

IP68 Protected DC Fan with PWM and Tach Output

04020VE-12Q/24Q (0-Type)

NMB

General Specifications

Motor Type:

DC Brushless Motor

Motor Protection:

Auto Restart / Polarity Protection (Motor withstands reverse connection for positive and negative leads.)

Insulation Resistance:

10MΩ or over with a DC 500V Megger

Dielectric Withstand Voltage:

AC 500V 1min or AC 700V 1sec

Allowable Ambient Temperature Range:

-10°C ~ + 70°C (Operating)

-40°C ~ + 70°C (Storage)

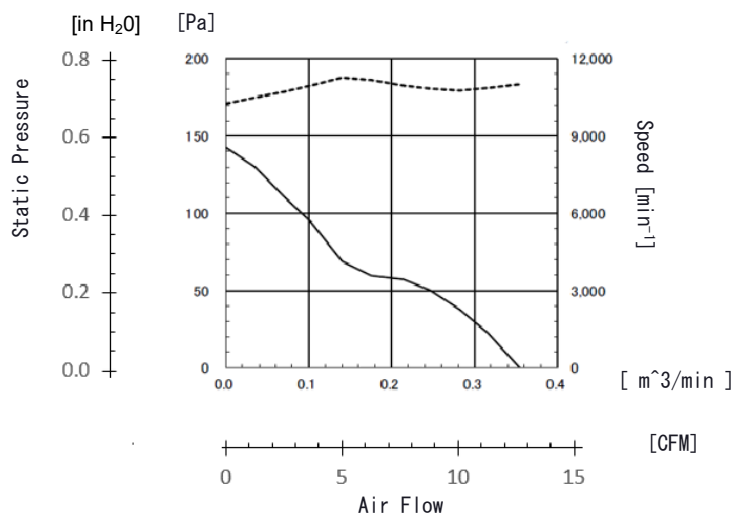
(non-condensing environment)



**For reference only. Please see fan outline for details*

Characteristic Curves

————— P-Q CURVE
 - - - - - SPEED CURVE



Features

- DC axial fan with outstanding P-Q performance, IP68 protection, PWM speed control, and tach output
- Vertically integrated manufacturing, with key components made in-house
- IP68 with highest level of protection from water/dust ingress
- Outfitted with NMB precision machined stainless steel ball bearings for long life
- Ideal for applications such as EV chargers, PV inverters, telecom cabinets, Bi-Directional chargers and many other outdoor applications

Life Expectancy L10

40,000 Hours at 60 Celsius

**Fan life expectation is based on free air operation at 60°C, rated voltage, and indoor benign lab environment*

**1: Values in Free Air*

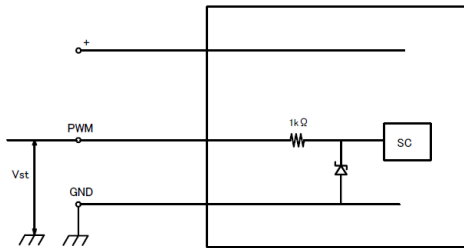
Specifications

MODEL	Rating Voltage (V)	Operating Voltage (V)	Current		Input Power		Speed (min ⁻¹)*1	Max. Air Flow		Max. Static Pressure		Noise (dB)*1	Mass (g)
			Avg	Max	Avg	Max		(CFM)	(m ³ /min)	(in H ₂ O)	(Pa)		
			(A)*1	(A)*1	(W)*1	(W)*1							
04020VE-12Q-CU-01	12	10.8 to 13.2	0.21	0.26	2.52	3.12	11,000	12.4	0.35	0.57	142	42	40
04020VE-24Q-CU-01	24	21.6 to 26.4	0.11	0.15	2.64	3.60	11,000	12.4	0.35	0.57	142	42	40

04020VE-12Q (0-Type)

PWM Specifications

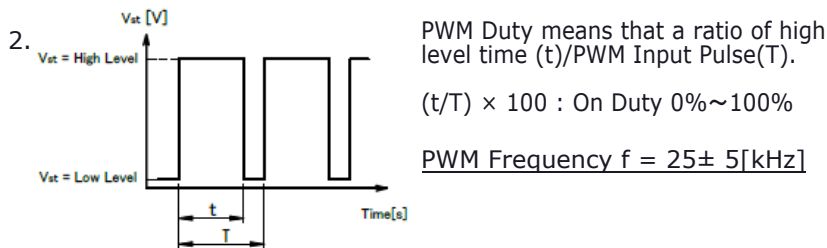
Connection



1. PWM Control

- Vst = Low Level (0V~0.4V) → Stop (On Duty 0%)
- Vst = High Level (3.3V~5.0V) → Full Speed (On Duty 100%)
- Vst = Open → Full Speed

