



SPECIFICATION FOR APPROVAL

Customer _____

Description DC FAN

Part No. _____ REV. _____

Delta Model No. AFB1224HHE-CR00 REV. 00

Sample Issue No. _____

Sample Issue Date AUG.24.2012

PLEASE SEND ONE COPY OF THIS SPECIFICATION BACK AFTER YOU SIGNED APPROVAL FOR PRODUCTION PRE-ARRANGMENT.

APPROVED BY: _____

DATE : _____

DELTA ELECTRONICS, INC.
TAOYUAN PLANT
252, SHANG YING ROAD, KUEI SAN INDUSTRIAL ZONE TAOYUAN
SHIEN, TAIWAN, R.O.C.
TEL:886-(0)3-3591968
FAX:886-(0)3-3591991

DELTA ELECTRONICS, INC.
 252, SHANG YING ROAD, KUEI SAN
 TAOYUAN HSIEN 333, TAIWAN, R. O. C.

TEL : 886-(0)3-3591968
 FAX : 886-(0)3-3591991

SPECIFICATION FOR APPROVAL

Customer:

| | |
|--------------------|-----------------|
| Description: | DC FAN |
| Customer P/N: | REV: |
| Delta Model NO.: | AFB1224HHE-CR00 |
| Sample Rev: | 00 |
| Sample Issue Date: | Issue NO: |
| | Quantity: |

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN

2. CHARACTERS:

| ITEM | DESCRIPTION |
|---|---|
| RATED VOLTAGE | 24 VDC |
| OPERATION VOLTAGE | 14.0 - 27.6 VDC |
| START VOLATGE (ENVIRONMENT TEMPERATURE AT 25°C) | ≤ 14.0 VDC. |
| INPUT CURRENT | 0.27 (MAX. 0.45) A |
| INPUT POWER | 6.48 (MAX 10.80) W |
| SPEED | 3500 ± 10% R.P.M. |
| MAX. AIR FLOW (AT ZERO STATIC PRESSURE) | 3.704 (MIN. 3.333) M ³ /MIN. 130.80 (MIN. 117.72) CFM |
| MAX. AIR PRESSURE (AT ZERO AIRFLOW) | 11.48 (MIN. 9.29) mmH ₂ O 0.452 (MIN. 0.366) inchH ₂ O |
| ACOUSTICAL NOISE (AVG.) | 47.0 (MAX. 51.0) dB-A |
| INSULATION TYPE | UL: CLASS A |

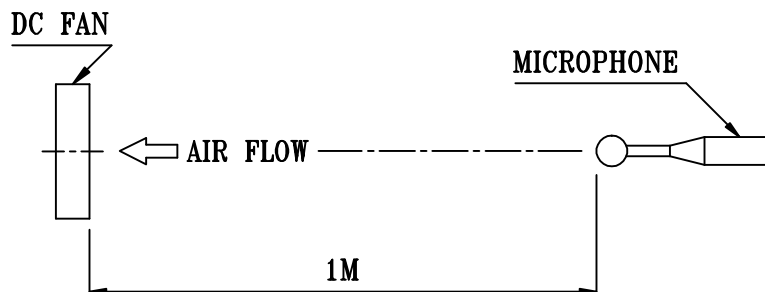
(continued)

PART NO:

DELTA MODEL: AFB1224HHE-CR00

| | |
|------------------------|--|
| INSULATION STRENGTH | 10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL) |
| DIELECTRIC STRENGTH | 5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL) |
| EXTERNAL COVER | OPEN TYPE |
| LIFE EXPECTANCE | 70,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH. |
| ROTATION | CLOCKWISE VIEW FROM NAME PLATE SIDE |
| OVER CURRENT SHUT DOWN | THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR. |
| LEAD WIRE | UL 1007 -F- AWG #24 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE LOCK SIGNAL(-R00) |

- NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. STANDARD AIR PROPERTY IS AIR AT (Td) 25°C TEMPERATURE, (RH) 65% RELATIVE HUMIDITY, AND (Pb) 760 mmHg BAROMETRIC PRESSURE.
3. THE VALUES WRITTEN IN PARENS , (), ARE LIMITED SPEC.
4. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN ANECHOIC CHAMBER WITH B & K SOUND LEVEL METER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

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3. MECHANICAL:

- 3-1. DIMENSIONS ----- SEE DIMENSIONS DRAWING
- 3-2. FRAME ----- PLASTIC UL: 94V-0
- 3-3. IMPELLER ----- PLASTIC UL: 94V-0
- 3-4. BEARING SYSTEM ----- TWO BALL BEARINGS
- 3-5. WEIGHT ----- 320 GRAMS

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE ----- -10 TO +70 DEGREE C
- 4-2. STORAGE TEMPERATURE ----- -40 TO +75 DEGREE C
- 4-3. OPERATING HUMIDITY ----- 5 TO 90 % RH
- 4-4. STORAGE HUMIDITY ----- 5 TO 95 % RH

5. PROTECTION:

5-1. LOCKED ROTOR PROTECTION

IMPEDANCE OF MOTOR WINDING PROTECTS MOTOR FROM FIRE IN 96 HOURS OF LOCKED ROTOR CONDITION AT THE RATED VOLTAGE.

5-2. POLARITY PROTECTION

BE CAPABLE OF WITHSTANDING IF REVERSE CONNECTION FOR POSITIVE AND NEGATIVE LEADS.

