ComPAC Family

50 to 600 Watt DC-DC Switchers

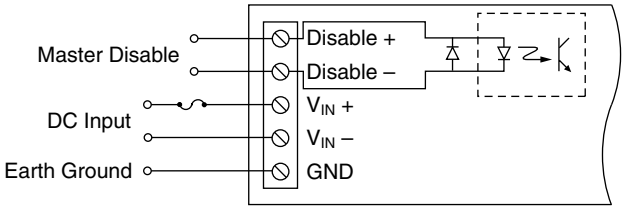
Application Notes
Functional and Mechanical Layout
Installation and Operation Guidelines

Product Description

The ComPAC family of user-definable power supplies provides a complete power solution optimized to meet the voltage, noise, and transient protection input requirements of commercial, industrial, military, and telecommunications applications. These switchers are available with one, two, or three outputs and total output ratings up to 600 Watts. Each unit incorporates one, two, or three component-level Vicor DC-DC converters in a chassis-mount housing. ComPAC's unique modular design accommodates thousands of different configurations.

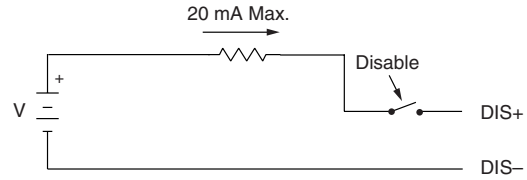
VICOR

Input Connections



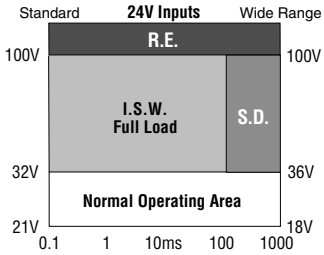
See fuse chart on page 6

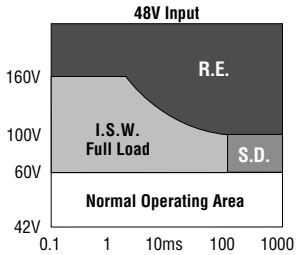
Master Disable Drive Circuit

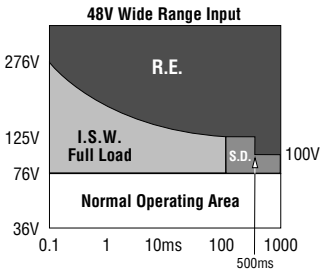


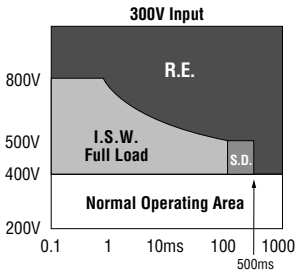
The Master Disable input is optically isolated and incorporates a reverse polarity protection diode. Apply a current of up to 20 mA to disable output(s). See ComPAC data sheet for minimum levels.

Input Operating Voltage









Long Term Safe Operating Curves. I.S.W. = Input Surge Withstand (no disruption of performance, 1% duty cycle max.).
R.E. = Ratings Exceeded. S.D. = Shutdown. For short duration transient capability, refer to product specifications.

Thermal Impedance

Note: Not applicable for conduction cooled (–CC) models.

Below are the chassis-to-air thermal impedance values, as a function of airflow, for ComPAC package configurations that incorporate one, two, and three internal component DC-DC converters.

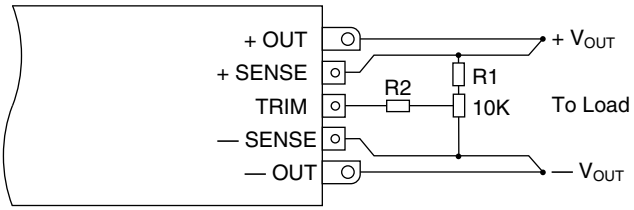
Thermal Impedance—Case-to-Air (°C/Watt)

	Standard Units			With Optional H1 Heatsink		
	1-Up	2-Up	3-Up	1-Up	2-Up	3-Up
Free Air (Horiz.)	3.6	1.7	1.4	2.1	1.3	1.0
Forced Convection Through Heat sink Fins						
50 LFM	2.7	1.4	1.3	1.5	1.1	0.9
100 LFM	2.3	1.3	1.1	1.2	0.9	0.7
250 LFM	1.6	1.0	0.8	0.7	0.5	0.4
500 LFM	1.2	0.7	0.6	0.4	0.3	0.3
750 LFM	0.9	0.5	0.5	0.3	0.2	0.2
1000 LFM	0.8	0.5	0.4	0.2	0.2	0.2

To calculate case temperature: total power dissipated *times* thermal impedance *plus* ambient temperature.
To calculate Watts dissipated per output: output power *divided by* efficiency *minus* output power.

