



Data Sheet

LoPAC™ COTS Family

PFC Mini MI, PFC Micro MI, PFC MicroS MI

Rugged AC-DC Switchers

for Demanding Environments

Family Features

- Near unity power factor
- EN61000-3-2 harmonic current compliance
- Low profile package
- Output power to 1,500 W
- Up to 6 user specifiable outputs
- Universal AC input
- Power density up to 11 W/in³
- Integral cooling fans
- Autosense
- MIL-STD-810G for vibration and shock
- MIL-STD 704 and 1399 for overvoltage and transients
- -40°C operation available
- Optional conformal coating

Overview

The MI versions of the PFC MicroS, PFC Micro and PFC Mini are new members of the LoPAC family specifically designed for demanding environments such as military and heavy industry. 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 1.72" (43,6 mm) high with a power density of 11 W/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 100 Vdc and 25 to 600 Watts. The optimum solution can be factory configured based on your exact voltage and power requirements.

The LoPACs are designed to meet MIL-STD-810G for shock and vibration, MIL-STD-704 and 1399 for transients and overvoltage, and have optional -40°C operational temp rating and conformal coating. The supplies are compliant with all EN61000-6-1 for conducted and radiated immunity, as well as EN61000-3-2 for harmonic currents emissions and EN61000-3-3 for voltage flicker .

PFC Mini MI

12.20" x 6.00" x 1.72"
309,9 x 152,4 x 43,6 mm
Up to 1,500 W
1 to 6 Outputs



PFC Micro MI

10.40" x 5.06" x 1.86"
264,1 x 128,5 x 47,3 mm
Up to 800 W
1 to 6 Outputs

PFC MicroS MI

7.95" x 5.06" x 1.86"
201,9 x 128,5 x 47,3 mm
Up to 600 W
1 to 3 Outputs



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. Vicor's 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 100 Vdc and 10 to 600 W 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	Available Power (W) per Package Size						
	Maxi	VI-200		Mini	VI-J00		Micro
2 Vdc	160	80	60	100	40	30	50
3.3Vdc	264	132	99	150	66	50	75
5Vdc	400	200	150	200	100	75	100
12Vdc	600	200	150	300	100	75	150
15Vdc	600	200	150	300	100	75	150
24Vdc	600	200	150	300	100	75	150
28Vdc	600	200	150	300	100	75	150
48Vdc	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	# Slots	Maximum Output Power		Modules per Slot
		Total		
		@ 230 Vac	@ 115 Vac	
PFC Mini MI	3	1,500 W	800 W	1 Full or 2 Half
PFC Micro MI	2	800 W	500 W	1 Full or 2 Half or 3 Quarter
PFC Micro MIS	1	600 W	500 W	1 Full or 2 Half or 3 Quarter

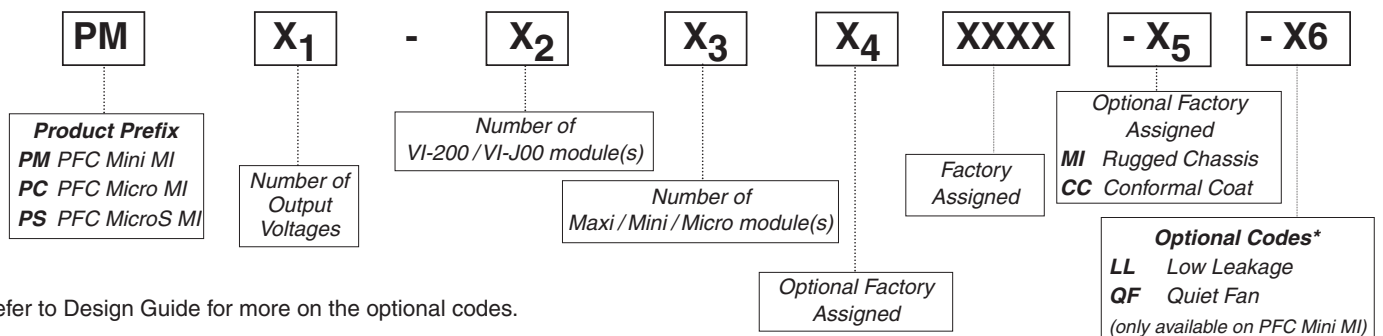
Autosense Feature*

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.

