

70 WATTS

SINGLE/MULTI OUTPUT AC-DC

FEATURES:

- Compact 2.5 x 4.5" x 1.2" Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- High Efficiency
- 0-70°C Operating Temperature
- IEC 60601-1 3rd ed. Medical Cert.
- IEC 62368-1 2nd Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- RoHS Compliant
- Optional Chassis/Cover



CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

 Underwriters Laboratories
File E137708/E140259

UL 62368-1:2014, 2nd Edition
CAN/CSA-C22.2 No. 62368-1-14
AAMI/ANSI ES60601-1:2005(R) 2012
CAN/CSA-C22.2 No. 60601-1:2014



CB Reports/Certificates (including all National and Group Deviations)
IEC 62368-1:2014, 2nd Edition
IEC 60601-1:2005/A1:2012



TUV SUD America
EN 62368-1:2014, 2nd Edition
EN 60601-1:2006/A1:2013



Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)



Electrical Equipment (Safety) Regulations 2016 SI No. 1101
Restriction of the Use of Certain Hazardous Substances in EEE Regulations
2012 SI No. 3032 + 2019 SI No.492

MODEL LISTING

| MODEL NO. | OUTPUT 1 | OUTPUT 2 | OUTPUT 3 | OUTPUT 4 |
|-------------|--------------------------|----------|-------------------------|--------------------------|
| REL-70-4001 | +3.3V/6A | +5V/5A | +12V/2A ₍₂₁₎ | -12V/2A ₍₂₁₎ |
| REL-70-4002 | +5V/6A | +3.3V/5A | +12V/2A ₍₂₁₎ | -12V/2A ₍₂₁₎ |
| REL-70-4003 | +5V/6A | +3.3V/5A | +15V/2A ₍₂₁₎ | -15V/2A ₍₂₁₎ |
| REL-70-4004 | +5V/6A | -5V/5A | +12V/2A ₍₂₁₎ | -12V/2A ₍₂₁₎ |
| REL-70-4005 | +5V/6A | -5V/5A | +15V/2A ₍₂₁₎ | -15V/2A ₍₂₁₎ |
| REL-70-4006 | +5V/6A | +24V/2A | +12V/2A ₍₂₁₎ | -12V/2A ₍₂₁₎ |
| REL-70-4007 | +5V/6A | +24V/2A | +15V/2A ₍₂₁₎ | -15V/2A ₍₂₁₎ |
| REL-70-4009 | 6.7V/5A | 5V/4A | +15V/2A ₍₂₁₎ | -15V/2A ₍₂₁₎ |
| REL-70-3001 | +5V/6A | +12V/2A | | -12V/2A ₍₂₁₎ |
| REL-70-3002 | +5V/6A | +15V/2A | | -15V/2A ₍₂₁₎ |
| REL-70-3003 | +5.1V/6A | +7.5V/2A | | -7.5V/2A ₍₂₁₎ |
| REL-70-3004 | +3.3V/6A | +7V/5A | +12V/2A ₍₂₁₎ | |
| REL-70-2001 | +3.3V/6A | +5V/5A | | |
| REL-70-2002 | +5V/6A | +12V/4A | | |
| REL-70-2003 | +5V/6A | +24V/2A | | |
| REL-70-2004 | +12V/3A | -12V/3A | | |
| REL-70-2005 | +15V/3A | -15V/2A | | |
| REL-70-2006 | +5.5V/6A | -5.5V/5A | | |
| REL-70-1001 | 2.5V/14A ₍₂₀₎ | | | |
| REL-70-1002 | 3.3V/14A ₍₂₀₎ | | | |
| REL-70-1003 | 5V/14A ₍₂₀₎ | | | |
| REL-70-1004 | 12V/5.8A | | | |
| REL-70-1005 | 15V/4.7A | | | |
| REL-70-1006 | 24V/2.9A | | | |
| REL-70-1007 | 28V/2.5A | | | |
| REL-70-1008 | 48V/1.5A | | | |

ORDERING INFORMATION

Consult factory for alternate output configurations.

Consult factory for positive, negative or floating outputs.

