

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 – 95 Vdc and power-up to 600 W.

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

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
28 V	2	18 – 50
270 V	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
24 V and 24 V (wide)	150 W	300 W	450 W
28 V, 270 V (military)	100 W	200 W	300 W
48 V and 48 V (wide), 300 V	200 W	400 W	600 W

Weight.

- 1-Up: 1.2 lbs (540 g)
- 2-Up: 2.4 lbs (1,080 g)
- 3-Up: 3.6 lbs (1,630 g)

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

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 2 V output, 81% for 5 V output and 83% for 12 – 48 V output).

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

- Telecom (24 V, 48 V inputs): Bellcore TR-TSY-000513, Issue 2 July 1987 and Rev. 1, December 1988. British Telecom Document BTR2511, Issue 2.
- Commercial (300 V input): FCC Pt. 15 Subpt. J, Class A / VDE 0871 Class A.
- Military (28 V, 270 V): 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 24 V, 48 V and 300 V 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 Shut Down. Surge protection shall also shut down the ComPAC in the presence of sustained input surges (100 – 1,000 ms) 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	UV Lockout (Vdc, Typical)
24 V	19
24 V (wide)	17
28 V (military)	17
48 V	41
48 V (wide)	35
270 V (military)	121
300 V	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 600 W).

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

RECOMMENDED INPUT WIRING AND TORQUE

1-Up	#16 AWG	10 in-lb
2-Up	#14 AWG	15 in-lb

RECOMMENDED OUTPUT WIRING

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

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

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.

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.

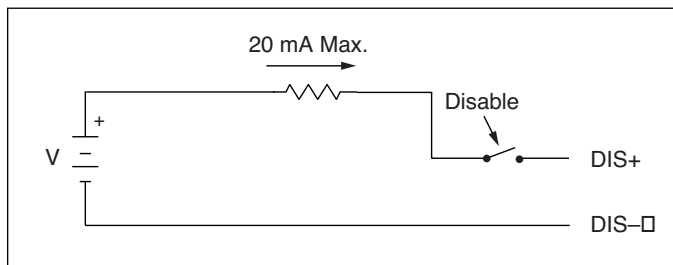


Figure 17-1 — ComPAC module disable

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.

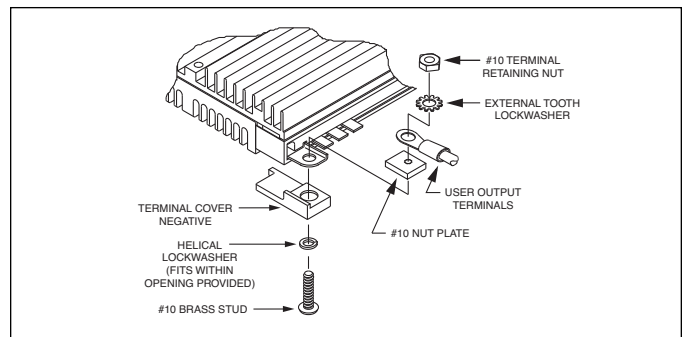
NOTE: 10 V, 12 V, and 15 V outputs, standard trim range $\pm 10\%$, 3.3 V output trim range 2.20 to 3.63 V.

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	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)
+ / – SENSE, TRIM Terminals			
All Models	Sized to accept Amp Faston® insulated receptacle #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 20, [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 6 lb-in (0.83 N-m).

Thermal Impedance, Free Convection.

Thermal resistance baseplate to air (°C/W):

Type of Mounting	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 1.37" (34,8 mm) heat sink, option H1, is also available.