



Specification For Approval

Customer : _____
Description : _____ EC FAN _____
Customer Part No. : _____ Rev : _____
Delta Model No. : _____ GTM045PUV36R-M002 _____ Rev : X00
Safety Model No. : _____
Sample Issue No. : _____
Sample Issue Date : _____ 02/10/2023 _____

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

Approved by : _____

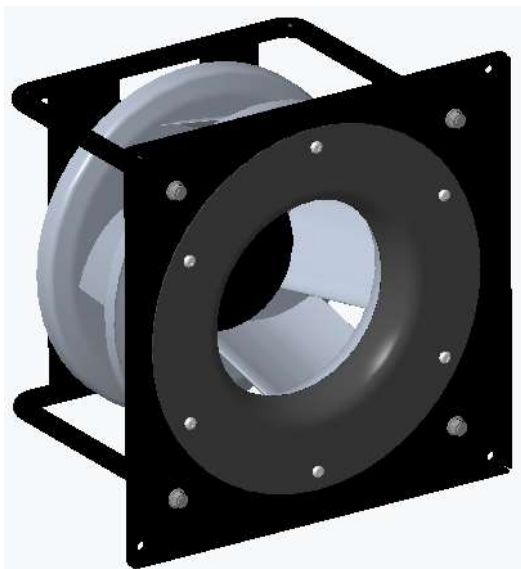
Date : _____

Beijing Hengrui Mechanical and Electrical Equipment Co,Ltd
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Electronically Commutated (EC) Fan

Centrifugal Fan

555 x 555 x 425 mm



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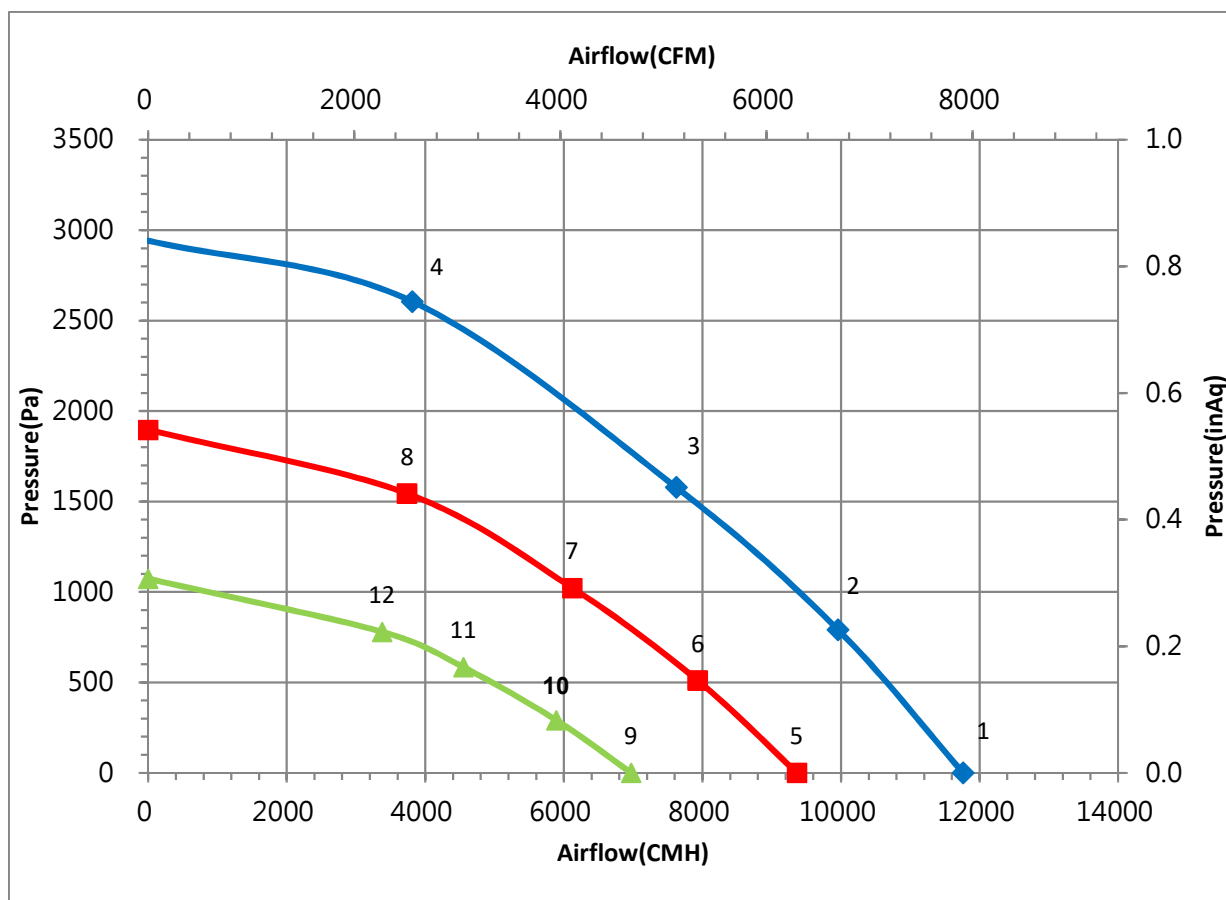
Technical features

