

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

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SPECIFICATION FOR APPROVAL

Customer: _____
 Description: DC FAN _____
 Customer P/N: _____ REV: _____
 Delta Model NO.: AFB0612H-AR00 _____
 Sample Rev: 02 _____ Issue NO: _____
 Sample Issue Date: APR.26.2005. _____ Quantity: _____

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN. THE FAN MOTOR IS WITH TWO PHASES AND FOUR POLES.

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	4.0 - 13.8 VDC
START VOLTAGE (ENVIRONMENT TEMPERATURE AT 25°C)	≤ 4.0 VDC.
INPUT CURRENT	0.14 (MAX. 0.17) A
INPUT POWER	1.68 (MAX. 2.04) W
SPEED	4250 R.P.M. (REF.)
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.662 (MIN. 0.596) M ³ /MIN. 23.38 (MIN. 21.05) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	5.35 (MIN. 4.33) mmH ₂ O 0.211 (MIN. 0.170) inchH ₂ O
ACOUSTICAL NOISE (AVG.)	34.0 (MAX. 38.0) dB-A
INSULATION TYPE	UL: CLASS A

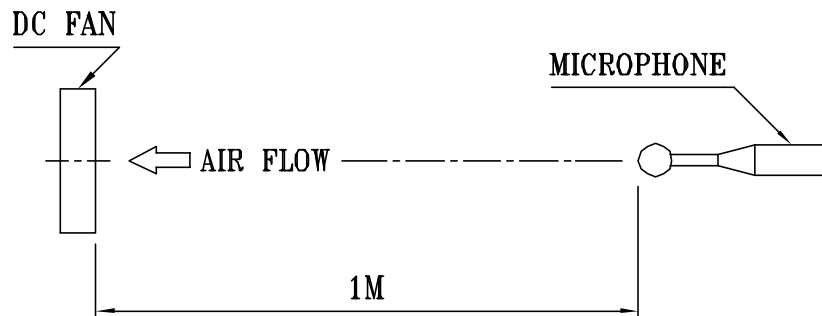
(continued)

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INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 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. THE VALUES WRITTEN IN PARENS , (), ARE LIMITED SPEC.
3. 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 ----- 80 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 OR TAIWAN.

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8. BASIC RELIABILITY REQUIREMENT :

8-1. THERMAL LOW TEMPERATURE: -40°C
CYCLING HIGH TEMPERATURE: +80°C
 SOAK TIME: 30 MINUTES
 TRANSITION TIME < 5 MINUTES
 DUTY CYCLES: 5

8-2. HUMIDITY TEMPERATURE: +25°C ~ +65°C
EXPOSURE HUMIDITY: 90-98% RH @ +65°C
 FOR 4 HOURS/CYCLE
 POWER: NON-OPERATING
 TEST TIME: 168 HOURS

