

CUSTOMER Cooler Master

PARTS NAME DC FAN MOTOR

CUSTOMER P/N 200000830-GP

MODEL 1604KL-04W-B49-M51

PROPOSED DRAWING FOR APPROVAL

REF NO. 05-1160

DATE 2005/9/27

TOTAL 5 Pages

SIGNATURE



代 曾煥凱

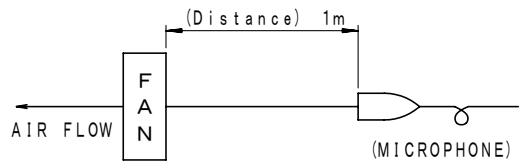
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Minebea-Matsushita Motor Corporation

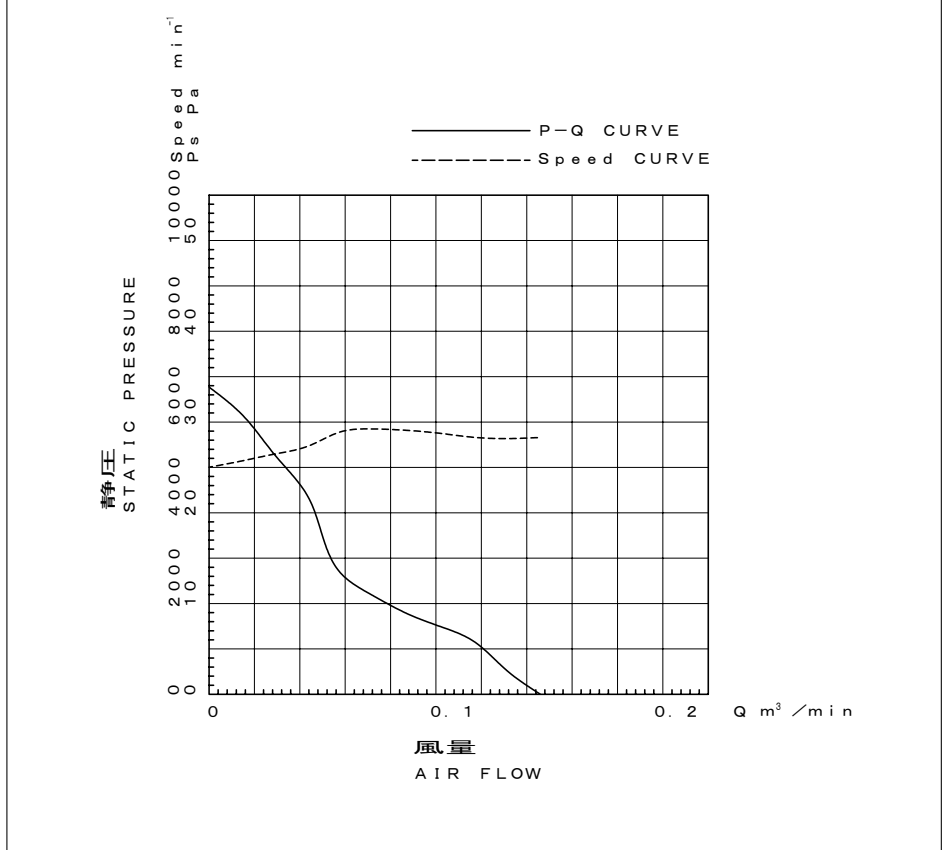
APD. BY	CHK. BY	DET. BY

項目 (Items)	諸元 (Description)	
モーターの種類 (Motor Type)	DC ブラシレスモーター (DC Brushless Motor)	
定格 (Rating)		
定格時間 (Duty)	連続 (Continuous)	
定格電圧 (Rating Voltage) [V]	12	
使用電圧範囲 (Operating Voltage) [V]	10.2 ~ 13.8	
起動電圧 (Starting Voltage) [V]	10.2	
定格回転速度 ☆3 ☆4 (Speed) [min ⁻¹]	標準値 (Average)	5500
	最小値 (Minimum)	5000
最大風量 ☆1 ☆4 (Max Air Flow) [m ³ /min]	標準値 (Average)	0.15
	最小値 (Minimum)	0.13
最大静圧 ☆2 ☆4 (Max Static Pressure) [Pa]	標準値 (Average)	34
	最小値 (Minimum)	27
定格電流 ☆3 ☆4 (Current) [A]	標準値 (Average)	0.073
	最大値 (Maximum)	0.10
定格入力 ☆3 ☆4 (Input Power) [W]	標準値 (Average)	0.876
	最大値 (Maximum)	1.20
騒音 (Acoustical Noise) [dB] ☆3 ☆4	25.0	

- * 測定条件 (Measuring Conditions)
- 無響音室内で、かつ障害物のない大気中において測定する。
Measurement with in anechoic test chamber under free air condition.
 - 測定機は、モーターの吸込側より 1m の距離に位置する。
Microphone is placed at a distance of 1m on the axis of air intake side.
 - 暗騒音は 16 dB 以下のこと。
Chamber back ground noise max 16dB
 - 使用測定機 : B&K sound level meter type 2234
Using Microphone: B&K sound level meter type 2234
 - 騒音は標準回転速度時。
Acoustical Noise at Average speed



特性曲線 (Performance Curves)



- * NOTE
- ☆1 静圧 "0" の時 (At 0 Static Pressure)
 - ☆2 風量 "0" の時 (At 0 Air Flow)
 - ☆3 フリーエア時 (At Free Air)
 - ☆4 室温 25°C において定格電圧印加時 (At Rating Voltage, At 25°C)



						NMB-MAT Minebea-Matsushita Motor Corporation ミネベア・松下モーター株式会社		単位 UNIT: mm 尺度 SCALE:		材質 MATERIAL: 表面粗さ SURF. ROUGH. 熱処理 HEAT TREAT:		作成日 DATE: Apr / 29 / 2003 品名 DESCRIPTION: AUTO RESTART TYPE DC BRUSHLESS FAN	
						APPROVED: NKZW CHECKED: MTNG DRAWN: MSO		一般公差 TOL:		表面処理 FINISH:		品番 PART NO. (MODEL NO.): 1604KL-04W-B49-M51 葉番 SHEET: 1/4 図番 DRAWING NO.: 1604KL-04W-B49-M51 改訂 REV.:	
符号 MARK	日付 DATE	変更事由 REASON	ECN NO.	担当 ENGINEER	承認 APPROVED								

項目 (Items)	諸元 (Description)
規格 (Standard)	
絶縁抵抗 (Insulation Resistance)	DC 500V メガーにて 10MΩ 以上 (Minimum 10MΩ by DC 500V Megger) フレームとリード線間 (Between Frame and (+) Terminal)
絶縁耐圧 (Dielectric Withstand Voltage)	AC 700V 1s ☆5 フレームとリード線間 (Between Frame and (+) Terminal)
期待できる寿命 (故障率10%) (Life Expectation (L10 Life))	25℃にて 50,000時間 (50,000h at 25℃) 寿命とは、定格電圧印加時の電流値及び回転速度の どちらかが、以下の様になった状態とする 電流値：初期値 +15%以上 回転速度：初期値 -15%以下 (The motor life is decided as follows Current: more than +15% of initial value Speed: less than -15% of initial value)
許容環境温度範囲 (Allowable Ambient Temperature)	-10℃~+70℃ (Operating) -40℃~+70℃ (Storage) ☆6 実用上さしつかえない状態で結露無きこと (No dew formation at operating and storage condition)
質量 (Mass: g)	15
保護方式 (Protection)	自動復帰方法 (Auto Restart) 逆接続防止 (Polarity Protection) ☆7
耐振動 (JIS C 0040 に準拠) (Vibration Test)	振幅 (Amplitude): 1.5mm 周波数 (Frequency): 10~55Hz X, Y, Z 3方向各1時間 (1h in 3 Directions, "X, Y, Z" Each)
耐衝撃 (JIS C 0041 に準拠) (Shock Test)	加速度 (Acceleration of Gravity): 500m/s ² 作用時間 (Time): 11ms X, Y, Z 3方向各1回 (1 time in 3 Directions, "X, Y, Z" Each)
絶縁階級 (Insulation Class)	E種 (UL: Class A)
回転方向 (Rotation)	銘板側から見て時計方向 (CW Viewed From Name Plate Side)
風吹き出し方向 (Air Flow Direction)	銘板側 (Air Out Over the Struts)
UL File No.	E89936
CSA File No.	LR65829
VDE File No.	1507300
生産国 (Producing Country)	JAPAN, CHINA

