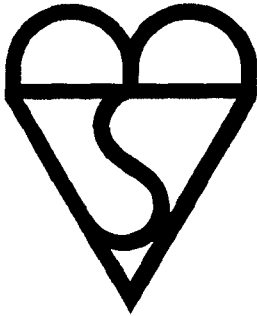


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No. KM 13930

Coutant Lambda Limited

Ilfracombe

Model

Vega 450, 650 and 900

Test Report Number

249/4532186 & 249/4469473

Vega 450, 650 and 900 models as described below:

Unit Configuration Code:

a) V4, V6, V9, Vega 450, Vega 650 or Vega 900 or Vega Smart or Vega Smart Plus

where V4 = Vega 450 range

V6 = Vega 650 range

V9 = Vega 900 range

Vega Smart = Vega 450 or 650 PSU with primary digital option fitted

Vega Smart Plus = Vega 450 or 650 PSU with primary and secondary digital options fitted

b) followed by: C, F, R, Q or P

where F = Standard fan, forward airflow

R = Standard fan, reverse air

Q = Quiet fan, forward airflow

P = Quiet fan, reverse air

C = Customer air

c) optionally followed by: F, I or S

where F = Fast-on or quick connect input terminals

S = Screw input terminals

I = IEC input

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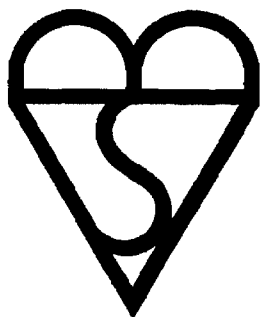
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Vega 450, 650 and 900 continued

d) followed by: S, M, L, R, or T

where S = Standard Leakage (Class B Filter)

M = Medium Leakage

L = Low Leakage

R = Reduced Leakage

T = Tiny Leakage

e) optionally followed by: E, F, EV, FV, xEW, xFW or D

where E = AC fail with PSU & fan enable and 5V aux supply

F = AC fail with PSU & fan inhibit and 5V aux supply

EV = AC fail with PSU & fan enable and 5V/300mA aux supply

FV = AC fail with PSU & fan inhibit and 5V/300mA aux supply

xEW = AC fail with PSU & fan enable and 5-15V/1A aux supply, where x = voltage setting

xFW = AC fail with PSU & fan inhibit and 5-15V/1A aux supply, where x = voltage setting

D = Primary digital option. Provides PSU inhibit and enable, fan monitor, standby supply, hours of operation, serial numbers, mains fail, over temperature warning. When secondary digital options fitted also provides status bytes, unit and module IDs, grouping, digital voltage and current limit programming, secondary inhibit and enable, secondary turn on delay, global and secondary module good, module monitoring.

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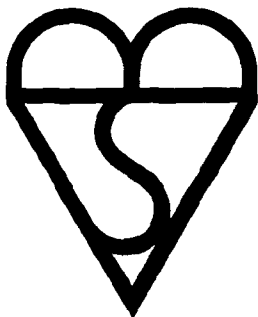
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Modules:

B@, C@, C1Y, D@, E@, F1, F2, H@/ @, L@, W2 or W5

where the letter represents a module and @ is a number between 1 and 5, which represents the number of turns on the transformer secondary. By reference to the following table, this in turn defines the permitted voltage range of the module. Blanking plates may be fitted in place of modules.

@ may optionally be followed by the letter L or H, where L and H indicate the low or high output voltage variants of the module.

For W2 & W5 modules only: @ is followed by F or T, indicating fixed or tracking OVP.

Followed by F or S, where F indicates fast-on output terminals and S indicates screw output terminals.

or Z#

where # is a number between 1 and 99. This code represents any two of the above modules that have had their outputs paralleled together. The number # is a module reference number and does not represent the number of turns. May optionally followed by F or S, where F indicates fast-on output terminals and S indicates screw output terminals.

or BB@, CC@, DD@, EE@, HH@/ @, JJ@/ @, LL@, C5B4 or B5B4

where @ is a number between 1 and 5, which represents the number of turns on the transformer secondary. For HH@/ @ the code represents one H module that has had its two outputs connected in series. For all other variants this code represents two modules, selected from those listed above, that have had their outputs connected in series. May optionally followed by F or S, where F indicates fast-on output terminals and S indicates screw output terminals.