8-3. VIBRATION TEMPERATURE: +25°C
 ORIENTATION: X, Y, Z
 POWER: NON-OPERATING
 VIBRATION LEVEL: OVERALL gRMS=3.2

FREQUENCY(Hz)	PSD(G ² /Hz)
10	0.040
20	0.100
40	0.100
800	0.002
1000	0.002

TEST TIME: 2 HOURS ON EACH ORIENTATION

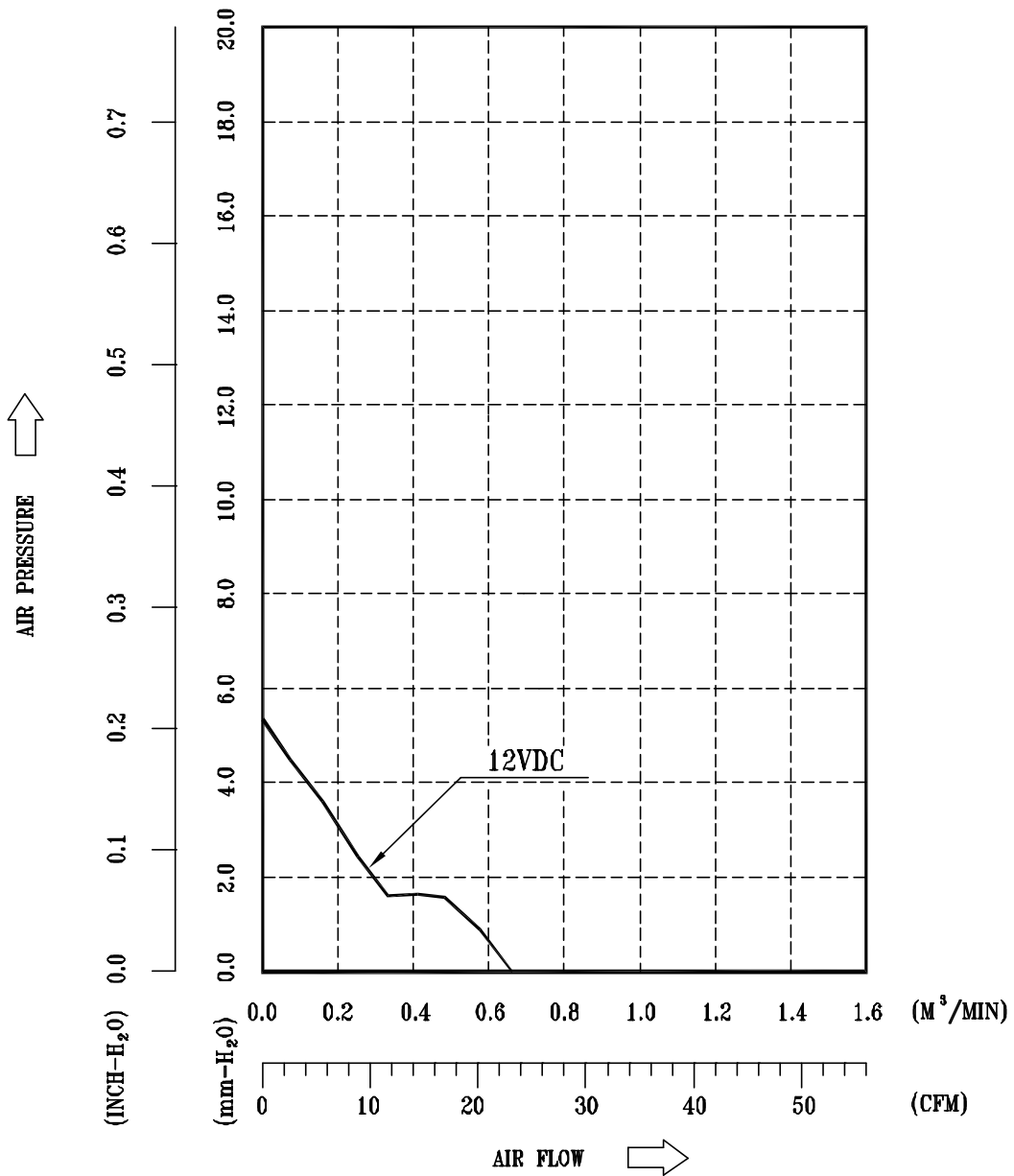
8-4. MECHANICAL TEMPERATURE: +20°C
SHOCK ORIENTATION: X, Y, Z
 POWER: NON-OPERATING
 ACCELERATION: 20 G MIN.
 PULSE: 11 ms HALF-SINE WAVE
 NUMBER OF SHOCKS: 5 SHOCKS
 FOR EACH DIRECTION

8-5. LIFE TEMPERATURE: MAX , OPERATING TEMPERATURE
 POWER: OPERATING
 DURATION: 1000 HOURS MIN.

