



## Specification For Approval

Customer : \_\_\_\_\_  
Description : \_\_\_\_\_ EC FAN \_\_\_\_\_  
Customer Part No. : \_\_\_\_\_ Rev : \_\_\_\_\_  
Delta Model No. : \_\_\_\_\_ GTW091NUT24R \_\_\_\_\_ Rev : 07  
Safety Model No. : \_\_\_\_\_ UL:GTW091NUT24 ; TUV:MU150HA3FC6 \_\_\_\_\_  
Sample Issue No. : \_\_\_\_\_  
Sample Issue Date : \_\_\_\_\_ 02/04/2020 \_\_\_\_\_

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

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

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

Delta Electronics, Inc.  
No.252, Shanying Rd., Guishan Dist.,  
Taoyuan City 333, Taiwan

TEL : 886-(0)3-3591968  
FAX : 886-(0)3-3591991

## Electronically Commutated (EC) Fan

Axial Fan

1070 x 1070 x 240 mm



**DELTA ELECTRONICS, INC.**  
 No.252, Shanying Rd., Guishan Dist.,  
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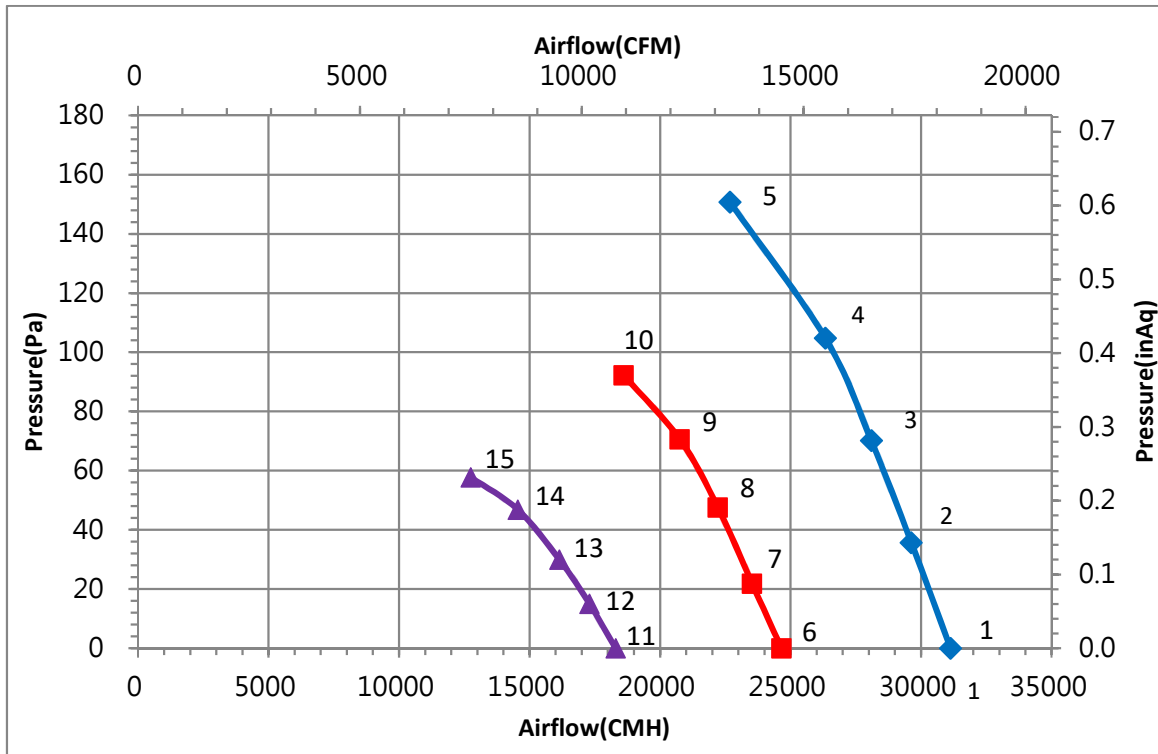
### Technical features

