

Programmable DC Power Supplies 5kW in 2U Built in RS-232 & RS-485 Interface Advanced Parallel Operation

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





# TDK·Lambda

The Genesys<sup>™</sup> family of programmable power supplies sets a new standard for flexible, reliable, AC/DC power systems in OEM, Industrial and Laboratory applications.

## Features include:

- High Power Density 5kW in 2U
- Wide Range of popular worldwide AC inputs, 3ø (208VAC, 400VAC)
- Active Power Factor Correction (Three-Phase AC Input)
- Output Voltage up to 600V, Current up to 600A
- 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
- Constant Voltage/Constant Current auto-crossover
- Parallel Operation with Active Current Sharing; up to four identical units.
- Advanced Parallel Master / Slave. Total Current is Programmed and Measured via the Master.
- Independent Remote ON/OFF and Remote Enable/Disable
- 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

**LX** Compliant LAN

- LabView<sup>®</sup> and LabWindows<sup>®</sup> drivers
- Five Year Warranty

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



## **Applications**

Genesys<sup>™</sup> power supplies have been designed to meet the demands of a wide variety of applications. Test & Measurement systems, Component Device Testing.

Semiconductor Processing & Burn-In, Aerospace & Satellite Testing, Medical Imaging, Green Technology. 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.

**Test Systems** using the IEEE-488 bus may achieve significant cost savings by incorporating the Optional IEEE Multi-Drop Interface for a Master and up to 30 RS-485 Multi-Drop Slaves.

**Higher power systems** can be configured with up to four 5kW modules. Each module is 2U with zero space between them (zero stack).

Flexible configuration is provided by the complete Genesys<sup>™</sup> Family: 1U 750W Half-Rack,

1U 750W, 1500W and 2400W Full-Rack. All are identical in Front Panel, Rear Panel Analog, and all Digital Interface Commands.

**OEM Designers** have a wide variety of Inputs and Outputs from which to select depending on application and location.

## **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
- 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<sup>™</sup> 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.
- 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 Interface Position for IEEE 488.2 SCPI (shown) or Isolated Analog Interface or LAN Interface.

