Specification For Approval

Customer : _____

Description : EC FAN

Customer Part No. : _____ Rev : ____

Delta Model No. : GTM036PUS32R Rev : 02

Safety Model No. : MU112EP3FC7

Sample Issue No. : _____

Sample Issue Date : 07/14/2022

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

Approved by : _____

Date : _____

Beijing Hengrui Mechanical and Electrical Equipment Co,Ltd
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en.bjhengrui.com

Electronically Commutated (EC) Fan

Centrifugal Fan

500 x 500 x 365 mm

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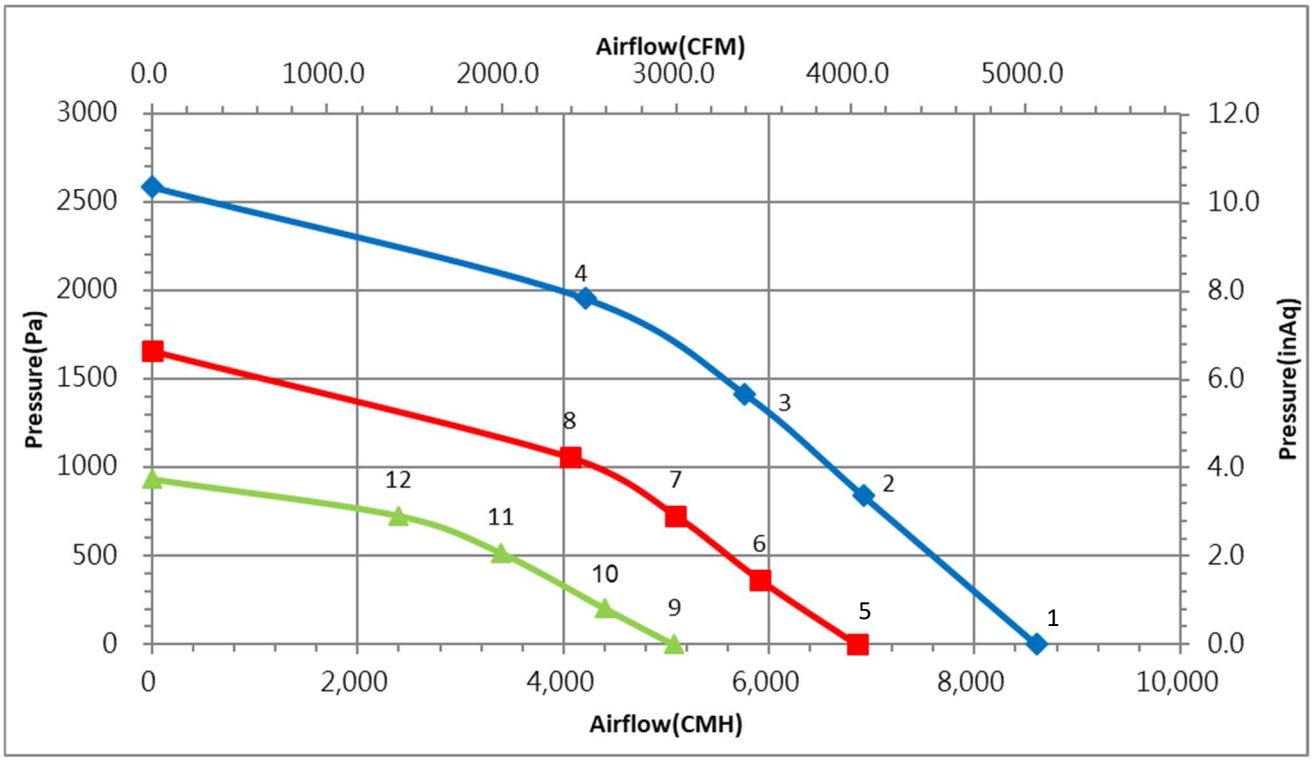
Input Side

Nominal Voltage	3~ 400Vac 50/60Hz
Input Source	3~ 380Vac - 480Vac
Power @ Free air	1800 W
Power @ Max. load	3650 W
Speed (RPM)	3650
Qmax. (CMH / CFM)	8602 / 5058
Pmax. (Pa / inAq)	2585 / 10.38
Noise (dB-A) @ Qmax.	90
Passive power factor correction	
Control input 0-10V_{DC} / PWM / 4-20mA.	
Output +10V_{DC} (±5%), max. 800mW.	
Control voltage output: 0-10V_{DC}.	
RS485 control bus (MODBUS V2.1 RTU / 8N1)	
Alarm relay, Locked rotor protection, Soft start.	
Voltage / Current monitoring.	