Input Side	
Nominal Voltage	3~ 400Vac 50/60Hz
Input Source	3~ 380Vac - 480Vac
Power @ Free air	2920 W
Power @ Max. load	6000 W
Output Side	
Speed (RPM)	3500
Qmax. (CMH / CFM)	11762 / 6923
Pmax. (Pa / inAq)	2941 / 11.81
Noise (dB-A) @ Qmax.	95.2
Functions	
Passive power factor correction	
Control input 0-10V _{DC} / PWM / 4-20mA.	
FG voltage output: 0-10VDC	
Control voltage output: 0-10V _{DC} .	
RS485 control bus (MODBUS (V20) RTU / Baudrate:9600 / 8N1)	
Alarm relay, Locked rotor protection, Soft start.	
Speed telling, Enable function.	
Voltage / Current monitoring.	

Physical	
Rotation Direction	CW, Seen on rotor
Material (Impeller / Motor Frame)	Aluminum / Die-cast Aluminum
Material (Bracket / Nozzle)	Sheet steel / Plastic
Bearing system	Ball bearings
Weight (kg)	50.5
Electrical leads	Via definition of cable
Environmental	
Operating temperature range	-25 ~ +60 °C
Storage temperature range	-40 ~ +70 °C
Safety	
Safety	UL , cUL ,CE (in progress)
IP Level	IP54
EMC	EN61000-6-2 , EN61000-6-4 (in process)
Protection class	I
Insulation class	F
Leakage current	<= 3.5 mA
Motor protection	Over temperature protected
Life expectance	55,000 hrs at 40 °C / 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	11762	3500	2920	4.76	95.2
2	792	9955	3500	4470	7.17	
3	1578	7620	3500	5600	9.05	
4	2606	3810	3500	5490	8.67	
5	0	9365	2800	1610	2.85	93.0
6	510	7933	2800	2400	3.99	
7	1022	6121	2800	2980	4.95	
8	1543	3740	2800	3030	5.11	
9	0	6970	2100	790	1.74	80.2
10	291	5890	2100	1120	2.20	
11	584	4551	2100	1360	2.56	
12	780	3373	2100	1410	2.84	

Test Condition :

- Input Voltage : Nominal Voltage
- Temperature : Room Temperature
- Humidity : 65%RH
- Air density : $1.15 \pm 2\%$ kg/m³
- 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 (%)	60.9	59.4
Eff Grade N	63.5	62
Power (kW)	5.6	
Air flow (CMH)	7620	
Pressure (Pa)	1578	
Speed (RPM)	3500	

Dimension drawing

Label 1 :



Fan :