## **Genesys** <sup>™</sup> 5kW Specifications

1.0 MODEL MODEL		0 600	10 500	16 210	20.250	20 170	40 125	60.95	90 GE	100 50	150.24	200.25	200 17	400.12	500-10	600.0
MODEL 1.Rated output voltage(*1)	GEN V	8-600	10-500 10	16-310	20-250	30-170	40-125	60-85	80-65	100-50	150-34	200-25	300-17	<u>400-13</u> 400	500-10	600-8
2.Rated Output Current(*2)	Â	600	500	310	250	170	125	85	65	50	34	25	17	13	10	8.5
B.Rated Output Power	W	4800	5000	4960	5000	5100	5000	5100	5200	5000	5100	5000	5100	5200	5000	5100
.1 CONSTANT VOLTAGE MODE					-	_		-	-	- 10	45	20	20		50	60
.Max.line regulation (0.01% of rated Vo)(*6) .Max load regulation (0.015% of rated Vo+5mV)(*7)		0.8	1.0	1.6	2	3	4	6	8	10	15	20	30	40	50	60
.Ripple and noise p-p 20MHz (*8)	mV mV	6.2 75	6.5 75	7.4 75	<u>8</u> 75	9.5 75	11 75	14 75	17.7 100	<u>20</u> 100	27.5 120	35 220	50 300	<u>65</u> 350	80 400	95 500
Ripple r.m.s 5Hz~1MHz	mV	10	10	10	10	10	10	10	15	100	25	45	60	80	100	120
.Remote sense compensation/wire	V	2	2	2	2	5	5	5	5	5	5	5	5	5	5	5
.Temp. coefficient			//°C of r								5	5				
Temp. stability			of rated \										oad & te	emp.		
.Warm-up drift		Less the	an 0.05%			t voltag	je+2mV	over 30	minute			er On.				
.Up-prog. response time, 0~Vo Rated (*9)	mS			3	0					5				65	80	100
0.Down-prog Full-load (*9)	mS	15 400	500	50 600	700	800	80	1000	1100	1200	100	2000	2500	<u>135</u> 3000	170 3000	200
esponse time No-load (*10)	mS													tput curre		
1.Transient response time	mS													ove 100V	int. Outpu	it set-
.2 CONSTANT CURRENT MODE		ipoint. It	2 100 /0, 1	<u>Jean Jenn</u>				Jucis up		cluding	1000.2111	Sec IOI II	ioucis up	010 1001		
Max.line regulation (0.05% of rated Io)(*6)	mA	300	250	155	125	85	62.5	42.5	32.5	25	17	12.5	8.5	6.5	5	4.25
.Max.load regulation (0.1% of rated Io)(*11)	mA	600	500	310	250	170	125	85	65	50	34	25	17	13	10	8.5
.Ripple r.m.s 5Hz~1MHz . (*12)	mA			1400		460	300	150	120	100	90	60	30	25	20	15
Load regulation thermal drift			an 0.1%									2.				
.Temp. coefficient	PPM/°C		N/°C fror													
.Temp. stability	<u> </u>		of rated I / models											<u>mperatu</u>	re.	
.Warm-up drift			00V models													
.3 PROTECTIVE FUNCTIONS	L	1200.000		CI3. LES	s charl <u>T</u>	J.Z.J /0 U	nateu (	Julpul	.anent(	2001 201	mutes	ionowi	ig powe			
.OCP		0~105%	6 Consta	nt Curr	ent											
. OCP Foldback			shut do			r supply	<u>/ chang</u>	e from C	V to CC	. <u>Use</u> r se	lectable	2				
. OVP type														n port coi		
. OVP trip point														5~440V	5~550V	5~660
Output Under Voltage Limit			by front					Prevent	s from a	djusting	g Vout b	elow lin	nit.			
Over Temp. Protection	AONUTO		lectable	, latche	d or nor	n-latche	d.									
.4 ANALOG PROGRAMMING AND M				10						) F0/ -f.						
.Vout Voltage Programming .lout Voltage Programming (*13)			<u>%, 0~5V (</u> %, 0~5V (													
.Vout Resistor Programming			%, 0~ <u>57 (</u> %, 0~5/1													
Lout Resistor Programming (*13)			%, 0~5/10													
.On/Off control (rear panel)			trical. Vo									1100100				
5.Output Current monitor (*13)			r 0~10V								J					
Output Voltage monitor			r 0~10V													
B.Power Supply OK signal			h (4~5V													
9. CV/CC Indicator			ollector,									n sink c	urrent: 1	0mA		
0. Enable/Disable			ntact. Op													
1. Local/Remote analog control			trical sig													
2. Local/Remote analog control Indi	cator	Open c	ollector,	Local: C	Jff, Rem	ote: On	. Maxim	um volt	age: 30	/, maxin	num sin	k curren	t: 10mA.			
.5 FRONT PANEL		Vout/L		ualadii	ct by co	noroto d	ncodor		1.0	o o diuc	tmonto	alactab	(a)			
				ual auju							tments	electab				
		() () () () () () () () () () () () () (	DVP/UVL manual adjust by Volt. Adjust encoder. Dn/Off, Output on/off, Re-start modes (auto, safe), Foldback control (CV to CC), Go to local control.										c/.			
Control functions							t encode	er.	e and fir		<sup>CV</sup> to CC	) Go to		ntrol		
.Control functions		On/Off,	, Output	on/off,	Re-start	modes	t encode (auto, s	er. afe), Fol	dback c	ontrol (				ntrol.		
.Control functions		On/Off, Addres		on/off, on by Ve	Re-start oltage (d	modes	t encode (auto, s nt) adju	er. afe), Fol st encoc	dback c	ontrol (				ntrol.		
.Control functions		On/Off, Addres Re-star Baud ra	, Output s selecti t modes ate selec	on/off, on by Vo (autom tion: 120	Re-start oltage (d atic rest 00,2400	modes or curren art, safe ,4800,96	t encode (auto, s nt) adjus e mode) 600 and	er. afe), Fol st encoc 19,200.	dback c der. Nun	ontrol ( ontrol a				ntrol.		
