



50 to 600 Watts; 1 to 3 outputs

## Features

- RoHS Compliant (VE versions)
- Inputs 24, 48, and 300 Vdc
- Any output: 1 to 95 Vdc
- Meets EN55022 Class A conducted emissions (See Notes)
- cULus, cTUVus (60950-1)
- CE marked (LVD)
- 80 – 90% efficiency
- Up to 10 W/cubic inch
- Master disable
- Overvoltage shutdown

## Product Highlights

ComPAC delivers up to 600 W from one, two, or three outputs in a package just 0.99" (25,2 mm) in height with the field proven performance, high efficiency and high reliability inherent in Vicor's component level power converters. ComPAC meets conducted emissions of EN55022 Class A. ComPAC is offered with input voltage ranges optimized for industrial and telecommunication applications and provides extended input overvoltage capability, undervoltage lockout, and master disable.

## Packaging Options

Conduction Cooled Models Available Add "-CC" to the end of the part number.

(Consult factory for details.)

Extended heat sink available add "-H1" to end of part number.

## ComPAC Configuration Chart

| Substitute VE- for VI- for RoHS compliant versions                                      |              |              |                                                  |
|-----------------------------------------------------------------------------------------|--------------|--------------|--------------------------------------------------|
| Configuration                                                                           | Output Power | # of Modules | Dimensions                                       |
| <b>Single Output</b>                                                                    |              |              |                                                  |
| VI-LC  | 50 – 200 W   | 1            | 8.6" x 2.5" x 0.99"<br>(218,4 x 63,5 x 25,2 mm)  |
| VI-MC  | 100 – 400 W  | 2            | 8.6" x 4.9" x 0.99"<br>(218,4 x 124,5 x 25,2 mm) |
| VI-NC  | 300 – 600 W  | 3            | 8.6" x 7.3" x 0.99"<br>(218,4 x 185,4 x 25,2 mm) |
| <b>Dual Output</b>                                                                      |              |              |                                                  |
| VI-PC  | 100 – 400 W  | 2            | 8.6" x 4.9" x 0.99"<br>(218,4 x 124,5 x 25,2 mm) |
| VI-QC  | 150 – 600 W  | 3            | 8.6" x 7.3" x 0.99"<br>(218,4 x 185,4 x 25,2 mm) |
| <b>Triple Output</b>                                                                    |              |              |                                                  |
| VI-RC  | 150 – 600 W  | 3            | 8.6" x 7.3" x 0.99"<br>(218,4 x 185,4 x 25,2 mm) |

### • Input Voltage

| Nominal                             | Input Range Full Power | Maximum Power <sup>a</sup> | Low Line 75% Max. Power | Transient <sup>b</sup> |
|-------------------------------------|------------------------|----------------------------|-------------------------|------------------------|
| 1 = 24 V                            | 21 – 32 V              | (1)                        | 18                      | 36                     |
| W = 24 V                            | 18 – 36 V              | (1)                        | n/a                     | n/a                    |
| 3 = 48 V                            | 42 – 60 V              | (2)                        | 41                      | 72                     |
| N = 48 V                            | 36 – 76 V              | (2)                        | n/a                     | n/a                    |
| 6 = 300 V                           | 200 – 400 V            | (2)                        | 188                     | 425                    |
| <sup>a</sup> Max. Output Per Module |                        |                            |                         |                        |
| (1)                                 | 5 V Outputs            | >5 V Outputs               | <5 V Outputs            |                        |
| (2)                                 | 150 W                  | 150 W                      | 30 A                    |                        |
|                                     | 200 W                  | 200 W                      | 40 A                    |                        |

<sup>b</sup> Transient voltage for one second

### • Product Grade Temps. °C

| Grade | Operating  | Storage     |
|-------|------------|-------------|
| E =   | -10 to +85 | -20 to +100 |
| C =   | -25 to +85 | -40 to +100 |
| I =   | -40 to +85 | -55 to +100 |
| M =   | -55 to +85 | -65 to +100 |

Temperatures apply to product case.

