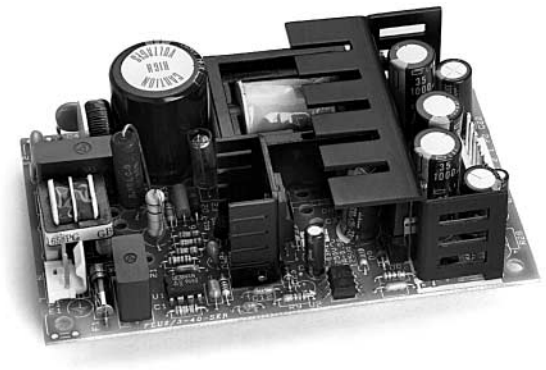
# 40W

## Open-Frame Switching Power Supplies

- ✔ Single, Dual and Triple Output Models
- ✔ Universal AC-Input and DC-Input Models
- ✔ *CE* Mark: UL/CSA/EN60950 Approvals
- ✔ BABT Approvals
- ✔ Austel CCL Certification
- ✔ EN55022/FCC Class B Input Line Filter
- ✔ 0% Minimum Load Requirement
- ✔ Over-Current/Short-Circuit Protection
- ✔ 2-Year Warranty
- ✔ Minimum 200,000-Hour MTBF



## Characteristics

| | |
|---|---|
| Input Voltage | FLU models, universal input range 85-265 VAC single phase or 100-370 VDC. DC input models, 36-75 VDC (48V, nominal). |
| Input Line Frequency | FLU models, 47-440 Hz (50-60 Hz, nominal). |
| Input Line Protection | MOV transient protected (FLU series). Input line fuse provided on-board. (See Note 1.) |
| EMI Filter | Standard. Performance surpasses conducted EMI requirements of EN55022/FCC Class B by 10 dB, typ. |
| DC Output | See table. (Note 2.) |
| Continuous Output Power | 40W, maximum. |
| Output Voltage Adjust | Primary output adjustable ±5%. Auxiliary outputs fixed. |
| Efficiency | 62-75%, typical (nominal input line voltage, nominal load conditions). |
| Hold-Up Time | FLU models: 16 ms (115 VAC input), 32 ms (230 VAC input), minimum, at full load |
| Overload Protection | Power-limit circuit. |
| Short-Circuit Protection | Continuous. |
| Over-Voltage Protection | Primary output only. |
| Soft Start | Standard on all models. |
| Design Topology | Flyback converter with current-mode control. |
| Frequency of Operation | 40 kHz (fixed). |
| Electrical Strength/Isolation | 5300 VDC, input-to-output for one minute. (Note 6.) |
| Noise, Ripple and Spike | 1% peak-to-peak, maximum. (See Note 8.) |
| Temperature Range | -20°C to +70°C. |
| Output Power De-Rating | De-rate output power and current linearly 2%/°C from +50°C to +70°C. |
| Temperature Coefficient | ±0.05%/°C over the entire operating temperature range. |
| Relative Humidity | 0 to 95%, non-condensing. |
| Altitude | 0 to 10,000 feet. |
| Cooling | Convection cooling is adequate. Moving air is recommended for operation in a confined area. |
| Storage Temperature | -40°C to +85°C. |
| Storage Humidity | 0 to 95%, non-condensing. |
| Mean Time Between Failures | >200,000 hours. (Note 9.) |