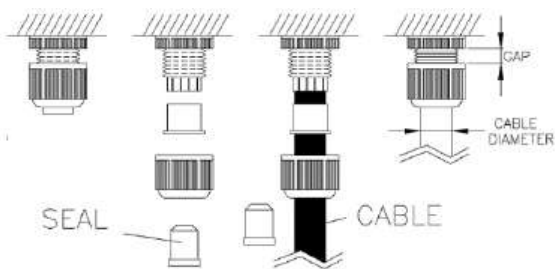
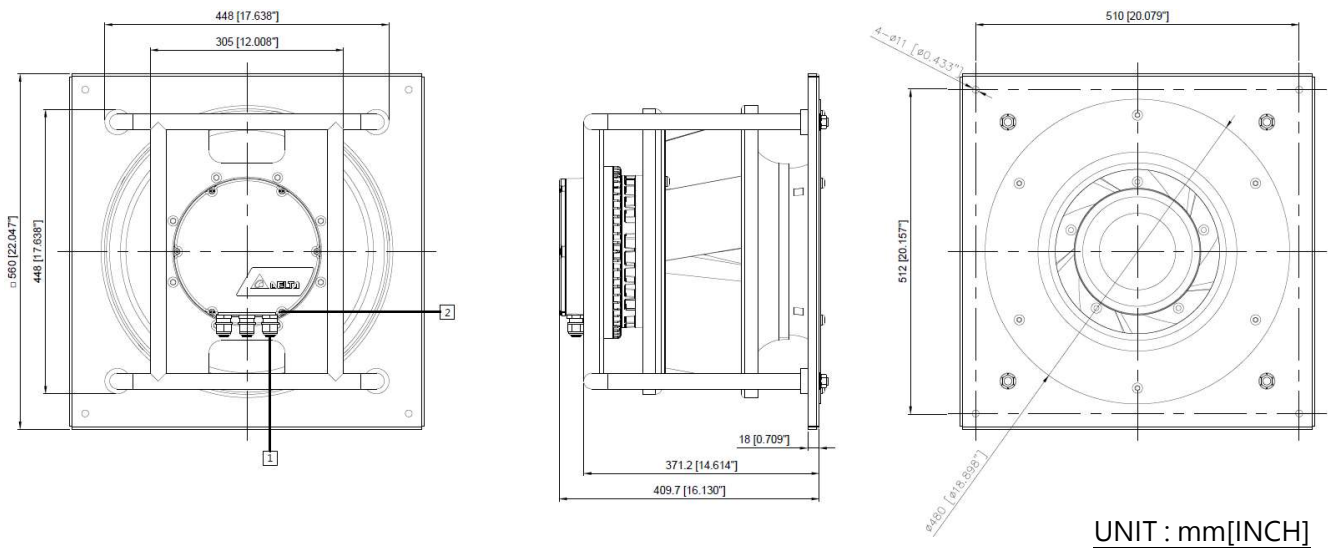


Fig.1

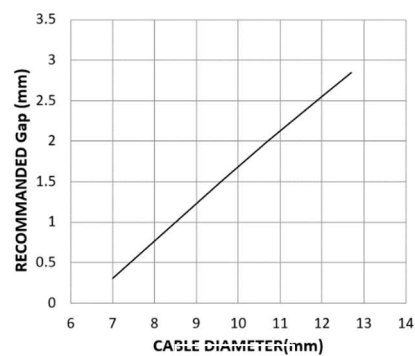
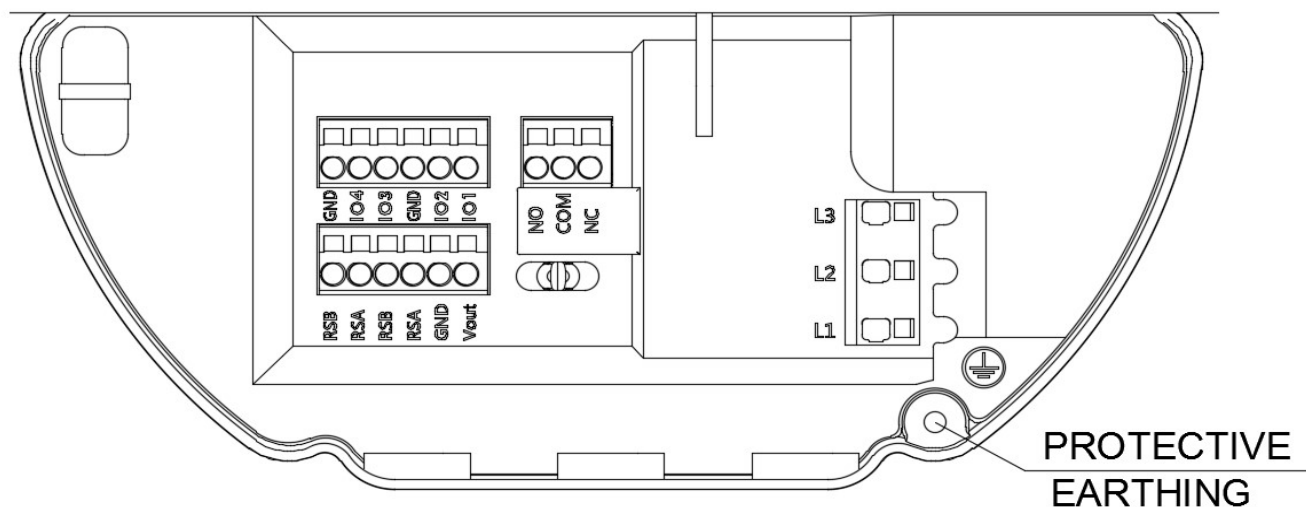


