Genesys™

Programmable DC Power Supplies
3.3 kW in 2U
Built in RS-232 & RS-485 Interface
Parallel Current Summing
Optional Interfaces: USB
LXI Compliant LAN
IEEE488.2 SCPI Multi-Drop
Isolated Analog Interface

Genesys™ Family

GEN H	750W Half Rack
GEN 1U	750/1500W Full Rack
GEN 2U	3.3/5kW
GEN 3U	10/15kW

TDK·Lambda

www.us.tdk-lambda.com/hp

The Genesys™ family of programmable power supplies sets a new standard for flexible, reliable, AC/DC power systems in Test & Measurement, Industrial and Laboratory applications.

Features include:

- **High Power Density 3.3kW in 2U**
- **Wide Range of popular worldwide AC inputs, 1ø (230VAC) & 3ø (208VAC, 400VAC)**
- **Active Power Factor Correction (Single-Phase & Three-Phase AC Input)**
- **Output Voltage up to 600V, Current up to 400A**
- **Built-in RS-232/RS-485 Interface Standard**
- **Last Setting Memory; Front Panel Lockout**
- **Advanced Parallel reports total current up to four identical units**
- **Global Commands for Serial RS-232/RS-485 Interface**
- Reliable Encoders for Voltage and Current Adjustment
- Independent Remote ON/OFF and Remote ENABLE/DISABLE
- Reliable Modular and SMT Design
- 19" Rack Mounted for ATE and OEM Applications, zero stack
- Optional Interfaces
  - Isolated Analog Programming and Monitoring
  - IEEE Multi-Drop - SCPI
  - LXI Compliant LAN Interface
  - USB Interface
- Labview™ and LabWindows™ drivers
- Five Year Warranty

Worldwide Safety Agency Approvals; CE Mark for LVD and EMC Regulation

Applications

Genesys™ power supplies are designed for demanding applications. Common controls are shared across all platforms.

Test & Measurement systems using GPIB control save significant costs by incorporating the optional IEEE Multi-Drop Interface (IEMD) in the Master. Then up to 30 Slaves may be equipped with the less expensive Optional RS-485 Multi-Drop (MD) interface.

Automated System designers will appreciate new, standard, remote programming features such as Global commands. Also, new high-speed status monitoring is available for the RS-485 bus as well as optional LAN (LXI compliant) or USB Interfaces.

Industrial & Military high power systems can be configured with up to four identical units in parallel, up to 60kW. No space is required above or below each power supply (zero stack). The Master can be configured by the user to report total current of the combination. Applications include Heaters, Magnets and Laser Diodes.

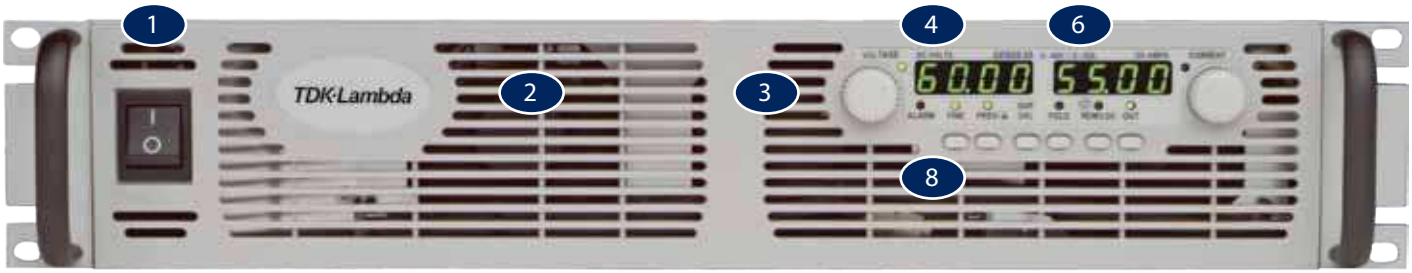
Aerospace & Satellite Testing systems use the complete Genesys™ Family: 1U 750W Half Rack, 1U 750W or 1500W Full-Rack, 2U 3.3kW and 3U 10/15kW. All are identical in Front Panel, Rear Panel Analog and Digital Interface Commands. A wide variety of outputs allows testing of many different devices.