Physical

Rotation Direction	CW, Seen on rotor
Material (Impeller / Bracket)	Aluminum / steel sheet
Bearing system	Ball bearings
Weight (kg)	27
Electrical leads	Via terminal block
Operating temperature range	-25 ~ +60 ℃
Storage temperature range	-40 ~ +70 ℃
Safety	UL , cUL ,CE
IP Level	IP54
EMC	EN61000-6-2/4
Protection class	I
Insulation class	F
Leakage current	<= 3.5 mA
Motor protection	Over temperature protected
Life expectance	40,000 hrs at 40 ℃ / 15 ~ 65 %RH
NOTE : Delta reserves the right to change specifications and other product information without prior notice.	

P & Q curves



Measure data:

	P [Pa]	Q [CMH]	N [R.P.M.]	P1 [W]	I [A]	Lp [dB(A)]
1	0	8603	3645	1787	2.87	90
2	839	6920	3650	2878	4.52	
3	1413	5768	3644	3383	5.25	
4	1955	4209	3640	3543	5.50	
5	0	6854	2917	981	1.65	84
6	366	5909	2919	1339	2.15	
7	728	5089	2921	1611	2.59	
8	1058	4062	2923	1811	2.90	
9	0	5076	2192	424	0.81	77.5
10	205	4401	2193	587	1.06	
11	518	3393	2188	770	1.31	
12	727	2395	2189	800	1.35	

Test Condition :

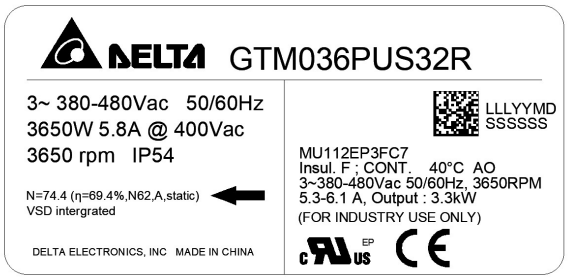
- Input Voltage : Nominal Voltage
- Temperature : Room Temperature
- Humidity : 65%RH
- Measured with inlet cone.
- Noise (Lp) is measured at a distance of one meter from the inlet side.

ErP Directive:

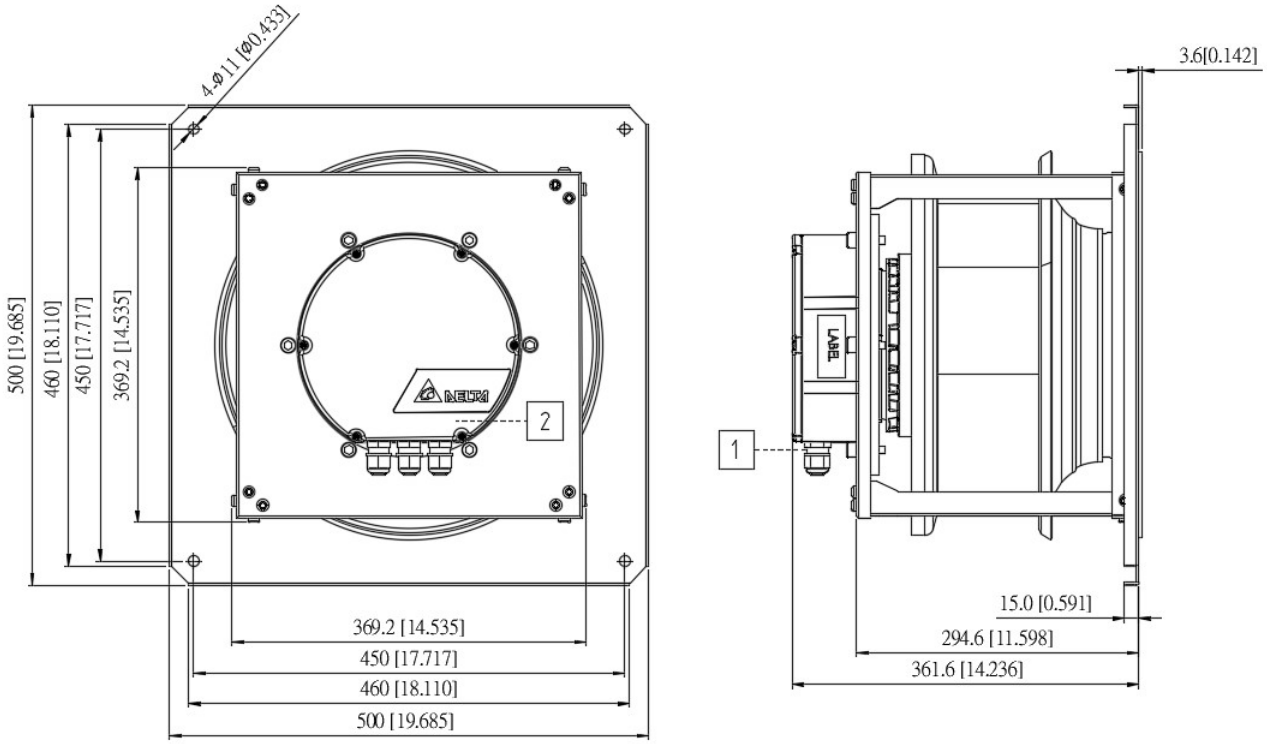
	Actual	2015
Over all Eff (%)	69.4	57.1
Eff Grade N	74.4	62.0
Power (kW)	3.38	
Air flow (CMH)	5768	
Pressure (Pa)	1413	
Speed (RPM)	3644	