		On/Off, Addres Re-star Baud ra Voltage	, Output s selecti t modes ate selec e: 4 digit	on/off, on by Vo (autom tion: 120 s , Accur	Re-start oltage (o atic rest 00,2400 racy: 0.5	modes or curren art, safe ,4800,96 % of rat	t encode (auto, s nt) adjus e mode) 600 and ced outp	er. afe), Fol st encoc 19,200. out Volta	dback c der. Nun age ±1 c	ontrol ( ontrol ( ontrol a				ntrol.		
.Display		On/Off, Address Re-star Baud ra Voltage Current	, Output s selecti t modes ate selec e: 4 digit t: 4 digit	on/off, on by Vo (autom tion: 120 s, Accur s, Accur	Re-start oltage (c atic rest 00,2400 racy: 0.5 acy: 0.5	modes or curren art, safe ,4800,96 % of rat % of rat	t encode (auto, s nt) adjus e mode) 600 and ed outp ed outp	er. afe), Fol st encoc 19,200. out Volta ut curre	dback c der. Nun age ±1 c nt ±1 cc	ontrol ( hber of a ount. ount.	addresse	25:31.	local co	ntrol.		
.Display .Indications		On/Off, Address Re-star Baud ra Voltage Current Voltage	, Output s selection t modes ate selec e: 4 digit t: 4 digit e, Curren	on/off, on by Vo (autom tion: 120 s, Accur s, Accur nt, Alarm	Re-start oltage (d atic rest 00,2400 racy: 0.5 acy: 0.5 n, Fine, P	modes or curren art, safe ,4800,96 % of rate % of rate review,	t encode (auto, s nt) adju: e mode) 600 and ed outp Foldbad	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca	dback c der. Nun age ±1 c nt ±1 cc I, Outpu	ontrol ( hber of a ount. ount. it On, Fr	ont Pan	el Lock,	local co CVCC.	ntrol.		
Display Indications	the GE	On/Off, Address Re-star Baud ra Voltage Current Voltage NESYS	, Output s selection t modes ate selection e: 4 digit t: 4 digit e, Curren <b>Series</b>	on/off, on by Vo (autom tion: 120 s, Accur s, Accur nt, Alarm with R	Re-start oltage (d atic rest 00,2400 racy: 0.5 acy: 0.5 h, Fine, P <b>S-232/</b>	modes or curren cart, safe ,4800,96 % of rate % of rate review, <b>RS-485</b>	t encode (auto, s nt) adjus e mode) 600 and ed outp Foldbac <b>or Op</b>	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca tional	dback c der. Nun age ±1 c nt ±1 cc I, Outpu GPIB/I	ontrol ( nber of a ount. ount. it On, Fr <b>_AN Int</b>	ont Pan	el Lock, Install	local co CVCC. ed			
2. Control functions 2. Display 3. Indications 1. 6 Interface Specifications for 1. Remote Voltage Programming (16 bit)	the GE	On/Off, Address Re-star Baud ra Voltage Current Voltage NESYS	, Output s selection t modes ate selection e: 4 digit t: 4 digit e, Curren <b>Series</b>	on/off, on by Vo (autom tion: 120 s, Accur s, Accur nt, Alarm with R	Re-start oltage (d atic rest 00,2400 racy: 0.5 acy: 0.5 h, Fine, P <b>S-232/</b>	modes or curren cart, safe ,4800,96 % of rate % of rate review, <b>RS-485</b>	t encode (auto, s nt) adjus e mode) 600 and ed outp Foldbac <b>or Op</b>	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca tional	dback c der. Nun age ±1 c nt ±1 cc I, Outpu GPIB/I	ontrol ( nber of a ount. ount. it On, Fr <b>_AN Int</b>	ont Pan	el Lock, Install	local co CVCC. ed		500	600
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Display Indications .6 Interface Specifications for .Remote Voltage Programming (16 bit) esolution (0.012% of Vo Rated) .ccuracy (0.1% of Vo Rated) .Remote Current Programming (16 bit) esolution (0.012% of Io Rated) .curacy (0.3% of Io Rated+0.1% of Io Actual Output) (*13)	the GE V mV mV mA	On/Off, Addres Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8	, Output s selecti t modes ate selec e: 4 digit t: 4 digit e, Curren <b>Series</b> 10 1.2 10	on/off, on by Vo (autom tion: 120 s, Accur s, Accur s, Accur t, Alarm <b>with R</b> 16 1.92 16 37.2	Re-start oltage (c atic rest 00,2400 racy: 0.5 acy: 0.5 b, Fine, P <b>S-232/I</b> 20 2.40 20 30	modes or current art, safe (4800,90 % of rate (review, <b>30</b> 3.60 30 20.4	t encode (auto, s nt) adju: e mode) 600 and eed outp Foldbac 60 <b>Or Op</b> 40 4.80 40	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca tional 60 7.2 60 7.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8	ontrol (( hber of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0	ont Pan- cerface 150 18 150 4.08	el Lock, Install 200 24 200 3.0	local co           CVCC.           ed           300           36           300           2.04	400 48 400 1.56	60 500 1.2	72 600