* NOTE

- ☆5 AC 500V、1分を保証 (Guarantee AC 500V 1 min)
- ☆6 但し100時間保存の24時間常温放置にて実用上問題無きこと。
(To be free of defects on practical use after 100h of stored at -40℃~+70℃ and 24h to ambient humidity.)
- ☆7 使用電圧範囲内において赤線および、黒線を逆接続されても異常無きこと。
(Motor withstands reverse connection for positive and negative leads.)

* 特記事項 (Additional Notice)

- (1) 本仕様書に記載されていない項目で特に決める必要のある項目は事前に御連絡ください。
Any modification to these specifications requested by customer shall be negotiated between the manufacturer and the customer.
- (2) 当仕様書満足範囲において性能向上等の為、部品等一部変更する場合があります。
The manufacturer reserves the right to change design, parts or manufacturing processes in order to improve the performance of the fan motor.
- (3) 保管はできるだけ6ヵ月以内とし、高温多湿の場所は避けてください。
Storage area should not be in high temperature, high humidity environment, and storage term shall be within 6 months as much as possible.
- (4) 定格電圧において72時間拘束されても焼損しません。
In case of locked rotor condition, the current shutdown feature of the fan motor protects the motor for 72h at the rated voltage.
- (5) 納入品単体の故障により誘発される損害はご容赦いただきます。
We shall be free from compensation for any damage induced due to failure of fan motor.

										単位 UNIT mm		材質 MATERIAL		作成日 DATE Apr / 29 / 2003	
										尺度 SCALE		表面粗さ SURF. ROUGH.		品名 DESCRIPTION AUTO RESTART TYPE DC BRUSHLESS FAN	
										寸法 L 公差		熱処理 HEAT TREAT		品番 PART NO. (MODEL NO.) 1604KL-04W-B49-M51	
										一般公差		表面処理 FINISH		葉番 SHEET 2 / 4	
										TOL				図番 DRAWING NO. 1604KL-04W-B49-M51	
										角度 DEG				改訂 REV. .	



符号 MARK	日付 DATE	変更事由 REASON	ECN NO.	担当 ENGINEER	承認 APPROVED

NMB-MAT Minebea-Matsushita Motor Corporation ミネベア・松下モータ株式会社		
APPROVED	CHECKED	DRAWN
NKZW	MTNG	MSO

回転信号 (SPEED SIGNAL)

1. 出力回路 : オープンコレクタ (OUTPUT CIRCUIT : OPEN COLLECTOR)

2. 仕様 (SPECIFICATION)

$V_{CEmax} : +15V$

$I_{Cmax} : 5mA$ [$V_{CE(sat)max} = 0.4V$]

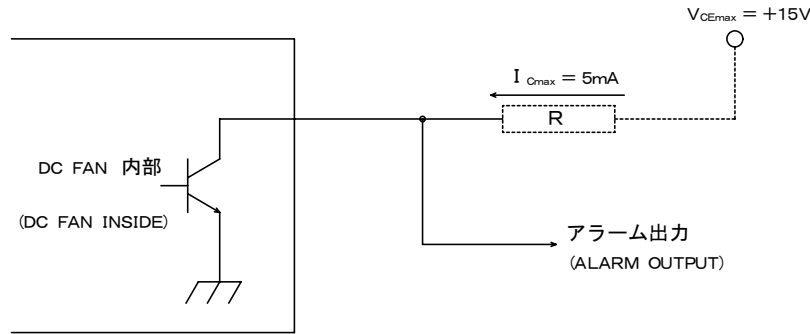


図1. アラーム信号回路 (ALARM SIGNAL CIRCUIT)

誤接続防止 : 信号出力線を誤接続しますと、FAN MOTOR内部駆動用IC内のトランジスタを破壊することがありますので、十分注意してください。

又、コネクタ等を使用される場合は、3極のコネクタの場合、

+	シ	-
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 又は

-	シ	+
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 となる様、設計時ご配慮ください。

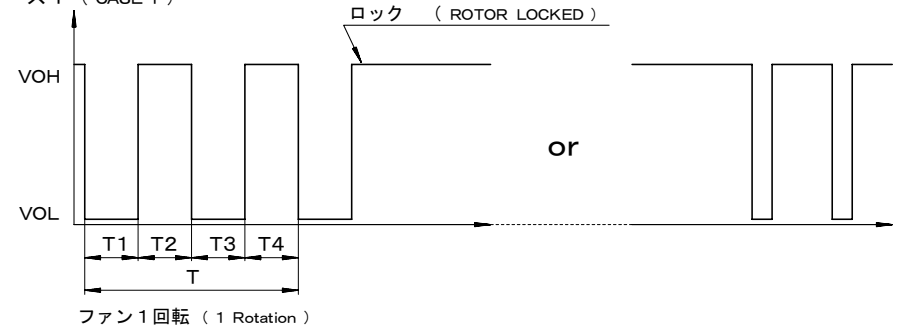
WARNING : Improper connection of the sensor lead may cause damage to the motor driver IC. It is suggested that if a three-Poles connector is used the sensor lead always be placed in the center position. Please see below.



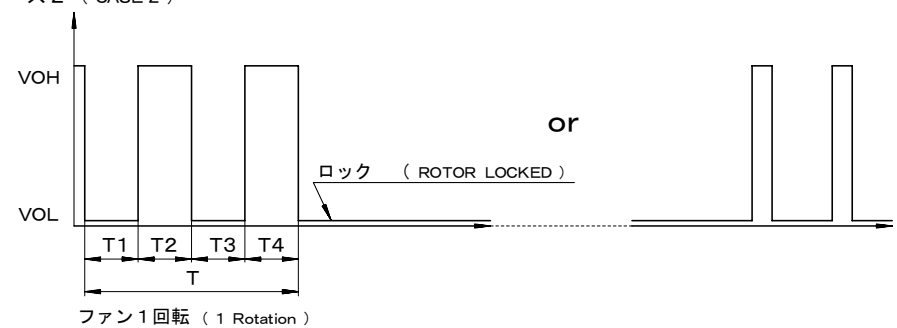
万一逆差しにより不都合が発生しても、当社は責任を負いません。
We shall be free from compensation, if it occurs trouble due to insertion of opposite direction.