6. RE OZONE DEPLETING SUBSTANCES:

- 6-1. NO CONTAINING PBBs, PBBOs, CFCs, PBBEs, PBDPEs AND HCFCs.

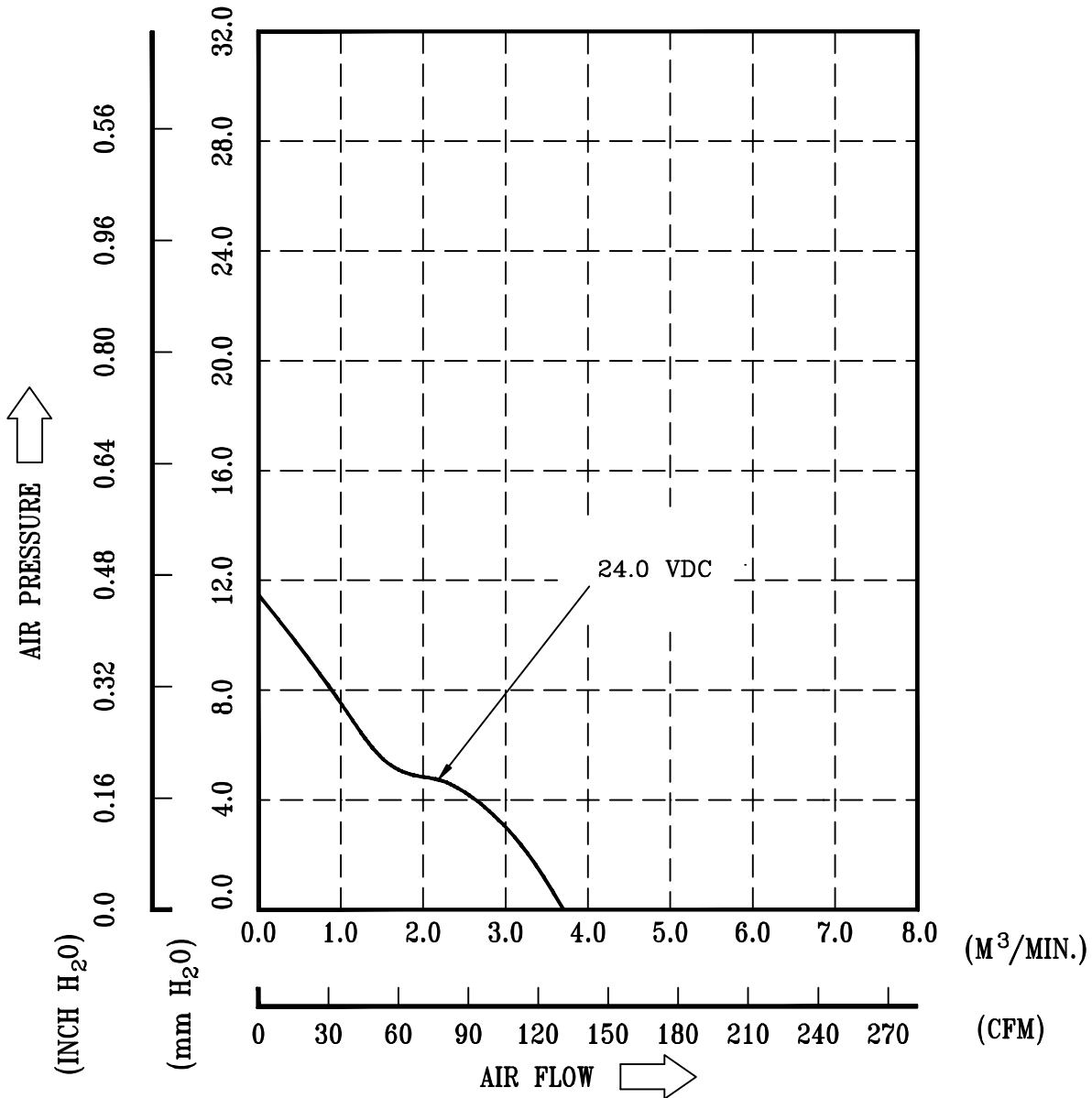
7. PRODUCTION LOCATION

- 7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR THAILAND.

PART NO:

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8. P & Q CURVE:



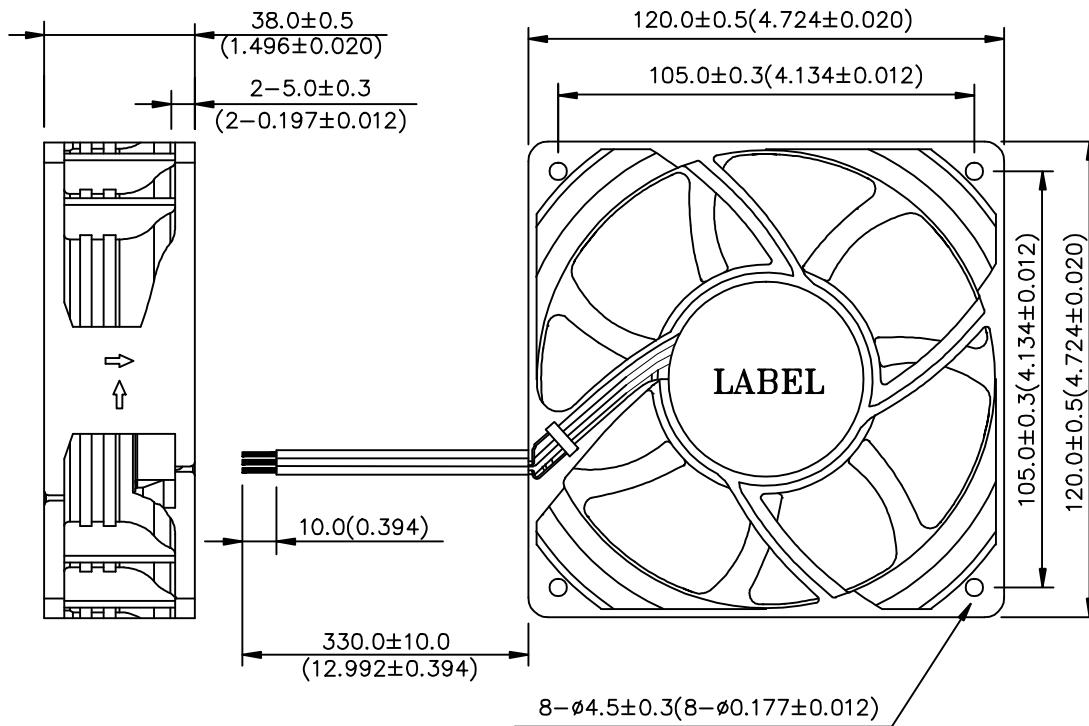
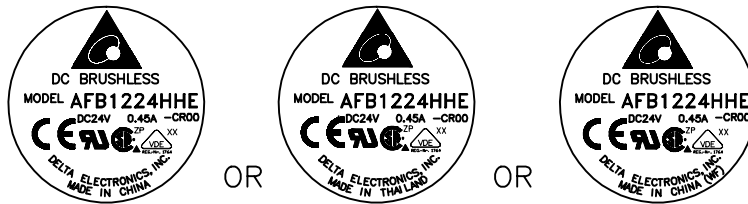
* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ----- ROOM TEMPERATURE
HUMIDITY ----- 65%RH

PART NO:

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9. DIMENSION DRAWING:

LABEL:



UNIT: mm(INCH)

1. THIS PRODUCT IS RoHS COMPLIANT
2. UL 1007 -F- AWG #24
BLACK WIRE NEGATIVE(-)
RED WIRE POSITIVE(+)
BLUE WIRE LOCK SIGNAL(-R00)

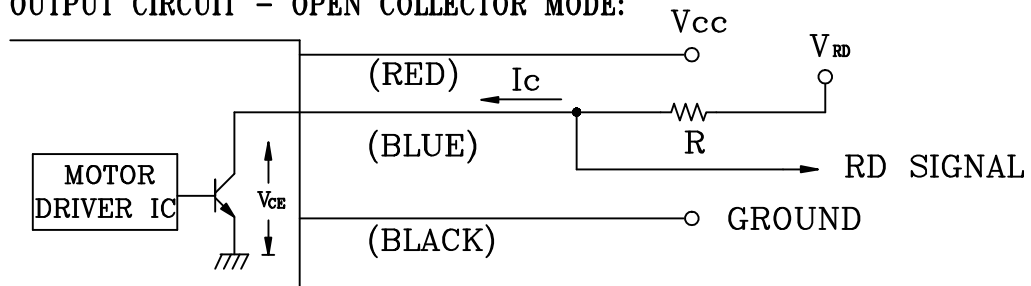
A00

PART NO:

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10. ROTATION DETECT (RD) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION: THE RD SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM
" + " LEAD WIRE & " - " LEAD WIRE.

