



## Specification For Approval

Customer : \_\_\_\_\_  
Description : \_\_\_\_\_ EC FAN \_\_\_\_\_  
Customer Part No. : \_\_\_\_\_ Rev : \_\_\_\_\_  
Delta Model No. : \_\_\_\_\_ GTB019FUG09R-V E1 \_\_\_\_\_ Rev : 06  
Safety Model No. : \_\_\_\_\_ GTB019FUG09R-V \_\_\_\_\_  
Sample Issue No. : \_\_\_\_\_  
Sample Issue Date : \_\_\_\_\_ 02/14'23 \_\_\_\_\_

Please send one copy of this specification back after  
you signed approval for production pre-arrangement

Approved by : \_\_\_\_\_

Date : \_\_\_\_\_

Delta Electronics, Inc.

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Taoyuan City, 33341, Taiwan

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## Electronically Commutated (EC) Fan

Centrifugal Fan

Ø 190 x 87.5 mm



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### Technical features

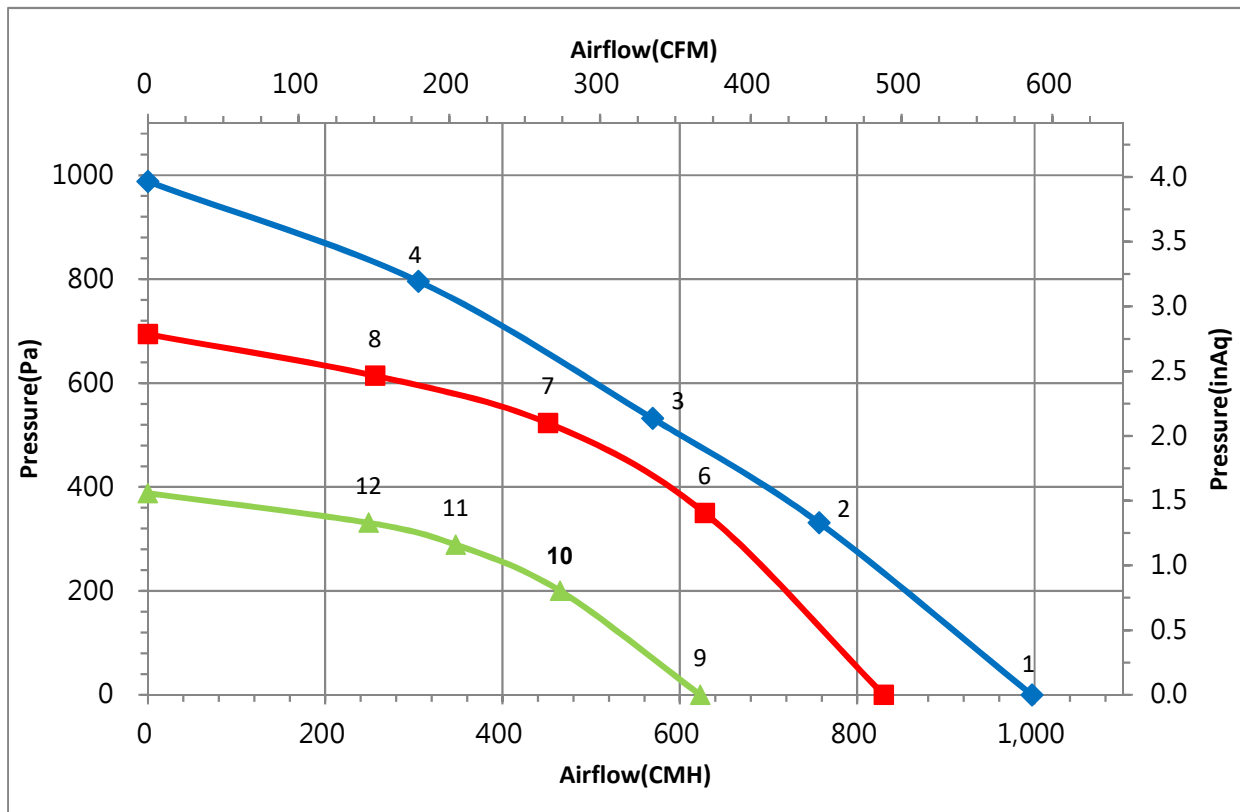
Input Side	
Nominal Voltage	1~ 230Vac 50/60Hz
Input Source	1~ 200Vac - 240Vac
Power @ Free air	172 W
Power @ Max. load	175 W
Output Side	
Speed (RPM)	4150
Qmax. (CMH / CFM)	997 / 587
Pmax. (Pa / inAq)	988 / 3.97
Noise (dB-A) @ Qmax.	76.5
Functions	
Control input 0-10VDC / PWM pattern.	
Output +10VDC (±10%), max. 5mA.	
Locked rotor protection, Soft start.	