Dimension drawing

Label :



Fan :



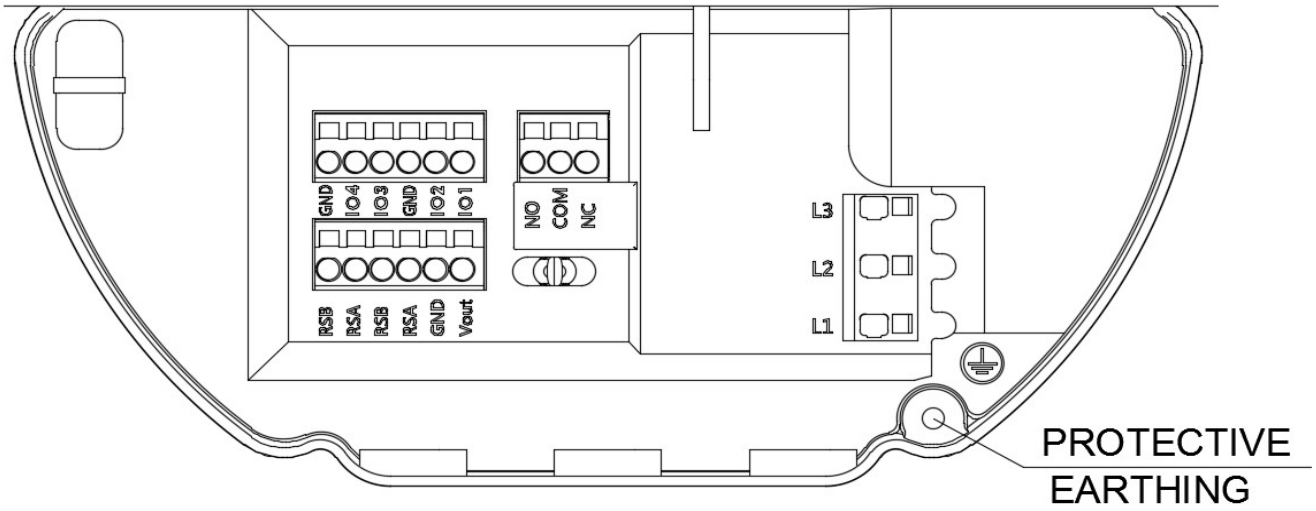
UNIT : mm[INCH]

Note :

