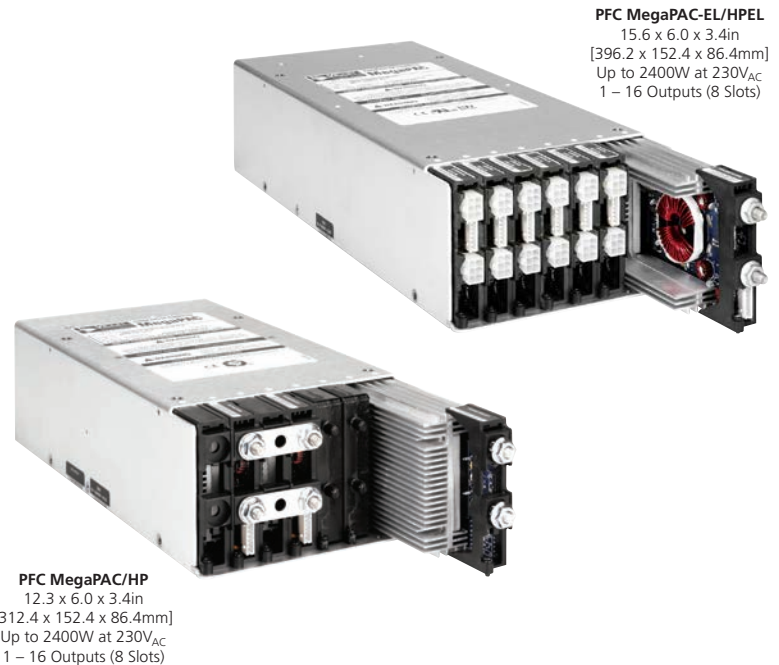


User- and Field-Configurable Power Supplies

Features & Benefits

- AC inputs available: 85 – 264V_{AC}, 208 / 240V_{AC} 3-Phase
- Power factor corrected (some models)
- Up to 4kW
- DC inputs available: 100 – 380V_{DC}
- User and field configurable
- Compact sizes as small as 3.4 x 6.0 x 9.5in [86.4 x 152.4 x 241.3mm]
- Fan cooled
- Efficiency >80%
- Up to 20 regulated outputs (up to 10 slots) from 1 to 95V_{DC} and above
- Full power to 45°C on most products
- OVP, OTL, OCP on most outputs
- Autosense
- Power fail warning
- Sequencing and general shut down
- Agency approved cTÜVus, CE Marked
- Current Sharing
- Low leakage option available (some models)



Product Description

The MegaPAC family of products offers four different versions of user configurability to meet almost any set of input and output requirements. Leveraging Vicor modular DC-DC converters, MegaPAC family products combine feature-laden front ends with slide-in output assemblies called ConverterPACs.

User configurability is at the heart of every MegaPAC. A wide variety of the same length ConverterPACs™ can be installed, exchanged or removed with the turn of just one screw. This means the MegaPAC can be reconfigured to meet evolving power requirements. Given its range of configurability, the MegaPAC is appropriate for virtually any application from prototype through production.

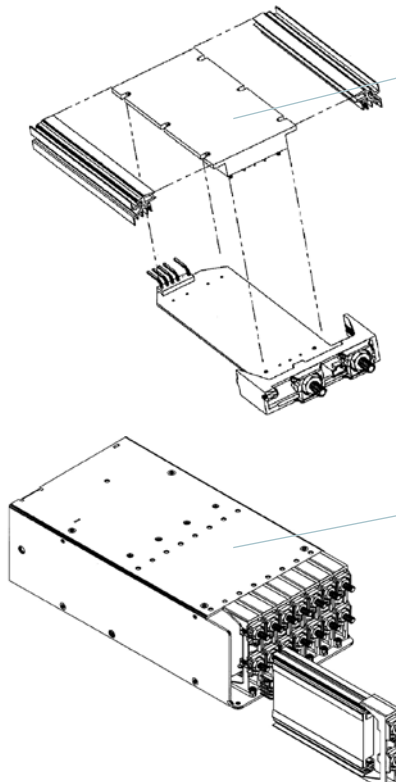
MegaPAC Family

Model	Dimension	Input Voltage	Output Power	Number of Outputs	ConvertPACs™ Per Slot
Mini MegaPAC™	9.5 x 6.0 x 3.4in [241.3 x 152.4 x 86.4mm]	90 – 132 / 180 – 264V _{AC} Strappable 260 – 380V _{DC}	1,000W @ 115V _{AC} or 230 Vac	1 – 10 (5 slots)	ModuPAC™, JrPAC™, DualPAC™, RamPAC™, BatPAC™
PFC MegaPAC-EL/HPEL™ [a]	15.6 x 6.0" x 3.4in [396.2 x 152.4 x 86.4mm]	85 – 264V _{AC} 100 – 380V _{DC}	1,200W @ 115V _{AC} 2,400W @ 230V _{AC}	1 – 16 (8 slots)	QPAC™, DualQPAC™, JrQPAC™, FinQPAC™ ^[b] (FinQPAC requires 2 slots)
PFC MegaPAC/HP™	12.3 x 6.0 x 3.4in [312.4 x 152.4 x 86.4mm]	85 – 264V _{AC} 100 – 380 Vdc	2,400W @ 230V _{AC} 1,200W @ 115V _{AC}	1 – 16 (8 slots)	ModuPAC, JrPAC, DualPAC, RamPAC, BatPAC, FinPAC™ ^[a] (FinPACs require 2 slots)
4kW MegaPAC™	14.0 x 7.5 x 4.9in [355.6 x 190.5 x 124.5mm]	208 or 240V _{AC} Three Phase 260 – 352V _{DC}	4,000W – 3 phase	1 – 20 (10 slots)	ModuPAC, JrPAC, DualPAC, RamPAC, BatPAC, UniPAC™ ^[b]