Note: Seriesed outputs may make all outputs hazardous, see Electrical & Thermal Ratings section for details. JJ@/ @ modules are HH@/ @ modules with reduced OVP and/or current ratings.

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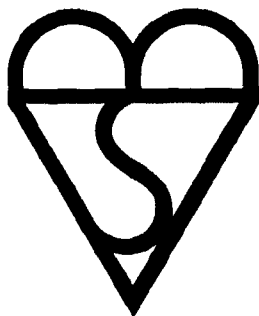
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or X1, X2, X4 or X8

where the number relates to the maximum voltage capability of the X module in accordance with X1=10V, X2=20V, X4=40V, X8=80V. The X module is connected to the output terminals of D or E modules, which may be connected in series or parallel. The X module contains diodes in series with its output (for paralleling use) and additional circuitry for remote sense, paralleling with other X modules and module inhibit. A maximum of two X modules may be fitted in a PSU.

Module Options:

N, P, R, T, L, K, D, V \ddagger or R \ddagger

where N = Inhibit, module good and remote sense

P = Parallel with current share

R = Remote sense (twin output modules only)

T = Remote sense (one output of twin output modules only)

L = Module good using LED indication

K = Allows for Vega products to be paralleled with Omega products

D = Secondary digital option (may only be fitted to single output modules). Provides analogue voltage and resistive programming, current limit modes, inhibit output, enable output, turn on delay, module good, N+1 paralleling.

V \ddagger = Voltage programmable output voltage

R \ddagger = Resistance programmable output voltage

where \ddagger represents a number between 1 and 99. Each number indicates an option variant which does not affect safety, of these the following are standard variants:

1 = Inhibit, fixed current limit

2 = Inhibit, programmable current limit

3 = Enable, fixed current limit

4 = Enable, programmable current limit

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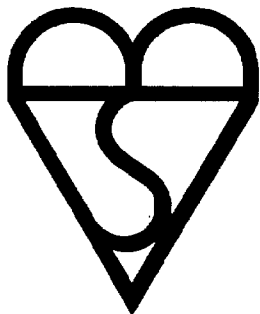
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K I T E M A R K L I C E N C E



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Electrical & Thermal Ratings:

Output modules:

Module	Output Voltage	Rated Current	Power	Occupied Slots	Secondary Turns	Ampere Turns
B1L	1 - 3.8V	20A	76W	1	1	20
B1H	3.9 - 5.5V	20A	110W	1	1	20
B2	5 - 9V	25A	225W	1	2	50
B3	9.1 - 16.2V	12A	195W	1	3	36
B4	16.3 - 21.5V	10A	215W	1	4	40
B5	21.6 - 31V	6A	186W	1	5	30
C1	1 - 4.1V	35A	144W	1	1	35
C1Y	1 - 4.1V	40A	164W	1	1	40
C3	9.1 - 16.2V	18A	292W	1	3	54
C4	16.3 - 21.5V	14A	301W	1	4	56
C5	21.6 - 31V	10A	310W	1	5	50
D1L	1 - 3.8	50A	190W	1.5	1	50
D1H	3.9 - 5.5	50A	275W	1.5	1	50
D2	3.8 - 9V	45A	405W	1.5	2	90
D3	8 - 16.5V	24A	396W	1.5	3	72
D4	14 - 21.5V	18A	387W	1.5	4	72
D5	21 - 28V	15A	420W	1.5	5	75