### • Output Power/Current

| V <sub>OUT</sub> ≥ 5 V | V <sub>OUT</sub> < 5 V |
|------------------------|------------------------|
| W = 100 W              | W = 20 A               |
| V = 150 W              | V = 30 A               |
| U = 200 W              | U = 40 A               |
| S = 300 W              | S = 60 A               |
| Q = 400 W              | Q = 80 A               |

### • Output Voltage

|            |            |
|------------|------------|
| Z = 2 V    | 2 = 15 V   |
| Y = 3.3 V  | N = 18.5 V |
| O = 5 V    | 3 = 24 V   |
| X = 5.2 V  | L = 28 V   |
| W = 5.5 V  | J = 36 V   |
| V = 5.8 V  | K = 40 V   |
| T = 6.5 V  | 4 = 48 V   |
| R = 7.5 V  | H = 52 V   |
| M = 10 V   | F = 72 V   |
| 1 = 12 V   | D = 85 V   |
| P = 13.8 V | B = 95 V   |

### • Output Power/Current

| V <sub>OUT</sub> ≥ 5 V | V <sub>OUT</sub> < 5 V |
|------------------------|------------------------|
| Y = 50 W               | Y = 10 A               |
| X = 75 W               | X = 15 A               |
| W = 100 W              | W = 20 A               |
| V = 150 W              | V = 30 A               |
| U = 200 W              | U = 40 A               |

### • Output Power/Current

| V <sub>OUT</sub> ≥ 5 V | V <sub>OUT</sub> < 5 V |
|------------------------|------------------------|
| S = 300 W              | S = 60 A               |
| P = 450 W              | P = 90 A               |
| M = 600 W              | M = 120 A              |

## COMPAC SPECIFICATIONS

(typical at  $T_{BP} = 25^{\circ}\text{C}$ , nominal line and 75% load, unless otherwise specified,  $V_{NOM}$  is factory set output voltage and  $I_{NOM}$  is maximum rated output current.)

### ■ INPUT SPECIFICATIONS

| Parameter                                                           | E-Grade |     |     | C-, I-, M-Grade |     |     | Unit  | Test Conditions                                                                                                                          |
|---------------------------------------------------------------------|---------|-----|-----|-----------------|-----|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                     | Min     | Typ | Max | Min             | Typ | Max |       |                                                                                                                                          |
| 24 V                                                                | 21      | 24  | 32  | 21              | 24  | 32  | Vdc   | See Fusing Information on Page 3                                                                                                         |
| 24 V Wide                                                           | 18      | 24  | 36  | 18              | 24  | 36  | Vdc   |                                                                                                                                          |
| 48 V                                                                | 42      | 48  | 60  | 42              | 48  | 60  | Vdc   |                                                                                                                                          |
| 48 V Wide                                                           | 36      | 48  | 76  | 36              | 48  | 76  | Vdc   |                                                                                                                                          |
| 300 V                                                               | 200     | 300 | 400 | 200             | 300 | 400 | Vdc   |                                                                                                                                          |
| No load power dissipation <sup>a</sup>                              | 1.35    |     | 2   | 1.35            |     | 2   | Watts |                                                                                                                                          |
| Master disable input current <sup>a</sup><br>(Absolute max., 20 mA) | 4       |     |     | 4               |     |     | mA    | Sink or source to disable optocoupler (See <a href="#">Section 18</a> ComPAC Technical Description in VI-200/VI-J00 Applications Manual) |
| Quiescent Input current<br>logic disable <sup>a</sup>               |         | 7   | 10  |                 | 7   | 10  | mA    | Current drawn from source when disabled                                                                                                  |

<sup>a</sup> For MC, PC series, multiply value by 2; for NC, QC, RC series, multiply value by 3.

