

GFC Power Supplies

electro sonic

**GFC
POWER**MANU
175
CODE

GFC GH DC LINEAR POWER SUPPLIES

Cat. No.	Input Volts	Dimensions (inches)			Output 1	Output 2	Output 3	Net Price
		Length	Width	Height				

SINGLE OUTPUT

GHOF1-5	110/220	4.87	4.00	1.62	5V @ 3.0A*	-	-	\$54.00
GHOF1-12	110/220	4.87	4.00	1.62	12V @ 1.7A	-	-	54.00
GHOF1-12 OVP	110/220	4.87	4.00	1.62	12V @ 1.7A*	-	-	63.00
GHOF1-15	110/220	4.87	4.00	1.62	15V @ 1.5A	-	-	54.00
GHOF1-15 OVP	110/220	4.87	4.00	1.62	15V @ 1.5A*	-	-	63.00
GHOF1-24	110/220	4.87	4.00	1.62	24V @ 1.2A	-	-	54.00
GHOF1-24 OVP	110/220	4.87	4.00	1.62	24V @ 1.2A*	-	-	63.00
GHOF1-28	110/220	4.87	4.00	1.62	28V @ 1.0A	-	-	54.00
GHOF1-28 OVP	110/220	4.87	4.00	1.62	28V @ 1.0A*	-	-	63.00
GHOF2-5	110/220	5.63	4.88	2.50	5V @ 6.0A*	-	-	83.00
GHOF2-12	110/220	5.63	4.88	2.50	12V @ 3.4A	-	-	83.00
GHOF2-12 OVP	110/220	5.63	4.88	2.50	12V @ 3.4A*	-	-	92.00
GHOF2-15	110/220	5.63	4.88	2.50	15V @ 3.0A	-	-	83.00
GHOF2-15 OVP	110/220	5.63	4.88	2.50	15V @ 3.0A*	-	-	92.00
GHOF2-24	110/220	5.63	4.88	2.50	24V @ 2.4A	-	-	83.00
GHOF2-24 OVP	110/220	5.63	4.88	2.50	24V @ 2.4A*	-	-	92.00
GHOF2-28	110/220	5.63	4.88	2.50	28V @ 2.0A	-	-	83.00
GHOF2-28 OVP	110/220	5.63	4.88	2.50	28V @ 2.0A*	-	-	92.00
GHOFN-5	110/220	7.00	4.87	2.75	5V @ 9.0A*	-	-	99.00
GHOFN-12	110/220	7.00	4.87	2.75	12V @ 5.1A	-	-	99.00
GHOFN-12 OVP	110/220	7.00	4.87	2.75	12V @ 5.1A*	-	-	108.00
GHOFN-15	110/220	7.00	4.87	2.75	15V @ 4.5A	-	-	99.00
GHOFN-15 OVP	110/220	7.00	4.87	2.75	15V @ 4.5A*	-	-	108.00
GHOFN-24	110/220	7.00	4.87	2.75	24V @ 3.6A	-	-	99.00
GHOFN-24 OVP	110/220	7.00	4.87	2.75	24V @ 3.6A*	-	-	108.00
GHOFN-28	110/220	7.00	4.87	2.75	28V @ 3.0A	-	-	99.00
GHOFN-28 OVP	110/220	7.00	4.87	2.75	28V @ 3.0A*	-	-	108.00
GHOF3-5	110/220	9.00	4.88	2.75	5V @ 12.0A*	-	-	126.00
GHOF3-12	110/220	9.00	4.88	2.75	12V @ 7.0A	-	-	126.00
GHOF3-12 OVP	110/220	9.00	4.88	2.75	12V @ 7.0A*	-	-	135.00
GHOF3-15	110/220	9.00	4.88	2.75	15V @ 6.2A	-	-	126.00
GHOF3-15 OVP	110/220	9.00	4.88	2.75	15V @ 6.2A*	-	-	135.00
GHOF3-24	110/220	9.00	4.88	2.75	24V @ 4.8A	-	-	126.00
GHOF3-24 OVP	110/220	9.00	4.88	2.75	24V @ 4.8A*	-	-	135.00
GHOF3-28	110/220	9.00	4.88	2.75	28V @ 4.0A	-	-	126.00
GHOF3-28 OVP	110/220	9.00	4.88	2.75	28V @ 4.0A*	-	-	135.00
GHOF4-5	110/220	14.00	4.88	2.75	5V @ 18.0A*	-	-	190.00
GHOF4-12	110/220	14.00	4.88	2.75	12V @ 10.2A	-	-	184.00
GHOF4-12 OVP	110/220	14.00	4.88	2.75	12V @ 10.2A*	-	-	194.00
GHOF4-15	110/220	14.00	4.88	2.75	15V @ 9.0A	-	-	185.00
GHOF4-15 OVP	110/220	14.00	4.88	2.75	15V @ 9.0A*	-	-	194.00
GHOF4-24	110/220	14.00	4.88	2.75	24V @ 6.0A	-	-	185.00
GHOF4-24 OVP	110/220	14.00	4.88	2.75	24V @ 6.0A*	-	-	194.00
GHOF4-28	110/220	14.00	4.88	2.75	28V @ 5.0A	-	-	185.00
GHOF4-28 OVP	110/220	14.00	4.88	2.75	28V @ 5.0A*	-	-	194.00
GHOF5-5	110/220	16.75	4.88	3.50	5V @ 25.0A*	-	-	249.00
GHOF5-12	110/220	16.75	4.88	3.50	12V @ 16.0A	-	-	249.00
GHOF5-12 OVP	110/220	16.75	4.88	3.50	12V @ 16.0A*	-	-	258.00
GHOF5-15	110/220	16.75	4.88	3.50	15V @ 15.0A	-	-	249.00
GHOF5-15 OVP	110/220	16.75	4.88	3.50	15V @ 15.0A*	-	-	258.00
GHOF5-24	110/220	16.75	4.88	3.50	24V @ 12.0A	-	-	249.00
GHOF5-24 OVP	110/220	16.75	4.88	3.50	24V @ 12.0A*	-	-	258.00
GHOF5-28	110/220	16.75	4.88	3.50	28V @ 10.0A	-	-	249.00
GHOF5-28 OVP	110/220	16.75	4.88	3.50	28V @ 10.0A*	-	-	258.00

DUAL OUTPUT

GHOF 10A	110/220	7.00	4.87	2.50	12-15V @ 1.5A	12-15V @ 1.5A	-	92.00
GHOF 10A OVP	110/220	7.00	4.87	2.50	12-15V @ 1.5A*	12-15V @ 1.5A*	-	101.00
GHOF 10B	110/220	7.00	4.87	2.50	5V @ 3.0A*	5V @ 3.0A*	-	98.00
GHOF 10C	110/220	7.00	4.87	2.50	5V @ 3.0A*	12-15V @ 1.5A	-	94.00
GHOF 10C OVP	110/220	7.00	4.87	2.50	5V @ 3.0A*	12-15V @ 1.5A*	-	103.00
GHOF 10D	110/220	7.00	4.87	2.50	5V @ 3.0A*	24V @ 0.4A	-	94.00
GHOF 10D OVP	110/220	7.00	4.87	2.50	5V @ 3.0A*	24V @ 0.4A*	-	103.00
GHOF 20A	110/220	9.38	4.88	2.75	12-15V @ 3.0A	12-15V @ 3.0A	-	159.00
GHOF 20A OVP	110/220	9.38	4.88	2.75	12-15V @ 3.0A*	12-15V @ 3.0A*	-	168.00
GHOF 20B	110/220	9.38	4.88	2.75	5V @ 6.0A*	5V @ 6.0A*	-	159.00
GHOF 20C	110/220	9.38	4.88	2.75	5V @ 6.0A*	12-15V @ 3.0A	-	159.00
GHOF 20C OVP	110/220	9.38	4.88	2.75	5V @ 6.0A*	12-15V @ 3.0A*	-	168.00
GHOF 20D	110/220	9.38	4.88	2.75	5V @ 6.0A*	24V @ 2.3A	-	159.00
GHOF 20D OVP	110/220	9.38	4.88	2.75	5V @ 6.0A*	24V @ 2.3A*	-	168.00