2. SPECIFICATION:

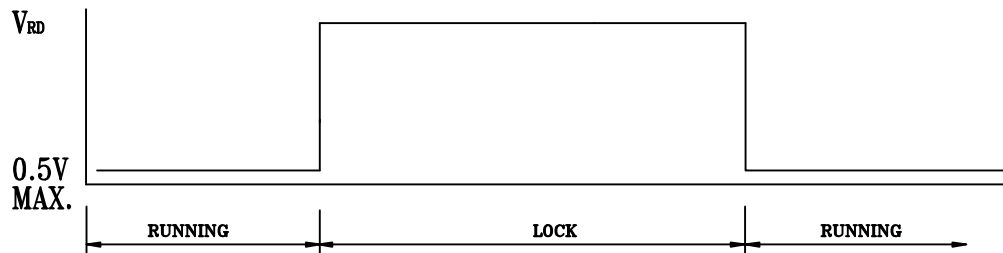
$$V_{CE(sat)} = 0.5V \text{ MAX}$$

$$V_{RD} = 27.6V \text{ MAX}$$

$$I_c = 5mA \text{ MAX.}$$

$$R \geq V_{RD} / I_c$$

3. ROTATION DETECT WAVEFORM:



Application Notice

- 1. Delta will not guarantee the performance of the products if the application condition falls outside the parameters set forth in the specification.**
- 2. A written request should be submitted to Delta prior to approval if deviation from this specification is required.**
- 3. Please exercise caution when handling fans. Damage may be caused when pressure is applied to the impeller, if the fans are handled by the lead wires, or if the fan was hard-dropped to the production floor.**
- 4. Except as pertains to some special designs, there is no guarantee that the products will be free from any such safety problems or failures as caused by the introduction of powder, droplets of water or encroachment of insect into the hub.**
- 5. The above-mentioned conditions are representative of some unique examples and viewed as the first point of reference prior to all other information.**
- 6. It is very important to establish the correct polarity before connecting the fan to the power source. Positive (+) and Negative (-). Damage may be caused to the fans if connection is with reverse polarity, if there is no foolproof method to protect against such error specifically mentioned in this spec.**
- 7. Delta fans without special protection are not suitable where any corrosive fluids are introduced to their environment.**
- 8. Please ensure all fans are stored according to the storage temperature limits specified. Do not store fans in a high humidity environment. We highly recommend performance testing is conducted before shipping, if the fans have been stored over 6 months.**
- 9. Not all fans are provided with the Lock Rotor Protection feature. If you impair the rotation of the impeller for the fans that do not have this function, the performance of those fans will lead to failure.**
- 10. Please be cautious when mounting the fan. Incorrect mounting of fans may cause excess resonance, vibration and subsequent noise.**
- 11. It is important to consider safety when testing the fans. A suitable fan guard should be fitted to the fan to guard against any potential for personal injury.**
- 12. Except where specifically stated, all tests are carried out at room (ambient) temperature and relative humidity conditions of 25°C, 65% RH. The test value is only for fan performance itself.**
- 13. Be certain to connect an “ 4.7 μ F or greater” capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.**



GPWV2.E132003 Fans, Electric - Component

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Fans, Electric - Component

[See General Information for Fans, Electric - Component](#)**DELTA ELECTRONICS INC**

E132003

252 SHANG YING RD
KUEI SHAN
TAOYUAN HSIEN, 333 TAIWAN

DC fans, Model AFB followed by 0405, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0505, followed by HB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0512, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0605, followed by H, L or M, followed by R00, R05, RR0 or RR05, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0805, followed by H, L or M, followed by (Y); Model AFB followed by 0612, 0624, followed by EH, SH, VH, followed by (Y); Model AFB followed by 0405, 0412, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0612, 0624, 0812, 0824, 0912 or 0924, followed by H, HB, HH, HHB, L, LB, LLB, M, MB, SHB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Models ASB0412MA, ASB0412LA, ASB0405MA followed by (Y); Model ASB followed by 0405, 0412, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0505, followed by HB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0512, 0524, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0812, 0824, followed by HB, HHB, LB, LLB, MB, SHB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0612 or 0624, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0812, followed by L or M, followed by (Y); Model ASB followed by 0912 or 0924, followed by H, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0505, 0512 or 0524, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0612, 0624, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0812 or 0824, followed by HB, HHB, LB, LLB, MB, SHB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0924, followed by L, M, H, HH or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model BFB followed by 1212, followed by H, HH, L, LL, M or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model BFB followed by 1224, followed by H, HH, L, LL, M or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model BFB followed by 1248, followed by H, HH, L, LL, M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model BFC followed by 1012, followed by A, B or C, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFB followed by 0405 or 0412, followed by H, L, LL, M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFB followed by 0612, 0812, 0824 or 0924 followed by H, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFB followed by 0612, 0812, 0824, 0912 or 0924, followed by HH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFB followed by 0424, followed by H, L, LL, M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFB followed by 0612, 0624, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFC followed by 0612, 0812 or 0912, followed by "A" or "B", followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model DFD followed by 0612 or 0624, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model SB followed by 0412, followed by H, L, LL or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model SB followed by 0612, 0624, followed by HH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model SB followed by 0612, 0624, 0812, 0824, followed by H, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model SB followed by 0612, 0624, followed by HD, LD or MD, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model SB followed by 0812, 0824, followed by HH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model SB followed by 0812, followed by MSA or MSG, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFC0612D(Y) where (Y) may be A through Z, 0 through 9, "-" or blank; Models AFB0612DH-8G33(Y), E47199(Y), E47159(Y), DTC-CDA(Y), DTC-CDC(Y), FFR1212DHE(Y), FFR0812DHE(Y), KFB0612HD-8K16(Y), BFB0712HB-8A97(Y), KUC1012D(Y) series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Models TFA1424AG(Y), TFA1448(X)G(Y), TFA1448AGL(Y) series, where (X) may be A, B or C, (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank

Model AFB followed by 02505, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 02512, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0305, followed by -HA, -LA, -LLA, MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0312, followed by -HA, LA, LLA, MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 03505, followed by HA, LA, MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0405, followed by HD, LD or MD, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 03512, followed by LA, MA or HA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0405, 0412 or 0424, followed by HD, HHD, LD, MD, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0412 or 0424, followed by HD, HHD, LD or MD, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0505, 0512, followed by HA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0524, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0605, followed by HB, HHB, LB, LLD, MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0605, followed by LLD, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0605, followed by HA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0612, followed by HA, HB, HHB, LA, MA or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0612 or 0624, followed by HD, HHD, LB, LD, LLD, MD, VHB or VHD, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0624, followed by HB, HHB, LB, MB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank

blank; Model AFB followed by 0648, followed by EH, H, HH, L, M, SH or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0705, followed by H, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0712 or 0724, followed by H, HA, HH, HHA, L, LA, M, MA, VH or VHA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0748, followed by H, HH, L or MM, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0812 or 0824, followed by LL, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0812 or 0824, followed by H, L, LL, M, SH or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0812 or 0824, followed by HB, HHB, LB, LLB, MB, SHB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0848, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0912 or 0924, followed by H, HH, L, M or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0948, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model WFB followed by 1212, followed by ME, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model WFB followed by 1212, followed by ME, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model WFB followed by 1212, 1224 or 1248, followed by VHE, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model WFB followed by 1248, followed by HHE, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Models AFC0812D followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFC0912D followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Models AFB0512(Z)B-A(Y), AFB04512(Z)B(Y) Series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank, (Z) may be H, M and L; Models AFB02512MA-A(Y), AFB02512HA-A(Y), AFB02512HHA-A(Y), AFB0312LA-A(Y), AFB0312MA-A(Y), AFB0312HA-A(Y), AFB03512LA-A(Y), AFB03512MA-A(Y), AFB03512HA-A(Y), GFB1412EHT(Y), GFC1412DT(Y), AFB0748SH-SP(Y), BFB1712EHT(Y) Series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Model EFB followed by 0912 or 0924, followed by H, HH, L, M, SH or VH.