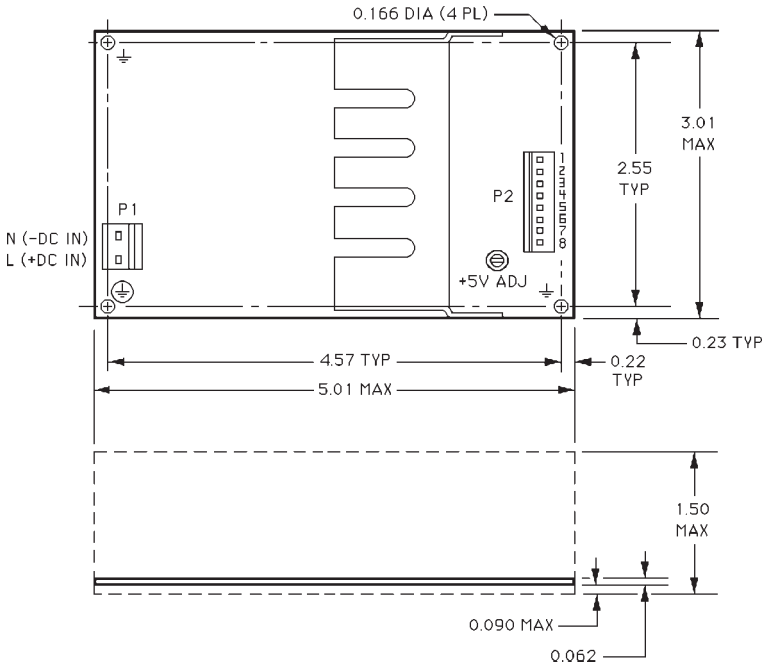
| Model | Output Voltage Output | (V) | Output Current Min. (A) | Nom. (A) | Max. (A) | Output Voltage Tol. | Line Reg. | Load Reg. | Cross-Reg. |
|---|---|---|---|---|---|---|---|---|---|
| **AC-DC Singles** | | | | | | | | | 85-265 VAC Input |
| FLU1-40-1AD | V1 | 5 | 0.0 | 8.00 | 8.00 | 1.0% | 0.1% | 0.2% | — |
| FLU1-40-2AD | V1 | 9 | 0.0 | 4.40 | 4.40 | 1.0% | 0.1% | 0.2% | — |
| FLU1-40-3AD | V1 | 12 | 0.0 | 3.30 | 3.30 | 1.0% | 0.1% | 0.2% | — |
| FLU1-40-4AD | V1 | 15 | 0.0 | 2.70 | 2.70 | 1.0% | 0.1% | 0.2% | — |
| FLU1-40-5AD | V1 | 24 | 0.0 | 1.70 | 1.70 | 1.0% | 0.1% | 0.2% | — |
| FLU1-40-6AD | V1 | 28 | 0.0 | 1.40 | 1.40 | 1.0% | 0.1% | 0.2% | — |
| **AC-DC Duals** | | | | | | | | | 85-265 VAC Input |
| FLU2-40-1AD | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| | V2 | +12 | 0.0 | 2.00 | 3.00 | 5.0% | 0.5% | 3.0% | 4.0% |
| FLU2-40-3AD | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| | V2 | +24 | 0.0 | 1.00 | 1.50 | 5.0% | 0.5% | 3.0% | 4.0% |
| FLU2-40-4AD | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| | V2 | +28 | 0.0 | 1.00 | 1.00 | 5.0% | 0.5% | 3.0% | 4.0% |
| FLU2-40-7AD | V1 | 15(ISO) | 0.0 | 1.50 | 2.50 | 1.0% | 0.2% | 1.0% | — |
| | V2 | 15(ISO) | 0.0 | 1.20 | 2.00 | 3.0% | 0.5% | 1.0% | 1.0% |
| **DC-DC Dual** | | | | | | | | | 36-75 VDC Input |
| DC2-40-1AC | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| | V2 | +12 | 0.0 | 2.00 | 3.00 | 5.0% | 0.5% | 3.0% | 4.0% |
| **AC-DC Triples** | | | | | | | | | 85-265 VAC Input |
| | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| FLU3-40-1AD | V2 | +12 | 0.0 | 1.50 | 3.00[3] | 5.0% | 1.0% | 3.0% | 4.0% |
| | V3 | -12 | 0.0 | 0.50 | 0.70 | 5.0% | 0.2% | 1.0% | 1.0% |
| | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| FLU3-40-2AD | V2 | +12 | 0.0 | 1.50 | 3.00[3] | 5.0% | 1.0% | 3.0% | 4.0% |
| | V3 | -5 | 0.0 | 1.00 | 1.00 | 3.0% | 0.2% | 1.0% | 1.0% |
| | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| FLU3-40-3AD | V2 | +15 | 0.0 | 1.20 | 2.00[4] | 5.0% | 1.0% | 3.0% | 4.0% |
| | V3 | -15 | 0.0 | 0.50 | 0.60 | 5.0% | 0.2% | 1.0% | 1.0% |
| | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| FLU3-40-4AD | V2 | +24 | 0.0 | 0.75 | 1.50[5] | 5.0% | 1.0% | 3.0% | 4.0% |
| | V3 | -12 | 0.0 | 0.50 | 0.70 | 5.0% | 0.2% | 1.0% | 1.0% |
| | V1 | 5(ISO) | 0.0 | 5.00 | 6.00 | 1.0% | 0.2% | 0.5% | — |
| FLU3-40-5AD | V2 | 12(ISO) | 0.0 | 0.30 | 0.50 | 4.0% | 0.5% | 1.0% | 1.0% |
| | V3 | 12(ISO) | 0.0 | 0.30 | 0.50 | 4.0% | 0.5% | 1.0% | 1.0% |
| | V1 | 5(ISO) | 0.0 | 5.00 | 6.00 | 1.0% | 0.2% | 0.5% | — |
| FLU3-40-6AD | V2 | 15(ISO) | 0.0 | 0.30 | 0.50 | 4.0% | 0.5% | 1.0% | 1.0% |
| | V3 | 15(ISO) | 0.0 | 0.30 | 0.50 | 4.0% | 0.5% | 1.0% | 1.0% |
| **DC-DC Triple** | | | | | | | | | 36-75 VDC Input |
| | V1 | +5 | 0.0 | 3.00 | 5.00 | 1.0% | 0.2% | 1.0% | — |
| DC3-40-1AC | V2 | +12 | 0.0 | 1.50 | 3.00[3] | 5.0% | 1.0% | 3.0% | 4.0% |
| | V3 | -12 | 0.0 | 0.50 | 0.70 | 5.0% | 0.2% | 1.0% | 1.0% |

