The ComPAC™ Family

DC-DC Switching Power Supplies

Overview

The ComPAC is a low profile, highly efficient, high density configurable DC-DC power solution with EMC filtering, transient protection and reverse polarity protection. It has an isolated master disable input for remote shutdown, and provides outputs from 1-95Vdc and power up to 600W.

Features

- EMI Filtering
- Transient Protection
- Reverse Polarity Protection
- Inrush Limiting
- UL, CSA, TÜV, VDE Approval
- CE Marked

There are five input voltages available which comply with telecommunication and industrial control EMC specifications: Refer to datasheet for applicable standards.

Nominal Input Voltage	Input Designator	Input Voltage Range
24	1	21.7-32
24 (wide)	W	18.7-36
48	3	42-60
48 (wide)	N	36-76
300	6	200-400

There are two military input voltages available which comply with military EMC specifications and the transient and spike specifications. Refer to datasheet for applicable standards.

Nominal Input Voltage	Input Designator	Input Voltage Range
28	2	18-50
270	6	125-400

ComPACs can be configured in 1-up, 2-up or 3-up packages with total output power limited to the maximum power of individual VI-200 or MI-200 series converters. Output voltages may be trimmed by the user.

Output Power

The maximum total power which is delivered from the ComPAC is:

Nominal Input Voltage	Total Output Power 1-Up	2-Up	3-Up
24V and 24V (wide)	150W	300W	450W
28V, 270V (military)	100W	200W	300W
48V and 48V (wide), 300V	200W	400W	600W

Dimensions and Mechanical Mounting

See page 18-6.

Features (cont)

Weight
1-up: 1.2 lbs (540g); 2-up: 2.4 lbs (1080g); 3-up: 3.6 lbs (1630g)

Operating Case Temperature
E-Grade = -10˚C to +85˚C
C-Grade = -25˚C to +85°C
I-Grade = -40˚C to +85°C
M-Grade = -55˚C to +85°C

Thermal Data
Operating Ambient Temperature: Depends on factors such as output power, availability of forced air, and mounting technique. Do not allow the ComPAC to exceed its maximum operating temperature, which is reached when the case is 85˚C. (Full power can be delivered up to this temperature.) Refer to Section 24, *Thermal Curves*, to determine the maximum ambient temperature for your application.

NOTE: To ensure proper heat transfer from the internal module(s) to the heatsink, the mounting holes through the heatsink must be properly torqued at all times during operation. If the unit is operated unmounted, insert a #4-40 or metric M3 flathead screw through each hole from below and secure with a nut on top, torqued to 6 lb-in (0.83 N-m).

Thermal Impedance, Free Convection
Thermal resistance baseplate to air (˚C/W):

	1-Up	2-Up	3-Up
Vertical Mounting	2.44	1.17	0.76
Horizontal Mounting	3.6	1.7	1.35

Forced Convection
Thermal resistance baseplate to air (horizontal mount):

Thermal Resistance (°C/W)			Airflow (LFM)
1-Up	**2-Up**	**3-Up**	
3.6	1.7	1.35	0
2.7	1.4	1.26	50
2.3	1.3	1.11	100
1.6	0.97	0.82	250
1.15	0.70	0.58	500
0.9	0.54	0.46	750
0.78	0.45	0.38	1000

NOTE: A higher heatsink, option H1, is available; consult factory.

Overall Efficiency
The overall efficiency of the ComPAC is approximately 1% less than the efficiency of the Vicor DC-DC converters (typical efficiencies: 77% for 2V output, 81% for 5V output and 83% for 12V-48V output).

Features (cont)

EMC Performance, Conducted EMC
The ComPAC will conform to the following conducted EMC specifications on the input power leads:

Telecom (24V and 48V inputs): Bellcore TR-TSY-000513, Issue 2 July 1987 and Rev. 1, December 1988. British Telecom Document BTR2511, Issue 2.
Commercial (300V input): FCC Pt. 15 Subpt. J, Class A/VDE 0871 Class A.
Military (28V, 270V): MIL-STD-461C Conducted Emissions: CE01, CE03, CE07
Conducted Susceptibility: CS01, CS02, CS06

Radiated EMC
The ComPAC will conform to the following radiated specifications:

Military: Radiated Emissions: RE02; Radiated Susceptibility: MIL-STD-461C, RS02, RS03.

Input Transient Protection
The input transient protection will suppress short term transients appearing on the input line. Refer to datasheet for applicable standards.

Input Surge Withstand
The 24V, 48V and 300V input ComPAC shall withstand, without damage or interruption of power, an input line surge shown below for a duration of 100 ms from a source impedance of 500 milliohms.

Extended Input OV Shutdown
Surge protection shall also shut down the ComPAC in the presence of sustained input surges (>100 ms) which would cause excessive dissipation or damage. The ComPAC will auto restart when the input overvoltage is removed.

Input Reverse Polarity Protection
The input of the ComPAC is protected against reverse polarity. No damage will occur provided that external current limiting is present (i.e., fuse).

Output Short Circuit Protection
Output short circuit protection is provided by the current limiting of the Vicor DC-DC converters.

