

Power Factor Corrected, AC-DC Switchers

Features & Benefits

- Near unity power factor
- EN61000-3-2 harmonic current compliance
- Low profile package
- Output power to 1,500W
- Up to six user-specifiable outputs
- Universal AC input
- Power density up to 11W/in³
- Integral cooling fans
- Autosense
- Safety agency approvals:
CE Marked, cTÜVus
- Vantage Line^[a]
- RoHS compliant

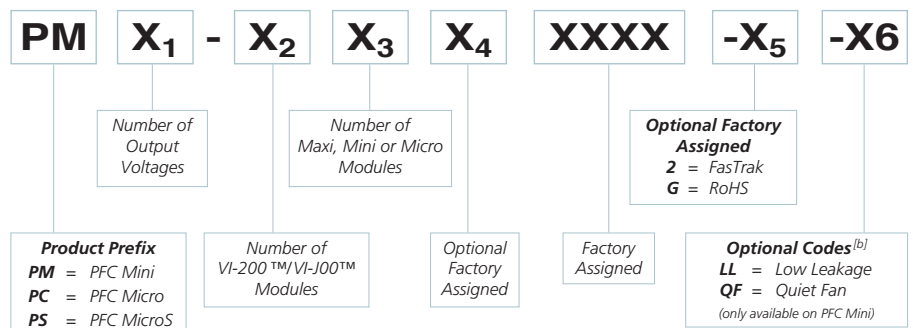
Product Description

The PFC MicroS, PFC Micro and PFC Mini are members of the low profile, high-density LoPAC series of power factor corrected AC-DC power supplies. Available as a one-, two- or three-slot package, respectively, each LoPAC slot can be configured with standard Vicor DC-DC converter modules enabling up to six user-specifiable isolated outputs in a package only 1.72in [43,6mm] high with a power density of 11W/in³.

For maximum versatility and flexibility, the LoPAC can be configured with VI-26x (full-brick), VI-J6x (half-brick) or Maxi, Mini, Micro V375 Series full-, half- and quarter-brick modules. These modules cover the entire range of outputs from 1 to 100V_{DC} and 25 to 600W. The optimum solution can be factory configured based on your exact voltage and power requirements.

For conducted EMI, the LoPACs meet FCC Class A and B. Certain configurations meet EN55022 Class A and B (consult factory). Harmonic current limits per EN61000-3-2 and Surge Immunity per EN61000-4-5 in addition to a wide variety of safety agency approvals further enhance the LoPAC flexibility.

Part Numbering



PFC Mini
12.20 x 6.00 x 1.72in
[309,9 x 152,4 x 43,6mm]
Up to 1500W
1 – 6 Outputs

PFC Micro
10.40 x 5.06 x 1.86in
[264,1 x 128,5 x 47,3mm]
Up to 800W
1 – 6 Outputs

PFC MicroS
7.95 x 5.06 x 1.86in
[201,9 x 128,5 x 47,3mm]
Up to 600W
1 – 3 Outputs

^[a] The Vantage Line is the Vicor affordable power supply option. Minor variances in some specifications between the Vantage Line and the Standard Line apply. Contact factory for more information.

^[b] Refer to Design Guide for more on the optional codes.

DC Output Selections

The versatility of the LoPAC series is due in large part to the wide array of Vicor modules available to be configured into the different package formats. Slots can be populated with VI-200™, VI-J00™ or Maxi, Mini, Micro modules in full-, half- or quarter-brick sizes. The Vicor full VI-26x, VI-J6x and V375 standard product matrices are available to choose from.

In addition, the full range of non-standard voltages and powers from 1 to 100V_{DC} and 10 to 600W is also available for inclusion. The table below is just a sampling of some of the most popular standard outputs that can be configured into LoPAC slots.

Output Voltage (V _{DC})	Available Power (W) per Package Size						
	Full Brick			Half Brick			Quarter Brick
	Maxi	VI-200		Mini	VI-J00		Micro
2	160	80	60	100	40	30	50
3.3	264	132	99	150	66	50	75
5	400	200	150	200	100	75	100
12	600	200	150	300	100	75	150
15	600	200	150	300	100	75	150
24	600	200	150	300	100	75	150
28	600	200	150	300	100	75	150
48	600	200	150	300	100	75	150

LoPAC Slot Configurations

The DC-DC converter modules are used to populate each LoPAC converter slot. Each slot can be configured in different ways depending on module sizes and power limitations.