Physical	
Rotation Direction	CW, Seen on rotor
Material (Impeller / Frame)	Plastic / Aluminum
Bearing system	Ball bearings
Weight (kg)	1.2
Electrical leads	Lead wire
Environmental	
Operating temperature range	-25 ~ +60 °C
Storage temperature range	-40 ~ +80 °C
Environment Class	ISO 12944-2 C2
Safety	
Safety	UL; cUL; TUV; CE
IP Level	IP54
EMC	EN61000-6-1/3
Protection class	I
Insulation class	B
Leakage current	≤ 3.5 mA
Motor protection	Over temperature protected
Life expectancy	60,000 hrs at 40 °C / 15 ~ 65 %RH

NOTE: Delta reserves the right to change specifications and other product information without prior notice.

(1) Base on installation conditions, ferrite core maybe required on the connection line for the application.

P & Q curves



Measure data:

	P [Pa]	Q [CMH]	N [R.P.M.]	P1 [W]	I [A]	Lp [dB(A)]
1	0	997	4612	172	1.13	76.5
2	331	757	4277	175	1.14	72.5
*3	532	569	4146	175	1.14	71.0
4	796	305	4403	175	1.15	75.5
5	0	830	3847	103	0.71	73.5
6	350	628	3853	137	0.92	70.0
7	523	451	3854	138	0.93	71.5
8	614	256	3859	118	0.81	72.0
9	0	623	2907	47	0.36	67.0
10	200	465	2904	60	0.44	63.5
11	289	347	2900	63	0.45	63.0
12	331	249	2907	56	0.42	65.5

Test Condition :

- Input Voltage: Nominal Voltage
- Temperature : Room Temperature
- Humidity : 65%RH
- Measured with inlet cone.
- Noise (Lp) is measured at a distance of one meter from the inlet side
- Testing method is compliance with ISO 3745.

ErP Directive:

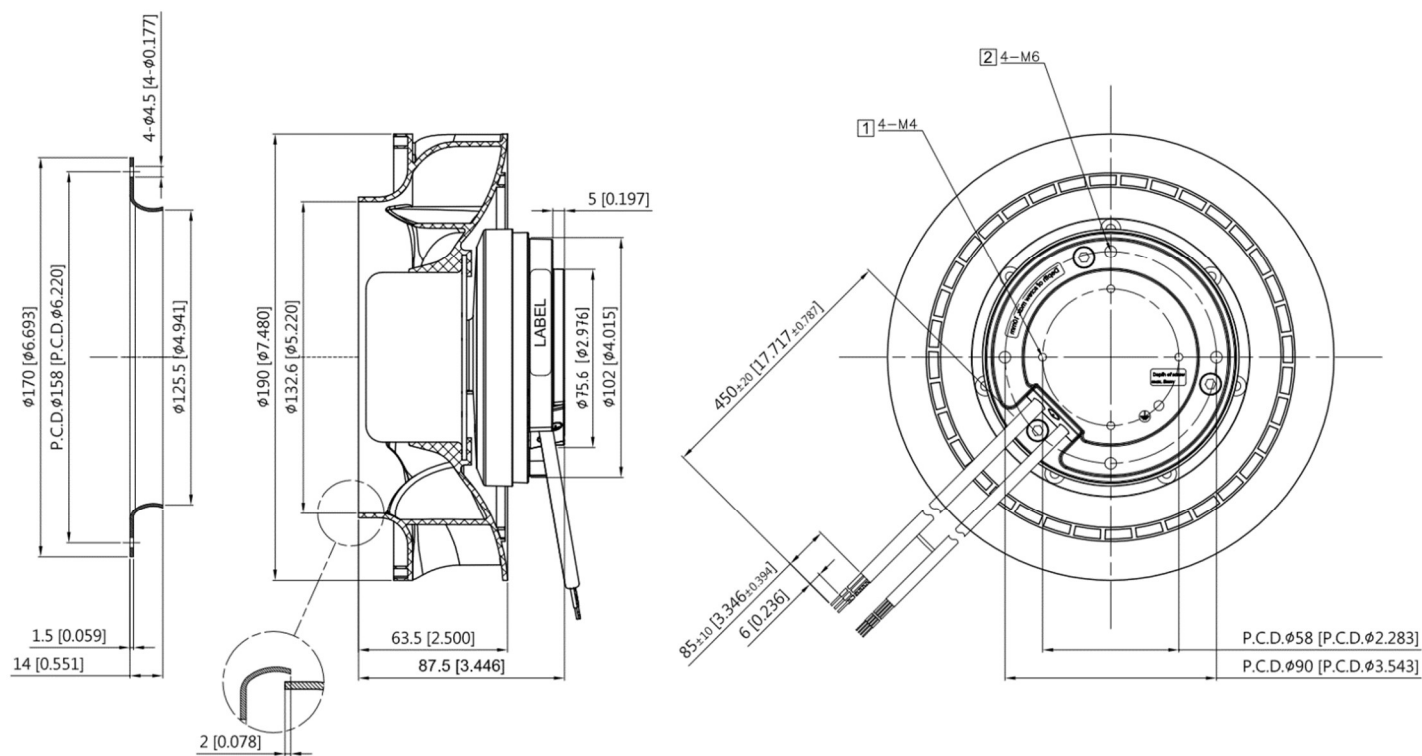
	Actual	2015
Over all Eff (%)	54.5	43.5
Eff Grade N	73.0	62.0
Power (kW)	0.175	
Air flow (CMH)	569	
Pressure (Pa)	532	
Speed (RPM)	4150	