[a] Low noise ripple for EL power supplies is 10mV_{P-P} or 0.15% whichever is greater.

[b] ConverterPACs with Maxi module

MegaPAC Configuration



DC-DC Converter

At the heart of every MegaPAC are Vicor zero-current switching, DC-DC converters. The modularity of the design combined with the breadth of the product line means virtually any output voltage can be provided.

ConverterPAC

ConverterPACs are the slide-in output assemblies that allow each MegaPAC to be easily configured to user-specified output requirements. Using the Vicor DC-DC converter, up to 600W of output power can be provided per ConverterPAC. Larger power needs are easily handled by paralleling ConverterPACs.

MegaPAC

Each MegaPAC houses an array of user-selected ConverterPACs to provide a customized power supply. Using a different front end for each product line, almost any input power can be accommodated. The result is a customized power supply with off-the-shelf delivery.

Performance Specifications

Typical at 25°C, nominal line and 75% load, unless otherwise specified

Parameter	PFC MegaPAC™, PFC MegaPAC-HP™, PFC MegaPAC-HPEL™, PFC MegaPAC-EL™	Mini MegaPAC™	4kW MegaPAC™
Input Characteristics			
Input	85 – 264V _{AC}	115 – 230V _{AC} , Strappable	208 / 240V _{AC} , 3-phase, 4 wire 180 – 264V _{AC} 1-phase
Standard Line	47 – 500Hz		
Vantage Line	47 – 63Hz		
	100 – 380V _{DC}	260 – 380V _{DC}	260 – 352V _{DC}
Line Regulation	0.2% max from 10% to full load		
Inrush Current	25A _{PK} at 115V _{AC}	80A _{PK} at 115 and 230V _{AC}	30A _{PK} at 230V _{AC}
	25A _{PK} at 230V _{AC}		
Ride-Through Time	>20ms at nominal line, full load		
Power Fail	>3ms warning		
Conducted EMI (47 – 63Hz)	EN 55022 Level B (certain configurations)	EN 55022 Level A	EN 55022 Level A
	FCC B		
Power Factor	0.99 (115V _{AC})	0.65	0.92 (3-phase operation)
	0.98 (230V _{AC})		
Surge Immunity (Common Mode & Normal Mode)	EN 61000-4-5 Class 3, Performance Criteria B		
Output Characteristics			
Load Regulation	0.2% max from 10% to full load		
	0.5% from no load to 10% load		
Set-Point Accuracy	Standard Line: 1.0% for standard voltages, 2.0% for special or adjustable voltages		
	Vantage Line: 2.0% for standard voltages, 5.0% for special or adjustable voltages		
	See Vicor module specifications. A preload may be necessary for modules trimmed down below 90% of normal output voltage.		
Ripple and Noise (20MHz BWL)	Standard outputs: 2% or 100mV _{p-p} max whichever is greater, 10% minimum load		
	VXI options: 50mV _{p-p} max for outputs, ≤15V _{DC} ; 150mV _{p-p} max. 15V < V _{OUT} ≤ 24V; 1% V _{OUT} > 24V		
	2nd Generation QPAC, FinPAC, FinQPAC and UniPAC performance dependent on the converter module used. (Output of module is unfiltered.)		
	QPAC, DualQPAC, JuniorQPAC, RampAC: 10mV _{p-p} max or 0.15%, whichever is greater.		
Overcurrent Protection	105 – 130% > 5V outputs		
	30 – 125% ≤ 5V outputs		
Overvoltage Protection	ModuPACs and QPACs: 115 – 135%		
Efficiency	80% typical	82% typical	82% typical
Output Power	1,600W at 40°C (230V _{AC}) PFC MegaPAC; PFC MegaPAC-EL (Low Noise)	1,000W at 45°C (115 / 230V _{AC})	4,000W at 45°C (3-phase)
	2,400W at 40°C (230V _{AC}) PFC MegaPAC HP, PFC MegaPAC HPEL		1,500W at 45°C (1-phase)
	1,200W at 40°C (115V _{AC}) PFC MegaPACs		

Performance Specifications (Cont.)

