

FAN MOTORS



NMBTM

A  **Minebea** Company

Personal Service...Global Reach

Vision

Strength

Innovation

Service

Solutions

Quality

Success



 **NMB-MAT**



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2406KL	5
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3110KL	7
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3612KL	8
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Part Numbering System

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Additional Products

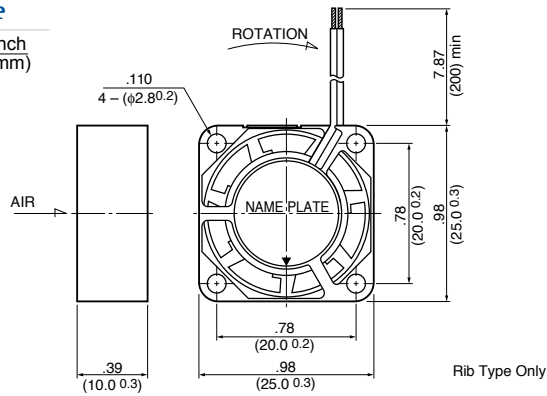
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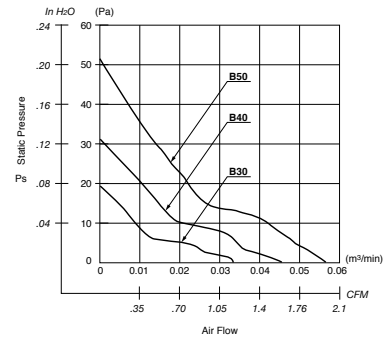
1004KL (25[□] x 10^{-L}) DC Volt: 5, 12 • CFM Range: 1.2 ~ 2.0

Outline

Units: inch (mm)



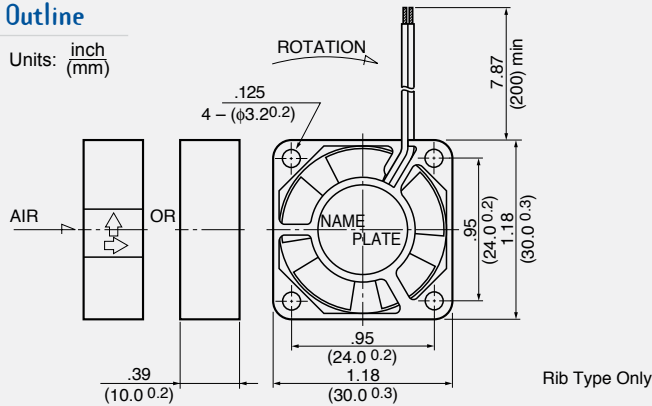
Characteristic Curves



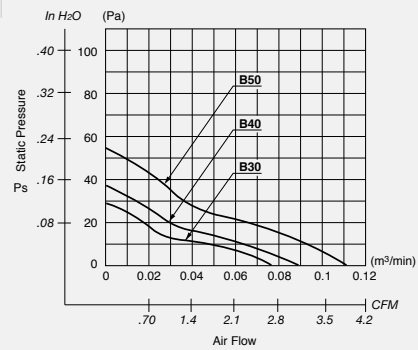
1204KL (30[□] x 10^{-L}) DC Volt: 5, 12 • CFM Range: 2.7 ~ 3.8

Outline

Units: inch (mm)



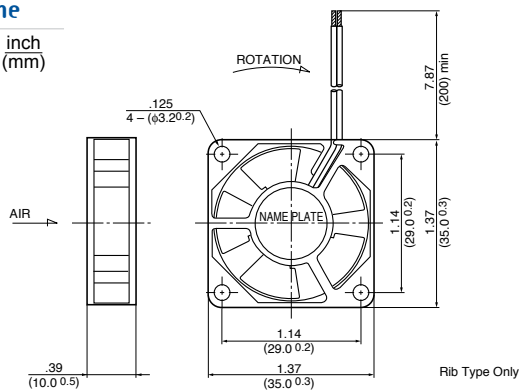
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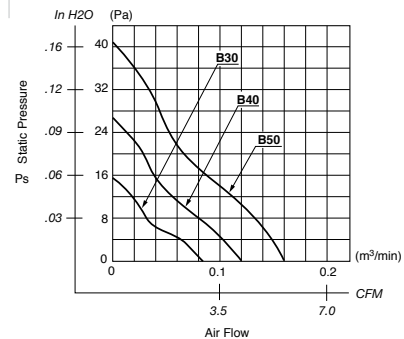
1404KL (35[□] x 10^{-L}) DC Volt: 5, 12 • CFM Range: 3.0 ~ 5.6

Outline

Units: inch (mm)



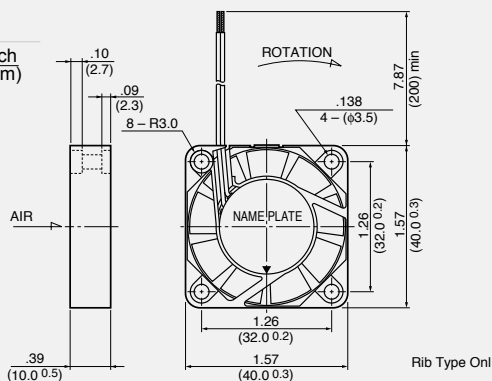
Characteristic Curves



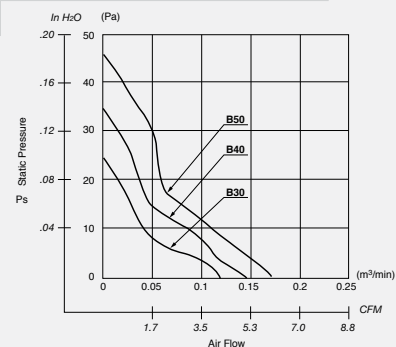
1604KL (40[□] x 10^{-L}) DC Volt: 5, 12 • CFM Range: 4.2 ~ 6.0

Outline

Units: inch (mm)



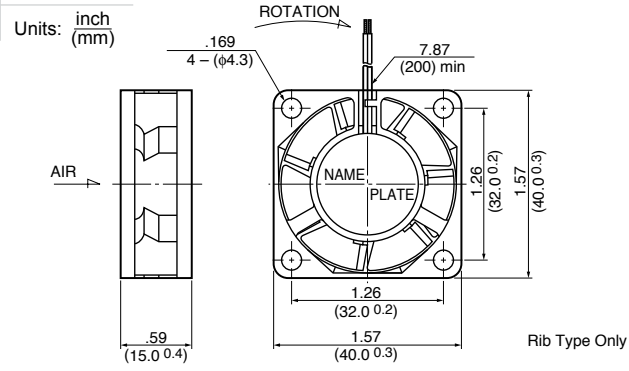
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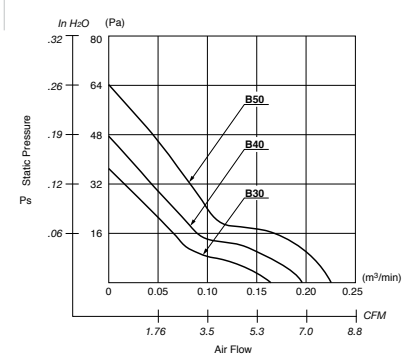


1606KL (40[□] x 15^L) DC Volt: 5, 12, 24 • CFM Range: 6.0 ~ 8.1

Outline

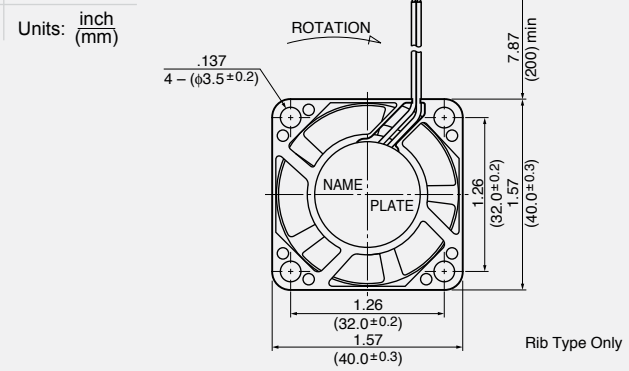


Characteristic Curves

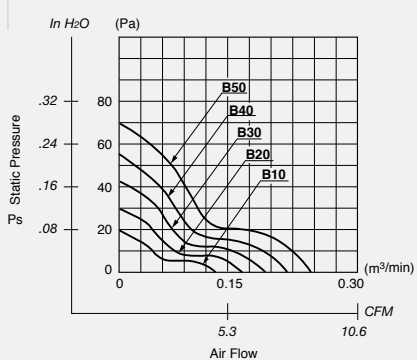


1608KL (40[□] x 20^L) DC Volt: 5, 12, 24 • CFM Range: 4.9 ~ 9.5

Outline

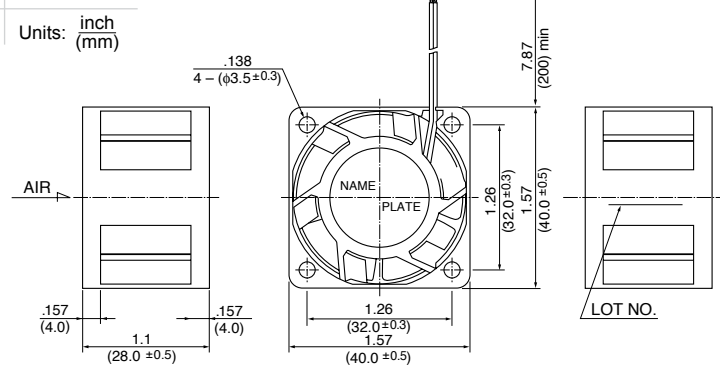


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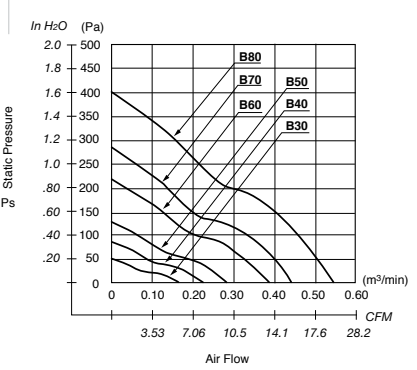


1611RL (40[□] x 28^L) DC Volt: 12 • CFM Range: 6.0 ~ 19.4

Outline

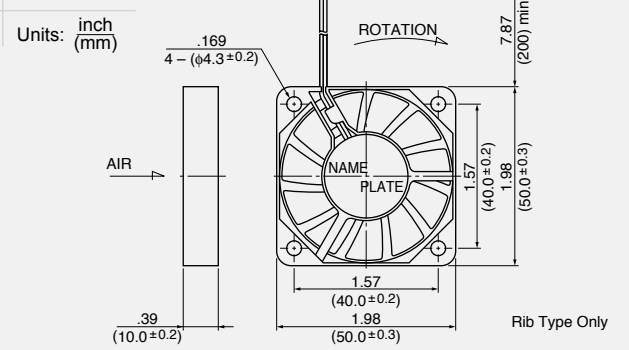


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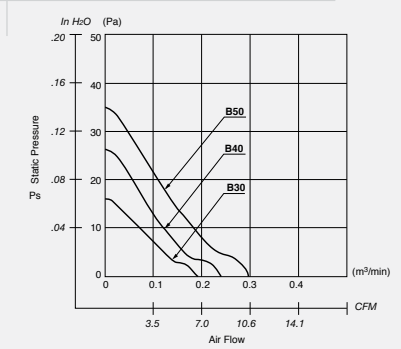


