

Convel 32000 Series Open Frame AC/DC Regulated Linear Power Supplies

These high quality linear regulated power supplies provide outstanding value and are designed for ease of application and long trouble free life.

- ◆ Universal AC input 100 - 240VAC
- ◆ 3.75kV Isolation safety transformer
- ◆ TÜV approved
- ◆ Quality UK design and manufacture
- ◆ International industry standard sizes
- ◆ Overload protection on all units
- ◆ Exceeds the requirements of UL, CSA, VDE, IEC, BT, ECMA & CEE
- ◆ Safety earth tag
- ◆ 2 year warranty

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GENERAL SPECIFICATIONS

A.C. Input	100/120/220/240VAC +10%, -12%, 47 to 440Hz
D.C. Output	See Voltage/Current Rating Chart. Adjustment range ±5% minimum.
Line Regulation	±0.05% for a 10% line change.
Load Regulation	±0.05% for a 50% load change.
Output Ripple	2V to 15V units: 5.0mV PK-PK maximum 20V to 28V units: 0.02% PK-PK maximum
Transient Response	50µseconds for a 50% load change
Short Circuit and Overload Protection	Automatic current limit/foldback Built-in on all 5V outputs. Set at 6.2V ±0.4V Other models use optional overvoltage protection. See Option 4 overleaf
Remote Sensing	Provided on most models, open sense load protection built in.
Stability	±0.3% for 24 hour period after 1 hour warm-up
Temperature Rating	Standard Range: 0°C to +50°C full-rated, derated linearly to 40% at 70°C Extended Range: -40°C to +50°C full-rated, derated linearly to 40% at 70°C
TEMPERATURE DERATING CURVE	
Temperature Coefficient	±0.03%/°C maximum
Efficiency (typical)	5V unit: 45%; 12V and 15V units: 55%; 24V units: 60%
Vibration	Per MIL-STD-810C, Method 514, Procedure X
Shock	Per MIL-STD-810C, Method 516, Procedure V
Isolation	Input to ground: 3750VAC min. Input to output(s): 3750VAC min. Output to ground: 500VAC min. Leakage current (live to ground): 5µA max.
Safety	In accordance with EN60950

SINGLE OUTPUT MODELS

Model	Output Voltage Volts	Output Current Amps	Case
32005A	5	3.0	A
32005B	5	6.0	B
32005C	5	9.0	C
32005D	5	12.0	D
32005E	5	18.0	E
32012A	12 to 15	1.7	A
32012B	12 to 15	3.4	B
32012C	12 to 15	5.1	C
32012D	12 to 15	6.8	D
32012E	12 to 15	10.2	E
32024A	24 to 28	1.2	A
32024B	24 to 28	2.4	B
32024C	24 to 28	3.6	C
32024D	24 to 28	4.8	D
32024E	24 to 28	7.2	E
32024E/10	24 to 28	10.0	E
32048A*	48	0.5	A
32048B*	48	1.0	B
32048D*	48	3.0	D
32150A	120 to 200	0.150**	A

* No remote sensing

** Output current from 180 to 200V falls linearly from 150mA to 125mA

DUAL OUTPUT MODELS

Model	Output 1		Output 2		Case
	Voltage Volts	Current Amps	Voltage Volt	Current Amps	
32205A*	5	1.5	-5	1.5	AA
32212A	12 to 15	1.0	-12 to -15 or -5	1.0	AA
32212B	12 to 15	1.7	-12 to -15 or -5	1.7	BB
32212C	12 to 15	3.4	-12 to -15	3.4	CC
32212D	12 to 15	5.0	-12 to -15	5.0	E

