# EIRE300

## DATASHEET

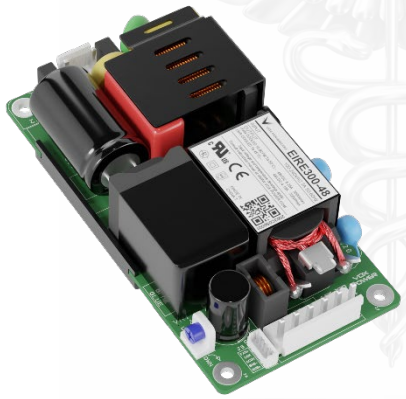
## Single Output Open Frame AC/DC Power Series

### 4" x 2" x 1"
Low profile

### 300W
Fan cooled

### 200W
Convection cooled (115$V_{AC}$)

### BF Rated
Medical



## Superior convection cooling, unlimited applications.

The EIRE300 series of open frame power supplies deliver 300 Watts of power in a miniature 4 x 2 x 1 inch package. The EIRE300 series is the ultimate solution for medical, home healthcare, industrial, household appliance or laboratory applications which require a high efficiency, BF rated, leading edge technology power solution with Class I or II installation capability. The EIRE300 series is designed to be a high reliability power solution which are produced in redundant minimum touch manufacturing locations. Standard output voltages of 12V, 15V, 18V, 24V, 28V, 36V, 48V and 54V are available, all of which have a wide adjustment range. The series includes internal dual line fusing, remote sensing, AC_OK signal, a 0.5A auxiliary fan supply, and protections against over-voltage, over-current, short circuit and over-temperature as standard. The series is approved to the latest medical (IEC/UL60601-1 edition 3.2) and industrial (IEC/UL62368-1 edition 3) standards and is designed to meet the requirements of IEC60335-1:2020 (Household appliances), IEC61558-1:2019 (Safety of Power Transformers) and IEC61010-1:2010 (Measurement, Control, and Laboratory). EMC emissions and immunity exceed the requirements of EN55035 and EN55032 class B and IEC/EN/UL60601-1-2 Edition 4.

## MAIN FEATURES & BENEFITS

MEDICAL · INDUSTRIAL · COMM · LAB & ANALYSIS · HOUSEHOLD · 3 YEAR WARRANTY

- 4" x 2" x 1" footprint
- 300 Watts continuous output power
- 125% peak power (1 second)
- Up to 200 Watts convection cooled (115$V_{AC}$)
- Wide input voltage range (85$V_{AC}$ – 264$V_{AC}$)
- Standard output voltages 12V,15V,18V,24V,28V,36V,48V & 54V
- Wide output voltage adjust range
- High efficiency (Up to 95%)
- Low standby power (0.25W typical)
- Low leakage & touch current (<100uA)
- Convection or forced air cooled
- Class I or II installation
- Remote sensing
- AC_OK signal
- 0.5A auxiliary fan supply
- Wide operating temperature range (-40°C to +70°C, Deratings apply)
- Holdup (8mS 300W, 14mS 180W)
- Start into large capacitive load
- Operating altitude up to 5000m
- BF rated output
- Low EMC emissions (EN55032:2020 Class B)
- IEC/EN/UL60601-1-2 Edition 4 EMC
- IEC/EN/UL62368-1:2018 (Industrial Safety)
- IEC/EN/UL60601-1:2006 (Medical Safety)
- CE compliant
- RoHS2 & REACH compliant
- High reliability design
- 3 year warranty
- World class engineering support
- Market leading technology

SAFETY UL COMPLIANT · SAFETY CE COMPLIANT · ENVIRONMENTAL Conflict Minerals COMPLIANT · ENVIRONMENTAL Proposition 65 COMPLIANT · ENVIRONMENTAL REACH COMPLIANT · ENVIRONMENTAL RoHS Directive (EU) 2015/863 COMPLIANT · ENVIRONMENTAL SCIP COMPLIANT · ENVIRONMENTAL TSCA COMPLIANT · ENVIRONMENTAL GreenSoft Technology, Inc. VERIFIED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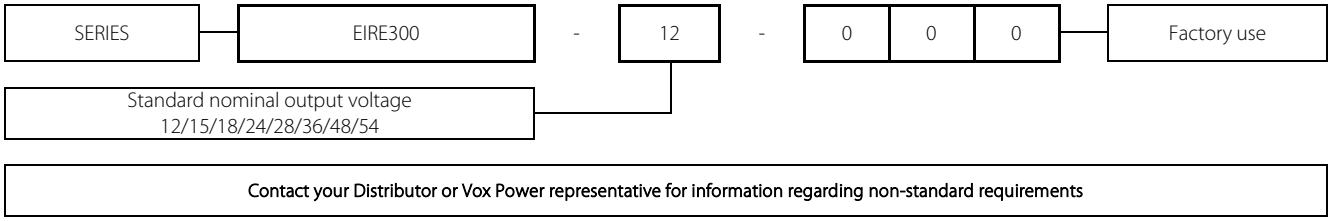
# MODEL SELECTION & ORDERING