2004KL (50[□] x 10^L) DC Volt: 5, 12 • CFM Range: 6.4 ~ 10.2

Outline



Characteristic Curves

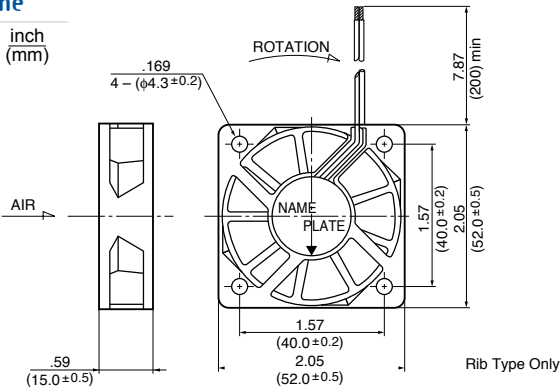




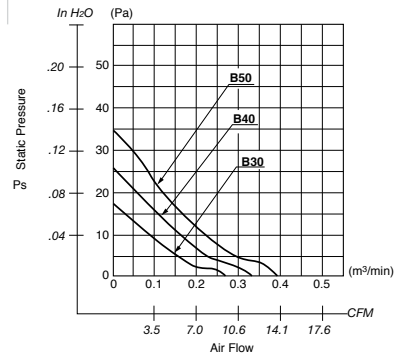
2106KL (52[□] x 15^L) DC Volt: 12 • CFM Range: 9.9 ~ 14.1

Outline

Units: inch
(mm)



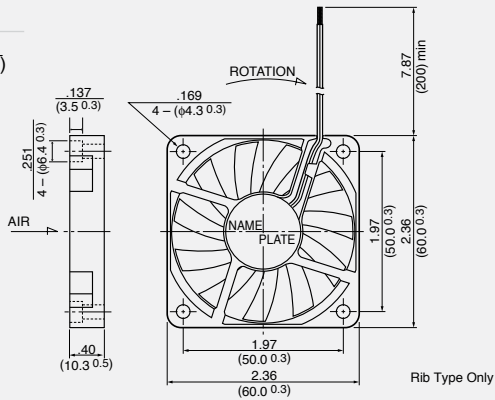
Characteristic Curves



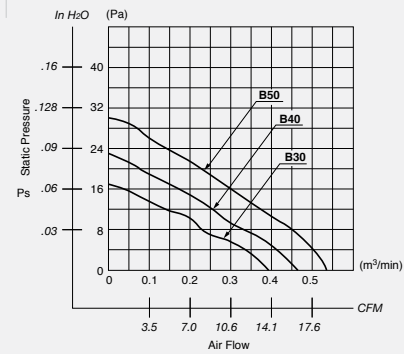
2404KL (60[□] x 10^L) DC Volt: 12 • CFM Range: 13.7 ~ 19.0

Outline

Units: inch
(mm)



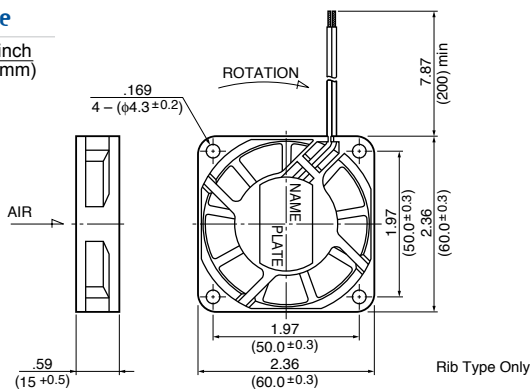
Characteristic Curves



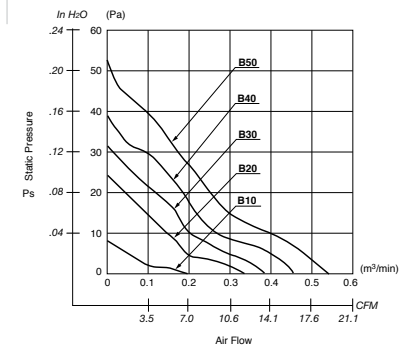
2406KL (60[□] x 15^L) DC Volt: 12, 24 • CFM Range: 6.7 ~ 18.3

Outline

Units: inch
(mm)



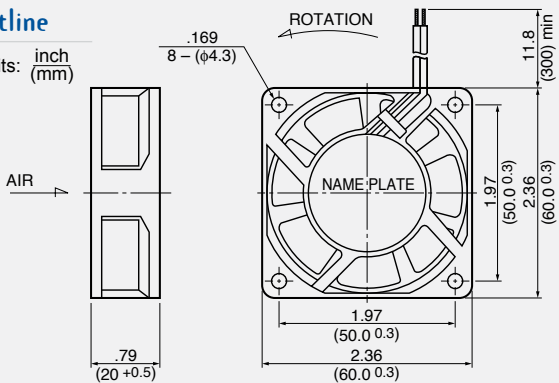
Characteristic Curves



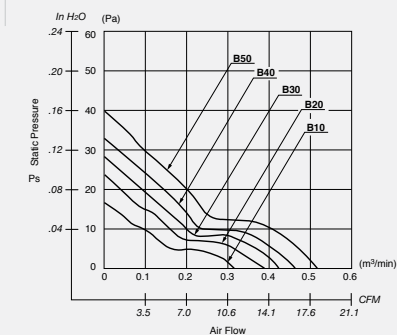
2408NL (60[□] x 20^L) DC Volt: 12, 24 • CFM Range: 10.9 ~ 17.6

Outline

Units: inch
(mm)



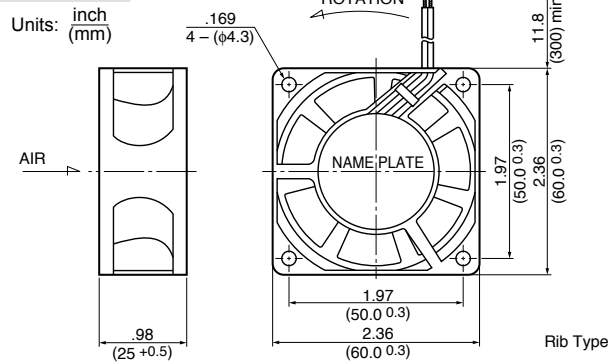
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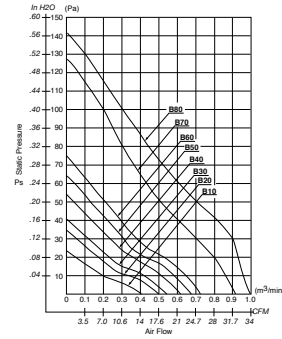


2410ML (60[□] x 25^L) DC Volt: 12, 24 • CFM Range: 13.7 ~ 37.0

Outline

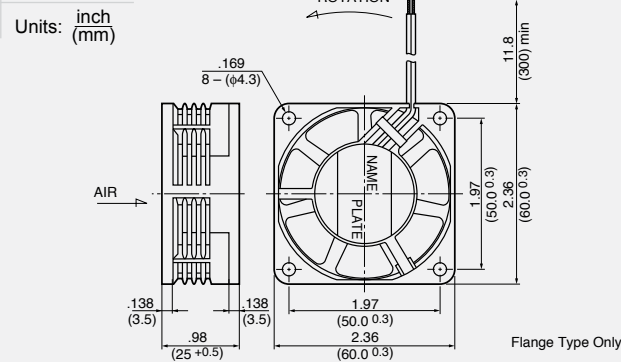


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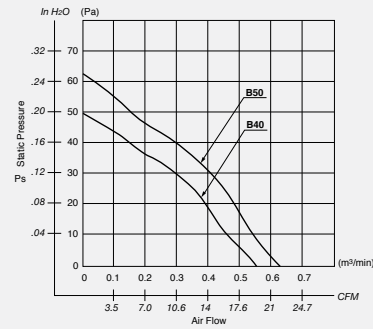


2410ML-X (60[□] x 25^L) DC Volt: 12 • CFM Range: 19.7 ~ 22.2

Outline

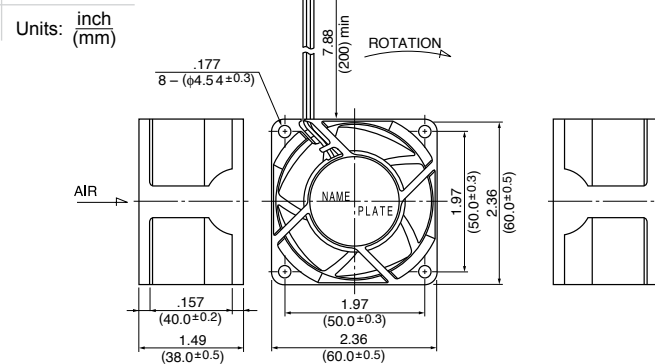


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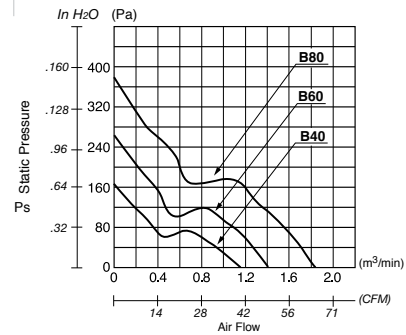


2415KL (60[□] x 38^L) DC Volt: 12 • CFM Range: 39.5 ~ 64.9

Outline

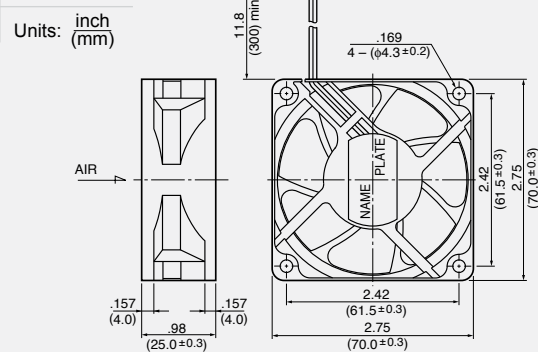


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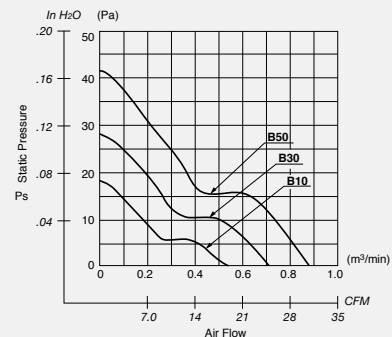


2810KL (70[□] x 25^L) DC Volt: 12 • CFM Range: 19.0 ~ 40.6

Outline



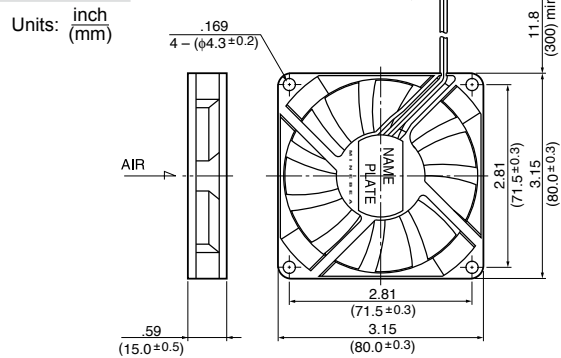
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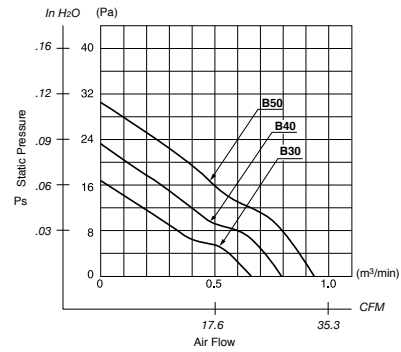