TRIPLE OUTPUT MODELS

Model	Output 1		Output 2		Output 3		Case
	Voltage Volts	Current Amps	Voltage Volts	Current Amps	Voltage Volts	Current Amps	
32305A	5*	2.0	9 to 15*	0.4	-9 to -15* or -5	0.4	AA
32305B	5	3.0	12 to 15	1.0	-12 to -15 or -5	1.0	AAA
32305C	5	6.0	12 to 15*	1.0	-12 to -15* or -5	1.0	D
32305D	5	6.0	12 to 15	1.7	-12 to -15 or -5	1.7	BBB
32305E	5	8.0	12 to 15	1.7	-12 to -15 or -5	1.7	BBB
32305F	5	12.0	12 to 15	1.7	-12 to -15 or -5	1.7	DBB
32305G	5	12.0	12 to 15	3.4	-12 to -15	3.4	DCC

OVP Selection Chart

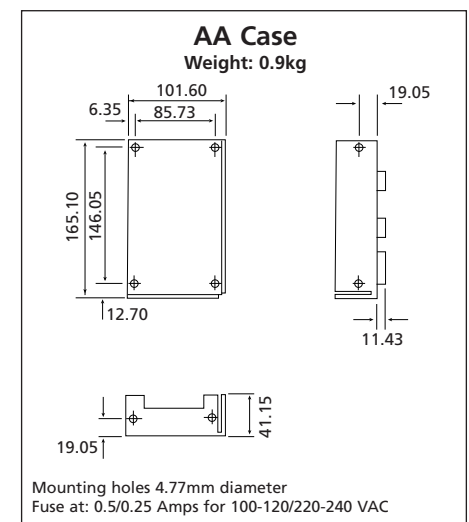
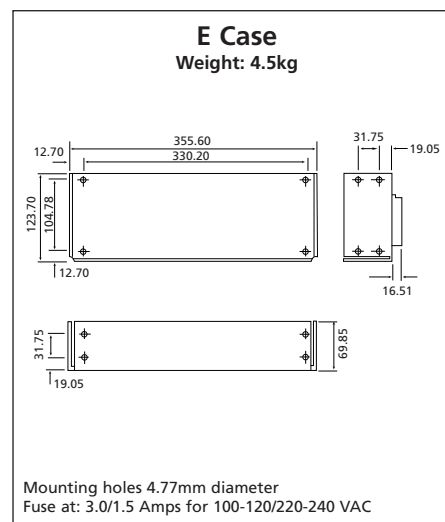
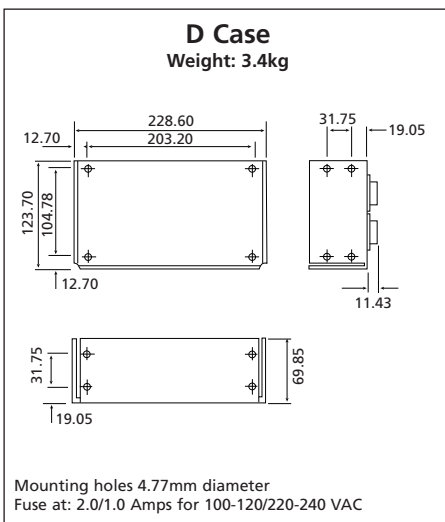
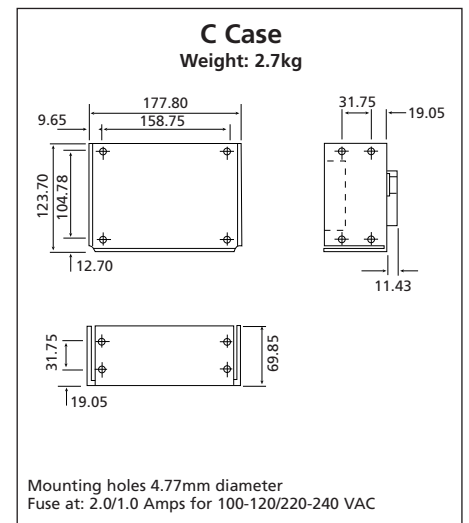
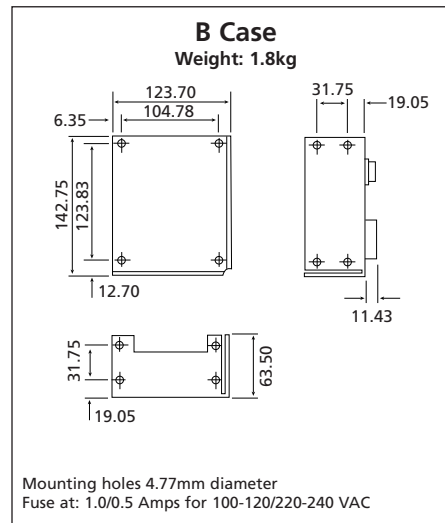
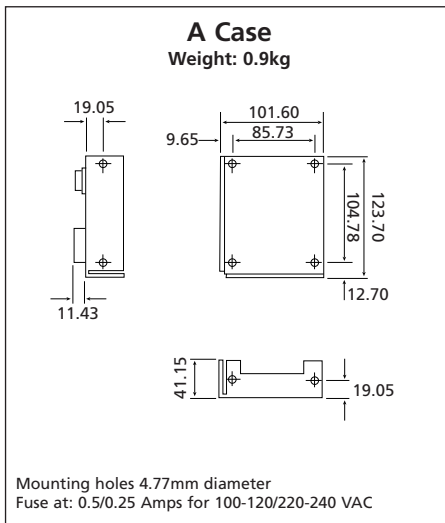
	Case	OVP Model Required
Single Output	A/B/C/D	32901A
	E	32901B
Dual Output	AA/BB/CC	32901A, protects both outputs
	E	32901B, protects both outputs
Triple Output	AA/AAA/D	32901A, protects dual outputs
	BBB/131	OVP built-in on 5V outputs
Disk Drive	C/131/AAA BB	32901A, protects any output not supplied with built-in OVP