Typical at 25°C, nominal line and 75% load, unless otherwise specified

Parameter	PFC MegaPAC™, PFC MegaPAC-HP™, PFC MegaPAC-HPEL™, PFC MegaPAC-EL™	Mini MegaPAC™	4kW MegaPAC™
Environmental			
Storage Temperature	-40 to +85°C		
Operating Temperature ^[d]			
Vantage Line Full Power	0 to +40°C	0 to +45°C	0 to +45°C
Vantage Line Half Power	0 to +60°C	0 to +65°C	0 to +65°C
Standard Line Full Power	-20 to +40°C	-20 to +45°C	-20 to +45°C
Standard Line Half Power	-20 to +60°C	-20 to +65°C	-20 to +65°C
Safety Agency Approvals	cTÜVus		
	CE Marked for Low Voltage Directive and RoHS Recast Directive, as applicable		
Product Weight (Fully Configured)	9.75lbs [4.43kg] (PFC MegaPAC & HP)	6.25lbs [2.84kg]	22.0lbs [10kg]
	12.8lbs [5.8kg] (PFC MegaPAC EL)		
	13.0lbs [6.0kg] (PFC MegaPAC HPEL)		
Limited Warranty	2 Years		












^[d] PFC MegaPACs: The maximum operating temperature is 40°C. If using a VI-200™ with output voltage <12V and >150W, the operating temperature decreases to 35°C. This also applies when using a FinPAC™ with output voltage <24V and >500W. Mini MegaPAC & 4kW MegaPACs: The operating temperature is 45°C using any combination of modules and output voltages as long as the front-end rating is not exceeded. Normal derating applies to half power if the ambient temperature is 20°C hotter.

ConverterPAC™ Overview

- Output voltages from 2 – 95V_{DC}
- Output power up to 600W
- DC OK
- Adjustment ranges from 50% to 110% of nominal
- Autosense / Remote Sense
- Low noise option: 10mV_{p-p} or 0.15%, whichever is greater
- 80 – 90% efficiency
- Current source outputs available