*Applies to converter slots utilizing Maxi or Mini size converters.

Part Numbering



* Refer to Design Guide for more on the optional codes.

Performance Specifications

The following are typical performance specifications at room ambient temperature, nominal line voltage (115/230Vac) 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 on our website (vicorpower.com).

INPUT CHARACTERISTICS

Parameter	PFC Mini MI	PFC Micro MI	PFC MicroS MI	Units	Notes
AC Input					
Voltage		85 – 264		Vac	
Frequency		47 – 500		Hz	
DC Input	100 – 380		100 – 300	Vdc	
Line Regulation		0.4		%	From low line to high line
Inrush Current					
@ 115 Vac	8.5		7	A pk	
@ 230 Vac	17		14	A pk	
Ride Through Time		>20		ms	
@ load	1,200		500	W	
Conducted EMI/RFI	FCC Class A EN55022 Class A		FCC Class A EN55022 Class A (<i>consult factory</i>)		Certain configurations meet FCC & EN Class B
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		Vdc	
Primary to Secondary		4,242		Vdc	
Secondary to Chassis GND		750		Vdc	
Transients and Overvoltage		MIL-STD 704 and 1399			

OUTPUT CHARACTERISTICS

Parameter	PFC Mini MI	PFC Micro MI	PFC MicroS MI	Units	Notes
Setpoint Accuracy (Standard)		1 % (Standard) 2% (Special)			% of Vnom
Load Regulation		0.05 0.2		%	10% to full load No load to full load
Temperature Regulation		0.005		%/°C	-40°C to 65°C
Long Term Drift		0.02		%/khr	
Output Ripple & Noise					
≤10Vout		100		mV	20 MHz bandwidth
>10Vout		1.0		% Vout	20 MHz bandwidth
Voltage Trim Range					
VI-200/VI-J00 Slots		50 – 110		% Vout	±10% on 10 – 15 Vout
Maxi, Mini, Micro Slots		10 – 110		% Vout	Preload may be required
Remote Sense Compensation		0.5		Vdc	Autosense (See page 2)
OVP Set Point		125		% Vout	Not available on VI-J00 modules
Current Limit		115		% I _{max}	Auto recovery