The following table summarizes the available slot configurations for each of the three LoPAC packages.

Model Type	Number of Slots	Maximum Output Power		Modules per Slot
		Total		
		at 230V _{AC}	at 115V _{AC}	
PFC Mini™	3	1,500W	800W	1 full or 2 half
PFC Micro™	2	800W	500W	1 full or 2 half or 3 quarter
PFC MicroS™	1	600W	500W	1 full or 2 half or 3 quarter

Autosense Feature^[c]

This feature is implemented in all converter slots in the LoPAC family. If remote-sense connections are not needed or are inadvertently not made, no local-sense connections are necessary.

Simply connect the output(s) to the load and the converter(s) will automatically operate in the local-sense mode. If remote-sense connections are made, the unit will operate in remote-sense mode.

^[c] Applies to converter slots utilizing Maxi or Mini size converters.

Performance Specifications

The following are typical performance specifications at room ambient temperature, nominal line voltage (115 / 230V_{AC}) and 75% load on all outputs, unless specified otherwise. For detail specifications, consult the Design Guide for the LoPAC configuration of interest. This is available at vicorpower.com.

Input Characteristics

Parameter	PFC Mini	PFC Micro	PFC MicroS	Units	Notes
AC Input					
Voltage		85 – 264		V _{AC}	
Frequency (Standard)		47 – 500		Hz	
Frequency (Vantage)		47 – 63		Hz	
DC Input	100 – 380		100 – 300	V _{DC}	
Line Regulation		0.4		%	From low line to high line
Inrush Current					
@ 115V _{AC}	8.5		7	A _{PK}	
@ 230V _{AC}	17		14	A _{PK}	
Ride-Through Time		>20		ms	
@ Load	1,200		500	W	
Conducted EMI / RFI	FCC Class A		FCC Class A		Certain configurations meet FCC & EN Class B
	EN55022 Class A		EN55022 Class A (consult factory)		
Power Factor		>0.98			>75% load
Harmonic Current Limits		EN61000-3-2/A14			Class A
Transient Burst Immunity	EN61000-4-4		EN61000-4-4		Level 3, Performance Criteria B
Surge Immunity		EN61000-4-5			Installation Class 3 Performance Criteria B
Dielectric Withstand					
Primary to Chassis GND		2,121		V _{DC}	
Primary to Secondary		4,242		V _{DC}	
Secondary to Chassis GND		750		V _{DC}	

Performance Specifications (Cont.)

The following are typical performance specifications at room ambient temperature, nominal line voltage (115 / 230V_{AC}) and 75% load on all outputs, unless specified otherwise. For detail specifications, consult the Design Guide for the LoPAC configuration of interest. This is available at vicorpower.com.

Output Characteristics

Parameter	PFC Mini	PFC Micro	PFC MicroS	Units	Notes
Setpoint Accuracy (Standard)	1% (standard), 2% (special)				Of V _{NOM}
Setpoint Accuracy (Vantage)	2% (standard), 5% (special)				
Load Regulation		0.05		%	10% to full load
		0.2		%	No load to full load
Temperature Regulation		0.005		%/°C	–20 to +65°C
Long-Term Drift		0.02		%/khr	
Output Ripple & Noise					
≤ 10V _{OUT}		100		mV	20MHz band width
> 10V _{OUT}		1.0		%V _{OUT}	20MHz band width
Voltage Trim Range					
VI-200™ / VI-J00™ modules		50 – 110		%V _{OUT}	±10% on 10 – 15V _{OUT}
Maxi, Mini, Micro modules		10 – 110		%V _{OUT}	Preload may be required
Remote Sense Compensation		0.5		V _{DC}	Autosense (See page 2)
OVP Set Point		125		%V _{OUT}	Not available on VI-J00 Modules
Current Limit		115		%I _{MAX}	Auto recovery