| Model | $V_{NOM}$ (V) | $V_{MIN}$ (V) | $V_{MAX}$ (V) | $I_{RATED}$[1] (A) | $P_{RATED}$[2] (W) | $P_{PEAK}$[3] (W) | $V_{OVP}$ (%$V_{NOM}$) | $I_{OCP}$ (%$I_{RATED}$) | Efficiency[4] (%) |
|---|---|---|---|---|---|---|---|---|---|
| EIRE300-12 | 12 | 11.7 | 14 | 25 | 300 | 375 | 135 | >130 | 93 |
| EIRE300-15 | 15 | 14.5 | 17 | 20 | 300 | 375 | 135 | >130 | 94 |
| EIRE300-18 | 18 | 17 | 20 | 16.67 | 300 | 375 | 135 | >130 | 94 |
| EIRE300-24 | 24 | 21.5 | 25 | 12.5 | 300 | 375 | 135 | >130 | 95 |
| EIRE300-28 | 28 | 26 | 30 | 10.7 | 300 | 375 | 135 | >130 | 95 |
| EIRE300-36 | 36 | 33.5 | 40 | 8.33 | 300 | 375 | 135 | >130 | 95 |
| EIRE300-48 | 48 | 42 | 50 | 6.25 | 300 | 375 | 135 | >130 | 95 |
| EIRE300-54 | 54 | 50 | 60 | 5.55 | 300 | 375 | 135 | >130 | 95 |

Notes
1. Maximum continuous current. Do not exceed even when output voltage setting is below nominal.
2. Fan cooled rating. Refer to graphs for appropriate deratings.
3. 1 second. 25% Duty. Average power <= $P_{RATED}$ (Mains voltage and thermal deratings apply where appropriate).
4. Vin = $230V_{AC}$, Vo = $V_{NOM}$, 100% load.

## PART NUMBERING SYSTEM




# SPECIFICATIONS

All specifications are measured @ $T_A$= 25°C, rated input & rated load unless otherwise stated)

| SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Parameter | Details | Min | Typical | Max | Units |
| AC Input Voltage | Nominal range is $100V_{RMS}$ to $240V_{RMS}$. DC voltage not allowed | 85 | | 264 | $V_{RMS}$ |
| AC Input Frequency | | | 50-60 | | Hz |
| Input Current | 300Watts output at 115 $V_{RMS}$ input | | | 3 | Amps |
| Input Current Limit | | | 5 | | Amps |
| Inrush Current | $230V_{RMS}$, 25°C (cold start). | | 65 | | Amps |
| Fusing | Live and Neutral lines fused (T4A/250V) | | | 4 | Amps |
| Efficiency | See graphs in user manual | | 94 | | % |
| Power Factor | $230V_{RMS}$, 150W | | 0.99 | | |
| Holdup | 300Watts, nominal output voltage at $115V_{RMS}$ input<br>180Watts, nominal output voltage at $115V_{RMS}$ input | 8<br>14 | 10<br>16 | | mS<br>mS |
| Standby power consumption | $230V_{RMS}$. Compliant with ErP Lot 6 Standby mode | | 0.25 | 0.4 | Watts |
| Continuous output power | De-rate linearly from 300Watts at $115V_{RMS}$ to 210Watts at $85V_{RMS}$ | | | 300 | Watts |
| Peak output power | 1 Second | | | 375 | Watts |
| Output Voltage | All Models. Initial Setting | -1 | | 1 | $\%V_O$ |
| Load & Line Regulation | All Models. Measured at sense lines. | -50 | | 50 | mV |
| Ripple & Noise [2] | 12V & 15V Models. 20MHz BW, $V_{PKPK}$<br>All other Models. 20MHz BW, $V_{PKPK}$ | | | 1.5<br>1 | $\%V_O$ |
| Minimum Load | All Models | | | 0 | Watts |
| Transient Response | 25% to 75% $I_{RATED}$, 1A/uS<br>Recovery to within 10% of $V_O$ | | | 6<br>1.5 | $\%V_O$<br>mS |
| Turn on Rise Time | All Models. 10% to 70% of $V_O$ | | 3 | | mS |
| Turn on Delay | All Models, All $V_{IN}$, All loads | | 500 | | mS |
| Temperature Coefficient | All Models | -0.02 | | 0.02 | $\%V_O$/°C |
| Over Current Protection | All Models. Hiccup mode | | 130 | | $\%I_{RATED}$ |
| Over Voltage Protection | All Models. Auto Restart | | 135 | | $\%V_{NOM}$ |
| Over Temperature Protection | All Models. Auto Restart. Various component temperatures | | 125 | | °C |
| Fan Supply[3] | Voltage (12V)<br>Voltage (18V,28V,36V,48V,54V)<br>Voltage (15V, 24V)<br>Current (All Models) – Fan cooled<br>Current (All Models) – Convection cooled | 10<br>7<br>12<br>0<br>0 | | 13.8<br>11<br>16<br>0.5<br>0.2 | V<br>V<br>V<br>A<br>A |
| AC_OK Signal | Voltage (Applied)<br>Current (Sink only)<br>Warning time (300W) | <br><br>2 | | 12<br>0.5<br> | V<br>mA<br>mS |
| Remote Sense | Compensation voltage (positive and negative)<br>Internal resistance to terminals<br>Offset to terminals (positive and negative combined) | | | 0.75<br>100<br>100 | V<br>Ω<br>mV |
| Reliability[1] | All Models | | 1.1 | | FPMH |
| Warranty | $T_{AMBIENT}$ <=45°C, 10.2 CFM. Standard terms and conditions apply | | | 3 | Years |
| Size | 101.3 (L) x 50.8 (W) x 25.4 (H). See diagram for tolerance details | | | | mm |
| Weight | 200 | | | | Grams |

Notes
30˚C ambient, 100% load, Fan cooled. SR332 Issue 2 Method I, Case 3, Ground, Fixed, Controlled
To ensure reliability, component temperatures must be maintained below recommended levels in the end application.
Up to 3% for 12V and 18V or 2% for all other models in burst mode with no external capacitance.
Main output loaded >10%

| SAFETY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Parameter | Details | Min | Typical | Max | Units |
| Isolation Voltages | Input to Output (2 MOPP) [1]<br>Input to Functional Earth (1 MOPP)<br>Output to Functional Earth (1 MOPP) | | | 4000<br>2000<br>1500 | $V_{AC}$<br>$V_{AC}$<br>$V_{AC}$ |
| Insulation resistance ($500V_{DC}$) | Input to Output, Input to Functional Earth, Output to Functional Earth | 50 | | | MΩ |
| Earth Leakage Current<br>(Input to Functional Earth) | NC/SFC (Class I), 264Vac, 63Hz, 25°C | | 230/400 | | µA |
| Touch Leakage Current<br>(Input to Functional Earth) | NC (Class I/Class II), 264Vac, 63Hz, 25°C<br>SFC (Class I/Class II), 264Vac, 63Hz, 25°C | | 40/160<br>160/290 | | µA |
| Patient Leakage Current<br>(Output to Earth) | NC (Class I/Class II), 264Vac, 63Hz, 25°C<br>SFC (Class I/Class II), 264Vac, 63Hz, 25°C | | 46/60<br>60/76 | | µA |
| Notes | Use DC equivalent voltage to test assembled unit.<br>NC = Normal Condition, SFC = Single Fault condition | | | | |

| INSTALLATION SPECIFICATIONS | | | |
|---|---|---|---|
| Parameter | Details | Parameter | Details |
| Equipment class | I or II [1] | Flammability Rating | 94V-2 |
| Overvoltage category | II | Ingress protection rating | IP10 |
| Material Group | IIIb (indoor use only) | Intended usage environment | Home Healthcare/Industrial/Home Appliance/Laboratory |
| Pollution degree | 2 | | |
| Conditions of acceptability may apply. See UL report. | | | |