Component Device Testing is simplified because of the many user-friendly control options in analog and digital interfaces. Lamps, capacitors, motors and actuators are typical devices tested.

Medical Imaging and Treatment systems require reliable power. Modular construction, SMT and thoroughly proven designs assure continuous performance at full rated power.

Semiconductor Processing & Burn-in equipment designers appreciate the wide variety of worldwide Inputs and Outputs from which to select depending on application. Selectable Safe and Auto Re-start protects loads and process integrity. Typical applications include Magnets, Filaments and Heaters.

Front Panel Description



1. ON/OFF Switch
2. Air Intake allows zero stacking for maximum system flexibility and power density.
3. Reliable encoder controls Output Voltage, Address, OVP and UVL settings.
4. Volt Display shows Output Voltage and directly displays OVP, UVL and Address settings.
5. Reliable encoder controls Output Current, sets baudrate, and Advanced Parallel Mode
6. Current Display shows Output Current and displays Baud rate. Displays total current in Parallel Master/Slave Mode
7. Function/Status LEDs:
   - Alarm
   - Fine Control
   - Preview Settings
   - Foldback Mode
   - Remote Mode
   - Output On
8. Pushbuttons allow flexible user configuration
   - Coarse and fine Adjustment of Output Voltage/Current and Advanced Parallel Master or Slave select.
   - Preview settings and set Voltage/Current with Output OFF, Front Panel Lock
   - Parallel Master/Slave
   - Set OVP and UVL Limits
   - Set Current Foldback Protection
   - Go to Local Mode and select Address and Baud rate
   - Output ON/OFF and Auto-Re-Start/Safe-Start Mode

Rear Panel Description

1. Remote/Local Output Voltage Sense Connections.
2. DIP Switches select 0-5V or 0-10V Programming and other functions.
3. DB25 (Female) connector allows (Non-isolated) Analog Program and Monitor and other functions.
4. RS-485 OUT to other Genesys™ Power Supplies.
5. RS-232/RS-485 IN Remote Serial Programming.
6. Output Connections: Rugged busbars (shown) for up to 100V Output; wire clamp connector for Outputs >100V
7. Exit air assures reliable operation when zero stacked.
8. Input: 230VAC Single Phase (shown), 208 & 400VAC Three Phase, 50/60 Hz
   AC Input Connector: PHOENIX CONTACT Power Combicon PC 6/... Series with strain relief.
9. Optional Interfaces Position for IEEE 488.2 (GPIB) (shown), Isolated Analog Interface, LAN Interface or USB Interface.

LAN Interface complies with LXI Class C Specification

Genesys ™ 3.3kW Specifications

1.0 MODEL	GEN	8-400	10-330	15-220	20-165	30-110	40-85	60-55	80-42	100-33	150-22	300-11	600-5.5
1.Rated output voltage(*1)	V	**8**	**10**	**15**	**20**	**30**	**40**	**60**	**80**	**100**	**150**	**300**	**600**
2.Rated Output Current(*2)	A	400	330	220	165	110	85	55	42	33	22	11	5.5
3.Rated Output Power	W	3200	3300	3300	3300	3300	3400	3300	3360	3300	3300	3300	3300