Input Side	
Nominal Voltage	3~ 400Vac 50/60Hz
Input Source	3~ 380Vac - 480Vac 50/60Hz
Power @ Free air	1592 W
Power @ Max. load	2100 W
Output Side	
Speed (RPM)	950
Qmax. (CMH / CFM)	31130 / 18311
Pmax. (Pa / inAq)	151 / 0.61
Noise (dB-A) @ Qmax	83.0 dBA
Functions	
Active power factor correction	
Control input 0-10VDC / PWM / 4-20mA.	
Output +10VDC (±10%), max. 10mA.	
Control voltage output: 0-10VDC.	
RS485 control bus (MODBUS (V1.1) RTU/ 8N1)	
Alarm relay, Locked rotor protection, Soft start.	
Speed telling, Frequency generator signal.	
Voltage / Current monitoring.	

Physical	
Rotation Direction	CCW, seen on rotor
Material (Impeller / Frame)	Plastic / Steel
Bearing system	Ball bearings
Weight (kg)	57
Electrical leads	Via terminal block
Environmental	
Operating temperature range	-25 ~ +60 °C
Storage temperature range	-40 ~ +70 °C
Safety	
Safety	UL , cUL , TUV (in progress)
IP Level	IP54
EMC	EN61000-6-2/4 , EN61000-3-2/3 (in progress)
Protection class	I
Insulation class	F
Leakage current	<= 3.5 mA
Motor protection	Over temperature protected
Life expectance	60,000 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(without fanguard condition)



Measure data:

	P [Pa]	Q [CMH]	N [R.P.M.]	P1 [W]	I [A]	Lp [dB(A)]
1	0	31130	950	1592	2.39	83.0
2	36	29626	950	1722	2.63	
3	70	28095	950	1924	2.93	
4	105	26330	950	1991	3.02	
5	151	22681	950	2060	3.13	
6	0	24654	760	850	1.33	78.0
7	22	23529	760	920	1.44	
8	48	22216	760	1032	1.60	
9	71	20755	760	1066	1.65	
10	92	18606	760	1085	1.66	
11	0	18298	570	390	0.67	71.0
12	15	17297	570	427	0.73	
13	30	16138	570	467	0.79	
14	47	14546	570	486	0.81	
15	58	12748	570	488	0.82	

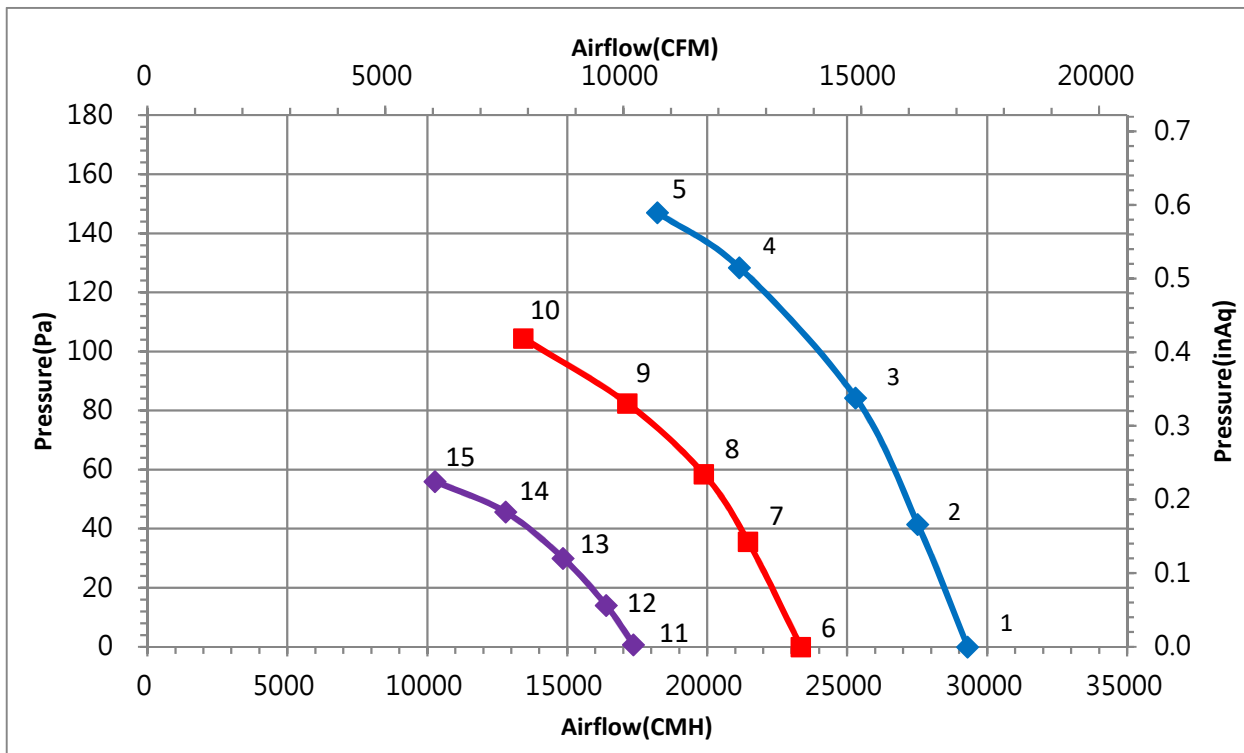
Test Condition:

- Input Voltage: 3~400Vac
- Temperature : Room Temperature
- Humidity : 65%RH
- 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 (%)	49.2	35.7
Eff Grade N	53.5	40
Power (kW)	2.060	
Air flow (CMH)	22681	
Pressure (Pa)	151	
Speed (RPM)	950	

P & Q curves(with fanguard condition)



Measure data:

	P [Pa]	Q [CMH]	N [R.P.M.]	P1 [W]	I [A]	Lp [dB(A)]
1	0	29305	950	1702	2.60	83.0
2	41	27524	950	1835	2.80	
3	84	25308	950	1950	2.96	
4	128	21153	950	2074	3.15	
5	147	18222	950	2115	3.20	
6	0	23351	760	905	1.41	78.0
7	36	21464	760	992	1.55	
8	58	19880	760	1043	1.61	
9	82	17150	760	1120	1.73	
10	104	13438	760	1161	1.78	
11	0	17373	570	410	0.70	71.0
12	14	16375	570	437	0.75	
13	30	14854	570	460	0.78	
14	46	12801	570	474	0.80	
15	56	10281	570	487	0.81	

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Dimension drawing

Label :

Label 1



Label 2



Fan :

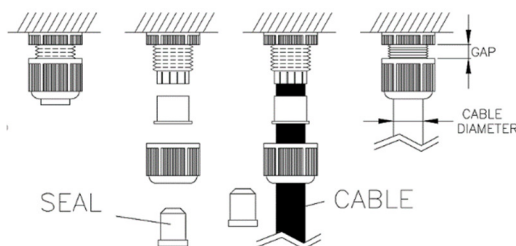
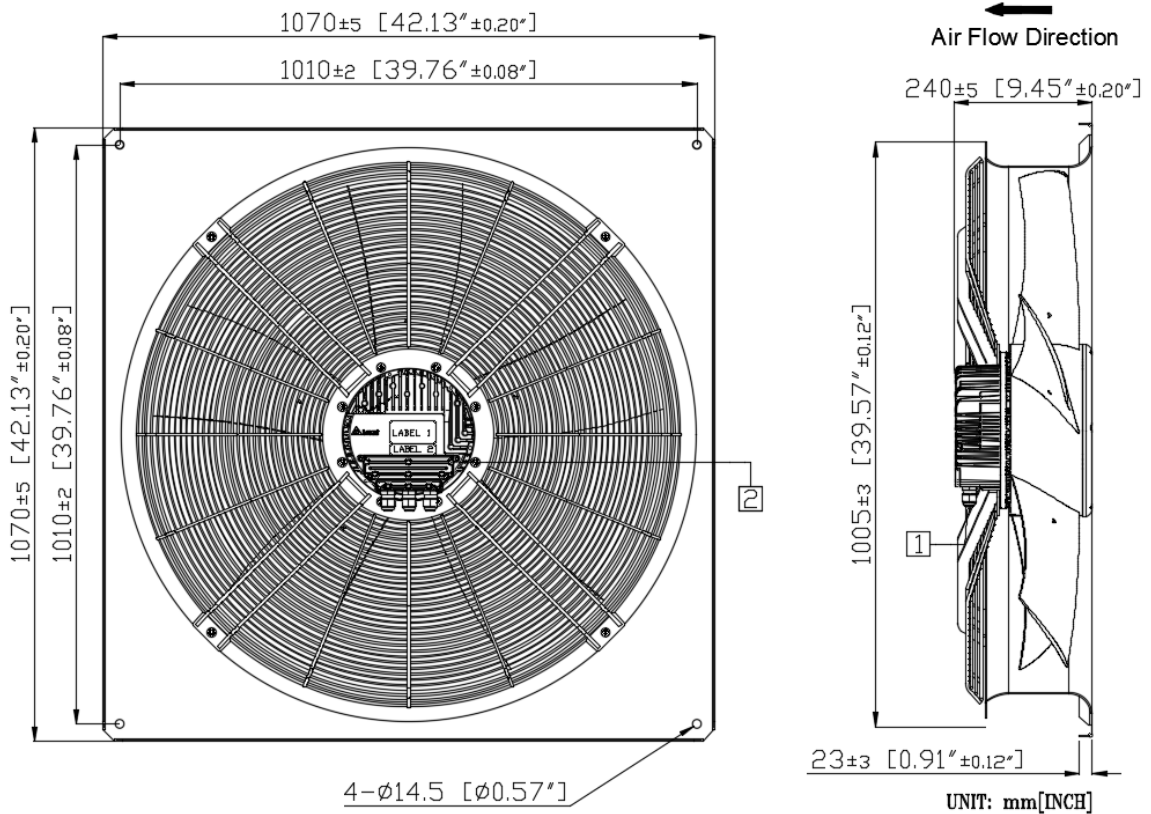