TRIPLE OUTPUT (Isolated Outputs)

GHDD 100	110/220	10.25	4.00	2.50	24V @ 2.0A	5V @ 1.5A*	5V @ 0.5A*	142.00
GHDD 100 OVP	110/220	10.25	4.00	2.50	24V @ 2.0A*	5V @ 1.5A*	5V @ 0.5A*	151.00
GHDD 101	110/220	10.25	4.00	2.50	12-15V @ 1.0A	5V @ 3.0A*	12-15V @ 1.0A	142.00
GHDD 101 OVP	110/220	10.25	4.00	2.50	12-15V @ 1.0A*	5V @ 3.0A*	12-15V @ 1.0A*	151.00
GHDD 102	110/220	10.25	4.00	2.50	24V @ 2.0A	5V @ 1.0A*	12-15V @ 0.7A	142.00
GHDD 102 OVP	110/220	10.25	4.00	2.50	24V @ 2.0A*	5V @ 1.0A*	12-15V @ 0.7A*	151.00
GHOF 2TA	110/220	11.00	4.88	2.75	5V @ 8.0A*	12-15V @ 1.5A	12-15V @ 1.5A	186.00
GHOF 2TA OVP	110/220	11.00	4.88	2.75	5V @ 8.0A*	12-15V @ 1.5A*	12-15V @ 1.5A*	195.00

* Overvoltage protection is standard on 5 Volt outputs; order OVP series for overvoltage protection on other output voltages; factory set - must be specified when placing order.

GFC MIDGET GF LINEAR POWER SUPPLIES

Cat. No.	AC Input Volts	Dimensions (inches)			Output 1	Output 2	Output 3	Net Price Each
		Length	Width	Height				

SINGLE OUTPUT MIDGET

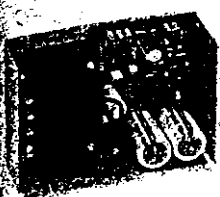
GFOF M-5	110	4.125	3.875	1.75	5V @ 1.2A	-	-	\$50.00
GFOF M2-6	110	4.125	3.875	1.75	2 to 6V @ 1.0A	-	-	50.00
GFOF M10-16	110	4.125	3.875	1.75	10 to 16V @ 0.5A	-	-	50.00
GFOF M16-24	110	4.125	3.875	1.75	16 to 24V @ 0.4A	-	-	50.00

GFC POWER GHOF SERIES
LINEAR POWER SUPPLIES

FEATURES:

- Engineered for greater reliability.
- Designed to comply with C.S.A. 22.2 specifications for Data Processing equipment.
- Dual AC primary input: 115/230 VAC 47-63 Hz (user selectable).
- User replaceable IC's.
- Remote sensing on most models.
- Fold back current limiting.
- Lo-flux transformers for minimum magnetic interference with CRT screens.
- Industry standard frame sizes for simplified second sourcing.
- Delivery from stock.
- Unconditionally guaranteed for two years.

E-365



GHOFN



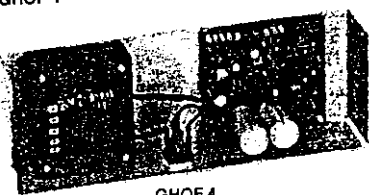
GHOF 2



GHOF 1



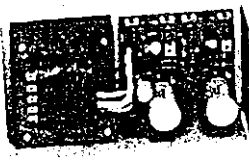
GHOF 3



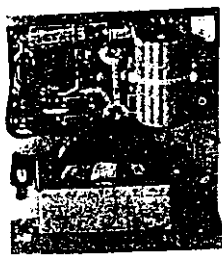
GHOF 4



GHOF 10



GHOF 2D



GFOFM

NOT used
004 →



GFC

DC LINEAR POWER SUPPLIES

GHOE 2 SERIES

ELECTRICAL

Input Voltage
120/220/240 V AC $\pm 10\%$ 1.3% $\pm 5\%$ minimum
50/60 Hz

Regulation
(5% maximum on full input)
all models

Line Regulation
15% from zero load load

Output Ripple
5V pk-pk typical 30V pk-pk
DC 100 KHz

Transient Response
Minimum deviation less than $\pm 1\%$
overs within 0.5% in less than 20
ms (for a load change of 1A per sec
at a minimum fixed load of 50%)

Overvoltage Protection
Crowbar type standard on 5V
outputs set to 6.2V $\pm 3\%$. Factory
optional on other outputs set

5V $\pm 8\%$ on 12V output
5V $\pm 8\%$ on 15V outputs
5V $\pm 8\%$ on 24V outputs
5V $\pm 8\%$ on 28V outputs

Output Adjustment Range
 $\pm 5\%$ minimum

Stability
0.1% for 24 hours after warm up

Temperature
Operating 0% to 100% load linearly
above 50°C to 100% load at 70°C
Storage -40°C to +85°C

Temperature Coefficient
0.01% per $^{\circ}\text{C}$ at 70°C

Efficiency (minimum)
5V outputs 45%
12V and 15V outputs 55%
24V and 28V outputs 60%

Short Circuit and Overload Protection
Automatic self-recovering
controlled prior to foldback

Remote Sensing
Standard on all models

Type Number	VOLTAGE	AMPS
GHOE 2-5	5	6.0
GHOE 2-12	12	3.4
GHOE 2-15	15	3.0
GHOE 2-24	24	2.4
GHOE 2-28	28	2.0

SAFETY



Global Series power supplies meet
the safety requirements of the
world's most respected safety
agencies. All models meet or exceed
the safety standards described in this
section.

Leakage Current
Line to Ground (max) 0.05 mA

Creepage Distance
Primary to Dead Metal (min) 9.0
mm (0.345 in)

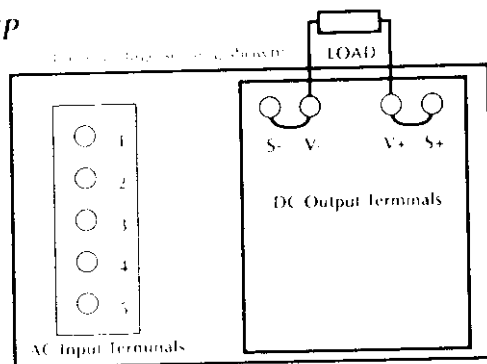
Dielectric Withstand Voltage (min)
Input to Ground 1250 VRMS
Input to Outputs 3750 VRMS
Outputs to Ground 500 VRMS