Models WFB1212H(Y), WFB1212HE(Y), WFB1212M(Y), WFB1212ME(Y), WFB1212L(Y), WFB1212LE(Y), WFB1224H(Y), WFB1224HE(Y), WFB1224M(Y), WFB1224ME(Y), WFB1224L(Y), WFB1224LE(Y), WFB1212HH(Y), WFB1212HHE(Y), WFB1224HH(Y), WFB1224HHE(Y), WFB1248HE(Y), WFB1248ME(Y), WFB1248LE(Y), WFC1212B(Y), WFC1212BE(Y), WFC1212B(Y), WFC1212BE(Y), KFB2348HHV(Y), KFB2348HHU(Y), KFB2348HV(Y), KFB2348HU(Y), KHB2348HHV(Y), KHB2348HHU(Y), KFB2324HHV(Y), KFB2324HHU(Y), KFB2524HHU(Y) Series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Model BFB followed by 1212, 1224 followed by HE.

Model BFB followed by 0305, 03505, followed by HP, LP, MP.

Model AFB or ASB followed by 0505 or 0512, followed by HA, LA or MA.

Model BFB followed by 0712, 0724, followed by H, L, M, suffixed (Y); Model LFB0512HD(Y)Series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Model BFC followed by 1212, followed by A, B; Models BFC1212C, BFC1224C, BFC1248C.

Model EFB followed by 0512, followed by HHA, HA, LA or MA; Models EFB0505HA, EFB0505MA, EFB0505LA followed by FOO or STD; Model EFB followed by 0505, followed by HA, LA or MA, followed by FOO or STD.

Model AFC followed by 0512, 0612, 0712, 0812, 0824, 0912 or 0924, followed by "A", "AB", "AD", "B", "BB", "BD" or "C"; Model AFC followed by 0912, followed by "A" or "B", followed by -(H), -(HH), -(M); Model ASC followed by 0612, 0812, 0912, followed by "A" or "B"; Model AFC0712D(Y), where (Y) may be A through Z, 0 through 9, "-" or blank.

Model ASB followed by 0605, followed by H, L, M, suffixed (Y); Model ASB followed by 0612, followed by H-SB, L-SB or M-SB, suffixed (Y); Model ASB followed by 0812 or 0824, followed by H, HH, L, LL or M, suffixed (Y); Model ASB followed by 0912, 0924, followed by H, HH, L, L-V, M, suffixed (Y); Model ASB followed by 0924, followed by H, HH, L or M, suffixed (Y); Model ASB0812L-SB, H-SB or M-SB suffixed (Y); Model ASB0912L-SB, ASB0912H-SB or ASB0912M-SB suffixed (Y); Model DSB followed by 0612, 0812, followed by H, H-N, L, L-N, M, M-N, suffixed (Y); Models DSB0624H-(Y), DSB0624M-(Y), DSB0624L-(Y), DSB0512HBB(Y), DSB0512HB(Y), DSB0512MB(Y), DSB0512LB(Y), DSB0512MD(Y), DSB0512LD(Y), DSB0612(X)-A(Y), DSB0612(X)D(Y), DSB0612(A)B(Y) Series, where (A) may be HH, H, M or L, (X) may be H, M or L, (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Model AFB followed by 0612, followed by H, HH, L, M, followed by SB; Model AFB followed by 0812, followed by H, L or M, followed by SB; Model AFB followed by 0912, followed by H, L or M, followed by SB.