MegaPAC Configuration for MegaPAC Family Product

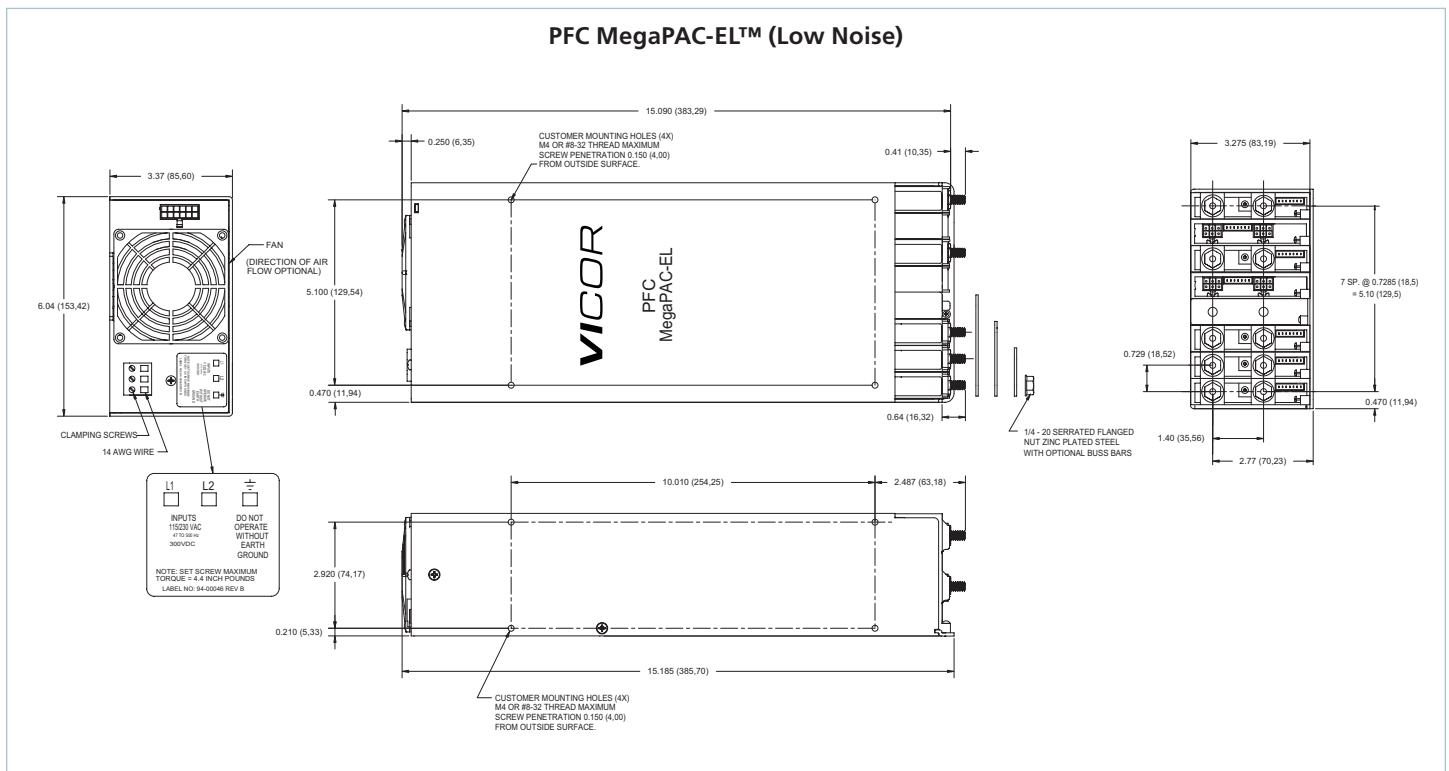
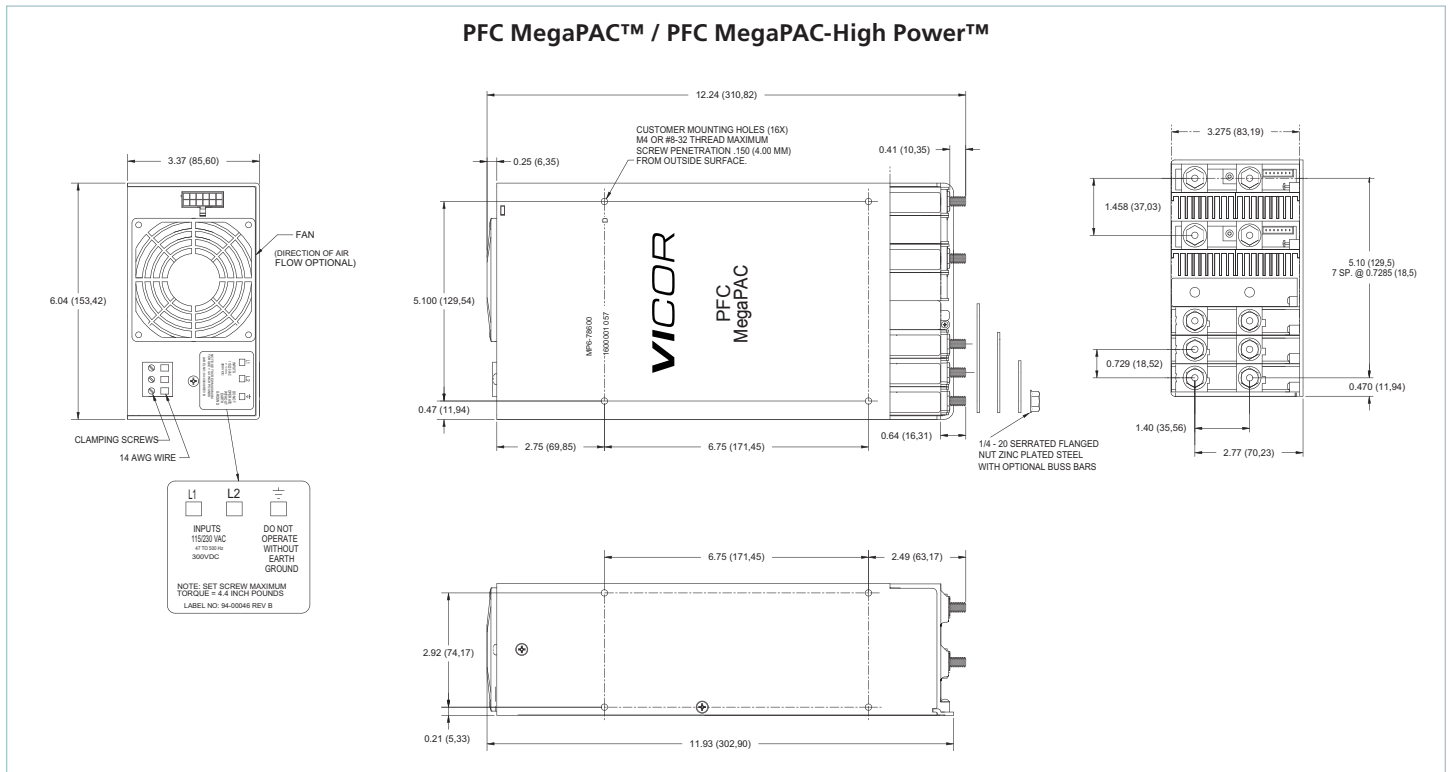
Converters	Module(s) Used	Maximum Output Power
VE-200 and VE-J00 ConverterPACs		
 ModuPAC™ (M) (RoHS – GM)	1 VE-200 DC-DC Converter	Up to 200W per ConverterPAC
 RamPAC™ (R) (RoHS – GR)	1 VE-J00 DC-DC Converter 1 Ripple Attenuator Module (VI-RAM)	Up to 100W for applications requiring low ripple / noise
 DualPAC™ (D) (RoHS – GD)	2 VI-J00™ DC-DC Converters	Dual Output; Up to 100W each output
 JuniorPAC™ (J) (RoHS – GJ)	1 VI-J00 DC-DC Converter	Up to 100W
 BatPAC™ (B) (RoHS – GB)	1 VI-200™ BatMod	A 200W programmable current source that can be configured as a battery charger
 QPAC™ ^[d] Low Noise (L) (RoHS – GL)	1 VI-200 DC-DC Converter with differential- and common-mode filters	Up to 200W for applications requiring as low as 10mV _{p-p} output noise
 JrQPAC™ ^[d] Low Noise (L) (RoHS – GLJ)	1 VE-J00 DC-DC Converter with differential- and common-mode filters	Up to 100W
 DualQPAC™ ^[d] Low Noise (LD) (RoHS – GLD)	2 VI-J00 DC-DC Converters with differential- and common-mode filters	Dual Output; Up to 100W each output
Maxi ConverterPACs		
 UniPAC™ (XU) (RoHS – GXU)	1 Maxi DC-DC Converter	Up to 500W; Applicable for 3-phase / 4kW product
 FinPAC™ ^[e] (PZ) (RoHS – GPZ)	1 Maxi DC-DC Converter	Up to 600W; Applicable for PFC MegaPAC High Power
 FinQPAC™ ^[e] (PZL) (RoHS – GPL)	1 Maxi DC-DC Converter with discrete output filter	Up to 600W; Applicable for PFC MegaPAC-HPEL