UL Recognized
UL File number E60885

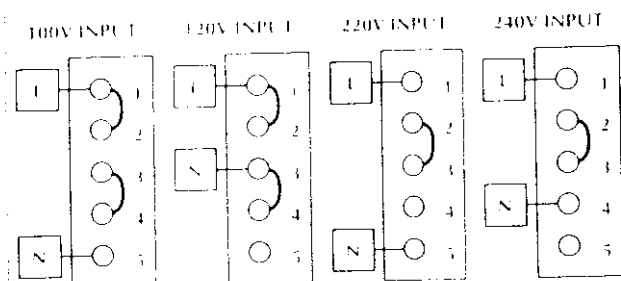
CSA Certified
CSA File Number LR53234

TUV Certified to VDE

HOOKUP



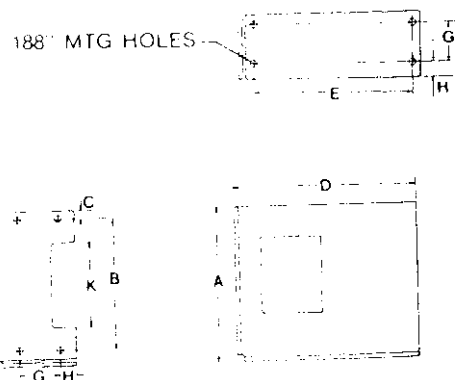
AC INPUT HOOKUP DIAGRAM



INPUT FUSE RATING

100 OR 120 INPUT	TYPE (IAG) FAST BLO	2 AMPS
220 OR 240 INPUT	TYPE (IAG) FAST BLO	1 AMP

MECHANICAL



Overall Chassis Size — 4.88" x 5.63" x 2.50"

	Inches	mm
A	4.88	123.95
B	4.125	104.78
C	.25	6.35
D	5.63	143.00
E	4.875	123.83
F	2.50	63.50
G	1.25	31.75
H	.50	12.70
J	.45	11.42
K	2.69	68.33

INSTRUCTIONS D'INSTALLATION

Modèle: GHOF 2-5 GHOF 2-24
GHOF 2-12 GHOF 2-28
GHOF 2-15

Cet équipement doit être installé d'après les normes DIN IEC 380/VDE 0806/08.81. Cet appareil est incorporé à de l'équipement de bureau, l'installation doit être faite selon les normes indiquées ci-dessus.

L'appareil doit être protégé par un fusible externe:
100/120V: F 2.0A/125V
220/240V: F 1.0A/250V

Le fusible doit être installé dans le circuit du conducteur non mis à la terre directement.

Refroidissement: à convection.
Avertissement: La température de châssis ne doit excéder 90 deg. C. Lorsque l'appareil est installé dans de l'équipement de bureau, assurez-vous que la température du boîtier reste en-dessous de 70 deg. C. pour prévenir toutes brûlures sérieuses.

Cet équipement peut être installé dans des appareils fixes (pertes de courant 3,5 A max), ou portatifs (pertes de courant 75 mA max).

Des connexions sécuritaires de mise à la terre sont requises à l'aide de vis d'acier trempé de grosseur minimale #6, 3,5 mm de diamètre, d'un écrou et d'une rondelle dentelée installés dans un trou sur le châssis. Un espace minimum de 4 mm doit être maintenu entre les parties activées et les connexions de mise à la terre.

Spécifications:
Entrée: AC 100/120/220/240V

Si les sorties sont interconnectées, la tension maximale tolérable SELV est 42,4V.

INSTALLATION INSTRUCTIONS

Model: GHOF 2-5 GHOF 2-24
GHOF 2-12 GHOF 2-28
GHOF 2-15

1) This equipment is approved in accordance with DIN IEC 380/VDE 0806/08-81. If installed in office equipment, the installation must comply with the same standards.

2) To comply with the safety standards, an external fuse is required.
AC 100/120V Fuse F 2.0A/125V
AC 220/240V Fuse F 1.0A/250V
Fuse must be installed in the ungrounded circuit conductor only.

3) Cooling method: Free convected air.
Warning: Unit surface temperatures may exceed 90°C. When installed into office equipment, ensure accessible surfaces do not exceed 70°C to prevent severe burns.

4) The ground leakage current does not exceed 0.05mA and the equipment is suitable for stationary or portable machines.

5) Safety ground connection is required with a minimum No. 6 (3.5 mm dia) plated metal screw, a nut, and a serrated washer through any free hole in the chassis. A minimum spacing of 4 mm must be maintained between live parts and the ground connection.

6) Specifications:
Input: AC 100/120/220/240 V

7) Outputs may be interconnected to provide higher current or voltage. To remain within SELV voltage ratings, the maximum voltage must not exceed 42.4V.

EINBAUANWEISUNG

Model: GHOF 2-5 GHOF 2-24
GHOF 2-12 GHOF 2-28
GHOF 2-15

1) Dieses Gerät ist zugelassen gemäss DIN IEC 380/VDE 0806/08.81. Im Falle dass dieses Gerät in eine Büromaschine eingebaut werden soll, muss die Installation gemäss der obengenannten Norm erfolgen.

2) Das Gerät muss mit einer externen Sicherung abgesichert werden:
Netz AC 110/120V: F 2.0A/125V
Netz AC 220/240V: F 1.0A/250V

3) Kühlung ohne Lüfter.
Warnung - Rahmentemperatur kann 90 Grad C erreichen! Es muss sichergestellt sein dass, um schwere Verbrennungen zu vermeiden, in eingebautem Zustand externen Gehäusetemperaturen unter 70 Grad C bleiben.

4) Für Einbau entweder in ortsfesten Büromaschinen (Ableitstrom 3.5mA) oder in ortsveränderlichen Büromaschinen (Ableitstrom 0.75mA).

5) Eine zusätzliche Schutzleiterverbindung nach der obengenannten Norm ist notwendig.

6) Nenneingang:
AC 100/120/220/240 V

7) Bei zusammenschalten der Ausgänge ist die maximal zugelassene SELV Spannung 42.4V.

	Modèle	V	A	W (max)
SELV	GHOF 2-5	5	6.0	30.0
SELV	GHOF 2-12	12	3.4	40.8
SELV	GHOF 2-15	15	3.0	45.0
SELV	GHOF 2-24	24	2.4	57.6
non-SELV	GHOF 2-28	28	2.0	56.0

	Model	V	A	W (max)
SELV	GHOF 2-5	5	6.0	30.0
SELV	GHOF 2-12	12	3.4	40.8
SELV	GHOF 2-15	15	3.0	45.0
SELV	GHOF 2-24	24	2.4	57.6
non-SELV	GHOF 2-28	28	2.0	56.0

	Model	V	A	W (max)
SELV	GHOF 2-5	5	6.0	30.0
SELV	GHOF 2-12	12	3.4	40.8
SELV	GHOF 2-15	15	3.0	45.0
SELV	GHOF 2-24	24	2.4	57.6
nicht-SELV	GHOF 2-28	28	2.0	56.0



FCC ID: D0063QAMLMBRP-400



FlatPAC™

50 to 600 Watt Autoranging AC-DC Switchers

Features

- Inputs: 115/230 VAC Autoranging
- VDE/FCC Class A, Class B
- 80-90% Efficiency
- Any Output: 1 to 95 VDC
- Now with Module Disable
- UL, CSA, TÜV, VDE, IEC 950
- Remote Sense and Current Limit
- BUS OK and AC OK
- 50 ms Ride-Through Time (typical)
- OVP and Thermal Shutdown
- One-Up Models: 1 Output;
Up to 200 Watts
- Two-Up Models: 1 or 2 Outputs;
Up to 400 Watts
- Three-Up Models: 1, 2, or 3 Outputs;
Up to 600 Watts

Product Highlights

Vicor's FlatPAC family of user-definable off-line power supplies combines Vicor high frequency DC-DC converters and front-end subassemblies in a set of modular, chassis-mount enclosures. The result is a flexible, economical power solution for systems requiring from 50 to 600 watts of total output power.

FlatPAC switchers incorporate one, two, or three Vicor VI-200 DC-DC Converters in packages of common height and length and three different widths. Each internal converter offers one output, 50-200 watts of power, and output voltage of 1 to 95 VDC. All models feature autoranging input, which automatically senses the input line voltage and sets the power supply's input range accordingly.