Dimension drawing

Label :



Fan :

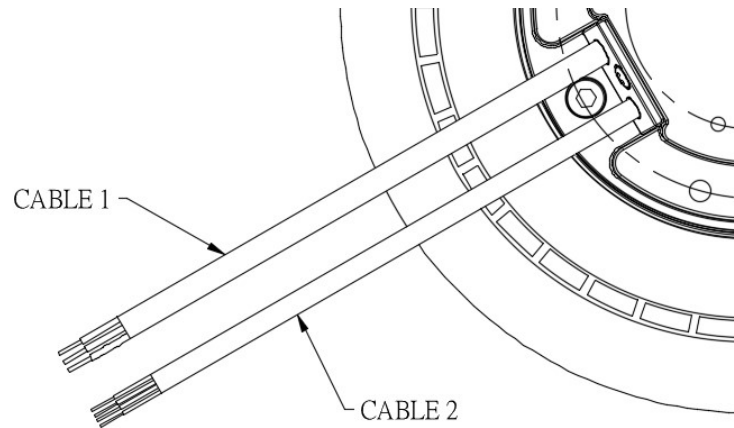


UNIT : mm [INCH]

Note :

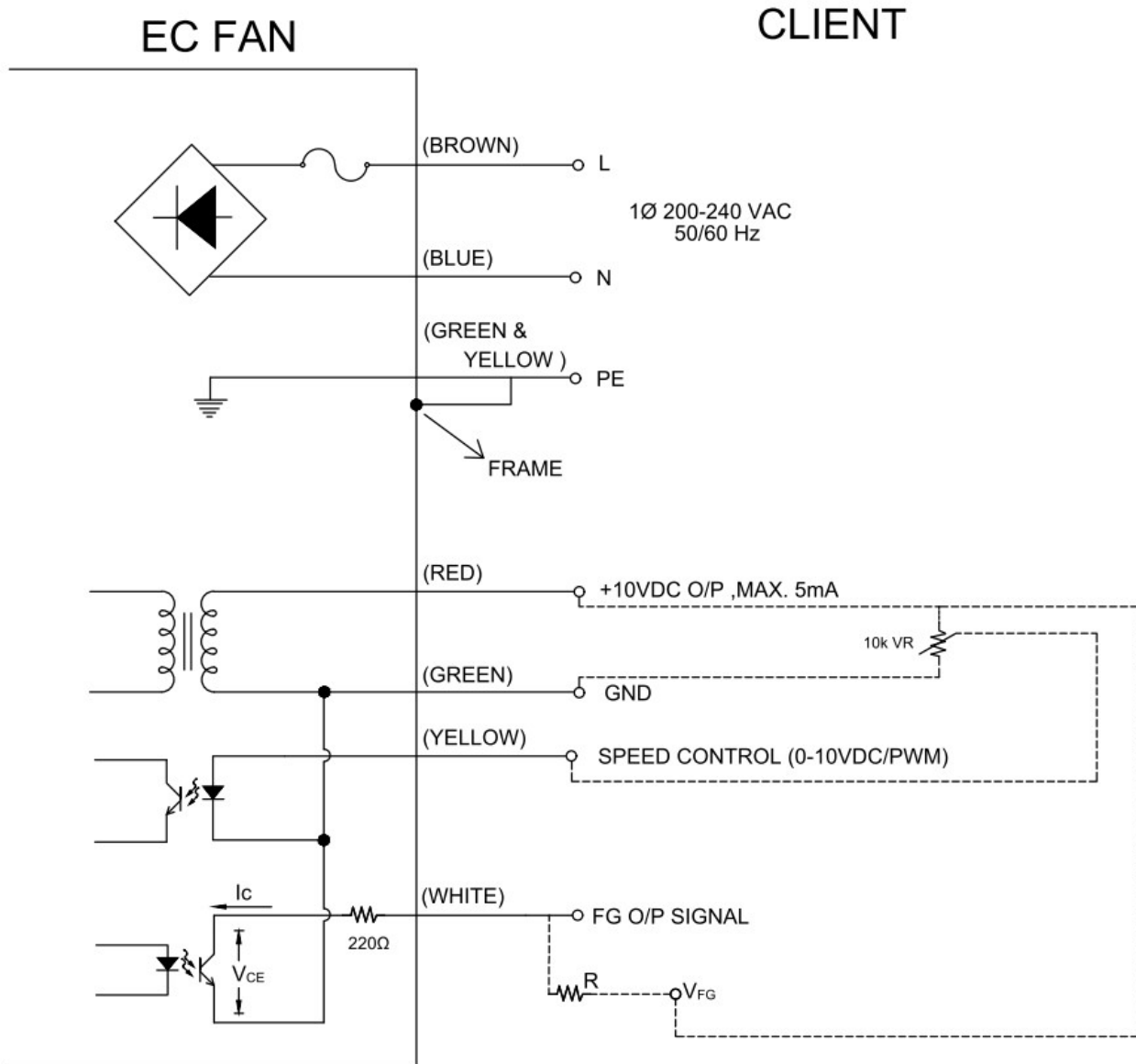
1. Depth of screw: 5mm (max.).
2. Depth of screw: 10mm (max.).