^[d] Only for the extended-length MegaPACs

^[e] FinPACs and FinQPACs require two (2) slots.

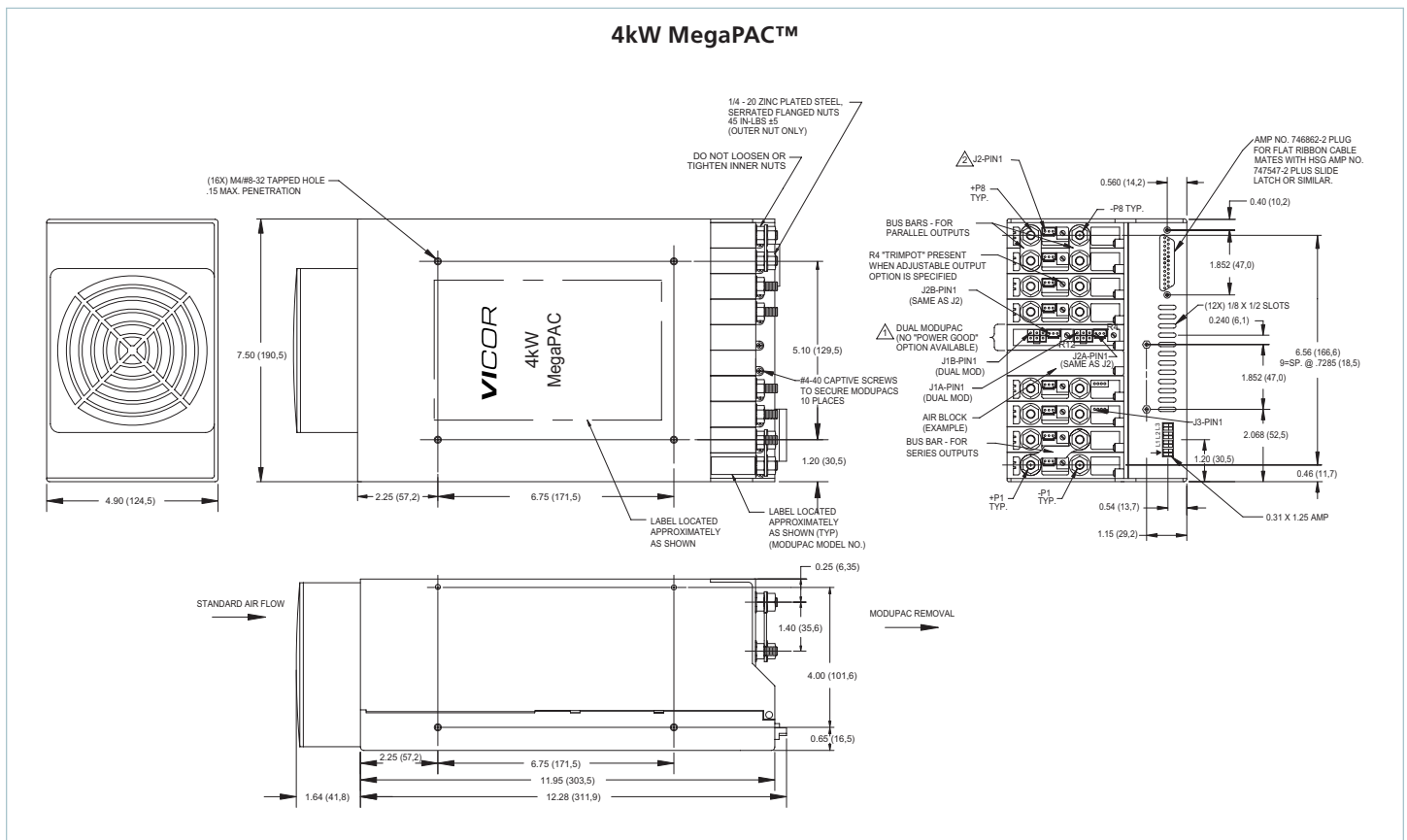
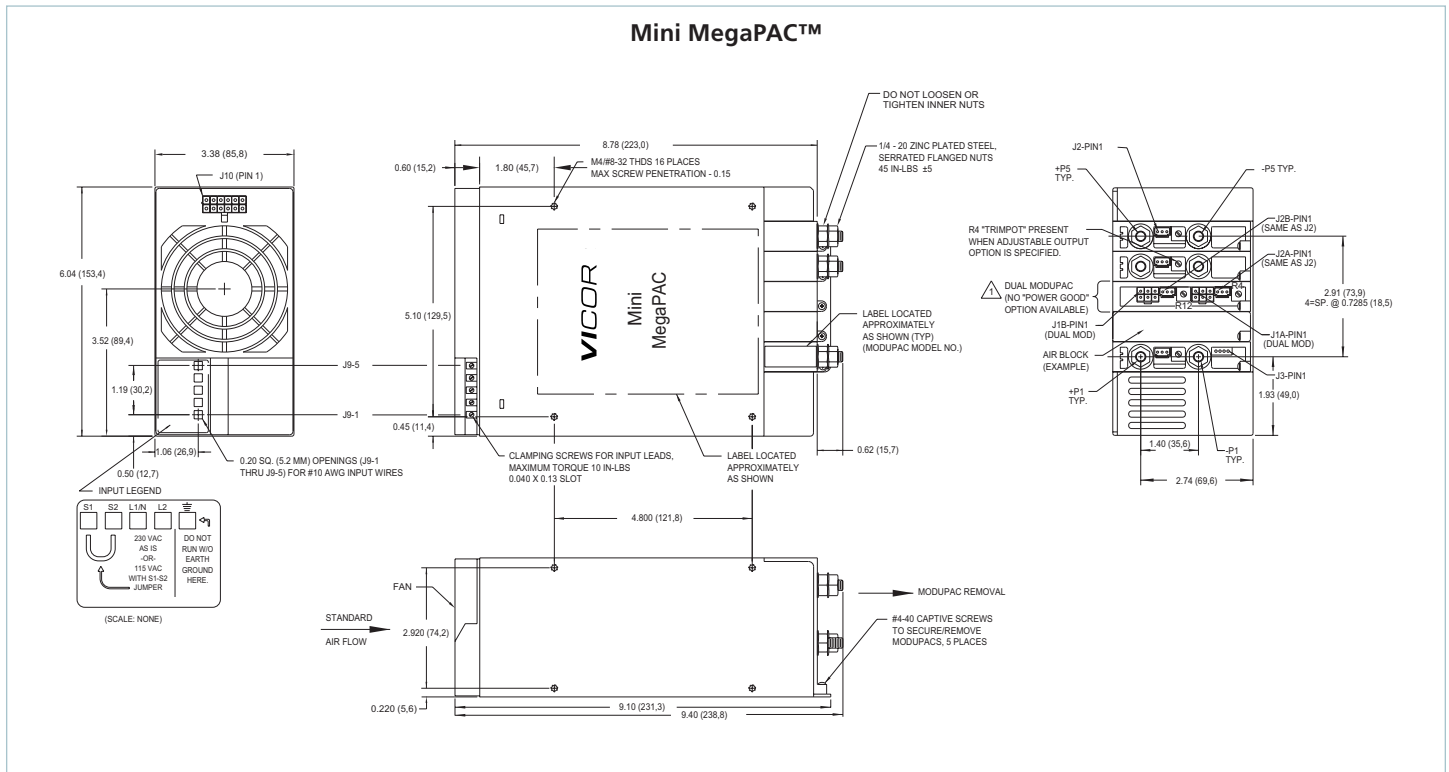
MegaPAC Mechanical Drawings