FlatPAC's unique modular design allows any of over 10,000 configurations to be assembled from stock components for next-day delivery.

Specifications

(typical at 25°C, nominal line and 75% load, unless otherwise specified)

Input Characteristics

AC Line Input	
Autoranging	90-135/180-270 VAC
Line Frequency	47 to 63 Hz (C-grade and E-grade)
	47 to 440 Hz (I-grade)

Inrush Current

115 VAC Operation	27 Amps at peak line
230 VAC Operation	54 Amps at peak line

Ride-through Time (Full Load)

90/180 VAC Low Line	5 ms minimum
115/230 VAC Nominal Line	40 ms minimum

AC Fail Warning Time

	5 ms minimum (low line, full load)
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AC and BUS OK (2-up and 3-up models only)

Off State	V _{ce} = 70V maximum
On State	V _{cesat} = 0.4V maximum @ 1 mA (1.5 mA max.)

Module Disable (optically isolated LED input; 2-up and 3-up models only)

Continuous Forward Current	1 mA to 30 mA
Forward Voltage	1.65V max. at 30 mA

Agencies

	UL, CSA, TÜV, VDE, IEC 950
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Conducted and Radiated EMI/RFI

	EN 55022-B All Models
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Dielectric Withstand

	Primary to chassis GND = 3535 VDC
	Primary to secondary = 4300 VDC
	Secondary to chassis GND = 750 VDC

Transient Surge

	IEC 801-5 Level 3
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Output Characteristics (applies to each output individually)

Setpoint Accuracy	±1% maximum (E-grade = 2%)
Line/Load Regulation	±0.2% maximum (E-grade = 0.5%)
Temperature Drift	±0.02%/°C maximum (E-grade = 0.02%/°C typ.)
Efficiency	80-90% (typ.), depending on output voltage
High Trim/Program ¹	110% of V _{nom} .
Low Trim/Program ¹	50% of V _{nom} .
Peak-to-Peak Ripple	3% max., 20 MHz BW, full load (E-grade = 5%)
Current Limit	115% (typ.) (E-grade = 105-135%)
Short Circuit Limit	20-130% as function of output voltage
OVP Set Point	115-135%, recycle power to restart

Environmental Characteristics/Product Grade Designators

Storage Temperature	-20°C to +100°C (C-grade and E-grade)
	-55°C to +100°C (I-grade)
Operating Temperature	0°C to +85°C (C-grade and E-grade)
Case	-30°C to +85°C (I-grade)

Warranty

	2 years
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¹12V and 15V outputs, standard trim range ±10%. Consult factory for wider trim range.

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FCC ID: D0063QAMLMRP-400

FlatPAC Configuration Chart

Single Outputs	VI-LU*	-	-	-	50-200W	8.6"L x 2.5"W x 1.37"H
	VI-MU	-	-	-	100-400W	8.6"L x 4.9"W x 1.37"H
	VI-NU	-	-	-	450-600W	8.6"L x 7.4"W x 1.37"H
Dual Outputs	VI-PU	-	-	-	100-400W	8.6"L x 4.9"W x 1.37"H
	VI-QU	-	-	-	250-600W	8.6"L x 7.4"W x 1.37"H
Triple Outputs	VI-RU	-	-	-	150-600W	8.6"L x 7.4"W x 1.37"H

Input Characteristics

90-135/180-270 VAC
U = Autoranging

Output Voltage

Z = 2V 1 = 12V
Y = 3.3V 2 = 15V
O = 5V 3 = 24V
M = 10V L = 28V
4 = 48V

1 to 95V, consult factory.

Product Grade

E = 0°C to +85°C Case
C = 0°C to +85°C Case
I = -30°C to +85°C Case

Output Power

$V_{out} \geq 5V$ $V_{out} < 5V$
Y = 50W Y = 10A
X = 75W X = 15A
W = 100W W = 20A
V = 150W V = 30A
U = 200W U = 40A

Output Power

$V_{out} \geq 5V$ $V_{out} < 5V$
W = 100W W = 20A
V = 150W V = 30A
U = 200W U = 40A
S = 300W S = 60A
Q = 400W Q = 80A

Output Power

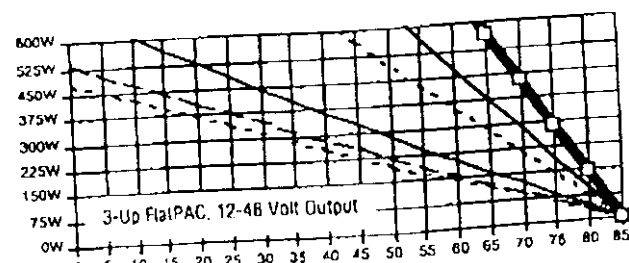
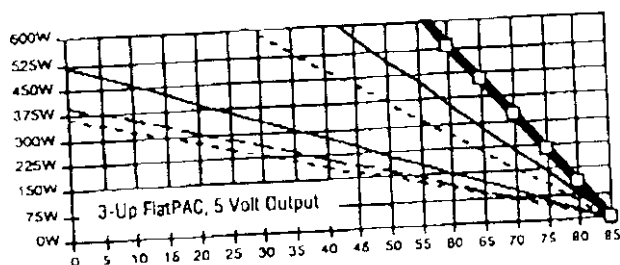
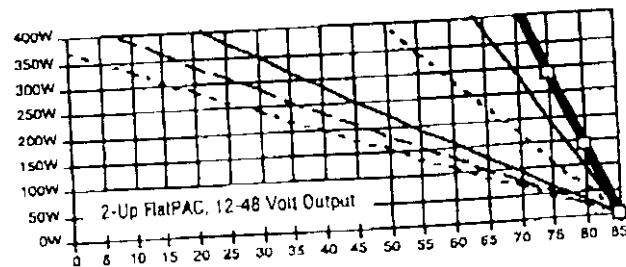
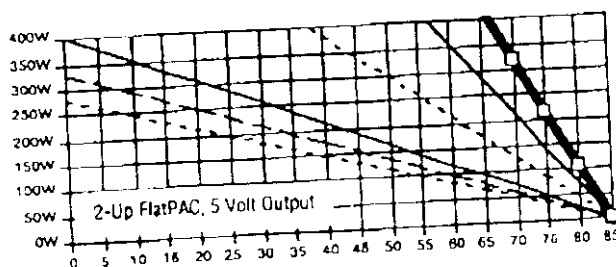
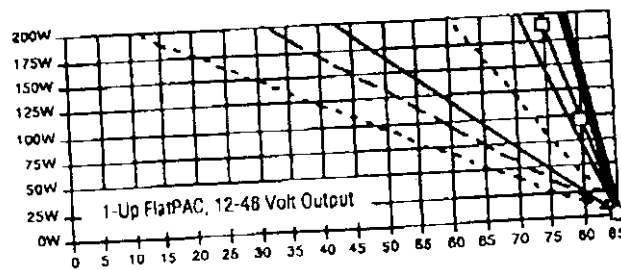
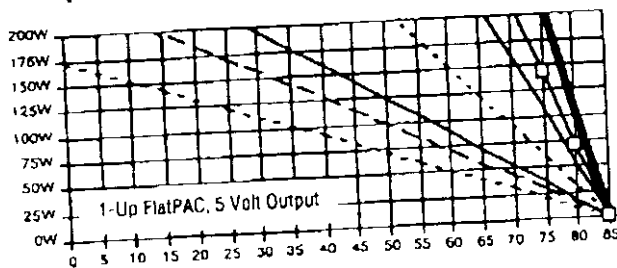
$V_{out} \geq 5V$ $V_{out} < 5V$
S = 300W S = 60A
P = 450W P = 90A
M = 600W M = 120A

Thermal Charts Guide

Free air
50 LFM
100 LFM
250 LFM
500 LFM
750 LFM
1000 LFM

*Please note that "U" indicates autoranging input and applies to all new FlatPAC products. Previously, "F" indicated strappable input and "A" indicated autoranging input. F and A designations are not recommended for new applications.