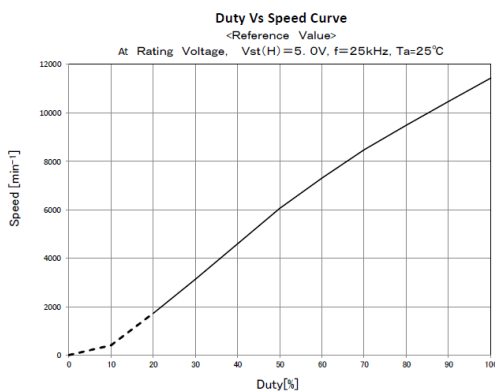
Vst = Open → Full Speed



3. The condition for PWM control are as follows

- Please install the fan in your system when inputting the PWM function. If the PWM duty is very low, or affected by external factors, the fan might not start up under your system conditions
- Run the fan at rated voltage only during PWM operation
- Please start the fan with duty cycle of 20% or more at 25kHz.[At rated voltage input, Ambient temperature 25°C]

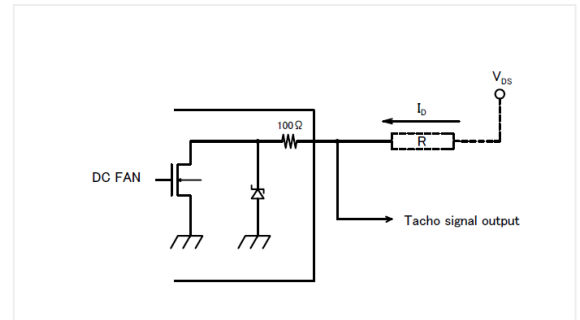
PWM Characteristic Curve



TACHO Specifications

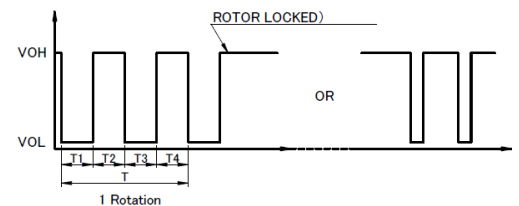
Tachometer Signal

1. Output Circuit: Open Drain
2. Specification
 - Absolute Maximum Ratings at Ta=25°C
 - V_{DSmax}: +15V
 - I_{Dmax}: 5mA[V_{DS(sat)}max=1.5V] for 12V

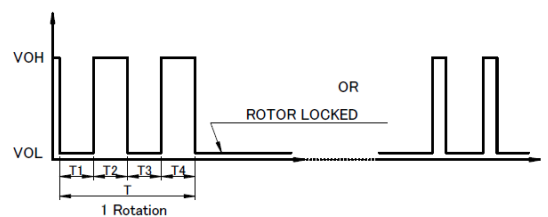


3. Output Waveform: At Rated Voltage Output Signal Voltage

Case-1



Case-2



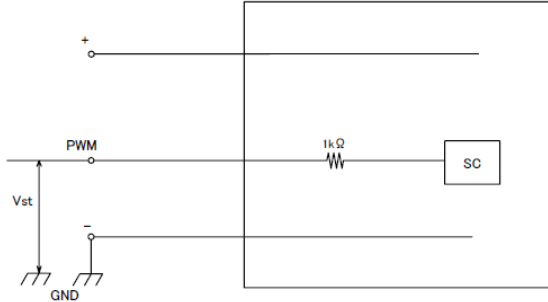
- 1) When the rotor is locked at VOH position of signal, signal stays at VOH position.
- 2) When the rotor is locked at VOL position of signal, signal stays at VOL position.
- 3) $T = T1 + T2 + T3 + T4 = 60/m = 1 \text{ rotation}$
 - m: Fan Speed (min⁻¹)
 - Tacho Duty Cycle=50%±10%

For 12 V DC Model

04020VE-24Q (0-Type)