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8. P & Q CURVE:



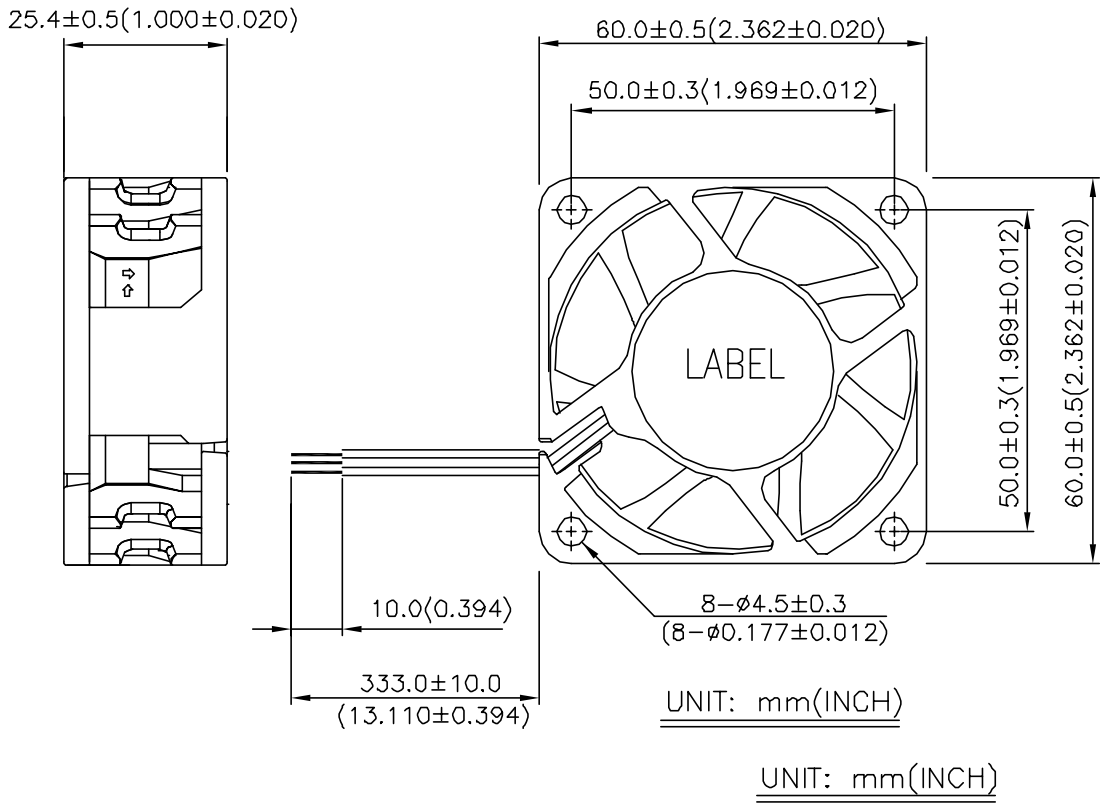
* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ----- ROOM TEMPERATURE
HUMIDITY ----- 65%RH

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9. DIMENSION DRAWING:

LABEL:

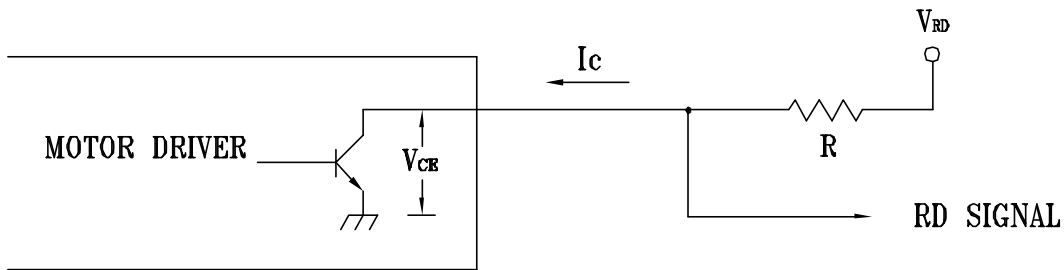


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10. ROTATION DETECT (RD) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION:

