


**CUI INC**

a bel group

date 12/09/2021

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## SERIES: VBM-70 | DESCRIPTION: AC-DC POWER SUPPLY

### FEATURES

- universal input range (90 ~ 264 Vac)
- wide operating temperature range (-40 to +85 C)
- ultra-low profile (17 mm)
- Class B emissions; no external components required
- over temperature, over voltage, over current, and short circuit protections
- low no-load power consumption (150 mW)

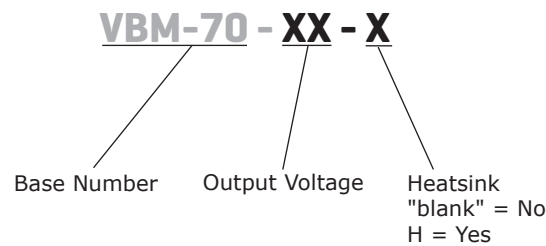


| MODEL     | output<br>voltage<br>(Vdc) | output<br>current<br>max<br>(A) | output<br>power<br>max<br>(W) | ripple<br>and noise <sup>1</sup><br>max<br>(mVp-p) | efficiency <sup>2</sup><br>typ<br>(%) |
|-----------|----------------------------|---------------------------------|-------------------------------|----------------------------------------------------|---------------------------------------|
| VBM-70-12 | 12                         | 5.83                            | 70.0                          | 120                                                | 88.0                                  |
| VBM-70-24 | 24                         | 2.92                            | 70.0                          | 240                                                | 88.5                                  |
| VBM-70-36 | 36                         | 1.94                            | 69.8                          | 360                                                | 89.0                                  |
| VBM-70-48 | 48                         | 1.46                            | 70.0                          | 480                                                | 89.5                                  |

Notes:

1. Ripple and noise are measured at 20 MHz BW with 10 uF aluminum electrolytic capacitor and 0.1 uF ceramic capacitor on the output.
2. Measured at 230 Vac, full load, and 25°C.
3. All specifications measured at: Ta=25°C, 230 Vac input voltage and 60% rated output load, unless otherwise specified.

### PART NUMBER KEY



## INPUT

| parameter                 | conditions/description | min | typ | max  | units |
|---------------------------|------------------------|-----|-----|------|-------|
| voltage                   |                        | 90  |     | 264  | Vac   |
| frequency                 |                        | 47  |     | 63   | Hz    |
| leakage current           | at 264 Vac             |     |     | 3.5  | mA    |
| no load power consumption |                        |     |     | 0.15 | W     |

## OUTPUT

| parameter           | conditions/description | min | typ | max  | units |
|---------------------|------------------------|-----|-----|------|-------|
| line regulation     | 90~264 Vac, full load  |     |     | ±0.5 | %     |
| load regulation     | 60% ±40% rated load    |     |     | ±1   | %     |
| voltage accuracy    | 25°C, full load        |     |     | ±1   | %     |
| hold-up time        | at 115 Vac             |     | 6   |      | ms    |
| switching frequency |                        |     | 65  |      | kHz   |

## PROTECTIONS

| parameter                   | conditions/description | min | typ | max | units |
|-----------------------------|------------------------|-----|-----|-----|-------|
| over current protection     | auto recovery, hiccup  | 110 |     | 150 | %     |
| over voltage protection     | auto recovery          |     |     | 16  | Vdc   |
|                             |                        |     |     | 24  | Vdc   |
|                             |                        |     |     | 36  | Vdc   |
|                             |                        |     |     | 48  | Vdc   |
| short circuit protection    | auto recovery          |     |     |     |       |
| over temperature protection | auto recovery          |     |     |     |       |