OPTIONS

- 1 Tropicalisation – suffix code 'T'
- 2 Wide range output voltage adjustment – suffix code 'R' available on 12V and higher output voltages enabling adjustment down to 2V (derate linearly from full load to zero at 2V)
- 3 Low temperature operation -40°C to +50°C – suffix code 'LT'
- 4 Overvoltage Protection Modules – These optional Overvoltage Protection Modules are available for use with any power supply NOT supplied with built-in OVP. Each is adjustable from 6.4V to 34V and should be used when maximum load protection is of prime importance. Response time is 1mS. Mounting holes are provided on the chassis for these modules, which mount within the specified outline dimensions of each power supply.

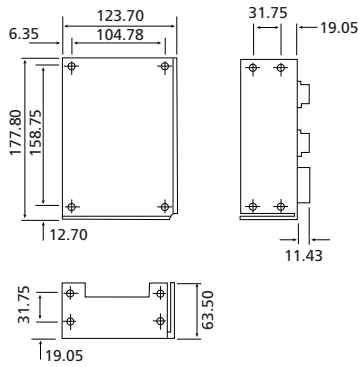
32000 SERIES - GENERAL DIMENSIONS

All dimensions are in mm



BB Case

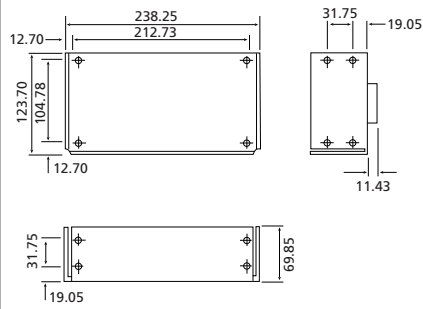
Weight: 1.8kg



Mounting holes 4.77mm diameter
Fuse at: 2.0/1.0 Amps for 100-120/220-240 VAC

CC Case

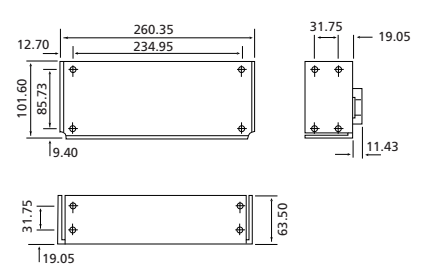
Weight: 3.2kg



Mounting holes 4.77mm diameter
Fuse at: 2.0/1.0 Amps for 100-120/220-240 VAC

AAA Case

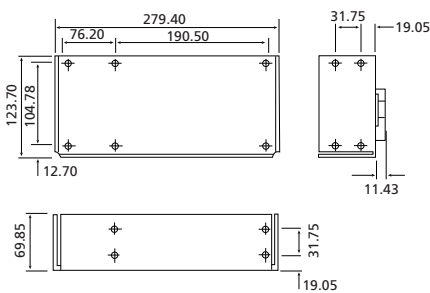
Weight: 2.3kg



Mounting holes 4.77mm diameter
Fuse at: 1.0/0.5 Amps for 100-120/220-240 VAC

BBB Case

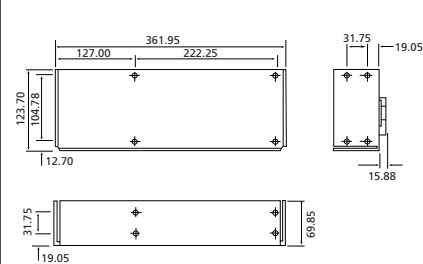
Weight: 3.6kg



Mounting holes 4.77mm diameter
