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 w disable input for remote shut down, and provides outputs from 1 – 95V_{DC} and power-up to 600W.

There are five input voltages available which comply with telecommunication and industrial control EMC specifications. Refer to data sheet for applicable standards at vicorpower.com.

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

There are two military input voltages available which comply with military EMC specifications and the transient and spike specifications. Refer to data sheet for applicable standards at vicorpower.com.

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

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

Weight:

1-Up: 1.2lbs [540g]
2-Up: 2.4lbs [1,080g]
3-Up: 3.6lbs [1,630g]

Operating Case Temperature:

E-Grade: –10 to +85°C
C-Grade: –25 to +85°C
I-Grade: –40 to +85°C
M-Grade: –55 to +85°C

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 12 – 48V output).

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

- Telecom (24V, 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 data sheet for applicable standards at vicorpower.com.

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 100ms from a source impedance of 500mΩ.

Extended Input OV Shut Down: Surge protection shall also shut down the ComPAC in the presence of sustained input surges (100 – 1,000ms) which would cause excessive dissipation or damage. The ComPAC will auto restart when the input overvoltage is removed.

Input Reverse Polarity Protection: The ComPAC's input 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.

Nominal Input Voltage	Undervoltage Lockout (V_{DC}, Typical)
24V	19
24V (wide)	17
28V	17
48V	41
48V (wide)	35
270V	121
300V	188

Following startup, the undervoltage lockout will inhibit the converter output(s) should the input drop roughly 8 – 10 V 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 (maximum output 200, 400 and 600W).

Nominal 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	10A / 250V	20A / 250V	30A / 125V
48V	8A / 60V	15A / 60V	25A / 60V
48V (wide)	6A / 100V	15A / 100V	25A / 100V
270V	2A / 250V	4A / 250V	6A / 250V
300V	2A / 250V	4A / 250V	6A / 250V

Recommended Input Wiring and Torque

Configuration	Wiring	Torque
1-Up	#16AWG	10in·lb
2-Up	#14AWG	15in·lb

Recommended Output Wiring

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

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

Long cable runs, or wires in large bundles will require heavier cable to avoid excessive voltage drops or overheating.

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.

Overall Disable

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

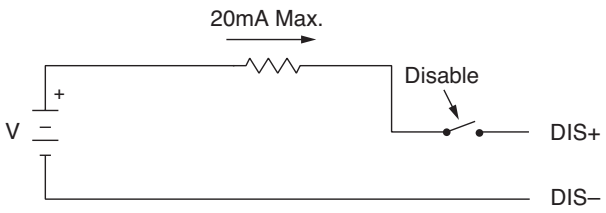


Figure 17.1 — *ComPAC module disable*

Disable Current

- 4mA DC minimum for 1-up ComPAC
- 8mA DC minimum for 2-up ComPAC
- 12mA 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.

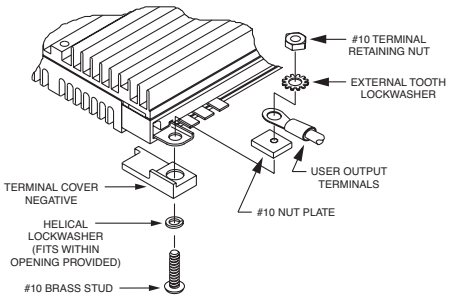
NOTE: 10V, 12V and 15V outputs, standard trim range ±10%, 3.3V output trim range 2.20 – 3.63V.

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. See Figure 17.2 for the recommended torque level for each stud size.



Terminal and Product Model	Terminal Style	Stud Size	Recommended Torque
–OUT, +OUT Terminals			
LC, PC, RC Series	PCB	8-32 UNC	10in·lbs [1.1N·m]
MC and NC Series	Metal	10-32 UNC	15in·lbs [1.7N·m]
QC Series	PCB Metal	8-32 UNC 10-32 UNC	10in·lbs [1.1N·m] 15in·lbs [1.7N·m]
–SENSE, +SENSE, TRIM Terminals			
All models	Sized to accept Amp Faston® insulated receptical #2-520184-2.		

Figure 17.2 — *Output terminal connections*

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. Temperature measured at center of heat sink. (Full power can be delivered up to this temperature.) Refer to Section 21, Thermal Curves, to determine the maximum ambient temperature for your application.

Note: To ensure proper heat transfer from the internal module(s) to the heat sink, the mounting holes through the heat sink must be properly torqued at all times during operation. If the unit is operated unmounted, insert a #6 or metric M3.5 flathead screw through each hole from below and secure with a nut on top, torqued to 6lb·in [0.83N·m].

Thermal Impedance, Free Convection:
Thermal resistance baseplate to air.

Mounting Type	Thermal Resistance (°C / W)		
	1-Up	2-Up	3-Up
Vertical	2.44	1.17	0.76
Horizontal	3.60	1.70	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	1,000

Note: A 1.37in [34,8mm] heat sink, option H1, is also available.