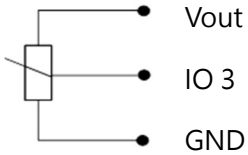
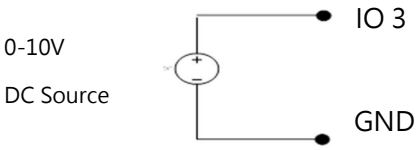
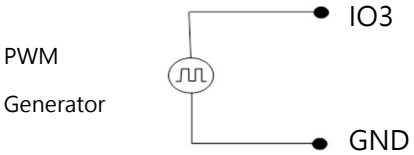
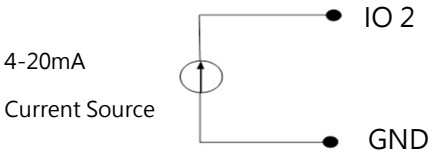
1 Cable diameter : Ø5.9 ~ Ø10.1mm.

2 Open the cover and refer to definition of terminal block.

Definition of terminal block

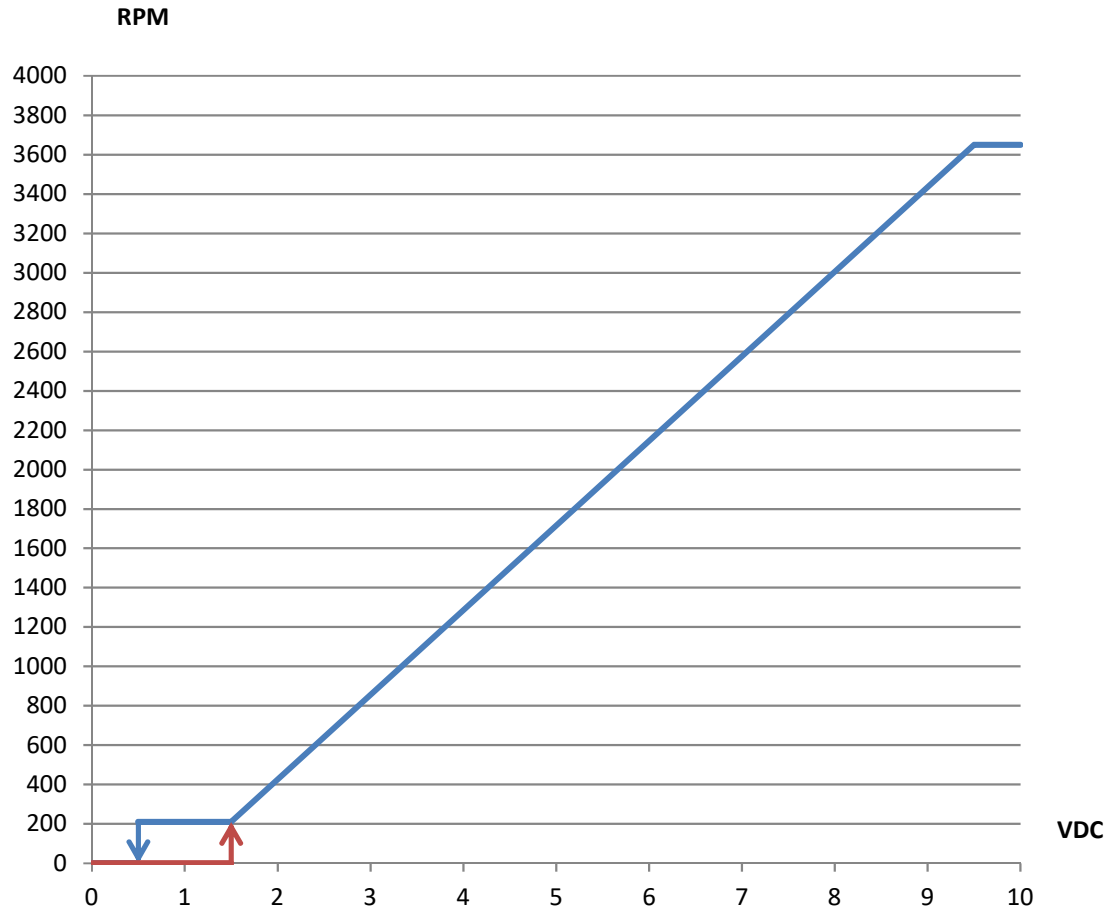


	Text	Functions
Power	L1	AC main (3~ 380-480VAC)
	L2	AC main (3~ 380-480VAC)
	L3	AC main (3~ 380-480VAC)
Status	NC	Alarm relay, open by failure
	COM	Alarm relay, common (2A/250VAC)
	NO	Alarm relay, close by failure
Signal	RSB	RS485-B
	RSA	RS485-A
	RSB	RS485-B
	RSA	RS485-A
	GND	Ground
	Vout	+3.3-24V/800mW output (default: +10V)
	GND	Ground
	OUT (IO4)	Control voltage output 0-10VDC
	0-10V/PWM (IO3)	Speed control, input 0-10VDC
	4-20mA (IO2)	Speed control, input 4-20mA
	FG (IO1)	Frequency generator (FG) signal (open collector and the pull high resistant ≥ 10kΩ)

Speed setting	
Full Speed  	**Short Vout & IO3** Fan will run at full speed.
 	**Connector 1-10kΩ variable resistor** Between **Vout** with **GND** and IO 3 (**0-10V/PWM**) Vary the variable resistance，to change the 'IO3' voltage (0...10V), then change FAN speed。
Voltage Control B  	**Use voltage source supply 0~10V_{DC} voltage** DC+ : connect to IO 3 (+) DC - : connect to GND (-)
PWM Control  	**PWM duty control** PWM amplitude is 3.3-24V_{DC}. (Except for the 10V_{DC}, other voltage amplitude must change IO3 to PWM mode by RS485.) Frequency Range is 100Hz...10kHz -PWM duty higher than 15%, fan start up。 -PWM duty lower than 5%, fan stop。
Current Control  	**4~20mA Current Control** Open 0-10V/PWM PIN - 4.0 mA → Fan Stop - 6.0 mA → Fan Start up - 19.5 mA → Maximum Speed

<table>
<tr><th colspan="2">Signal function</th></tr>
<tr><td>RS485 control function</td><td>RS485 control function