## SAFETY AND COMPLIANCE

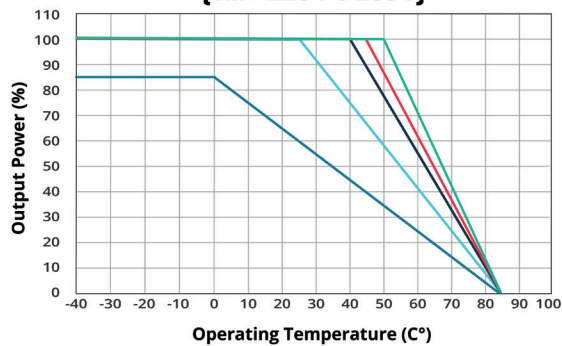
| parameter                     | conditions/description                                                                                                                              | min     | typ | max | units |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|-----|-------|
| isolation voltage             | input to output for 1 minute                                                                                                                        | 3,000   |     |     | Vac   |
|                               | input to ground for 1 minute                                                                                                                        | 1,800   |     |     | Vac   |
|                               | output to ground for 1 minute                                                                                                                       | 500     |     |     | Vac   |
| safety approvals              | certified to 62368: IEC/UL/EN                                                                                                                       |         |     |     |       |
| conducted emissions           | EN 55032: 2015+AC: 2016, EN 61204-3: 2000, EN 61000-6-3: 2007+A1: 2011+AC: 2012, EN 61000-6-4: 2007+A1: 2011, 47 CFR FCC Part 15 Subpart B, Class B |         |     |     |       |
| radiated emissions            | EN 55032: 2015+AC: 2016, EN 61204-3: 2000, EN 61000-6-3: 2007+A1: 2011+AC: 2012, EN 61000-6-4: 2007+A1: 2011, 47 CFR FCC Part 15 Subpart B, Class B |         |     |     |       |
| harmonic current              | EN 61000-3-2: 2014                                                                                                                                  |         |     |     |       |
| ESD                           | IEC 61000-4-2: 2008, Air Discharge: ±8KV, Contact Discharge: ±4KV, perf. Criteria A                                                                 |         |     |     |       |
| radiated immunity             | EN 55035:2017, EN 61204-3:2000, EN 61000-6-1:2019, EN 61000-6-2:2019                                                                                |         |     |     |       |
| EFT/Burst                     | IEC 61000-4-4: 2012, ±1kv, ±2kv, perf. Criteria A                                                                                                   |         |     |     |       |
| surge                         | IEC 61000-4-5: 2014+A1: 2017, perf. Criteria A                                                                                                      |         |     |     |       |
|                               | L-N: ±0.5kv, ±1kv, L/N-E(Earth): ±0.5kv, ±1kv, ±2kv, perf. Criteria A                                                                               |         |     |     |       |
| conducted immunity            | EN 55035: 2017, EN 61204-3: 2000, EN 61000-6-1: 2019, EN 61000-6-2: 2019                                                                            |         |     |     |       |
| voltage dips and interruption | IEC 61000-4-11: 2004+A1: 2017, Dip: 30% Reduction, Dip >95% Reduction, perf. Criteria A                                                             |         |     |     |       |
| MTBF                          | as per MIL-HDBK-217F at 25°C                                                                                                                        | 550,000 |     |     | hours |
| RoHS compliant                | yes                                                                                                                                                 |         |     |     |       |

## ENVIRONMENTAL

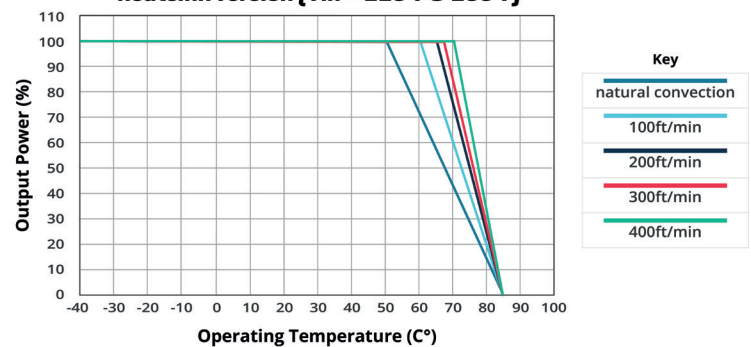
| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curves    | -40 |     | 85  | °C    |
| storage temperature   |                        | -40 |     | 85  | °C    |
| humidity              | non-condensing         |     |     | 93  | %     |