Model AFB followed by 1212, followed by HE, HHE, LE, ME, VHE; Model AFB followed by 1224, followed by HE, HHE, LE, ME, VHE; Model AFB followed by 1248, followed by HE(Y), HHE(Y), LE(Y), ME(Y), VHE(Y), L, M, H, HH, VH, SH; Model EFB followed by 1212, followed by HE(Y), HHE(Y), LE(Y), ME(Y), SHE(Y), VHE(Y); Model EFB followed by 1224, followed by HE(Y), HHE(Y), LE(Y), ME(Y), SHE(Y), VHE(Y); Model EFB followed by 1248, followed by HE(Y), HHE(Y), LE(Y), ME(Y), SHE(Y), VHE(Y); Models AFB1212SHE(Y), AFB1212EHE(Y), AFB1212GHE(Y), AFB1224SHE(Y), AFB1224EHE(Y), AFB1224GHE(Y), AFB1248SHE(Y), AFB1248EHE(Y), AFB1248GHE(Y); Model AFB1348 followed by SHE(Y), VHE(Y), HHE(Y), HE(Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB1348 followed by SHE(Y), VHE(Y), HHE(Y), HE(Y); Models AFB1312SHE(Y), AFB1312VHE(Y), AFB1312HHE(Y), AFB1312HE(Y), AFB1324SHE(Y), AFB1324VHE(Y), AFB1324HHE(Y), AFB1324HE(Y) Series; Models AFB1248MF(Y), AFB1248HF(Y), AFB1248HHF(Y), AFB1248VHF(Y), AFB1248SHF(Y), AFB1448HE(Y) series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Model BFB followed by 1012, followed by H(Y), HH(Y), VH(Y), SH(Y), EH(Y), L(Y), LL(Y) or M(Y); Model BFB1012M-5J60R; Model BFB followed by 1024, followed by H, HH, L, LL or M, suffixed (Y); Model BFB followed by 1212, followed by H, HH, L, LL, M or VH, suffixed (Y); Model BFB followed by 1224, followed by H, HH, L, LL or M, suffixed (Y); Model BFB followed by 1248, followed by H, HH, L, LL or M, suffixed (Y); Models BFC1012D-A(Y), BFB1012VH-3F16(Y), BFB12(X)(Z)-A(Y); Model SFB0412VH/HH/H/M(Y), BFB04512HA-SM(Y) Series; Model BFB04512(X)(Y) series, where (X) may be MD/HD/HHD/VHD, (Y) may be (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Models KFB2548HHU(Y), KFB2548HU(Y), BFB04512MD-S(Y) Series, where (X) may be 12, 24 or 48, (Z) may be GH, EH, SH or VH, (Y) may be (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Model BFB1224HHE-4J97(Y) Series; Model BFB followed by 1212, 1224, followed by HE, HHE, LE, ME or VH; Model BFB followed by 1248, followed by HE, LE or ME; Model BFB followed by 1612, followed by VH, H, L or M; Model BFB followed by 1624, followed by VH, H, L or M; Model BFB followed by 1648, followed by VH, H, L or M.

Models BFB0405HE, -LE, -ME, BFB0412HE, -HHE, -LE, -ME; Models BFB0412HN(Y), BSB0412HN(Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.



Certification Record

| CUSTOMER | CLASS | FILE |
|---|--|--------------|
| Delta Electronics Inc. 252 Shang Ying Rd, Kuei San Taoyuan Hsien 333 Taiwan | 3812-30 FANS AND BLOWERS- Component Fans | 091949_0_000 |
| Refer to Class Description for program details | | |

PLEASE UPDATE THE MODELS IN ALPHABETICAL ORDER

- Component fans, D.C. (Brushless), impedance protected, models and electrical ratings are as follows:

| Model | Volts (dc) | Amperes (mA) | Optional Suffixes |
|-------------------|------------|--------------|------------------------------|
| AFB SERIES | | | |
| AFB0405LB | 5 | 200 | 0 to 9, A to Z, blank or "-" |
| AFB0405MB | 5 | 250 | 0 to 9, A to Z, blank or "-" |
| AFB0405HB | 5 | 380 | 0 to 9, A to Z, blank or "-" |
| AFB0405HHB | 5 | 450 | 0 to 9, A to Z, blank or "-" |
| AFB0412LB | 12 | 90 | 0 to 9, A to Z, blank or "-" |
| AFB0412MB | 12 | 130 | 0 to 9, A to Z, blank or "-" |
| AFB0412HB | 12 | 160 | 0 to 9, A to Z, blank or "-" |
| AFB0412HHB | 12 | 200 | 0 to 9, A to Z, blank or "-" |
| AFB0412VHB | 12 | 240 | 0 to 9, A to Z, blank or "-" |
| AFB0412SHB | 12 | 350 | 0 to 9, A to Z, blank or "-" |
| AFB0424LB | 24 | 80 | 0 to 9, A to Z, blank or "-" |
| AFB0424MB | 24 | 90 | 0 to 9, A to Z, blank or "-" |
| AFB0424HB | 24 | 120 | 0 to 9, A to Z, blank or "-" |

| | | | |
|-----------------|----|------|----------------------------------|
| | | | " |
| AFB1212EHE | 12 | 2200 | 0 to 9, A to Z, blank or "- " |
| AFB1212GHE | 12 | 3240 | 0 to 9, A to Z, blank or "- " |
| AFB1212HE | 12 | 480 | 0 to 9, A to Z, blank or "- " |
| AFB1212HHE | 12 | 70 | 0 to 9, A to Z, blank or "- " |
| AFB1212HHE-8C2A | 12 | 750 | 0 to 9, A to Z, blank or "- " |
| AFB1212LE | 12 | 300 | 0 to 9, A to Z, blank or "- " |
| AFB1212ME | 12 | 400 | 0 to 9, A to Z, blank or "- " |
| AFB1212SHE | 12 | 1600 | A to Z, 0 to 9, blank or "- " |
| AFB1212VHE | 12 | 900 | 0 to 9, A to Z, blank or "- " |
| AFB1224EHE | 24 | 1050 | 0 to 9, A to Z, blank or "- " |
| AFB1224GHE | 24 | 1600 | 0 to 9, A to Z, blank or "- " |
| AFB1224HE | 24 | 360 | 0 to 9, A to Z, blank or "- " |
| AFB1224HHE | 24 | 450 | 0 to 9, A to Z, blank or "- " |
| AFB1224LE | 24 | 230 | 0 to 9, A to Z, blank or "- " |
| AFB1224ME | 24 | 300 | 0 to 9, A to Z, blank or "- " |
| AFB1224SHE | 24 | 750 | A to Z, 0 to 9, blank or "- " |
| AFB1224VHE | 24 | 570 | 0 to 9, A to Z, blank or "- " |
| AFB1248EHE | 48 | 600 | 0 to 9, A to Z, blank or "- " |
| AFB1248GHE | 48 | 900 | 0 to 9, A to Z, blank or "- " |
| AFB1248HE | 48 | 180 | 0 to 9, A to Z, blank or "- " |
| AFB1248HHE | 48 | 230 | 0 to 9, A to Z, blank or "- " |
| AFB1248LE | 48 | 90 | 0 to 9, A to Z, blank or "- " |