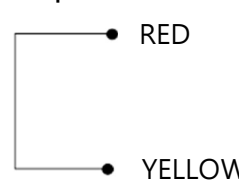
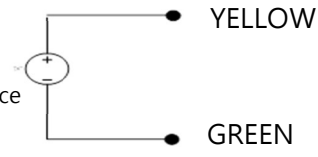

## Definition of terminal block

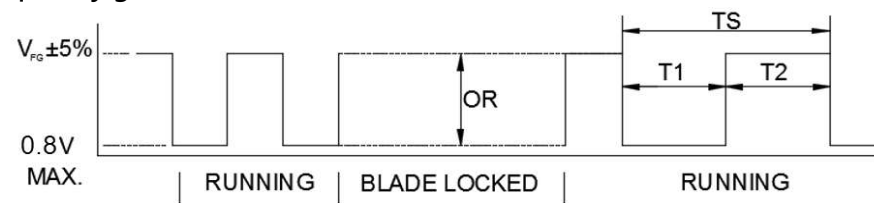


Cable	Wire Type	Color	Functions
1	UL2464 18#AWG	Brown	Line/ AC main
		Blue	Neutral/AC main
		Green / Yellow	Protective Earth
2	UL2464 24#AWG	Green	Ground
		Red	+10V output
		White	F00
		Yellow	0-10VDC / PWM