.Display .Indications .6 Interface Specifications for .Remote Voltage Programming (16 bit) esolution (0.012% of Vo Rated) .ccuracy (0.1% of Vo Rated) .Remote Current Programming (16 bit) esolution (0.012% of Io Rated) .ccuracy (0.3% of Io Rated+0.1% of Io Actual Output) (*13) .Readback Voltage	the GE V mV mV mA mA	On/Off, Addres, Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400	, Output s selecti t modes atte selecc e: 4 digit t: 4 digit e, Curren <b>Series</b> 10 1.2 10 60 2000	on/off, on by Vi (autom tion: 120 s , Accur s , Accur t, Alarm <b>with R</b> 16 1.92 16 37.2 1240	Re-start oltage (c atic rest 00,2400 racy: 0.5 acy: 0.55 a, Fine, P <b>S-232/I</b> 20 2.40 20 30 1000	modes or curree art, safe (4800,90 % of rat % of rat % of rat review, <b>{S-485</b> 30 3.60 30 20.4 680	t encoda (auto, s nt) adju: e mode) 600 and eed outp Foldbaa 6 <b>Or Op</b> 40 4.80 40 15 500	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca tional 60 7.2 60 10.2 340	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8 260	ontrol ( ber of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0 200	ont Pan erface 150 18 150 4.08 136	el Lock, Install 200 24 200 3.0 100	local co           CVCC.           ed           300           36           300           36           300           4           68	400 48 400 1.56 52	60 500 1.2 40	72 600 1.02 34
.Display .Indications .6 Interface Specifications for .Remote Voltage Programming (16 bit) tesolution (0.012% of Vo Rated) .ccuracy (0.1% of Vo Rated) .Remote Current Programming (16 bit) tesolution (0.012% of Io Rated) .Readback Voltage tesolution (0.012% of Vo Rated)	the GE V mV mV mA	On/Off, Addres Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8	, Output s selecti t modes ate selec e: 4 digit t: 4 digit e, Curren <b>Series</b> 10 1.2 10	on/off, on by Vo (autom tion: 120 s, Accur s, Accur s, Accur t, Alarm <b>with R</b> 16 1.92 16 37.2	Re-start oltage (c atic rest 00,2400 racy: 0.5 acy: 0.5 b, Fine, P <b>S-232/I</b> 20 2.40 20 30	modes or current art, safe (4800,90 % of rate (review, <b>30</b> 3.60 30 20.4	t encode (auto, s nt) adju: e mode) 600 and eed outp Foldbac 60 <b>Or Op</b> 40 4.80 40	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca tional 60 7.2 60 7.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8	ontrol (( hber of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0	ont Pan- cerface 150 18 150 4.08	el Lock, Install 200 24 200 3.0	local co           CVCC.           ed           300           36           300           2.04	400 48 400 1.56	60 500 1.2	72 600 1.02 34 72
2.Display 3.Indications 3.GInterface Specifications for 3.Remote Voltage Programming (16 bit) 4.esolution (0.012% of Vo Rated) 4.ccuracy (0.1% of Vo Rated) 5.Remote Current Programming (16 bit) 4.esolution (0.012% of Io Rated) 5.Readback Voltage 4.esolution (0.012% of Vo Rated)	the GE V mV mV mA mA mA mA	On/Off, Addres Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400	Output           s selecti           t modes           ate selec           : 4 digit           : 4 digit           : 60           10           1.2           10           2000	ion/off, on by Ve (autom tion: 12r s, Accur s, Accur s, Accur t, Alarm <b>with R</b> 16 1.92 16 37.2 1240	Re-start oltage (c atic rest 00,2400 0,2400 acy: 0.5° b, Fine, P <b>S-232/I</b> 20 2.40 20 30 1000	modes pr curre (4800,90 (% of rate (% of rate (review, ( <b>S-485</b> ) 30 3.60 30 20.4 680 3.60	t encoda (auto, s nt) adju: emode) 600 and ed outp Foldbac <b>600 and</b> 40 4.80 40 4.80 40 4.80 4.80	er. afe), Fol st encoor in 19,200, out Volta ut curre ck, Loca tional 60 7.2 60 10.2 340 7.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8 260 9.6	ontrol ( ber of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0 200 12	2000 Cont Pan- cerface 150 150 4.08 136 136	el Lock, Install 200 24 200 3.0 100 36	local co           CVCC.           ed           300           36           300           2.04           68           36	400 48 400 1.56 52 48	60 500 1.2 40 60	72 600 1.02 34 72