Output Trimming

Trim resistors not required for operation at rated output voltage.



+Sense and –Sense must be connected locally or remotely (shown).

Resistor Values for Trimming Standard Output Voltages

Nominal Output Voltage	5 V	12 V	15 V	24 V	28 V	48 V	Trim Range
R1(KΩ)	.953	15.8	22.1	41.2	48.7	90.9	+10%, -10%
R2(KΩ)	90	90	90	90	90	90	

Refer to Applications Manual, Chapter 5, for other trimming methods.

Functional and Mechanical Layout

LC-Series
Single output
50-200 Watts

MC-Series
Single output
100-400 Watts

NC-Series
Single output
300-600 Watts

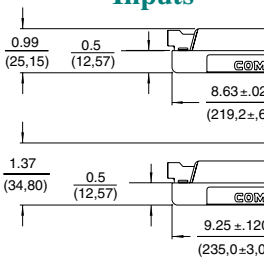
PC-Series
Dual output
100-400 Watts

QC-Series
Dual output
150-600 Watts

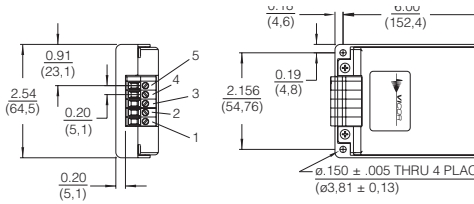
RC-Series
Triple output
150-600 Watts

All Models

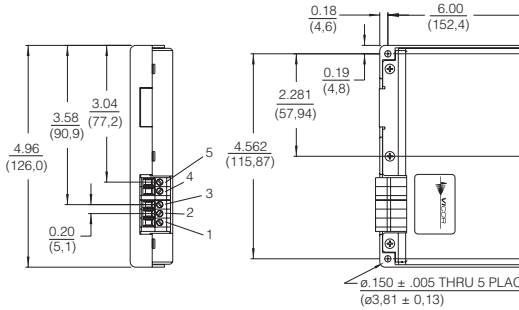
Inputs



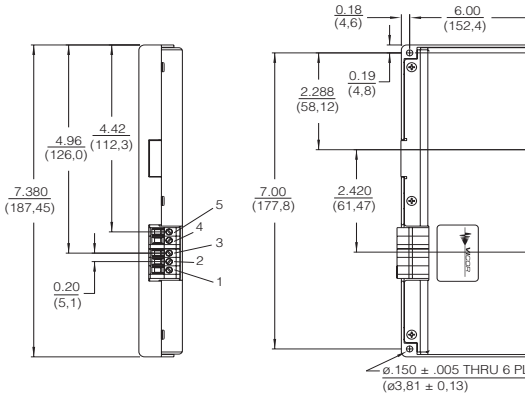
LC-Series



MC-, PC-Series

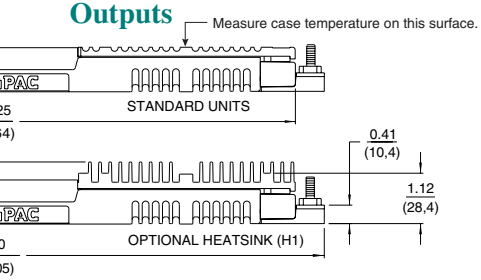


NC-, QC-, and RC-Series



Drawing: P.N. 11926

Outputs



Inputs

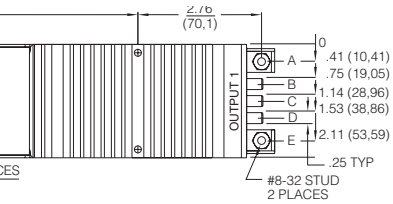
1 Ground
2 $-V_{IN}$
3 $+V_{IN}$
4 –Disable
5 +Disable