Note: Newer power supplies have redesigned output studs which are 1/8th inch longer. Design guides available online at vicorpower.com for more details.



MegaPAC Mechanical Drawings

Note: Newer power supplies have redesigned output studs which are 1/8th inch longer. Design guides available online at vicorpower.com for more details.



Connection Diagrams – Input

PFC MegaPAC™
PFC MegaPAC-High Power™
PFC MegaPAC-EL™
PFC MegaPAC-HPEL™

INPUT CONNECTIONS
J9

J10 Interface

J10-1	E/D-1
J10-2	E/D-2
J10-3	E/D-3
J10-4	E/D-4
J10-5	E/D-5
J10-6	E/D-6
J10-7	E/D-7
J10-8	E/D-8
J10-9	Vcc +5V, 0.3A
J10-10	Signal Ground
J10-11	AC Power OK
J10-12	General Shutdown

J10

Housing-Molex P/N: 39-01-2120
 Terminal-Molex P/N: 39-00-0039
 Crimp Tool-Molex P/N: 11-01-0197

Mini MegaPAC™

INPUT CONNECTIONS
J9

J9-5 120V_{L-N} } Jumper for 115V operation
 J9-4 120V_{L-N}
 J9-3 AC Neutral
 J9-2 AC Hot
 J9-1 Earth Ground

J10 Interface

J10-1	E/D-1
J10-2	E/D-2
J10-3	E/D-3
J10-4	E/D-4
J10-5	E/D-5
J10-6	N/C
J10-7	N/C
J10-8	N/C
J10-9	VCC +5V, 0.3A
J10-10	Signal Ground
J10-11	AC Power OK
J10-12	General Shutdown

