



ISO 9001:2008  
REGISTERED

GS-400



## Dual-High Voltage DC/DC Switching Power Supply



THE DUAL HIGH -VOLTAGE POWER SUPPLY CONSISTS OF TWO (2) SEPARATE CIRCUITS COMBINED INTO ONE PC ASSEMBLY. THRU-HOLE & SMD TECHNOLOGY, HOUSED IN METAL (AL ALLOY) ENCLOSURE. THESE CIRCUITS ARE INDIVIDUALLY TESTABLE AND HAVE COMPLETELY SEPARATE TEST REQUIREMENTS AS SUCH.

THE TWO REGULATOR CIRCUITS ARE:

- 2.1.1. 312 V@ 0 - 50MA POWER SUPPLY CIRCUIT
- 2.1.2. 3.0 KV TO 6.5 KV@ 0-50UA (PROGRAMMABLE) HIGH-VOLTAGE SUPPLY CIRCUIT.

THESE CIRCUITS ARE DC/DC PARALLEL QUASI-RESONANT FLYBACK CONVERTER TYPE AND REQUIRE AN EXTERNAL 12VDC SOURCE AS INPUT FOR OPERATION.

### ELECTRICAL SPECIFICATIONS: 312 V CONVERTER SECTION

#### INPUT VOLTAGE:

12.0 V + 1% (11.88 TO 12.12) @ 3 A MAX, DC SOURCE.

#### INPUT CURRENT:

< 1.3A @ 11.88 V INPUT MIN. - WITH OUTPUT SET TO 312.00 @ 30 MA

#### INPUT RIPPLE:

< 500 MV PPK (DC SOURCE)

#### EFFICIENCY: (FULL LOAD)

70% MIN. @ 11.88 V INPUT MIN

#### REMOTE ON/OFF CONTROL:

OPEN COLLECTOR SINKING CURRENT TO DC RETURN/  
GROUND REQUIRED TO TURN UNIT ON:  
VIN < .8V = ON VIN = VCC(12V) = OFF

#### INPUT IDLE CURRENT:

< 200MA @ 12.12V MAX INPUT, WHEN REMOTE CONTROL: OFF

### 3.1.2. OUTPUT CHARACTERISTICS:

#### VOLTAGE OUTPUT:

312 V<sub>NOM.</sub> @ 0-50MA MAX

#### ADJUSTABILITY( CUSTOMER ACCESSIBLE):

OUTPUT SET TO NOM. 312.0V + 2.0V - 1.5V INCLUDING  
TEMPERATURE DRIFT FROM 40° TO 110 °F. NOTE: MIN. AND  
MAX VALUES DEFINED TOTAL VOLTAGE BAND

#### MAXIMUM OUTPUT POWER:

16 WATTS @ 40 °C.

#### LINE REGULATIONS:

< + 0.1% VOUT AT FULL LOAD.

#### LOAD REGULATIONS:

< + 0.1% VOUT NO LOAD TO FULL LOAD AT VIN NOM.

#### OUTPUT NOISE AND RIPPLE:

< 200MV PK-PK NO LOAD TO FULL LOAD.

#### PROTECTION CIRCUITRY:

REVERSE INPUT POLARITY (OPTION): INPUT PROTECTED  
FROM REVERSED POLARITY; POLARITY CHANGE CIRCUIT.  
INPUT OVER VOLTAGE PROTECTION (OPTION): INPUT  
PROTECTED FOR VIN > 27.0V + 10% DC INPUT.

#### SHORT CIRCUIT CURRENT:

AUTOMATIC ELECTRONIC CIRCUIT DISABLES OUTPUT SHORT  
CIRCUIT FOR SHORTED OUTPUT CONDITIONS. REGULATOR  
WILL NOT POWER UP WITH OUTPUT SHORT.

#### INPUT CURRENT PROTECTION:

PROTECTED BY OUTPUT CURRENT LIMIT / FOLDBACK  
CIRCUITRY AND INPUT FUSING.

#### OVERLOAD PROTECTION:

AUTOMATIC CIRCUIT SHUTS REGULATOR DOWN FOR  
OVERLOADS EXCEEDING 150% OF MAX. CURRENT OUTPUT.  
ONCE REGULATOR SHUTS DOWN,CONTROL INPUT MUST BE  
SEQUENCED TO START REGULATOR AGAIN.