Output Power vs. Ambient Temperature



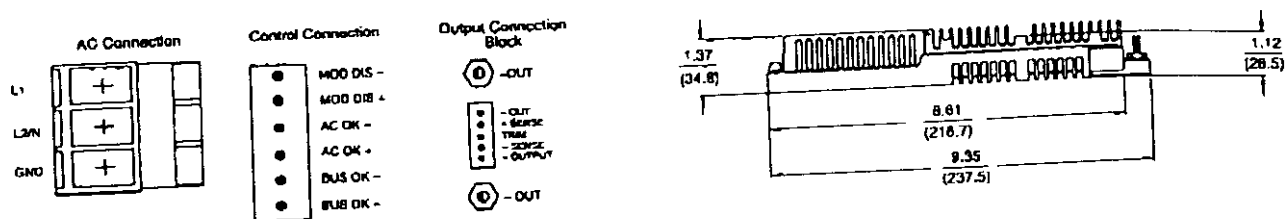
Ambient Temperature °C

Ambient Temperature °C

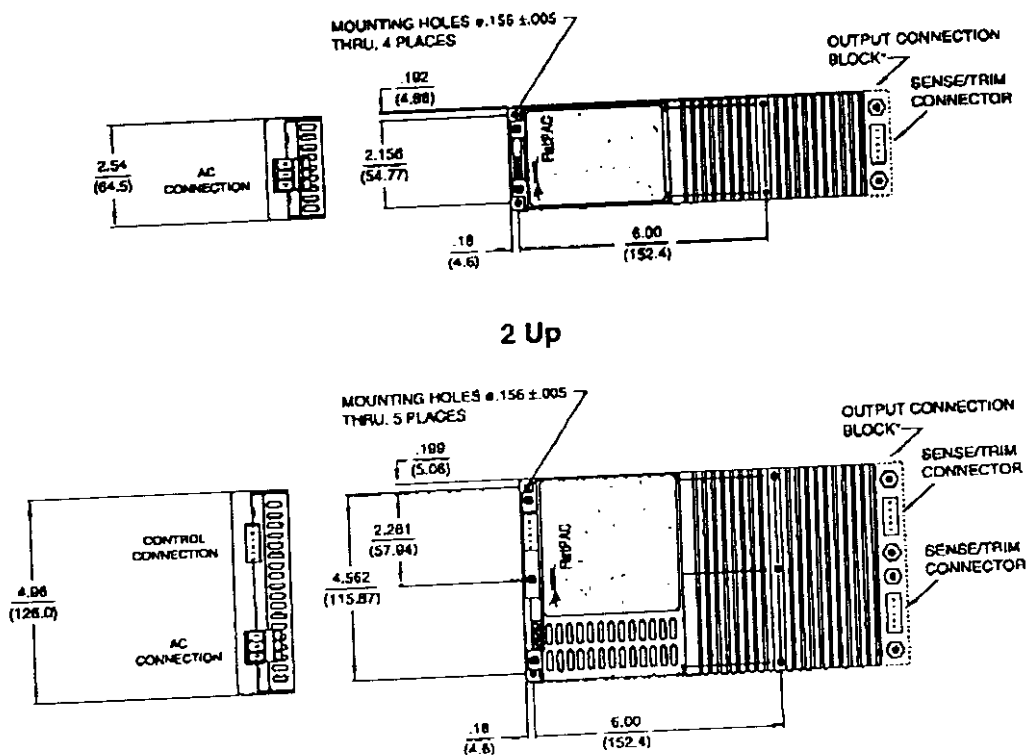
FCC ID: D0063QAMLMBRP-400

FlatPAC Mechanical Diagram

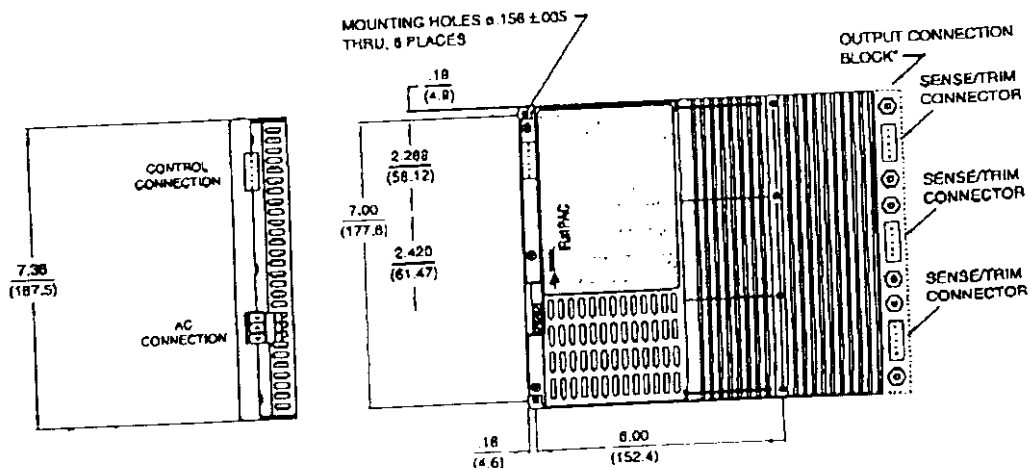
Side View (All Models)



1 Up



3 Up



FCC ID: D0063QAMLMBRP-400

Additional Configurable Products**ComPAC™****DC-DC Switchers, 50-600 Watts**

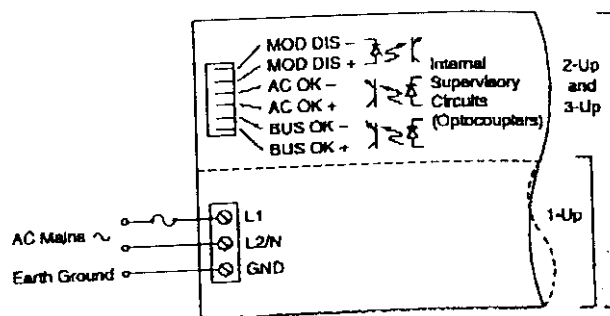
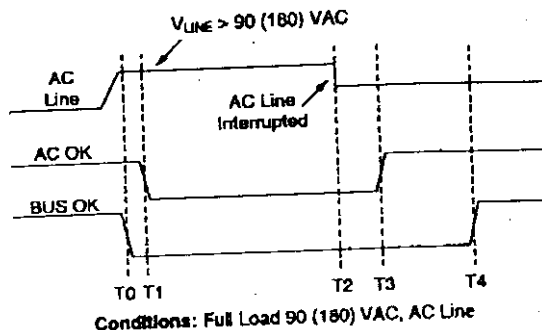
Inputs: 24, 48, and 300 VDC
 Any Output: 1-95 VDC
 User Configurable, Reconfigurable
 UL, CSA, TÜV (IEC 950), VDE
 FCC/VDE Class A
 80-90% Efficiency
 Size: 8.6" x 2.5" x 0.99"
 (1 Up, Single Output)