3. 出力波形 (OUTPUT WAVEFORM) : 定格電圧時 (AT RATED VOLTAGE)
出力信号電圧 (OUTPUT SIGNAL VOLTAGE)

3-1 ケース1 (CASE-1)



3-2 ケース2 (CASE-2)



- 1) ローターがロックされ、信号がVOHの時は、そのままVOHに固定、若しくはモーターが起動動作を行う度にVOLとなります。
(When the rotor is locked at VOH position of signal, signal keeps VOH position or signal becomes to VOL position for a few seconds at any time of the auto-restart motion.)
- 2) ローターがロックされ、信号がVOLの時は、そのままVOLに固定、若しくはモーターが起動動作を行う度にVOHとなります。
(When the rotor is locked at VOL position of signal, signal keeps VOL position or signal becomes to VOH position for a few seconds at any time of the auto-restart motion.)
- 3) $T = T1 + T2 + T3 + T4 = \text{ファン1回転 (1 Rotation)}$
 $T1 = T2 = T3 = T4 = 60 / 4m$ m : ファン回転速度 (min^{-1})



								単位 UNIT mm 尺度 SCALE 		材質 MATERIAL 表面粗サ SURF. ROUGH. 熱処理 HEAT TREAT 表面処理 FINISH		作成日 DATE Apr / 29 / 2003 品名 DESCRIPTION AUTO RESTART TYPE DC BRUSHLESS FAN	
						APPROVED CHECKED DRAWN NKZW MTNG MSO		一般公差 L ≤ 4 ±0.1 4 < L ≤ 16 ±0.2 16 < L ≤ 63 ±0.3 63 < L ≤ 250 ±0.5 250 < L ≤ 1000 ±0.8 角度 DEG ±0.5		品番 PART NO. (MODEL NO.) 1604KL-04W-B49-M51		葉番 SHEET 3 / 4 図番 DRAWING NO. 1604KL-04W-B49-M51 改訂 REV.	
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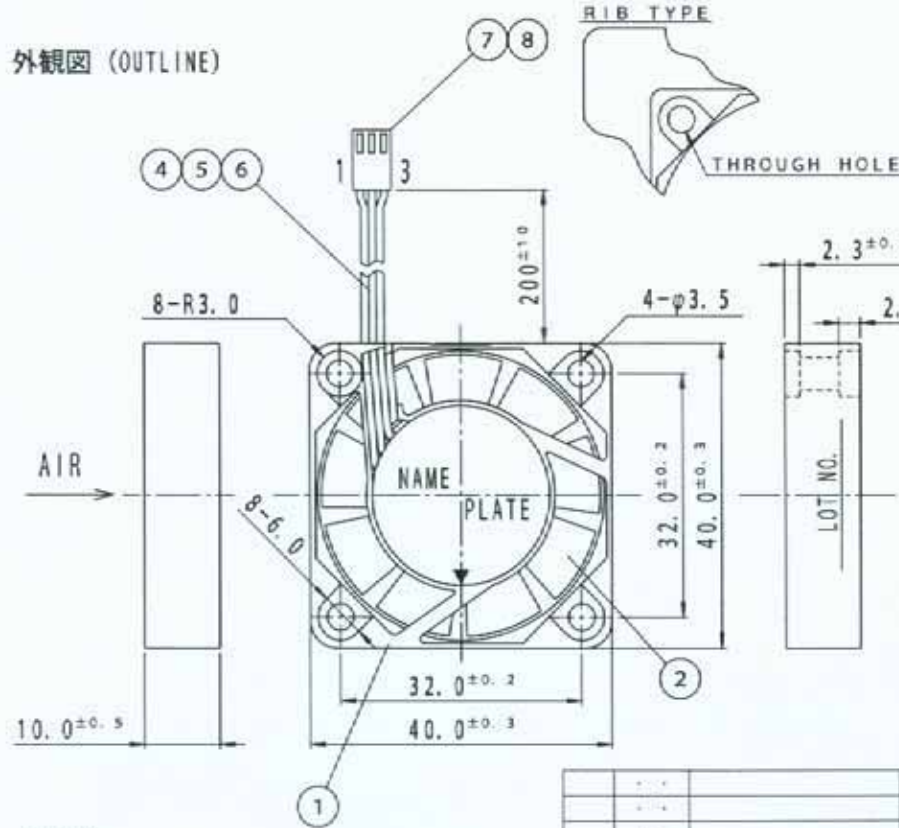
銘板表示 (NAME PLATE)



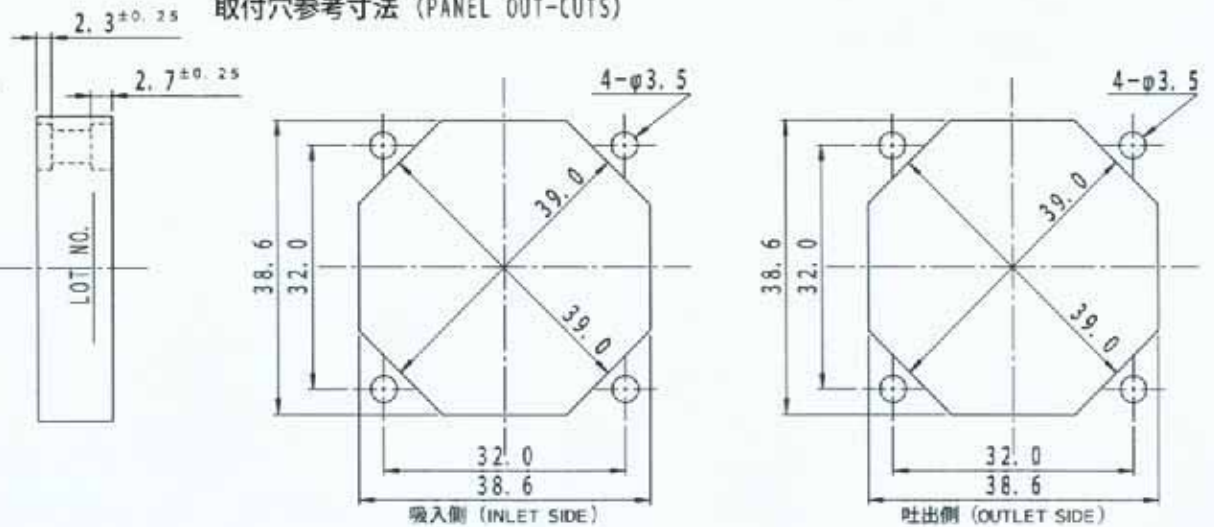
部品構成表 (PART LIST)

品番 ITEM NO.	品名 DESCRIPTION	材質 MATERIAL	個数 QTY	備考 REMARKS
1	ケーシング (CASING)	プラスチック PLASTIC BLACK UL 94V-0	1	
2	インペラー (IMPELLER)	プラスチック PLASTIC BLACK UL 94V-0	1	
3	銘板 (NAME PLATE)		1	
4	リード線 (LEAD WIRE)	UL1061 AWG26	1	赤 (+) (RED) PIN NO. 2
5	リード線 (LEAD WIRE)	UL1061 AWG26	1	黒 (-) (BLACK) PIN NO. 1
6	リード線 (LEAD WIRE)	UL1061 AWG26	1	白 (S) (WHITE) PIN NO. 3
7	コネクターハウジング (CONN. HOUSING)	2695-03RP	1	MOLEX
8	コンタクト (CONTACT)	08-50-0113 (08-50-0114)	3	増設品 MOLEX
	軸受 (BEARING)	ボールベアリング (BALL BEARING)	2	

外観図 (OUTLINE)



取付穴参考寸法 (PANEL OUT-CUTS)