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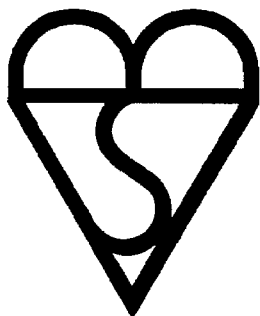
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Module	Output Voltage	Rated Current	Power	Occupied Slots	Secondary Turns	Ampere Turns
E1	1 - 3.8V	60A	228W	2	1	60
E2	3.8 - 8V	60A	480W	2	2	120
E3L	8 - 13.9V	40A	556W	2	3	120
E3H	14 - 15V	36A	540W	2	3	108
E4	14 - 19.9V	30A	597W	2	4	120
E5L	20 - 24V	27A	648W	2	5	135
E5H	24 - 28V	25A	650W	2	5	125
F1	1 - 3.8V	80A	640W	2	1	80
F2	3.8 - 8V	80A	640W	2	2	160
H1L/1L	1-3.8/1-3.8V	12A/8A	46W/31W	1	1/1	12/8
H1L/1H	1-3.8/3.9-5.5V	12A/8A	46W/44W	1	1/1	12/8
H1H/1L	3.9-5.5 /1-3.8V	12A/8A	66W/31W	1	1/1	12/8
H1H/1H	3.9-5.5 /3.9-5.5V	12A/8A	66W/44W	1	1/1	12/8
H1L/2	1-3.8/5-9V	12A/6A	46W/54W	1	1/2	12/12
H1H/2	3.9-5.5/5-9V	12A/6A	66W/54W	1	1/2	12/12
H1L/3	1-3.8/9.1-16.2V	12A/6A	46W/98W	1	1/3	12/18
H1H/3	3.9-5.5/9.1-16.2V	12A/6A	66W/98W	1	1/3	12/18
H1L/4	1-3.8/16.3-25V	12A/4.5A	46W/113W	1	1/4	12/18
H1H/4	3.9-5.5/16.3-25V	12A/4.5A	66W/113W	1	1/4	12/18
H2/1L	5.6-9/1-3.8V	10A/8A	90W/31W	1	2/1	20/8
H2/1H	5.6-9/3.9-5.5V	10A/8A	90W/44W	1	2/1	20/8
H2/2	5.6-9/5.6-9V	10A/6A	90W/54W	1	2/2	20/12

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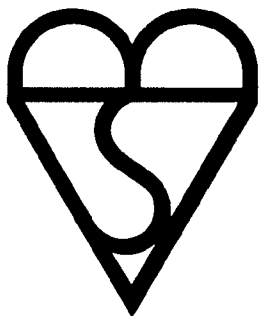
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Module	Output Voltage	Rated Current	Power	Occupied Slots	Secondary Turns	Ampere Turns
H2/3	5.6-9/9.1-16.2V	10A/6A	90W/98W	1	2/3	20/18
H2/4	5.6-9/16.3-25V	10A/4.5A	90W/113W	1	2/4	20/18
H3/1L	9.1-16.2/1-3.8V	10A/8A	162W/31W	1	3/1	30/8
H3/1H	9.1-16.2/3.9-5.5V	10A/8A	162W/44W	1	3/1	30/8
H3/2	9.1-16.2/5.6-9V	10A/6A	162W/54W	1	3/2	30/12
H3/3	9.1-16.2/9.1-16.2V	10A/6A	162W/98W	1	3/3	30/18
H3/4	9.1-16.2/16.3-25V	10A/4.5A	162W/113W	1	3/4	30/18
H5/1L	16.2-31/1-3.8V	5A/8A	155W/31W	1	5/1	25/8
H5/1H	16.2-31/3.9-5.5V	5A/8A	155W/44W	1	5/1	25/8
H5/2	16.2-31/5.6-9V	5A/6A	155W/54W	1	5/2	25/12
H5/3	16.2-31/9.1-16.2V	5A/6A	155W/98W	1	5/3	25/18
H5/4	16.2-31/16.3-25V	5A/4.5A	155W/113W	1	5/4	25/18
L1	4.2 - 5.5V	35A	193W	1	1	35
W2	0.25 - 7.5V	30A	225W	1	2	60
W5	0.25 - 32V	8.5A	272W	1	5	42.5
X1	10V (see Note 1)	90A	See Note 2	1	-	-
X2	20V (see Note 1)	64.5A	See Note 2	1	-	-
X4	40V (see Note 1)	32.4A	See Note 2	1	-	-
X8	80V (see Note 1)	16.2A	See Note 2	1	-	-