## DERATING CURVES

**TEMPERATURE DERATING CURVE**  
( $V_{in} = 115\text{ V} \& 230\text{ V}$ )

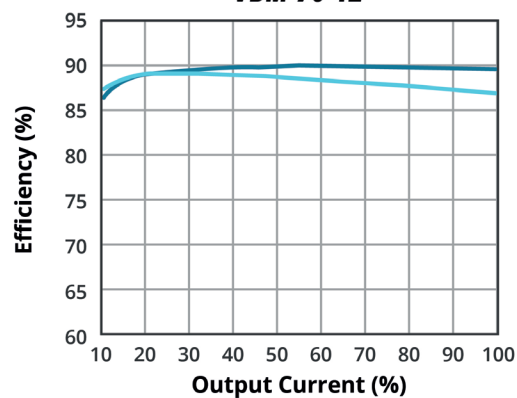


**TEMPERATURE DERATING CURVE**  
heatsink version ( $V_{in} = 115\text{ V} \& 230\text{ V}$ )

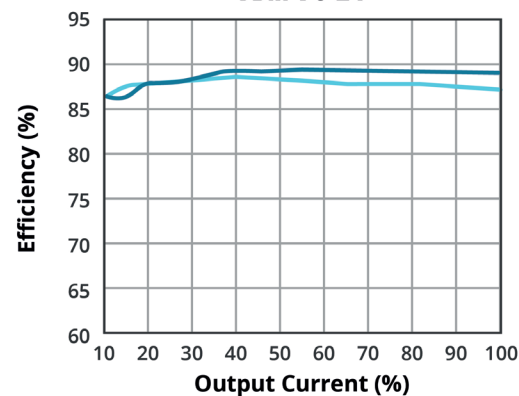


## EFFICIENCY CURVES

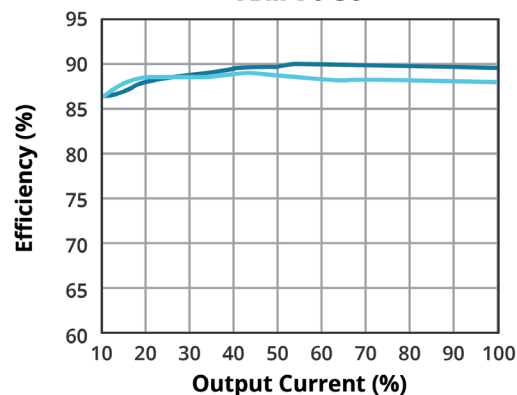
**EFFICIENCY VS OUTPUT LOAD**  
VBM-70-12



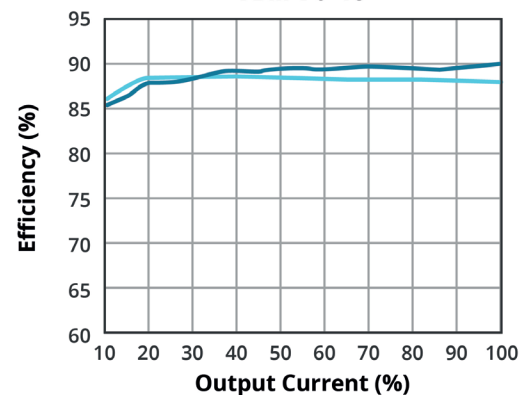
**EFFICIENCY VS OUTPUT LOAD**  
VBM-70-24