				NMB-MAT Minebea-Matsushita Motor Corporation ミネベア・松下モータ株式会社		単位 UNIT mm		材質 MATERIAL		作成日 DATE Apr / 29 / 2003	
						尺規 SCALE		表面処理 SURF. TREAT		品名 DESCRIPTION	
						寸法L 公差		熱処理 HEAT TREAT		品番 PART NO. (MODEL NO.)	
						L ≤ 4 0.1		表面処理 FINISH		図番 SHEET	
						4 < L ≤ 18 0.1				1604KL-04W-B49-M51	
						18 < L ≤ 50 0.1				4 / 4	
						50 < L ≤ 250 0.1				図番 DRAWING NO.	
						250 < L ≤ 1200 0.1				1604KL-04W-B49-M51	
						1200 < L 公差				改訂 REV.	
						0.1					
符号 MARK	日付 DATE	変更理由 REASON	ECN NO.	担当 ENGINEER	承認 APPROVED	NKZW	MTNG	MSO			



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MINERBEA CO LTD
FAN MOTOR DIV
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4106-73 MIYOTA-MACHI
KITASAKU-GUN
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GPWV2

June 16, 2004

Fans, Electric - Component

**MINERBEA CO LTD FAN MOTOR DIV
4106-73 MIYOTA-MACHI KITASAKU-GUN, NAGANO-KEN 389-
0293 JAPAN**

E899936

Models 2412PS-12W-B30, 2415PS-10W-B30, -12W-B30, 3108FS-12W-B30, 3110PS-10W-B30, -12W-B30, 3115PS-10W-B30, -12W-B10, -12W-B20, 3610PS-12W-B10, -12W-B20, -12W-B30, 4710PS-12W-B10, -12W-B10-B05, -12W-B10-B06, -12W-B10-B07, -12W-B10-B08, -12W-B20, -12W-B30, 4715FS-10W-B30, -12W-B10, -12W-B20, -12W-B30. The "B" in the model number may be replaced by an "S" and the "W" in the model number may be replaced by a letter "T". The suffix -BXO may be replaced with -BXA where X is 1-3.

Models 2412PS-10W-B30, 2415PS-10W-B30, 3108FS-10W-B30, 3110PS-10W-B30, -12W-B30, -20W-B30, 3115FS-10W-B10, -10W-B20, -12W-B30, -20W-B30, -20W-B20, -20W-B10, -22W-B20, -22W-B30, -23T-B3A, -23W-B10, -23W-B20, -23W-B30, -24W-B30, -24W-B20, -24W-B10, 3610PS-10W-B31, -10W-B30, -10W-B20, -10W-B10, -20W-B30, -20W-B20, -20W-B10, -22W-B30, -23W-B20, -23W-B10, -24W-B30, -24W-B20, -24W-B10, 4710PS-10W-B30, -10W-B20, -10W-B10, -20W-B30, -20W-B20, -20W-B10, -23W-B30, -23W-B20, -23W-B10, -24W-B30, -24W-B20, -24W-B10, 4715FS-10W-B20, -10W-B10, -20W-B30, -20W-B20, -20W-B10, -22W-B20, -22W-B10, -23W-B30, -23W-B20, -23W-B10, 3115FS-12T-B00, -B10, -B20, -B30, 3115FS-12W-B20, -24W-B10, 3115FS-23W-B00, -B10, -B20, -B30. The "B" in the catalog numbers above may be replaced by an "S" and the "W" in the model number may be replaced by a "T".

Models 4728QS-12W-S20, 4728RS-12W-S20, 4730QS-12W-S20, 4730RS-12W-S20. Models 5915PC-10T-B10, -10T-B20, -10T-B30, -12T-B10, -12T-B20, -12T-B30, -20T-B10, -20T-B20, -20T-B20-SXX, -20T-B30, -22T-B10, -22T-B20, -22T-B30, -23T-B10, -23T-B20, -23T-B30, -24T-B10, -24T-B20, -24T-B30. The letter "B" in the model numbers may be replaced by the letter "S". The letter "T" in the model numbers may be replaced by the letter "W".

Models 4715MS-12T-B50, -B40, -B30, -B20; Models 4715MS-12W-B50, -B40, -B30, -B20; Model 4715MS, followed by 23T or 23W, followed by -B50, -B40, -B30, -B20, -B10; Model 4715MS-24T-B50, 4715MS-24TW-B50. The suffix -BXO may be replaced with -BXA where "X" is 1-5. Model 3610NL-04W-B10-A02; Model 3610NL followed by -04W or -05W, followed by -B10, -B17, -B18, -B19, -B20, -B27, -B28, -B29, -B30 -B37, -B38, -B39, -B40, -B47, -B48, -B49, -B50, -B57, -B58, -B59; Models 3610NL-04W-B29-D50, 3610NL-012P435, -436, -437, -438, -439, -440 followed by -00, or -01; 4710NL-012P535, -536, -537, -538, -539, -540 followed by -00, -01 or -PX; Models 4715KL-012P3XX, -012P4XX, -012P5XX, -012P6XX, -024P3XX, -024P4XX, -024P5XX, -024P6XX may be followed by YZ, where XX is 35, 40 or 45, Y is P or 0 and Z is 1 through 9; Model 4715KL-112P555-P1. The letter "W" in the model numbers may be replaced by the letter "T". The letter "P" in the above Models 4715ML, 4710NL, 3610NL Series may be replaced by the letter "O".

Model 3110NL-04W followed by -B10, -B15, -B16, -B17, -B18, -B20, -B25, -B26, -B27, -B28, -B30, -B35, -B36, -B37, -B38, -B40, -B45, -B46, -B47, -B48, -B50, -B55, -B56, -B57, -B58 or -BX9; The letter "X" may be 1 thru 5; Model 3110NL-05W followed by -B10, -B15, -B16, -B17, -B18, -B20, -B25, -B26, -B27, -B28, -B30, -B35, -B36, -B37, -B38, -B40, -B45, -B46, -B47, -B48, -B50, -B55, -B56, -B57, -B58, -B59, -B60; Model 2410ML-04W or -05W followed by BX0, BX5, BX6, BX7, BX8 or BX9 where X is 1, 2, 3, 4, 5 or 6. Models 2410-04W, -05W f/b B1X, B2X, B3X, B4X, B5X or B6X, f/b j, f/b two alphanumeric characters where X is 0, 5, 6, 7, 8 or 9.

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Models 3110NL-012P3, 3110NL-024P3 followed by 35, 40 or 45, followed by letter "P" or "O", followed by single digit number. The letter "P" in the Model 3110NL Series may be replaced by the letter "Q".

Models 4710NL-04W-B50-K01, 4710NL-05W-B10, -B15, -B16, -B17, -B18, -B19, -20, -B25, -B26, -B27, -B28, -B29, -B30, -B35, -B36, -B37, -B38, -B39, -B40, -B45, -B46, -B47, -B48, -B49, -B50, -B55, -B56, -B57, -B58, -B59, Model 4710NL-04W-B10, -B15, -B16, -B17, -B18, -B19, -B20, -B25, -B26, -B27, -B28, -B29, -B30, -B35, -B36, -B37, -B38, -B39, -B40, -B45, -B46, -B47, -B48, -B49, -B50, -B55, -B56, -B57, -B58, -B59; Models 4710NL-07W-B40, -B49, -B50, -B59, -B60, -B69. The letter "W" in the model numbers may be replaced by the letter "T". The above models may be followed by -L or -P, followed by two numbers.

Models 4715MS-10T-B30, -B50, -B5A, 4715MS-12T-B1A, -B10, -B10A-04, 4715MS-20T-B1A, -B4A, -B5A, -B50, 4715MS-22T-B2A, -B4A, -B5A, -B50, 4715MS-23T-B1A, 4715MS-24T-B1A, -B3A, -B4A, B715MS-10T-B10, 4715MS-22T-B10, -B30, 4715MS-24T-B10, -B30. The letter "T" in the model numbers may be replaced by the letter "W".