3106KL (80[□] x 15^{-L}) DC Volt: 12 • CFM Range: 23.3 ~ 32.8

Outline

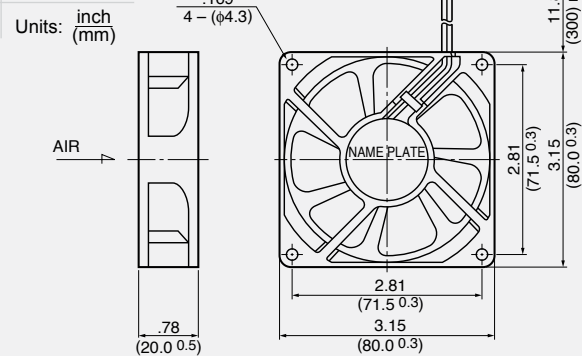


Characteristic Curves

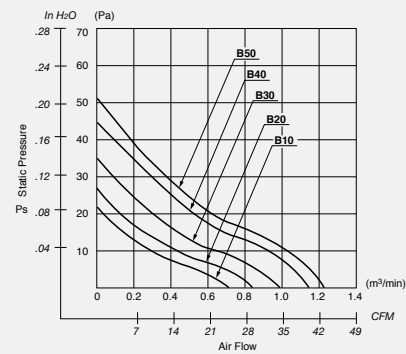


3108NL (80[□] x 20^{-L}) DC Volt: 12, 24 • CFM Range: 26.5 ~ 44.0

Outline

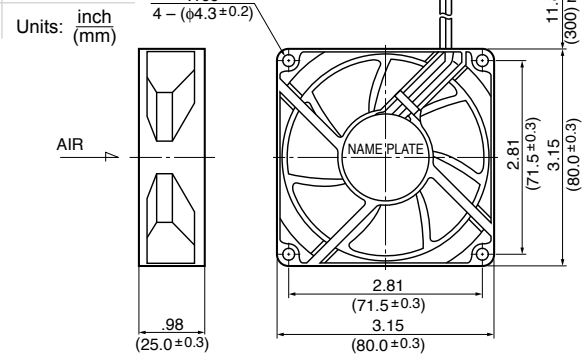


Characteristic Curves

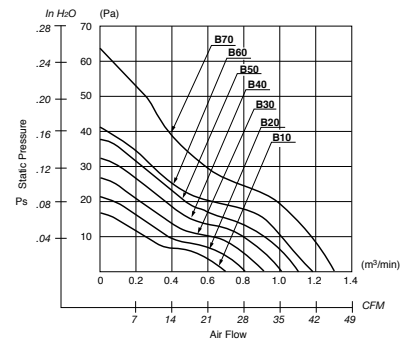


3110KL (80[□] x 25^{-L}) DC Volt: 12, 24 • CFM Range: 24.7 ~ 45.8

Outline

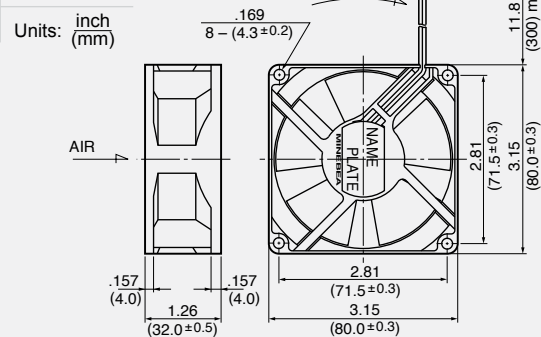


Characteristic Curves

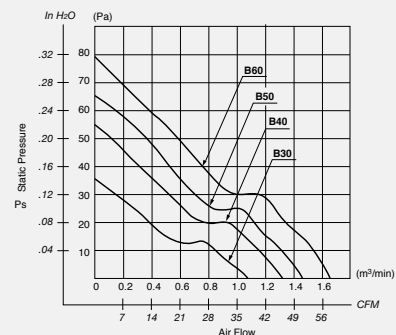


3112KL (80[□] x 32^{-L}) DC Volt: 12, 24 • CFM Range: 38.1 ~ 58.6

Outline



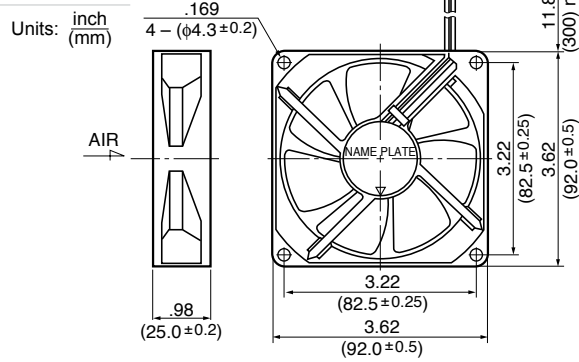
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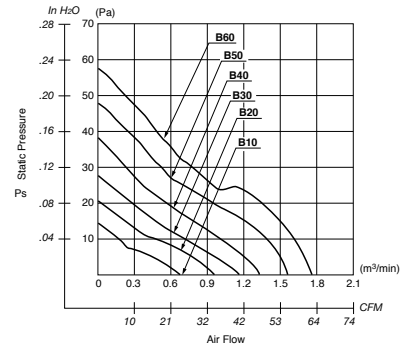


3610KL (92[□] x 25^L) DC Volt: 12, 24 • CFM Range: 26.5 ~ 61.8

Outline

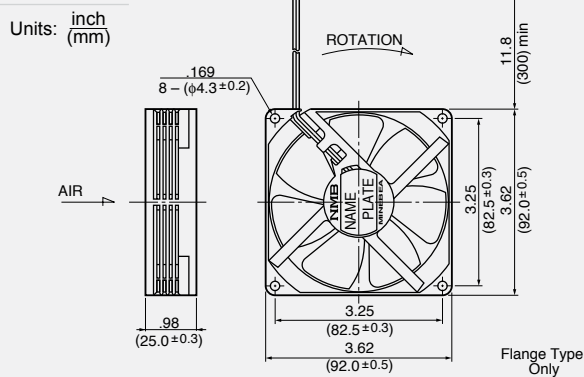


Characteristic Curves

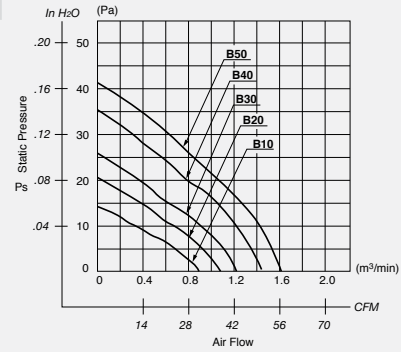


3610KL-X (92[□] x 25^L) DC Volt: 12, 24 • CFM Range: 31.4 ~ 62.8

Outline

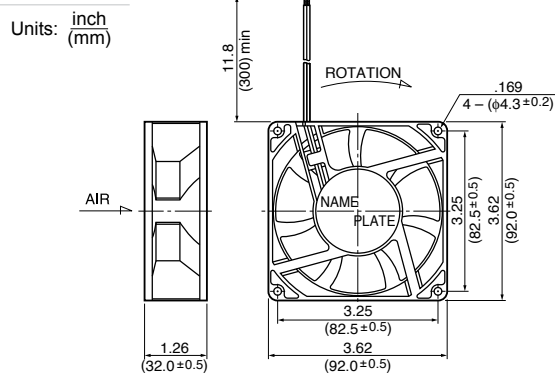


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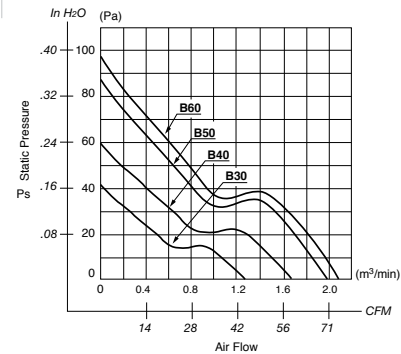


3612KL (92[□] x 32^L) DC Volt: 12, 24 • CFM Range: 47.3 ~ 70.5

Outline

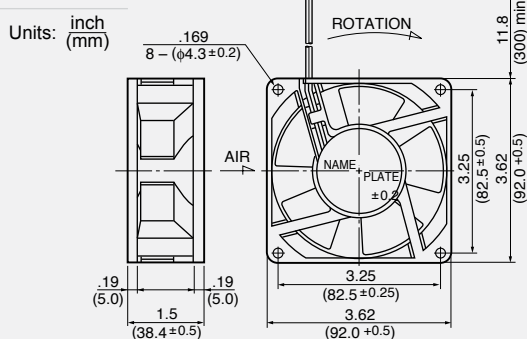


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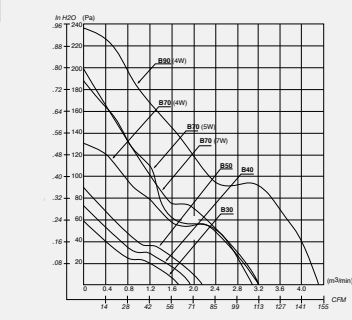


3615KL (92[□] x 38^L) DC Volt: 12, 24, 48 • CFM Range: 60.3 ~ 151.7

Outline



Characteristic Curves

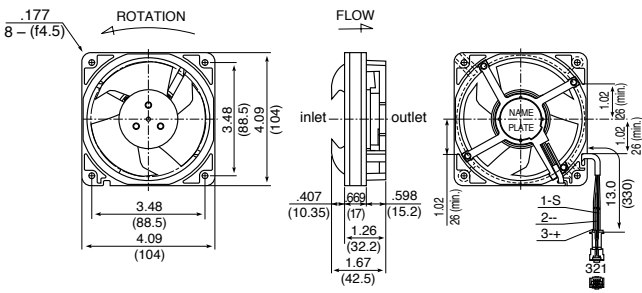




FBA10J12L (104[□] × 42^L) DC Volt: 12 • CFM Range: 38.8

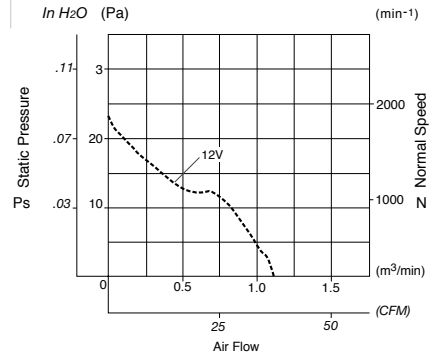
Outline

Units: $\frac{\text{inch}}{\text{mm}}$



Housing with solid corner type are available.

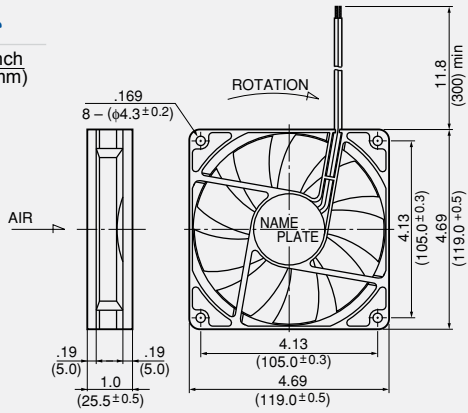
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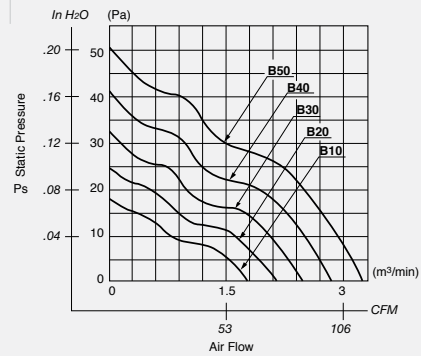
4710KL (119[□] × 25^L) DC Volt: 12, 24 • CFM Range: 63.5 ~ 114.7

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



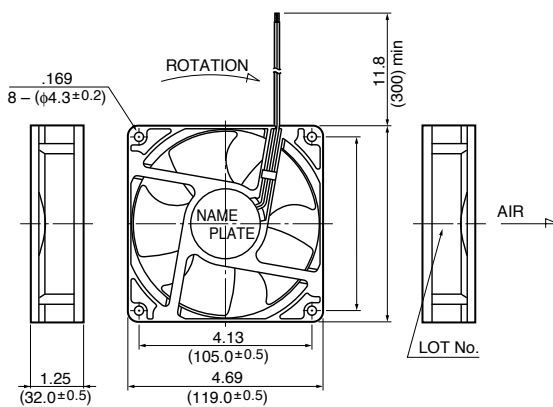
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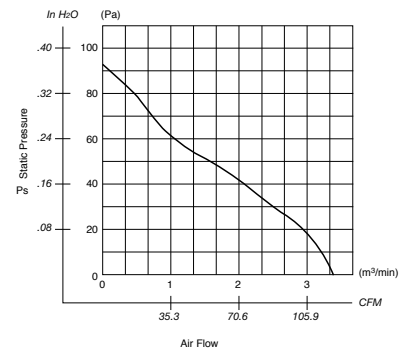
4712FL (119[□] × 32^L) DC Volt: 48 • CFM Range: 120.0