MegaPAC Family™
AC-DC, DC-DC Switchers
300-2000 Watts

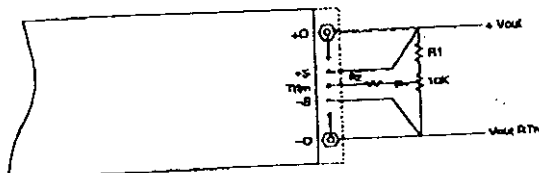
- MegaPAC: 1-16 Outputs, Up to 1600W
- Autoranging, PFC, 3Ø, Mini, DC Input Versions
- 1-20 Outputs, 1-95 VDC
- User Configurable, Reconfigurable
- UL, CSA, TÜV (IEC 950), VDE
- VDE/FCC Class A or Class B
- Fan-Cooled

Mini StakPAC™**AC-DC Switcher, 250 to 600 Watts**

- Inputs: 115/230 VAC, Single-Phase, Field Selectable
- 1-5 Outputs, 1-95 VDC
- Full Power to 40°C; 60°C Operation with Derating
- Power Good/Power Fail Signals
- Logic Enable/Disable
- Size: 12"L x 5.5"W x 1.9"H

Application Circuits**AC Mains Connections****Power Up and Power Down Sequencing**

Time Interval	Min	Typ	Max	Units	Notes
T0-T1	0	0.1	1.0	ms	
T2-T3	0	-	-	ms	
T2-T4	5	-	-	ms	Ride-through time
T3-T4	5	-	-	ms	AC fail warning time

Output Trimming

Resistor Values for Trimming Standard Output Voltages						
Nom. Output Voltage	5V	12V	15V	24V	28V	48V Trim Range
R1(KΩ)	.953	15.8	22.1	41.2	48.7	90.9
R2(KΩ)	90	90	90	90	90	90

For price, delivery, product, accessory or applications assistance, or to simply find out how your system can benefit from Vicor's complete line of Component Power Solutions, contact Vicor Express at (800) 735-6200 or fax us at (508) 475-6715.



Component Solutions For Your Power System
 Vicor Corporation, 23 Frontage Road, Andover, MA 01810

FCC ID: D0063QAMLMBRP-400

Last modified: Dec 18 1996

Enhanced Product

[News Index](#)

Autoranging FlatPAC Power Supply

The enhanced autoranging FlatPAC Switcher includes two new key features: a microprocessor-controlled front end that continuously tracks the AC line to ensure correct strapping of the doubler, and new input/output connectors that enable easier, more secure installation. In addition, autoranging is now standard on all FlatPAC models. The new streamlined design provides greater reliability through the use of fewer parts.

Input and output retrofit adapter kits are available that allow the supervisory terminals of the new FlatPAC to be connected in the same manner as for the earlier style unit.

Available in thousands of variations, configurable FlatPAC switchers provide up to 3 outputs (1 to 95 Vdc) and up to 600W of total power. The low profile package measures 8.6 x (2.5, 4.9, or 7.3) x 1.37 inches. These products are safety approved by UL, CSA, TUV, VDE (0805), EN 60950, and IEC 950, and meet the conducted noise standards of FCC/VDE Classes A and B. Prototype quantities are available with one-week delivery. See the [FlatPAC](#) page in this web site.



FCC ID: D0063QAMLMBRP-400

FlatPAC™

50 to 600 Watt

Autoranging AC-DC
Switchers

Features

- Microcontroller Architecture
- Inputs: 115/230 VAC Autoranging
- VDE/FCC Class A, Class B
- 80-90% Efficiency
- Any Output: 1 to 95 VDC
- Now with Module Disable (2- & 3-up)
- UL, CSA, TÜV, VDE, IEC 950
- Remote Sense and Current Limit
- BUS OK and AC OK
- 40 ms Ride-Through Time (typical)
- OVP and Thermal Shutdown
- One-Up Models: 1 Output;
Up to 200 Watts
- Two-Up Models: 1 or 2 Outputs;
Up to 400 Watts
- Three-Up Models: 1, 2, or 3 Outputs;
Up to 600 Watts

Product Highlights

Vicor's FlatPAC family of user-definable off-line power supplies combines Vicor high frequency DC-DC converters and front-end subassemblies in a set of modular, chassis-mount enclosures. The result is a flexible, economical power solution for systems requiring from 50 to 600 watts of total output power.

FlatPAC switchers incorporate one, two, or three Vicor VI-200 DC-DC Converters in packages of common height and length and three different widths. Each internal converter offers one output, 50-200 watts of power, and output voltage of 1 to 95 VDC. All models feature autoranging input, which automatically senses the input line voltage and sets the power supply's input range accordingly.

FlatPAC's unique modular design allows any of over 10,000 configurations to be assembled from stock components for next-day delivery.

Specifications

(typical at 25°C, nominal line and 75% load, unless otherwise specified)

Input Characteristics

AC Line Input	
Autoranging	90-132/180-264 VAC
Line Frequency	47 to 63 Hz (C-grade and E-grade; 400 Hz optional) 47 to 440 Hz (I-grade)
Inrush Current	
115 VAC Operation	1 up: 16A at peak line; 2 up: 23A at peak line; 3 up: 39 A at peak line
230 VAC Operation	1 up: 32A at peak line; 2 up: 47A at peak line; 3 up: 78A at peak line
Ride-through Time (Full Load)	
90/180 VAC Low Line	5 ms minimum
115/230 VAC Nominal Line	40 ms minimum
AC Fail Warning Time	5 ms minimum (low line, full load)
AC and BUS OK (2-up and 3-up models only)	
Off State	V _{ce} = 70V maximum
On State	V _{cesat} = 0.4V maximum @ 1 mA (1.5 mA max.)
Module Disable (optically isolated LED input; 2-up and 3-up models only)	
Continuous Forward Current	1 mA to 30 mA
Forward Voltage	1.65V max. at 30 mA
Agencies	UL, CSA, TÜV, VDE, IEC 950, CE Marked
Conducted and Radiated	EN 55022-B All Models; 2 up/3 up: VDE 0871
EMI/RFI	Level B
Dielectric Withstand	
	Primary to chassis GND = 3535 VDC Primary to secondary = 4300 VDC Secondary to chassis GND = 750 VDC
Transient Surge	IEC 1000-4-5 Level 3

Output Characteristics (applies to each output individually)

Setpoint Accuracy	±1% maximum (E-grade = 2%)
Line/Load Regulation	±0.2% maximum (E-grade = 0.5%)
Temperature Drift	±0.02%/°C maximum (E-grade = 0.02%/°C typ.)
Efficiency	80-90% (typ.), depending on output voltage
High Trim/Program ¹	110% of V _{nom}
Low Trim/Program ¹	50% of V _{nom}
Peak-to-Peak Ripple	3% max., 20 MHz BW, full load (E-grade = 5%)
Current Limit	115% (typ.) (E-grade = 105-135%)
Short Circuit Limit	20-130% as function of output voltage
OVP Set Point	115-135%, recycle power to restart

Environmental Characteristics/Product Grade Designators

Storage Temperature	-20°C to +100°C (C-grade and E-grade)
	-55°C to +100°C (I-grade)
Operating Temperature	0°C to +85°C (C-grade and E-grade)
	-30°C to +85°C (I-grade)

Warranty	2 years
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¹12V and 15V outputs, standard trim range ±10%. Consult factory for wider trim range.