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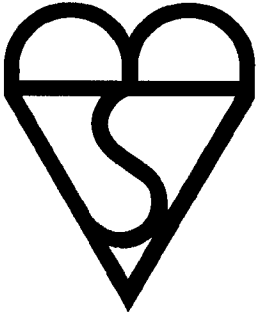
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Coutant Lambda Limited

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Note 1: Actual voltage and current output of an X module is dependent, and limited by, the ratings of the modules from which it is fed. The ratings given above are additional rating limitations imposed by the X module itself.

Note 2: The maximum power output of PSUs fitted with X modules is reduced from 450/650W by the following power: $0.55 \times (\text{total X1 current}) + 0.7 \times (\text{total X2 \& X4 current}) + 0.9 \times (\text{total X8 current})$

Additional module limitations:

E2 module fitted in slots 4/5 is limited to 55A.

C1Y module can only be fitted in slot 1.

F2 module may only be fitted in slots 1/2 and is limited to 75A for ambient temperatures of greater than 45°C.

F1 module may only be fitted in slots 1/2.

For PSUs with three D modules fitted:

D1L & D1H in slots 2/3 is limited to 42A and in slots 4/5 is limited to 47A

D2 in slots 2/3 is limited to 40A

For 900W PSUs:

W2 module not permitted.

F1 and F2 modules not permitted.

PSUs fitted with a W2 module are limited to a maximum ambient of 45°C.

All the above ratings and limitations apply to the individual modules from which a series or paralleled pair is made.

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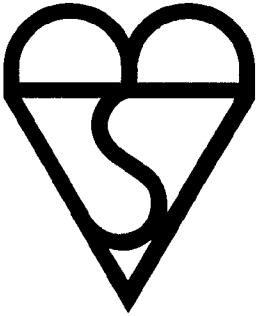
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SELV and Outputs Connected In Series:

Outputs are SELV except as described below:

- Non-earthed outputs that have secondaries with 2 or more turns are non-SELV as a single fault in the secondary may make them exceed the SELV limit between output and earth.
- Non-earthed outputs that are connected in series are non-SELV unless all the seriesed outputs use 1 turn secondaries and there are no more than 3 outputs connected in series.
- Outputs connected in series are non-SELV if the total output voltage + 20% of the max. rated output voltage of the output with the highest rated voltage exceeds 60Vdc (the 20% addition allows for a single fault in any one individual channel).
- The total voltage of a seriesed output must not exceed 160V.
- If any output or seriesed output is non-SELV then all the outputs in the PSU must be considered non-SELV.

Note:

- Non-SELV outputs must be guarded or a deflector fitted during installation to avoid a service engineer making inadvertent contact with the output terminals, or dropping a tool onto them.
- All outputs have operational spacings to earth, and due consideration must be given to this in the end product design.

When the IEC inlet option is fitted (option I) together with a plastic fan grill then the end face of the PSU with the fan grill may be operator accessible.

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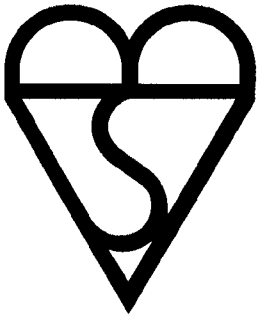
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Ratings Specific to Vega 450 Range:

Input voltage: 100-240 V ac nom., 90-264V ac max., 47-63 Hz, 8.5 A rms max.

Permitted orientations: Horizontal with chassis lowest, on either side or vertical with the airflow upwards.