### ■ OUTPUT SPECIFICATIONS (Applies to each output individually)

| Parameter                                    | E-Grade |      |      | C-, I-, M-Grade |       |      | Units              | Test Conditions                            |
|----------------------------------------------|---------|------|------|-----------------|-------|------|--------------------|--------------------------------------------|
|                                              | Min     | Typ  | Max  | Min             | Typ   | Max  |                    |                                            |
| Set point accuracy                           |         | 1%   | 2%   |                 | 0.5%  | 1%   | $V_{NOM}$          |                                            |
| Load / line regulation                       |         |      | 0.5% |                 | 0.05% | 0.2% | $V_{NOM}$          | LL to HL, 10% to full load                 |
| Load / line regulation                       |         |      | 1%   |                 | 0.2%  | 0.5% | $V_{NOM}$          | LL to HL, no load to full load             |
| Output temperature drift                     |         | 0.02 |      |                 | 0.01  | 0.02 | $^{\circ}\text{C}$ | Over rated temperature range               |
| Long term drift                              |         | 0.02 |      |                 | 0.02  |      | %/1 k hrs.         |                                            |
| Output ripple                                |         |      |      |                 |       |      |                    |                                            |
| 2 V, 3.3 V                                   |         |      | 150  |                 | 60    | 100  | mVp-p              | 20 MHz bandwidth                           |
| 5 V                                          |         |      | 250  |                 | 100   | 150  | mVp-p              | 20 MHz bandwidth                           |
| 10 – 48 V                                    |         |      | 3%   |                 | 0.75% | 1.5% | $V_{NOM}$ p-p      | 20 MHz bandwidth                           |
| Output voltage trimming <sup>a</sup>         | 50%     |      | 110% | 50%             |       | 110% | $V_{NOM}$          |                                            |
| Total remote sense compensation <sup>a</sup> | 0.5     |      |      | 0.5             |       |      | Volts              | 0.25 V maximum allowable drop in –Out lead |
| OVP set point                                |         | 125% |      | 115%            | 125%  | 135% | $V_{NOM}$          | Recycle power to restart                   |
| Current limit                                | 105%    |      | 135% | 105%            |       | 125% | $I_{NOM}$          | Automatic restart                          |
| Short circuit current <sup>b</sup>           | 20%     |      | 140% | 20%             |       | 130% | $I_{NOM}$          |                                            |

<sup>a</sup> 10 V, 12 V and 15 V outputs, trim range  $\pm 10\%$ . Consult factory for wider trim range.

<sup>b</sup> Output voltages of 5 V or less incorporate foldback current limiting, outputs greater than 5 V incorporate straight line current limiting.

**CONFIGURABLE SPECIFICATIONS (Cont.)****■ THERMAL CHARACTERISTICS**

| Parameter                           | <b>E-Grade</b> |          |     | <b>C-, I-, M-Grade</b> |          |     | Units | Test Conditions                   |
|-------------------------------------|----------------|----------|-----|------------------------|----------|-----|-------|-----------------------------------|
|                                     | Min            | Typ      | Max | Min                    | Typ      | Max |       |                                   |
| Efficiency                          |                | 78 – 88% |     |                        | 80 – 90% |     |       | for 5 V outputs and higher        |
| Shut down temp. — case <sup>a</sup> | 90             | 95       | 105 | 90                     | 95       | 105 | °C    | Cool and recycle power to restart |
| Operating temp. — case              |                |          | 85  |                        |          | 85  | °C    | See Thermal Curves                |

<sup>a</sup> Shut down temperature threshold is above maximum operating temperature. For over temperature protection, external means of disable should be employed below maximum operating temperature.

**■ ISOLATION CHARACTERISTICS**

| Parameter       | <b>E-Grade</b> |     |     | <b>C-, I-, M-Grade</b> |     |     | Unit | Test Conditions |
|-----------------|----------------|-----|-----|------------------------|-----|-----|------|-----------------|
|                 | Min            | Typ | Max | Min                    | Typ | Max |      |                 |
| Isolation       |                |     |     |                        |     |     |      |                 |
| Input to output | 4,242          |     |     | 4,242                  |     |     | Vdc  |                 |
| Output to case  | 707            |     |     | 707                    |     |     | Vdc  |                 |
| Input to case   | 2,121          |     |     | 2,121                  |     |     | Vdc  |                 |