.Display .Indications .6 Interface Specifications for .Remote Voltage Programming (16 bit) tesolution (0.012% of Vo Rated) .ccuracy (0.1% of Vo Rated) .Remote Current Programming (16 bit) tesolution (0.012% of Io Rated) .ccuracy (0.3% of Io Rated+0.1% of Io Actual Output) (*13) . Readback Voltage tesolution (0.012% of Vo Rated) .ccuracy (0.15% Vo Rated)	the GE V mV mV mA mA mA mA	On/Off, Addres Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400	Output           s selecti           t modes           ate selec           : 4 digit           : 4 digit           : 60           10           1.2           10           2000	ion/off, on by Ve (autom tion: 12r s, Accur s, Accur s, Accur t, Alarm <b>with R</b> 16 1.92 16 37.2 1240	Re-start oltage (c atic rest 00,2400 0,2400 acy: 0.5° b, Fine, P <b>S-232/I</b> 20 2.40 20 30 1000	modes pr curre (4800,90 (% of rate (% of rate (review, ( <b>S-485</b> ) 30 3.60 30 20.4 680 3.60	t encoda (auto, s nt) adju: emode) 600 and ed outp Foldbac <b>600 and</b> 40 4.80 40 4.80 40 4.80 4.80	er. afe), Fol st encoor in 19,200, out Volta ut curre ck, Loca tional 60 7.2 60 10.2 340 7.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8 260 9.6	ontrol ( ber of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0 200 12	2000 Cont Pan- cerface 150 150 4.08 136 136	el Lock, Install 200 24 200 3.0 100 36	local co           CVCC.           ed           300           36           300           2.04           68           36	400 48 400 1.56 52 48	60 500 1.2 40 60	72 600 1.02 34 72
.Display .Indications .6 Interface Specifications for .Remote Voltage Programming (16 bit) tesolution (0.012% of Vo Rated) .ccuracy (0.1% of Vo Rated) .Remote Current Programming (16 bit) tesolution (0.012% of Io Rated) .ccuracy (0.3% of Io Rated+0.1% of Io Actual Output) (*13) . Readback Voltage tesolution (0.012% of Vo Rated) .ccuracy (0.15%Vo Rated) .ccuracy (0.15%Vo Rated) .Readback Current	the GE V mV mV mA mA mA mA	On/Off, Addres Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400	Output           s selecti           t modes           ate selec           : 4 digit           : 4 digit           : 60           10           1.2           10           2000	ion/off, on by Ve (autom tion: 12r s, Accur s, Accur s, Accur t, Alarm <b>with R</b> 16 1.92 16 37.2 1240	Re-start oltage (c atic rest 00,2400 0,2400 acy: 0.5° b, Fine, P <b>S-232/I</b> 20 2.40 20 30 1000	modes pr curre (4800,90 (% of rate (% of rate (review, ( <b>S-485</b> ) 30 3.60 30 20.4 680 3.60	t encoda (auto, s nt) adju: emode) 600 and ed outp Foldbac <b>600 and</b> 40 4.80 40 4.80 40 4.80 4.80	er. afe), Fol st encoor in 19,200, out Volta ut curre ck, Loca tional 60 7.2 60 10.2 340 7.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8 260 9.6	ontrol ( ber of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0 200 12	2000 Cont Pan- cerface 150 150 4.08 136 136	el Lock, Install 200 24 200 3.0 100 36	local co           CVCC.           ed           300           36           300           2.04           68           36	400 48 400 1.56 52 48	60 500 1.2 40 60	72 600 1.02 34 72 1200
2.Display 3.Indications	the GE V mV mV mA mA mA mV mV	On/Off, Addres, Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 0.96 8 72 2400 0.96 12	, Output s selectii t modes ate selecc e: 4 digit t: 4 digit e, Curren <b>Series</b> 10 1.2 10 60 2000 1.2 15	:on/off, on by V. (autom tion: 12' s, Accur t, Alarm <b>with R</b> : 16 1.92 16 37.2 1240 1.92 24	Re-start oltage (c latic rest 00,2400 racy: 0.5 acy: 0.5 b, Fine, P S-232/I 20 2.40 20 30 1000 2.40 30	modes pr currei (4800,94) (% of rate (review, ( <b>85-485</b> ) 30 3.60 30 20.4 680 3.60 45	t encode (auto, s (auto, s (auto, s mode) 600 and eed outp Foldbac <b>500</b> 40 4.80 40 4.80 4.80 4.80 4.80	er. afe), Fol st encoc 19,200. out Volta ut curre ck, Loca tional 60 7.2 60 10.2 340 7.2 90	dback c der. Nun age ±1 c nt ±1 cc <b>GPIB/I</b> 80 9.6 80 7.8 260 9.6 120	ontrol ( hber of a ount. it On, Fr <b>AN Int</b> 100 12 100 6.0 200 12 150	2000 Pan 2000 Pan 200	el Lock, Install 200 24 200 3.0 100 36 450	local co           cVCC.           ed           300           36           300           2.04           68           36           36           300	400 48 400 1.56 52 48 800	60 500 1.2 40 60 1000	72 600 1.02 34 72 1200