<http://www.vicor.com>

FCC ID: D0063QAMLMBRP-400

FlatPAC Configuration Chart

Single Outputs	VI-LU* ☐ - ☐ ☐	50-200W	8.6"L x 2.5"W x 1.375"H
	VI-MU ☐ - ☐ ☐	100-400W	8.6"L x 4.9"W x 1.375"H
	VI-NU ☐ - ☐ ☐	450-600W	8.6"L x 7.4"W x 1.375"H
Dual Outputs	VI-PU ☐ ☐ - ☐ ☐ ☐	100-400W	8.6"L x 4.9"W x 1.375"H
	VI-QU ☐ ☐ - ☐ ☐ ☐	250-600W	8.6"L x 7.4"W x 1.375"H
Triple Outputs	VI-RU ☐ ☐ ☐ - ☐ ☐ ☐ ☐	150-600W	8.6"L x 7.4"W x 1.375"H

Input Characteristics

90-135/180-270 VAC
U = Autoranging

Output Voltage

Z = 2V 1 = 12V
Y = 3.3V 2 = 15V
0 = 5V 3 = 24V
M = 10V L = 28V
4 = 48V

1 to 95V, consult factory.

Product Grade

E = 0°C to +85°C Case
C = 0°C to +85°C Case
I = -30°C to +85°C Case

Output Power

V_{OUT} ≥ 5V V_{OUT} < 5V
Y = 50W Y = 10A
X = 75W X = 15A
W = 100W W = 20A
V = 150W V = 30A
U = 200W U = 40A

Output Power

V_{OUT} ≥ 5V V_{OUT} < 5V
W = 100W W = 20A
V = 150W V = 30A
U = 200W U = 40A
S = 300W S = 60A
Q = 400W Q = 80A

Output Power

V_{OUT} ≥ 5V V_{OUT} < 5V
S = 300W S = 60A
P = 450W P = 90A
M = 600W M = 120A

Thermal Considerations

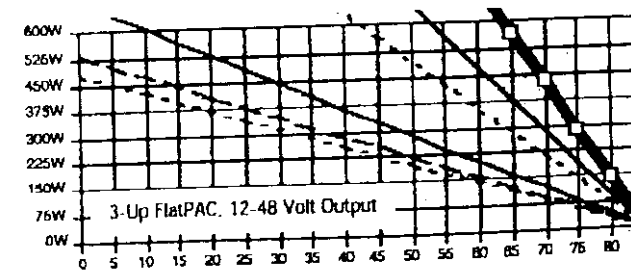
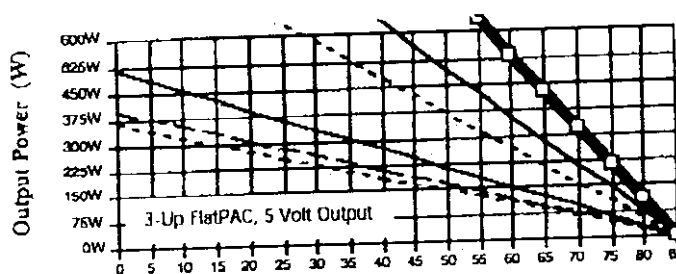
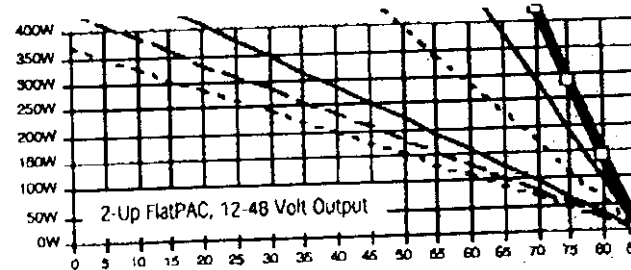
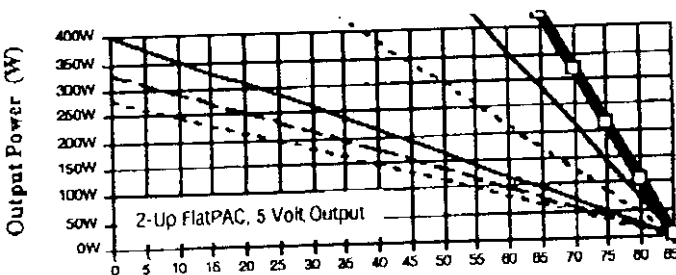
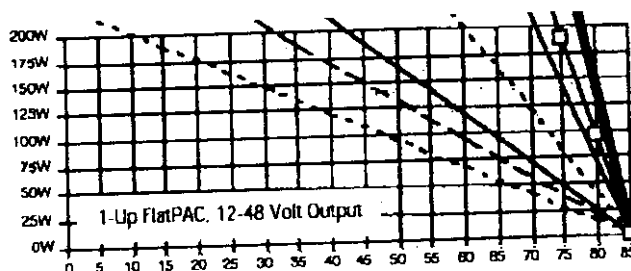
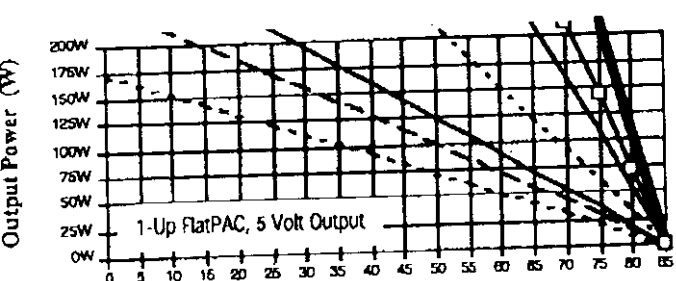
For each FlatPAC model, an "Output Power vs. Ambient Temperature" curve is shown for estimating the maximum output power deliverable in a free convection or forced convection environment. Two curves are given for each frame: one for power delivered from 5V outputs, the other for power delivered from 12-48V outputs. These account for the difference in efficiency as a function of output voltage. For designs where the FlatPAC contains a mix of 5V and higher voltages, the thermal performance may be estimated by interpolation.

Thermal Charts Guide

-----	Free air
-----	50 LFM
-----	100 LFM
-----	250 LFM
-----	500 LFM
-----	750 LFM
-----	1000 LFM

Please note that "U" indicates autoranging input and applies to all new FlatPAC products. Previously, "F" indicated strappable input and "A" indicated autoranging input. F and A designations are not recommended for new applications.

