

SERIES: VUFM-S400 | **DESCRIPTION:** MEDICAL AC-DC POWER SUPPLY

FEATURES

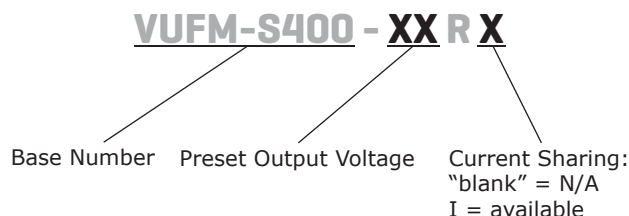
- up to 400 W continuous power
- compact 1U size
- 5.56 W/inch³ power density
- universal input (90~264 Vac)
- single output from 3.3~48V
- short circuit, over voltage and over temperature protections
- full medical approvals
- built-in active PFC function
- built-in remote sense function
- efficiency up to 83%



| MODEL | output voltage | output current | output power | ripple and noise ⁴ | efficiency |
|---------------|----------------|----------------|------------------|-------------------------------|------------|
| | (Vdc) | max (A) | max (W) | max (mVp-p) | typ (%) |
| VUFM-S400-03R | 3.3 | 60 | 200 ¹ | 33 | 70 |
| VUFM-S400-05R | 5 | 60 | 300 ² | 50 | 75 |
| VUFM-S400-12R | 12 | 33.34 | 400 ³ | 120 | 80 |
| VUFM-S400-18R | 18 | 25 | 400 ³ | 180 | 83 |
| VUFM-S400-24R | 24 | 18.19 | 400 ³ | 240 | 83 |
| VUFM-S400-36R | 36 | 12.9 | 400 ³ | 360 | 83 |
| VUFM-S400-48R | 48 | 9.53 | 400 ³ | 480 | 83 |

- Notes:
1. total continuous output power will not exceed 200 W forced air (23 CFM), 150 W without fan
 2. total continuous output power will not exceed 300 W forced air (23 CFM), 225 W without fan
 3. total continuous output power will not exceed 400 W forced air (23 CFM), 250 W without fan
 4. 1% minimum load is required to maintain the ripple and regulation

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. | | | | |
| power factor 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%. | | | | |
| start-up time | at 120 Vac | | | 1 | s |
| hold-up time | at 120 Vac, 80% load | 20 | | | ms |
| adjustability | output user adjustable | | | ±5 | % |
| switching frequency | | | 30 | | kHz |
| overshoot | Turn-on and turn-off overshoot shall not exceed 5% over nominal voltage. | | | | |
| remote sense ¹ | 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. 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) | 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. Not available for current sharing models

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 | auto recovery upon removal of short | | | | |
| over temperature protection | shutdown | 85 | | | °C |

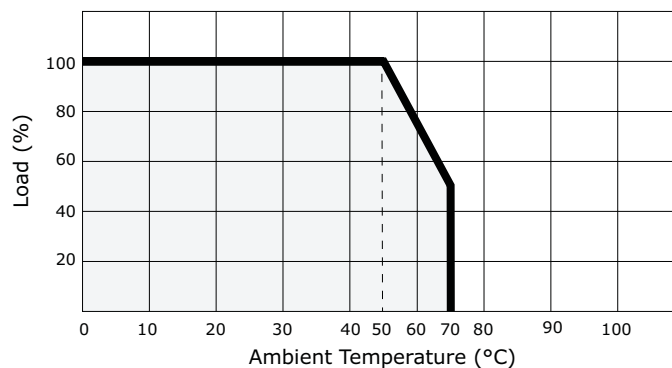
SAFETY & COMPLIANCE

| 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 |
| isolation resistance | 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 |
| safety approvals | UL 60601-1, CSA C22.2 No. 601.1-M90, TUV EN 60601-1, CE Mark (LVD) 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 | μ A |
| 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 |
| vibration | 5 ~ 50 Hz, per axis | | ± 7.35 | | m/s ² |

