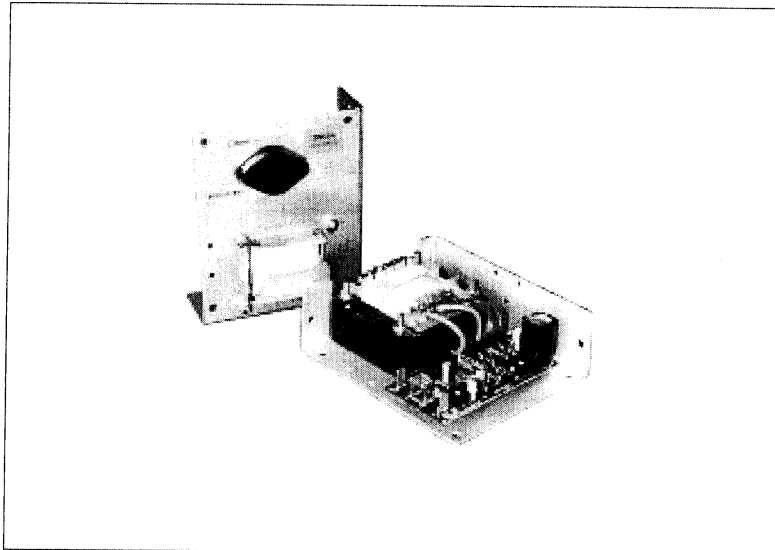


# Convel 32000 Series Open Frame AC/DC Regulated Linear Power Supplies

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
- ◆ 2 year warranty
- ◆ Quality UK design and manufacture
- ◆ International industry standard sizes
- ◆ Overload protection on all units
- ◆ Safety earth tag

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## GENERAL SPECIFICATIONS

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

**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	1.0	AA
32212B	12 to 15	1.7	-12 to -15	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*	0.4	AA
32305B	5	3.0	12 to 15	1.0	-12 to -15	1.0	AAA
32305C	5	6.0	12 to 15*	1.0	-12 to -15*	1.0	D
32305D	5	6.0	12 to 15	1.7	-12 to -15	1.7	BBB
32305E	5	8.0	12 to 15	1.7	-12 to -15	1.7	BBB
32305F	5	12.0	12 to 15	1.7	-12 to -15	1.7	DBB
32305G	5	12.0	12 to 15	3.4	-12 to -15	3.4	DCC