Fig1

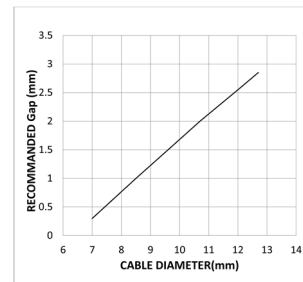
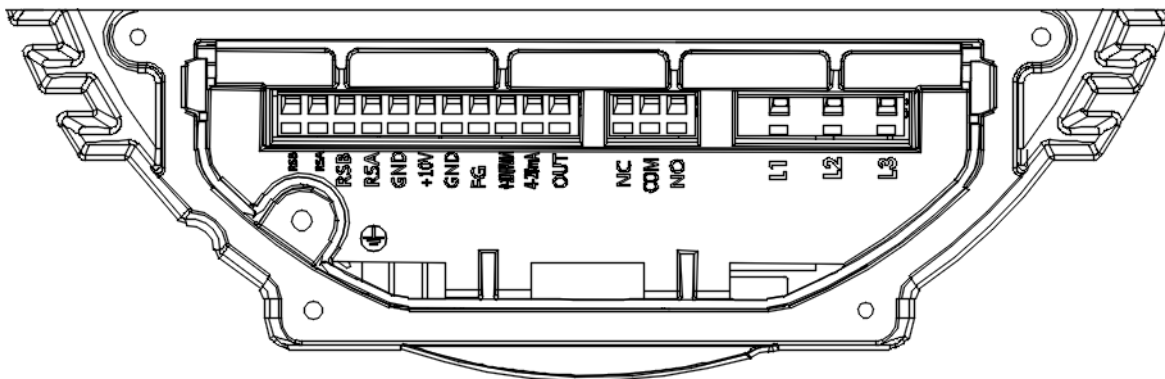


Fig 2

Note:

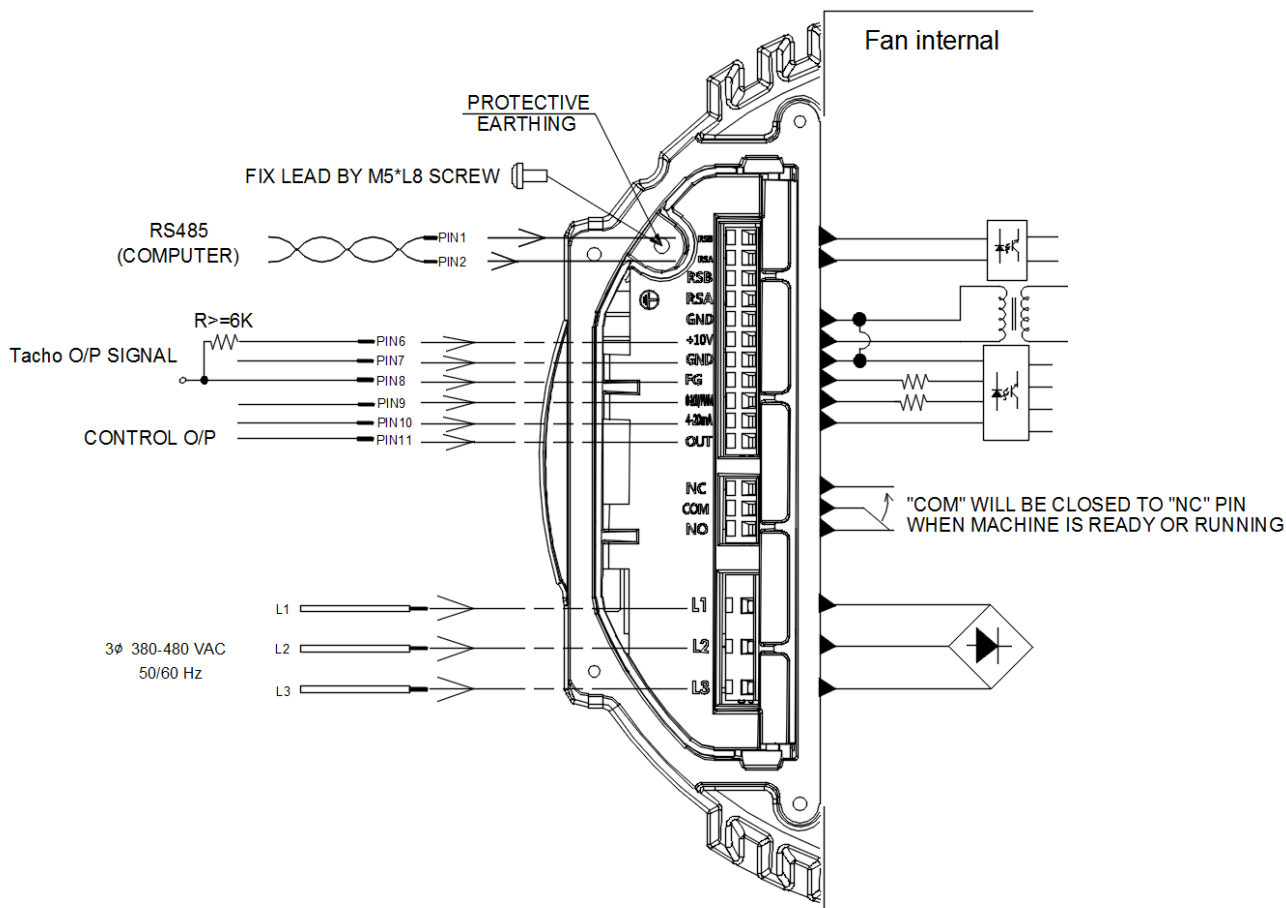
1. Cable Diameter :  $\phi$  7.0~  $\phi$  12.7 mm
2. Open the cover and refer to definition of terminal block.  
Screws tighten torque  $20 \pm 2$  Kgf-cm ,when close the cover.
3. Cable sealing nut's gap refer Fig 1 & 2.