#### OUTPUT VOLTAGE STATUS:

OPEN COLLECTOR TTL-L, VSAT < 0.7 VDC, IOL< .3A SINK

CURRENT WHEN VOUT > 260 VDC; SYSTEM INTERFACE FOR  
FAULT DETECTION / ISOLATION.

### 3 KVDC TO 6.5 KVDC HIGH - VOLTAGE CONVERTER SECTION:

#### INPUT VOLTAGE:

12V + 1% (11.88. TO 12.12) @ 3 A MAX, DC SOURCE.

#### INPUT CURRENT:

< 500 MA INCLUDING 312 V INPUT IDLE CURRENT < 200MA.

#### INPUT RIPPLE:

< 500MV PPK. (DC SOURCE).

#### EFFICIENCY:

(FULL LOAD) 70% @ 11.88V INPUT MIN.

#### VOLTAGE PROGRAMMING INPUT:

+3.0VDC TO +6.5 VDC (IV PROGRAMMING = 1 KVVDC  
OUTPUT) VPROG MUST BE > 2.8V +5% FOR PROGRAMMING  
HIGH-VOLTAGE OUTPUT (UNDER VOLTAGE PROTECTION)  
IF VPROG <2.8V +5% = NO OUTPUT OR <40 VDC OUTPUT  
(RESIDUAL VOLTAGE) VPROG IS LIMITED TO -0.7 VDC BY  
DIODE ACTION (REVERSE POLARITY PROTECTION).

#### VOLTAGE OUTPUT:

3KV +3% TO 6.5 KV +3% 0-50 MICRO-AMPS PROPORTIONAL  
TO VPROG WHERE 1V = 1 KV.

#### LINE REGULATION:

< 0.1% VOUT AT FULL LOAD.

#### LOAD REGULATION:

<1% VOUT NO LOAD TO FULL LOAD (0-50 MICRO-AMPS)  
AT VIN NOM.

#### OUTPUT NOISE AND RIPPLE:

<1% VOT PPK MAX @ FULL LOAD.

#### OUTPUT CURRENT:

50 MICRO-AMPS MAX.

#### MONITOR TEST POINT:

1000: 1 RATIO +2%.

#### H.V.STATUS OUTPUT:

OPEN COLLECTOR TTL-L, VSAT < 0.7VDC SINK CURRENT  
IOL = .3A MAX. FOR H.V. OUTPUT > 1.5KV. SYSTEM INTER-  
FACE FOR FAULT DETECTION / ISOLATION.

#### OUTPUT VOLTAGE DECAY TIME:

6KV TO 1 KV IN 1 SECOND.

#### TURN ON / TURN OFF OVERSHOOT:

4% MAX 500US MAX RECOVERY

#### TURN ON DELAY:

TIME FOR 25% STOP LOAD 1 SEC MAX

#### SWITCHING FREQUENCY:

50 KHZ TYP.

#### OTHER PROTECTION:

INPUT FUSING

#### SAFETY APPROVALS:

UL 60950, CUL TO 22.2 # 950, TUV TO EN 60950

#### DIELECTRIC WITHSTAND VOLTAGE:

NON-ISOLATED PRIMARY TO SECONDARY  
NOTE: HI-VOLTAGE OUTPUT SECTION, CONFORMAL COATING,  
HUMISEAL OR EQUIVALENT

#### LEAKAGE CURRENT:

< 3.5 MA

#### LINE SURGE:

EN 61000-4.5 LEVEL 4

#### EMI:

COMPLIES WITH EN 55022 CLASS B AND FCC PART 15 CLASS  
B, WHEN TESTED WITH A RESISTIVE LOAD, BOTH CONDUCT-  
ED AND RADIATED.