Model 3610MML followed by -04W/T or -05W/T, followed by -B1X, -B2X, -B3X, -B4X, -B5X, 3610MML-04W/T-B6X, X may be 0, 6, 7, 8 or 9. The letter "M" in the model numbers may be replaced by the letter "K" or "G".

Models 1606MML-04W, 1606MML-05W followed by -B3X, -B4X, -B5X, -B6X where X may be 0, 6, 7, 8 or 9. The letter "M" in the model numbers may be replaced by the letter "K".

Model 2106KTL-04W, followed by -B3X, -B4X or -B5X, where X may be 0, 5, 6, 7, 8 or 9.

Models 2106KTL-04W-B6X where X may be 6 or 7 and the letter K may be replaced by the letter M.

Models 1608MML-01W-B1X, 1608MML-01WB2X, 1608MML-01W-B3X, 1608MML-01W-B4X, 1608MML-01W-B5X, 1608MML-04W-B1X, 1608MML-04W-B2X, 1608MML-04W-B3X, 1608MML-04W-B4X, 1608MML-04W-B5X X = 0 or 9 the letter "M" may be replaced by letter "K".

Models 1608KTL-04W-B70 XAX, 1608KTL-04W-B79 XAX, 1608KTL-04W-B79 XBX, 1608KTL-04W-B70 XXX, 1608KTL-04W-B79 XXX, where X may be any alphanumeric character.

Model 1608KTL-05W-B39-XOY where the letter "X" may be any numbers and the letter "Y" may be any numbers or any alphabets.

Models 3108NL-04W-B10, -B15, -B16, -B17, -B18, -B19, -B20, -B25, -B26, -B27, -B28, -B29, -B30, -B35, -B36, -B37, -B38, -B39, -B40, -B45, -B46, -B47, -B48, -B49, -B50, -B55, -B56, -B57, -B58, -B59, Models 3108NL-05W-B10, -B15, -B16, -B17, -B18, -B19, -B20, -B25, -B26, -B27, -B28, -B29, -B30, -B35, -B36, -B37, -B38, -B39, -B40, -B45, -B46, -B47, -B48, -B49, -B50, -B55, -B56, -B57, -B58, -B59.

Model 2410MML and 2410GL, followed by -04W or -05W followed by BX0, BX5, BX6, BX7, BX8 or BX9, may be followed by JYY or EYY where Y is any two alphanumeric characters and where "X" is 1, 2, 3, 4, 5, 6 or 7; Models 2410MML, 2410GL followed by -012P6 or -024P6 followed by 35, 40 or 45, 2410MML-05W-B89, -B80, 2410MML-04W-B89, -80.

Model 2410MML-05W-B39-XOY where "X" may be any numbers and "Y" may be any numbers or any alphabets.

Boxer fans, Models B or W, S2107FL-1004, -1074 may be followed by H and/or R; Boxer Series 4715, Models DB115, DS115, DS230. The basic model is followed by suffixes "A", "B", "D" or "F", followed by any letter from A-T incl, followed by additional letters from A-E incl. Model 4715FS or -RS followed by 12 or 23, followed by "T" or "W", followed by "R" or "S", followed by 0-5, followed by "O" or "A".

Pewee boxes, Series 3115, Models AB115, AS115, AS230. The basic model is followed by suffixes "A", "B" or "D", followed by any letter A-N incl, followed by additional letters from A-E incl, followed by "S", Model 3115FS or -RS followed by 12 or 23, followed by T or W, followed by "B" or "S", followed by 11, 10, 20 or 30.

Tandem fans, Models WS2107FL-1670H, -1672H, -1673H may be followed by H, M or R; Model TBS2107FL.

DC Fans, Model 1611KL, followed by -04W, followed by -B2X, -B3X, -B4X and -B5X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9, may be followed by additional suffixes; Model 2806FL-04W-B86-HXX and 2806FL-04W-B56-HXX where XX represents any two alphanumeric characters.

DC fans, Models 5910PL-07W-B58-L51, 5910PL-07W-B49-L50, 5910PL-07W-B48-L54, 5910PL-04W-B10, 5910PL-04W-B20, 5910PL-04W-B30, 5910PL-04W-B40, 5910PL-04W-B50, 5910PL-05W-B10, 5910PL-05W-B20, 5910PL-05W-B30, 5910PL-05W-B40, 5910PL-05W-B50, 5910PL-05W-B60, 5910PL-05W-B70, 5910PL-07W-B10, 5910PL-07W-B20, 5910PL-07W-B30, 5910PL-07W-B40, 5910PL-07W-B50, 5910PL-07W-B60, 5910PL-07W-B70, followed by -XXX, where XXX may be replaced by any alphanumeric character.

Model 5910PL-09W-B70-LW0.

DC fans, Model 5920PL or 6820PL followed by -0(A)(B)-B(XX), (A) may be 4, 5 or 7, (B) may be 10, 17, 18, 19, 20, 27, 28, 29, 30, 37, 38, 39, 40, 47, 48, 49.

Models 5920PL and 6820PL, followed by B6X or B7X where x may be 0, 5, 6, 7, 8 or 9 followed by DXY where X represents A, 5 or 6 and where Y may be represented by 0 thru 9.

Model 5920PL-04W followed by B39, followed by D51 or D61.

Model 5920PL-07W-B65-1D51.

Models 5920PL followed by B49, followed by D52 or DA2.

Model 6820PL-07W followed by B19-D53, B46-D51, B46-DA1, B49-D53, B49-DA3, or B49-DA4.

Models BS2107FL-1, -2-1, -7, -55, -59, -61, -1000, -1001, -1002, -1003, -1006, -1007, -3110, -7010, -7010, -7070, -7072, -7073, BS2107F-111, -510, -1110, MBS2107FL-1000, -1002, MWS2107FL-1000, -1002, SBS2107FL, TBS2107FL, WS2107FL-1, -2-1, -3, -7, -8, -9, -16, -26, -52, -55, -59, -3110, -1000, -1001, -1002, -1003, -1006, -1007, -1009, -7010, -7070, -7072, -7073, WS2107F-110, -111, -510, -1110. The basic model number or suffix letters "R", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Models WS2107FL-531, -570, -572, -573, -1010, -1070, -1072, -1073, BS2107FL-570, -572, -1070, -1073. The basic model number or suffix letters "P", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S". The basic number (last digit) is a 1, the optional 3/16 in terminals are used.

Models WS2107FL followed by suffix number 120. The basic model number or suffix letters "R", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Model PWS2107FL-M1, The basic model number or suffix letters "F", "FL" or the additional suffix numbers may be followed by "R" or "S".

Models S or M, B or W, S2107FL followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Models S or M, B or W, S2107FL followed by suffix numbers 3, 6, 7 or -106; Models SW or B, S2107FL-2; Models SW2107FL-1002, -1009, -1062, MWS2107FL-1077, -1007. The basic model number or suffix letters "R", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Models S, W or B, S2107FL, followed by suffix numbers (-4) or (-6-4). The basic model number or suffix letters "F", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Models P, W or B S2107FL-2M, -2M-3, -3, -3M, PWS2107FL-1002, -1002M. The basic model number or suffix letters "R", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Model WS2107FL-308. The basic model number or suffix letters "F", "FL" or the additional suffix numbers may be followed by suffix letter "H". Suffix numbers may be followed by "R" or "S".

