

## General Specifications

Motor Type: DC Brushless Motor

Motor Protection: Auto Restart/Polarity Protection

Motor withstands reverse connection for positive and negative leads.

Insulation Resistance:

10M  $\Omega$  or over with a DC500V Megger

Dielectric Withstand Voltage:

AC 700V 1s or 500V 1min

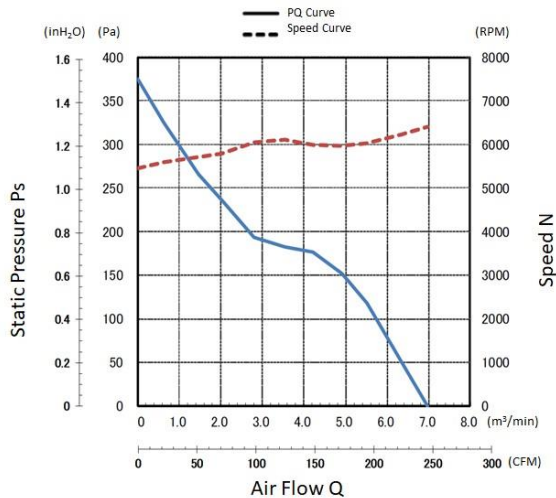
Allowable Ambient Temperature Range:

-10°C ~ +60°C (Operating)

-40°C ~ +60°C (Storage)

(non-condensing environment)

## Characteristics Curves



## PWM Benefits & Applications

### PWM Benefits

- Increased Life Expectancy
- Energy Saving
- Lower Vibration
- Lower Noise
- Current Spike Prevention

### PWM Applications

- Routers
- Switches
- Storage
- Data Centers
- Optical Repeaters
- Broadcast Equipment
- Inverters
- UPS
- Battery Chargers
- Fuel Cells
- Industrial Power Supplies
- Welders
- Plasma Cutters
- Instrumentation
- Test Equipment
- Enclosures and more

- Customized fan performances at multiple operating points.
- Peak efficiency resulting in lower total ownership costs.
- Cost effective and better reliability.

## Life Expectancy L10

60°C 40,000 Hours

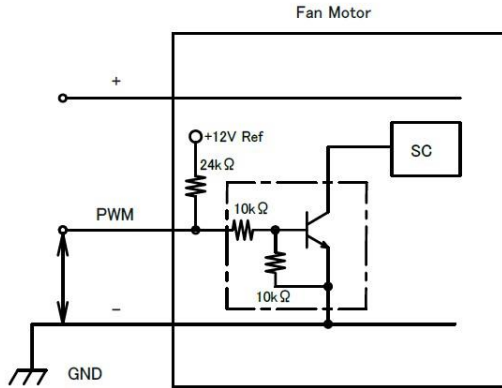
## Specifications

MODEL	Rated	Operating	Current		Input Power		Speed	Max.		Max. Static		Noise	Mass
	Voltage	Voltage	Avg	Max	Avg	Max		Air Flow	Pressure	Pressure	Pressure		
	(V)	(V)	(A) <sup>*1</sup>	(A) <sup>*1</sup>	(W) <sup>*1</sup>	(W) <sup>*1</sup>	(min <sup>-1</sup> ) <sup>*1</sup>	(CFM) <sup>*1</sup>	(m <sup>3</sup> /min) <sup>*1</sup>	(inH <sub>2</sub> O) <sup>*1</sup>	(Pa) <sup>*1</sup>	(dB) <sup>*1</sup>	(g)
12038VA-24R-FU-6	24	18.0 ~ 27.6	1.48	1.77	35.52	42.48	6400	243.7	6.90	1.49	370	64.0	370

\*1: Maximum Values in Free Air

## PWM Specifications

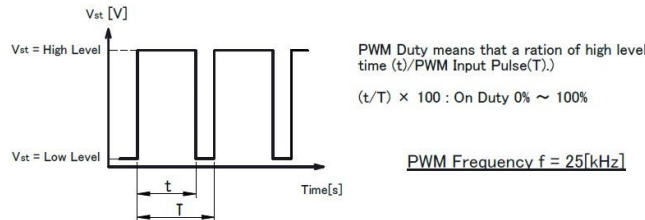
### PWM CONTROL CONNECTION



#### 1. PWM Control

- V<sub>st</sub> = Low Level (0V~0.4V) → Stop (On Duty 0%)
- V<sub>st</sub> = High Level → Full Speed (On Duty 100%)
- V<sub>st</sub> = Open → Full Speed