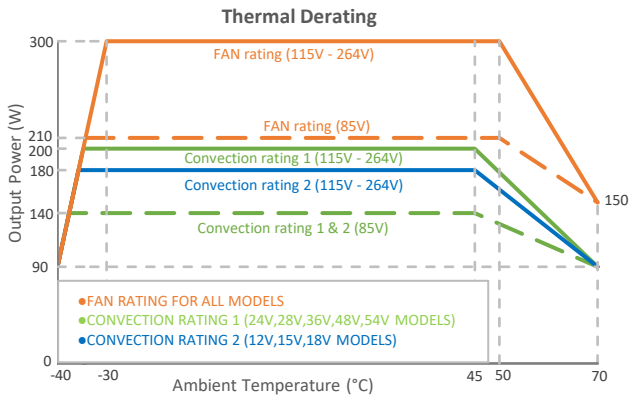
| ENVIRONMENTAL | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Details | Non-Operational | | Operational | | Units |
| | | Min | Max | Min | Max | |
| Air Temperature | Operational limits subject to appropriate de-ratings | -40 | +85 | -40[1] | 70 | °C |
| Humidity | Relative, non-condensing | 5 | 95 | 5 | 95 | % |
| Altitude | | -200 | 5000 | -200 | 5000[2] | m |
| Shock | IEC60068-2-27: Half sine, 3 axes, 3 positive & 3 negative. | | 50, 11 | | 30,18 | g, mS |
| Vibration | IEC60068-2-6: Sine,10 – 500 Hz, 3 axes, 1 oct/min., 10 cycles each axis<br>IEC60068-2-64: Random, 5 – 500 Hz, 3 axes, 30 min. | | <br>0.02,2.56 | | 2<br>0.0122,1 | g<br>$g^2/Hz$, $g_{RMS}$ |
| Notes | Some specifications may not be met below -20°C.<br>Additional power derating may be necessary at high altitudes to ensure component temperatures remain within specification. | | | | | |

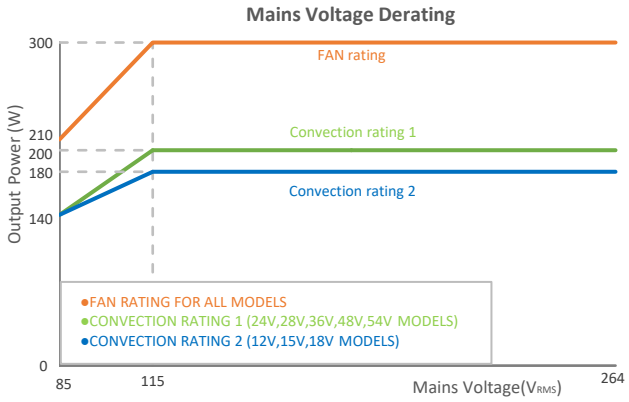
| ELECTROMAGNETIC COMPLIANCE – EMISSIONS | | |
|---|---|---|
| Phenomenon | Basic EMC Standard | Test Details |
| Radiated emissions, electric field | EN55011/32 | Class B compliant |
| Conducted emissions | EN55011/32, CISPR 32/11 | Class B compliant |
| Harmonic Distortion | IEC61000-3-2 | Compliant |
| Flicker & Fluctuation | IEC61000-3-3 | Compliant |