**OVP Selection Chart**

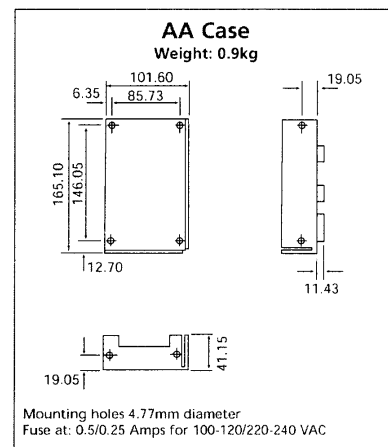
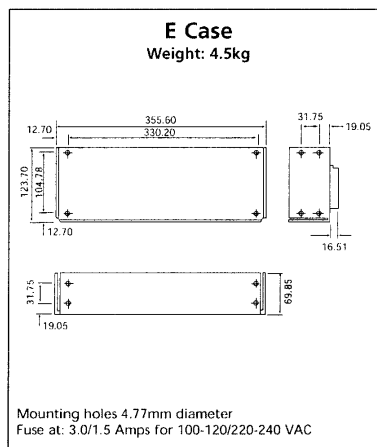
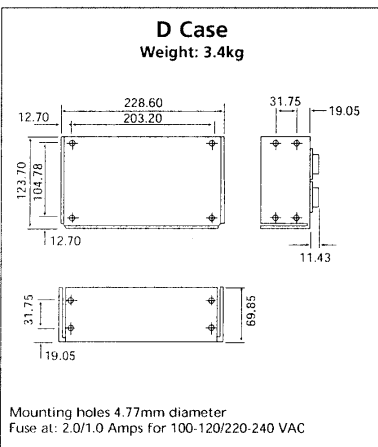
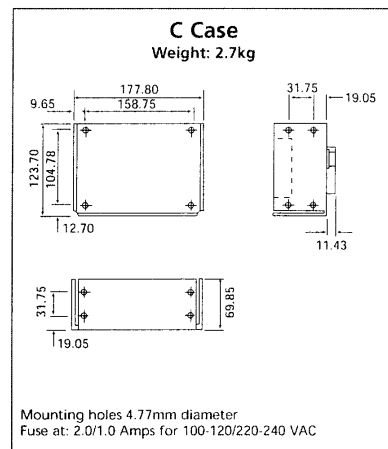
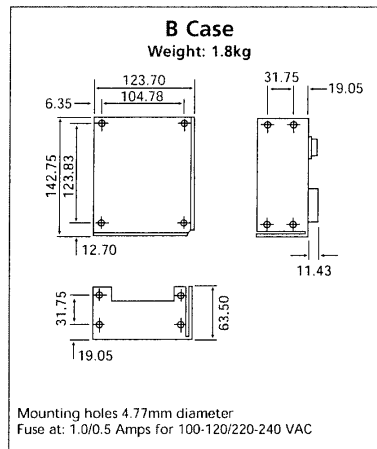
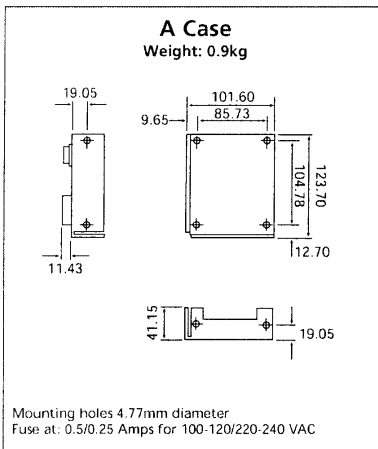
	Case	OVP Model Required
Single Output	A/B/C/D	32901A
	E	32901B
Dual Output	AA/BB/CC	32901A, protects both outputs
	E	32901B, protects both outputs
Triple Output	AA/AAA/D	32901A, protects dual outputs
	BBB/131	OVP built-in on 5V outputs

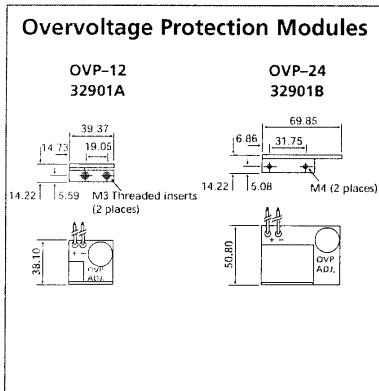
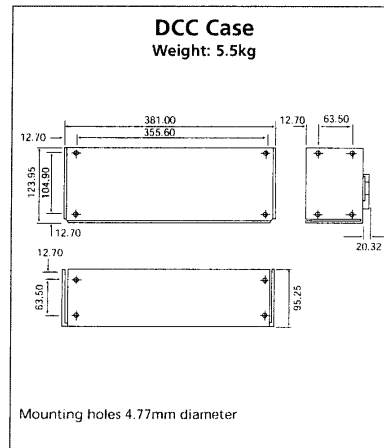
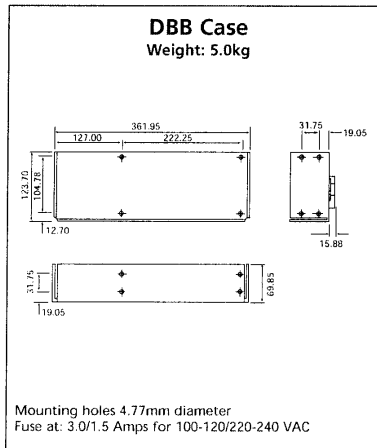
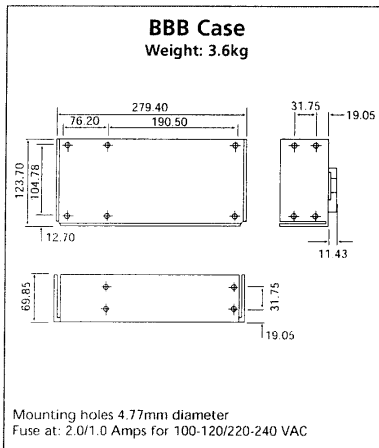
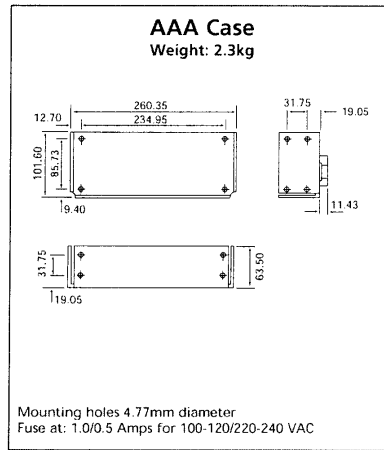
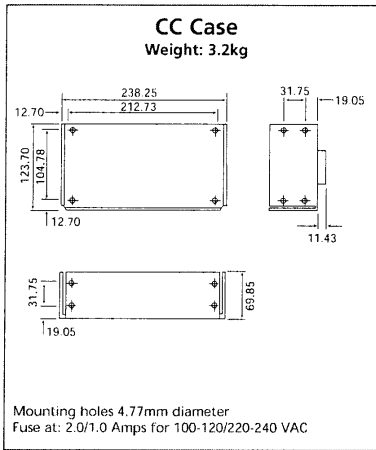
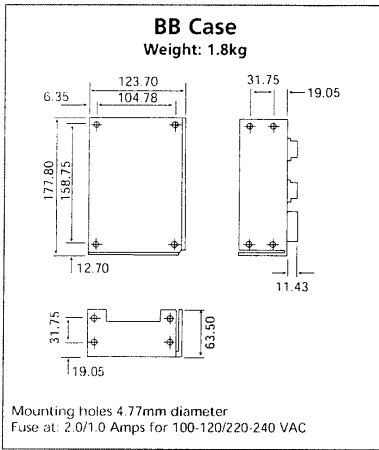
**OPTIONS**