Fuse at: 2.0/1.0 Amps for 100-120/220-240 VAC

DBB Case

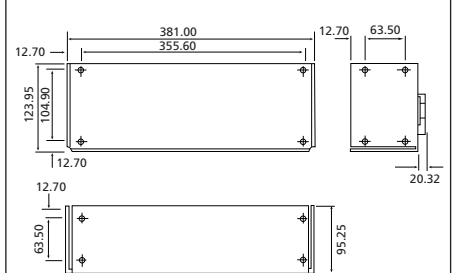
Weight: 5.0kg



Mounting holes 4.77mm diameter
Fuse at: 3.0/1.5 Amps for 100-120/220-240 VAC

DCC Case

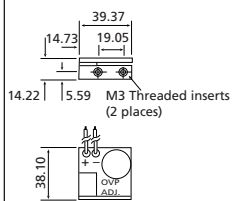
Weight: 5.5kg



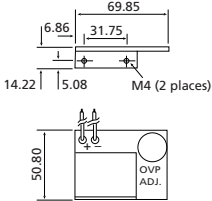
Mounting holes 4.77mm diameter

Overvoltage Protection Modules

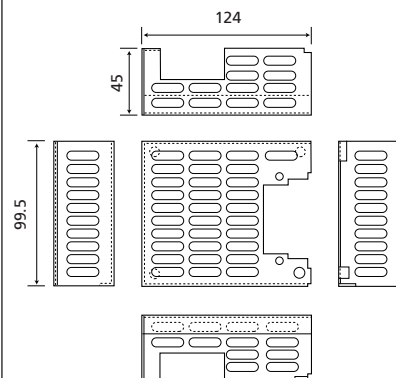
OVP-12 32901A



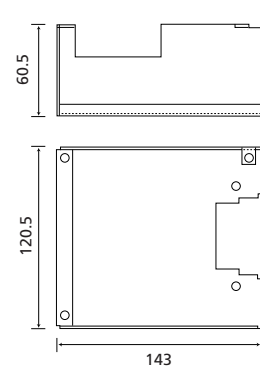
OVP-24 32901B



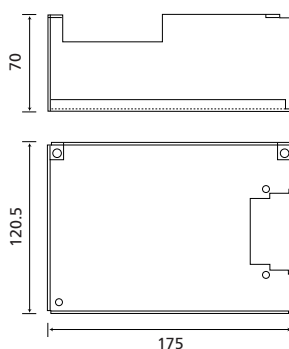
A Cover



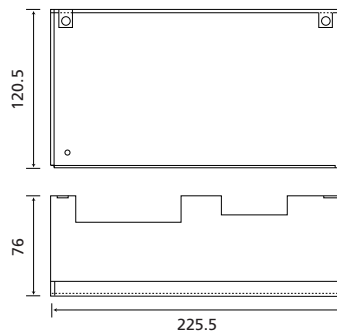
B Cover



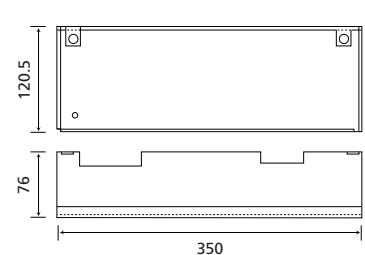
C Cover



D Cover



E Cover



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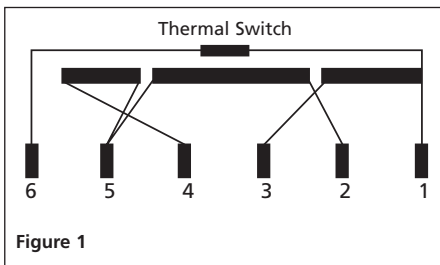
APPLICATION NOTES

AC CONNECTION AND FUSING

The 32000 SERIES has four AC input ranges: 100/120/220/240 Vac + 10% -12%. See input selection table. Inputs must be fused with a slow-blow (T) HBC type fuse. Units are factory set for 220/240Vac input. For additional safety the transformer primary is protected from thermal overloads by a non-resettable thermal switch. This switch will permanently break if a transformer temperature of 130°C is exceeded.

NOTE: Pin 1 on the transformer primary MUST NOT be used to by-pass this switch.

Suitable fuse types to comply with safety approvals WICKMANN 19181 LITTLEFUSE Series 215