#### 2. PWM Duty & PWM Input Pulse



## TACHO Specifications

### TACHO SIGNAL

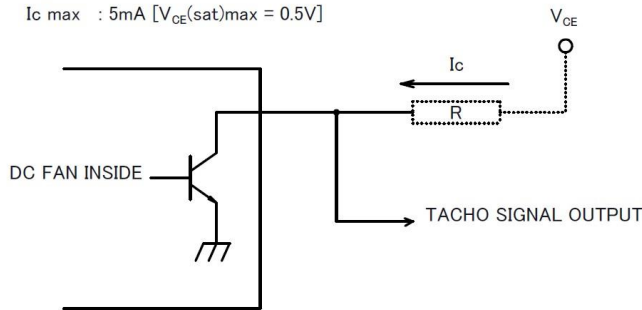
1. OUTPUT CIRCUIT : OPEN COLLECTOR
2. SPECIFICATION

T<sub>a</sub>=25°C

Absolute Maximum Ratings at T<sub>a</sub>=25°C

V<sub>CE</sub> max : +30V

I<sub>c</sub> max : 5mA [V<sub>CE(sat)</sub>max = 0.5V]

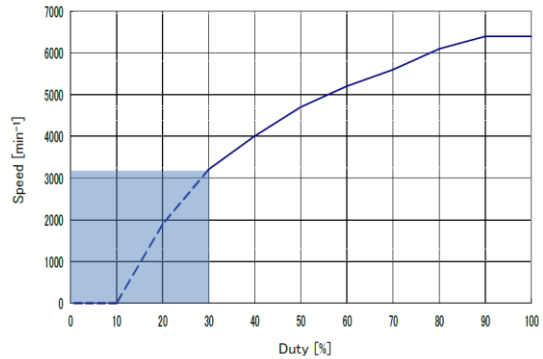


TACHO SIGNAL CIRCUIT

## PWM Characteristics Curve

### Reference PWM Duty VS Speed

Conditions: at rating Voltage, V<sub>st</sub>=5.0V, f=25kHz, T<sub>a</sub>=25°C



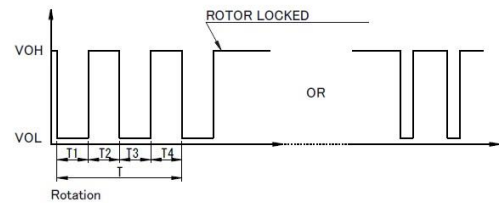
#### 3. The condition for PWM control are as follows.

- When you use this under PWM control, always be sure the motor's operation under practical mounting state. Fan motor may not start up caused by PWM control at very low speed condition.
- To run at Rating Voltage.
- Please use the start with Duty 30% or more at 25kHz. [At rated voltage input, Ambient temperature 25°C]

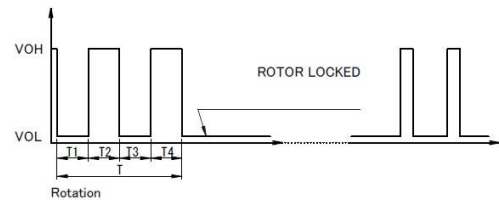
#### 3. OUTPUT WAVEFORM : AT RATED VOLTAGE

#### 4. OUTPUT SIGNAL VOLTAGE

3-1 Case-1



3-2 Case-2



1) 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.

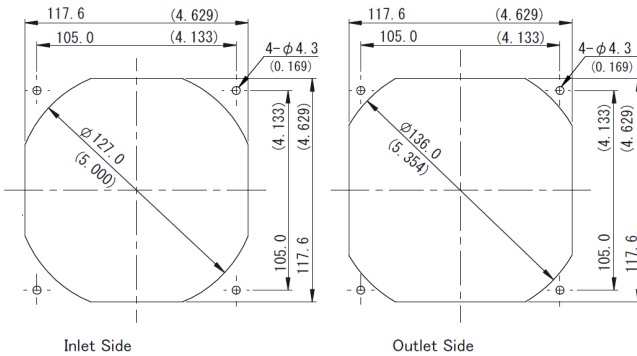
2) When the rotor is locked at VOL position of signal, signal keeps VOL position or signal becomes to VOH position for a few seconds at any time of the auto-restart motion.