J10

Molex header Mini-Fit Jr. 12 POS #39-30-1120
 Customer I/O interface mating receptacle
 Molex #39-01-2120 with terminal #39-00-0039 and 18-24 AWG str anded wire.
 Use Molex tool #11-01-0197

4kW MegaPAC™

INPUT CONNECTIONS
J1

J10 Interface

1	Signal Ground	14	Phase Fail Warning
2	Signal Ground	15	Signal Ground
3	Overtemp. Warning	16	Vcc +5 volt, 300 mA
4	Analog Temperature	17	Vcc +5 volt, 300 mA
5	General Shutdown	18	AC Power OK
6	No Connection	19	AC Power Fail
7	Enable/Disable #10	20	Enable/Disable #9
8	Enable/Disable #8	21	Enable/Disable #7
9	Enable/Disable #6	22	Enable/Disable #5
10	Enable/Disable #4	23	Enable/Disable #3
11	Enable/Disable #2	24	Enable/Disable #1
12	Signal Ground	25	Gate Out Slot #10 (isolated)
13	Gate In Slot #1 (isolated)		

J1

Amp 25 pin connector #841-17-DBFR-DA25P
 plug for flat ribbon cable. Mates with housing ADAM TECH #DB25-SR-SL and contacts #DCS-01B plus slide latch #HDW-043-25.

Connection Diagrams – Output

ModuPAC™
JuniorPAC™
RamPAC™

J2 (REMOTE SENSE)

1	TRIM PIN ACCESS
2	+SENSE
3	-SENSE

J3 DC OK (POWER GOOD)

4	VCC IN
3	POWER GOOD
2	POWER GOOD INVERTED
1	SIGNAL GROUND

MATING HARDWARE
 HOUSING- MOLEX P/N: 50-57-9403
 TERMINALS- MOLEX P/N: 16-02-0103
 CRIMP TOOL MOLEX P/N: 63811-8700

MATING HARDWARE
 HOUSING- MOLEX P/N: 50-37-5043
 TERMINALS- MOLEX P/N: 08-70-1040
 CRIMP TOOL MOLEX P/N: 63811-5200

DualPAC™

J1 (OUTPUT CONNECTORS)

4	1	AND 4 +VOUT
5	2	AND 5 -VOUT
6	3	3 +R/SENSE 6 -R/SENSE

J2 (REMOTE SENSE)

1	TRIM PIN ACCESS
2	+SENSE
3	-SENSE

MATING HARDWARE
 HOUSING- MOLEX P/N: 39-01-2060
 TERMINALS- MOLEX P/N: 39-00-0039
 CRIMP TOOL MOLEX P/N: 11-01-0197

MATING HARDWARE
 HOUSING- MOLEX P/N: 50-57-9403
 TERMINALS- MOLEX P/N: 16-02-0103
 CRIMP TOOL MOLEX P/N: 11-01-0208

BatPAC™

J2 (BATPAC REMOTE INTERFACE)