AC INPUT 47-63Hz

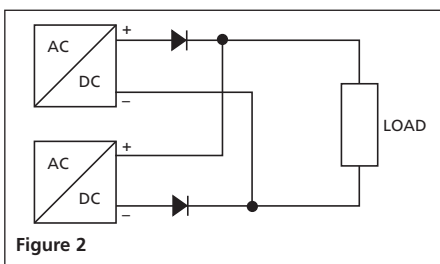
For use at	100VAC	120VAC	220VAC	240VAC
Jumper	1&2;3&4	1&2;3&4	2&3	2&3
Apply AC	6&5	6&4	6&5	6&4

PARALLEL CONNECTION

1. Units of the same type may be connected in parallel in order to achieve greater output currents. In simple parallel operation the unit with the highest output voltage will supply the load current up to its limit whereon the next highest will provide the additional current up to its limit etc. To operate safely in this way the current limit should be adjusted to the nominal max unit current to avoid a constant overload situation.

2. On some units provision is made to operate in a master-slave mode in which all units connected provide approximately the same current.

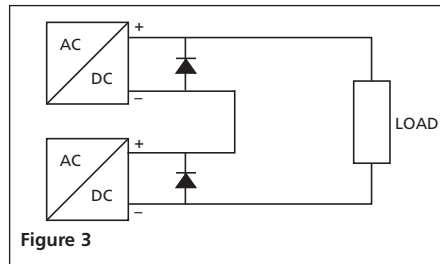
3. In some cases it is desirable to have each supply capable of delivering 100% of the load current (parallel redundant) in this case the units should be connected as shown below (fig.2)



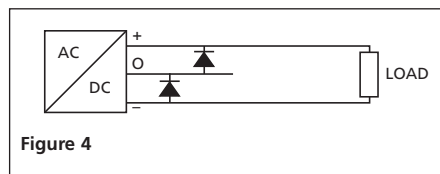
SERIES CONNECTION

1. Units may be connected in series to achieve higher output voltages. It is normal

practice in these circumstances to install a reverse biased diode across the output in order to protect each unit from the reverse voltage of the other in the event of a short circuit at the load, as shown below (fig. 3).