Outputs

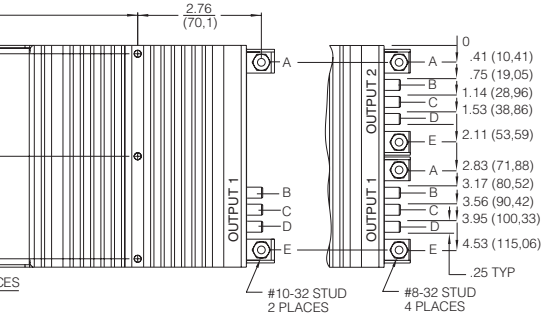
A +Out
B +Sense
C Trim
D –Sense
E –Out

Consult factory for outline drawings of models with conduction cooled (–CC) option.

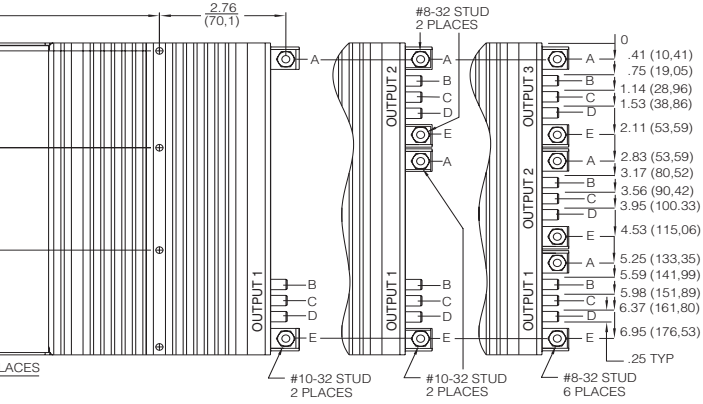
LC-Series



MC-Series PC-Series



NC-Series QC-Series RC-Series



Input Line Fusing. The ComPAC must be fused externally. The table below lists the fuse ratings for one-, two-, and three-up units (max. output 200, 400, and 600 Watts).

VI Series	200 W	400 W	600 W
24 V Input	10 A/32 V (AGC-10)	20 A/32 V (AGC-20)	35 A/32 V (AGC-35)
24 V Wide Input	12 A/32 V (3AB-12)	20 A/32 V (AGC-20)	35 A/32 V (AGC-35)
48 V Input	8 A/60 V (3AB-8)	15 A/60 V (3AB-15)	25 A/60 V (3AB-25)
48 V Wide Input	6 A/100 V (3AB-6)	15 A/100 V (3AB-15)	25 A/100 V (3AB-25)
300 V Input	2 A/250 V (3AB-2)	4 A/250 V (3AB-4)	6 A/250 V (3AB-6)
MI Series	**200 W**	**400 W**	**600 W**
Use MIL-F-15160 or MIL-F-23419 equivalents of the commercial fuses listed below.			
28 V Input	10 A/250 V (3AB-10)	20 A/250 V (3AB-20)	30 A/125 V (3AB-30)
270 V Input	2 A/250 V (3AB-2)	4 A/250 V (3AB-4)	6 A/250 V (3AB-6)

Grounding. For safe operation, the ComPAC unit must be grounded. Connect a ground lead to the terminal marked ⏚ (GND). Use the same wire gauge as that specified for your ComPAC unit's input voltage connections, below.

Input Voltage Connections. Connect the line voltage to V_{IN}+ (positive) and V_{IN}– (negative). For one-up ComPAC models (max. output 200 W), use #16 input wire; for two-up and three-up models (max. output 400 W and 600 W), use #14 input wire. Be sure to tighten the lead connections securely—recommended connector screw torque is 3.5 in-lbs (0.4 N-m). Recommended strip length is 9 mm.