Please specify the following optional features when ordering:

CH - Chassis

I/O - Isolated Outputs

CO - Cover

TS - Terminal Strip

REL-70

OUTPUT SPECIFICATIONS

| | | |
|---|--|--|
| Total Output Power at 50°C ₍₁₎ | 50W | Convection Cooled ₍₁₆₎₍₁₈₎ |
| (See Derating Chart) | 70W | 300LFM Forced-Air Cooled ₍₁₅₎₍₁₇₎₍₁₉₎ |
| Output Voltage Centering | Output 1: ± 0.5% | (All outputs at 50% load) |
| | Output 2,3,4: ± 5.0% | |
| Output Voltage Adjust Range | Output 1: 95 - 105% | |
| Load Regulation | Output 1: 0.5% (10-100% load change) | |
| | Output 2: 5.0% | |
| | (4001-5) 8.0% | |
| | (2001) 8.0% | |
| | Output 3: 5.0% | |
| | Output 4: 5.0% | |
| Source Regulation | Outputs 1 - 4: 0.5% | |
| Cross Regulation | Outputs 2 - 4: 5.0% | |
| Output Noise | Outputs 1 - 4: 1.0% | |
| Turn on Overshoot | None | |
| Transient Response | Outputs 1 - 4 | |
| | Voltage Deviation 5.0% | |
| | Recovery Time 500µS | |
| | Load Change 50% to 100% | |
| Output Overvoltage Protection | Output 1: 110% to 150% | |
| Output Overpower Protection | 110-160% rated Pout, cycle on/off, auto recovery | |
| Hold Up Time | 16mS min., Full Power, 85V Input | |
| Start Up Time | 4 Seconds, 120V Input | |

INPUT SPECIFICATIONS

| | |
|---------------------|---|
| Protection Class | I |
| Source Voltage | 85 - 264 Volts AC |
| Frequency Range | 47 - 63 Hz |
| Peak Inrush Current | 40A |
| Efficiency | 78% Typ., Full Power, 230V, varies by model |
| Power Factor | 0.95 (Full Power, 230V) |

ENVIRONMENTAL SPECIFICATIONS

| | |
|-----------------------------|--|
| Ambient Operating | 0°C to + 70°C |
| Temperature Range | Derating: See Power Rating Chart |
| Ambient Storage Temp. Range | - 40°C to + 85°C |
| Temperature Coefficient | Outputs 1 - 4: 0.02% / °C |
| Altitude | 3,000m ASL - Operating - Medical 60601-1 5,000m ASL - Operating - ITE/AV - 62368-1 12,192m ASL - Non-Operating |

GENERAL SPECIFICATIONS

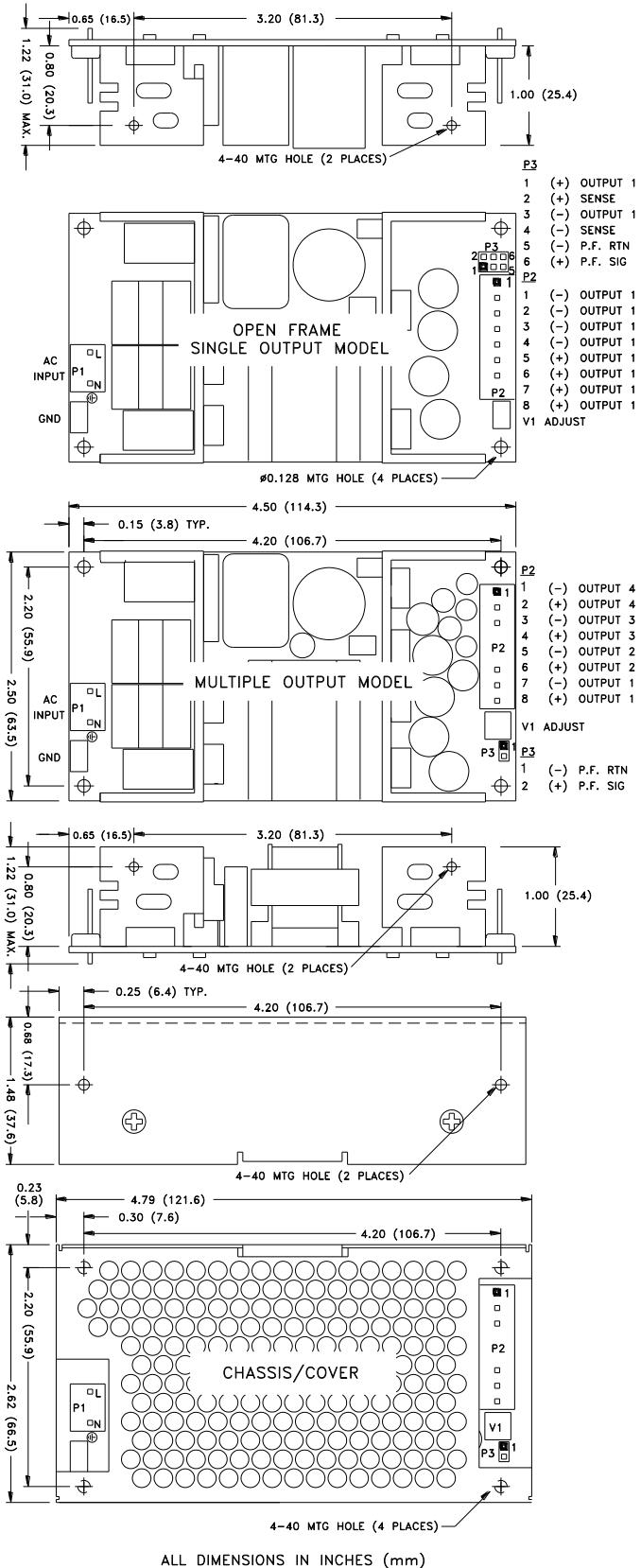
| | |
|---|--|
| Means of Protection | 2MOPP (Means of Patient Protection) 1MOPP (Means of Patient Protection) Operational Insulation (Consult factory for 1MOPP) |
| Dielectric Strength _(8, 9) | |
| Reinforced Insulation | 5656 VDC, Primary to Secondary |
| Basic Insulation | 2121 VDC, Primary to Ground |
| Operational Insulation | 707 VDC, Secondary to Ground |
| Leakage Current | |
| Earth Leakage <300µA NC, <1000µA SFC | |
| Touch Current <100µA NC, <500µA SFC | |
| Power Fail Signal ₍₁₄₎ | Logic low with input power failure 10 ms minimum prior to Output 1 dropping 1% |
| Remote Sense (singles only) ₍₁₀₎ | 250mV compensation of output cable losses |
| Mean-Time Between Failures | 100,000 Hours min., MIL-HDBK-217F, 25°C, GB |
| Weight | 0.60 Lbs. Open Frame 1.00 Lbs. Chassis and Cover |

EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ED./IEC 61000-6-2:2005)

| | | |
|-----------------------------------|--|---|
| Electrostatic Discharge | EN 61000-4-2 ±8KV contact / ±15KV air discharge | A |
| Radiated Electromagnetic Field | EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM | A |
| Electrical Fast Transients/Bursts | EN 61000-4-4 ±2 KV, 5KHz/100KHz | A |
| Surge Immunity | EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line | A |
| Conducted Immunity | EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM | A |
| Magnetic Field Immunity | EN 61000-4-8 30A/m, 60 Hz. | A |
| Voltage Dips | EN 61000-4-11 0% Ut, 0.5 cycles, 0-315° 100/240V A/A 0% Ut, 1 cycles, 0° 100/240V A/A 40% Ut, 10/12 cycles, 0° 100/240V B/A 70% Ut, 25/30 cycles, 0° 100/240V B/A | |
| Voltage Interruptions | EN 61000-4-11 0% Ut, 300 cycles, 0° 100/240V B/B | |
| Radiated Emissions | EN 55011/32 Class B | |
| Conducted Emissions | EN 55011/32 Class B | |
| Harmonic Current Emissions | EN 61000-3-2 Class A | |
| Voltage Fluctuations/Flicker | EN 61000-3-3 Compliant | |

All specifications are maximum at 25°C/70W unless otherwise stated, may vary by model and are subject to change without notice.

REL-70 MECHANICAL SPECIFICATIONS

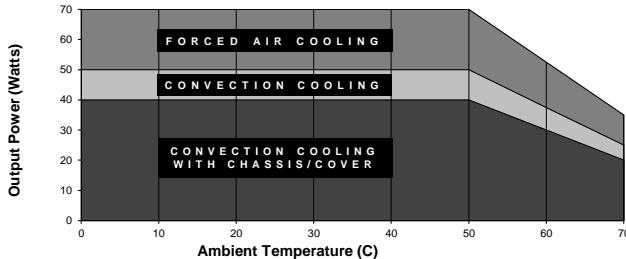


ALL DIMENSIONS IN INCHES (mm)

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 70W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV (single output models only). The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power-Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure, 5V/10mA.
15. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
16. Total power must not exceed 50W with convection cooling on open-frame models.
17. Total power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
18. Total power must not exceed 40W with convection cooling and Chassis/Cover option.
19. Total power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
20. Rated 10A with convection cooling.
21. Rated 1.5A with convection cooling.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



CONNECTOR SPECIFICATIONS

| | | |
|----|-----------------------|---|
| P1 | AC Input | 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal. |
| P2 | DC Output (Single) | 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal. |
| P2 | DC Output (Multiple) | 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal. |
| G | Ground | 0.187 quick disconnect terminal. |
| P3 | P.F./Sense (Single) | 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal. |
| P3 | Power Fail (Multiple) | 0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal. |