- 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





## Convel 32000 Series Operators Guide

### INSTALLATION AND APPLICATION INFORMATION

These open frame power supplies are intended for installation by suitably qualified personnel in enclosures that provide safety protection and as such are not user accessible.

Chassis models with suffix A to D are convection cooled and provision must be made for free air to flow round the unit. Chassis models with Suffix E must be fan cooled if it is intended to operate continuously at, or near, full power. It is recommended that a fan of  $\geq 94$  CFM (44.7 l/s) be mounted  $\leq 150$  mm from the transformer, blowing through the coils, and that a clearance on the opposite side of a similar distance is allowed. It is not abnormal for chassis temperatures to exceed 80°C. Worst case condition temperatures in excess of 100°C may be found.

Additional cooling will improve the long term reliability normally achieved by mounting on a large metal surface, or if this is not possible by fan cooling.

#### 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

#### OVERLOAD PROTECTION

All models are fitted with foldback current limiting. This feature is factory set at 120% of  $I_{max}$  to minimise the risk of erroneous tripping due to line spikes etc. It is not recommended to run the power supply at greater than  $I_{max}$  continuously. The foldback current limit is user adjustable over a wide range to cater for

individual requirements. The minimum adjustment range is from 0.5  $I_{max}$  to 1.2  $I_{max}$ . This is obtained by adjusting the "I LIM" potentiometer.

#### 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.

#### 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 2 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.

#### 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

With the 32000 SERIES power supplies 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  $\mu$ A and minimum dielectric withstanding are 3750VAC input to chassis, 3750 VAC input to output and 500VAC output to chassis.

\* The output voltage may be adjusted over the range indicated using the V adj potentiometer. The current rating is unchanged over the entire output voltage range

\*\*  $\pm 0.2\%$  on 5V o/p line of the 32305A only

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

## Convel Série 32000 Guide de l'opérateur

### INFORMATIONS POUR L'INSTALLATION ET LES APPLICATIONS

Ces blocs d'alimentation à châssis ouvert doivent être installés par un personnel ayant une formation adéquate, dans des coffrets offrant un niveau de protection approprié et qui, de ce fait, ne sont pas accessibles à l'utilisateur.

