

**SERIES:** VUFM-D400-D | **DESCRIPTION:** MEDICAL AC-DC POWER SUPPLY

**FEATURES**

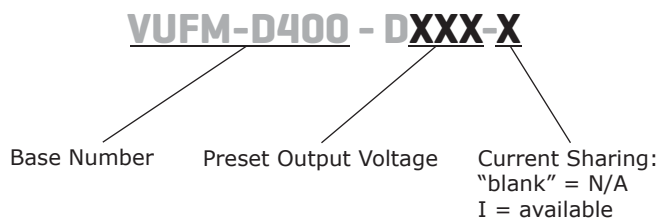
- medical approvals: UL 60601-1, CSA C22.2 No. 60601-1-03
- dual output
- current monitoring and remote voltage adjustments (margin)
- compact 1U size and high power density: 5.56 W/inch<sup>3</sup>
- power factor corrected to EN 61000-3-2 Class D
- short circuit, overload, over voltage and over temperature protections
- optional IEC320 AC inlet or terminal block
- current sharing



| MODEL           | output voltage <sup>1,2,3</sup> |      | output current          |                         | ripple and noise <sup>6,7</sup> | efficiency |
|-----------------|---------------------------------|------|-------------------------|-------------------------|---------------------------------|------------|
|                 | (Vdc)                           |      | max <sup>4</sup><br>(A) | max <sup>5</sup><br>(A) | max<br>(% Vp-p)                 | typ<br>(%) |
| VUFM-D400-D312  | 3.3                             | 30   | 40                      | ±1                      | 75                              |            |
|                 | 12                              | 16.7 | 25                      |                         |                                 |            |
| VUFM-D400-D324  | 3.3                             | 30   | 40                      | ±1                      | 75                              |            |
|                 | 24                              | 8.34 | 12.5                    |                         |                                 |            |
| VUFM-D400-D512  | 5                               | 30   | 40                      | ±1                      | 75                              |            |
|                 | 12                              | 16.7 | 25                      |                         |                                 |            |
| VUFM-D400-D524  | 5                               | 30   | 40                      | ±1                      | 75                              |            |
|                 | 24                              | 8.34 | 12.5                    |                         |                                 |            |
| VUFM-D400-D1242 | 12                              | 16.7 | 25                      | ±1                      | 75                              |            |
|                 | 24                              | 8.33 | 12.5                    |                         |                                 |            |

- Notes:
1. output is fully isolated
  2. output voltage is measured at output power connector
  3. provides peak power of 700 W within 500 μs for all models
  4. convection cooling
  5. 23 CFM cooling
  6. 1% minimum load is required to maintain the ripple and regulation
  7. Ripple and noise is measured from 10 KHz to 20 MHz at output terminals with a 0.1 μF ceramic capacitor and a 22 μF electrolytic capacitor in parallel

**PART NUMBER KEY**



## INPUT

| parameter               | conditions/description   | min | typ | max  | units |
|-------------------------|--|-----|-----|------|-------|
| voltage                 |  | 90  |     | 264  | Vac   |
| frequency               |  | 47  |     | 63   | Hz    |
| current                 | at 90 Vac, full load   |     |     | 6.35 | A     |
| inrush current          | at 230 Vac, full load, cold start  |     |     | 35   | A     |
| input fuse              | built-in ac fuse. A blown fuse usually indicates permanent damage to the power supply serviceable by factory only. |     |     |      |       |
| active power correction | meets EN 61000-3-2 Class D   |     |     |      |       |

## OUTPUT

| parameter                       | conditions/description  | min | typ | max | units |
|---------------------------------|---|-----|-----|-----|-------|
| total regulation                |   |     | ±1  |     | %     |
| transient response              | output voltage returns to within 1% in less than 2.5 ms for a 50% load change, peak transient does not exceed 5%.   |     |     |     |       |
| overshoot                       | turn-on and turn-off overshoot shall not exceed 5% over nominal voltage.  |     |     |     |       |
| turn-on delay                   | at 230 Vac  |     |     | 1   | s     |
| hold-up time                    | at 80% load   | 20  |     |     | ms    |
| adjustment range                | output user adjustable  |     | ±5  |     | %     |
| switching frequency             |   |     | 30  |     | kHz   |
| remote sense                    | designated as RS+ and RS- on CN3. Total voltage compensation for cable losses with respect to the main output.  |     |     |     |       |
| remote on/off                   | defined RSW on CN3, requiring a low signal to inhibit output.   |     |     |     |       |
| LED display (LED 1)             | green - the power supply is operating normally.<br>orange - when any protection occurs or RSW is low.   |     |     |     |       |
| power good                      | designated as PG on CN3. This signal goes high 100~500 ms after the output reaches regulation. It goes low at least 1 ms before loss of regulation.                       |     |     |     |       |
| current sharing                 | designated as CSH on CN3, optional single wired for forced current sharing function and parallel up to 4 units within 10% accuracy at full load.                          |     |     |     |       |
| current monitor                 | designated as CMN on CN3 for for current sense for 0.5~3 Vdc to represent 0~100% output current.  |     |     |     |       |
| AC fail (optional) <sup>2</sup> | designated as ACF on CN3 to monitor the input voltage when input goes under 80 ±5 Vac the signal will go low (0 V) and then go high (+5 V) once it reappears over 86 Vac. |     |     |     |       |