Models SP2107FL-5, -51, SWS2107FL-5, -51, -1000. The basic model number or suffix letters "F", "FL" or the additional suffix numbers may be followed by suffix letter "T". Suffix numbers may be followed by "R" or "9".

Model (P) followed by (W or B), followed by (S2142FL-), followed by (no entry, 9 or 70), followed by (no entry, A, 1, 1A or M), followed by (no entry or H).

Model (P) followed by (W or B), followed by (S2142FL-), followed by (no entry, 9 or 70), followed by (no entry, A, 1, 1A or M), followed by (no entry or H).

Model (P) followed by (W or B), followed by (S2142FL-), followed by (6, 7 or 4), followed by (no entry or 2), followed by (no entry, A, 1, 1A or M), followed by (no entry or H).

DC Fan, Model 2410RL-04W-BYX, where Y is 1, 2, 3, 4, 5, 6 or 7; where X is 0 or 9; may be followed by additional suffixes: 2410RL-05W-BYX, where Y is 1, 2, 3, 4, 5, 6 or 7, where X is 0 or 9; may be followed by additional suffixes.

Impedance protected, Boxer Series, Model B or WS2107FL-1004 or WS2107FL-1074. May be followed by R and/or H.

Impedance protected, Models WS2107FL-1670H, -1672H, -1673H. May be followed by R, H or M.

Impedance protected, Boxer Series, Models KWS2107FL-1002, -1009, -1072 or KRS2107FL-1002, -1009, -1072. May be followed by R and/or H and/or M.

Models 2408NL-04W, 2408NL-05W, followed by -B1X, -B2X, -B3X, -B4X, -B5X and -B6X where the letter "X" represents digits 0, 6, 7, 8 or 9. The letter "W" may be replaced by the letter "T".

Model 3110GL-B4W Series, followed by -Bx4 where X represents 1 through 5; Model 3110GL-B4W-B50-K01.

Models 3110GL-B4W-B8X, where "X" represents digits 0, 5, 6, 7, 8 or 9.

Models 3110GL-B5W, followed by -B6X, -B5X, -B4X, -B3X, -B2X or -B1X where "X" represents 0, 5, 6, 7, 8 or 9.

Models 3110KL-04W, 3110KL-05W, followed by -B1X, -B2X, -B3X, -B4X, -B5X, -B6X and -B7X, where the letter "X" represents digits "0", "6", "7" or "9"; Model 3112KL followed by -04W or -05W, followed by -B3X, -B4X, -B5X, -B6X, where "X" represents 0, 5, 6, 7, 8 or 9; Model 3110KL-04W-B19-P01/P02; Models 3112KL-07W-B4X, where X may be 0, 5, 6, 7, 8 or 9.

Models 4712KL-04W-B1X, 4712KL-04W-B2X, 4712KL-04W-B3X, 4712KL-04W-B4X, 4712KL-05W-B1X, 4712KL-05W-B2X, 4712KL-05W-B3X, 4712KL-05W-B4X, 4712KL-05W-B5X, 4712KL-07W-B1X, 4712KL-07W-B2X, 4712KL-07W-B3X, 4712KL-07W-B4X where X represents 0, 5, 6, 7, 8, 9.

Models 4712HL-07W-B49, 4712HL-07W-B49.

Models 4715KL-04W, 4715KL-05W, followed by -B1X, -B2X, -B3X, -B4X and -B5X where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715KL-07W followed by -B1X, -B2X, -B3X, or -B4X, where the letter "X" represents digits 0, 5, 6, 7, 8 and 9. The letter "W" in the above models may be replaced by the letter "T".

Model 4715KL-04W-B8X where the letter "X" represents digits 0, 5, 6, 7, 8 or 9. May be followed by additional suffixes.

Model 4715KL-05W-B39-XOY, where the letter "X" may be any numbers and the letter "Y" may be any numbers or any alphabets.

Models 3612-KL-04W-B3X, -B4X, -B5X, -B6X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Models 3612-KL-05W-B3X, -B4X, -B5X where "X" represents 0 or 9.

Models 1204KL-04W followed by -B3X, -B4X, -B5X, followed by -L00 or -YZZ; Models 1204KL-01W-B4X-L00; Models 1204KL-01W followed by -B3X, -B4X, -B5X, followed by -YZZ. Where X may be 0 or 9; Y may be any alphanumeric characters, except for "L", "Z" may be any combination of alphanumeric characters.

Model 2406KL-04W followed by -BXY, where X represents digits 1 through 6, or 8, and Y represents digits 0 thru 9; Model 2406KL-04W-BXY-K88 where "X" represents digits 1 through 6, "Y" represents digits 0 thru 9 and "88" represents digits any combination of numbers or letters; Model 2406KL-04W-B36-151; Model 2406KL-09W-B40; Models 2406KL-04W-B1X, -B2X, -B3X, -B4X and -B5X where X represents 5 thru 8.

Model 2406KL-05W-BXY, where X represents 1 through 5 and Y represents 1 through 9.

Model 2406KL-05W-B59-XOY, where "X" may be any numbers and "Y" may be any numbers or any alphabets.

Model BL4747-05W-B30-01.

Models BL4447-04W-B49-XX where XX represents any two digit number.

Models 1004KL-01W followed by -B3Y, -B4Y, -B5Y, 1604KL-04W, followed by -B3Y, -B4Y, -B5Y, where Y represents digits 0 or 9.

Model 3615KL-04W, -05W, followed by -B3X, -B4X, -B5X, where X represents 0, 5, 6, 7, 8 or 9; may be followed by 3 suffixes. The letter "W" may be replaced by the letter "T".

Model 3615KL-04W followed by -B7X, where X represents 0, 6, 7 or 9, may be followed by 3 suffixes. The letter "W" may be replaced by the letter "T".

Model 3615KL-04W-B8X, where "X" represents digits 0, 5, 6, 7, 8 or 9.

Model 3615KL-04W-B9X, where "X" represents digits 0, 5, 6, 7, 8 or 9.

Model BC0703 followed by B0, followed by 4 or 5, followed by 1, 2, 3 or 4, followed by 000 or 001; Model BC0703 followed by B045, followed by XYZ.

Model 2004KL followed by -01W or -04W, followed by -B3X, -B4X or -B5X where "X" represents 0 or 9.

Models 1404KL-04W-B30, -B39, -B40, -B49, -B50 and -B59.

Model 3106KL-04W followed by -B3X, -B4X, -B5X, where X represents digits 0 or 5 through 9; Model 3106KL-05W followed by -B3X, -B4X, -B5X, where X represents digits 0 or 5 through 9.

Models RL6927-05W-B39-50, RL8728-07W-B29-72W, RL8728-09W-B29, RL9833-07W-B29-72W, RL9833-09W-B29.

Models RL-9835-05W-B29, -B39.

Model 1608KL-05W, followed by -B1X, -B2X, -B3X, -B4X, -B5X, where X represents digits 0 or 9.

Models BC1203-B042, -B043, -B044, -B045, -B052, -B053, -B054 and -B055, followed by X, Y, Z, where X may be 0, 2, V or P; Y may be 0 or T; Z may be 0, L or S.

Models BM5115-04W-B3X, -B4X, -B5X, where X=0 or 9. May be followed by three letters/numbers.

Models BM5125-04W-B30-XXX, -B39-XXX, -B40-XXX, -B49-XXX, -B50-XXX, -B59-XXX, BM5125-01W-B30-XXX, -B39-XXX, -B40-XXX, -B49-XXX. The first "X" in the models represents any number and the last two "XX" represents digits 00 through 99.

