UVP programming. User preset Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or by communication | | | | |
| | | User Sele | ctable. Latched or no | n latched | |
| | | | | | |
| | 0~100% 0 | ~5V or 0~10V. user se | lectable. Accuracy an | d linearity: +/-0.5% o | f rated Vout. |
| | | | | | |
| | | | | | |
| | | | | | |
| | By e | electrical Voltage: 0~0 | .6V/4~15V or dry con | tact, user selectable | logic. |
| | | | | | |
| | | | | | |
| | | , , | | | |
| | Possible, up | | | | e connection. |
| | | | | | |
| | | | | | |
| | Enables/Disables the | | | | s than 0.5mA). Ena/l |
| | Ryplact | | | | nen: Local |
| | | | | | |
| | | el output =0.8V, Minin | num high level output | t =3.8V, Maximum hig | |
| | Maximum low level input =1.2V, Minimum high level input =3.5V, Maximum high lev | | | | |
| | Mavimum cink | | | 10us minimum Tr/Tf | |
| | | | ive edge, trigger: tw = | | |
| | | Ovtput shut-down Reset by AC input recy O~100%, O O~100%, O~5, O~100%, O~5, O~100%, O~5, By o Possible, up Possible, up Open collector, C By elect By elect Open collector (shu Maximum low lev | Output shut-down when power supply Reset by AC input recycle in autostart mode or User Sele 0~100%, 0~5V or 0~10V, user se 0~100%, 0~5V or 0~10V, user se 0~100%, 0~5V or 0~10V, user se 0~100%, 0~5/10Kohm full scale, use 0~5/0 or 0~10 0 0 0/5/0 or 0~10 0 0 | in analog programmin Output shut-down when power supply output voltage goes b Reset by AC input recycle in autostart mode or by OUTPUT button or by User Selectable. Latched or no 0~100%, 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectable. Accuracy an 0~5V or 0~10V, user selectab | in analog programming. Output shut-down when power supply output voltage goes below UVP programming Reset by AC input recycle in autostart mode or by OUTPUT button or by rear panel ENABLE, or User Selectable. Latched or non latched 0~100%, 0~5V or 0~10V, user selectable. Latched or non latched 0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-0.5% or 0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-1% of 0~100%, 0~5V or 0~10V, user selectable. Accuracy and linearity: +/-1% of 0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1% 0~100%, 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1% 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1%. 0~5/10Kohm full scale, user selectable. Accuracy and linearity: +/-1%. 0~5/0 or 0~10V, user selectable. Accuracy: +/-1%. 0~5V or 0.0V, overselectable. Accuracy: +/-1%. 0~5V or 0.0V, 0V-Fail. 500ohm series resistance. Possible, up to 6 units in master/slave mode with single wire current blanc |

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. |

FRONT PANEL

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

PROGRAMMING AND READBACK (RS232/485,USB, Optional: IEEE(*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 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 o | ontinuous, 47~63Hz, | single phase | |
| 2. Maximum Input current 100/200VAC (*4) | | 9.00/4.45 | 9.65/4.75 | 10.30/5.10 | 10.00/4.95 | 9.50/4.7 |
| 3. Power Factor (Typ) | | 0.99 at 100Vac, 100% load / 0.98 at 200Vac, 100% load | | | | |
| 4. Efficiency (Typ) 100/200VAC (*4) | % | 81/83 | 84/86 | 85/87 | 85/87 | 85/87 |
| 5. Inrush current (*5) | | | | Less than 30A | | |

ENVIRONMENTAL CONDITIONS

| 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 | % | | 10~9 | 95% RH (no condensa | tion). | |
| 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 | 7.5 |

SAFETY/EMC

| 1. Applicable standards: | lards: 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 | 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: 4242VDC/1min; Input-Ground: 2828VDC/1min. Output & J1,J2-13,J4,USB,LAN/IEEF/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

| meennanente | | | |
|-----------------------|-----------|----|---------------------------------------------------------------------------------|
| 1. Co | oling | | Forced air cooling by internal fan |
| 2.14/2:244 | 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 (W/vHvD) | 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. Vib | ration | | According to: IEC60068-2-64 |
| 5. Shock | | | Less than 20G, half sine, 11mS. Unit is unpacked. According to: IEC60068-2-27 |

NOTES:

*1: Minimum voltage is guaranteed to maximum 0.1% of rated output voltage.

*2: Minimum current is guaranteed to maximum 0.2% of rated output current.

*3: For cases where conformance to various safety standards (UL, IEC, etc...) is required, to be described as 100-240Vac (50/60Hz).

*4: Ta=25°C with rated output power.

*5: Not including EMI filter inrush current, less than 0.2mSec.

At 85~132Vac or 170~265VAC, constant load. *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. *q.

*10: From 90% to 10% of Rated Output Voltage.

*11: For load voltage change, equal to the unit voltage rating, constant input voltage.

*12: For 10V model the ripple is measured at 2V to rated output voltage and rated output current. For other models, the ripple is measured at 10~100% of rated output voltage and rated output current.

*13: The Constant Current programming, readback and monitoring accuracy do not include the warm-up and Load regulation thermal drift. *14: Measured with JEITA RC-9131A (1:1) probe.

*15: For cases where the time interval between each down programming is longer than Td (time delay). *16: For cases where the time interval between each down programming is shorter than Td (Time delay).