PWM Specifications

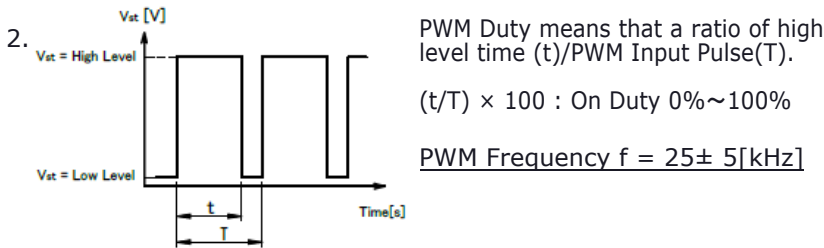
Connection



1. PWM Control

- Vst = Low Level (0V~0.4V) → Stop (On Duty 0%)
- Vst = High Level (4.0V~5.0V) → Full Speed (On Duty 100%)
- Vst = Open → Full Speed

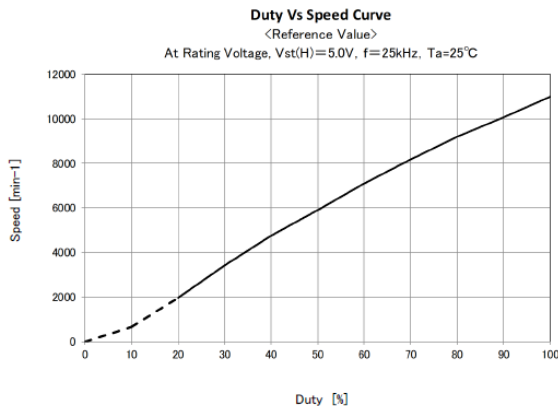
Vst = Open → Full Speed



3. The condition for PWM control are as follows

- Please install the fan in your system when inputting the PWM function. If the PWM duty is very low, or affected by external factors, the fan might not start up under your system conditions
- Run the fan at rated voltage only during PWM operation
- Please start the fan with duty cycle of 20% or more at 25kHz.[At rated voltage input, Ambient temperature 25°C]

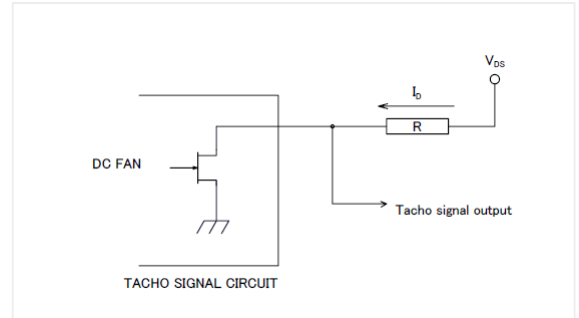
PWM Characteristic Curve



TACHO Specifications

Tachometer Signal

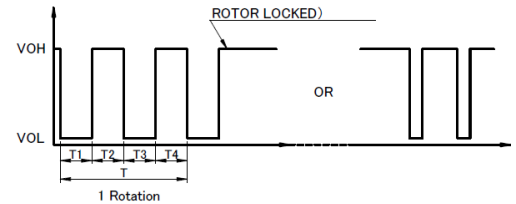
1. Output Circuit: Open Drain
2. Specification
 - Absolute Maximum Ratings at Ta=25°C
 - V_{DSmax}: +15V
 - I_{Dmax}: 5mA[V_{DS(on)}max=0.5V]



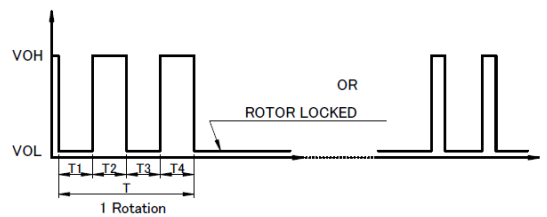
3. Output Waveform: At Rated Voltage

Output Signal Voltage

Case-1



Case-2



- 1) When the rotor is locked at VOH position of signal, signal stays at VOH position.
- 2) When the rotor is locked at VOL position of signal, signal stays at VOL position.
- 3) $T = T1 + T2 + T3 + T4 = 60/m = 1 \text{ rotation}$
 m: Fan Speed (min⁻¹)
 Tacho Duty Cycle=50%±10%