Model WL1202-04W-B49-91.

Models 2406GL-04W-B2X, -B3X, -B4X, -B5X, where "X" represents 0, 5, 6, 7 or 9.

Model 2006HL-04W-B49-HB1.

Models 5015HL-09W-B56, 5015HL-09W-BAX-XXX.

Models BC0903-B042-00Z, -B043-00Z, -B044-00Z-01, -03, -B044-00Z, -B047-POS, -B049-POX, -B052-00Z, -B053-00Z, -B054-00Z, -B044-00Z-02, -04, -B045-00Z, where Z represents 0, L or 5, "X" represents 0, L or 5. May be followed by additional suffixes.

Models BC0903-B04X-VTL, BC0903-B04X-VTS, BC0903-B04X-VTS, where X represents 2, 3 or 4. May be followed by additional suffixes.

Models BC1002-B042-XYZ, -B043-XYZ, -B044-XYZ, -B052-XYZ, -B054-XYZ, where "XYZ" represents 000, 00L, 00S, 200, 20L, 20S, P00, P0L, P0S, V00, V0L, V0S, V10, VTL or VTS.

Models 2404KL-04W-B3X, -B4X, -B5X, where the letter X represents digits 0, 5, 6, 7, 8 or 9.

Models BM4515-04W-B3X, -B4X, -B5X, where the letter X represents 0 or 9.

Models BG0702-B043-XYZ, -B044-XYZ, -B045-XYZ, -B053-XYZ, -B054-XYZ, -B055-XYZ, where X represents 0, 2, P or V, where Y represents 0 or 1, Z represents 0, L or S.

Models 4710KL followed by -04W or -05W, followed by -B1X, -B2X, -B3X, -B4X or -B5X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Models 4710KL-07W, followed by -B1X, -B2X, -B3X, -B4X or -B5X, where the letter "X" represents digits 0 or 9

Models 2810KL-04W-B1X, -B3X, -B5X, -B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9.

Models 2810KL-04W-B6Y, 2810KL-04W-B8Y, where the letter "Y" represents digits 0, 5, 6, 7, 8 or 9.

Models BG0803-B045-005-01, BG0803-B045-005-02, BG0803-B045-005-03, BG0803-B045-005-04.

Models 4715SL-05W-B2X, -B3X, -B4X, -B5X, -B6X, -B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL-09W-B49-EB1.

Model 4715SL followed by -04W, -05W, followed by B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Models 4715SL followed by -04W, -05W, followed by B8X; where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL followed by B6X, B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL followed by -07W, followed by B6X, B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL followed by -07W, followed by B8X; where the letter "X" represents digits 0, 5, 6, 7, 8 or 9, may be followed by DXX; Model 4715SL followed by -04W, -05W, followed by -04W, -05W, followed by B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL followed by -04W, -05W, followed by B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL followed by -07W, followed by B6X, B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9, may be followed by DXX.

Model 4715SL followed by -04W, -05W, followed by B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9; Model 4715SL followed by -07W, followed by B6X, B7X, where the letter "X" represents digits 0, 5, 6, 7, 8 or 9, may be followed by DXX.

Model 2806FL Series followed by -04W or -05W, followed by -B3X, -B4X or -B5X; where "X" represents digits 0, 5, 6, 7, 8 or 9; Model 2806FL followed by additional suffixes.

Model 2806GL Series followed by -04W followed by -B3X, -B4X or -B5X, where the letter "X" represents digits 0 or 9.

Models 4715HL-09W-B46-LQ1, 4715HL-09W-B4X-XXX, where XXX represents any numeric character.

DC fan tray, Model FT151B14-29-06A0.

DC fan tray, Model FT2001.

DC fan tray, Model FT51B14-29-06A0.

DC fan tray, Model FT76DA3/48/14A0.

DC fan tray, Model FT41B17-26-05B0.

DC component fan, Model 110R041D0701-A01.

DC blowers, Models 133R091D0902-XXX, 190R071D0701-XXX, 220R071D0701-XXX, 250R100D0701-XXX, where XXX may be any alphanumeric character.

DC Fan, Model 1611KL, followed by -04W, followed by -B2X, -B3X, -B4X and -B5X; where the letter "X" represents digits 0 or 9; may be followed by additional suffixes.

DC Fan, Models 175R-069D-053X, 175R-069D-056X, 175R-069D-073X, 175R-069D-074X, 175R-069D-075X, 175R-069D-076X, 175R-069D-095X, where X may be 0 thru 9 or Z, may be followed by additional suffixes.

Model 2806KL-04W-B8X, where X may be 0, 5 thru 9, may be followed by additional suffixes.

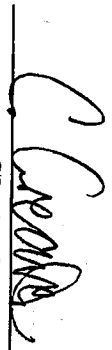
Marking: Company name or trademarks **NMB** or **UMC** or "E89936" and model designation.

See General Information Preceding These Recognitions

For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

I the undersigned hereby declare that the products listed on page 14 of this report comply with the European standards:

EMISSION	EN50081	~	1987
IMMUNITY	EN50082	~	1992
ESD	IEC 801-2		
FAST BURST			
TRANSIENTS	IEC 801-4 (DC PORT)		

Signed: 
Chris Greaves
European Applications Engineer

Date: 30 JAN / 03

This file is the responsibility of:

**Mr C Greaves
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**Signed for, and on behalf of, The NMB-Minebea European Group of
Companies**



Date: 30/JAN/03

BRAND NAMES

NMB uses and has rights in the following marks:-

- **Boxer ®**
- **Flowmax ®**
- **NMB**
- **Minebea**

MANUFACTURING SITES:

The fans are manufactured in identically tooled production lines and using identically tooled piece parts in:

Kariizawa Address:

Minebea Matsushita Motor Corporation
(Formerly Minebea Co Ltd)
4106-73 Oaza Miyota
Miyota Machi
Kitasaku Gun
Nagano-Pref 389-01
Japan

Thailand Address:

Minebea Thai Ltd
1 Moo 7 Phahalyothin Road KM51
Tambol Chiang Rak-Noi
Amphoe Bang Pa-In
Ayuthaya Province 13180
Thailand

China Address:

Minebea Electronics & Hi-Tech Components Ltd
Shanghai Factory
No 8313 Hu Qing Ping Road,
Xicun Town,
Qingpu County
Shanghai 201721
China

Taiwan Address:

Taiwan Minebea Electronics Co Ltd
No 95-1 Kang-Shan Allen
Kaohsiung
Taiwan
Republic of China

USA Address:

NMB Technologies
7307 S Harl Avenue
Suite #3
Tempe
Arizona 85283
USA

Description of the Devices

The device comprises a rotating member with attached aerofoil sections (blades). The said aerofoil sections being driven by a brushless DC motor whose windings are energised sequentially by angular position signals generated from a hall effect switch.

The total device is enclosed in a casing. All plastic parts are moulded using flame retardant 94 V-0 materials.

The devices are used as cooling fans for office equipment, personal computer, electronic assemblies and similar applications. The fans include an automatic shut down / overload protection circuit, and reverse polarity protection.

Operating Environment

The operating conditions are defined in the catalogue which is attached as Appendix 1 of this Technical Construction File.

Test Rationale ~ DC FANS

The market led requirement to achieve the maximum air flow with the minimum noise, in any particular application, leads to a vast number of fans of various speed and frame size.

In order to ascertain if the operating voltage or speed had any impact on fan EMC characteristics a series of quick swing tests were made. These tests, on selected types, at the extremes of the physical size range, comprised testing variants at highest and lowest speed and at 12 and 24 volts.