- *17: Td typical Minimum time between consecutive down programming cycles.
- *18: At rated output power.
- *19: Max. ambient temperature for using IEEE is 45°C

 $\mathbf{I}_1(\mathbf{A}) = \mathbf{I}_2(\mathbf{A})$ Ta ≤ 40°C *20: For Parallel operation more than 2 units 5% of toatal output
 Z10-72
 72
 66

 Z20-40
 40
 36

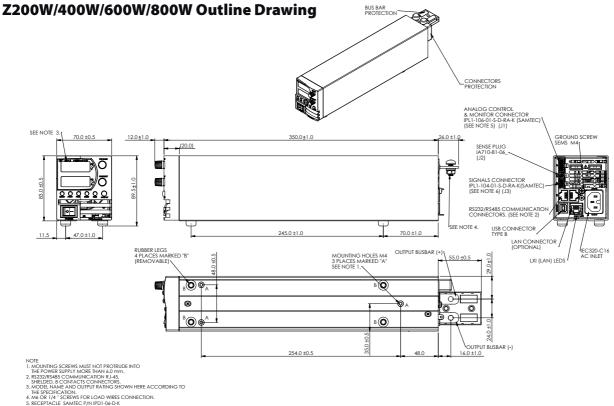
 Z36-24
 24
 20
 I, (A) IO" < Ta ≤ 50°C current is requierd. I₂ (A) *21: Refer to Fig.2-1 below

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

. 100Va

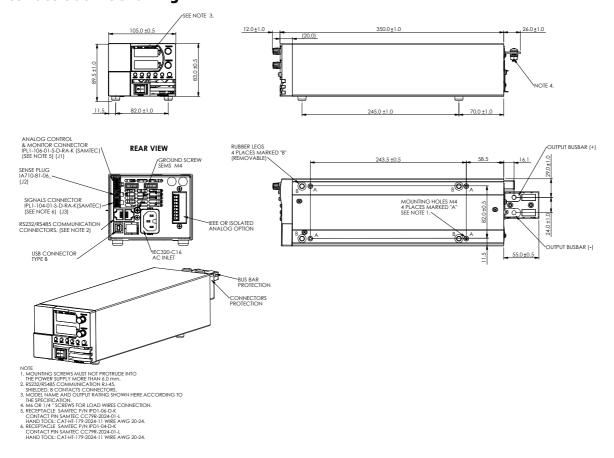
851/2

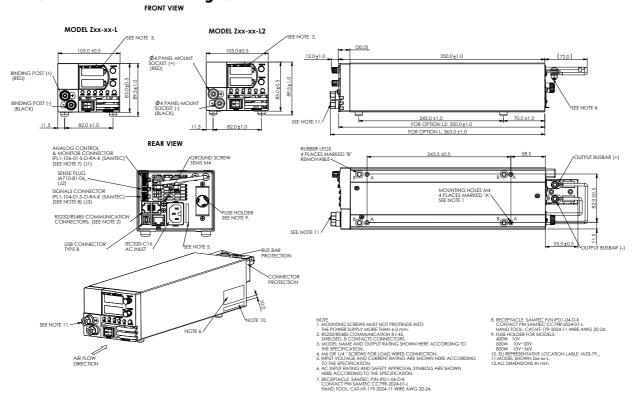
265Vac



- 4. M6 UK 1/4 SURTING TOK LOND MINES CONTRECING SRECEFTACLE SAMTEC PN (NPD)-06-D-K CONTACT PIN SAMTEC CC798-2024-01-L HAND TOOL: CATH-179-2024-11 WIRE AWG 20-24. 6. RECEPTACLE SAMTEC PN (NPD)-04-D-K CONTACT PIN SAMTEC CC798-2024-01-L HAND TOOL: CATH-179-2024-11 WIRE AWG 20-24.

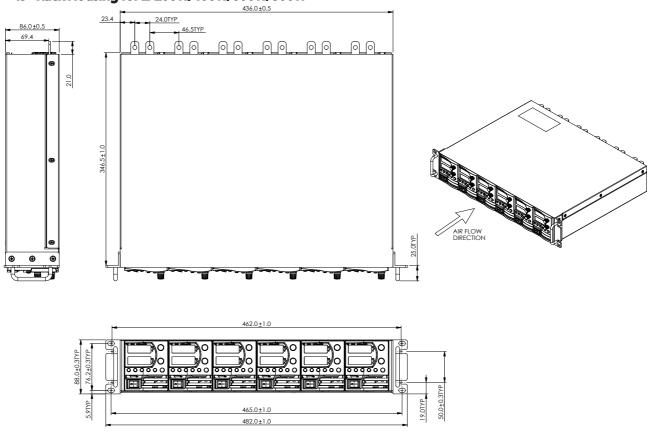
Z200W/400W/600W/800W Optional IEEE, Isolated Analog **Interface Outline Drawing**





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

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



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 RKP-1UI
 PFE1100-12-054ND
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 DS550DC-3
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 LCM300W-T-4
 LCM600N-T

 4-A
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 FNR-5-12G
 SPSPFE3-05G
 TET3200-12-069RA
 IEC-A-1
 FXX1600PCRPS 915606
 DHP-1UT-A
 DRP

 3200-24
 RCP-1000-12
 RCP-1000-24
 RCP-1000-24-C
 RCP-1000-48
 DHP-100-48