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



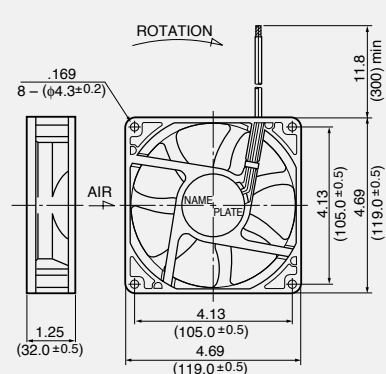
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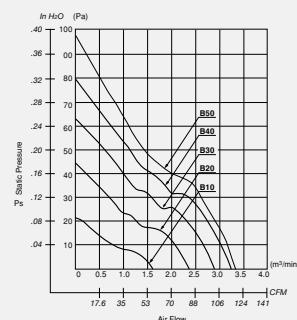
4712KL (119[□] × 32^L) DC Volt: 12, 24, 48 • CFM Range: 56.1 ~ 116.4

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



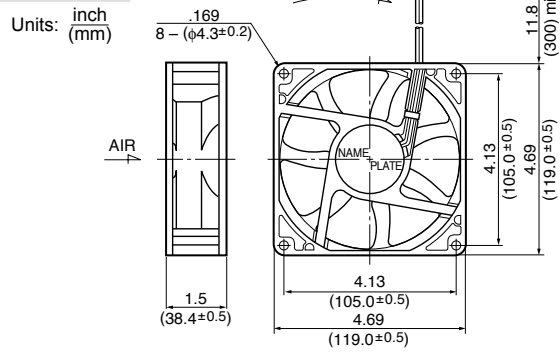
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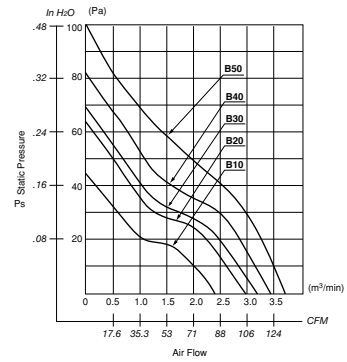


4715KL (119[□] x 38^L) DC Volt: 12, 24, 48 • CFM Range: 83.6 ~ 130.0

Outline

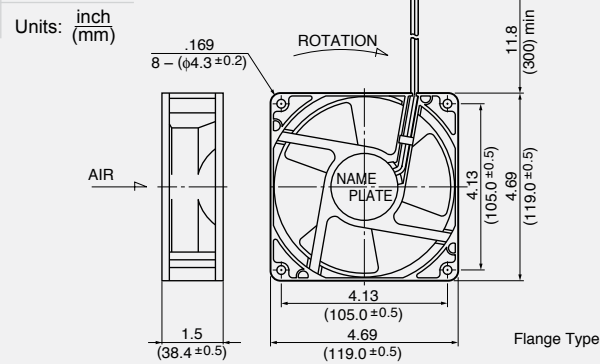


Characteristic Curves

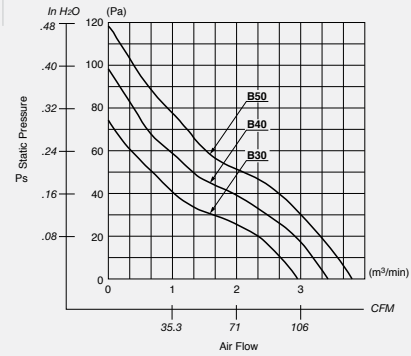


4715KL-3 BLADE (119[□] x 38^L) DC Volt: 12, 24, 48 • CFM Range: 105.0 ~ 132.0

Outline

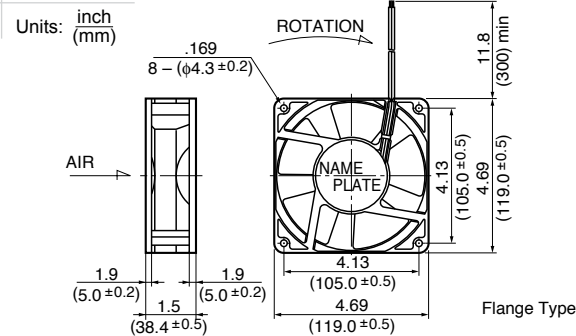


Characteristic Curves

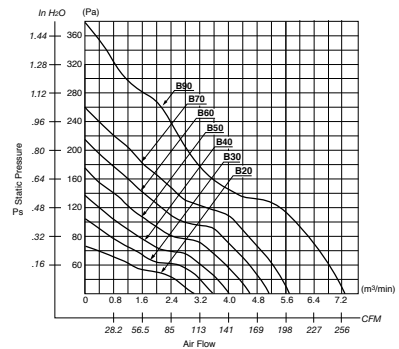


4715SL (119[□] x 38^L) DC Volt: 12, 24, 48 • CFM Range: 102.7 ~ 257.6

Outline

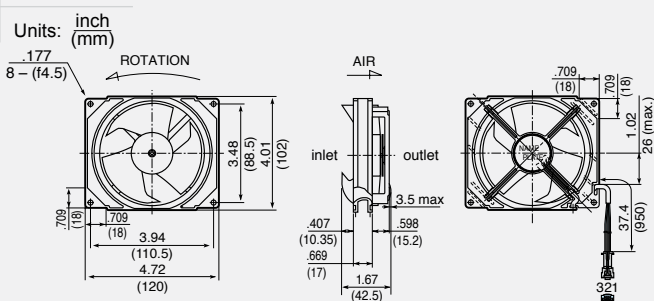


Characteristic Curves

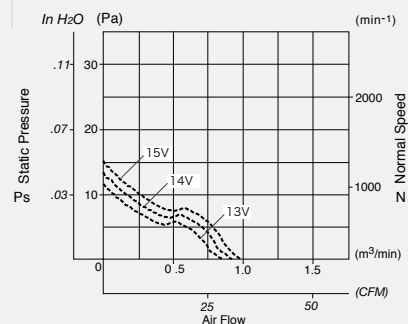


FBA10B14L (120[□] x 42^L) DC Volt: 14 • CFM Range: 32.1

Outline



Characteristic Curves

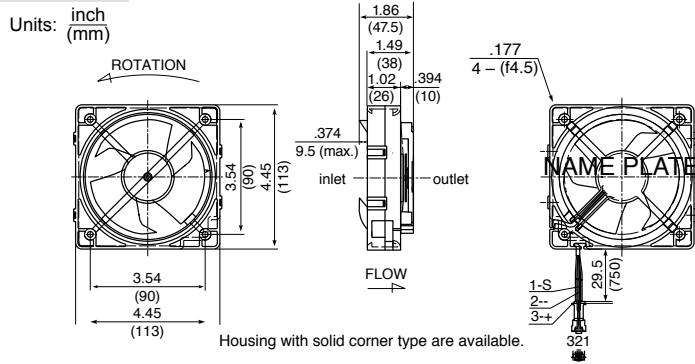


Housing with solid corner type are available.