Les modèles de châssis portant les suffixes de A à D sont refroidis par convection. Il faut donc prévoir un passage d'air libre autour de l'unité. Les modèles de châssis portant le suffixe E doivent être refroidis à l'aide d'un ventilateur si l'on a l'intention de les faire fonctionner de façon continue à pleine puissance, ou presque. Il est recommandé qu'un ventilateur de  $\geq 94$  CFM (44,7 l/s) soit installé  $\leq 150$  mm du transformateur, soufflant à travers les bobines, et qu'une distance minimale d'importance égale soit prévue du côté opposé.

**DIAGRAMS, DIAGRAMMES, DIAGRAMME, DIAGRAMAS, DIAGRAMS**

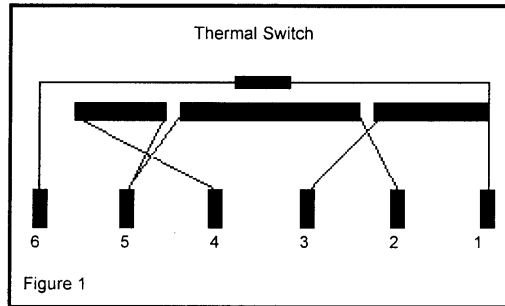


Figure 1

AC INPUT 47-63Hz, ENTREE CA 47-63Hz, AC-EINGANG 47-63Hz, ENTRADA DE CA 47-63Hz, INGRESSO CA 47-63Hz

For use at, Pour utilisation à, Einsatz bei, Para su uso a, Per utilizzo a	100VAC	120VAC	220VAC	240VAC
Jumper, Cavalier, Brücke, Puente, Ponticello	1 & 2; 3 & 4	1 & 2; 3 & 4	2 & 3	2 & 3
Apply AC, Appliquer CA, AC anlegen, Aplicar CA, Applicare CA	6 & 5	6 & 4	6 & 5	6 & 4