1.1 CONSTANT VOLTAGE MODE

1.Max.line regulation (0.01% of rated Vo+ 2mV)(*6)	mV	2.8	3	3.5	4	5	6	8	10	12	17	32	62
2.Max load regulation (0.015% of rated Vo+5mV)(*7)	mV	6.2	6.5	7.25	8	9.5	11	14	17	20	27.5	50	95
3.Ripple and noise p-p 20MHz (*8)	mV	60	60	60	60	60	60	60	80	100	100	300	500
4.Ripple r.m.s 5Hz~1MHz	mV	8	8	8	8	8	8	8	8	8	25	100	120
5.Remote sense compensation/wire	V	2	2	2	2	5	5	5	5	5	5	5	5
6.Temp. coefficient	PPM/ºC	100PPM/											
7.Temp. stability		0.05% of rated Vout over 8hrs interval following 30 minutes warm-up. Constant line, load & temp.											
8.Warm-up drift		Less than 0.05% of rated output voltage+2mV over 30 minutes following power On.											
9.Up-prog. response time, 0~Vo Rated (*9)	mS	80						150					250
10.Down-prog response time — Full-load (*9)	mS	20	100			160			300				500
10.Down-prog response time — No-load (*10)	mS	500	600	700	800	900	1000	1100	1200	1500	2000	3500	4000
11.Transient response time	mS	Time for output voltage to recover within 0.5% of its rated output for a load change 10-90% of rated output current. Output set-point: 10-100%, local sense. Less than 1mSec for models up to and including 100V. 2msec for models above 100V											

1.2 CONSTANT CURRENT MODE

1.Max.line regulation (0.01% of rated Io+ 2mA)(*6)	mA	42	35	24	18.5	13	10.5	7.5	6.2	5.3	4.2	3.1	2.6
2.Max.load regulation (0.02% of rated Io+5mA)(*11)	mA	85	71	49	38	27	22	16	13.4	11.6	9.4	7.2	6.1
3.Ripple r.m.s 5Hz~1MHz . (*12)	mA	1300	1200	880	660	300	200	100	80	70	60	20	10
4.Load regulation thermal drift		Less than 0.1% of rated output current over 30 minutes following load change.											
5.Temp. coefficient	PPM/ºC	200PPM/ºC from rated output current, following 30 minutes warm-up.											
6.Temp. stability		0.05% of rated Iout over 8hrs. interval following 30minutes warm-up. Constant line, load & temperature.											
7.Warm-up drift		8V~20V models: Less than 0.5% of rated output current over 30 minutes following power On.											
		30V~600V models: Less than 0.25% of rated output current over 30 minutes following power On.											

1.3 PROTECTIVE FUNCTIONS

1. OCP	0~105% Constant Current										
2. OCP Foldback	Output shut down when power supply change from CV to CC. User selectable.										
3. OVP type	Inverter shut-down, manual reset by AC input recycle or by OUT button or by communication port command.										
4. OVP trip point	0.5~10V	0.5~12V	1~18V	1~24V	2~36V	2~44V	5~66V	5~88V	5~110V	5~165V	5~330V	5~660V
5. Output Under Voltage Limit	Preset by front panel or communication port. Prevents from adjusting Vout below limit.											
6. Over Temp. Protection	User selectable , latched or non-latched.											

1.4 ANALOG PROGRAMMING AND MONITORING

1.Vout Voltage Programming	0~100%, 0~5V or 0~10V, user select. Accuracy and linearity:±0.5% of rated Vout.
2.Iout Voltage Programming (*13)	0~100%, 0~5V or 0~10V, user select. Accuracy and linearity:±1% of rated Iout.
3.Vout Resistor Programming	0~100%, 0~5/10Kohm full scale,user select.,Accuracy and linearity: ±1% of rated Vout.
4.Iout Resistor Programming (*13)	0~100%, 0~5/10Kohm full scale,user select. Accuracy and linearity:±1.5% of rated Iout.
5.On/Off control (rear panel)	By electrical. Voltage: 0~0.6V/2~15V,or dry contact ,user selectable logic.
6.Output Current monitor (*13)	0~5V or 0~10V , Accuracy:±1% , user selectable.
7.Output Voltage monitor	0~5V or 0~10V ,Accuracy:±1% ,user selectable.
8.Power Supply OK signal	TTL high (4~5V) -OK, 0V-Fail 500ohm series resistance.
9. CV/CC Indicator	CV: TTL high (4~5V) source: 10mA, CC: TTL low (0~0.6V), sink current: 10mA.
10. Enable/Disable	Dry contact. Open:off , Short: on. Max. voltage at Enable/Disable in: 6V.
11. Local/Remote analog control	By electrical signal or Open/Short: 0~0.6V or short: Remote, 4~5V or open: Local.
12. Local/Remote analog control Indicator	Open collector, Local: Off, Remote: On. Maximum voltage: 30V, maximum sink current: 10mA.