Notes: 1. 1% minimum load is required to maintain ripple and regulation  
2. Not available for current sharing models  
3. Input voltage protection must be disabled when AC Fail is enabled

## PROTECTIONS

| parameter                      | conditions/description  | min | typ | max | units |
|--------------------------------|---|-----|-----|-----|-------|
| input under voltage protection | Power supply shuts down when ac input is under 80 ±5 Vac. When ac line reappears over 86 ±5 Vac, the power supply restarts automatically. |     |     |     |       |
| over voltage protection        | shutdown and latches, ac input reset required to restart  |     |     | 130 | %     |
| over current protection        | auto recovery   | 110 |     | 140 | %Io   |
| short circuit protection       | continuous, auto recovery upon removal of short   |     |     |     |       |
| over temperature protection    | shutdown  | 85  |     |     | °C    |

**SAFETY & COMPLIANCE**

| parameter         | conditions/description   | min     | typ | max | units |
|-------------------|--|---------|-----|-----|-------|
| isolation voltage | primary to secondary at 2 mA for 3 seconds   | 4,000   |     |     | Vac   |
|                   | primary to transformer core at 2 mA for 3 seconds  | 1,500   |     |     | Vac   |
|                   | primary to earth ground at 2 mA for 3 seconds  | 1,500   |     |     | Vac   |
| safety approvals  | UL 60601-1, CSA C22.2 No. 601.1-M90, TUV 60601-1, CE Mark (LVD)<br>EN 61204-3/60601-1-2/61000-3-(2,3) & IEC 61000-4 Series Regulations, CB       |         |     |     |       |
| EMI/EMC           | FCC Part 15, CISPR22 Class B, conducted  |         |     |     |       |
| leakage current   |  |         |     | 300 | µA    |
| grounding test    | allowable resistance measured when 40 A current is applied from the ground pin of the three prong plug to the farthest earthed connection point. |         |     | 0.1 | Ω     |
| RoHS compliant    | yes  |         |     |     |       |
| MTBF              | according to MIL-HBK-217F at 30°C  | 100,000 |     |     | hours |

