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## EU DECLARATION OF CONFORMITY

### Alpha 400/CA400 Series

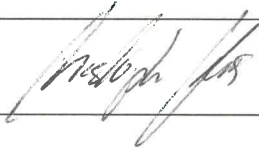
We, TDK-Lambda UK Limited, of Kingsley Avenue, Ilfracombe, Devon, EX34 8ES declare under our sole responsibility that the TDK-Lambda Alpha 400/CA400 series of power supplies, as detailed on the attached products covered sheets, complies with the provisions of the following European Directives and is eligible to bear the CE mark:

Low Voltage Directive	2014/35/EU
RoHS Directive	2011/65/EU
RoHS Directive (EU)	2015/863

Assurance of conformance of the described product with the provisions of the stated EC Directive is given through compliance to the following standards:

Electrical Safety (LVD)	EN60950-1:2006 + A2:2013
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Our representative in the EU is TDK-Lambda Germany GmbH, located at Karl-Bold-Str. 40, 77885 Achern, Germany.

Name of Authorized Signatory	Christopher Haas
Signature of Authorized Signatory	
Position of Authorized Signatory	Technical Manager and Head of Quality & Compliance, TDK-Lambda Germany GmbH
Date	22 <sup>nd</sup> October 2019
Date series first CE marked	29 <sup>th</sup> January 1996
Place where signed	Achern, Germany

# ALPHA 400/CA400 PRODUCTS COVERED

## Unit Configuration Code:

Alpha 400 and CA400 are identical.

Alpha 400 or CA400 may be followed by: TL, RL, LL, ML, A or no letter,

- where TL = Tiny leakage input filter
- RL = Reduced leakage input filter
- LL = Low leakage input filter
- ML = Medium leakage input filter
- A = Class A input filter
- No letter = Class B input filter

may be followed by: LSF, RA or QF

- Where LSF = Low speed fan
- RA = Reverse air fan
- QF = Quiet fan

followed by up to five of the following:

@ followed by AA, A, BB, B, C, D, E, EB, EQ, F, G, H, J, K, L, M, N, P Q, R, S, T, U, W or Z. or B/S

optionally followed by \_MF, MFE, MFU, MFV or \_MFV, \_PA, \_IN, \_PP, \_RP

@/@ followed by: E,EB, EQ, H, P:

- where @ and @/@ = applicable voltage range and the following one or two letters are the module type.
- \_MF, MFE = Mains fail option (may also be called X).
- MFU = Mains fail option with uncommitted output connections.
- MFV or \_MFV = Mains fail option with VME bus
- \_PA, \_PP, \_IN, \_RP = Secondary module options.
- B/S = Blanking slot which occupies one 23mm slot.

Only up to five 23mm slots may be filled up per unit, noting that all modules occupy one 23mm slot except for AA, A, F, G, J, K, R, S and T modules which occupy two 23mm slots. All primary MF options can only be fitted in slot 1.

## Valid voltage ranges for @ and @/@ for each module are as follows:

Module	Voltage Range	Module	Voltage Range
A	@ = 4.5 – 5.5V	K	@ = 18 – 29V
AA	@ = 4.5 – 6.5V	L	@ = 1.8 – 3.2V
BB	@ = 4.5 – 6.5V	M	@ = 5 – 16V
B	@ = 4.5 – 5.5V	N	@ = 18 – 32V
C	@ = 5 – 16V	P	@/@ = 18 – 29V / 5 – 16V
D	@ = 18 – 29V	Q	@ = 2.7 – 3.9V
E	@/@ = 5 – 16V / 5 – 16V	R	@ = 2.7 – 3.9V
EB	@/@ = 4.5 – 5.5V / 4.5 – 5.5V	S	@ = 2.5 – 5.7V
EQ	@/@ = 4.5 – 5.5V / 2.7 – 3.9V	T	@ = 1.8 – 3.2V
F	@ = 9 – 16V	U	@ = 10 – 21V
G	@ = 17.5 – 29V	W	@ = 4.5 – 5.5V
H	@/@ = 18 – 32V / 18 – 32V	Z	@ = 4.5 – 5.5V
J	@ = 30 – 48V		

## Secondary Options:

Option	Description
_PA	Forces paralleled modules to share load current. Additionally it also provides the module good signal.
_PP	Provides either of the following functions: a) Reduces module current limit and caters for paralleled modules with busbar linking. For use with modules providing a max output of up to 16V only; or

b) Identical to \_PA except that the module is paralleled at the output of the module with busbar linking.