DERATING CURVE

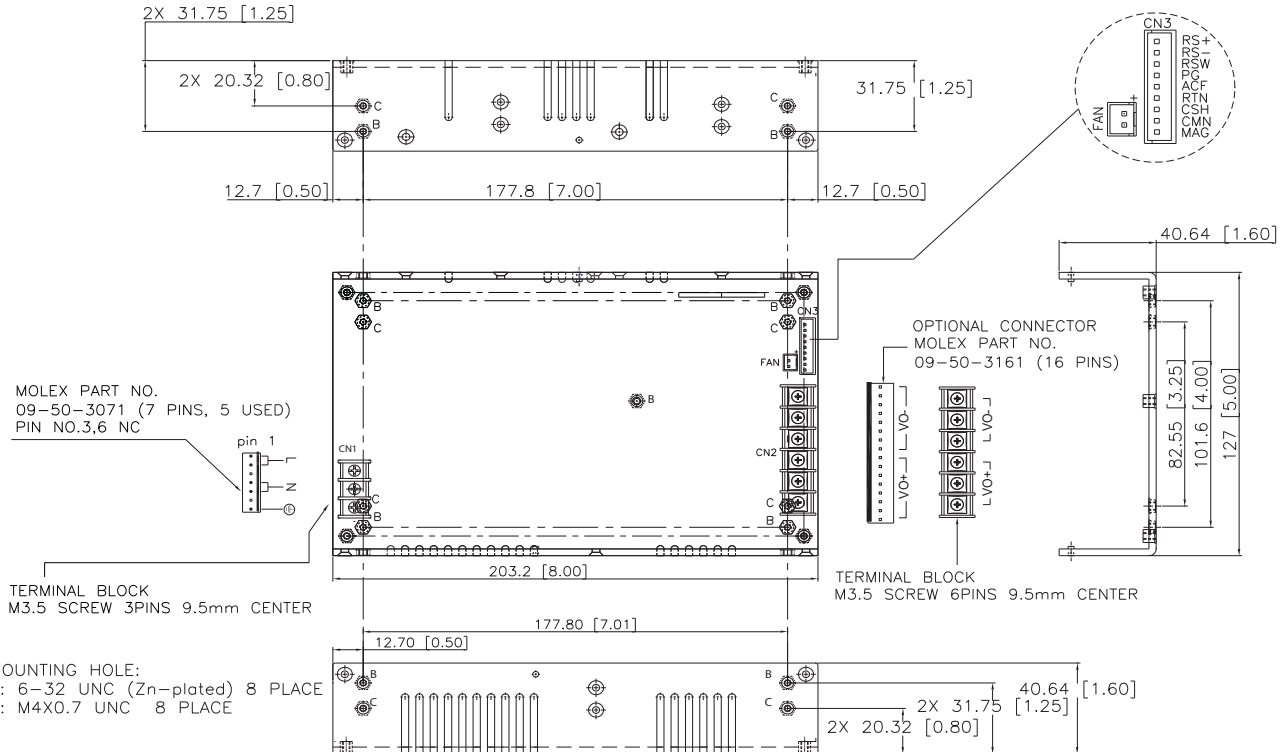
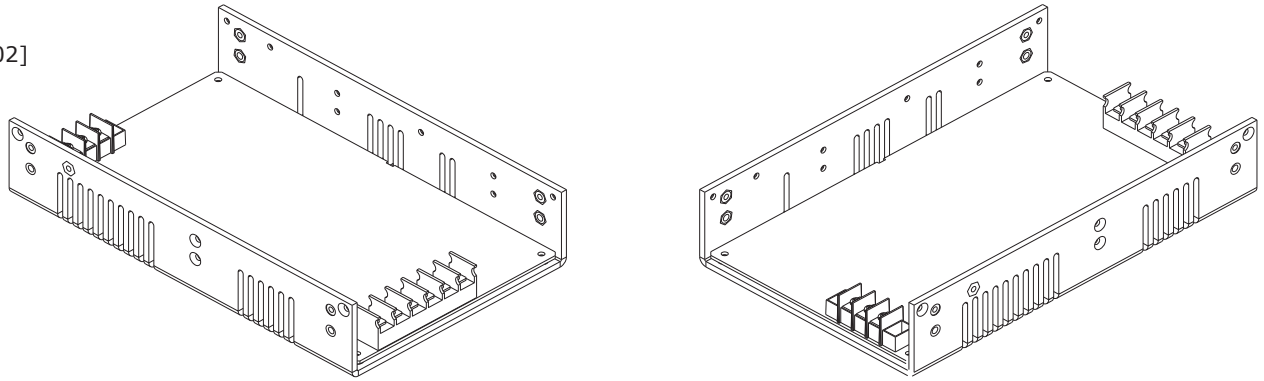


MECHANICAL

| parameter | conditions/description | min | typ | max | units |
|------------|--|-----|-----|-----|-------|
| dimensions | 203.2 x 127 x 40.64 (8 x 5 x 1.6 inch) | | | | mm |
| weight | | | | 1.3 | kg |

MECHANICAL DRAWING

units: mm[inches]
tolerance: ±0.5[0.02]



| INPUT CONNECTOR [CN1] | | | | LOGIC CONNECTOR [CN3] | | | | FAN | |
|--|----------|--|----------|---|--------------------------|-----|------------------------|--|--|
| Howder terminal block HD-121-3P (option 1) | | Molex 09-50-3071 (7 pins, 5 used) (option 2) | | Suggested mating connector --- or equivalent Contact: SXH-002T-P0.6 | | | | --- | |
| OUTPUT CONNECTOR [CN2] | | | | PIN | FUNCTION | PIN | FUNCTION | Suggested mating connector --- or equivalent, Contact: SXH-002T-P0.6 | |
| Howder terminal block HD-121-6P (option 1) | | Molex 09-50-3161 (16 pins) (option 2) | | 1 | MAG - margin | 6 | PG - power good signal | | |
| PIN | FUNCTION | PIN | FUNCTION | 2 | CMN - current monitoring | 7 | RSW - remove on/off | | |
| 1~3 | +Vo | 1~8 | +Vo | 3 | CSH - current sharing | 8 | RS- - remote sense (-) | | |
| 4~6 | -Vo | 9~16 | -Vo | 4 | RTN - return | 9 | RS+ - remote sense (+) | | |
| | | | | 5 | ACF - AC fail | | | | |

Note: 1. Bottom mounting holes have a maximum screw depth of 3.8mm. Side mounting holes have a maximum screw depth of 6.3mm.

REVISION HISTORY

| rev. | description | date |
|------|---|------------|
| 1.0 | initial release | 07/06/2006 |
| 1.01 | updated features, added preset voltage data | 12/27/2006 |
| 1.02 | updated connector data and drawing | 12/12/2007 |
| 1.03 | new template applied | 05/11/2012 |
| 1.04 | V-Infinity branding removed | 08/28/2012 |
| 1.05 | added derating curve | 10/30/2012 |
| 1.06 | updated spec, Molex connectors changed | 01/21/2014 |

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



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