2. Display 3. Indications 3. <b>6 Interface Specifications for</b> 3. Remote Voltage Programming (16 bit) 4. Remote Voltage Programming (16 bit) 4. Remote Current Programming (16 bit) 4. Remote Current Programming (16 bit) 4. Remote Current Programming (16 bit) 4. Readback Voltage 4. Readback Voltage 4. Readback Current 4. Readback (*13) 4. Remote (*13) 4. R	the GE V mV mV mV mA mA mA mA	On/Off, Addres, Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400 2400 12	, Output s selecti s selecti s selecti : 4 digit : 10 : 1	ion/off, on by Vi (autom tion: 120 s, Accur s, Accur t, Alarm with R: 16 1.92 16 37.2 1240 1.92 24 37.2	Re-start oltage (c oltage (c acy: 0.5 acy: 0.5 acy: 0.5 acy: 0.5 20 2.40 20 2.40 20 30 1000 2.40 30 30 30	modes or curree aart, safe % of rat % of rate review, <b>RS-485</b> 30 3.60 30 20.4 680 3.60 45 20.4	t encode (auto, s (auto, s mode) 600 and eed outpe 600 and eed outpe 600 and 600 and 700 A 40 4.80 4.80 4.80 4.80 60	er. afe), Fol st encoor 19,200, put Volta ut currec ck, Loca tional 60 7.2 60 10.2 340 7.2 90 10.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8 260 9.6 120 7.8	ontrol ( her of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0 200 12 150 6.0	addresse ont Pan- cerface 150 18 150 4.08 136 18 225 4.08	El Lock, Install 200 24 200 3.0 100 36 450 3.0	local co           local co           cVCC.           ed           300           36           300           2.04           68           36           300           2.04           36           36           300	400 48 400 1.56 52 48 800 1.56	60 500 1.2 40 60 1000	72 600 1.02 34 72 1200
2. Display 3. Indications 1.6 Interface Specifications for 1.8 emote Voltage Programming (16 bit) Resolution (0.012% of Vo Rated) Accuracy (0.1% of Vo Rated) 2. Remote Current Programming (16 bit) Resolution (0.012% of Io Rated) 2. Readback Voltage Resolution (0.012% of Vo Rated) Accuracy (0.15%Vo Rated) 4. Readback Current Resolution (0.012% of Io Rated ) Accuracy (0.4% of Io Rated) (*13) 5. OVP/UVL Programming	the GE	On/Off, Addres, Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400 0.96 12 72 2400	, Output s selectii s selectii t modes att eselecc e: 4 digit t: 4 digit e, Curren <b>Series</b> 10 1.2 10 60 2000 1.2 15 60 2000	ion/off, on by Vi (autom tion: 12' s, Accur t, Alarm with R: 16 1.92 16 37.2 1240 1.92 24 37.2 1240	Re-start oltage (c latic rest o0,2400 racy: 0.5 acy: 0.5 b, Fine, P S-232/I 20 2.40 20 30 1000 2.40 30 1000	modes pr currei art, safe (4800,90 % of rate review, <b>R5-485</b> 30 3.60 3.60 3.60 45 20.4 680	t encode (auto, s nt) adju: encode) 600 and eed outp Foldbac <b>Or Op</b> 40 4.80 40 15 500 4.80 60	er. afe), Fol st encoor 19,200, out Volta ut curreck, Loca tional 60 7.2 60 10.2 340 7.2 90	dback c           der. Nun           age ±1 c           nt ±1 cc           l, Outpu           GPIB/I           80           9.6           120           7.8           260           7.8           260	ontrol (( aber of a ount. unt. it On, Fr. <b>AN Int</b> 100 12 100 6.0 200 12 150 6.0 200	addresse ont Pan- rerface 150 18 150 4.08 136 4.08 136	El Lock, Install 200 24 200 3.0 100 36 450 3.0 100	local co           cVCC.           ed           300           36           300           2.04           68           36           600           2.04           68	400 48 400 1.56 52 48 800 1.56 52	60 500 1.2 40 60 1000 1.2 40	72 600 1.02 34 72 1200 1.02 34
.Display .Indications .6 Interface Specifications for .Remote Voltage Programming (16 bit) esolution (0.012% of Vo Rated) .ccuracy (0.1% of Vo Rated) .ccuracy (0.1% of Vo Rated) .ccuracy (0.3% of Io Rated+0.1% of Io Actual Output) (*13) .Readback Voltage esolution (0.012% of Vo Rated) .ccuracy (0.15%Vo Rated) .ccuracy (0.15%Vo Rated) .Readback Current esolution (0.012% of Io Rated ) .ccuracy (0.4% of Io Rated ) (*13)	the GE V mV mV mV mA mA mA mA	On/Off, Addres, Re-star Baud ra Voltage Current Voltage NESYS 8 0.96 8 72 2400 2400 12	, Output s selecti s selecti s selecti : 4 digit : 10 : 1	ion/off, on by Vi (autom tion: 120 s, Accur s, Accur t, Alarm with R: 16 1.92 16 37.2 1240 1.92 24 37.2	Re-start oltage (c oltage (c acy: 0.5 acy: 0.5 acy: 0.5 acy: 0.5 20 2.40 20 2.40 20 30 1000 2.40 30 30 30	modes or curree aart, safe % of rat % of rate review, <b>RS-485</b> 30 3.60 30 20.4 680 3.60 45 20.4	t encode (auto, s (auto, s mode) 600 and eed outpe 600 and eed outpe 600 and 600 and 700 A 40 4.80 4.80 4.80 4.80 60	er. afe), Fol st encoor 19,200, put Volta ut curre ck, Loca tional 60 7.2 60 10.2 340 7.2 90 10.2	dback c der. Nun age ±1 c nt ±1 cc l, Outpu <b>GPIB/I</b> 80 9.6 80 7.8 260 9.6 120 7.8	ontrol ( her of a ount. unt. it On, Fr <b>AN Int</b> 100 12 100 6.0 200 12 150 6.0	addresse ont Pan- cerface 150 18 150 4.08 136 18 225 4.08	El Lock, Install 200 24 200 3.0 100 36 450 3.0	local co           local co           cVCC.           ed           300           36           300           2.04           68           36           300           2.04           36           36           300	400 48 400 1.56 52 48 800 1.56	60 500 1.2 40 60 1000	72 600 1.02 34 72 1200