POWER GENERAL

*Rev. PG/ABBB*

# 40W

## Open-Frame Switching Power Supplies




### FLU AND DC 40W SERIES

A. Dimensions shown are in inches.
B. Tolerances = 0.00 ±0.01 inch.
0.000 ±0.005 inch.
C. P1 input connectors are Molex 26-62-4030. The mating connector combines Molex housing 43061-0003 and crimp terminal 08-70-1030.
D. P2 output connectors for the 40W series, except for models 5 and 6 of the FLU3-40 series, are Molex 26-60-4060. The mating connector combines Molex housing 43061-0006 and crimp terminal 08-70-1030. Models 5 and 6 of the FLU3-40 series use Molex 26-60-4080 for the P2 connector. The mating connector uses Molex housing 43061-0008 and crimp terminals 08-70-1030.

### Pin-Out

| Pin | FLU1-40 | FLU2-40 Models 1, 3 | FLU2-40 Models 4, 7 | DC2-40 | FLU3-40 Models 1-4 | FLU3-40 Models 5-6 | DC3-40 |
|---|---|---|---|---|---|---|---|
| 1 | V1 | V2 | $+V1_{(ISO)}$ | V2 | V2 | $+V2_{(ISO)}$ | V2 |
| 2 | V1 | V1 | $+V1_{(ISO)}$ | V1 | V1 | $-V2_{(ISO)}$ | V1 |
| 3 | V1 | V1 | $-V1_{(ISO)}$ | V1 | V1 | $+V1_{(ISO)}$ | V1 |
| 4 | Return | Common | $-V1_{(ISO)}$ | Common | Common | $+V1_{(ISO)}$ | Common |
| 5 | Return | Common | $-V2_{(ISO)}$ | Common | Common | $-V1_{(ISO)}$ | Common |
| 6 | Return | N/C | $+V2_{(ISO)}$ | N/C | V3 | $-V1_{(ISO)}$ | V3 |
| 7 | N/A | N/A | N/A | N/A | N/A | $+V3_{(ISO)}$ | N/A |
| 8 | N/A | N/A | N/A | N/A | N/A | $-V3_{(ISO)}$ | N/A |

### Notes

1. Replace the input line fuse with the same type and rating. Recommended: 2A/250V slow-blow fuse.
2. The sum of primary and auxiliary output currents from triple output models -1AD through -4AD must not exceed 5.0A.
3. Peak output current rating = 5.0A (<60 seconds, duty cycle <10%).
4. Peak output current rating = 3.0A (<60 seconds, duty cycle <10%).
5. Peak output current rating = 2.0A (<60 seconds, duty cycle <10%).
6. Electrical strength/isolation is 2200 VDC from the input of the power supply to ground for 60 seconds.
7. All measurements are made directly at the terminals of the power supply.
8. Peak-to-peak and RMS metering equipment must have a 20 MHz frequency response with probes and cables that maintain a frequency response of 20 Hz to 20 MHz. Output ripple and spikes are measured directly at the output terminals of the power supply with a 0.1 µF ceramic capacitor. The probe ground band must make direct contact with the output return or common terminal to prevent erroneous noise measurements.
9. MTBF is calculated using the parts stress method in MIL-HDBK 217F (ground benign, $T_A$ = +25°C).
10. Output voltage tolerance is measured under nominal load current conditions.
11. Line regulation is measured under nominal load conditions as the input voltage is varied from 85 to 265 VAC (ac-input models) or from 36 to 75 VDC (dc-input models).
12. Load regulation is measured at 115 VAC or 230 VAC. For single output models, load regulation is measured while output current is varied from 0% to 100% of full load. With multiple output models, the output under test is brought to 60%of nominal load; load current is then varied +40%/-30% of nominal while other outputs are held at nominal load conditions.
13. Cross-regulation is tested by changing the load on the primary output from 50% to 100% of nominal load while measuring the voltage change on the auxiliary output under test.
14. The FLU1-40, FLU2-40 and FLU3-40 series are approved to UL1950 (File E140439), CSA22.2 No. 234 (File LR52335), EN60950/IEC950/DIN VDE 0805 (TÜV Licenses R9679206, R9779161, R9779037), and Austel CCL (Certificate A92/PS/004).
15. The FLU3-40 series has BABT/EN41003 approval /4199/123/R/604674).
16. The DC2-40 and DC3-40 series are approved to UL1950 (File E140439), CSA22.2 No. 234 (File LR52335), and EN60950/IEC950/DIN VDE 0805 (TÜV License R9071501).