3)  $T = T1 + T2 + T3 + T4 = 60 / m$  / m = 1 rotation

m : min<sup>-1</sup>

Tach Duty Cycle = 50% ± 10%

## Panel Cut-Outs

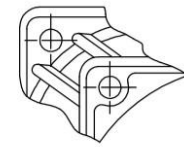
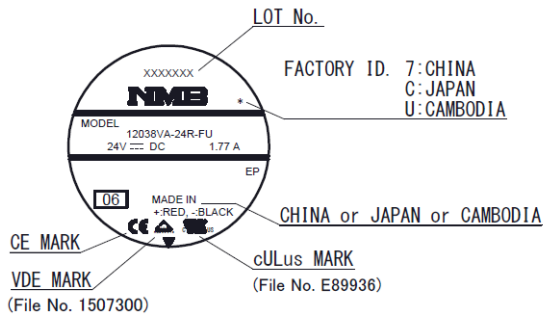


Unit: mm (inch)

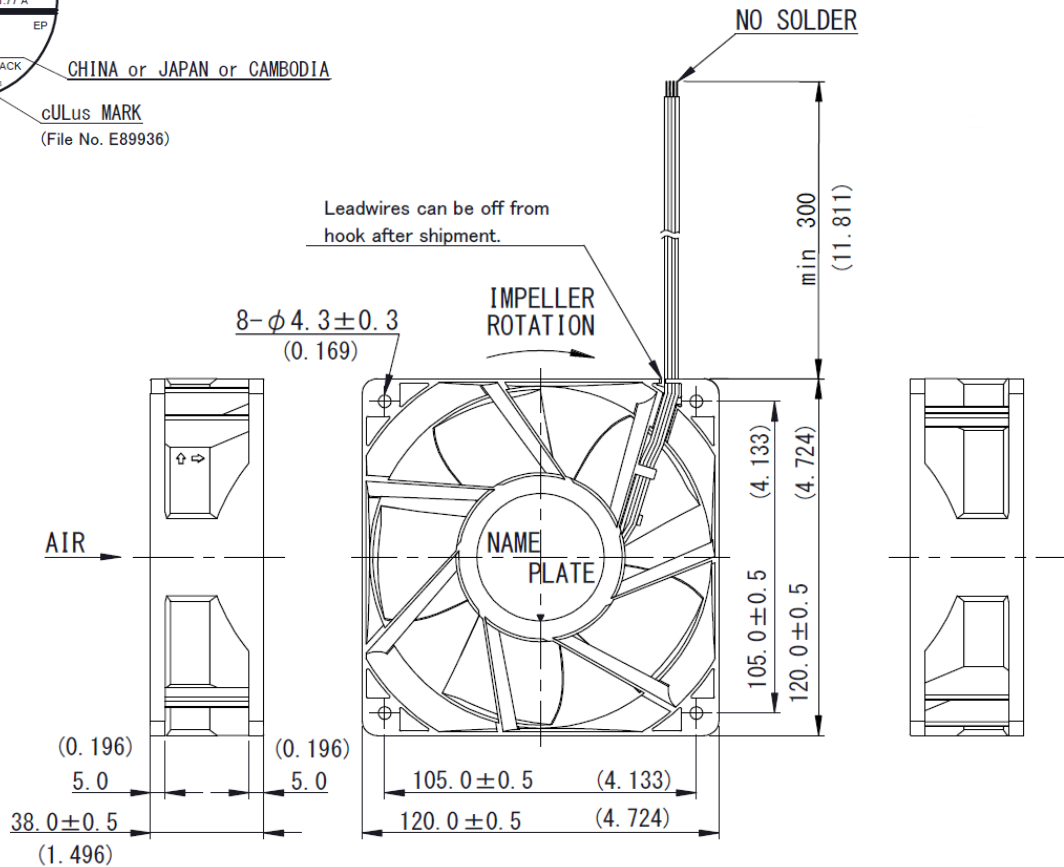
## Materials

- Casing : Plastic (Black UL94V-0)
- Impeller : Plastic (Black UL94V-0)
- Bearing : Ball Bearing
- Lead Wire : UL3443 AWG24
  - (+) : Red (-) : Black
  - PWM : Brown Tach : White

## Outline



FLANGE TYPE



Unit: mm (inch)

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