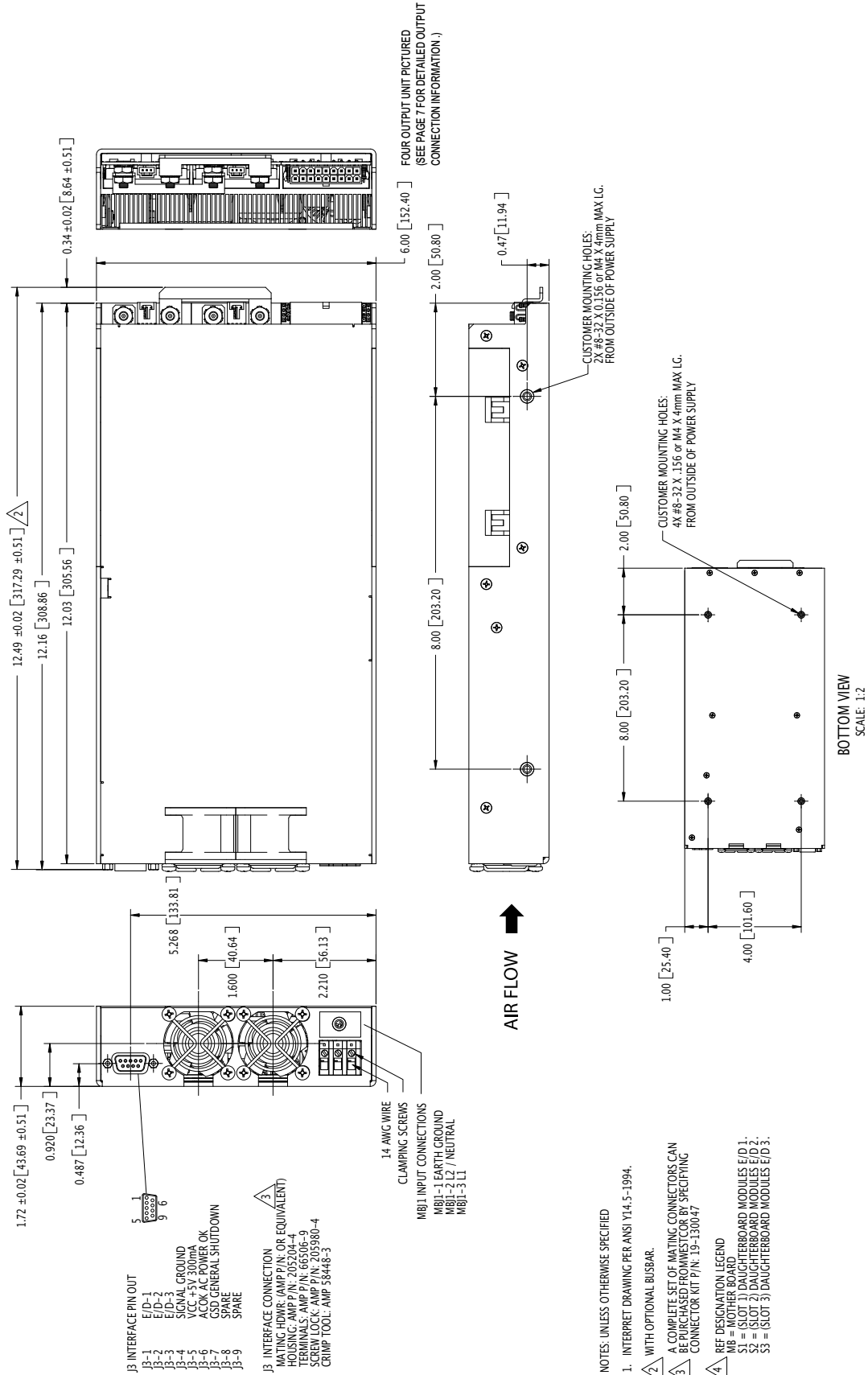
ENVIRONMENTAL CHARACTERISTICS

Parameter	PFC Mini MI	PFC Micro MI	PFC MicroS MI	Units	Notes
Storage Temperature		-40 to +85		°C	
Operating Temperature					
Full Rated Power		-40 to +45		°C	
50% Rated Power		-40 to +65		°C	
Vibration		MIL-STD-810E, Category 10, Minimum integrity test (PFC Mini MI only)			
Safety Approvals		CE Marked, cTUVus			Not applicable to -40°C operating model