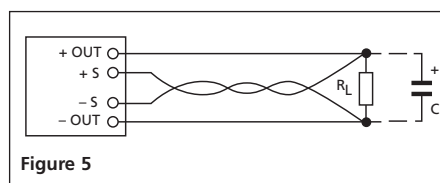
2. It is also possible to use the outputs of a dual supply in series to achieve the sum voltage as shown (fig. 4).



3. In both the above cases occasionally difficulties may be experienced at 'switch-on' and overload recovery. It is recommended that wherever possible a separate load switch is incorporated to overcome this problem.

REMOTE SENSING

The remote sensing feature, included in almost all Convel 32000 SERIES power supplies, may be used to compensate the voltage drop across the load lines. Figure 5 outlines the proper termination for a power supply with remote sensing.



Load lines should be sized to prevent a voltage drop less than 0.5V from the output to the load. It is recommended to use twisted or shielded pair for the sense lines. To prevent the power supply from oscillation it is highly recommended to bypass the load with a small AC decoupling capacitor (0.1 to 10uF).

All Convel 32000 SERIES Power Supplies have an open sense lead protection to protect the load from an overvoltage condition if the sense leads are removed. There is no need to strap the sense terminals if remote sensing is not required.

GROUNDING

Ground loops can cause serious interference problems when voltages developed by currents are coupled into sensitive circuits. Therefore a single point system ground should be employed where possible.

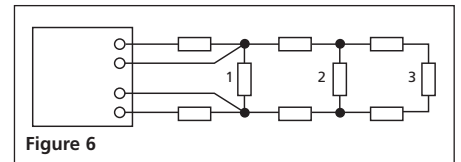


Figure 6

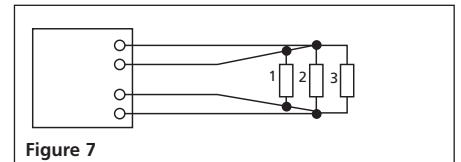


Figure 7

Figure 6 shows an often used power buss system. But regulation of loads 2 and 3 becomes progressively worse due to the voltage drops between loads. Figure 7 shows an improved connection, because wire losses are not cumulative. Unfortunately, this single point power routing is very often impractical because of additional PC board area.

OVERVOLTAGE PROTECTION (OVP)

An overvoltage protection circuit protects sensitive loads against excessive voltage such as in TTL logic. Overvoltage protection is implemented by means of a crowbar. The trip point set usually at 115% -135% of the output voltage. The OVP will rapidly short the output terminal to reduce output voltage to a low value.

The foldback feature will prevent the primary fuse from blowing an OVP condition.

Noise from input line spikes or load noise can cause the OVP to fire. To minimise this problem the 32000 SERIES is equipped with OVP noise filtering and reduced transformer interwinding capacitance to minimise input line susceptibility.

COMMON-MODE LATCH UP

All 32000 SERIES dual power supplies have incorporated a unique anti-latch circuit to minimise common-mode latch up. Common-mode latch up occurs in certain instances when one supply comes up first and forces a reverse bias condition on the second supply. The second supply latches up in a current limit condition.

EMI/RFI

Linear power supplies have inherently low conducted and radiated noise levels. They will meet the requirements of VDE0871 for Class A equipment and FCC Docket 20780 for Class A equipment without additional noise filtering.

SAFETY SPECIFICATIONS

The 32000 SERIES power supplies are designed to meet or exceed requirements for the following specifications: VDE0730 Part 2, VDE0806, IEC380, IEC435, ECMA-57, CEE10Part 2P, UL 1012, CSA 22.2 No. 134, CSA22.2 No. 154. Specifically, field terminal spacing is greater than 3.5 mm and creepage spacing from terminal to other metal is greater than 3.0mm, leakage current is less than 5.0 μ A and minimum dielectric withstanding are 3750VAC input to chassis, 3750 VAC input to output and 500VAC output to chassis.