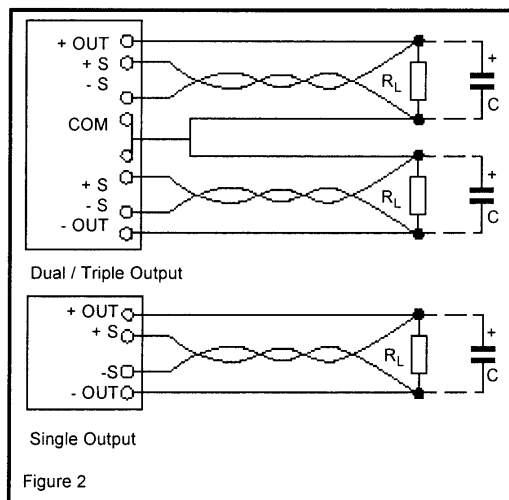


Figure 2

**SPECIFICATION, SPÉCIFICATIONS, SPEZIFIKATION, CARACTERÍSTICAS, SPECIFICA**

**GENERAL, GÉNÉRALES, ALLGEMEIN, GENERAL, GENERALE**

<b>Input voltage</b> <b>Voltage d'entrée</b> <b>Eingangsspannung</b> <b>Tensión de entrada</b> <b>Tensione di entrata</b>	100/120/220VAV at 47-63Hz 100/120/220VCA à 47-63Hz 100/120/220VAC bei 47-63Hz 100/120/220 V CA a 47-63Hz 100/120/220 VCA a 47-63Hz
<b>Line regulation</b> <b>Régulation de linge</b> <b>Netzregelung</b> <b>Regulación de la línea</b> <b>Regolazione di linea</b>	±0.05% for 10% line change ±0.05% pour changement ligne 10% ±0.05% für 10% veraorgungsveränderung ±0.05% para cambio de línea del 10% ±0.05% per un cambiamento di linea del10%
<b>Load regulation</b> <b>Régulation de charge</b> <b>Lastregelung</b> <b>Regulación de la carga</b> <b>Regolazione del carico</b>	±0.05% for 50% load change** ±0.05% pour changement charge 50%** ±0.05% für 50% versorgungsveränderung** ±0.05% para cambio de carga del 50%** ±0.05% per un cambiamento di carico del 50%**
<b>Overvoltage protection</b> <b>Protection surtension</b> <b>Überspannungsschutz</b> <b>Protección frente a sobretensión</b> <b>Protezione da sovratensione</b>	Built in on all 5V outputs Intégrée dans toutes les sortie 5V auf allen 5V ausgängen integriet Integrada en todas las slidas de 5V Incorporata in tutte le uscite da 5V
<b>Output ripple</b> <b>Ondulation de sortie</b> <b>Ausgangswelligkeit</b> <b>Fluctuación de salida</b> <b>Ondulazione di uscita</b>	<1mV pk-pk typical <1mV crête typique <1mV spitze-spitze typisch <1mV pk-pk tipica <1mV picco-picco tipica
<b>Leakage current</b> <b>Courant de fuite</b> <b>Leckstrom</b> <b>Corriente de fuga</b> <b>Corrente di dispersione</b>	5µA max 5µA maxi 5µA max 5µA máx 5µA massimo
<b>Temperature range</b> <b>Fourchette de températures</b> <b>Temperaturbereich</b> <b>Intervalo de temperatura</b> <b>Gamma di temperatura</b>	0 to +50°C operaing ambient (derate linearly to 40% at 70°C) 0 à +50°C en fonctionnement - ambiant (réduire la valeur nominale de façon linéaire de 40% à 70°C) 0 bis +50°C betried - umgebung (lineare Unterbelastung auf 40% bei 70°C) 0 a +50°C en funcionamiento - ambiente (disminuir linealmente hasta el 40% a 70°C) da 0 a +50°C temperatura di funzionamento - ambientale (degradare linearmnte verso il 40% a 70°C)
<b>Isolation: Input to ground</b> <b>Isolation: Entrée vers masse</b> <b>Trennung: Eingang gegen erde</b> <b>Aislamiento: Entrada a tierra</b> <b>Isolamento: Entrata a terra</b>	3750 VAC minimum 3750 VCA mini 3750 VAC min 3750 V CA mín 3750 VCA minimo
<b>Isolation: Input to output</b> <b>Isolation: Entrée vers sortie</b> <b>Trennung: Eingang gegen ausgang</b> <b>Aislamiento: Entrada a salida</b> <b>Isolamento: Entrata a uscita</b>	3750 VAC minimum 3750VCA mini 3750 VAC min 3750 V CA mín 3750 VCA minimo
<b>Isolation: Output to ground</b> <b>Isolation: Sortie vers masse</b> <b>Trennung: Ausgang gegen erde</b> <b>Aislamiento: Salida a tiere</b> <b>Isolamento: Uscita a terra</b>	500 VAC minimum 500 VCA mini 500VAC min 500 V CA mín 500 VCA minimo

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**OUTPUT, DIMENSIONS & MOUNTING DETAILS**  
**SORTIE, DIMENSIONS & INSTRUCTIONS DE MONTAGE**  
**ANGABEN ZU ASGANG, ABMESSUNGEN UND MONTAGE**  
**SALIDA, DIMENSIONES Y DETALLES DE LA INSTALACIÓN**  
**DETTAGLI SULL'USCITA, LE DIMENSIONI & IL MONTAGGIO**