GUTACHTEN MIT FERTIGUNGSÜBERWACHUNG CERTIFICATE OF CONFORMITY WITH FACTORY SURVEILLANCE

Delta Electronics Inc.
6F, No. 186, Ruey Kuang Road
11491 NEIHU, TAIPEI
TAIWAN

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Einbauventilator für IT-Geräte
Fan for building-in, IT-equipment

die hier abgebildeten markenrechtlich geschützten Zeichen
für die ab Blatt 2 aufgeführten Typen zu benutzen /
the legally protected Marks as shown below for the types referred to on page 2 ff.



REG.-Nr. 1764 oder/or



oder/or VDE-REG.-Nr. 1764

REG.-Nr. 1764

Geprüft und zertifiziert nach /
Tested and certified according to

DIN EN 60950-1 (VDE 0805 Teil 1):2011-01; EN 60950-1:2006 + A11:2009 + A1:2010
DIN EN 60950-1/A12 (VDE 0805-1/A12):2011-08; EN 60950-1/A12:2011-02
IEC 60950-1(ed.2);am1

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Zertifizierungsstelle / Certification

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VDE certificates are valid only when published on:

Aktenzeichen: 1164100-2611-0011 / 165883

File ref.:

Ausweis-Nr. 40016423

Blatt 1

Certificate No.

Page

Weitere Bedingungen siehe Rückseite und Folgeblätter /
further conditions see overleaf and following pages

Offenbach, 2006-01-09

(letzte Änderung/updated 2012-04-10)

<http://www.vde.com/zertifikat>

<http://www.vde.com/certificate>

Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Certificate holder*
Delta Electronics Inc., 6F, No. 186, Ruey Kuang Road, 11491 NEIHU, TAIPEI, TAIWAN

Aktenzeichen / *File ref.*
1164100-2611-0011 / 165883 / FG13 / DO

letzte Änderung / *updated* Datum / *Date*
2012-04-10 2006-01-09

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| | |
|---------------------------------------|----------------------------|
| AFB1224LE/ME/HE/HHE/VHE [new version] | DC 24V (Appendix No.65) |
| AFB1212SHE [new version] | DC 12V (Appendix No.66) |
| AFB1212EHE/GHE | DC 12V (Appendix No.66) |
| AFB1224SHE [new version] | DC 24V (Appendix No.66) |
| AFB1224EHE/GHE | DC 24V (Appendix No.66) |
| AFB1248SHE | DC 48V (Appendix No.66) |
| AFB1248EHE/GHE | DC 48V (Appendix No.66) |
| AUB0812LD/MD/HD/HHD [new version] | DC 12V (Appendix No.67) |
| AUB0812VHD [new version] | DC 12V (Appendix No.67) |
| BFB0512LA-A/MA-A/HA-A/HHA-A | DC 12V (Appendix No.68) |
| DSB0412LA/MA/HA/HHA | DC 12V (Appendix No.69) |
| DSB0824HH/VH | DC 24V (Appendix No.70) |
| DSB0924L/M/H | DC 24V (Appendix No.70) |
| DSB0924HH | DC 24V (Appendix No.70a) |
| AFB02505LB-A/MB-A/HB-A/HHB-A | DC 5V (Appendix No.71) |
| NFB0612LB/MB/HB | DC 12V (Appendix No.72) |
| NUB0612LB/MB/HB | DC 12V (Appendix No.72) |
| AUB0712HH-T6L1 | DC 12V (Appendix No.73) |
| DSB0612LA/MA | DC 12V (Appendix No.74) |
| AFB02505LA/MA/HA/HHA | DC 5V (Appendix No.75) |
| AFB0305LA/MA/HA | DC 5V (Appendix No.75) |
| AFB03505LA/MA/HA | DC 5V (Appendix No.75) |
| BFB0712HD-A | DC 12V (Appendix No.76) |
| AUB0812HE/HHE/VHE | DC 12V (Appendix No.77) |
| AUB0824HE/HHE/VHE | DC 24V (Appendix No.77) |
| AUC0812DE | DC 12V (Appendix No.77) |
| FFB03612EHN | DC 12V (Appendix No.78) |
| BSB04505HA | DC 5 V (Appendix No. 79) |
| BFB0605LB-SX | DC 5 V (Appendix No. 80) |
| QFR0812DE | DC 12V (Appendix No. 82) |

Zusatz zur Typenbezeichnung Optional - Anhang 0 bis 9 oder A bis Z
kann hinzugefügt sein für optionale Signal-Ausgänge
Addition for type designation Optional - Suffix 0 to 9 or A to Z
may be added denoting optional signal leads

Nennspannung min. DC 5V -
Rated voltage max. DC 48V (SELV)

Fortsetzung siehe Blatt 5 /
continued on page 5

Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Certificate holder*
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Aktenzeichen / *File ref.*
1164100-2611-0011 / 165883 / FG13 / DO

letzte Änderung / *updated* Datum / *Date*
2012-04-10 2006-01-09

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Nennstrom
Rated current siehe Anlagen Nr. 1 - 82 / see Appendices No. 1 - 82