\_IN Provides an external signal which may be used to inhibit the output of the module.

\_RP Provides remote programming of the module output voltage.

**Note:**

The RP option can only be used on modules with output voltages rated up to 16V.  
Not for use with a module voltage range of 18-29V or twin output modules.

**ELECTRICAL & THERMAL RATINGS:**

**Input parameters**

<b>NOMINAL INPUT VOLTAGE RANGE</b>	100 - 240VAC
<b>MAX. INPUT VOLTAGE RANGE</b>	90-264VAC
<b>INPUT FREQUENCY</b>	47-63Hz
<b>MAXIMUM INPUT CURRENT</b>	7 AMPS
<b>INRUSH CURRENT</b>	<50 AMPS

**Output parameters**

CONFIGURATION	ORIENTATION	MAX. POWER	MAX. AMPERE-TURNS
Configurations with one or more A, AA, R or T modules	Vertical with airflow downwards	350W	80
Configurations with one or more F modules	Vertical with airflow downwards	375W	80
PSU's with Low Speed Fan (LSF) Option	All, except vertical with fan at top	155W	30
PSU's with Reverse Air (RA) Option	Horizontal only	300W	60
Use of input/output connector mouldings	All, except vertical with airflow downwards	80 + (3.2 x Vin)	80
Use of input/output connector mouldings	Vertical with airflow downwards	14.7 + (3.67 x Vin)	80

**Adjustment and Derating:**

The Alpha 400 series is designed to provide a max output power of 400W at nominal output voltages. The following procedure must be used to ensure the PSU is operated within its ratings:

- Calculate user power for each module (volts x amps).
- Add all the individual module powers together. The total power must not exceed the power rating of the C converter 400W.
- Calculate secondary transformer turns x amps or each module see outputs table for transformer secondary turns.
- Add all the module turns x amps together and this must not exceed 80AT.
- If necessary reduce the loading until the conditions are met. ie. power and ampere-turns maxima.

**Output module ratings:**

Module	Output Voltage	Current	Slots	Turns	Ampere-Turns	Max Current Limit	Setting for Hazardous Energy
A	4.5 – 5.5V	60A	2	1	60	79.2A	>3V
AA	4.5 – 6.5V	60A	2	1	60	79.2A	>3V
B	4.5 – 5.5V	25A	1	1	25	33A	-
BB	4.5 – 6.5V	25A	1	1	25	33A	-
C	5 – 16V	16A	1	2	32	21.2A	>11.3V
D	18 – 29V	8A	1	4	32	10.6A	>22.6V
E	5 – 16V / 5 – 16V	8/8A	1	2/2	16/16	10.6A/10.6A	-
EB	4.5 – 5.5V / 4.5 – 5.5V	9/9A	1	1/1	9/9	11.9A/11.9A	-
EQ	4.5 – 5.5V / 2.7 – 3.9V	9/9A	1	1/1	9/9	11.9A/11.9A	-
F	9 – 16V	33A	2	2	66	43.6A	>5.5V
G	17.5 – 29V	25A	2	4	100	33A	>7.2V
H	18 – 32V / 18 – 32V	5/5A	1	4/4	20/20	6.6A/6.6A	-
J	30 – 48V	10A	2	8	80	13A	>18.4V
K	18 – 29V	15A	2	4	60	19.8A	>12V
L	1.8 – 3.2V	25A	1	1	25	33A	-
M	5 – 16V	8A	1	2	16	10.6A	-