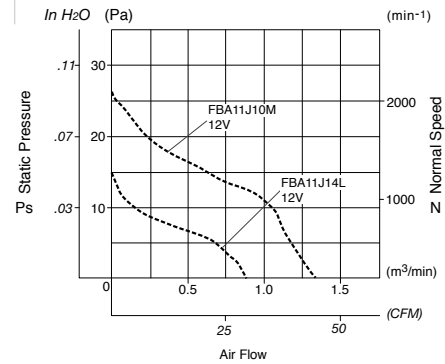


FBA11J10M/14L (113[□] x 47^L) DC Volt: 9, 14 • CFM Range: 36.0 ~ 39.5

Outline

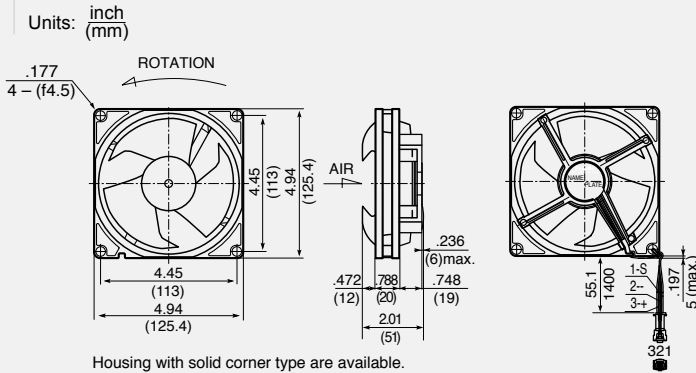


Characteristic Curves

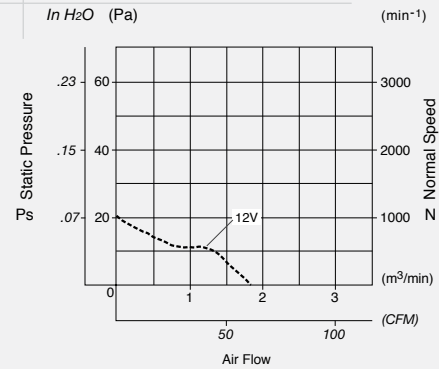


FBA12J12M (125.4[□] x 51^L) DC Volt: 12 • CFM Range: 65.3

Outline

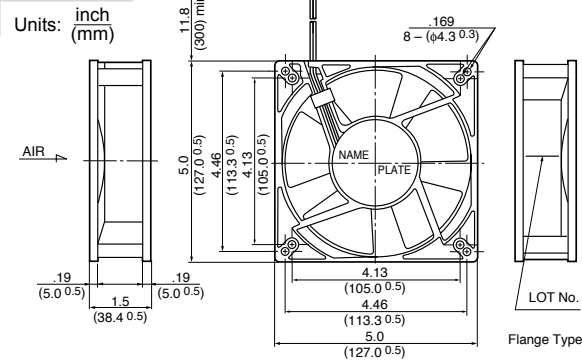


Characteristic Curves

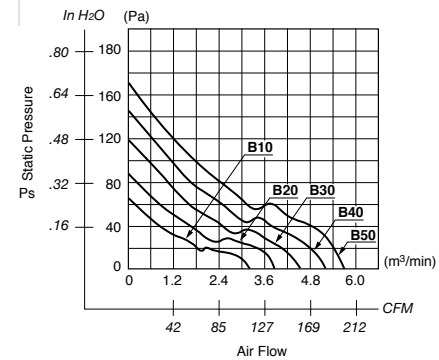


5015KL (127[□] x 38^L) DC Volt: 12, 24, 48 • CFM Range: 115.0 ~ 199.0

Outline

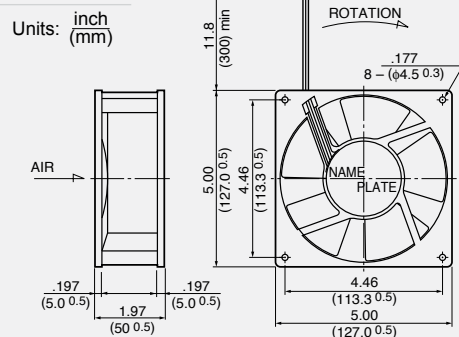


Characteristic Curves

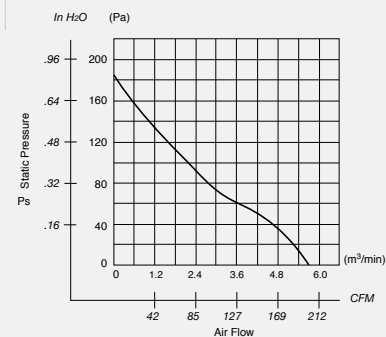


5020KL (127[□] x 50^L) DC Volt: 12 • CFM Range: 198.7

Outline



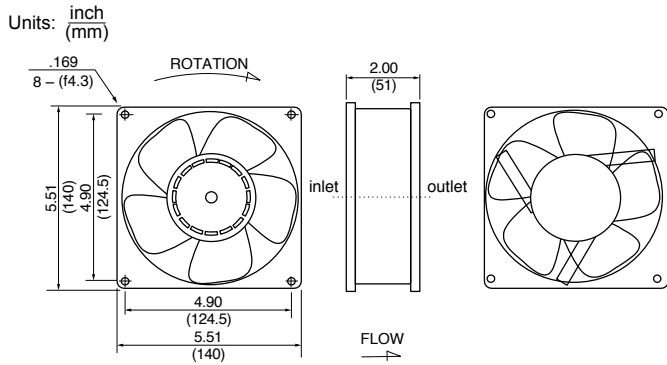
Characteristic Curves



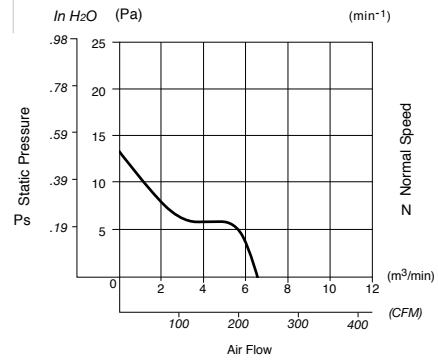


FBX14 (140[□] x 51^L) DC Volt: 48 • CFM Range: 219.0

Outline

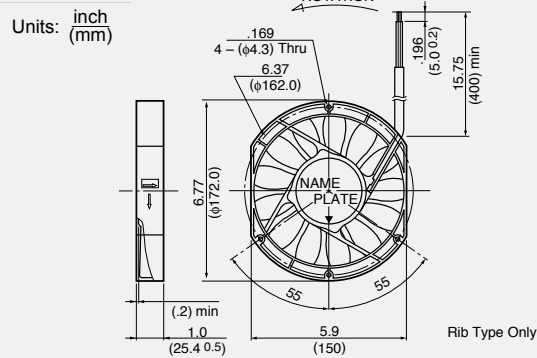


Characteristic Curves

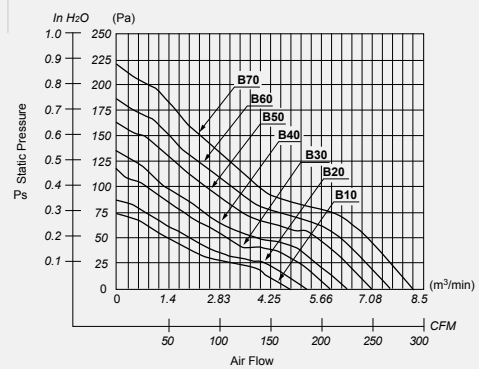


5910PL (150 x Ø172 x 25^L) DC Volt: 12, 24, 48 • CFM Range: 158.8 ~ 268.2

Outline

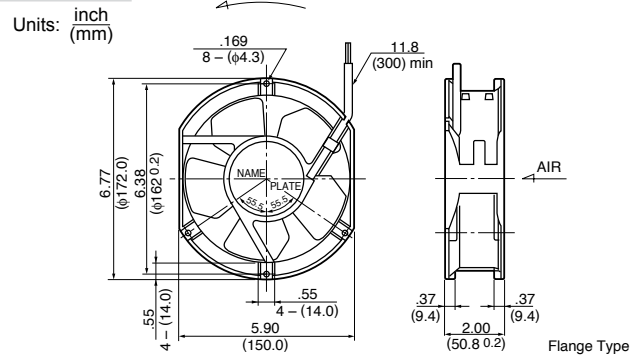


Characteristic Curves

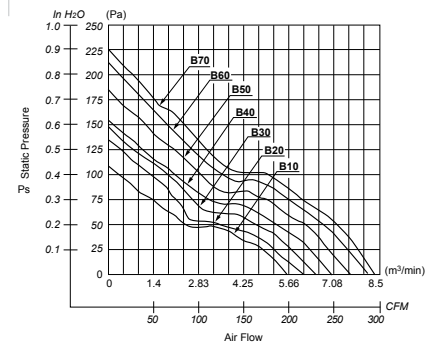


5920PL (150 x Ø172 x 50^L) DC Volt: 12, 24, 48 • CFM Range: 180.0 ~ 300.0

Outline

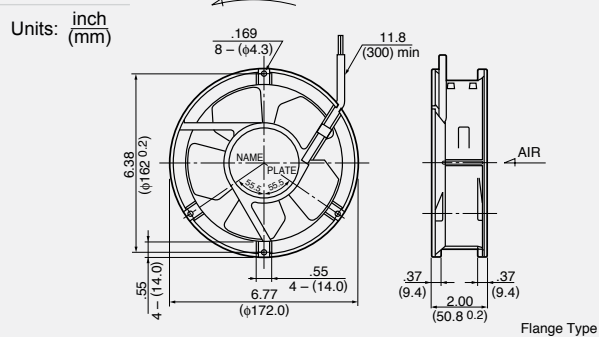


Characteristic Curves

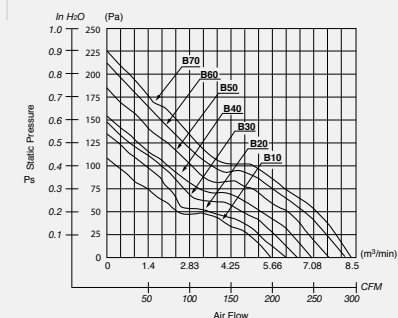


6820PL (Ø172 x 50^L) DC Volt: 12, 24, 48 • CFM Range: 180.0 ~ 300.0

Outline



Characteristic Curves

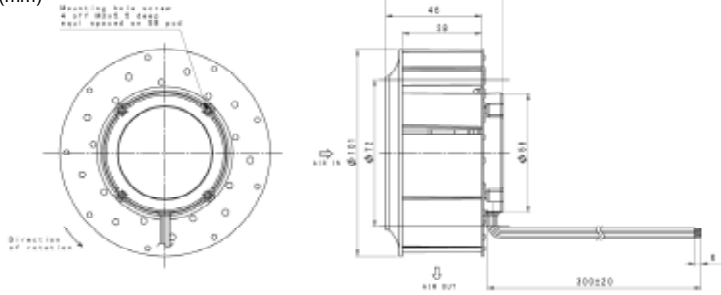




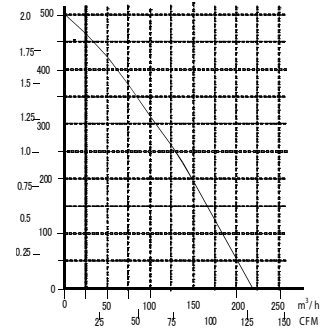
101R057 (∅101 x 57^L) DC Volt: 24, 48 • CFM Range: 137.1

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



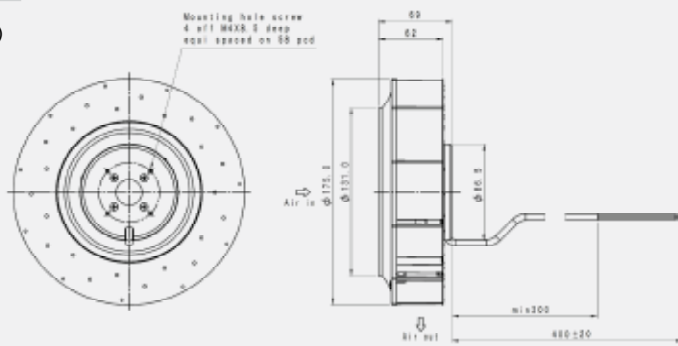
Characteristic Curves



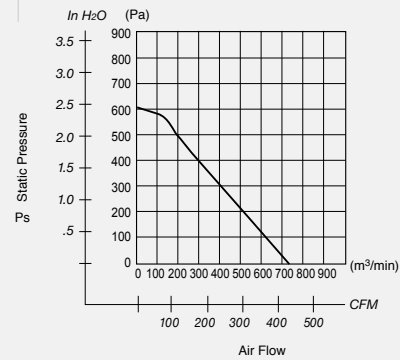
175R069 (∅175 x 69^L) DC Volt: 24, 48 • CFM Range: 432.6

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



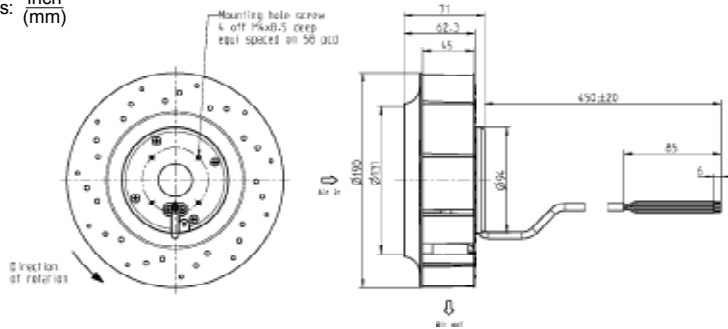
Characteristic Curves



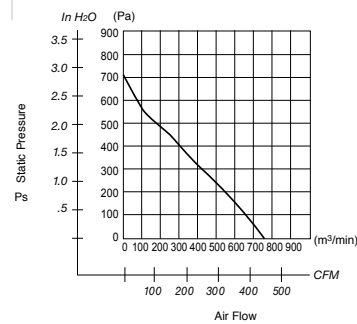
190R071 (∅190 x 71^L) DC Volt: 24, 48 • CFM Range: 432.0

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



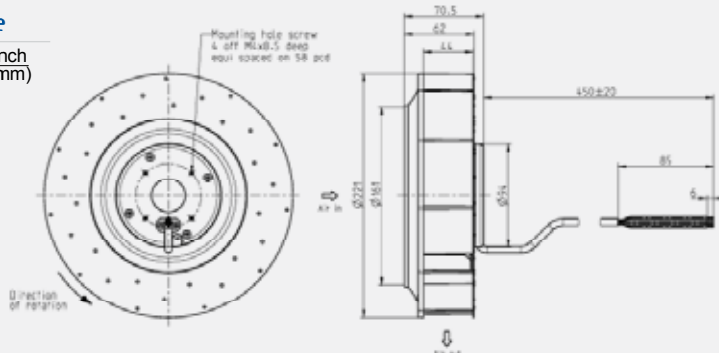
Characteristic Curves



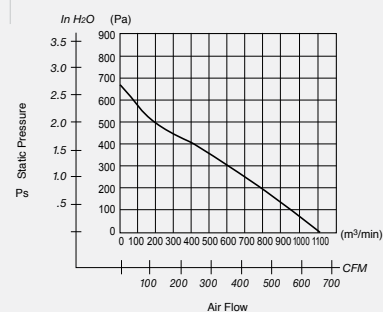
220R071 (∅221 x 71^L) DC Volt: 24, 48 • CFM Range: 648.6

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



Characteristic Curves

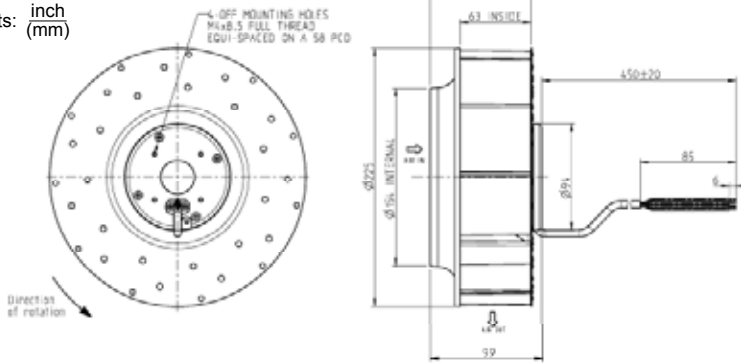




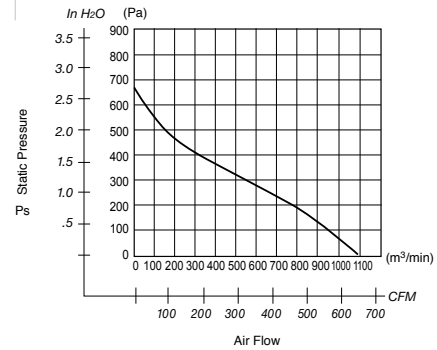
225R099 (∅225 x 99L) DC Volt: 24, 48 • CFM Range: 679.2

Outline

Units: inch (mm)