Cooling Option	Max Ambient	Dual Width Modules Fitted	Max Power	Max AT (total)	Max AT in adjacent regions (note 1)	Module Current Rating
F	50	No	450	180	n/a	100%
		Yes	450	180	180	100%
R	50	No	450	180	n/a	100%
		Yes	450	180	162	90%
Q	50	No	450	180	n/a	100%
		Yes	450	180	180	100%
P	50	No	450	180	n/a	100%
		Yes	450	180	180	85%
C	50	See Customer Air Cooling section for ratings				

Note 1: The PSU main transformer has three regions for module secondaries separated by two primary windings. Starting nearest slot 1, region A, primary winding, region B, primary winding, region C. The total ampere turns (AT) in any two adjacent regions is limited to that in the table above column, "Max AT in adjacent regions (note 1)". See Mains transformer regions table below for modules allowed in each region. The table uses module widths with a twin output module being single width. For PSUs fitted with F2 modules "Max AT in adjacent regions" does not apply.

n/a = not applicable

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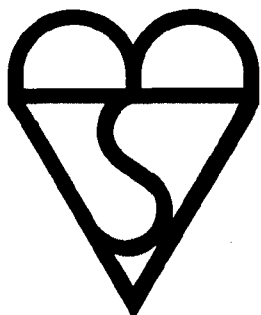
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Ampere Turns (AT) is the sum of (output amps x secondary turns)

Ratings Specific to Vega 650 Range:

Input voltage: 100-240 V ac nom., 90-264V ac max., 47-63 Hz, 11 A rms max.

Permitted orientations: Horizontal with chassis lowest, on either side or vertical with the airflow upwards.

Cooling Option	Max Ambient	Dual Width Modules Fitted	Max Power	Max AT (total)	Max AT in adjacent regions (note 1)	Module Current Rating
F	50	No	650	220	n/a	100%
		Yes	650	220	180	100%
R	40	No	530	212	n/a	100%
		Yes	550	212	158	90%
	45	Yes	500	212	158	90%
	50	No	575	180	n/a	100%
		Yes	600	210	162	90%
		No	500	200	n/a	100%
Q	50	Yes	550	180	140	100%
		No	650	220	n/a	100%
		Yes	610	220	180	95%
		Yes	650	145	115	95%
P	40	Yes	500	203	152	85%
	45	Yes	420	203	152	85%
	50	No	500	180	n/a	100%
		Yes	450	190	162	85%
C	50	See Customer Air Cooling section for ratings				

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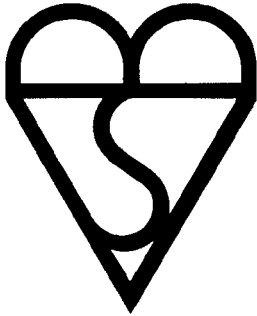
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Note 1: The PSU main transformer has three regions for module secondaries separated by two primary windings. Starting nearest slot 1, region A, primary winding, region B, primary winding, region C. The total ampere turns (AT) in any two adjacent regions is limited to that in the table above column, "Max AT in adjacent regions (note 1)". See Mains transformer regions table below for modules allowed in each region. The table uses module widths with a twin output module being single width. For PSUs fitted with F2 modules "Max AT in adjacent regions" does not apply.

n/a = not applicable

Ampere Turns (AT) is the sum of (output amps x secondary turns)

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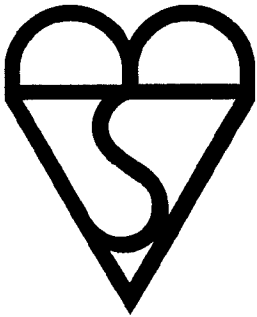
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K I T E M A R K L I C E N C E



No. KM 13930

Coutant Lambda Limited

Ilfracombe

Ratings Specific to Vega 900 Range:

Input voltage: 165-240 V ac nom., 150-264V ac max., 47-63 Hz, 9 A rms max.

Permitted orientations: Horizontal with chassis lowest, on either side or vertical with the airflow upwards.