There were no measurable emissions (when tested in accordance with EN50081-1987) and none of the fans showed any susceptibility to electromagnetic fields (EN50082-1992) or fast burst transients (IEC801-4) (DC port). The test data is contained in Appendix 2.

On the basis of these results it was decided to submit one fan, in each physical size of the highest speed, and highest voltage, to a full EMC test. The test data is in Appendix 3.

TEST SUBMISSION DATAD C FANS

Model No	Emission	Immunity	Fast Burst Transient	SECTION Ref.
1606KL-04W-B50	Passed	Passed	Passed	4
2408NL-05W-B50	“	“	“	5
2410ML-05W-B60	“	“	“	6
3108NL-05W-B50	“	“	“	7
3110KL-05W-B60	“	“	“	8
3110GL-B4W-B14	“	“	“	8A
3110GL-B4W-B54	“	“	“	8B
3610KL-05W-B50	“	“	“	9
4710NL-05W-B50	“	“	“	10
4715KL-07W-B30	“	“	“	11
5920PL-04W-B40	“	“	“	12
5920PL-07W-B40	“	“	“	13

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Part Number System D C FANS

NMB uses a number system which defines the product in this way:

4715KL-05W-BXX-YY

- 47 = 4.7 Inch square**
- 15 = 1.5 inch thick**
- KL = Modification status**
- 05 = DC Voltage (07 = 48V / 05 = 24V / 04 = 12V / 01 = 5V)**
- W = Lead wire type (T = terminal type)**
- BXX = Fan speed**
- YY = Minor variants**

Approved Product List

Using the quick swing and formal test data it is claimed that the range of NMB DC fans listed on page 14 are compliant with the European directives:

EN50081	~	1987
EN50082	~	1992
IEC 801-2		
IEC 801-4		

LIST OF COMPLIANT D C FANS

1004KL-04W-B10	To	B50-YY
1204KL-04W-B30	To	B50-YY
1404KL-01W-B10	To	B50-YY
1604KL-04W-B10	To	B50-YY
1606KL-01W-B10	To	B50-YY
1606KL-04W-B10	To	B50-YY
1606KL-05W-B10	To	B50-YY
1608KL-01W-B10	To	B50-YY
1608KL-04W-B10	To	B50-YY
1608KL-05W-B10	To	B50-YY
1611KL-04W-B10	To	B50-YY
1611KL-05W-B10	To	B50-YY
1910RL-04W-B4x	Only	
2004KL-01W-B10	To	B50-YY
2004KL-04W-B10	To	B50-YY
2004KL-05W-B10	To	B50-YY
2006FL-04W-B10	To	B60-YY
2006FL-05W-B10	To	B60-YY
2006ML-04W-B1x	To	B2x-YY
2106KL-01W-B10	To	B50-YY
2106KL-04W-B10	To	B50-YY
2106KL-05W-B10	To	B50-YY
2404KL-04W-B10	To	B50-YY
2404KL-05W-B10	To	B50-YY
2406GL-01W-B10	To	B60-YY
2406GL-04W-B10	To	B60-YY
2406GL-05W-B10	To	B60-YY
2406GL-04W-B10	To	B60-YY
2406GL-05W-B10	To	B60-YY
2406KL-04W-B10	To	B50-YY
2408NL-01W-B10	To	B60-YY
2408NL-04W-B10	To	B60-YY
2408NL-05W-B10	To	B60-YY
2408NL-09W-B10	To	B60-YY
2410ML-01W-B10	To	B70-YY
2410ML-04W-B10	To	B80-YY
2410ML-05W-B10	To	B80-YY
2410ML-09W-B10	To	B70-YY
2410RL-04W-B10	To	B70-YY
2415KL-04W-B10	To	B80-YY
2806FL-01W-B10	To	B70-YY
2806FL-04W-B10	To	B70-YY
2806FL-05W-B10	To	B70-YY
2806GL-04W-B10	To	B70-YY
2806KL-04W-B10	To	B80-YY
2810FL-04W-B56-HS1	and	HS2

2810KL-04W-B10	To	B70-YY
2810KL-05W-B10	To	B70-YY
3106KL-01W-B10	To	B50-YY
3106KL-04W-B10	To	B50-YY
3106KL-05W-B10	To	B50-YY
3108NL-04W-B10	To	B50-YY
3108NL-05W-B10	To	B50-YY
3110GL-B4W-B14	To	B54-YY
3110KL-04W-B10	To	B70-YY
3110KL-05W-B10	To	B70-YY
3110KL-09W-B10	To	B70-YY
3112KI-01W-B10	To	B50-YY
3112KL-04W-B10	To	B60-YY
3112KL-05W-B10	To	B60-YY
3112KL-07W-B10	To	B40-YY
3610KL-04W-B10	To	B60-YY
3610KL-04T-B10	To	B60-YY
3610KL-05W-B10	To	B60-YY
3610KL-05T-B10	To	B60-YY
3610KL-09W-B10	To	B50-YY
3610ML-04W-B10	To	B50-YY
3610ML-04T-B10	To	B50-YY
3610ML-05W-B10	To	B50-YY
3610ML-05T-B10	To	B50-YY
3610NL-04W-B10	To	B50-YY
3610NL-04T-B10	To	B50-YY
3610NL-05W-B10	To	B50-YY
3610NL-05T-B10	To	B50-YY
3612KL-04W-B10	To	B50-YY
3612KL-04T-B10	To	B50-YY
3612KL-05W-B10	To	B50-YY
3612KL-05T-B10	To	B50-YY
3615KL-04W-B10	To	B50-YY
3615KL-05W-B10	To	B50-YY
4710NL-04W-B10	To	B50-YY
4710NL-04T-B10	To	B50-YY
4710NL-05W-B10	To	B50-YY
4710NL-05T-B10	To	B50-YY
4710KL-04W-B10	To	B50-YY
4710KL-04T-B10	To	B50-YY
4710KL-05W-B10	To	B50-YY

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4710KL-05T-B10	To	B50-YY
4712KL-04W-B10	To	B50-YY
4712KL-04T-B10	To	B50-YY
4712KL-05W-B10	To	B50-YY
4712KL-05T-B10	To	B50-YY
4712KL-07W-B10	To	B50-YY
4712KL-07T-B10	To	B50-YY
4715KL-04W-B10	To	B50-YY
4715KL-04T-B10	To	B50-YY
4715KL-05W-B10	To	B50-YY
4715KL-05T-B10	To	B50-YY
4715KL-07W-B10	To	B50-YY
4715KL-07T-B10	To	B50-YY
4715SL-04W-B10	To	B70-YY
4715SL-04T-B10	To	B70-YY
4715SL-05W-B10	To	B70-YY
4715SL-05T-B10	To	B70-YY
4715SL-07W-B10	To	B70-YY
4715SL-07T-B10	To	B70-YY
5910PL-04W-B10	To	B70-YY
5910PL-05W-B10	To	B70-YY
5910PL-07W-B10	To	B70-YY
5920PL-04W-B10	To	B40-YY
5920PL-04T-B10	To	B40-YY
5920PL-05W-B10	To	B40-YY
5920PL-05T-B10	To	B40-YY
6820PL-04W-B10	To	B70-YY
6820PL-04T-B10	To	B70-YY
6820PL-05W-B10	To	B70-YY
6820PL-05T-B10	To	B70-YY
6820PL-07W-B10	To	B70-YY
6820PL-07T-B10	To	B70-YY