THE LEAD WIRE OF RD SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

2. SPECIFICATION:

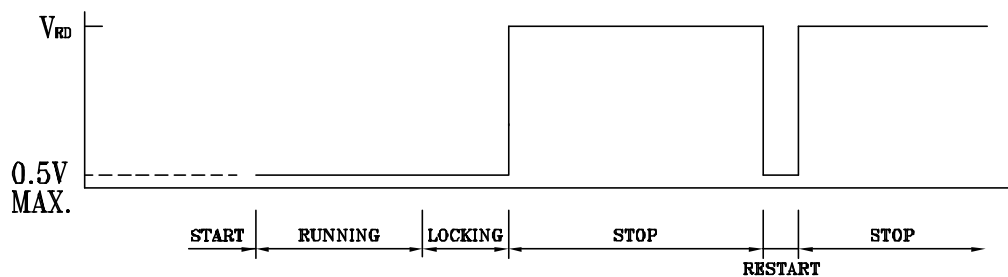
$V_{ce(sat)} = 0.5V \text{ MAX}$

$V_{rd} = 13.8V \text{ MAX}$

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

$R \geq V_{rd} / I_c$

3. ROTATION DETECT WAVEFORM:





Descriptions:

- 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 fans are 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, as there is no foolproof method to protect against such error.**
- 7. Delta fans 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 relative (ambient) temperature and humidity conditions of 25°C, 65%. The test value is only for fan performance itself.**
- 13. Be certain to connect an “over 4.7μF” capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.**



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Fans, Electric - Component

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DELTA ELECTRONICS INC

E132003

14TH FL

266 2ND WEN-HWA RD, SEC 1

LINKOU

TAIPEI HSIEN 244, TAIWAN

Model AFB followed by 0405, 0412, followed by HA, HHA, LA or MA; Model AFB followed by 0505, followed by HB, LB or MB; Model AFB followed by 0512, followed by HB, HHB, LB or MB; Model AFB followed by 0605, followed by H, L or M, followed by R00, R05, RR0 or RR05; Model AFB followed by 0605 or 0805, followed by H, L or M; Model AFB followed by 0612, 0624, followed by EH, SH VH; Model AFB0612LB; Model AFB followed by 0612, 0624, 0812, 0824, 0912 or 0924, followed by H, HB, HH, HHB, LB, LLB, MB, SHB or VHB; Models ASB0412MA, ASB0412LA, ASB0405MA; Model ASB followed by 0405, 0412, followed by HA, HHA, LA or MA; Model ASB followed by 0505, followed by HB, LB or MB; Model ASB followed by 0512, 0524, followed by HB, HHB, LB or MB; Model ASB followed by 0812, 0824, followed by HB, HHB, LB, LLB, MB, SHB or VHB; Model ASB followed by 0612 or 0624, followed by H, HH, L or M; Model ASB followed by 0812, followed by L or M; Model ASB followed by 0912 or 0924, followed by H, L or M; Model AUB followed by 0505, 0512 or 0524, followed by HB, HHB, LB or MB; Model AUB followed by 0612, 0624, followed by H, HH, L or M; Model AUB followed by 0912, 0924, followed by H, HH, L, M or VH; Model AUB followed by 0612 or 0624, followed by L, M, H or HH; Model AUB followed by 0812 or 0824, followed by HB, HHB, LB, LLB, MB, SHB or VHB; Model AUB followed by 0924, followed by L, M, H, HH or VH; Model BFB followed by 1212, followed by H, HH, L, LL, M or VH; Model BFB followed by 1224, followed by H, HH, L, LL, M or VH; Model BFB followed by 1248, followed by H, HH, L, LL, M; Model BFC followed by 1012, followed by A, B or C; Model DFB followed by 0405 or 0412, followed by H, L, LL, M; Model DFB followed by 0612, 0812, 0912, 0824 or 0924 followed by H, L or M; Model DFB followed by 0612, 0812, 0824, 0912 or 0924, followed by HH; Model DFB followed by 0424,