Environmental Characteristics

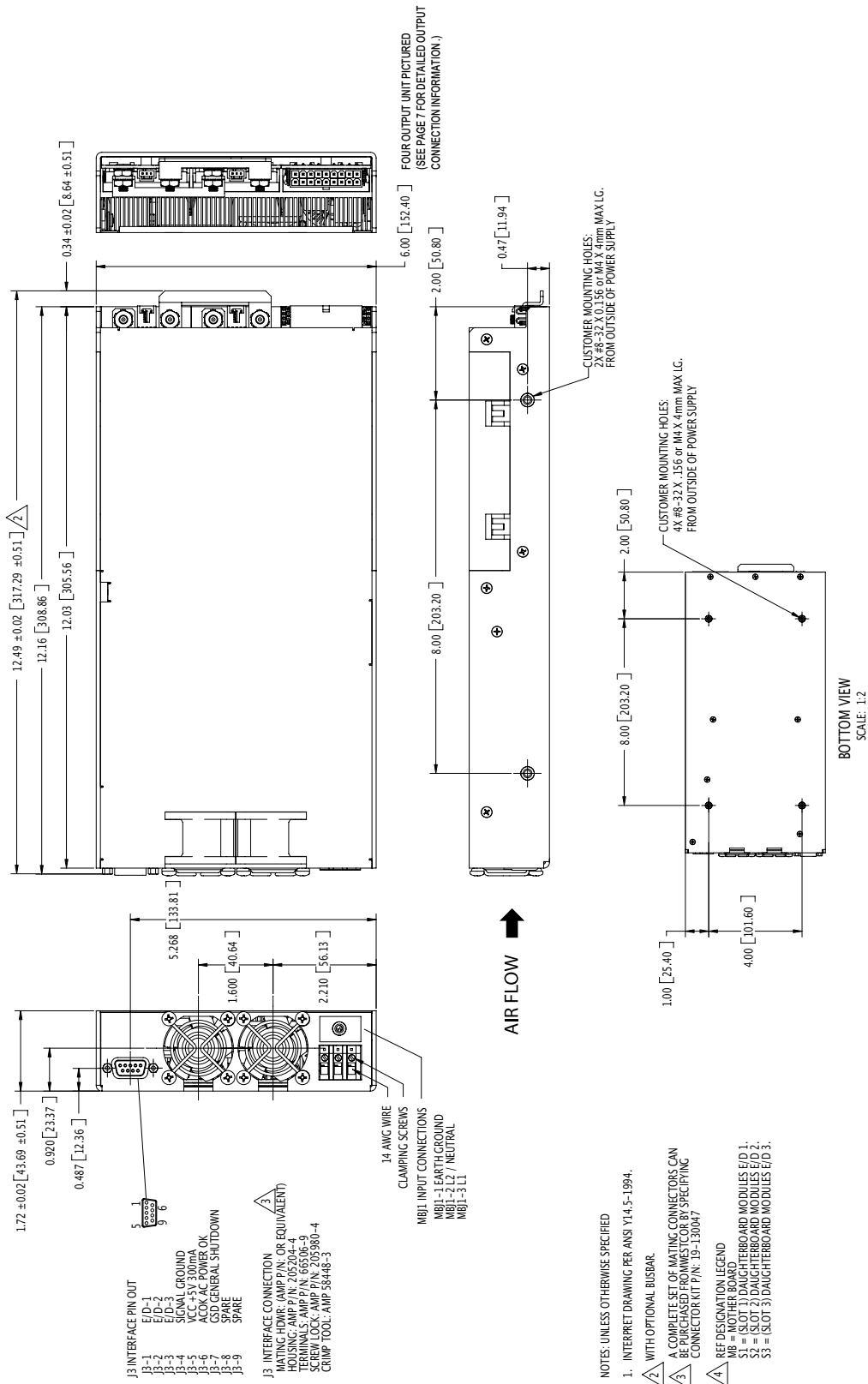
Parameter	PFC Mini	PFC Micro	PFC MicroS	Units	Notes
Storage Temperature		–40 to +85		°C	
Operating Temperature					
Full Rated Power (Standard)		–20 to +45		°C	
50% Rated Power (Standard)		–20 to +65		°C	
Full Rated Power (Vantage)		0 to +45		°C	
50% Rated Power (Vantage)		0 to +65		°C	
Vibration	MIL-STD-810E, Category 10				
	Minimum Integrity Test				
Safety Approvals	CE Marked, cTÜVus				