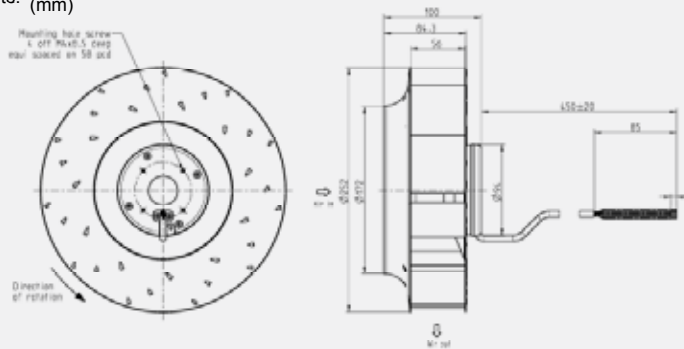
Characteristic Curves



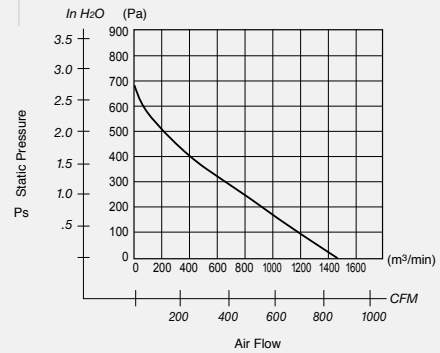
250R100 (∅252 x 100L) DC Volt: 24, 48 • CFM Range: 855.7

Outline

Units: inch (mm)



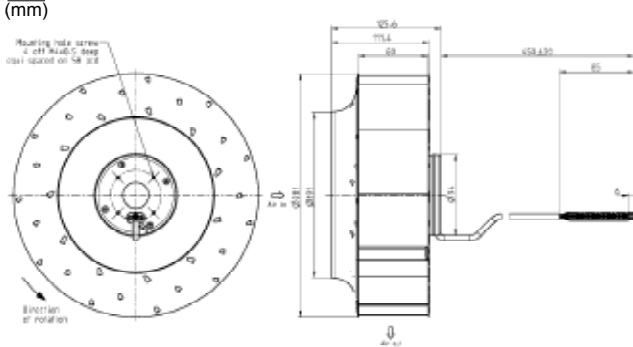
Characteristic Curves



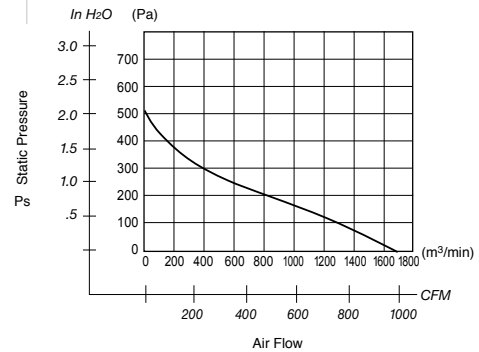
280R125 (∅281 x 125L) DC Volt: 24, 48 • CFM Range: 974.6

Outline

Units: inch (mm)



Characteristic Curves

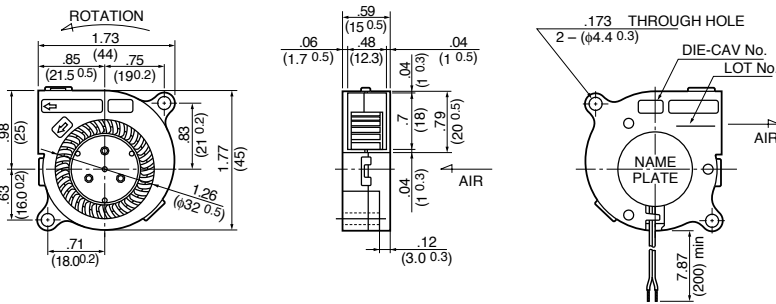




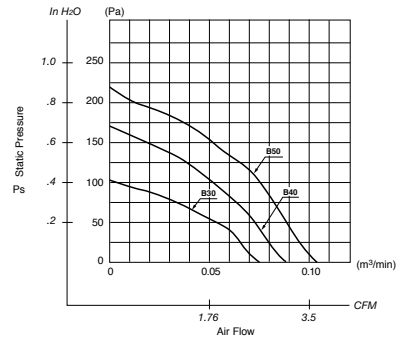
BM4515 (45[□] x 15^L) DC Volt: 12 • CFM Range: 2.6 ~ 3.5

Outline

Units: inch (mm)



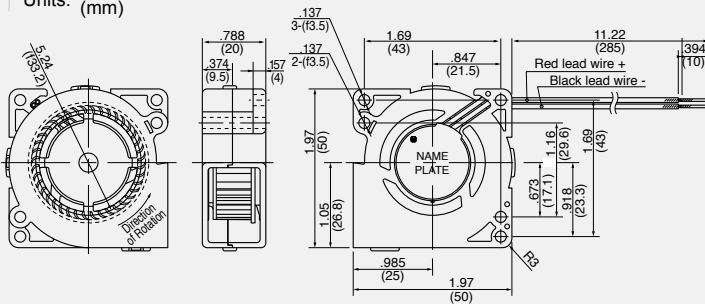
Characteristic Curves



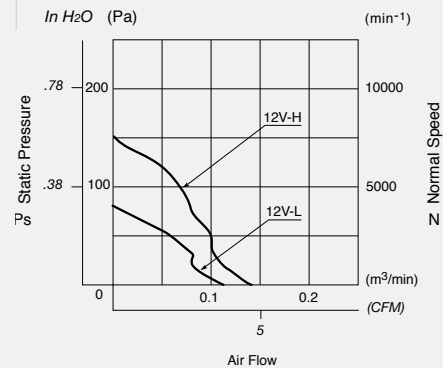
FAL3F (50[□] x 20^L) DC Volt: 5, 12, 24 • CFM Range: 3.95 ~ 4.87

Outline

Units: inch (mm)



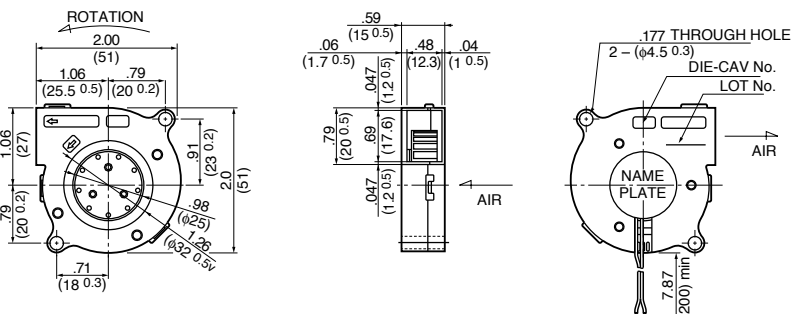
Characteristic Curves



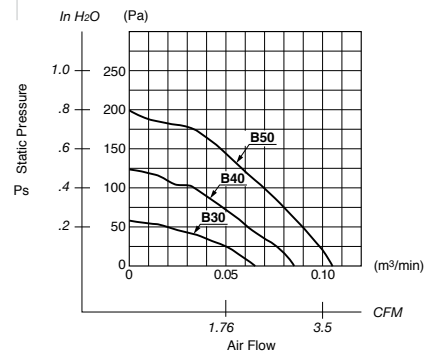
BM5115 (Ø51 x 15^L) DC Volt: 12 • CFM Range: 2.1 ~ 3.5

Outline

Units: inch (mm)



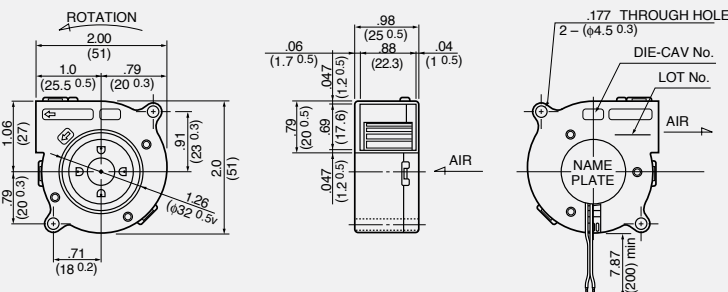
Characteristic Curves



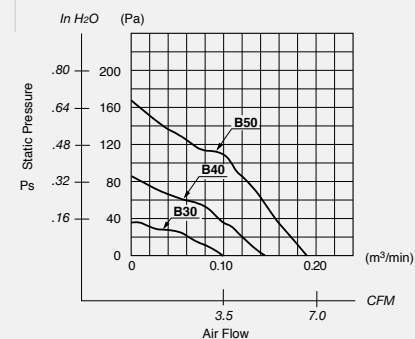
BM5125 (Ø51 x 25^L) DC Volt: 12 • CFM Range: 3.5 ~ 6.7

Outline

Units: inch (mm)



Characteristic Curves

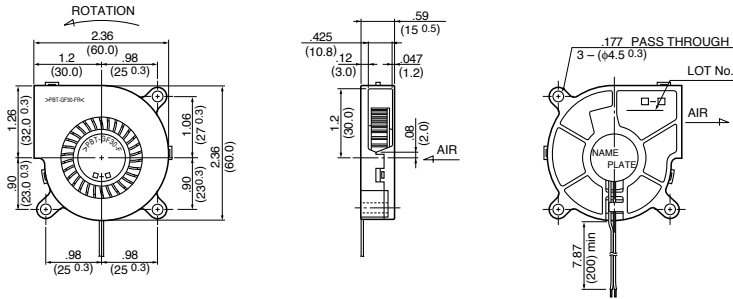




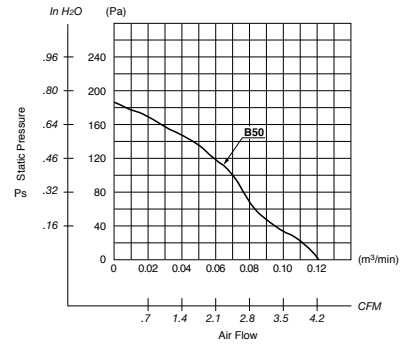
BM6015 (Ø60 x 15^L) DC Volt: 12 • CFM Range: 4.2

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



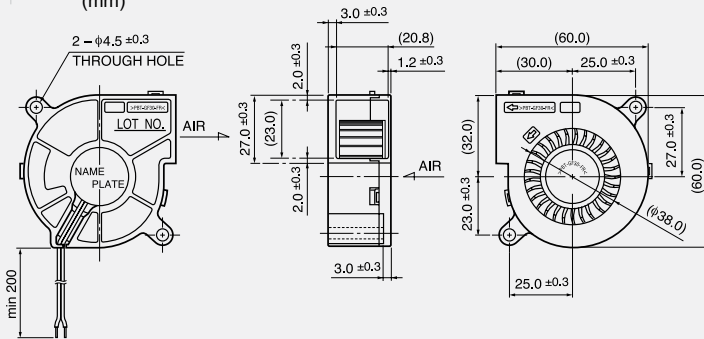
Characteristic Curves



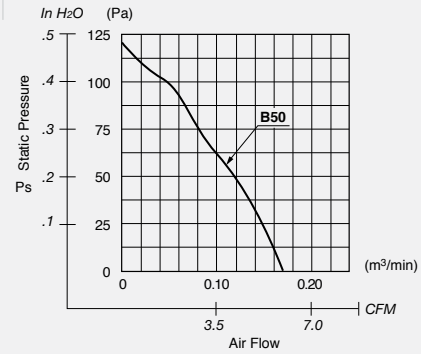
BM6025 (Ø60 x 25^L) DC Volt: 12 • CFM Range: 6.0

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



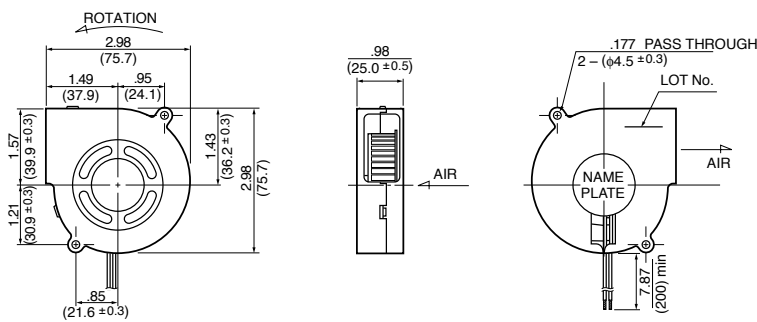
Characteristic Curves



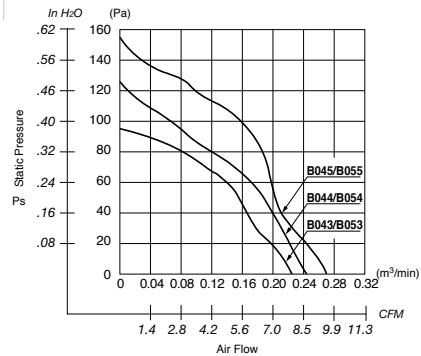
BG0702 (Ø75 x 25^L) DC Volt: 12, 24 • CFM Range: 7.76 ~ 9.50