1.5 FRONT PANEL

1.Control functions	Vout/ Iout manual adjust by separate encoders (coarse and fine adjustment selectable).
	OVP/UVL manual adjust by Volt. Adjust encoder.
	On/Off, Output on/off, Re-start modes (auto, safe), Foldback control (CV to CC), Go to local control.
	Address selection by Voltage (or current) adjust encoder. Number of addresses:31.
	Re-start modes (automatic restart, safe mode).
	Baud rate selection: 1200,2400,4800,9600 and 19,200.
2.Display	Voltage: 4 digits , Accuracy: 0.5% of rated output Voltage ±1 count.
	Current: 4 digits, Accuracy: 0.5% of rated output current ±1 count.
3.Indications	Voltage, Current, Alarm, Fine, Preview, Foldback, Local, Output On, Front Panel Lock, CVCC.

1.6 Interface RS232&RS485 or Optional GPIB Interface

Model	V	8	10	15	20	30	40	60	80	100	150	300	600
1. Remote Voltage Programming (16 bit)													
Resolution (0.012% of Vo Rated)	mV	0.96	1.2	1.8	2.40	3.60	4.80	7.2	9.6	12	18	36	72
Accuracy (0.05%Vo Rated+0.05% of Vo Actual Output)	mV	8	10	15	20	30	40	60	80	100	150	300	600
2. Remote Current Programming (16 bit)													
Resolution (0.012% of Io Rated)	mA	48	39.6	26.4	19.8	13.2	10.2	6.6	5.0	4.0	2.6	1.3	0.7
Accuracy (0.2% of Io Rated+0.1% of Io Actual Output) (*13)	mA	1200	990	660	495	330	255	165	126	99	66	33	16.5
3. Readback Voltage													
Resolution (0.012% of Vo Rated)	mV	0.96	1.2	1.8	2.40	3.60	4.80	7.2	9.6	12	18	36	72
Accuracy (0.1%Vo Rated+0.1% of Vo Actual Output)	mV	16	20	30	40	60	80	120	160	200	300	600	1200
4. Readback Current													
Resolution (0.012% of Io Rated)	mA	48	39.6	26.4	19.8	13.2	10.2	6.6	5.0	4.0	2.6	1.3	0.7
Accuracy (0.3% of Io Rated+0.1% of Io Actual Output) (*13)	mA	1600	1320	880	660	440	340	220	168	132	88	44	22
5. OVP/UVL Programming													
Resolution (0.1% of Vo Rated)	mV	8	10	15	20	30	40	60	80	100	150	300	600
Accuracy (1% of Vo Rated)	mV	80	100	150	200	300	400	600	800	1000	1500	3000	6000

*1: Minimum voltage is guaranteed to maximum 0.2% of rated output voltage.
*2: Minimum current is guaranteed to maximum 0.4% of rated output current.
*3: For cases where conformance to various safety standards (UL, IEC, etc..) is required, to be described as 190-240Vac (50/60Hz) for single phase and 3-Phase 208V models, and 380~415Vac (50/60Hz) for 3-Phase 400V models.
*4: Single-Phase and 3-Phase 208V models: At 208Vac input voltage, 3-Phase 400V: At 380Vac input voltage. With rated output power.
*5: Not including EMI filter inrush current, less than 0.2mSec.
*6: Single-Phase and 3-Phase 208V models: 170~265Vac, constant load. 3-Phase 400V models: 342~460Vac, constant load.
*7: From No-Load to Full-Load, constant input voltage. Maximum drop in Remote Sense.
*8: For 8V~300V models: Measured with JEITA RC-9131A (1:1) probe. For 600V model: Measured with 10:1 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 8V~15V models the ripple is measured from 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 does not include the warm-up and Load regulation thermal drift.