Mechanical Characteristics

Parameter	PFC Mini	PFC Micro	PFC MicroS	Units	Notes
Weight	5.5 [2,5]	5.2 [2,4]	3.1 [1,4]	lbs [kg]	
Overall Dimensions	12.20 x 6.00 x 1.72 [309,9 x 152,4 x 43,6]	10.40 x 5.06 x 1.86 [264,1 x 128,5 x 47,3]	7.95 x 5.06 x 1.86 [201,9 x 128,5 x 47,3]	in [mm]	L x W x H

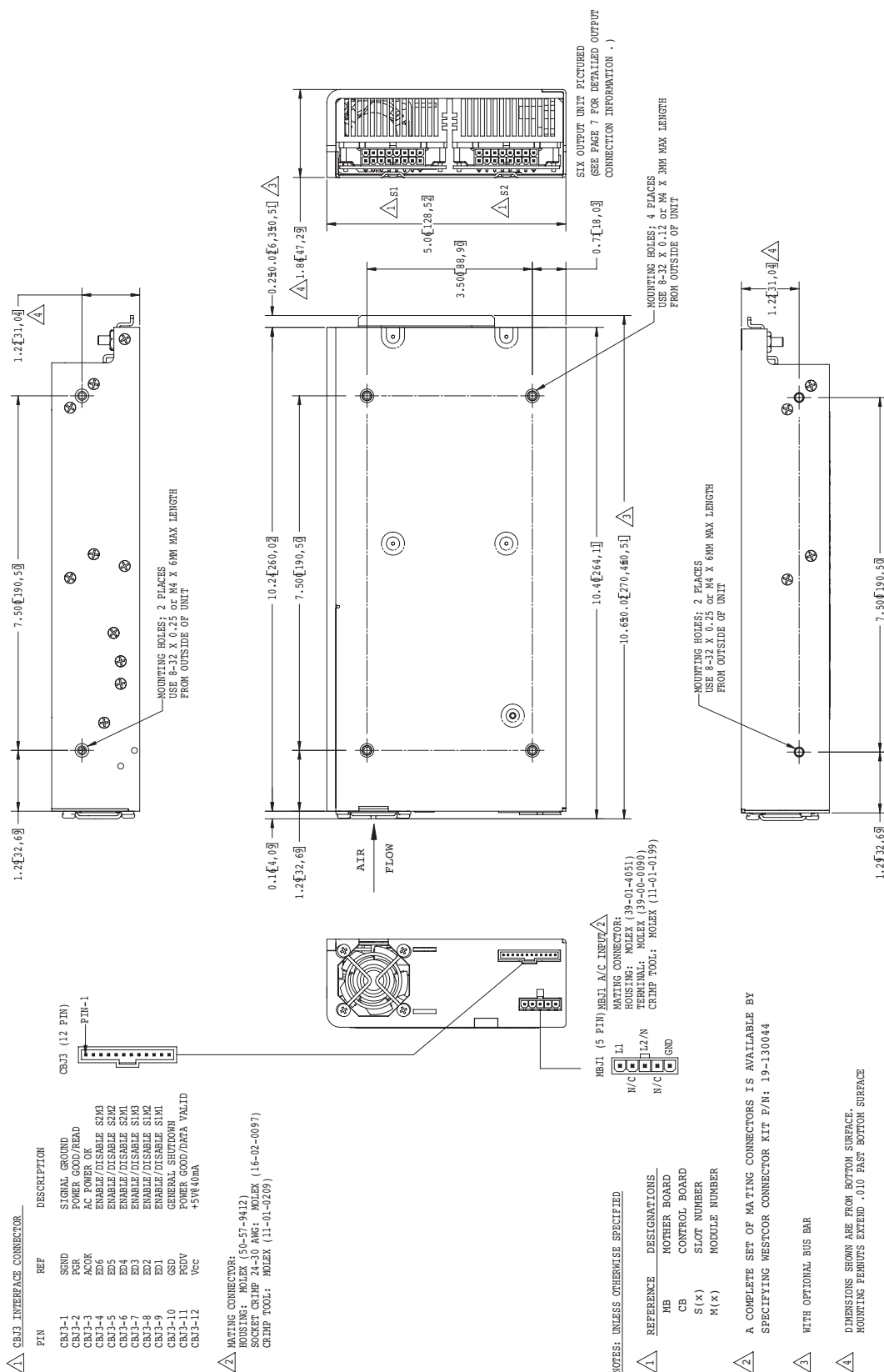
Mechanical Drawing, PFC Mini

PFC MINI