**EFFICIENCY VS OUTPUT LOAD**  
VBM-70-36



**EFFICIENCY VS OUTPUT LOAD**  
VBM-70-48



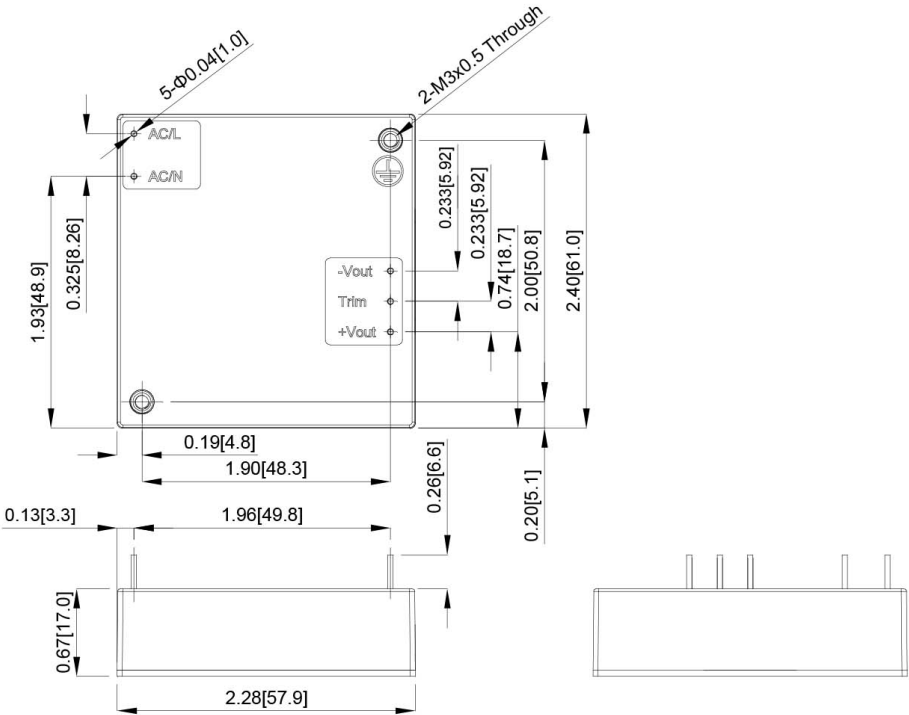
MECHANICAL

| parameter  | conditions/description | min                                        | typ | max | units  |
|------------|------------------------|--------------------------------------------|-----|-----|--------|
| dimensions |                        | 2.28 x 2.40 x 0.67 [57.9 x 61.0 x 17.0 mm] |     |     | inches |
|            | with heatsink          | 2.39 x 2.28 x 1.46 [60.7 x 58.0 x 37.0 mm] |     |     | inches |
| weight     |                        |                                            | 135 |     | g      |
|            | with heatsink          |                                            | 260 |     | g      |

MECHANICAL DRAWING

units: inch [mm]  
tolerance: inches: x.xx = ±0.02, x.xxx = ±0.010  
mm: x.x = ±0.5, x.xx = ±0.25

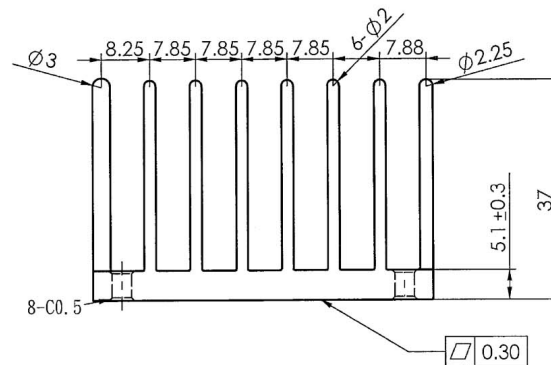
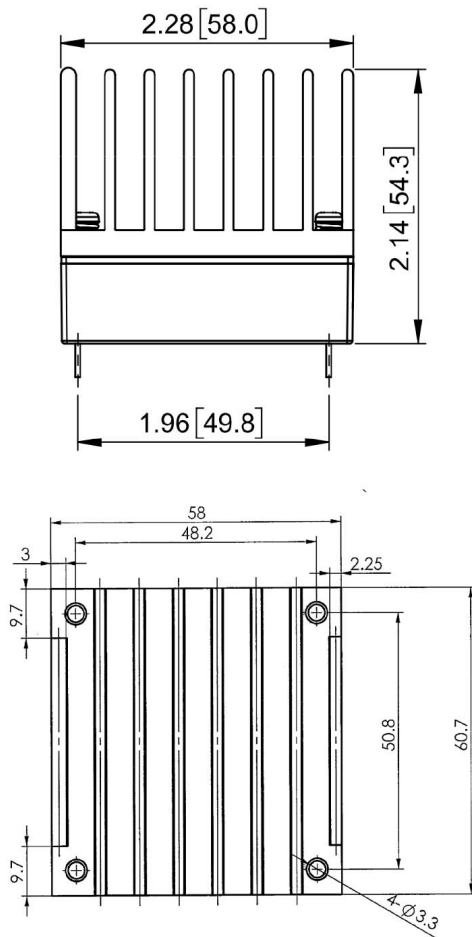
| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | FUNCTION |
| 1               | AC (L)   |
| 2               | AC (N)   |
| 3               | +Vo      |
| 4               | Trim     |
| 5               | -Vo      |



## MECHANICAL DRAWING (CONTINUED)

### HEATSINK VERSION

units: inch [mm]

tolerance: inches: x.xx =  $\pm 0.02$ , x.xxx =  $\pm 0.010$ mm: x.x =  $\pm 0.5$ , x.xx =  $\pm 0.25$ 

## REVISION HISTORY

| rev. | description     | date       |
|------|-----------------|------------|
| 1.0  | initial release | 12/09/2021 |

The revision history provided is for informational purposes only and is believed to be accurate.



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