Cooling Option	Max Ambient	Dual Width Modules Fitted	Max Power	Max AT (total)	Max AT in adjacent regions (note 1)	Module Current Rating
F	50	No	900	220	180	100%
		Yes	900	220	180	100%
		No	650	220	n/a	100%
Q	50	No	750	180	n/a	100%
		Yes	750	180	140	100%
C	50	See Customer Air Cooling section for ratings				

Note 1: The PSU main transformer has three regions for module secondaries separated by two primary windings. Starting nearest slot 1, region A, primary winding, region B, primary winding, region C. The total ampere turns (AT) in any two adjacent regions is limited to that in the table above column, "Max AT in adjacent regions (note 1)". See Mains transformer regions table below for modules allowed in each region. The table uses module widths with a twin output module being single width. For PSUs fitted with F2 modules "Max AT in adjacent regions" does not apply.

n/a = not applicable

Ampere Turns (AT) is the sum of (output amps x secondary turns)

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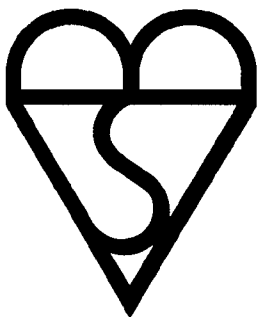
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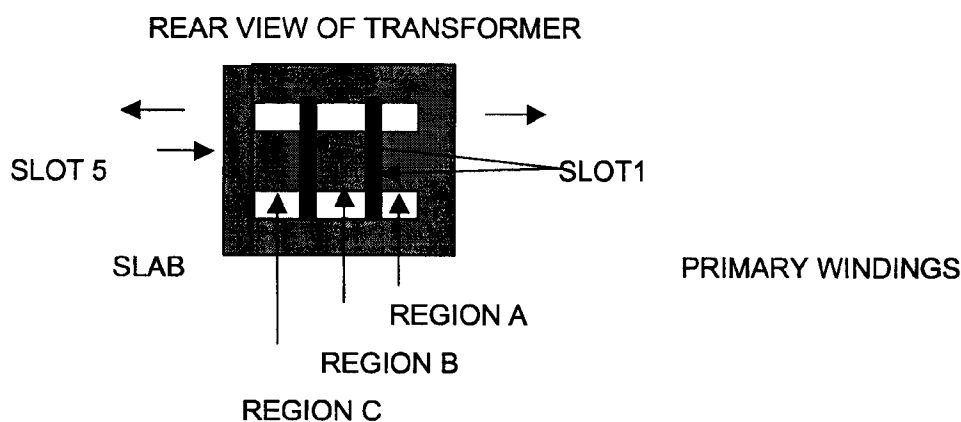


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Main transformer regions table:



Slot 1	Slot 5.5	
Region A	Region B	Region C
Single	Dual	Dual
Blank	Dual	Dual
Single	Dual, Single	Single
Single	Dual	Single
Single	Dual	-
-	Dual	-
Single	Single, Single, Single	Single
Single	Single, Single	Single

Slot 1	Slot 5.5	
Region A	Region B	Region C
1.5	1.5	-
Single	Single, Single	Dual
1.5	1.5	Dual
-	F module, Single	Single, Single
-	F module, Single	Single
-	F module, Single	-
-	F module	-
-	F module, Single	Dual

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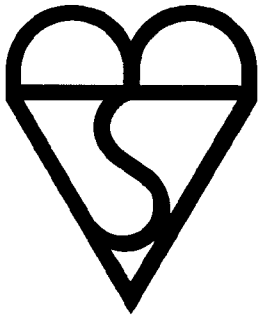
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No. KM 13930

Coutant Lambda Limited

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Main transformer regions table continued:

Slot 1		Slot 5.5
Region A	Region B	Region C
Single	Single	-
-	Single	-
1.5	Dual	1.5
Single	Dual	1.5
-	Dual	1.5
Single	1.5, Single	Single
Single	1.5	Single
Single	1.5	-
1.5	1.5	1.5
Single	1.5, 1.5	Single
Single	1.5	1.5
-	1.5	1.5
-	1.5	-
-	Single, Single	Dual
-	1.5, Single	Single
1.5	1.5, Single	Single
-	Dual, Single	Single