**■ MECHANICAL SPECIFICATIONS**

| Parameter           | <b>E-Grade</b> |     |     | <b>C-, I-, M-Grade</b> |     |     | Units  | Test Conditions |
|---------------------|----------------|-----|-----|------------------------|-----|-----|--------|-----------------|
|                     | Min            | Typ | Max | Min                    | Typ | Max |        |                 |
| Weight <sup>a</sup> | 19.2           |     |     | 19.2                   |     |     | Ounces |                 |
|                     | 544            |     |     | 544                    |     |     | Grams  |                 |

<sup>a</sup> For MC, PC series, multiply value by 2; for NC, QC, RC series, multiply value by 3.

**■ FUSING INFORMATION**

| Input Voltage             | 24 V | 48 V | 300 V |
|---------------------------|------|------|-------|
| LC series (200 W)         | 10 A | 7 A  | 2 A   |
| MC, PC series (400 W)     | 20 A | 15 A | 4 A   |
| NC, QC, RC series (600 W) | 35 A | 25 A | 6 A   |

**CONFIGURABLE SPECIFICATIONS (Cont.)****■ AGENCY APPROVALS**

| Safety Standards                                                               | Markings                          | Notes                                                          |
|--------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------|
| ANSI / ISA 12.12.01 - 2012, C22.2 No. 213-M1987<br>UL / CSA / EN / IEC 60950-1 | cURus<br>cURus, cTÜVus, CE Marked | Low Voltage Directive and RoHS Recast Directive as applicable. |

**■ EMI/EMC Characteristics** (Performed on selected samples representative of the ComPac product family.)

| Parameter                                | Notes                                                                                                                                   |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Conducted Emissions<br>EN 55022, class A | 3 Module configurations may require additional filter components under certain line and load conditions to comply with EN55022 class A. |
| ESD<br>IEC 61000-4-2 level 4             | Top, Bottom and Sides                                                                                                                   |