General Specifications Genesys™ 3.3kW

2.1 INPUT CHARACTERISTICS		GEN	8-400	10-330	15-220	20-165	30-110	40-85	60-55	80-42	100-33	150-22	300-11	600-5.5
1. Input voltage/freq. (*3)		VAC	Single Phase,230V models: 170~265Vac, 47~63Hz											
			3-Phase, 208V models: 170~265Vac, 47~63Hz											
			3-Phase, 400V models: 342~460Vac, 47~460Hz											
2. Maximum Input current at 100% load	Single Phase,230V models:	A	24	24	24	23	24	23	23	23.5	23	23	23	23
	3-Phase, 208V models:		14.5	14.5	14.5	14.5	14	14.5	13.6	14	13.7	13.7	13.8	13.9
	3-Phase, 400V models:		7.2	7.2	7.2	7.2	7	7.2	6.8	7	6.8	6.8	6.9	7
3. Power Factor (Typ)			Single Phase models: 0.99@230Vac, rated output power. 3-Phase models: 0.94@208/380Vac, rated output power.											
4. Efficiency (*4)		%	82	84	84	86	86	88	88	88	88	88	88	87
5. Inrush Current (*5)		A	Single-Phase and 3-Phase 208V models: Less than 50A											
			3-Phase 400V models: Less than 20A											
6. Hold-up time (Typ)		mS	10mSec for Single-Phase and 3-phase 208V models, 6mSec for 3-Phase 400V models. Rated output power.											

2.2 POWER SUPPLY CONFIGURATION

1. Parallel Operation	Up to 4 identical units in master/slave mode with parallel current summing (Advanced Parallel)
2. Series Operation	Up to 2 identical units. with external diodes. 600V Max to Chassis ground

2.3 ENVIRONMENTAL CONDITIONS

1. Operating temp	0~50 °C, 100% load.
2. Storage temp	-30~85°C
3. Operating humidity	20~90% RH (non-condensing).
4. Storage humidity	10~95% RH (non-condensing).
5. Vibration	MIL-810F, method 514.5 , The EUT is fixed to the vibrating surface.
6. Shock	Less than 20G , half sine , 11mSec. Unit is unpacked.
7. Altitude	Operating: 10000ft (3000m), Derate output current by 2%/100m above 2000m, Alternatively, derate maximum ambient temp. by 1ºC/100m above 2000m. Non operating: 40000ft (12000m).
8. RoHS Compliance	Complies with the requirements of RoHS directive.

2.4 EMC

1.Applicable Standards:	
2.ESD	IEC1000-4-2. Air-disch.-8KV, contact disch.-4KV
3.Fast transients	IEC1000-4-4. 2KV
4.Surge immunity	IEC1000-4-5. 1KV line to line, 2KV line to ground
5.Conducted immunity	IEC1000-4-6, 3V
6.Radiated immunity	IEC1000-4-3, 3V/m
7.Magnetic field immunity	EN61000-4-8, 1A/m
8.Voltage dips	EN61000-4-11
9.Conducted emission	EN55022A, FCC part 15-A, VCCI-A.
10. Radiated emission	EN55022A, FCC part 15-A, VCCI-A.

2.5 SAFETY

1.Applicable standards:	**CE Mark, UL60950,EN60950 listed**. Vout<40V:Output is SELV , IEEE/Isolated analog are SELV.
	40<Vout<400V: Output is hazardous, IEEE/Isolated analog are SELV.
	400<Vout<600V:Output is hazardous, IEEE/Isolated analog are not SELV.
2.Withstand voltage	Vout 40V models :Input-Outputs (SELV): 4242VDC 1min, Input-Ground: 2828VDC 1min.
	40<Vout<100V models: Input-Haz. Output: 2600VDC 1min, Input-SELV: 4242VDC 1min.
	Hazardous Output.-SELV: 1900VDC 1min, Hazardous Output-Ground:1200VDC 1min. Input-Ground: 2828VDC 1min.
	100<Vout<600V models: Input-Haz. Output: 4000VDC 1min, Input-SELV: 4242VDC 1min.
	Hazardous Output.-SELV: 3550VDC 1min. Hazardous Output-Ground:2670VDC 1min. Input-Ground: 2828VDC 1min.
3.Insulation resistance	More than 100Mohm at 25ºC , 70% RH.