Slot 1		Slot 5.5
Region A	Region B	Region C
-	F module	Dual
-	F module, Single	1.5
-	F module	1.5
-	F module, 1.5	1.5
Combined Modules		
Single	Dual	Dual
-	Dual	Dual
1.5	Dual	1.5
Single	Dual	1.5
-	Dual	1.5
Single	1.5, 1.5	Single
Single	1.5, 1.5	-
-	1.5, 1.5	-
1.5	1.5, Dual	-
1.5	1.5	1.5
1.5	1.5, Single	Single

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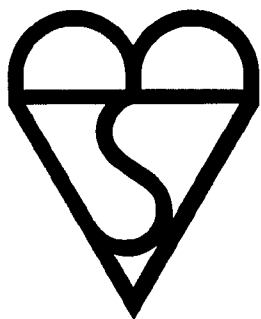
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Customer Air Cooling (option C):

The following method must be used for determining the safe operation of PSUs when C option (Customer Air) is fitted, ie fan not fitted to PSU.

For PSUs cooled by customer supplied airflow the components listed in the following table must not exceed the temperatures given. Additionally ratings specified for units with an internal fan must still be complied with, eg mains input voltage range, maximum output power, ampere turns, module voltage / current ratings and maximum ambient temperature. To determine the component temperatures the heating tests must be conducted in accordance with the requirements of EN60950-1:2001 Clause 4.5. Consideration should also be give to the requirements of other safety standards.

Test requirements include: PSU to be fitted in its end-use equipment and operated under the most adverse conditions permitted in the end-use equipment handbook/specification and which will result in the highest temperatures in the PSU. To determine the most adverse conditions consideration should be given to the end use equipment maximum operating ambient, the PSU loading and input voltage, ventilation, end use equipment orientation, the position of doors & covers, etc. Temperatures should be monitored using type K fine wire thermocouples (secured with cyanoacrylate adhesive, or similar) placed on the hottest part of the component (out of any direct airflow) and the equipment should be run until all temperatures have stabilised.

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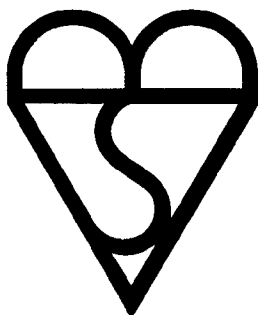
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Customer Air Cooling (option C) continued:

Circuit Ref.	Description	Max. Temperature (°C)
-	Power transformer primary, secondary and core	130
T1, TX101, TX201	Module current transformer windings	127
XQ1	E, EV, F & FV Primary option transformers	90
L1, L2, XT601	Choke winding	127
L4, T2	Choke winding	117
Various	All other choke & transformer windings	140
RLY1	Relay	100
C15	X capacitor	100
Various	All other X and electrolytic capacitors	105

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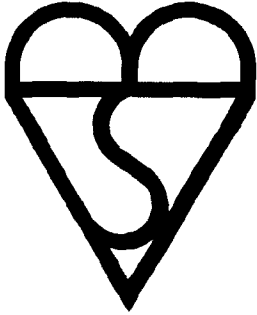
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K I T E M A R K L I C E N C E



No. KM 13930

Coutant Lambda Limited

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Custom Models:

Model: V6 RSF 3/1HS C3S B/S E2S

Maximum outputs: 12V, 2A; 5V, 1.5A; 12V, 10A; 5V 52A

Maximum Power: 411.5W

Maximum ambient: 40°C

Orientation: Horizontal only

Cooling: Reverse air, Papst 612NM.

Model: V6 FISFV 5.1F2SP 12B3F 3.4E1SP

Maximum outputs: 5.1V, 80A; 12V, 3A; 3.4V, 60A

Maximum power: 648W

Maximum ambient: 50°C

Orientation: Horizontal only

Cooling: Forward air

Model: V6FSS 24C5S 24D5S

Maximum outputs: 24V, 10A; 24V, 15A

Maximum Power: 600W

Maximum ambient: 65°C

Orientation: All except upside down and vertical with the airflow downwards

Cooling: Forward air

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