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



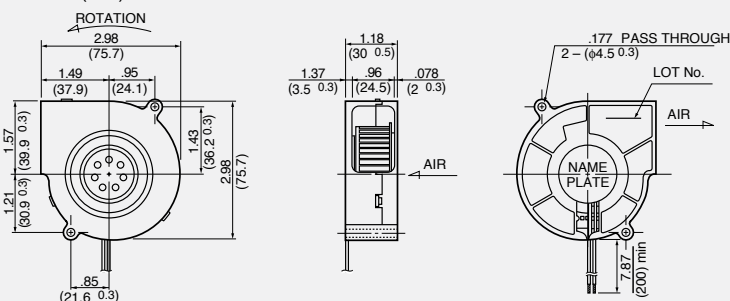
Characteristic Curves



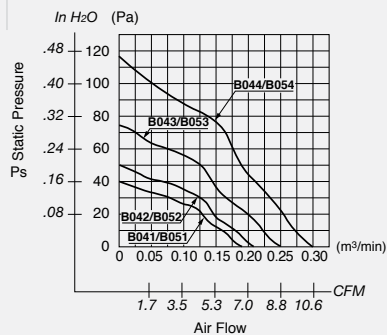
BG0703 (Ø75 x 30^L) DC Volt: 12, 24 • CFM Range: 6.7 ~ 10.6