\*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.

\*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.

\*3: For cases where conformance to various safety standards (UL, IEC, etc.) is required, to be described as 190-240Vac (50/60Hz) for 3-Phase 208V models, and 380~415Vac (50/60Hz) for 3-Phase 400V models. 12: For 8V~16V 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

\*4: 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.

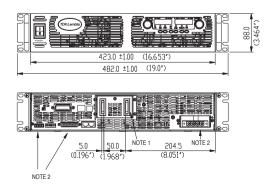
\*6: 3-Phase 208V models: 170~265Vac, constant load. 3-Phase 400V models: 342~460Vac, constant load.
 \*7: From No-Load to Full-Load, constant input voltage. Maximum drop in Remote Sense.

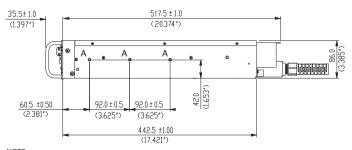
\*13: The Constant Current programming readback and monitoring accuracy does not include the warm-up and Load regulation thermal drift.

## General Specifications Genesys™ 5kW

2.1 INPUT CHARACTERISTICS	GEN	8-600 10-500 16-31	0 20-250	30-170	40-125	60-85	80-65	100-50	150-34	200-25	300-17	400-13	500-10	600-8	
		3-Phase, 208V mode											10000		
I. Input voltage/freq. (*3)		3-Phase, 400V mode		,											
. Maximum Input 3-Phase, 208V models:		21 22 22	22	22	22	22	22	22	22	22	22	22	22	22	
urrent at 100% load 3-Phase, 400V models:	1	10.5 11 11	12	11	11	11	11	11	11	11	11	11	11	11	
3. Power Factor (Typ)		3-Phase models: 0.9		1	1								1		
4. Efficiency (*4)	%	83 84 84	86	86	88	88	88	88	88	88	88	88	88	88	
		3-Phase 208V mode													
5. Inrush Current (*5)	A	3-Phase 400V mode													
5. Hold-up time (Typ)	mS	6mSec for 3-phase 2			hase 400	)V mod	els. Rat	ed outp	ut powe	er.					
2.2 POWER SUPPLY CONFIGURATION		indeeror o pridoe i			labe lot		ciorna	eu outp	arpont						
1. Parallel Operation		Up to 4 identical un	its in mas	ter/slave	mode										
2. Series Operation		Up to 2 identical un				500V N	lax to C	hassis d	round						
2.3 ENVIRONMENTAL CONDITIONS					aroucor				- o un u						
1. Operating temp		0~50°C, 100% load.													
1. Operating temp         0~50 C, 100% load.           2. Storage temp         -20~85°C															
3. Operating humidity		20~90% RH (non-co	ndensing	(r											
4. Storage humidity		10~95% RH (non-co													
5. Vibration		MIL-810F, method 5			ived to t	he vibr	atings	urface							
5. Shock		Less than 20G , half					ating 5	anacc.							
). SHOCK							/100m a	above 20	00m Alte	arnativel	lv derate	maximum	amhient	temn	
7. Altitude		Operating: 10000ft (3000m), Derate output current by 2%/100m above 2000m, Alternatively, derate maximum ambient temp. by 1°C/100m above 2000m. Non operating: 40000ft (12000m).													
8. RoHS Compliance		Complies with the r					. (12000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
2.4 EMC		complies with the r	equirente			cuve.									
1.Applicable Standards:		-													
2.ESD		EC1000-4-2. Air-dis	ch_8KV c	ontact	disch - 41	~									
3.Fast transients		EC1000-4-4.2KV				\v									
4.Surge immunity		EC1000-4-5. 1KV lin	e to line	2KV line	to grou	nd									
5.Conducted immunity		EC1000-4-6, 3V	e to line,	ZIVV IIIIE	to grou	nu									
5.Radiated immunity		EC1000-4-3, 3V/m													
7.Magnetic field immunity		EN61000-4-8, 1A/m													
3.Voltage dips		EN61000-4-11													
9.Conducted emission		EN55022A, FCC part													
10. Radiated emission		EN55022A, FCC part EN55022A, FCC part													
2.5 SAFETY		INSSUZZA, FCC part	15-A, VC	CI-A.											
2.5 SAFETY						0						/			
1 Applicable standards		CE Mark, UL60950, EN60950 listed. Vout≤40V:Output is SELV, IEEE/Isolated analog are SELV.													
1.Applicable standards:		40 <vout≤400v: analog="" are="" hazardous,="" ieee="" is="" isolated="" output="" selv.<br="">400<vout≤600v:output analog="" are="" hazardous,="" ieee="" is="" isolated="" not="" selv.<="" td=""></vout≤600v:output></vout≤400v:>													
											1				
		Vout≤40V models :Input-Outputs (SELV): 4242VDC 1min, Input-Ground: 2828VDC 1min.													
		40 <vout≤100v 1min,="" 1min.<br="" 2600vdc="" 4242vdc="" input-haz.="" input-selv:="" models:="" output:="">Hazardous OutputSELV: 1900VDC 1min, Hazardous Output-Ground:1200VDC 1min. Input-Ground: 2828VDC 1min.</vout≤100v>													
2.Withstand voltage												una: 2828	SVDC IMI	n.	
2.withstand Voltage		100 <vout≤600v 1min,="" 1min.<="" 4000vdc="" 4242vdc="" input-haz.="" input-selv:="" models:="" output:="" td=""><td>1 2020</td><td></td><td></td></vout≤600v>										1 2020			
2.withstand Voltage				VDC 1	Hazardous OutputSELV: 3550VDC 1min. Hazardous Output-Ground:2670VDC 1min. Input-Ground: 2828VDC 1min.										
-		Hazardous OutputS	ELV: 3550			10030	utput-e	irounu.z	0/0VDC		iput-Gro	und: 2828	SVDC IMI	n.	
3.Insulation resistance			ELV: 3550			1003 0	utput-e	irounu.z	orovoc		iput-Gro	und: 2828		n <b>.</b>	
3.Insulation resistance 2.6 MECHANICAL CONSTRUCTION		Hazardous OutputS More than 100Mohr	ELV: 3550 n at 25°C	, 70% RH	H.										
3.Insulation resistance 2.6 MECHANICAL CONSTRUCTION 1. Cooling		Hazardous OutputS More than 100Mohr Forced air flow: fron	ELV: 3550 m at 25°C	, 70% RH rear. No	H. ventilat	ion ho	les at tł	ne top ol	botton	n of the					
B.Insulation resistance 2.6 MECHANICAL CONSTRUCTION 1. Cooling 2. Dimensions (WxHxD)		Hazardous OutputS More than 100Mohr Forced air flow: fron W: 423mm, H: 88mn	ELV: 3550 m at 25°C	, 70% RH rear. No	H. ventilat	ion ho	les at tł	ne top ol	botton	n of the					
3.Insulation resistance 2.6 MECHANICAL CONSTRUCTION 1. Cooling 2. Dimensions (WxHxD) 3. Weight		Hazardous OutputS More than 100Mohr Forced air flow: fron W: 423mm, H: 88mn 16 kg.	ELV: 3550' m at 25°C n front to n, D: 442.	, 70% RH rear. No 5mm (ex	H. ventilat cluding	ion ho conne	les at th ctors, e	ne top oi ncoders	r botton , handle	n of the es, etc.)	chassis;	Variable			
3.Insulation resistance 2.6 MECHANICAL CONSTRUCTION 1. Cooling 2. Dimensions (WxHxD) 3. Weight 4. AC Input connector (with Protective C		Hazardous OutputS More than 100Mohr Forced air flow: fron W: 423mm, H: 88mn 16 kg. 3-Phase, 208V & 400	ELV: 3550 m at 25°C n front to n, D: 442.5	, 70% RH rear. No 5mm (ex s, Power	H. ventilat cluding Combic	ion ho conne on PC (	les at th ctors, e 6-16/4-	ne top or ncoders GF-10,16	r botton , handle series, v	n of the es, etc.) with Str	chassis; ain relie	Variable f.	fan spee	d.	
3.Insulation resistance 2.6 MECHANICAL CONSTRUCTION 1. Cooling 2. Dimensions (WxHxD) 3. Weight 4. AC Input connector (with Protective C 5.Output connectors		Hazardous OutputS More than 100Mohr Forced air flow: fron W: 423mm, H: 88mn 16 kg.	ELV: 3550 m at 25°C n front to n, D: 442.5	, 70% RH rear. No 5mm (ex s, Power	H. ventilat cluding Combic	ion ho conne on PC (	les at th ctors, e 6-16/4-	ne top or ncoders GF-10,16	r botton , handle series, v	n of the es, etc.) with Str	chassis; ain relie	Variable f.	fan spee	d.	
3.Insulation resistance 2.6 MECHANICAL CONSTRUCTION 1. Cooling 2. Dimensions (WxHxD) 3. Weight	Cover)	Hazardous OutputS More than 100Mohr Forced air flow: fron W: 423mm, H: 88mn 16 kg. 3-Phase, 208V & 400	ELV: 3550 m at 25°C n front to n, D: 442.5	, 70% RH rear. No 5mm (ex s, Power	H. ventilat cluding Combic	ion ho conne on PC (	les at th ctors, e 6-16/4-	ne top or ncoders GF-10,16	r botton , handle series, v	n of the es, etc.) with Str	chassis; ain relie	Variable f.	fan spee	d.	