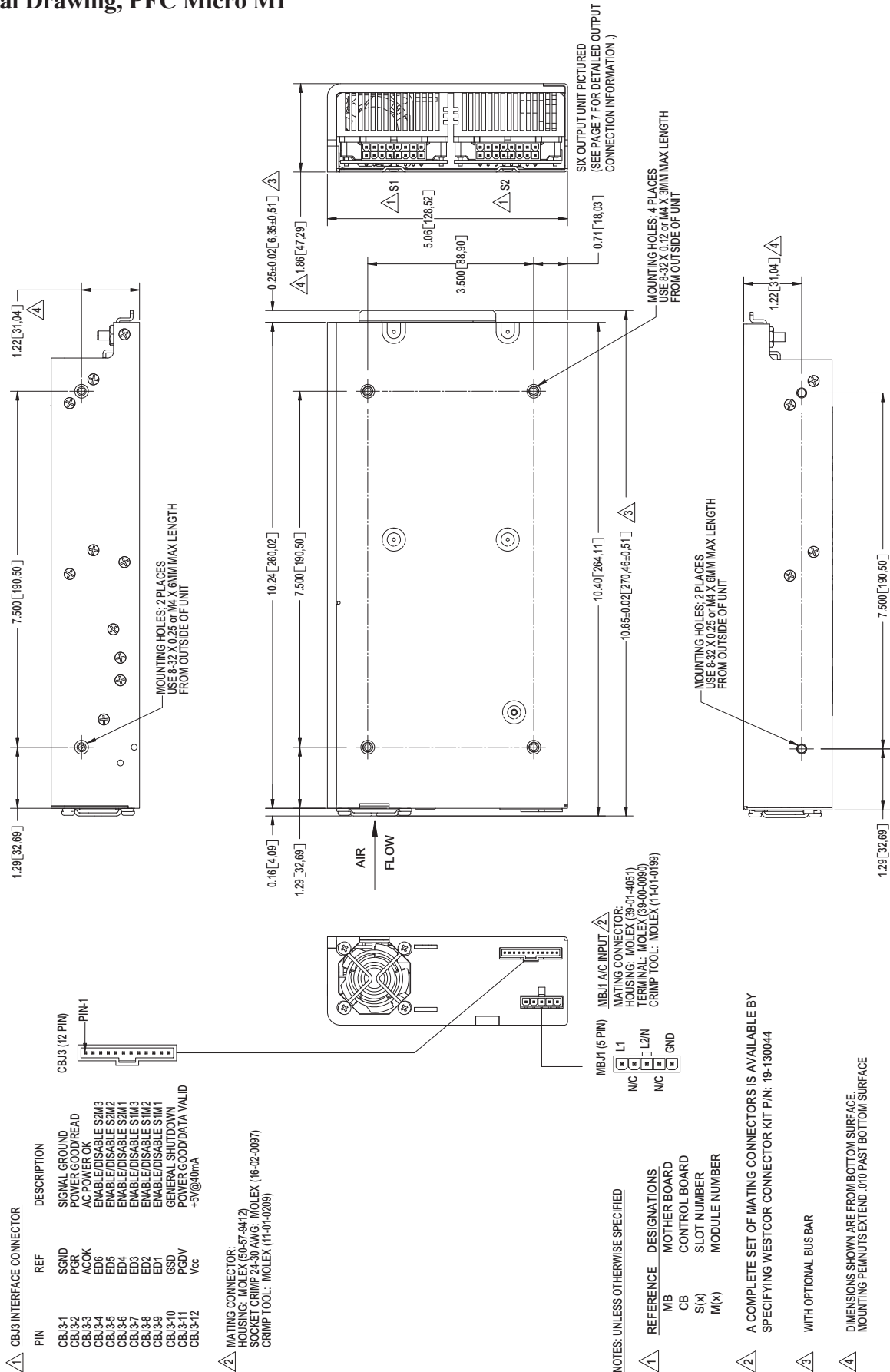
MECHANICAL CHARACTERISTICS

Parameter	PFC Mini MI	PFC Micro MI	PFC MicroS MI	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 1.867.95 x 5.06 x 1.86 264,1 x 128,5 x 47,3201,9 x 128,5 x 47,3		in mm	L x W x H