Output Wire Gauge. Use the output wire gauge that corresponds to the output current of your ComPAC unit, below:

105 A–160 A : #4	26 A–40 A : #10	7 A–10 A : #16
66 A–104 A : #6	16 A–25 A : #12	4 A–6 A : #18
41 A–65 A : #8	11 A–15 A : #14	0 A–3 A : #20

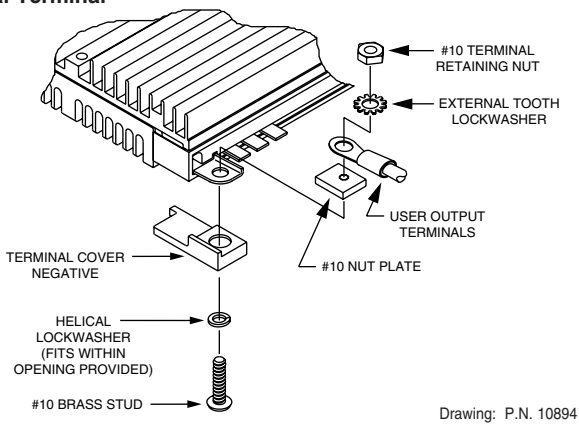
Output Voltage Trimming. Do not trim the outputs higher than 110% of their nominal output voltage. When an output is trimmed up, do not exceed its maximum rated output power.

Operating Temperature. Do not allow the ComPAC to exceed its maximum operating temperature, which is reached when the heat sink/–CC plate is 85°C. (Full power can be delivered up to this temperature.) Heat sink temperature is a function of the output power and voltage of the supply, ambient temperature, and airflow across the heat sink. Refer to the Vicor Applications Manual to determine the maximum ambient temperature for your application. Always use worst-case conditions when calculating operating temperature.
Note: To ensure proper heat transfer from the internal module(s) to the heat sink, the mounting holes through the heat sink (2, 3, and 4 holes on one-, two-, and three-up models, respectively) must contain properly torqued screws at all times during operation, whether or not the unit is mounted.

If the unit is operated unmounted, insert a #6 or metric flathead screw through each hole from below and secure with a nut on top, torqued to 6 in-lbs (0.7 N-m). A thermal interface material is recommended for –CC models – consult factory.

Output Terminal Connections. A hardware kit with parts for output terminal connections is provided with each ComPAC unit. The following drawing shows the assembly of those parts for the proper connection of metal power terminals. Assembly for PCB power terminals is the same except that they do not require an external tooth lockwasher. Consult the table below for the recommended torque level for each stud size.

Metal Terminal



Drawing: P.N. 10894 #1

Terminal and Product Model	*Terminal Style*	*Stud Size*	*Recommended Torque*
–Output, +Output			
LC-, PC-, & RC-Series	PCB	8-32 UNC	10 in-lbs (1.1 N-m)
MC- & NC-Series	Metal	10-32 UNC	15 in-lbs (1.7 N-m)
QC-Series	PCB Metal	8-32 UNC 10-32 UNC	10 in-lbs (1.1 N-m) 15 in-lbs (1.7 N-m)
Supervisory All models	Sized to accept AMP Faston® insulated receptacle #2-520184-2		

For More Information

The Vicor Applications Manual and product data sheet contain complete information about ComPAC DC-DC Switchers. To receive literature or to consult an applications engineer about installation or operation of this product, contact your nearest Vicor office. (See page 8.)

(Bitte lesen Sie die Sicherheits-Vorschriften auf Seite 8.)

Absicherung am Eingang. Das ComPAC muß mit einer externen Sicherung am Eingang versehen werden. Die entsprechenden Sicherungswerte entnehmen Sie bitte der Tabelle auf Seite 6 unter der Rubrik “Input Line Fusing”.

Erdung. Um den IEC 950 Klasse I Erdungsforderungen zu entsprechen, muß ein Erdungskabel an den Anschluß ⏚ (GND) angeschlossen werden. Für ComPAC Modelle mit einem Modul (max. Leistung 200 W) benutzen Sie bitte AWG 16- und für Modelle mit 2 und 3 Modulen (max. Leistung 400 W und 600 W) AWG 14-Kabel.

Anschlüsse Eingangsspannung. Vergewissern Sie sich, daß die Kabel für die Eingangsspannung fest angeschlossen sind und achten Sie auf die Polarität.

Betriebstemperatur. Die maximale Betriebstemperatur des ComPAC-Gerätes darf nicht überschritten werden. Dies ist gegeben, wenn der Kühlkörper eine Temperatur von 85 Grad Celsius erreicht hat.

Weitere Informationen. Das Vicor Applications Manual und Produkt-Datenblätter enthalten ausführliche Informationen über ComPAC DC-DC Wandler. Fordern Sie bitte Unterlagen bei Vicor oder Ihrer nächsten Vicor Vertretung an.

Visit the Vicor website at:
www.vicorpower.com

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