



Actual Size:  
2.28 x 2.4 x 0.5in  
57,9 x 61,0 x 12,7mm



## Input Attenuator Modules

### Features & Benefits

- Inputs: 24, 48 and 300V<sub>DC</sub>
- High surge withstand:
  - Bellcore
  - British Telecom BTR 2511
  - IEC-60801-5
- EMI/RFI specifications:
  - Bellcore TR-TSY-000513
  - British Telecom BTR 2511
  - FCC Level "A"
  - EN55022 Level "B"
- cULus, CTÜVus
- 97% efficiency
- Logic disable
- Expansion output for arrays
- Size: 2.28" x 2.4" x 0.5"  
(57,9 x 61,0 x 12,7)
- CE Marked
- RoHS Compliant (VE-IAM)

### Product Highlights

The Input Attenuator Module (VI-IAM) is a component-level, DC input front end filter designed to occupy minimum board space while providing maximum protection for today's sophisticated electrical systems. The VI-IAM, in combination with Vicor 24, 48 and 300V<sub>DC</sub> input modules, provides a highly efficient, high density power system with outputs from 1 to 95V<sub>DC</sub> and power expandable from 25 to 800W. Your system will benefit from the small size, efficiency and inherent reliability of Vicor's component-level converters, while meeting the toughest demands of Telecommunications and Industrial power applications.

This combination provides compliance with the transient requirements of Bellcore, British Telecom and IEC standards, and meets the EMI/RFI specifications of Bellcore, British Telecom and FCC Part 15, Subpart B and EN55022.

### Compatible Products

- VI-200, VE-200, VI-J00, VE-J00  
(Inputs: 1, W, 3, N and 6)
- Mega Modules
- (Inputs: 1, W, 3, N and 6)

For additional information see Section 14 of the [VI-200 & VI-J00 Design Guide](#).

### Input Characteristics

Parameter	Min	Typ	Max	Units	Notes
<b>24V<sub>DC</sub> modules</b>					
Steady state input	21	24	32	V <sub>DC</sub>	–A11– models
Input spike limit			300	V <sub>DC</sub>	Per BTNR2571 issue 4
			2500	V <sub>DCPK</sub>	Ringwave 0.5µs rise 100kHz
Input surge limit			100	V <sub>DC</sub>	Figure 1
Overvoltage shut down <sup>[a]</sup>	34		38	V <sub>DC</sub>	100ms, automatic recovery
Recommended fuse			20	Amps	32V ACG-20
<b>24V<sub>DC</sub> modules</b>					
Steady state input	18	24	36	V <sub>DC</sub>	–AWW– models
Input spike limit			300	V <sub>DC</sub>	Per BTNR2571 issue 4
			2500	V <sub>DCPK</sub>	Ringwave 0.5µs rise 100kHz
Input surge limit			100	V <sub>DC</sub>	Figure 1
Overvoltage shut down <sup>[a]</sup>	37		42	V <sub>DC</sub>	100ms, automatic recovery
Recommended fuse			20	Amps	36V ACG-20
<b>48V<sub>DC</sub> modules</b>					
Steady state input	42		60	V <sub>DC</sub>	–A33– models
Input spike limit			300	V <sub>DC</sub>	Per BTNR2571 issue 4
			2500	V <sub>DCPK</sub>	Ringwave 0.5µs rise 100kHz
Input surge limit			160	V <sub>DC</sub>	Figure 1
Overvoltage shut down <sup>[a]</sup>	62		67	V <sub>DC</sub>	100ms, automatic recovery
Recommended fuse			20	Amps	60V 3AB-20
<b>48V<sub>DC</sub> modules</b>					
Steady state input	36		76	V <sub>DC</sub>	–ANN– models
Input spike limit			300	V <sub>DC</sub>	Per BTNR2571 issue 4
			2500	V <sub>DCPK</sub>	Ringwave 0.5µs rise 100kHz
Input surge limit			276	V <sub>DC</sub>	Figure 1
Overvoltage shut down <sup>[a]</sup>	77		83	V <sub>DC</sub>	100ms, automatic recovery
Recommended fuse			20	Amps	80V 3AB-20
<b>300V<sub>DC</sub> modules</b>					
Steady state input	200		400	V <sub>DC</sub>	–A66– models
Input spike limit			1000	V <sub>DC</sub>	DM, 2 Joule, IAW IEC-801-5
			2000	V <sub>DC</sub>	CM, 2 Joule, IAW IEC-801-5
Input surge limit			800	V <sub>DC</sub>	Figure 1
Overvoltage shut down <sup>[a]</sup>	402		424	V <sub>DC</sub>	100ms, automatic recovery
Recommended fuse			5	Amps	250V Bussman PC-Tron
<b>All models</b>					
No load power dissipation		0.5	1.5	Watts	
Inrush current		110	125	% I <sub>IN</sub>	Steady state, I <sub>IN</sub> 10ms

<sup>[a]</sup> The VI-IAM disables downstream converters and clamps the converter input voltage at a safe level.