Fig.2

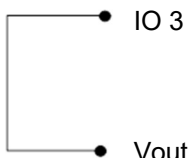
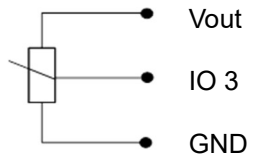
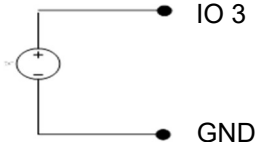
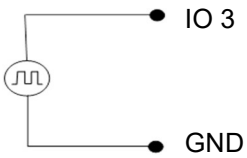
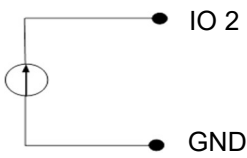
Note :

- 1 Cable gland: M20xP1.5 (1 pcs), Material: Nylon, Cable Diameter: Ø7.0 ~ Ø12.7mm.
Cable gland nut's gap refer Fig.1 & 2
- 2 Open the cover and refer to definition of terminal block, and screw torque is 17±10% kgf-cm

Definition of terminal block

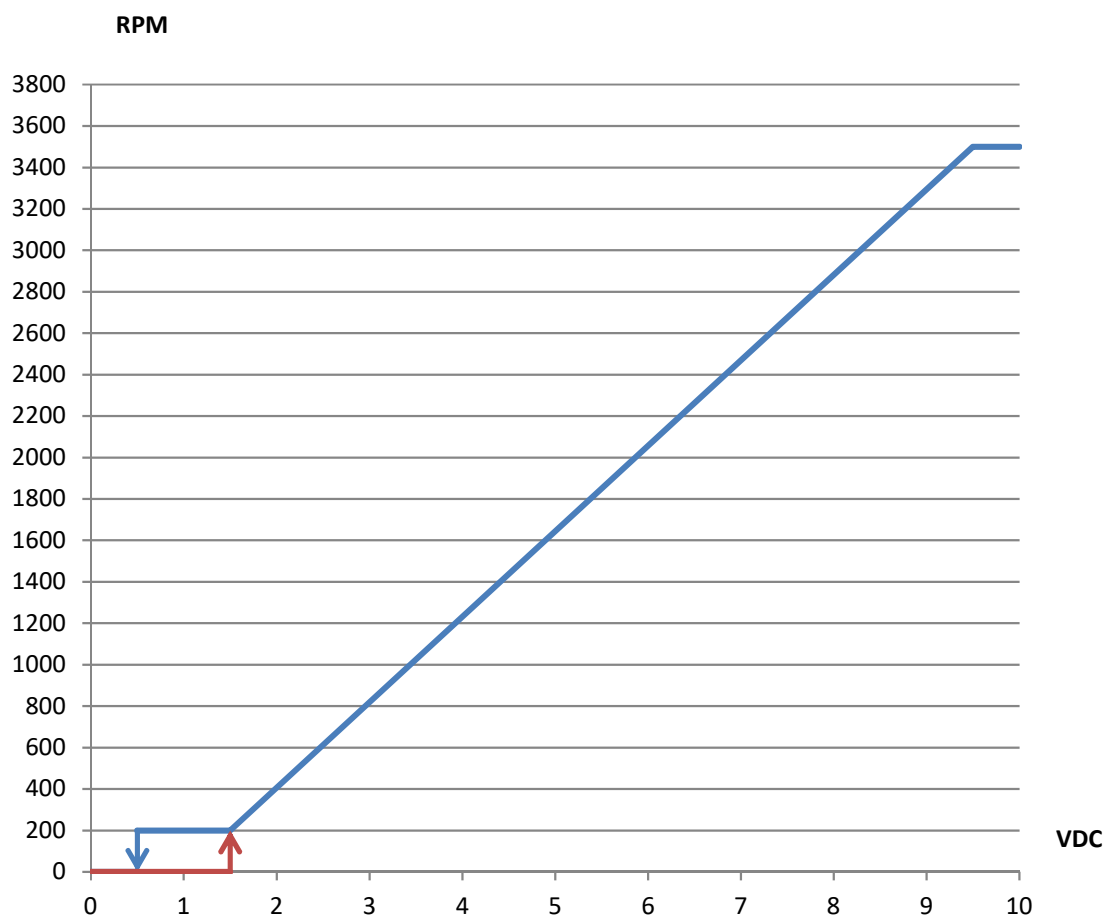


	Text	Functions
Power	L1	AC main (3~ 380-480VAC)
	L2	AC main (3~ 380-480VAC)
	L3	AC main (3~ 380-480VAC)
Status	NC	Alarm relay, open by failure
	COM	Alarm relay, common (2A/250VAC)
	NO	Alarm relay, close by failure
Signal	RSB	RS485-B
	RSA	RS485-A
	RSB	RS485-B
	RSA	RS485-A
	GND	Ground
	Vout	+3.3-24V/800mW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