Undervoltage Lockout
The ComPAC incorporates an undervoltage lockout which will inhibit the output of all converters until the input line exceeds the brownout voltage specified for the converter input range.

Features (cont)

Nominal Input	UV Lockout (Vdc, typical)
24	19
24 (wide)	17
28 (military)	17
48	41
48 (wide)	35
270 (military)	121
300	188

Following startup, the undervoltage lockout will inhibit the converter output(s) should the input drop roughly 8-10V below the UV lockout limits stated above.

Recommended 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 600W).

Input Voltage	Fuse Rating		
	1-Up	2-Up	3 Up
24V	10A/32V	20A/32V	30A/32V
24V (wide)	12A/32V	20A/32V	30A/32V
28V (military)	10A/250V	20A/250V	30A/125V
48V	8A/60V	15A/60V	25A/60V
48V (wide)	6A/100V	15A/100V	25A/100V
270V (military)	2A/250V	4A/250V	6A/250V
300V	2A/250V	4A/250V	6A/250V

Recommended Input Wiring and Torque

1 up	#16 AWG	10 in-lb
2 up, 3 up	#14 AWG	15 in-lb

Recommended Output Wiring
Use the output wire gauge that corresponds to the output current of the ComPAC unit:

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

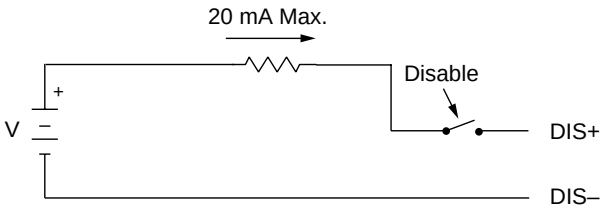
Grounding
For safe operation, the ComPAC unit must be grounded. Connect a ground lead to the terminal marked (GND). Use the same wire gauge as that specified for your ComPAC unit's input voltage connections.

Features (cont)

Master Disable

The ComPAC incorporates an optically isolated Master Disable input which will shut down the ComPAC output when a current is driven through the disable terminals.

Figure 1. ComPAC Module Disable



Disable Current

- 4 mA DC minimum for 1 Up ComPAC
- 8 mA DC minimum for 2 Up ComPAC
- 12 mA DC minimum for 3 Up ComPAC

Trimming

The nominal output voltage of the ComPAC can be adjusted from 110% to 50% of nominal voltage. Refer to *Output Voltage Trimming*, Section 5, for external resistor values. Do not trim the outputs higher than 110% of their nominal output power (output overvoltage protection may trigger). When the output is trimmed up, do not exceed its maximum rated output power.

NOTE: 10V, 12V, and 15V outputs, standard trim range ±10%. Consult factory for wider trim range.

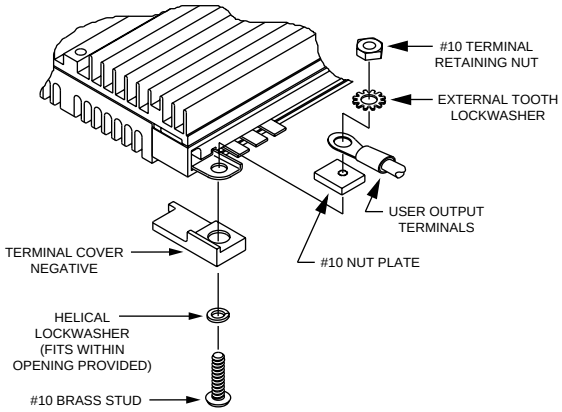
Remote Sensing

+Sense and -Sense must be connected locally or remotely.

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.