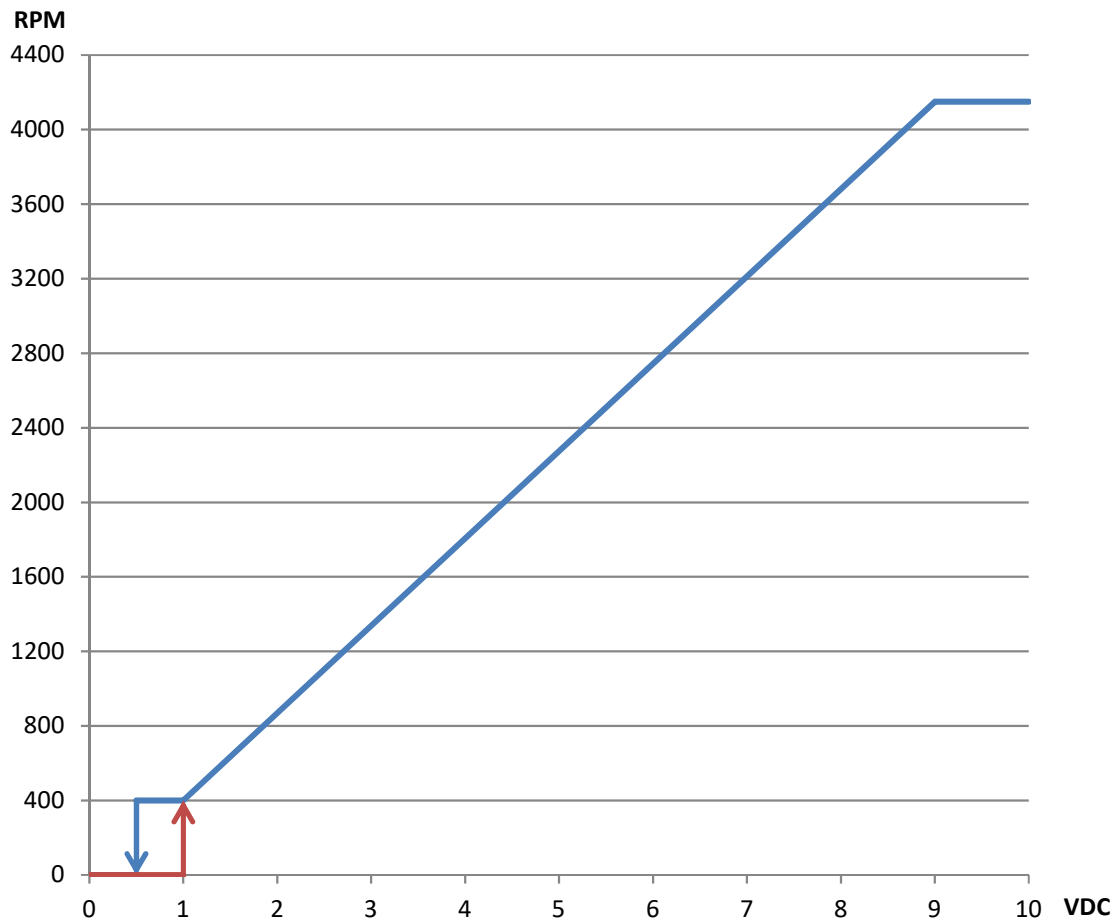
Lead wire connection:



Speed setting	
<p><b>Full Speed</b></p> 	<p><b>Short RED &amp; YELLOW</b> Fan will run full speed.</p>
<p><b>Voltage Control</b></p> 	<p><b>Use voltage source support 0~10VDC voltage</b> DC+ : connect to YELLOW DC - : connect to GREEN -Voltage higher than 1.0 VDC, fan start up. -Voltage lower than 0.5 VDC , fan stop</p>
<p><b>PWM Control</b></p> 	<p><b>PWM duty control</b> PWM amplitude is 10VDC(+/-5%) Frequency Range is 100Hz ~ 100kHz -PWM duty higher than 10%, fan start up · -PWM duty lower than 5%, fan stop ·</p>

Signal function										
<p><b>Voltage/PWM control</b></p>	<p>The speed comparison will control level.</p> <table border="1"> <thead> <tr> <th>Voltage (V)</th> <th>PWM(%)</th> <th>Speed (RPM)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>10</td> <td>99</td> <td>4150<sup>(1)</sup> ±5%</td> </tr> </tbody> </table> <p>(1) Reference point 3<sup>(*)</sup> in P&amp;Q curve page.</p>	Voltage (V)	PWM(%)	Speed (RPM)	0	0	0	10	99	4150 <sup>(1)</sup> ±5%
Voltage (V)	PWM(%)	Speed (RPM)								
0	0	0								
10	99	4150 <sup>(1)</sup> ±5%								
<p><b>FG</b></p>	<p><math>V_{CE(sat)} = 0.8V \text{ MAX.}</math>      <math>V_{FG} = 30.0V \text{ MAX.}</math>  <math>I_C = 5mA \text{ MAX.}</math>              <math>R \geq V_{FG} / I_C</math></p> <p><b>Frequency generator waveform</b></p>  <p style="text-align: center;">  RUNNING   BLADE LOCKED   RUNNING</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>N = R.P.M</math></td> <td>1 PULSE PER REVOLUTION</td> </tr> <tr> <td><math>TS = 60/N(SEC)</math></td> <td><math>T1 = T2 = 1/2 TS</math></td> </tr> </table>	$N = R.P.M$	1 PULSE PER REVOLUTION	$TS = 60/N(SEC)$	$T1 = T2 = 1/2 TS$					
$N = R.P.M$	1 PULSE PER REVOLUTION									
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## Control Voltage VS. RPM Curve



Voltage (VDC), PWM duty (%) table

Voltage	0	0.5	1	1.5	2	3	4	5	6	7	8	9	10	VDC
PWM duty	0	5	10	15	20	30	40	50	60	70	80	90	100	%

Note: If the fan is used on heavy load, the speed will be limited by power consumption.



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