Umgebungstemperatur
Ambient temperature siehe Anlagen / see Appendices

Schutzklasse
Class III

Schutzart
Degree of protection Einbaulüfter (für IT-Geräte)
Fan for building-in (for IT equipment)

Einbaubedingungen
Built-in requirements Beim Einbau des genehmigten Erzeugnisses, der entsprechend der zugehörigen Installationsanleitung zu erfolgen hat, ist darauf zu achten, dass alle Anforderungen gemäss der oben genannten Bestimmung(en) eingehalten sind.
For the installation of the certified equipment, which has to be carried out according to the respective installation manual, all requirements of the standard(s) mentioned above have to be fulfilled.

Die Ventilatoren entsprechen dem Abschnitt 4.4.5.1c. Im End-system sollten entsprechende Schutzmaßnahmen getroffen werden, die das Berühren der beweglichen Teile des Ventilators durch den Benutzer verhindern. Ein Warnsymbol oder ein Text in Übereinstimmung mit Abschnitt 4.4.5.2 sollen im Endgerät angebracht werden.

The fans are classified in accordance with clause 4.4.5.1c. Proper protection shall be provided in the end-system so that the possibility of contact by user with the moving parts of the fan is unlikely. A warning symbol or a warning statement in accordance with clause 4.4.5.2 shall be provided in the end-system.

Weitere Angaben
Further information siehe Anlagen Nr. 1 - 82 / see Appendices No. 1 - 82

Fortsetzung siehe Blatt 6 /
continued on page 6

Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Certificate holder*
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2012-04-10 2006-01-09

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Dieser Zeichengenehmigungs-Ausweis bildet eine Grundlage für die EG-Konformitätserklärung und CE-Kennzeichnung durch den Hersteller oder dessen Bevollmächtigten und bescheinigt die Konformität mit den grundlegenden Schutzanforderungen der **EG-Niederspannungsrichtlinie 2006/95/EG** mit ihren Änderungen.

*This Marks Approval is a basis for the EC Declaration of Conformity and the CE Marking by the manufacturer or his agent and proves the conformity with the essential safety requirements of the **EC Low-Voltage Directive 2006/95/EC** including amendments.*

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Fachgebiet FG13
Section FG13

VDE Prüf- und Zertifizierungsinstitut Gutachten mit Fertigungsüberwachung

Ausweis-Nr. / Beiblatt /
Certificate No. Supplement
40016423

Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Certificate holder*
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Aktenzeichen / *File ref.* 1164100-2611-0011 / 165883 / FG13 / DO
letzte Änderung / *updated* Datum / *Date*
2012-04-10 2006-01-09

Dieses Beiblatt ist Bestandteil des Gutachtens mit Fertigungsüberwachung Nr. 40016423.
This supplement is part of the Certificate of Conformity with factory surveillance No. 40016423.

Einbauventilator für IT-Geräte *Fan for building-in, IT-equipment*

Fertigungsstätte(n) *Place(s) of manufacture*

Referenz/*Reference*
30009495 Delta Electronics
(Dongguan) Co., Ltd.
Hetianxia village
523300 SHIJIE TOWN, DONGGUAN CITY
Guangdong
CHINA

Referenz/*Reference*
30011790 Delta Electronics
(Jiang Su) Ltd.
No. 1688 Jiangxing East Road
Wujiang Economy Developm. Zone
215200 WUJIANG CITY, SUZHOU CITY
Jiangsu
CHINA

Referenz/*Reference*
30013236 Delta Electronics (Thailand)
Public Co., Ltd.
111 Moo 9 Wellgrow Industrial Est. Bangna-Trad Rd.
Tambon Bangwa, Bangpakong
TH-24180 CHACHOENGSAO

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Fachgebiet FG13
Section FG13

VDE Prüf- und Zertifizierungsinstitut Gutachten mit Fertigungsüberwachung

Ausweis-Nr. / Infoblatt /
Certificate No. Info sheet
40016423

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Aktenzeichen / *File ref.* 1164100-2611-0011 / 165883 / FG13 / DO
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2012-04-10 2006-01-09

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Produkte, die das Biozid Dimethylfumarat (DMF) enthalten, dürfen gemäß der Kommissionsentscheidung 2009/251/EG nicht mehr in den Verkehr gebracht oder auf dem Markt bereitgestellt werden.

Der VDE-Zeichengenehmigungsausweis wird ausschließlich auf der ersten Seite unterzeichnet.

Approval to use the legally protected Mark of the VDE as shown on the first page:

Basis for the use are the general terms and conditions of the VDE Testing and Certification Institute (www.vde.com\terms-institute). The right to use the mark is granted only to the mentioned company with the named places of manufacture and the listed products with the related type references. The place of manufacture shall be equipped in a way that a constant manufacturing of the certified construction is assured.

The approval is valid as long as the VDE specifications are in force, on which the certification is based on, unless it is withdrawn according to the VDE Testing and Certification Procedure (PM102E).

The validity period of a VDE-GS-Mark Approval may be prolonged on request. In case of changes in legal and / or normative requirements, the validity period of a VDE-GS-Mark Approval may be shortened.

Products containing the biocide dimethylfumarate (DMF) may not be marketed or made available on the EC market according to the Commission Decision 2009/251/EC.

The approval is solely signed on the first page.