Speed setting	
Voltage Control_1 	Fixed full speed mode - Connect Vout and IO3 directly - A simple way to keep fan runs at full speed continuously
Voltage Control_2 	Control by variable resistor - Connect variable resistor to Vout, GND, and IO3 - Adjust the variable resistance to change the voltage (0-10V_{DC}) of IO3 for speed control - Refer the speed control curve on page 9 for detail about speed setting
Voltage Control _3 0-10V DC Source 	Control by DC voltage source (0-10V_{DC}) - Connect DC voltage source to IO3(+) and GND(-) - Change the voltage (0-10V_{DC}) of DC source for speed control - Refer the speed control curve on page 9 for detail about speed setting
PWM Control PWM Generator 	- Connect PWM signal to IO3 and GND - PWM amplitude should be 3.3~24V_{DC} - PWM frequency should be 100Hz-10kHz - Change the PWM duty (0-100%) for speed control - Refer the speed control curve on page 9 for detail about speed setting
Current Control 4-20mA Current Source 	- Connect DC current source to IO2 and GND - Change the current (4-20 mA) for speed control - Refer the speed control curve on page 9 for detail about speed setting

Signal function														
RS485 control function	RS485 control function - Select the control mode of speed, fixed speed or fixed PWM duty - Speed and power consumption feedback. - 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.													
Voltage / PWM control	Table of speed setting for Voltage / PWM control <table><tr><td>Voltage (V) ± 5%</td><td>PWM(%) ± 5%</td><td>Speed (RPM)</td></tr><tr><td>0 ~ 0.5</td><td>0 ~ 5</td><td>0</td></tr><tr><td>1.5</td><td>15</td><td>200 ± 50 RPM</td></tr><tr><td>9.5</td><td>95</td><td>3500 ± 5%</td></tr></table>		Voltage (V) ± 5%	PWM(%) ± 5%	Speed (RPM)	0 ~ 0.5	0 ~ 5	0	1.5	15	200 ± 50 RPM	9.5	95	3500 ± 5%
Voltage (V) ± 5%	PWM(%) ± 5%	Speed (RPM)												
0 ~ 0.5	0 ~ 5	0												
1.5	15	200 ± 50 RPM												
9.5	95	3500 ± 5%												
Current control	Table of speed setting for current control <table><tr><td>Current (mA) ± 5%</td><td>Speed (RPM)</td></tr><tr><td>0 ~ 4.0</td><td>0</td></tr><tr><td>6.0</td><td>200 ± 50 RPM</td></tr><tr><td>19.5</td><td>3500 ± 5%</td></tr></table>		Current (mA) ± 5%	Speed (RPM)	0 ~ 4.0	0	6.0	200 ± 50 RPM	19.5	3500 ± 5%				
Current (mA) ± 5%	Speed (RPM)													
0 ~ 4.0	0													
6.0	200 ± 50 RPM													
19.5	3500 ± 5%													
IO4 for FG voltage output * IO4 can output FG voltage (DCV) for different speed. $FG\ OUT\ Voltage = \frac{Setting\ Speed}{3500} * 10$ = 0 ~ 10Vdc	Table of FG voltage for different speed <table><tr><td>Speed (RPM)</td><td>FG Voltage ± 5% (V_{DC})</td></tr><tr><td>0</td><td>0.14</td></tr><tr><td>200</td><td>0.57</td></tr><tr><td>3500</td><td>10</td></tr></table>		Speed (RPM)	FG Voltage ± 5% (V _{DC})	0	0.14	200	0.57	3500	10				
Speed (RPM)	FG Voltage ± 5% (V _{DC})													
0	0.14													
200	0.57													
3500	10													
Alarm state	1. NC and COM will Close if fan works normally 2. NO and COM will OPEN if fan works normally													
IO1 Enable Function	Enable function. 1. IO1 is H or Blank, the fan is enabled 2. IO1 is L, the fan is disabled ※ H : 9.5 ~ 10V L : 0 ~ 0.7V													

Speed Control Curve



Voltage (V_{DC}) , PWM duty (%) , 4~20mA table

Voltage $\pm 5\%$	0	0.5	1	1.5	2	3	4	5	6	7	8	9	10	VDC
PWM duty $\pm 5\%$	0	5	10	15	20	30	40	50	60	70	80	90	100	%
4~20 mA $\pm 5\%$	0	4.0	5.0	6.0	6.9	8.5	10.2	12.0	13.6	15.3	17.0	18.7	20.0	mA