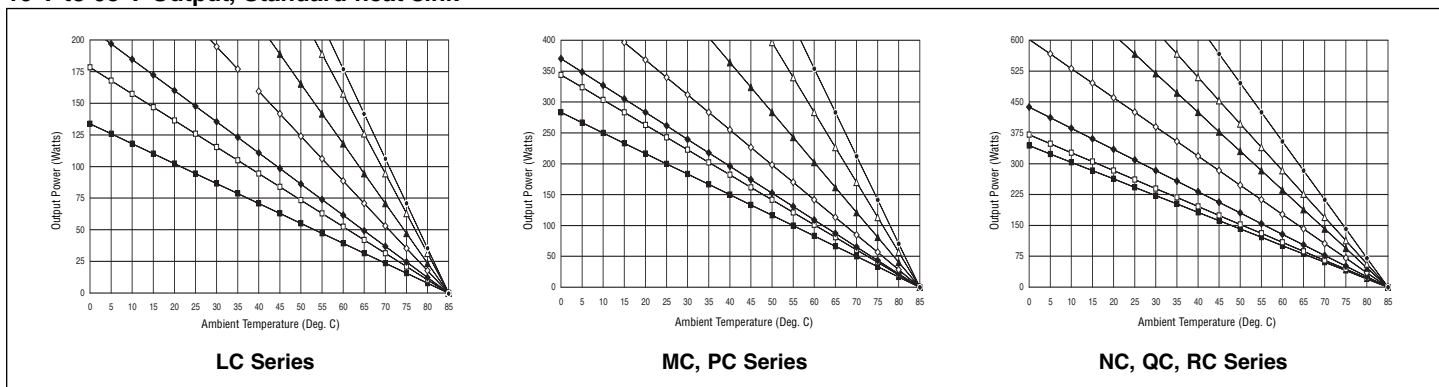
## THERMAL CURVES

■ FREE AIR    □ 50 LFM    ◆ 100 LFM    ◇ 250 LFM    ▲ 500 LFM    △ 750 LFM    ● 1000 LFM

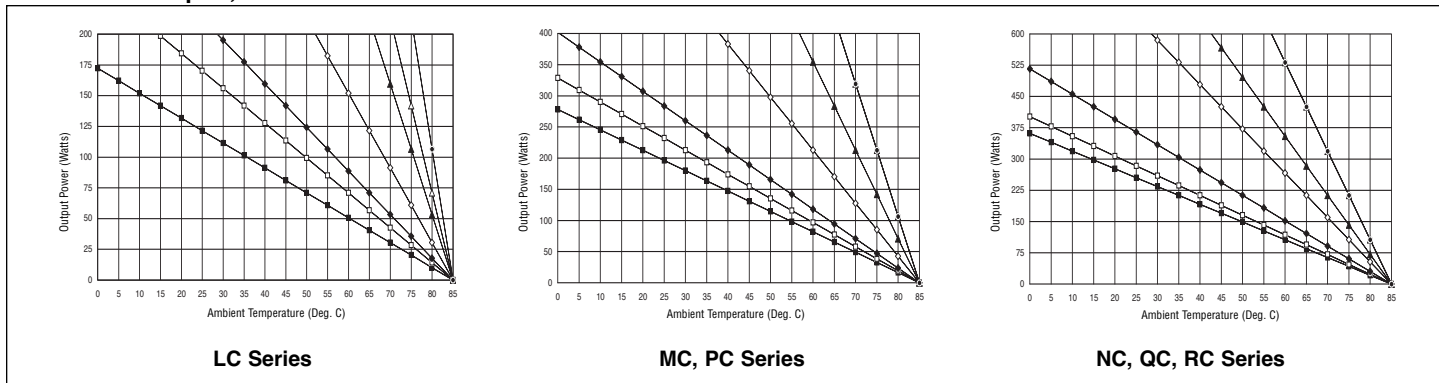
### 2 V to 7.5 V Output, Standard heat sink