#### MTBF:

GREATER THAN 50,000 HOURS AT 25°C AMBIENT TEMPERATURE

#### OPERATING TEMPERATURE:

0°C TO 50°C; DERATE TO 50% OUTPUT POWER AT 70°C

#### STORAGE TEMPERATURE:

-40°C TO 80°C

#### HUMIDITY:

0% TO 90% RELATIVE HUMIDITY

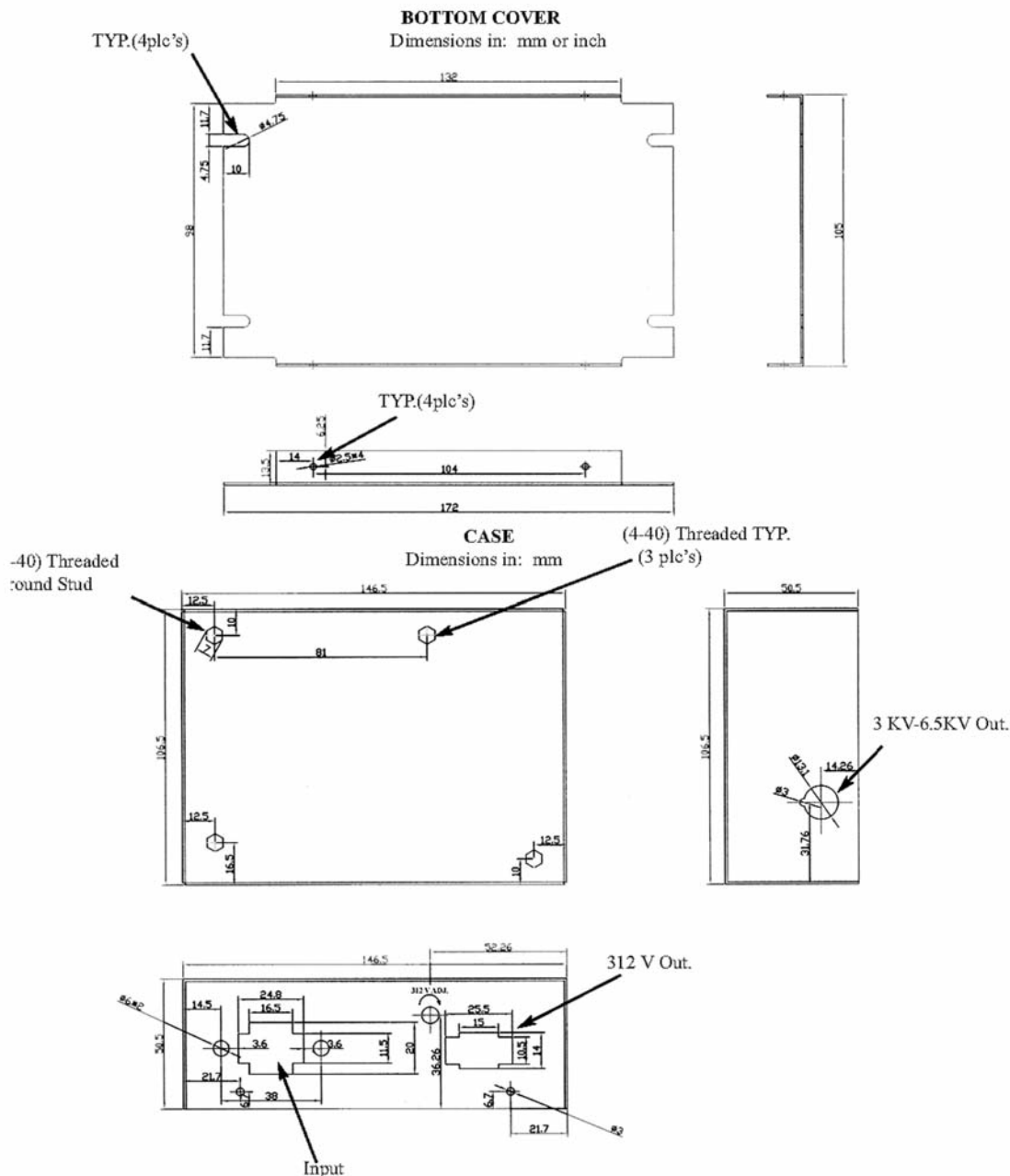
### OUTPUT VOLTAGE / CURRENT:

MODEL NUMBER		OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (A)	RATED OUTPUT POWER (W)
GS-400	312 V CONVERTER	+312.00	50mA	15.6W
	3 KVDC TO 6.5 KVDC HIGH-VOLTAGE CONVERTER	3 - 6.5KV	50mA	325mW

SPECIFICATIONS MAY CHANGE WITHOUT PRIOR NOTICE. CONSULT GLOBTEK CUSTOMER SERVICE FOR LATEST SPECIFICATIONS.