PFC MINI MI



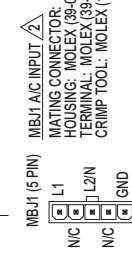
PFC MICRO MI



▲ CBJ3 INTERFACE CONNECTOR

PIN	REF	DESCRIPTION
CBJ3-1	SGND	SIGNAL GROUND
CBJ3-2	PGR	POWER GOOD/READ
CBJ3-3	ACOK	AC POWER OK
CBJ3-4	ED6	ENABLE/DISABLE SZM3
CBJ3-5	ED5	ENABLE/DISABLE SZM2
CBJ3-6	ED4	ENABLE/DISABLE SZM1
CBJ3-7	ED3	ENABLE/DISABLE SIM3
CBJ3-8	ED2	ENABLE/DISABLE SIM2
CBJ3-9	ED1	ENABLE/DISABLE SIM1
CBJ3-10	GSD	GENERAL SHUTDOWN
CBJ3-11	PGDV	POWER GOOD/DATA VALID
CBJ3-12	Vcc	+5V@40mA

▲ MATING CONNECTOR:
 HOUSING: MOLEX (59, 57, 9412)
 SOCKET CRIMP: 2A, 30 AWG; MOLEX (16-02-0087)
 CRIMP TOOL: MOLEX (11-01-0209)



MBJ1 (5 PIN) A/C INPUT / 2
 MATING CONNECTOR:
 HOUSING: MOLEX (39-01-4051)
 TERMINAL: MOLEX (39-00-0090)
 CRIMP TOOL: MOLEX (11-01-0198)

▲ NOTES: UNLESS OTHERWISE SPECIFIED

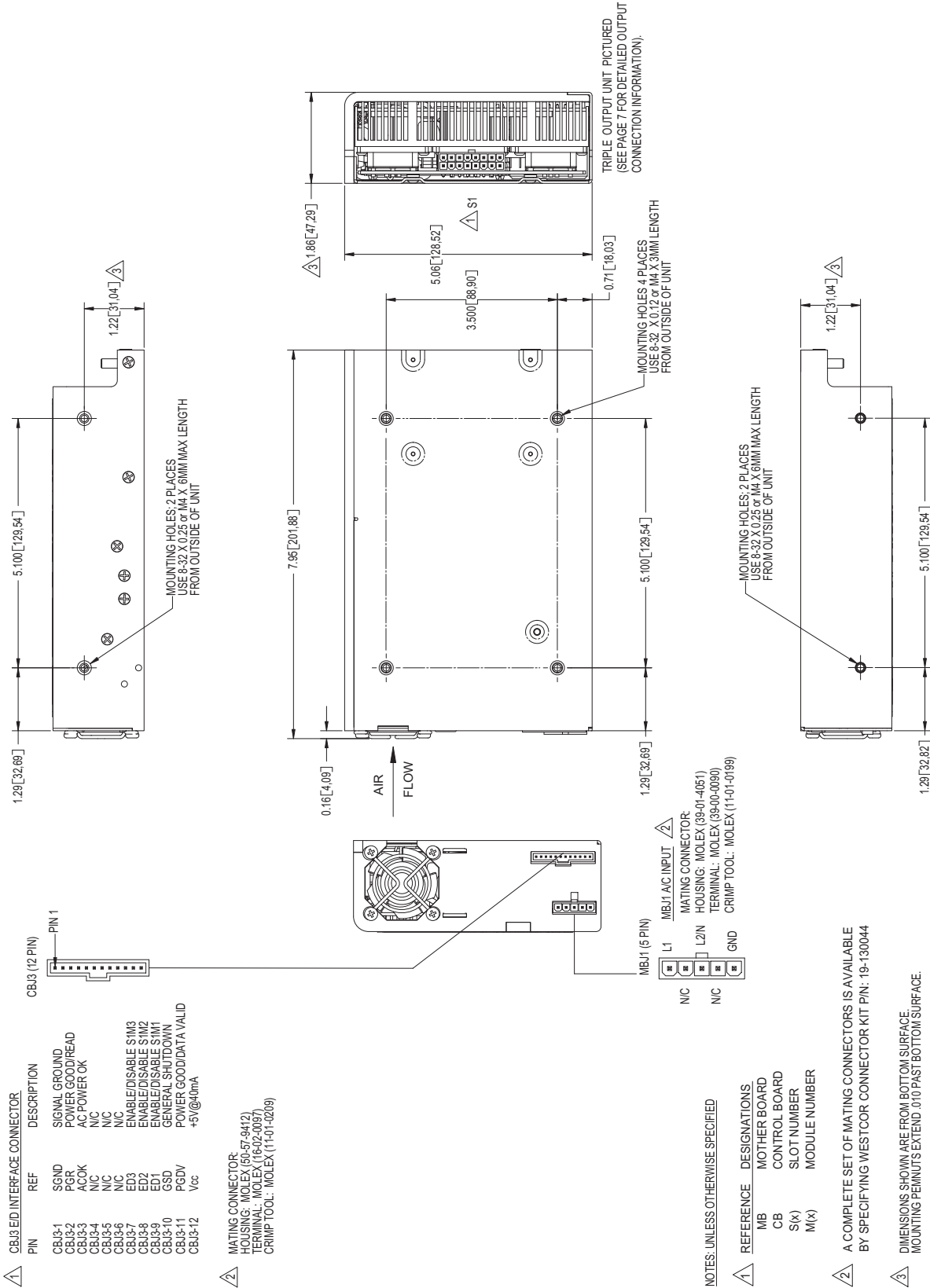
- ▲ REFERENCE DESIGNATIONS
 MB MOTHER BOARD
 CB CONTROL BOARD
 S(X) SLOT NUMBER
 M(X) MODULE NUMBER