## Outline Drawing Genesys<sup>™</sup> 5kW Units





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

# TDK·Lambda

## Genesys<sup>™</sup> 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.



## **Programming Options (Factory installed)**

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

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

## **Isolated Analog Programming**

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

- Voltage Programming, user-selectable 0-5V or 0-10V signal. P/N: IS510 Power supply Voltage and Current Programming Accuracy  $\pm 1\%$ Power supply Voltage and Current Monitoring Accuracy ±1.5%
- Current Programming with 4-20mA signal. P/N: IS420 Power supply Voltage and Current Programming Accuracy ±1% Power supply Voltage and Current Monitoring Accuracy ±1.5%

#### LAN Interface

#### **LX** Compliant to Class C

- Meets all LXI-C Requirements Address Viewable on Front Panel
- VISA & SCPI Compatible
  - LAN Fault Indicators
  - Auto-detects LAN Cross-over Cable

P/N: LAN

- Compatible with most standard Networks Fast Startup
- TCP / UDP Socket Programming

Fixed and Dynamic Addressing

#### P/N: IEEE

- Program Current Measure Current
- Current Foldback shutdown

6 | GENESYS™ | 5kW -

## **TDK**·Lambda

## **Power Supply Identification / Accessories How to order**

GEN	8 -	600 -		-
			Factory Options:	Factory AC Input
Series	Output	Output	Option: IEEE	
Name	Voltage	Current	IS510	3P208 (Three Pha
	(0~8V	(0~600A)	IS420	3P400 (Three Pha

LAN

## **Models 5kW**

Model	Output Voltage VDC	Output Current ( A )	Output Power ( W )
GEN 8-600	0~8V	0~600	4800
GEN 10-500	0~10V	0~500	5000
GEN 16-310	0~16V	0~310	4960
GEN 20-250	0~20V	0~250	5000
GEN 30-170	0~30V	0~170	5100
GEN 40-125	0~40V	0~125	5000

#### **Factory option** P/N

RS-232/RS-485 Interface built-in Standard **GPIB** Interface Voltage Programming Isolated Analog Interface Current Programming Isolated Analog Interface

LAN Interface (Complies with **L** Class C)

### 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	DB-9F	DB-9F	DB-25F
Communication Cable	Shield Ground L=2m	Shield Ground L=2m	Shield Ground L=2m
Power Supply Connector	EIA/TIA-568A (RJ-45)	EIA/TIA-568A (RJ-45)	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<sup>™</sup> 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



**Options:** 

ase 170~265VAC) ase 342~460VAC)

Model	Output Voltage VDC	Output Current ( A )	Output Power (W)
GEN 60-85	0~60V	0~85	5100
GEN 80-65	0~80V	0~65	5200
GEN 100-50	0~100V	0~50	5000
GEN 150-34	0~150V	0~34	5100
GEN 200-25	0~200V	0~25	5000
GEN 300-17	0~300V	0~17	5100
GEN 400-13	0~400V	0~13	5200
GEN 500-10	0~500V	0~10	5000
GEN 600-8.5	0~600V	0~8.5	5100

Also available, Genesys™

1U full Rack 750W/1500W/2400W

1U Half Rack 750W

2U full Rack 3300W

Distributed by: IEEE IS510 IS420 LAN

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