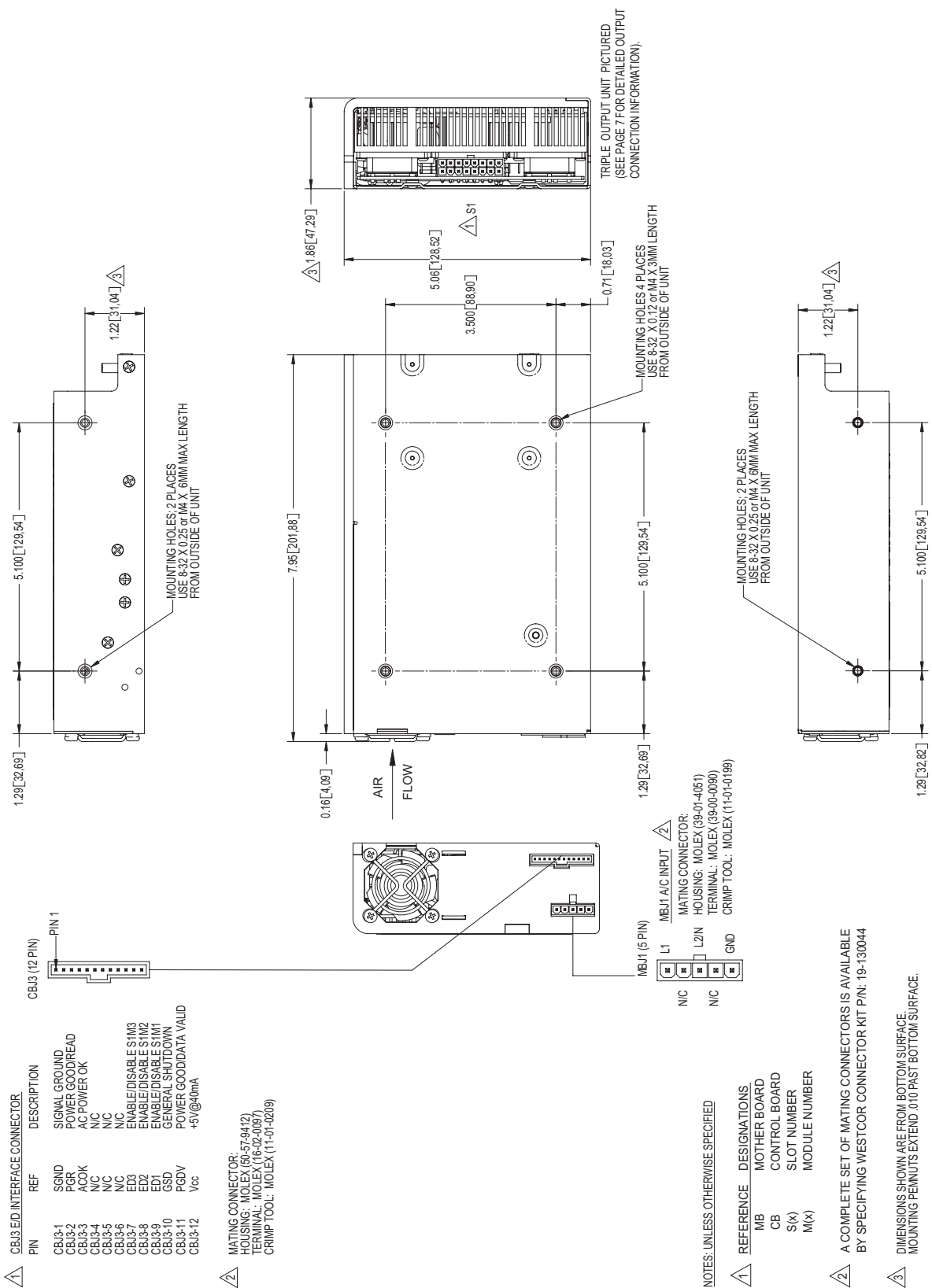
BOTTOM VIEW
SCALE: 1:2

PFC MICRO

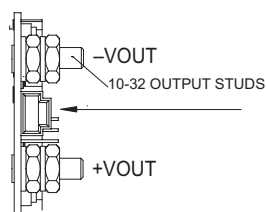


Mechanical Drawing, PFC MicroS

PFC MICROS



Output Connections for the PFC Mini, PFC Micro and PFC MicroS

A. OUTPUT STUDS - SINGLE OUTPUT(when populated with Full Brick modules)
PFC Mini, PFC Micro and PFC MicroSSxJ2 REMOTE SENSE/TRIM
PIN CONNECTOR