### 10 V to 95 V Output, Standard heat sink



### 2 V to 7.5 V Output , H1 heat sink



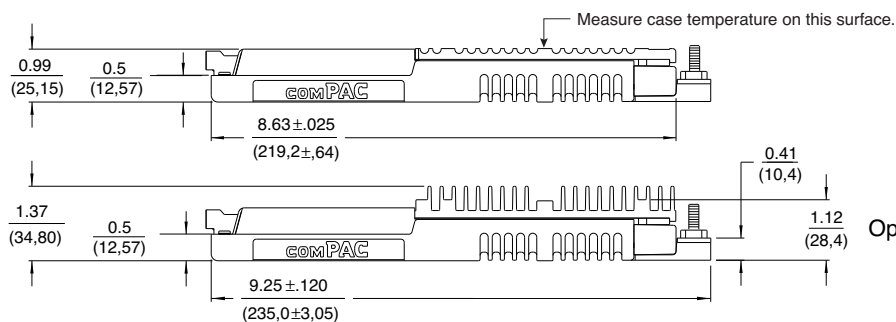
### 10 V to 95 V Output, H1 heat sink



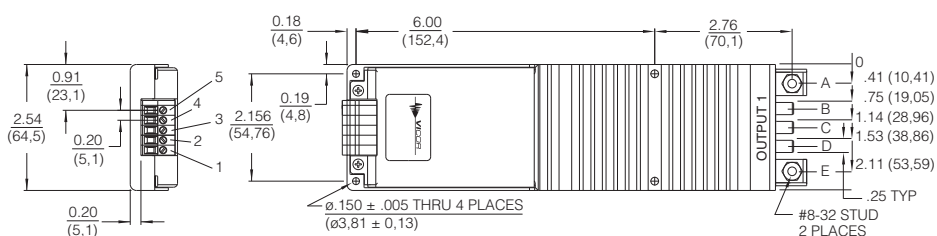
## MECHANICAL DRAWINGS

## ALL MODELS

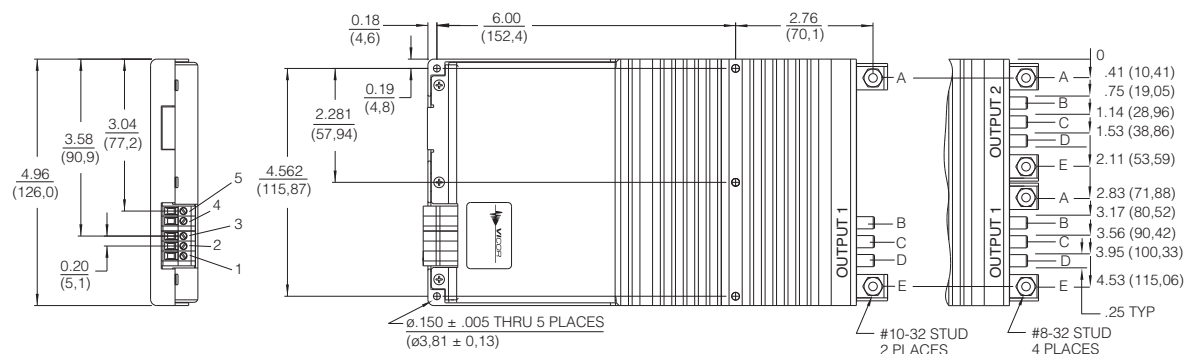
| INPUTS  |          |
|---------|----------|
| 1       | Ground   |
| 2       | -Input   |
| 3       | +Input   |
| 4       | Disable- |
| 5       | Disable+ |
| OUTPUTS |          |
| A       | +Output  |
| B       | +Sense   |
| C       | Trim     |
| D       | -Sense   |
| E       | -Output  |



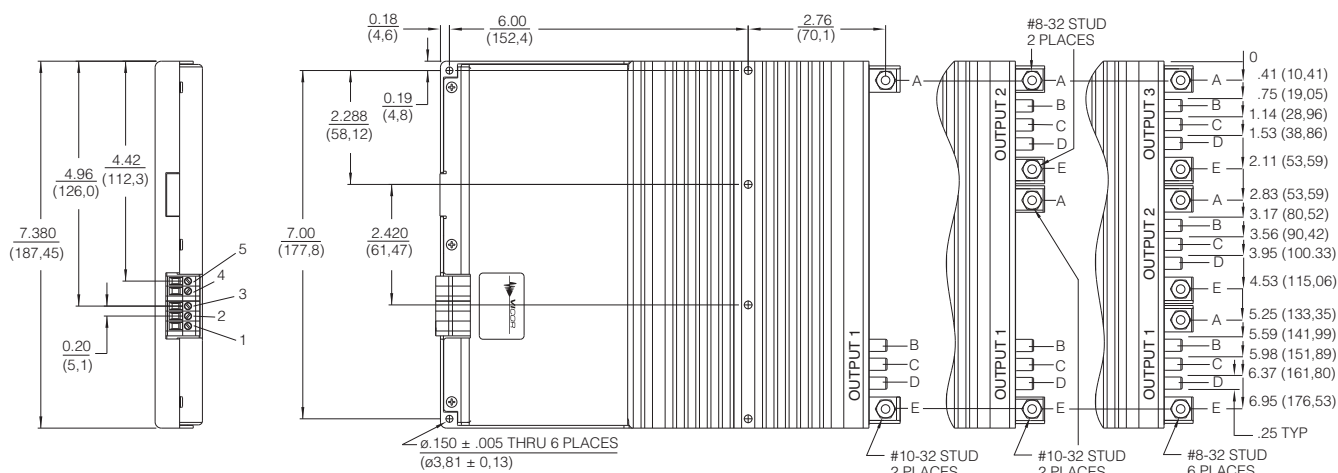
## LC SERIES



## MC, PC SERIES



## NC, QC, RC Series



## LONG TERM SAFE OPERATING AREA CURVES

(1% duty cycle max.,  $Z_s = .5$ , for short duration transient capability refer to specifications)



**I.S.W.:** Input surge withstand, no degradation of performance. **R.E.:** Ratings Exceeded **S.D.:** Shutdown

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