| ELECTROMAGNETIC COMPLIANCE – IMMUNITY | | |
|---|---|---|
| Phenomenon | Basic EMC Standard | Test Details |
| Electrostatic discharge | IEC61000-4-2 | Test level 4: 15kV air, 8kV contact |
| Radiated RF EM fields | IEC61000-4-3 | Test Level 3: (10V/m, 80MHz-2.7GHz) sine wave AM 80% 1kHz |
| Proximity fields from RF wireless communications equipment | IEC61000-4-3 | Test levels as per IEC60601-1-2:2014 Table 9 |
| Electrical Fast Transients/bursts | IEC61000-4-4 | Test Level 3: (2kV Power, 1kV I/O) 5kHz(ed3) & 100kHz(ed4) |
| Surges | IEC61000-4-5 | Test Level 3: 1kV L-N, 2kV L-E |
| Conducted disturbances induced by RF fields | IEC61000-4-6 | Test Level 3: 10V, 0.15 to 80MHz sine wave AM 80% 1kHz |
| Power Frequency Magnetic Fields | IEC61000-4-8 | Test level 4: 30A/m 50Hz |
| Voltage Dips | IEC61000-4-11[2] | 0% 10ms (Criterion B[3]), 0% 20ms (Criterion B [4])<br>70% 0.5s (Criterion A), 40% 0.2s (Criterion B) |
| Voltage Interruptions | IEC61000-4-11 | 0% 250/300 cycle as per IEC60601-1-2:2014 (Criterion B) |
| Voltage Sag Immunity | SEMI-F47-0706[2] | 0% 20mS (Criterion B [4])<br>70% 0.5s, 80% 1s, 80% 10s, 90% continuous (Criterion A)<br>50% 0.2s (Criterion A at 240V and Criterion B at 100V [5]) |
| Notes: | Criterion A = No degradation of performance or loss of function.<br>Criterion B = Temporary degradation of performance or loss of function is allowed, provided the function is self-recoverable.<br>Criterion C = Temporary loss of function is allowed but requires operator intervention to recover.<br>Tested at nominal range (100V to 240V). Line deratings applied where appropriate.<br>Criterion A is achieved for all input voltages when Pout <= 280W<br>Criterion A is achieved for all input voltages when Pout <= 150W<br>Criterion A is achieved for full power when Vin >=170V or at all input voltages when Pout <= 130W | | |

| AGENCY APPROVALS | | |
|---|---|---|
| Standard | Details | File |
| UL62368-1<br>IEC62368-1<br>CSA C22.22 No. 62368-1:19 | Edition 3 2021 - Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements<br>Edition 3 2018 - Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements<br>Edition 3 2021 - Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements | UL: E316486 |
| IEC 60601-1:2005+A1:2012+A2:2020<br>CAN/CSA-C22.2 No.60601-1:08,<br>CAN/CSA-C22.2 No.60601-1:14+A1+A2:2022 | Edition 3.2 - Medical electrical equipment— Part 1: General requirements for basic safety and essential performance | |
| AAMI ES60601-1:2005+<br>AMD1:2012+AMD2:2021 | Medical electrical equipment— Part 1: General requirements for basic safety and essential performance | |
| CE MARK | LVD 2014/35/EU, EMC 2014/30/EU, RoHs 2011/65/EU | |
| Approval certificates available at www.vox-power.com | | |