**ENVIRONMENTAL**

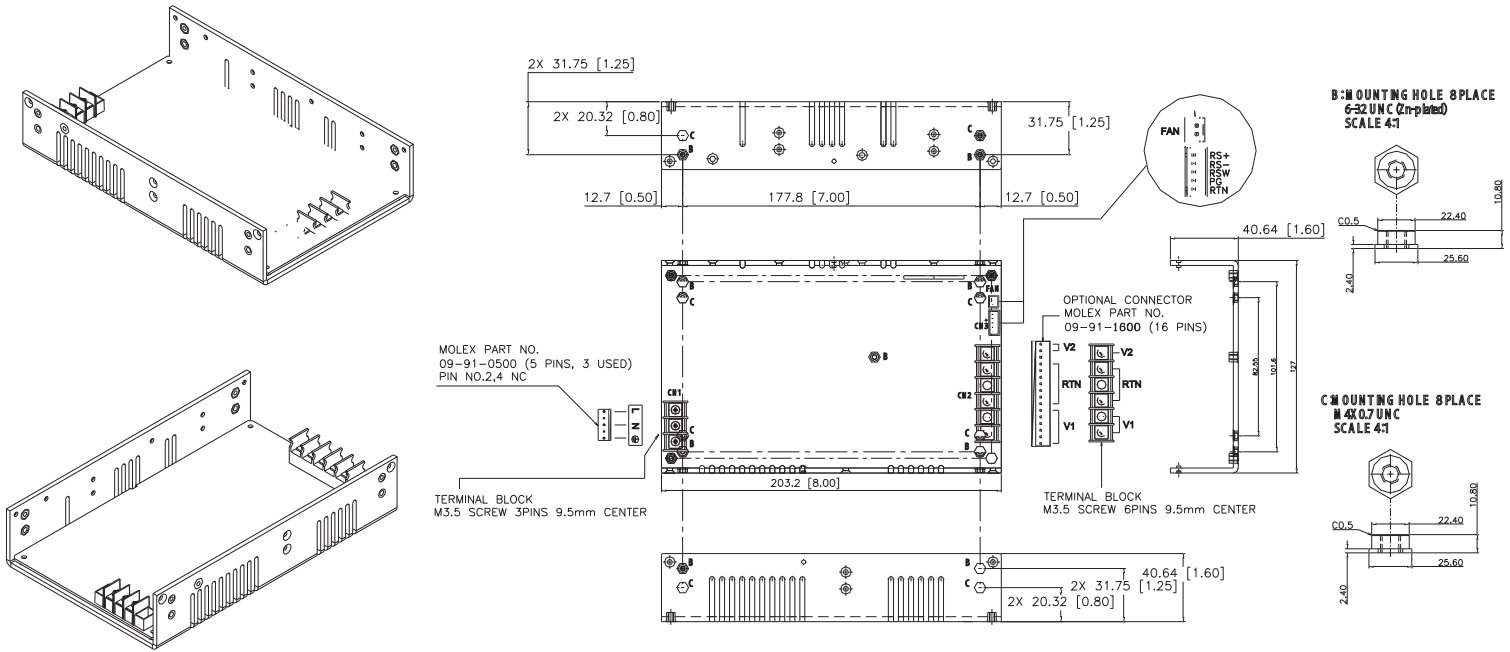
| parameter             | conditions/description                 | min | typ | max | units |
|-----------------------|--|-----|-----|-----|-------|
| operating temperature | derating linearly at 2.5% from 50~70°C | 0   |     | 70  | °C    |
| storage temperature   |  | -20 |     | 85  | °C    |
| operating humidity    | non-condensing                         | 5   |     | 90  | %RH   |
| storage humidity      | non-condensing                         | 5   |     | 95  | %RH   |

## MECHANICAL

| parameter       | conditions/description               | min | typ | max | units |
|-----------------|--------------------------------------|-----|-----|-----|-------|
| dimensions      | 8 x 5 x 1.6 (203.2 x 127 x 40.64 mm) |     |     |     | inch  |
| weight          |                                      |     |     | 1.3 | kg    |
| Mounting screws | 6-32, 1/4" or shorter                |     |     |     |       |

## MECHANICAL DRAWING

units: inches (mm)  
 tolerance: inches: x.xx = ±0.02  
 mm: x.xx = ±0.5



| INPUT CONNECTOR [CN1]       |  |
|-----------------------------|--|
| Howder HD-121-3P (option 1) | Molex Part No. 26-48-1071 or similar. (option 2) |
|                             | Suggested mating plug Molex Part No. 09-91-0700  |

| LOGIC CONNECTOR [CN3]   |                        | FAN  |  |
|---|------------------------|--|--|
| JS B5B-XH-A   |                        | JS B2B-XH-A  |  |
| Suggested mating connector JST XHP-5 or equivalent Contact: SXH-002T-P0.6 |                        | Suggested mating connector JST XHP-2 or equivalent, Contact: SXH-001T-P0.6 |  |
| PIN   | FUNCTION               |  |  |
| 1   | RTN - return           |  |  |
| 2   | PG - power good signal |  |  |
| 3   | RSW - remove on/off    |  |  |
| 4   | RS- - remote sense (-) |  |  |
| 5   | RS+ - remote sense (+) |  |  |

| OUTPUT CONNECTOR [CN2]                                 |          |   |          |
|--|----------|---|----------|
| Howder HD-121-6P (option 1)                            |          | Molex 26-48-1161 or similar. (option 2)     |          |
| Suggested mating connector Molex 19198-0045 or similar |          | Suggested mating connector Molex 09-91-1600 |          |
| PIN  | FUNCTION | PIN   | FUNCTION |
| 1~2  | +Vo      | 1~6   | +Vo      |
| 3~5  | RTN      | 7~13  | RTN      |
| 6  | -Vo      | 14~16                                       | -Vo      |

## REVISION HISTORY

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| rev. | description                                       | date       |
|------|---|------------|
| 1.0  | initial release                                   | 07/11/2006 |
| 1.04 | new template applied, V-Infinity branding removed | 08/28/2012 |

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



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