AFB0605L	5	230	STD F00 R00 R05 RR0 RR05
AFB0605LA	5	250	-
*AFB0605LB	5	200	STD F00
AFB0605LD	5	210	-
AFB0605LLD	5	170	-
AFB0605M	5	330	STD F00 R00 R05 RR0 RR05
AFB0605MA	5	350	-
*AFB0605MB	5	300	STD F00
AFB0605MD	5	290	-
AFB0612EH	12	480	STD R00 F00
AFB0612H	12	150	STD R00 RR0 F00
AFB0612H-SB	12	150	STD
AFB0612HA	12	220	-
*AFB0612HB	12	150	STD R00 F00 R05 F05
AFB0612HH	12	400 or 250	STD R00 RR0 F00
AFB0612HH-SB	12	250	STD
*AFB0612HHB	12	180	STD R00 F00 R05 F05
AFB0612HD	12	170	-
AFB0612HHD	12	230	-
AFB0612L	12	90	STD R00 RR0 F00
AFB0612L-SB	12	90	STD
AFB0612LA	12	120	-
*AFB0612LB	12	100	STD R00 F00 R05 F05
AFB0612LD	12	110	-
AFB0612LLD	12	90	-
AFB0612M	12	120	STD R00 RR0 F00
AFB0612M-SB	12	120	STD
AFB0612MA	12	150	-

VDE Prüf- und Zertifizierungsinstitut

Gutachten mit Fertigungsüberwachung

Ausweis-Nr. /
Licence No. 001764 ÜG

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Name und Sitz des Genehmigungs-Inhabers / Name and registered seat of the Licence holder

Delta Electronics Inc.
186 Ruey Kuang Road
NEIHU TAIPEI (114), Taiwan

Aktenzeichen / File ref.

11641-2611-0001 / 32Y3F F13 / SFK

letzte Änderung / updated

2001-06-05

Datum / Date

1994-06-08

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Gutachtens mit Fertigungsüberwachung Nr. 001764 ÜG.
This supplement is only valid in conjunction with page 1 of the Licence No. 001764 ÜG.

Jahresgebühren-Einheiten /
Annual fee units

WFB1212HE	DC 12 V	1,00
WFB1212LE	DC 12 V	1,00
WFB1212ME	DC 12 V	1,00
WFB1224H	DC 24 V	2,00
WFB1224L	DC 24 V	1,00
WFB1224M	DC 24 V	1,00
WFB1224HE	DC 24 V	1,00
WFB1224LE	DC 24 V	1,00
WFB1224ME	DC 24 V	1,00
SB0XY/ZZ	DC 12 V oder/or DC 24 V	40,00
DFB0412MA/LA	DC 12 V	2,00
DFB0424H/M/L/LL	DC 24 V	4,00
DFD0612HH	DC 12 V	2,00
DFD0624HH	DC 24 V	2,00
DFB0612HH	DC 12 V	2,00
DFB0624HH	DC 24 V	2,00
DFB0812HH	DC 12 V	2,00
DFB0824HH	DC 24 V	2,00
DFB0912HH	DC 12 V	2,00
DFB0924HH	DC 24 V	2,00
SB0612HH	DC 12 V	2,00
SB0624HH	DC 24 V	2,00
SB0812HH	DC 12 V	2,00
SB0824HH	DC 24 V	2,00
WFB1212HE	DC 12 V	2,00
WFB1224HE	DC 24 V	2,00
WFB1248HE/ME/LE	DC 48 V	4,00
WFC1212BE	DC 12 V	2,00
WFC1212BE-R00	DC 12 V	1,00
WFC1212BE-F00	DC 12 V	1,00
DFC0612B(-X00)	DC 12 V	3,00
DFC0812B(-X00)	DC 12 V	3,00
DFC0912B(-X00)	DC 12 V	3,00
AFB0612H/M/L/HH	DC 12 V	4,00
AFB0624H/M/L/HH	DC 24 V	4,00
AFB0812H/M/L/HH	DC 12 V	4,00
AFB0824H/M/L/HH	DC 24 V	4,00
ASB0612H/M/L/HH	DC 12 V	4,00
ASB0624H/M/L/HH	DC 24 V	4,00
AFB0412MA	DC 12 V	2,00

Fortsetzung siehe Blatt 4 /