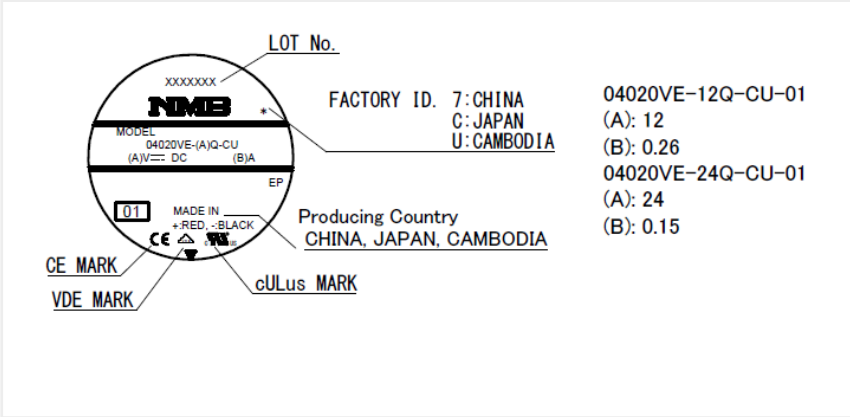
For 24 V DC Model

IP68 Protected DC Fan with PWM and Tach Output 04020VE-12Q/24Q (0-Type)

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Outlines

(Name Plate)



Materials

Casing: Plastic (Black UL 94V-0)

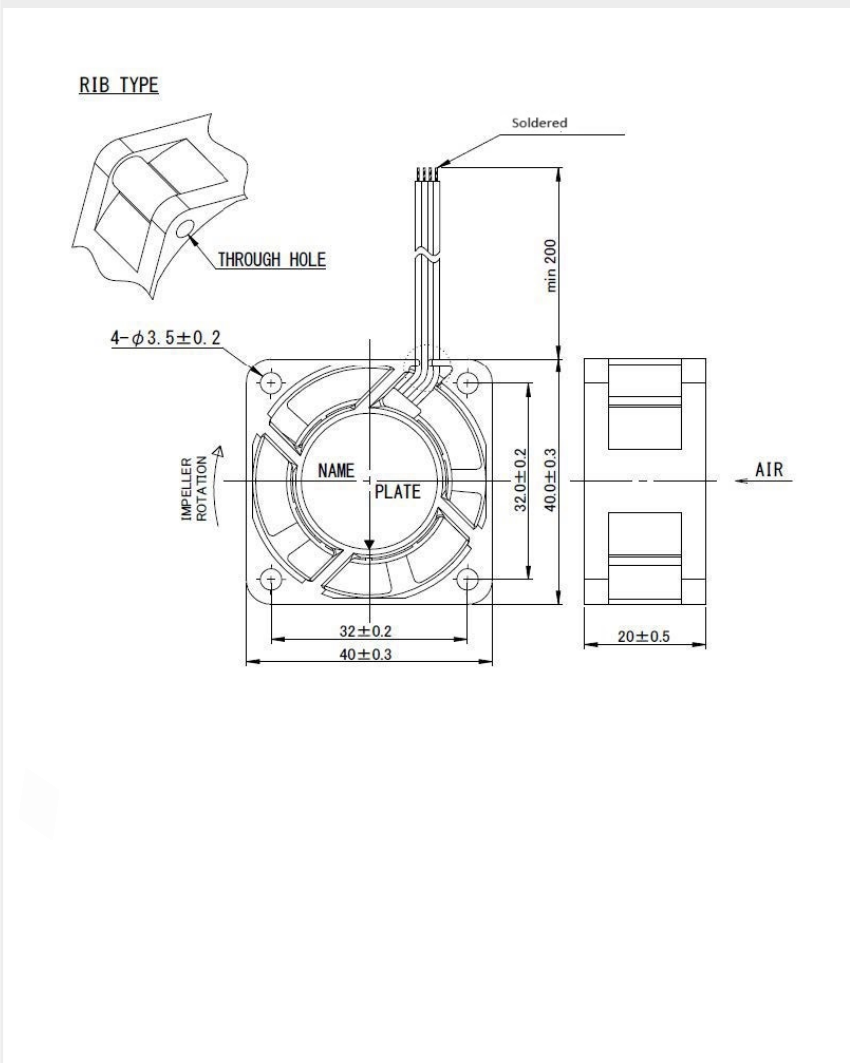
Impeller: Plastic (Black UL 94V-0)

Bearing: Stainless Steel Ball Bearing

Lead Wire: UL3385 AWG26 or UL3443 AWG26 or UL1430 AWG26 or equivalent for

Red (+)
Black (-)
White (Tach)
Brown (PWM)

(Outline)



(Panel Out-line)