Outline

Units: $\frac{\text{inch}}{\text{mm}}$



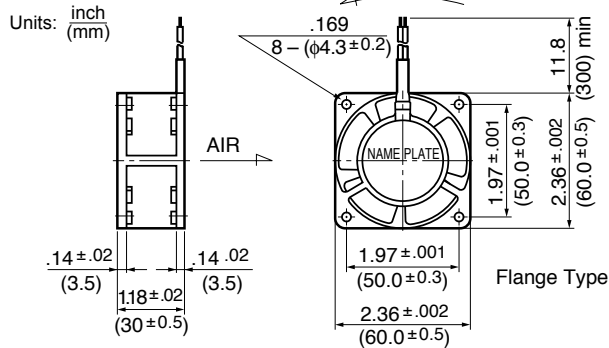
Characteristic Curves



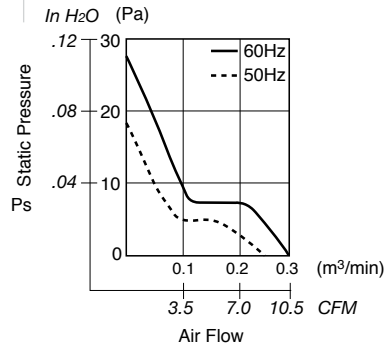


2412PS (60[□] × 30^L) AC Volt: 100, 115 • CFM Range: 7.0 ~ 9.1

Outline

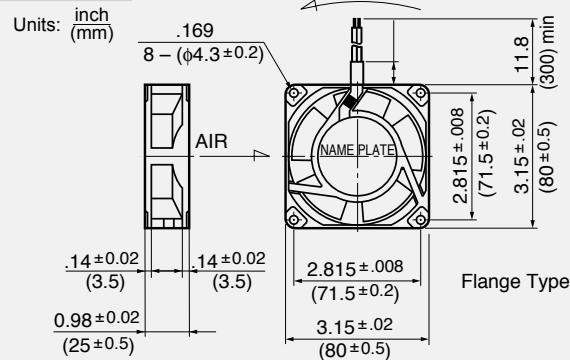


Characteristic Curves

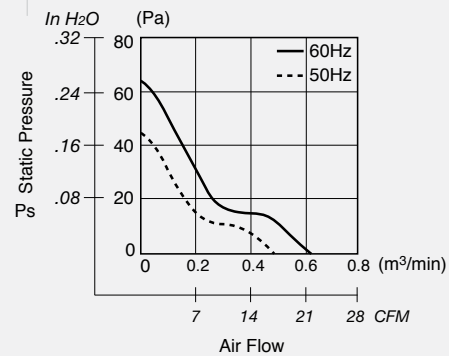


3110PS (80[□] × 25^L) AC Volt: 115 • CFM Range: 16.2 ~ 19.7

Outline

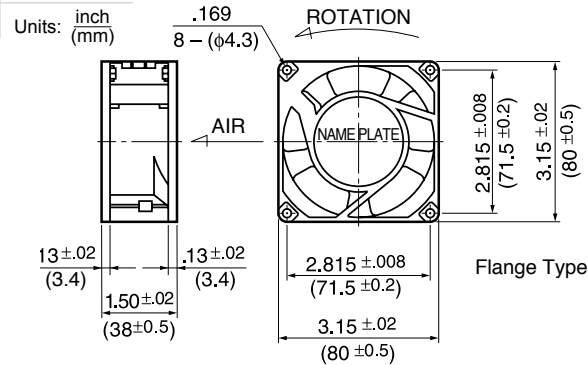


Characteristic Curves

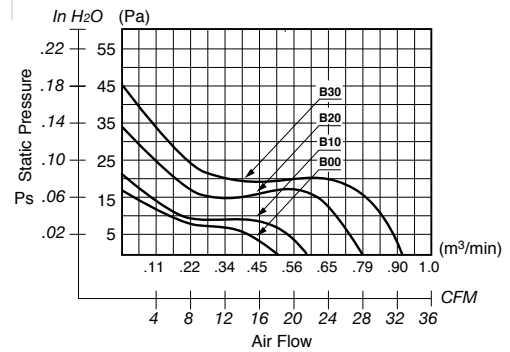


3115FS (80[□] × 38^L) AC Volt: 115, 230 • CFM Range: 18.0 ~ 33.0

Outline

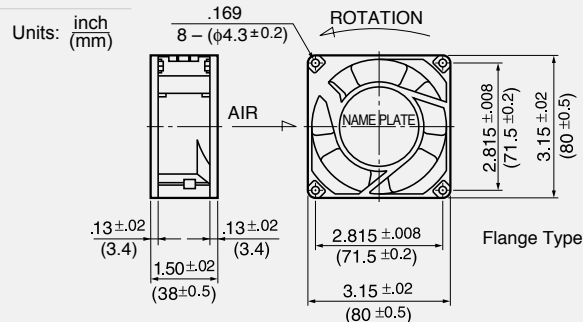


Characteristic Curves

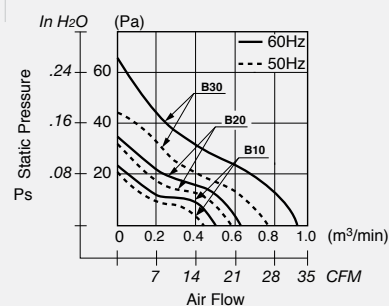


3115PS (80[□] × 38^L) AC Volt: 115, 230 • CFM Range: 17.6 ~ 32.0

Outline



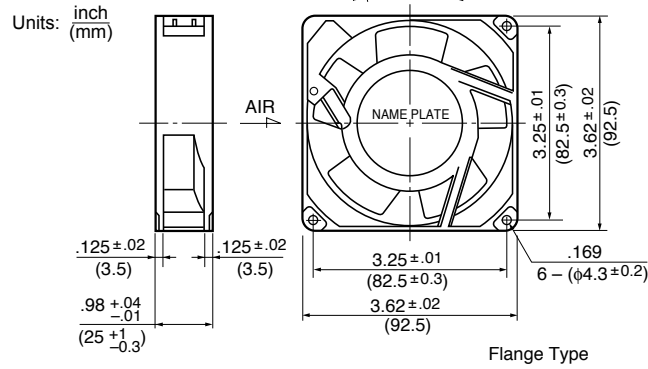
Characteristic Curves



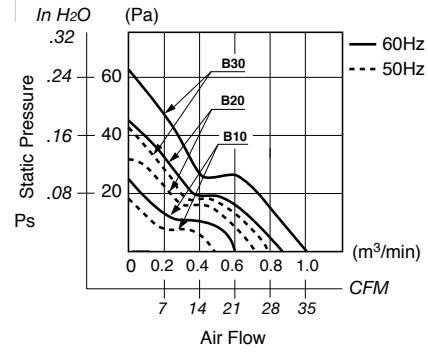


3610PS (92[□] x 25^L) AC Volt: 115, 230 • CFM Range: 16.0 ~ 34.5

Outline

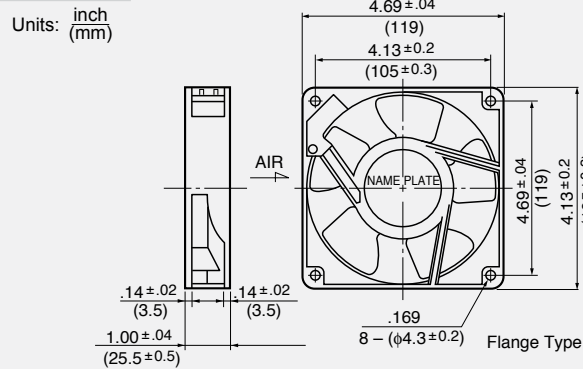


Characteristic Curves

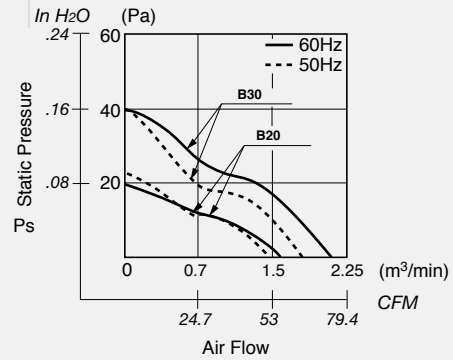


4710PS (119[□] x 25^L) AC Volt: 115, 230 • CFM Range: 49.4 ~ 70.6

Outline

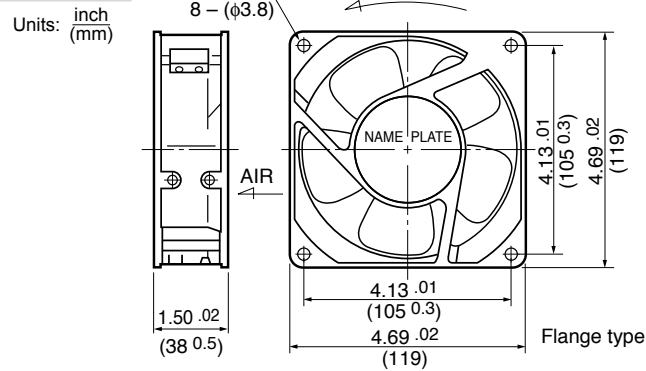


Characteristic Curves



4715FS (119[□] x 38^L) AC Volt: 115, 230 • CFM Range: 55.0 ~ 110.0

Outline



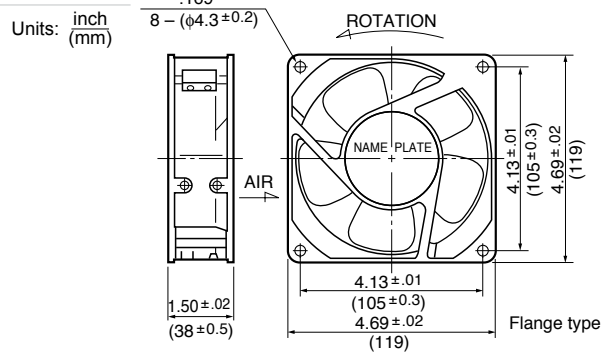
Characteristic Curves

CURVE NOT AVAILABLE

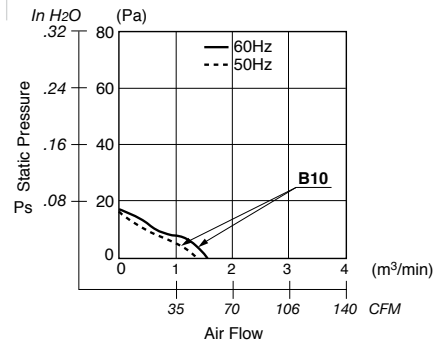


4715MS (119[□] x 38^L) AC Volt: 115, 230 • CFM Range: 45.9 ~ 102.0

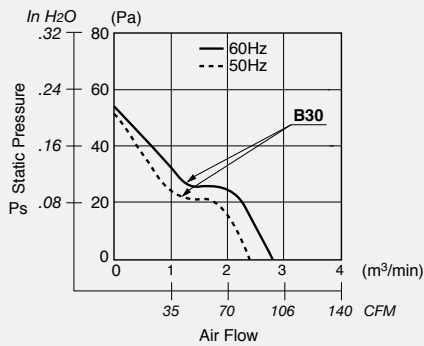
Outline



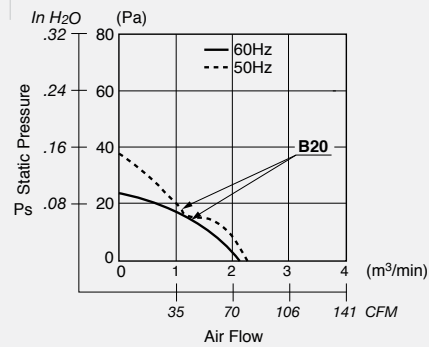
Characteristic Curves



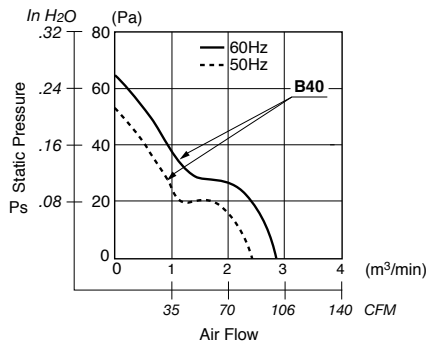
Characteristic Curves



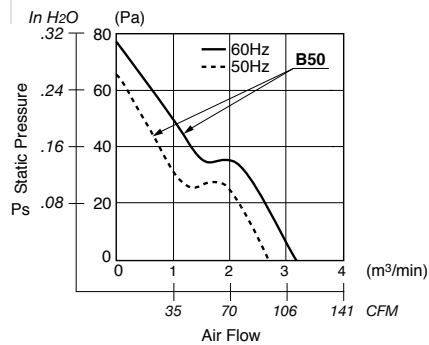
Characteristic Curves



Characteristic Curves

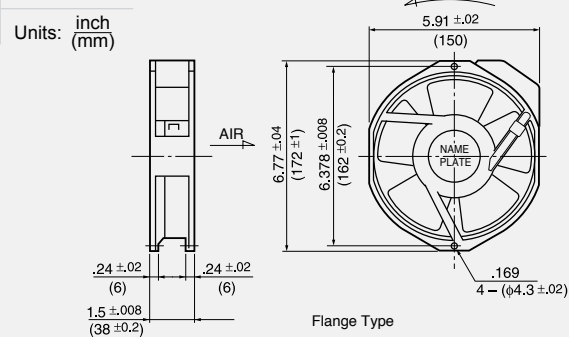


Characteristic Curves

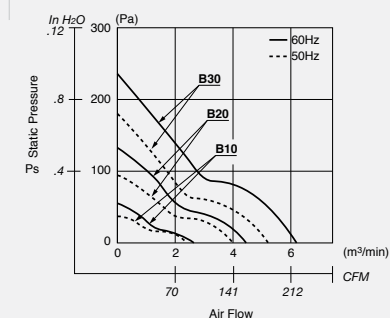


5915PC (150 x 172 x 38^L) AC Volt: 115, 230 • CFM Range: 84.7 ~ 212.0

Outline



Characteristic Curves





Part Numbering System

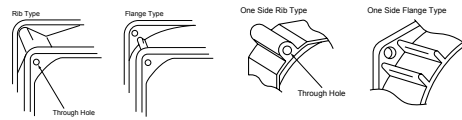
- Frame Size
10:25mm
12:30mm
14:35mm
16:40mm
20:50mm
21:52mm
24:60mm
28:70mm
31:80mm
36:92mm
47:119mm
50:127mm
59:150mm
68:172mm
- Overall Length (Thickness)
04:10mm
06:15mm
08:20mm
10:25mm
12:32mm
15:38mm
20:50mm
- Series
P Series
M Series
N Series
K Series
H Series
S Series
F Series
R Series
- Motor Function
Brushless Type DCM
- Input Voltage
O: Standard Current
C: Special Current
D~Z: Special Current (A.B.O. are not used)
- Termination
W: Lead Wires
T: Terminal (Terminal option on 3610KL and 4715KL Series)

24 10 M L - 04 W - B 1 0 - X 00
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- Bearing
B: Ball Bearing
S: Sleeve Bearing
- Speed
1<2<3<4<5<6<7<8
low high
- Special Control Function
0: Standard Type
9: Sensor Type
7: Temperature Detecting Variable Speed Type/PWM Control Type
- Temperature Detecting Variable Speed Type/Sensor Type
5: 2-Speed Type/Sensor Type
8: 2-Speed Type
- Product Number
Item Classification Mounting Style
L: Standard Model Rib Type
P: Standard Model Flange Type
B: Standard Model Rib Type
E: Standard Model Flange Type
G: Standard Model Rib Type
D: Standard Model Flange Type
T: Value Model Rib Type
- Value Model Flange Type
Value Model Rib Type
Value Model Flange Type
Value Model One Side Rib Type
Value Model One Side Flange Type
Value Model Rib Type
Value Model Flange Type
Vented Casing Flange Type

11. Individual Specifications

- Standard
00 Standard
01~99: Custom
- Sensor Type
00: Locked Rotor Alarm Signal (Standard)
01~49: Locked Rotor Alarm Signal (Custom)
50: Tachometer Signal (Standard)
51~99: Tachometer Signal (Custom)



BM Series Part Numbering System

- Series
BM Series
- Size
45: 45mm
51: 51mm
60: 60mm
- Thickness
15: 15mm
25: 25mm
- Input Voltage
O: Standard Current
C: Special Current
D~Z: Special Current (A.B.O. are not used)
- Termination
Lead Wire
- Bearing
B: Ball Bearing
S: Sleeve Bearing
- Speed
1<2<3<4<5
low high

BM 51 15 - 04 W - B 3 0 - L 00
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

- Special Control Function
0: Standard Type
9: Sensor Type
8: 2-Speed Type
7: Temperature Detecting Variable Speed Type/PWM Control Type
6: Temperature Detecting Variable Speed Type/Sensor Type
5: 2-Speed Type/Sensor Type
- Classification
L-Standard Model/Rib Type
T-Value Model/Rib Type
- Individual Specifications
Standard Type
00: Standard
01~99: Custom
Sensor Type
00: Locked Rotor Alarm Signal (Standard Type)
01~49: Locked Rotor Alarm Signal (Custom Type)
50: Tachometer Signal (Standard Type)
51~99: Tachometer Signal (Custom Type)

BG Series Part Numbering System

- Series
BG Series
- Size
07: 75mm
08: 80mm
09: 95mm
10: 100mm
12: 120mm
- Thickness
01: 18mm
02: 25mm
03: 30~33mm
- Bearing
B: Ball Bearing
S: Sleeve Bearing
- Input Voltage
O: Standard Current
C: Special Current
D~Z: Special Current (A.B.O. are not used)
- Termination
Lead Wire
- Speed
1<2<3<4<5
low high

BG 07 03 - B 04 - 4 - 000 - 00
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- Speed
1<2<3<4<5
low high
- Special Control Function
0 0 0
A B C
- Special Control Function
A: Special Control Function
O: Fix Speed Type
2: 2-Speed Type
V: Temperature Detecting Variable Speed Type
P: PWM Control Type
- Thermistor Mounting Position
O: No Thermistor
T: Thermistor On PCB
- Output Signal
O: No Signal
L: Locked Rotor Alarm Signal
S: Tachometer Signal
- Product Number
00: Standard
01~: Customized Standard
T0: Standard Value
T1~: Customized Value

Part Numbering System

- Frame Size
24: 60mm
31: 80mm
36: 92mm
47: 119mm
59: 150mm
- Frame Thickness
10: 25mm
12: 30mm
15: 38mm
- Series
P Series
M Series
F Series
- Motor Function
S: Shaded Pole
C: Capacitor Run
- Input Voltage
100V Class
10: 100V
12: 115V
200V Class
20: 200V
22: 220V
23: 230V
24: 240V

47 15 P S - 12 T - B 2 0 - A 00
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- Termination
W: Lead Wires
T: Terminal
- Bearing
B: Ball Bearing
- Speed
1<2<3<4<5
low high
- Protection
O: Impedance Protected
A: Thermal Protected (including 5915PC B30 only)
- Product Number
A: Standard 115V, 230V & 240V
B: Standard 100V, 200V & 220V
D: Custom Casing 115V-230V
K: Frameless
- Individual Specification
00: Standard
01~99: Custom



Additional Products from NMB

Mechanical Assemblies

NMB's Precision Mechanical Assemblies are bearing assemblies designed for a wide range of applications, including high-accuracy head positioning pivot assemblies, encoder assemblies for robotics, CAD/CAM systems and factory automation.



Many of these mechanical assemblies are found in office automation, including integral bearings for use in rigid disk drive spindles, and as part of printers, fax machines and copiers. Our Precision Mechanical Assemblies are custom made - NMB engineers work with you to design the best solution for your project.

For more information on our mechanical assembly products, e-mail us at: assemblies@nmbtc.com

Small Motors

NMB offers a wide variety of small motors, including hybrid step motors in standard NEMA sizes 14 to 23, as well as molded type flange (MTF) step motors available in NEMA sizes 10 to 17.



A new line of gear motors available in range of ratios from 3:1 to 2000:1. Gearbox offerings are available for all hybrid and PM motors. The NMB family of small motors also includes hybrid linear motors, brush DC motors and a range of brushless DC motors from 0.1 W to 500 W. Our newest small step motor line is found in the consumer electronic industry, from digital cameras, mobile, and audio visual equipment to measuring and game equipment.

For more information on our motor products, e-mail us at motors@nmbtc.com

Bearings

Our miniature bearings range in sizes from .1181 to 1.000 inch O.D. (3mm to 26mm), and are available in inch and metric sizes. Stainless steel or chrome



steel bearings are available with crown or ribbon type metallic cages, as well as plastic crown type cages. NMB bearings are found in medical equipment, advanced automotive applications and household electrical appliances such as air conditioners, vacuum cleaners, VCRs and video cameras, and in motors for electronic controls systems, among others.

Keyboards

NMB produces more than 1.5 million keyboards each month to meet the needs of leading PC OEM's. The keyboard division offers a wide range of



standard and custom product. We are experts in desktop, notebook, wireless, security and accessory keyboard designs. Capabilities include industrial design, keyswitches, protocols, firmware development and wireless technology such as Radio Frequency and Infrared Communications.

For more information on our keyboard products, e-mail us at keyboards@nmbtc.com

Audio

PC and consumer industries turn to NMB for speaker drivers as well as total audio solutions. NMB is a leading speaker driver supplier to elite audio brands



found in Hi-Fi, home entertainment, and automotive sound systems. In addition, PC industry leaders choose NMB to provide high quality, cost-effective multimedia solutions.

For more information on our audio products, e-mail us at speakers@nmbtc.com



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Manila, Philippines
Singapore
Seoul, South Korea
Taipei, Taiwan
Bangkok, Thailand
Hanoi, Vietnam

Errors

All information, data and dimension tables in this catalog have been carefully compiled and thoroughly checked. However, no responsibility for possible errors or omissions can be assumed.

Changes

The company reserves the right to change specifications and other information included in this catalog without notice.

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