▲ A COMPLETE SET OF MATING CONNECTORS IS AVAILABLE BY SPECIFYING WESTCOR CONNECTOR KIT P/N: 19-130044

▲ WITH OPTIONAL BUS BAR

▲ DIMENSIONS SHOWN ARE FROM BOTTOM SURFACE. MOUNTING PEEHNUTS EXTEND .010 PAST BOTTOM SURFACE

PFC MICROS MI

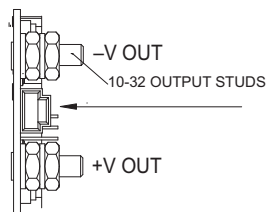


Output Connections for the PFC Mini MI, PFC Micro MI and PFC MicroS MI

A. OUTPUT STUDS - SINGLE OUTPUT

(when populated with Full Brick modules)

PFC Mini MI, PFC Micro MI and PFC MicroS MI



SxJ2 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 MI 18 Pin Housing

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

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

PFC Mini MI 18 Pin Housing

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

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

*PFC MicroS dual output slot configuration uses the type A stud connection for both outputs.

3-pin connector designators are S1J1 and S1J2.

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 MI and PFC MicroS MI

SxJ1 (16 PIN OUTPUT, REMOTE SENSE
AND TRIM PIN CONNECTOR)

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

The following accessories are available for the LoPAC units:

Connector Kits

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

PFC Micro MI & PFC MicroS MI
PFC Mini MI

19-130044
19-130047

Current Share Boards

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

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

CSB01
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.

Information furnished by Vicor is believed to be accurate and reliable. However, no responsibility is assumed by Vicor for its use. Vicor components are not designed to be used in applications, such as life support systems, wherein a failure or malfunction could result in injury or death. All sales are subject to Vicor's Terms and Conditions of Sale, which are available upon request.

**Specifications are subject to change without notice.
The latest data is available on the Vicor web site at vicorpower.com.**

Westcor, a division of Vicor, designs and builds medium to high power configurable power supplies incorporating Vicor's high density DC-DC converters and accessory components. Westcor's rugged COTS product line includes:

- PFC Mini MI
- PFC Micro MI
- PFC MicroS MI
- PFC MegaPAC MI
- PFC MegaPAC HP MI
- FlatPAC-EN MI

See Design Guides for detailed information about all Westcor products. They can be downloaded in PDF format from the website.



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