2.6 MECHANICAL CONSTRUCTION

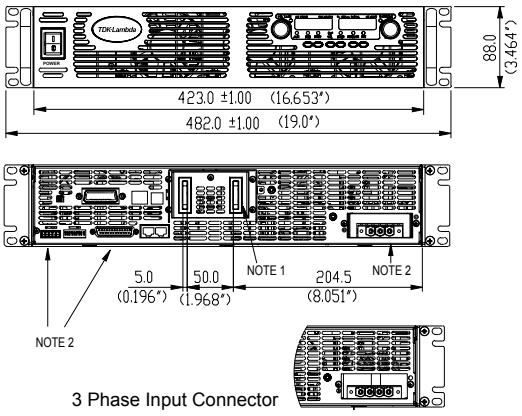
1. Cooling	Forced air flow: from front to rear. No ventilation holes at the top or bottom of the chassis; Variable fan speed.
2. Dimensions (WxHxD)	W: 16.65in, H: 3.46in, D: 17.42in (excluding connectors, encoders, handles, etc.)
3. Weight	13 kg.
4. AC Input connector (with Protective Cover)	Single Phase,230V models, Power Combicon PC 6-16/3-GF-10,16 series, with Strain relief.
	3-Phase, 208V & 400V models, Power Combicon PC 6-16/4-GF-10,16 series, with Strain relief.
5.Output connectors	8V to 100V models: Bus-bars (hole Ø 10.5mm). 150V to 600V models: wire clamp connector, Phoenix P/N: FRONT-4-H-7.62

2.7 RELIABILITY SPECS

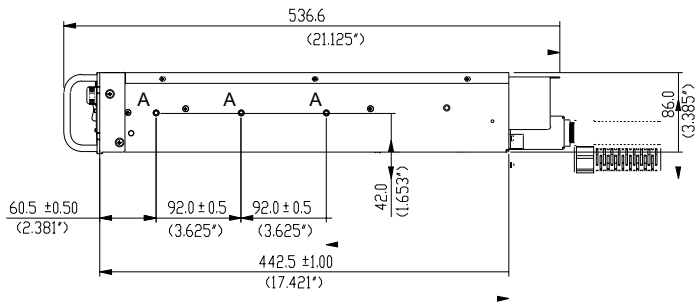
1. Warranty	5 years.

All specifications subject to change without notice.

Outline Drawing Genesys™ 3.3kW Units



3 Phase Input Connector



NOTE

1. Bus bars for 8V to 100V models (shown)
   Wire clamp connector for 150V to 600V models
2. Plug connectors included with the power supply
3. Chassis slides mounting holes #10-32 marked "A"
   GENERAL DEVICES P/N: C-300-S-116 or equivalent

Genesys™ Power Parallel and Series Configurations

Parallel operation - Master/Slave:

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

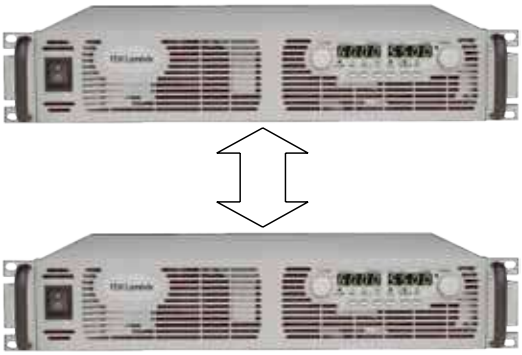
In Advanced Parallel Master/Slave Mode, total current is programmed and reported by the Master. Up to four supplies act as one.

Series operation

Up to two units may be connected in series to increase the output voltage or to provide bipolar output. (Max 600V to Chassis Ground).

Remote Programming via RS-232 & RS-485 Interface

Standard Serial Interface allows daisy-chain control of up to 31 power supplies on the same communication bus with built-in RS-232 & RS-485 Interface with or without Multi-Drop option.