-Select the control mode of speed, fixed speed or fixed PWM duty
-Speed and power consumption feedback.
-Allow multiple FANs control and status patrol.
Note:
1. A MODBUS over Serial Line Cable must be shielded. At one end of each cable its shield must be connected to protective ground.</td></tr>
<tr><td>Voltage / PWM</td><td>The speed comparison will control level.
<table>
<tr><th>Voltage (V)</th><th>PWM(%)</th><th>Speed(RPM)</th></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1.5</td><td>15</td><td>200 ± 50</td></tr>
<tr><td>6.0</td><td>60</td><td>2140 ± 8%</td></tr>
<tr><td>9.5</td><td>95</td><td>3650 ± 8%</td></tr>
</table></td></tr>
<tr><td>Current Control</td><td>The speed comparison will control level.
<table>
<tr><th>Current (mA)</th><th>Speed (RPM)</th></tr>
<tr><td>4.0</td><td>0</td></tr>
<tr><td>6.0</td><td>200 ± 50</td></tr>
<tr><td>13.6</td><td>2140 ± 8%</td></tr>
<tr><td>19.5</td><td>3650 ± 8%</td></tr>
</table></td></tr>
<tr><td>IO4 OUT
(Control O/P)
＊’OUT’ outputs a 0-10V voltage, for series fan connection. (fan1→ fan2 → …→fan(n)). Which apply a voltage command, all fans run in same RPM.</td><td>The OUT voltage Vs. current control input (almost linear ,4~20mA).
<table>
<tr><th>Current (mA)</th><th>OUT (VDC) (REF)</th></tr>
<tr><td>4.0</td><td>0.5</td></tr>
<tr><td>6.0</td><td>1.5</td></tr>
<tr><td>13.6</td><td>6.0</td></tr>
<tr><td>19.5</td><td>9.5</td></tr>
</table></td></tr>
<tr><td>Alarm state</td><td>1. NC and COM will OPEN.
2. NO and COM will CLOSE.</td></tr>
</table>

Control Voltage VS. RPM Curve



Voltage (VDC) , PWM duty (%), 4~20mA table

Voltage	0	0.5	1	1.5	2	3	4	5	6	7	8	9.5	10	VDC
PWM duty	0	5	10	15	20	30	40	50	60	70	80	95	100	%
4~20 mA	0	4.0	5.1	6.0	6.8	8.5	10.2	11.9	13.6	15.3	17.0	19.5	20	mA