N	18 – 32V	5A	1	4	20	6.6A	-
P	18 – 29V / 5 – 16V	5/8A	1	4/2	20/16	6.6A/10.6A	-
Q	2.7 – 3.9V	25A	1	1	25	33A	-
R	2.7 – 3.9V	60A	2	1	60	79.2A	>3V
S	2.5 – 5.7V	85A	2	1	75	110.5A	>2.2V
T	1.8 – 3.2V	60A	2	1	60	79.2A	>3V
U	10 – 21V	16A	1	3	48	21.2A	>11.3V
W	4.5 – 5.5V	15A	1	1	15	19.8A	-
Z	4.5 – 5.5V	25A	1	1	25	33A	-

- A & AA modules can be used in slots 1-5 up to 60A/channel.
- B & BB modules can be used in slots 1-4 up to 25A/channel and in slots 5 up to 20A per channel.
- C modules can be used in slots 1-5 up to 16A/channel if o/p is limited to 12V. At 15 to 16V C modules can be used up to 12A/channel. Module derates linearly between 12 and 15V.
- D modules can be used in slots 1-5 up to 8A/channel.
- E modules can be used in slots 1-3 up to 8A/channel and in slots 4 and 5 up to 6A/channel.
- EB modules can be used in slots 1-5 up to 9A/channel
- EQ modules can be used in slots 1-3 up to 9A/channel and in slots 4 and 5 up to 6.75A/channel
- F modules can be used in slots 1-5 up to 33A channel.
- G modules can be used in slots 1-5 up to 20A/channel.
- H modules can be used in slots 1-3 up to 5A/channel and in slots 4 and 5 up to 4A/channel. For outputs voltages 30.01 to 32V maximum rated current is 1A.
- J modules can be used in slots 1-5 at 30-41V at 10A max, For output of 48V at 8A max. For voltages between 41 and 48V the current is linearly interpolated.
- K modules can be used in slots 1-5 up to 15A.
- M modules can be used in slots 1-5 up to 8A/channel.
- L modules can be used in slots 1-4 up to 25A/ channel and in slot 5 up to 20A per channel.
- N modules can be used in slots 1-5 up to 5A/channel for output voltages up to 29V, For output voltages 29.01V to 32V maximum rated current is 1A.
- P modules 18-29V outputs can be used in slots 1-3 up to 5A and in slots 4-5 at up to 4A. P & PL modules 5-16V outputs can be used in slots 1-3 up to 8A an in slots 3-4 at up to 6A.
- Q modules can be used in slots 1-5 up to 25A/channel.
- R modules can be used in slots 1-5 up to 60A/ channel.
- S modules can be used in slots 1/2 up to 75A, Slots 2/3 up to 71A, Slots 3/4 up to 69A & Slots 4/5 up to 66A.
- T modules can be used in slots 1-5 up to 60A
- U modules can be used in slots 1-3 up to 16A, slot 4 up to 15A and slot 5 up to 13A
- W modules can be used in slots 1-5 up to 15A/channel
- Z modules can be used in slots 1-4 up to 25A/channel and in slot 5 up to 20A per channel.

The following limitations also apply:

- For power supplies having one or more A, AA, R and/or T modules and mounted vertically with the airflow downwards, the output is limited to 350W.
- For power supplies having one or more F modules, the output is limited to 375W, only when operated in a vertical position with the fan on top of the power supply.
- For power supplies fitted with an LSF option fan, the output is limited to 300W and 60AT. Operation in a vertical orientation with the fan at the top is not permitted.
- For power supplies fitted with the fan reversed (RA option), the output is limited to 300W and 60AT. Operation in a vertical orientation is not permitted.
- For power supplies having input or output connector housings fitted the total output is limited as follows:

PSU Orientation	Total Power Output
Vertical with fan at top	$P = 14.7 + 3.67 * V_{in}$
All other orientations	$P = 80 + 3.2 * V_{in}$

subject to a maximum total power output of 400W and a minimum mains input voltage of 90Vac.  
Where P = maximum total output power and  $V_{in}$  = mains input voltage

An example of a product would be: CA400 @B @B @C @/@E @M where @ and @/@ would be written on the product label as numbers representing the voltage of the module e.g. 5B.