Programming Options (Factory installed)

New IEEE Multi-Drop Interface

P/N: IEMD

- Allows IEEE Master to control up to 30 (Multi-Drop equipped) slaves over RS-485 daisy-chain
- Only the Master needs be equipped with IEEE Interface
- IEEE 488.2 SCPI Compliant
- Program Voltage
- Measure Voltage
- Over Voltage setting and shutdown
- Error and Status Messages
- Program Current
- Measure Current
- Current Foldback shutdown

New Multi-Drop Slave Option

P/N: MD

- Slaves need to be equipped with the MD Slave (RS-485) option

Isolated Analog Programming

- Four Channels to Program and Monitor Voltage and Current.
- Isolation allows operation with floating references in harsh electrical environments.
- Choose between programming with Voltage or Current.
- Connection via removable terminal block: Phoenix MC1,5/8-ST-3.81.

P/N: IS510

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

P/N: IS420

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

LAN Interface

LXI Compliant to Class C

P/N: LAN

- Meets all LXI-C Requirements
- Address Viewable on Front Panel
- Fixed and Dynamic Addressing
- Fast Startup
- VISA & SCPI Compatible
- LAN Fault Indicators
- Auto-detects LAN Cross-over Cable
- Compatible with most standard Networks

USB Interface

P/N: USB

- Allows Serial Connection to USB Port on computer
- Serial commands same as (standard) RS-232/RS-485 Interface

Power Supply Identification / Accessories

How to order

GEN **8** - **400** - _____ - _____

Factory Options

AC Input options

Series Name	Output Voltage (0~8V)	Output Current (0~400A)	Option: :	
			IEMD	1P230 (Single Phase 230VAC)
			MD	3P208 (Three Phase 208VAC)
			IS510	3P400 (Three Phase 400VAC)
			IS420	
			LAN	
			USB	

Models 3.3kW

Model	Output Voltage VDC	Output Current (A)	Output Power (W)
GEN 8-400	0~8V	0~400	3200
GEN 10-330	0~10V	0~330	3300
GEN 15-220	0~15V	0~220	3300
GEN 20-165	0~20V	0~165	3300
GEN 30-110	0~30V	0~110	3300
GEN 40-85	0~40V	0~85	3400

Model	Output Voltage VDC	Output Current (A)	Output Power (W)
GEN 60-55	0~60V	0~55	3300
GEN 80-42	0~80V	0~42	3360
GEN 100-33	0~100V	0~33	3300
GEN 150-22	0~150V	0~22	3300
GEN 300-11	0~300V	0~11	3300
GEN 600-5.5	0~600V	0~5.5	3300

Factory options	P/N
RS-232/RS-485 Interface built-in Standard	-
GPIB (Multi-Drop Master) Interface	IEMD
Multi-Drop Slave Interface	MD
Voltage Programming Isolated Analog Interface	IS510
Current Programming Isolated Analog Interface	IS420
LAN Interface	LAN
USB Interface	USB

Accessories

1. Serial Communication cable

RS-232/RS-485 cable is used to connect the power supply to the Host PC.

Mode	RS-485	RS-232	RS-232
PC Connector Communication Cable Power Supply Connector	DB-9F Shield Ground L=2m EIA/TIA-568A (RJ-45)	DB-9F Shield Ground L=2m EIA/TIA-568A (RJ-45)	DB-25F Shield Ground L=2m EIA/TIA-568A (RJ-45)
P/N	GEN/485-9	GEN/232-9	GEN/232-25

2. Serial link cable*

Daisy-chain up to 31 Genesys™ power supplies.

Mode	Power Supply Connector	Communication Cable	P/N
RS-485	EIA/TIA-568A (RJ-45)	Shield Ground L=50cm	GEN/RJ45

* Included with power supply

Also Available Genesys™
1U Half Rack 750W
1U 750W/1500W
2U 5kW
3U 10/15kW

TDK·Lambda GLOBAL NETWORK

USA
TDK-Lambda Americas Inc.
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