Output Power vs. Ambient Temperature

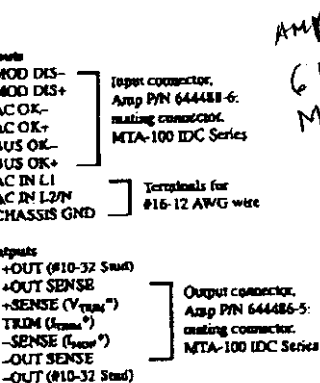


Ambient Temperature °C

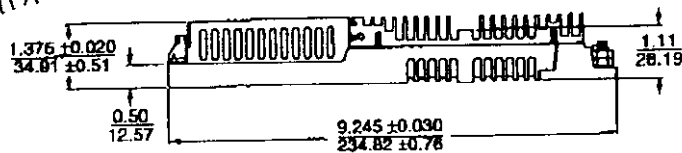
Ambient Temperature °C

FCC ID: D0063QAMLMBRP-400

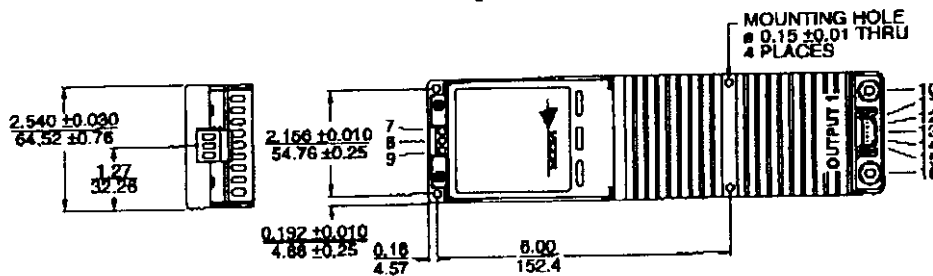
FlatPAC Mechanical Diagram



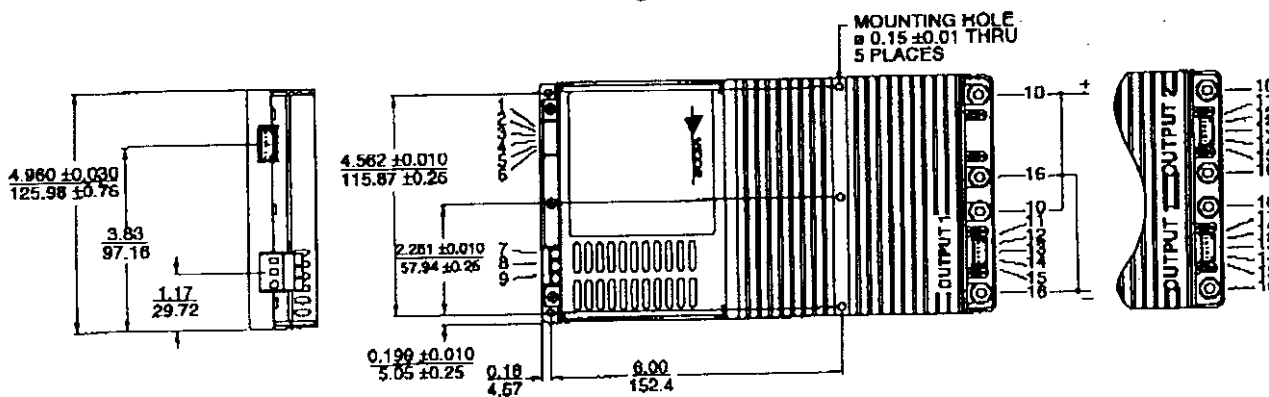
Side View (All Models)



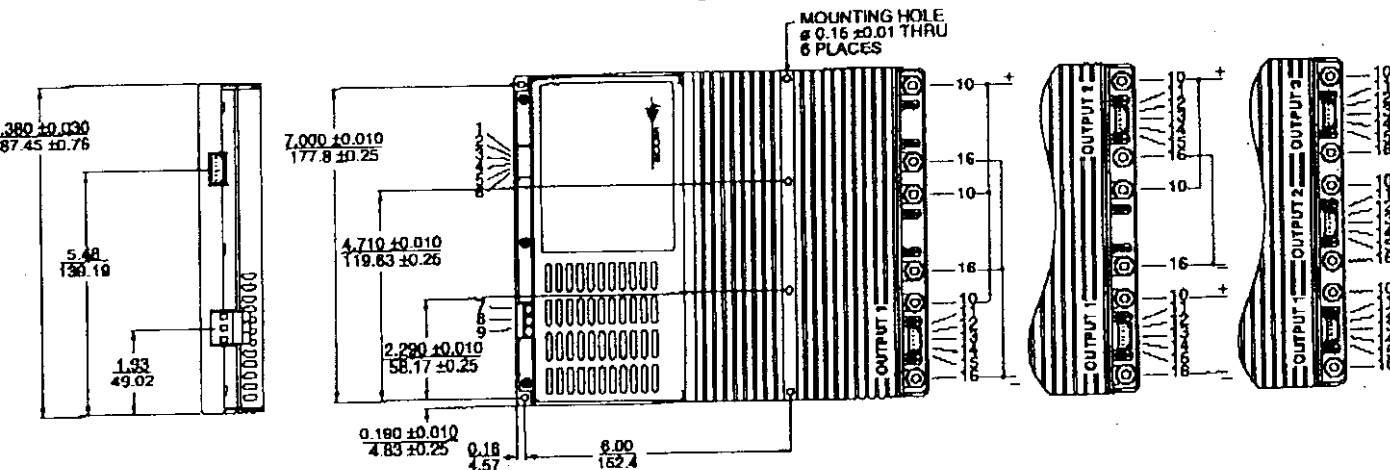
1 Up



2 Up



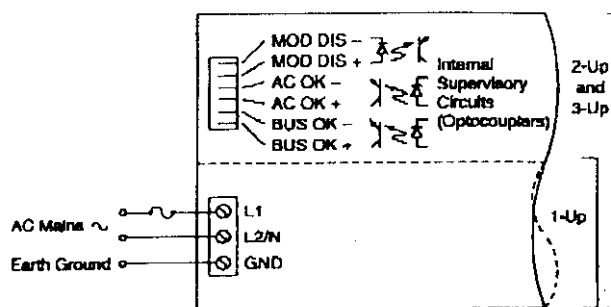
3 Up



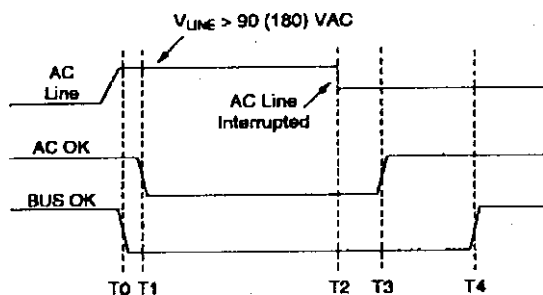
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Additional Configurable Products**ComPAC™****DC-DC Switchers, 50-600 Watts**

Inputs: 24, 48, and 300 VDC
 Any Output: 1-95 VDC
 User Configurable, Reconfigurable
 UL, CSA, TÜV (IEC 950), VDE
 FCC/VDE Class A
 80-90% Efficiency
 Size: 8.6" x 2.5" x 0.99"
 (1 Up, Single Output)

Application Circuits**AC Mains
Connections**
MegaPAC Family™
AC-DC, DC-DC Switchers
300-2000 Watts

MegaPAC: 1-16 Outputs, Up to 1600W
 Autoranging, PFC, 3Ø, Mini,
 DC Input Versions
 1-20 Outputs, 1-95 VDC
 User Configurable, Reconfigurable
 UL, CSA, TÜV (IEC 950), VDE
 VDE/FCC Class A or Class B
 Fan-Cooled

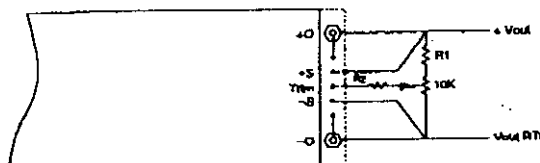
**Power Up and
Power Down
Sequencing**

Conditions: Full Load 90 (180) VAC, AC Line

Time Interval	Min	Typ	Max	Units	Notes
T0-T1	0	0.1	1.0	ms	
T2-T3	0	-	-	ms	
T2-T4	5	-	-	ms	Ride-through time
T3-T4	5	-	-	ms	AC fall warning time

Mini StakPAC™**AC-DC Switcher, 250 to 600 Watts**

Inputs: 115/230 VAC, Single-Phase, Field
 Selectable
 1-5 Outputs, 1-95 VDC
 Full Power to 40°C; 60°C Operation with
 Derating
 Power Good/Power Fail Signals
 Logic Enable/Disable
 Size: 12"L x 5.5"W x 1.9"H

Output Trimming

Resistor Values for Trimming Standard Output Voltages						
Nom. Output Voltage	5V	12V	15V	24V	28V	48V
R1(KΩ)	.953	15.8	22.1	41.2	48.7	90.9
R2(KΩ)	90	90	90	90	90	90

Trim Range
+10%, -10%

For price, delivery, product, accessory or applications assistance, or to simply find out how your system can benefit from Vicor's complete line of Component Power Solutions, contact Vicor Express at (800) 735-6200 or fax us at (508) 475-6715.

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