4	CURRENT LIMIT ADJUST
3	VOLTAGE LIMIT ADJUST
2	CURRENT MONITOR
1	-VOUT

MATING HARDWARE
 HOUSING- MOLEX P/N: 50-37-5043
 TERMINALS- MOLEX P/N: 08-70-1040
 CRIMP TOOL MOLEX P/N: 63811-5200

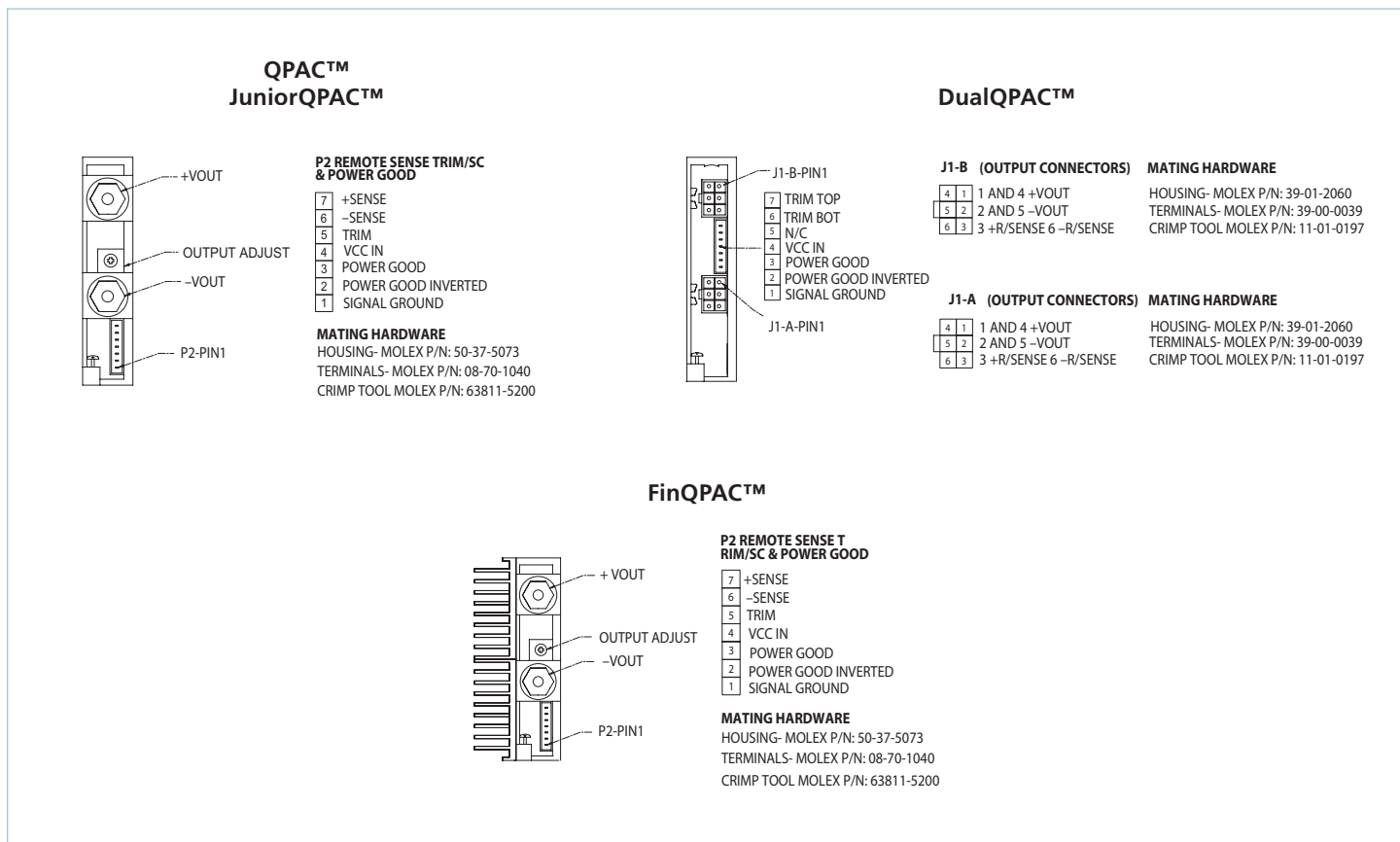
FinPAC™

P2 REMOTE SENSE T RIM/SC & POWER GOOD

7	+SENSE
6	-SENSE
5	TRIM
4	VCC IN
3	POWER GOOD
2	POWER GOOD INVERTED
1	SIGNAL GROUND

MATING HARDWARE
 HOUSING- MOLEX P/N: 50-37-5073
 TERMINALS- MOLEX P/N: 08-70-1040
 CRIMP TOOL MOLEX P/N: 63811-5200

Connection Diagrams – Output (Cont.)



ConverterPAC™ Options

Option	ModuPAC™ (M)	BatPAC™ (B)	DualPAC™ (D)	JuniorPAC™ (J)	RamPAC™ (R)	DualQPAC™ (LD)	QPAC™ (L)	JuniorQPAC™ (LJ)	UniPAC™ (XU)	FinPAC™ (PZ) ^[f]	FinQPAC™ (PLZ) ^[f]
D Power Good	OPT	NA	NA	OPT	OPT ^[i]	OPT ^[i]	OPT	OPT	OPT	OPT	OPT
T Trim: +10%/–10%	OPT ^[g]	NA	OPT	OPT ^[g]	OPT ^[g]	NA	OPT ^[g]	OPT	OPT	OPT	OPT
F Trim: +10%/–50%	OPT ^[g]	NA	OPT	OPT ^[g]	OPT ^[g]	NA	OPT ^[g]	OPT	OPT	OPT	OPT
V1 VXi Low Noise (150mV _{p-p} 15V < V _{OUT} ≤ 24V)	OPT	NA	OPT	OPT	NA ^[h]	NA ^[h]	NA ^[h]	NA ^[h]	NA	NA	NA ^[h]
V2 VXi Low Noise (50mV _{p-p} ≤ 15V)	OPT	NA	OPT	OPT	NA	NA	NA	NA	NA	NA	NA
V3 VXi Low Noise (1% V _{OUT} > 24V)	OPT	NA	OPT	OPT	NA	NA	NA	NA	NA	NA	NA
Parallelable	STD	STD	NA	NA	NA	NA	STD	NA	STD	STD	STD
Autosense	STD	NA	STD	STD	NA	STD	STD	STD	STD	STD	STD

^[f] FinPACs and FinQPACs require two slots.

^[g] Module dependent, 3.3V, 10 – 15V “T” option only.

^[h] All QPACs and RamPACs have output ripple of 10mV_{p-p} or 0.15% whichever is greater.

^[i] Per slot-based indicator.

Vicor's comprehensive line of power solutions includes high density AC-DC and DC-DC modules and accessory components, fully configurable AC-DC and DC-DC power supplies, and complete custom power systems.

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Contact Us: <http://www.vicorpower.com/contact-us>

Vicor Corporation
25 Frontage Road
Andover, MA, USA 01810
Tel: 800-735-6200
Fax: 978-475-6715
www.vicorpower.com

email

Customer Service: custserv@vicorpower.com
Technical Support: apps@vicorpower.com

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