Calex Model No	Output Sortie Ausgang Salida Uscita		Input fuse Fusible d'entrée Eingang Sicherung Fusible de la entrada Fusible dell'input		Dimensions Dimensions Konstruktion Construcción Costruzione (mm)			Hole Centres Centres trous Bohrmittelpunkt Centros del agujero Centri del foro (Ø4.8mm)		Weight Poids Gewicht Peso Peso
	V	A	110V	230V	L	W	H	Long Face	Short Face	
32005A	5	3	0.5A	0.25A	123.7	101.6	52.6	104.78(2 holes)	85.73(2 holes)	1.0
32005B	5	6	1.0A	0.5A	142.8	123.7	74.9	123.83 x 31.75	104.78 x 31.75	1.8
32005C	5	9	2.0A	1.0A	177.8	123.7	81.3	158.75 x 31.75	104.78 x 31.75	3.2
32005D	5	12	2.0A	1.0A	228.6	123.7	81.3	203.2 x 31.75	104.78 x 31.75	3.4
32005E	5	18	3.15A	1.6A	355.6	123.7	86.4	330.2 x 31.75	104.78 x 31.75	4.2
32012A	12 to 15*	1.7	0.5A	0.25A	123.7	101.6	52.6	104.78(2 holes)	85.73(2 holes)	1.0
32012B	12 to 15*	3.4	1.0A	0.5A	142.8	123.7	74.9	123.83 x 31.75	104.78 x 31.75	1.8
32012C	12 to 15*	5.1	2.0A	1.0A	177.8	123.7	81.3	158.75 x 31.75	104.78 x 31.75	3.2
32012D	12 to 15*	6.8	2.0A	1.0A	228.6	123.7	81.3	203.2 x 31.75	104.78 x 31.75	3.4
32012E	12 to 15*	10.2	3.15A	1.6A	355.6	123.7	86.4	330.2 x 31.75	104.78 x 31.75	4.2
32024A	24 to 28*	1.2	0.5A	0.25A	123.7	101.6	52.6	104.78(2 holes)	85.73(2 holes)	1.0
32024B	24 to 28*	2.4	1.0A	0.5A	142.8	123.7	74.9	123.83 x 31.75	104.78 x 31.75	1.8
32024C	24 to 28*	3.6	2.0A	1.0A	177.8	123.7	81.3	158.75 x 31.75	104.78 x 31.75	3.2
32024D	24 to 28*	4.8	2.0A	1.0A	228.6	123.7	81.3	203.2 x 31.75	104.78 x 31.75	3.4
32024E	24 to 28*	7.2	3.15A	1.6A	355.6	123.7	86.4	330.2 x 31.75	104.78 x 31.75	4.2
32024E/10	24 to 28*	10	3.15A	1.6A	355.6	123.7	86.4	330.2 x 31.75	104.78 x 31.75	4.2
32048A	48	0.5	0.5A	0.25A	123.7	101.6	52.6	104.78(2 holes)	85.73(2 holes)	1.0
32048B	48	1.0	1.0A	0.5A	142.8	123.7	74.9	123.83 x 31.75	104.78 x 31.75	1.8
32048C	48	3.0	2.0A	1.0A	177.8	123.7	81.3	158.75 x 31.75	104.78 x 31.75	3.2
32150A	120 to 200	0.150***	0.5A	0.25A	123.7	101.6	52.6	104.78(2 holes)	85.73(2 holes)	1.0
32205A	±5	1.5	1.0A	0.5A	165.1	101.6	52.6	146.05(2 holes)	101.6(2 holes)	1.0
32212A	±12 to ±15*	1.0	1.0A	0.5A	165.1	101.6	52.6	146.05(2 holes)	101.6(2 holes)	1.0
32212B	±12 to ±15*	1.7	1.0A	0.5A	177.8	123.7	74.9	158.75 x 31.75	104.78 x 31.75	1.8
32212C	±12 to ±15*	3.4	2.0A	1.0A	238.3	123.7	81.3	212.73 x 31.75	104.78 x 31.75	3.2
32212D	±12 to ±15*	5.0	3.15A	1.6A	355.6	123.7	86.4	330.2 x 31.75	104.78 x 31.75	4.2
32305A	5V, ±9 to ±15*	2, 0.4	0.5A	0.25A	165.1	101.6	52.6	146.05(2 holes)	101.6(2 holes)	1.0
32305B	5V, ±12 to ±15*	3, 1.0	1.0A	0.5A	260.4	101.6	74.9	234.95 x 31.75	85.73 x 31.75	2.3
32305C	5V, ±12 to ±15*	6, 1.0	2.0A	1.0A	228.6	123.7	81.3	203.2 x 31.75	104.78 x 31.75	3.4
32305D	5V, ±12 to ±15*	6, 1.7	2.0A	1.0A	279.4	123.7	81.3	190.5 x 31.75	104.78 x 31.75	3.6
32305E	5V, ±12 to ±15*	8, 1.7	2.0A	1.0A	279.4	123.7	81.3	190.5 x 31.75	104.78 x 31.75	3.6
32305F	5V, ±12 to ±15*	12, 1.7	3.15A	1.6A	361.9	123.7	69.9	222.3 x 31.75	104.78 x 31.75	5.0
32305G	5V, ±12 to ±15*	12, 3.4	3.15A	1.6A	381.0	124.0	63.5	355.6 x 63.5	104.9 x 63.5	5.5

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