## Model Selection Chart

Model Number	Nominal Input Voltage	Input Range	Compatible DC-DC Converter	Converter
VI-A11-CU/VE-A11-CU	24V <sub>DC</sub>	21 – 32V <sub>DC</sub>	VI-21x-Cx and VI-J1x-Cx	C-grade
VI-AWW-CU/VE-AWW-CU	24V <sub>DC</sub>	18 – 36V <sub>DC</sub>	VI-2Wx-Cx and VI-JWx-Cx	C-grade
VI-A33-CQ/VE-A33-CQ	48V <sub>DC</sub>	42 – 60V <sub>DC</sub>	VI-23x-Cx and VI-J3x-Cx	C-grade
VI-ANN-CQ/VE-ANN-CQ	48V <sub>DC</sub>	36 – 76V <sub>DC</sub>	VI-2Nx-Cx and VI-JNx-Cx	C-grade
VI-A66-CQ/VE-A66-CQ	300V <sub>DC</sub>	200 – 400V <sub>DC</sub>	VI-26x-Cx and VI-J6x-Cx	C-grade

Note: For alternative product grades change the “C” in the part number to “E”, “I”, or “M”.

## Specifications

(typical at T<sub>BP</sub> = 25°C, nominal line and 75% load, unless otherwise specified)

### OUTPUT CHARACTERISTICS

Parameter	Min	Typ	Max	Units	Test Conditions/Notes
Clamp voltage					
24V <sub>DC</sub> input	36.0		44.0	V <sub>DC</sub>	–A11– models
	40.5		50.0	V <sub>DC</sub>	–AWW– models
48V <sub>DC</sub> input	62.0		71	V <sub>DC</sub>	–A33– models
	80.0		90.0	V <sub>DC</sub>	–ANN– models
300V <sub>DC</sub> input	400		435	V <sub>DC</sub>	–A66– models
Output power					
24V models			250	Watts	Output of IAM
48V models			510	Watts	Output of IAM
300V models			510	Watts	Output of IAM
Internal voltage drop					
24V <sub>DC</sub>	0.6		0.85	V <sub>DC</sub>	
48V <sub>DC</sub>	0.6		0.95	V <sub>DC</sub>	
300V <sub>DC</sub>	1.7		3.5	V <sub>DC</sub>	
Overload protection					
24V <sub>DC</sub> input	–AWW–	20		Amps	Foldback threshold; auto recovery with latched shut down after 2ms
	–A11–	15		Amps	
48V <sub>DC</sub> input	–ANN–	20		Amps	
	–A33–	15		Amps	
300V <sub>DC</sub> input	–A66–	4		Amps	

## Specifications (Cont.)

## ISOLATION CHARACTERISTICS

Parameter	Min	Typ	Max	Units	Test Conditions
Input to base		1,500		V <sub>RMS</sub>	1 minute
Output to base		1,500		V <sub>RMS</sub>	1 minute

## THERMAL CHARACTERISTICS

Parameter	Min	Typ	Max	Units	Test Conditions
Efficiency		97		%	
Baseplate to sink		0.14		°C/Watt	
Operating temperature, baseplate			100	°C	See product grade specifications
Storage temperature			125	°C	See product grade specifications

## MECHANICAL SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Test Conditions
Weight		3.0 (85)		ounces (grams)	

## PRODUCT GRADE SPECIFICATIONS

Parameter	E	C	I	M
Storage Temp. (Baseplate)	-20°C to +105°C	-40°C to +105°C	-55°C to +105°C	-65°C to +105°C
Operating Temp. (Baseplate)	-10°C to +100°C	-25°C to +100°C	-40°C to +100°C	-55°C to +100°C

## EMI CHARACTERISTICS

EMI/RFI (conducted emissions)	Meets Bellcore TR-TSY-000513, Issue 2, Rev. 1 (24 and 48V Input); British Telecom BTR 2511, Issue 2 (24 and 48V Input); FCC Part 15, Class A, EN55022 Class B
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## TRANSIENT PROTECTION

	Meets Bellcore TA-TSY-001003, Issue 1, 9/89 British Telecom BTR 2511, IEC61000-4-5 Level 2 (VI-A66 only)
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**Figure 1** — Safe operating area based on input voltage of IAM (1% duty cycle max.,  $Z_s=0.5\Omega$ , for short duration transient capability refer to specifications.)



**Figure 2** — Block diagram of Input Attenuator Module (IAM)



**Figure 3** — Typical connection diagram. For recommended fuse (F2) see VI-200 / VI-100 application manual.

Input Voltage	Recommended Fuse
24V	20A / 32V (AGC-20)
24V "W"	20A / 36V (AGC-20)
48V	20A / 60V (3AB-20)
48V "N"	20A / 80V (3AB-20)
300V	5A / 250V Bussman PC-Tron

**Table 1** — Recommended F1 fusing based on input voltage (see Figure 3)

Input Voltage	Maximum Capacitance <sup>[a]</sup>
24V <sub>DC</sub> (21 – 32V)	470μF
24V <sub>DC</sub> (18 – 36V)	470μF
48V <sub>DC</sub> (42 – 60V)	220μF
48V <sub>DC</sub> (36 – 76V)	120μF
300V <sub>DC</sub> (200 – 400V)	27μF

<sup>[a]</sup> Capacitance should be distributed across the input of each DC-DC converter. (C1, Figure 3)

**Table 2** — Recommended distributed capacitance on input of DC-DC converter(s)

**Storage**

Vicor products, when not installed in customer units, should be stored in ESD safe packaging in accordance with ANSI/ESD S20.20, "Protection of Electrical and Electronic Parts, Assemblies and Equipment" and should be maintained in a temperature controlled factory/warehouse environment not exposed to outside elements controlled between the temperature ranges of 15°C and 38°C. Humidity shall not be condensing, no minimum humidity when stored in an ESD compliant package.



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