3	- REMOTE SENSE
2	+ REMOTE SENSE
1	TRIM

MATING CONNECTOR:
HOUSING: MOLEX (50-57-9403)
TERMINAL FEMALE CRIMP 22-24 AWG: MOLEX (16-02-0103)
USE CRIMP TOOL: MOLEX (11-01-0208)

B. MOLEX CONNECTOR - SINGLE OR DUAL OUTPUT(when populated with Half Brick modules)
PFC MICRO 18 Pin HousingSxJ1 (18 PIN OUTPUT, REMOTE SENSE
AND TRIM PIN CONNECTOR)

PIN	DESCRIPTION	PIN	DESCRIPTION
9	+ VOUT M2	10	+ VOUT M2
8	- VOUT M2	11	+ VOUT M2
7	- VOUT M2	12	- VOUT M2
6	+ SENSE M2	13	+ SENSE M1
5	- SENSE M2	14	TRIM M2
4	TRIM M1	15	- SENSE M1
3	+ VOUT M1	16	+ VOUT M1
2	+ VOUT M1	17	- VOUT M1
1	- VOUT M1	18	- VOUT M1

*PFC MicroS dual output slot configuration uses the
type A stud connection for both outputs.
3-pin connector designators are S1J1 and S1J2.

PFC MINI 18 Pin Housing

SxJ1 (18 PIN OUTPUT, REMOTE SENSE
AND TRIM PIN CONNECTOR)

PIN	DESCRIPTION	PIN	DESCRIPTION
9	+ VOUT M1	10	+ VOUT M1
8	- VOUT M1	11	+ VOUT M1
7	- VOUT M1	12	- VOUT M1
6	+ SENSE M1	13	+ SENSE M2
5	- SENSE M1	14	TRIM M1
4	TRIM M2	15	- SENSE M2
3	+ VOUT M2	16	+ VOUT M2
2	+ VOUT M2	17	- VOUT M2
1	- VOUT M2	18	- VOUT M2

MATING CONNECTOR:
18 PIN HOUSING: MOLEX (39-01-2180)
TERMINAL FEMALE CRIMP 18-24 AWG: MOLEX 39-00-0039)
USE CRIMP TOOL: MOLEX (11-01-0197)

C. MOLEX CONNECTOR - SINGLE, DUAL OR TRIPLE OUTPUT(when populated with Quarter Brick modules)
PFC Micro and PFC MicroSSxJ1 (16 PIN OUTPUT, REMOTE SENSE
AND TRIM PIN CONNECTOR)

PIN	DESCRIPTION	PIN	DESCRIPTION
8	+VOUT M3	9	+VOUT M3
7	-VOUT M3	10	-VOUT M3
6	TRIM M3	11	N/C
5	+VOUT M2	12	+VOUT M2
4	-VOUT M2	13	-VOUT M2
3	TRIM M2	14	TRIM M1
2	+VOUT M1	15	+VOUT M1
1	-VOUT M1	16	-VOUT M1

MATING CONNECTOR:
16 PIN HOUSING: MOLEX (39-01-2160)
TERMINAL FEMALE CRIMP 18-24 AWG: MOLEX (39-00-0039)
USE CRIMP TOOL: MOLEX (11-01-0197)

LoPAC Accessories

The following accessories are available for the LoPAC:

Connector Kits

A complete set of mating hardware for all combinations of input & output connections

- PFC Mini 19-130047
- PFC Micro & PFC MicroS 19-130044

Current-Share Boards

Used for current sharing between identical LoPAC Models for increased output power or redundancy

- LoPACs with VI-200™/VI-J00™ Modules CSB01
- LoPACs with Maxi, Mini, Micro Modules CSB02

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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