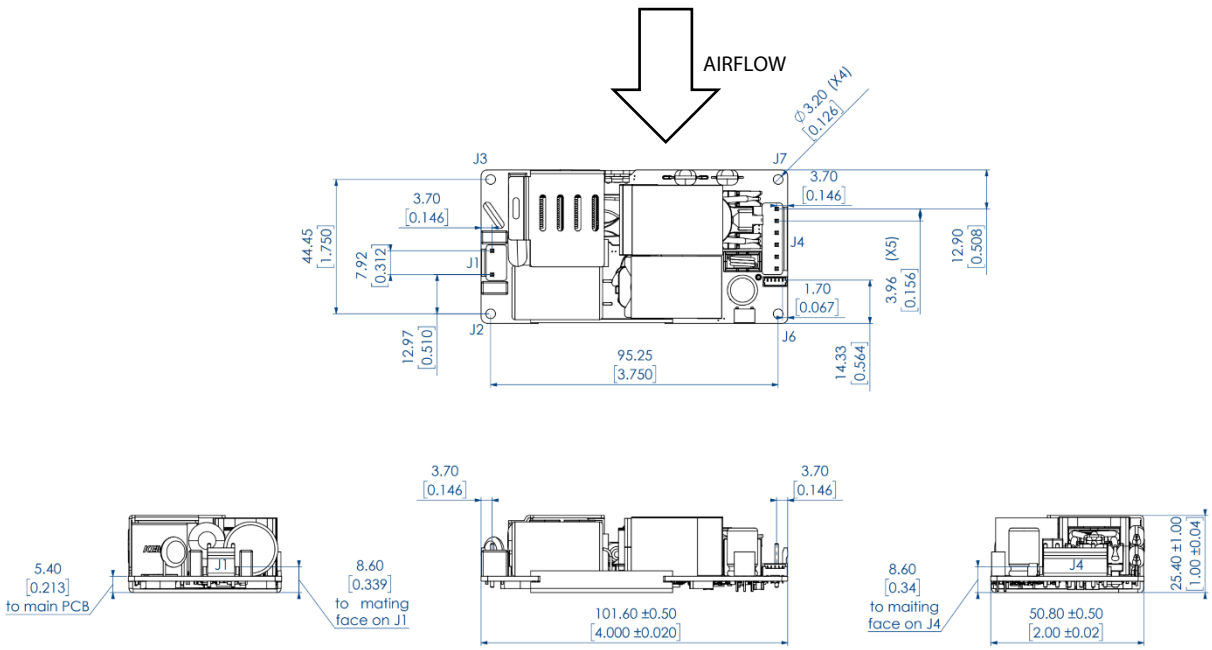
## POWER RATINGS



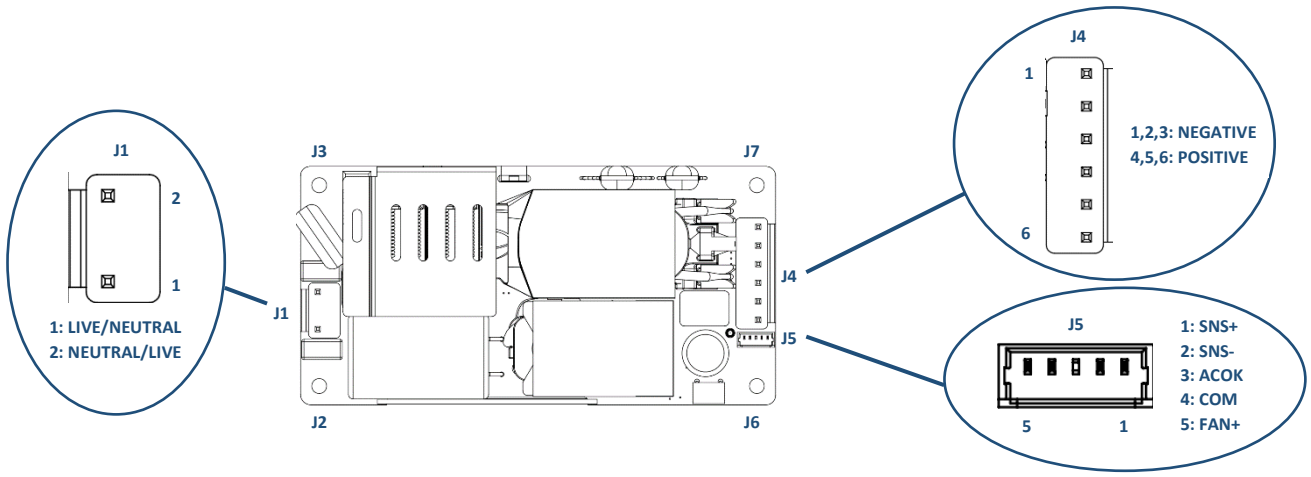




## MECHANICAL DIMENSIONS AND MOUNTING

| SCREWS | | |
|---|---|---|
| Location | Details | Tightening |
| Mounting holes<br>(Screw from top side): J2,J3,J6,J7 | M3 PAN Screw | 0.5NM |



## CONNECTOR DETAILS




**CONNECT J2 & J3 TO FUNCTIONAL EARTH IN CLASS I SYSTEMS**

## MATING CONNECTORS

| Ref. | Details | Manufacturer | Housing | Terminal |
|---|---|---|---|---|
| J1 - Mains Input | 2 Pin, 7A, 250$V_{AC}$, 7.92mm, with Friction lock, 18-20 AWG [1] | JST [3,4] | VAR-2 [2] | SVA-41T-P1.1 |
| J2 & J3 - Functional Earth | M3 Screw mount | - | - | - |
| J4 - Output Power | 6 Pin, 10A/Pin, 3.96mm, with Friction lock, 16-20 AWG | JST [3,4] | VHR-6N [2] | SVH-41T-P1.1 |
| J5 - Signals | 5 Pin, 1.25mm, with Friction lock, 28-32 AWG | Molex [3,4] | 0510210500 | 0500588000 |

Notes
1. Cable 18-20AWG, 300V, >7A, 105°C.
2. Connectors J1 and J4 are rated for a minimum operating temperature of -25°C. For continuous operation below this temperature, please consult Vox Power.
3. Direct equivalents may be used for any connector parts.
4. All cables must be rated 105°C min, equivalent to UL1015