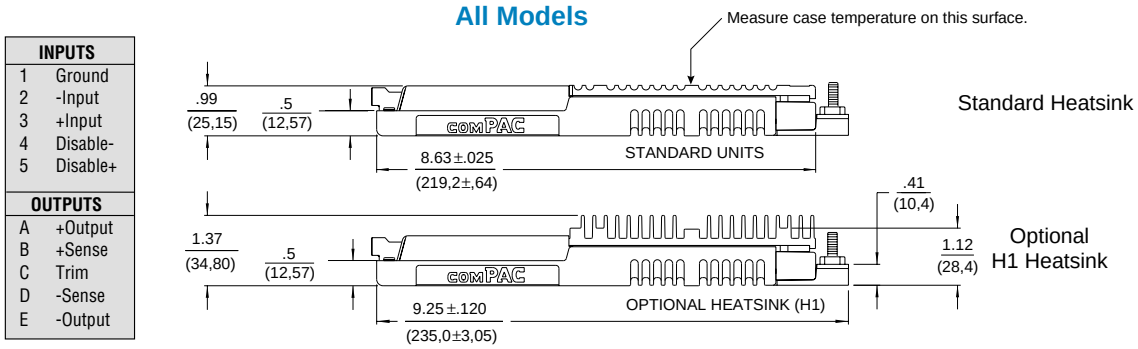
Figure 2. Output Terminal Connections



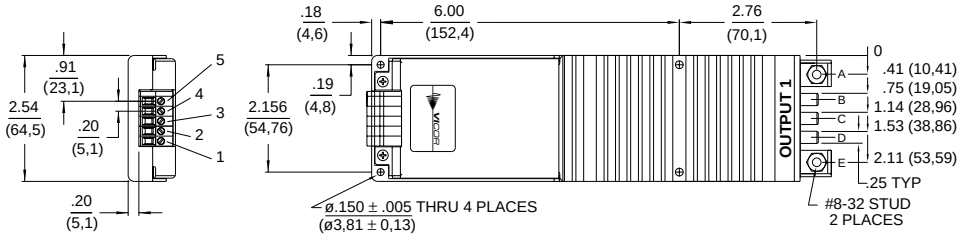
Terminal and Product Model	Terminal Style	Stud Size	Recommended Torque
-Output, +Output			
LC, PC, RC Series	PCB	8-32 UNC	10 in-lbs (1.1 N-m)
MC and NC Series	Metal	10-32 UNC	15 in-lbs (1. 7 N-m)
QC Series	PCB	8-32 UNC	10 in-lbs (1.1 N-m)
	Metal	10-32 UNC	15 in-lbs (1.7 N-m)
Supervisory: All Models	Sized to accept Amp Faston© insulated receptacle #2-520184-2.		

Mechanical Drawings

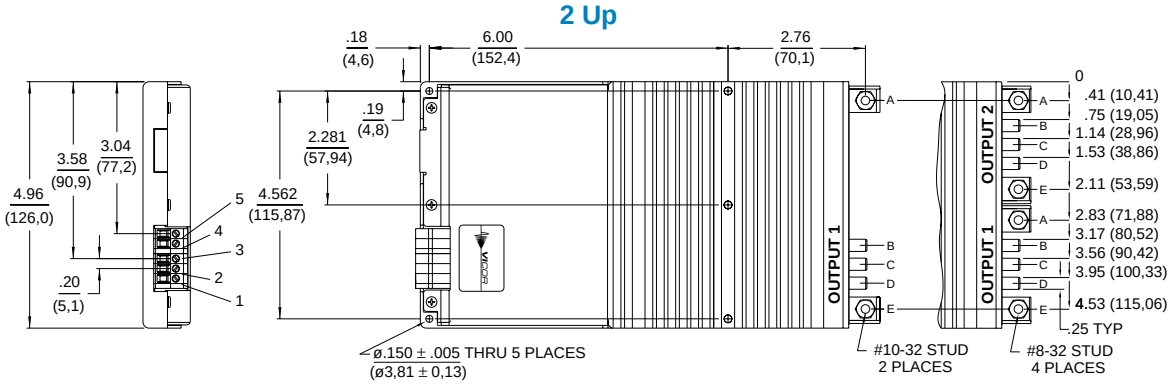
All Models



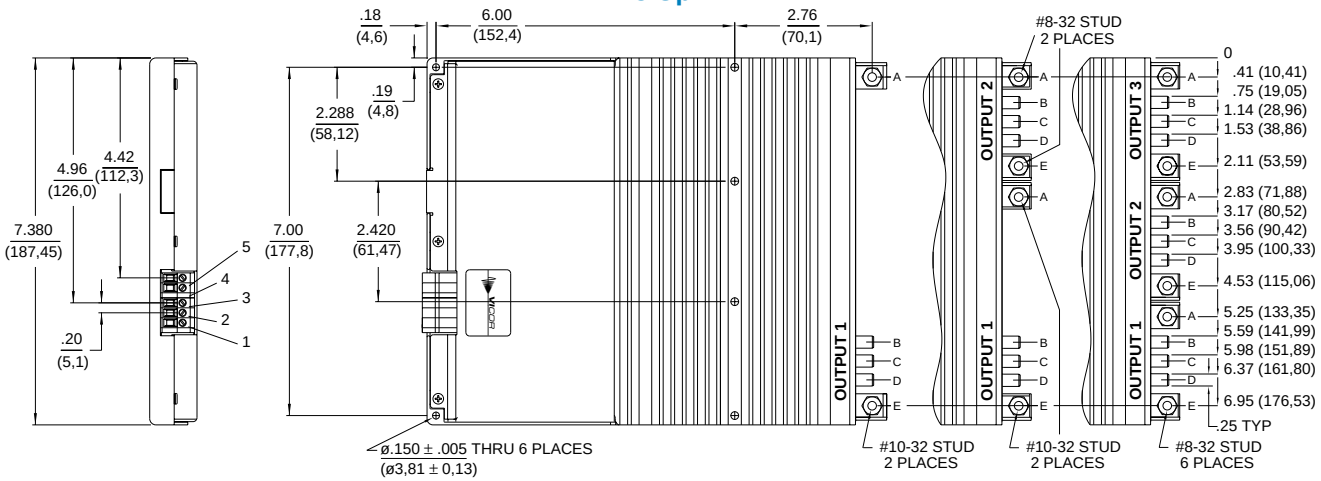
1 Up



2 Up



3 Up



Supervisory:	Sized to accept Amp Faston© insulated
All Models	receptacle #2-520184-2.