CONFIGURATION: ENCLOSED SWITCHING POWER SUPPLY, .040"AL. ALLOY 5052-H34 OR EQUIVALENT, CHEM.TREATED, BRUSH FINISH, BOTTOM COVER: 'U' CHANNEL WITH MOUNTING TABS, (4) ELONGATED 0.100 IN DIA. FOR (4) 8-32 THREADED STUDS MOUNT, AS SHOWN BELOW; CASE, MULTI-FOLD WITH CAPTIVE, BALK HEADED, INPUT AND OUTPUTS (2) CONNECTORS AND (4) MOUNTING INSERT 4-40, AS SHOWN BELOW. OVERALL MAX. DIMENSIONS: ( 5.75L X 4.25W X 2.06H) INCH / (146.5L X 106.5W X 50.5H) MM



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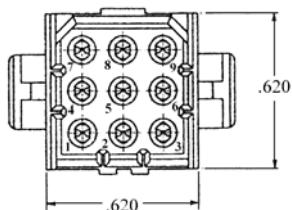


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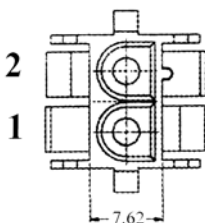


### MECHANICAL

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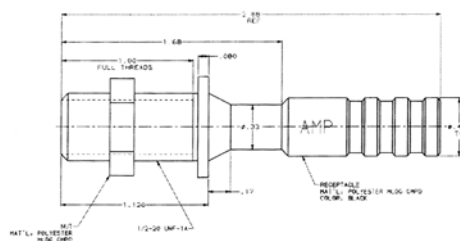


PIN 1: DC IN (+)  
PIN 2: N/C  
PIN 3: DC IN RTN  
PIN 4: 312V STATUS  
PIN 5: 312V REMOTE ON/OFF  
PIN 6: DC IN RTN  
PIN 7: H.V. PROGRAMMING  
PIN 8: H.V. STATUS  
PIN 9: H.V. MONITOR



PIN 1: 312 V (+)  
PIN 2: 312 V RTN.

### HI-VOLT OUTPUT CONNECTOR



### INPUT CONNECTOR:

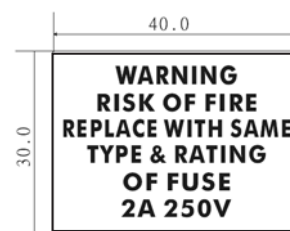
FULLY POLARIZED, NYLON UL 94V-0 HOUSING, MATE-N-LOK CONNECTOR, 9 PINS, "LIVE SPLIT" MODEL, AMP P/N: 640501-1; CONNECTOR COLOR: BRICK-RED, BALK HEADED THROUGH METAL CASE AND SOLDERED ON THE INPUT POWER DISTRIBUTION PCB. HEADER MATES WITH AMP P/N: 640521 OR EQUIVALENT. PER MANUFACTURER, TYCO ELECTRONICS, SPECIFICATION # 108-1078 REV.0 CONNECTOR MAY REQUIRE SLIGHT ADJUSTMENT PRIOR TO MATING

### OUTPUT CONNECTOR:

FULLY POLARIZED NYLON UL 94V-0 HOUSING, UNIVERSAL MATE-N-LOCK, 600V INSULATION RANGE .100 IN DIA., 10 KV DIELECTRIC WITHSTAND VOLTAGE BETWEEN ADJACENT CIRCUITS, AMP P/N: 1-480699-0 2 PINS, 19A MAX, PIN AMP P/N: 350561-1. CONNECTOR COLOR: NATURAL, BALKHEADED THROUGH METAL CASE AND (+,-) RED, BLACK AWG 18 STRANDED WIRES SOLDERED TO MOTHER PCB. HEADER MATES WITH AMP P/N 350582 OR EQUIVALENT.



### WARNING LABEL (INSIDE UNIT)



### TEST LABEL



### MARKING:

SILK SCREEN ON CASE, TOP SURFACE, AS SHOWN; MARKING SYSTEM(S), UL FILES MH17427 AND MH 17292.

WARNING LABEL, AFFIXED INTERNAL TO CASE: MATERIAL: .007 (0.18) THICK FLAT THERMAL TRANSFER, IMPRINTABLE, POLYESTER MATERIAL WITH BLACK TEXT ON WHITE BACKGROUND.

MANUFACTURER: STEVEN LABEL, MATERIAL I.D. NO:3302-33, UL FILE NO.MH128221(N), UL MATERIAL DESIGNATION FILE NO:GHW332RL. OPTIONAL LABEL MATERIAL CAN BE SUBSTITUTED. PROVIDING MATERIAL IS UL LISTED AND COMPLIES WITH APPLICABLE SAFETY REQUIREMENT.

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