Definition of terminal block





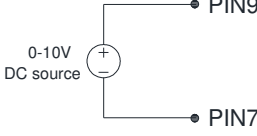
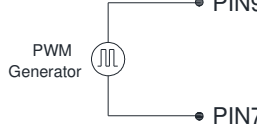
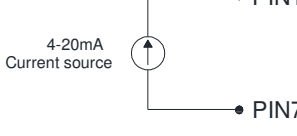
	Text	Functions
Power	L1	AC main (3~ 380-480VAC)
	L2	AC main (3~ 380-480VAC)
	L3	AC main (3~ 380-480VAC)
Status	NC	Alarm relay, open by failure
	COM	Alarm relay, common (2A/250VAC)
	NO	Alarm relay, close by failure
Signal	RSA	RS485-A
	RSB	RS485-B
	RSA	RS485-A
	RSB	RS485-B
	GND	Ground
	+10V	+10V output, MAX 10mA (For external potentiometer)
	GND	Ground
	FG	Frequency generator (FG) signal
	0-10V/PWM	Speed control ,input 0-10VDC
	4-20mA	Speed control ,input 4-20mA
OUT	Control voltage output0-10VDC (For external potentiometer)	

Lead wire connection:

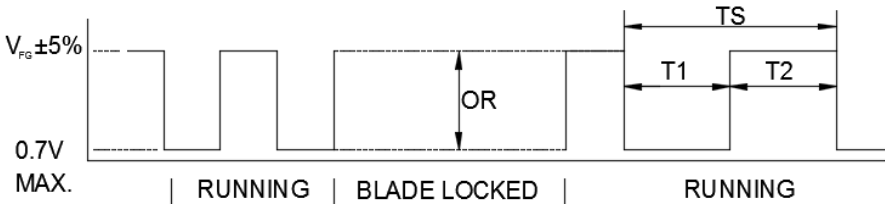


Note:

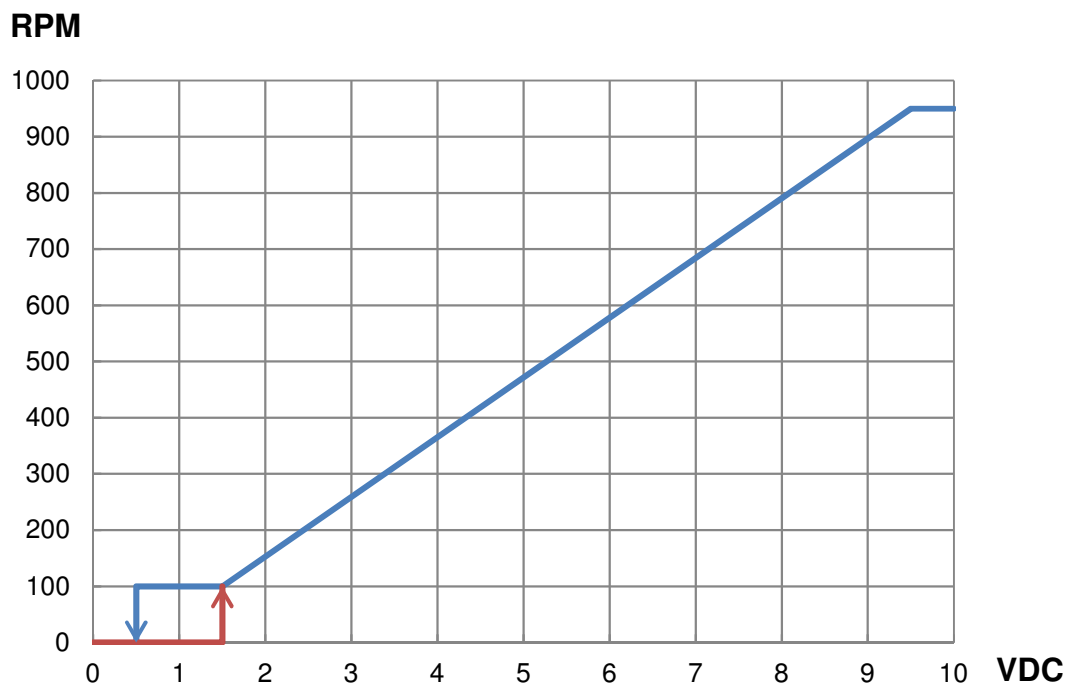
1. A MODBUS over Serial Line Cable must be shielded. At one end of each cable its shield must be connected to protective ground.

Speed setting	
<p>Full Speed</p> 	<p><b>Short PIN6&amp; PIN9</b> Fan will run full speed.</p>
<p>Voltage Control A</p> 	<p><b>Connector 1-10kΩ variable resistor</b> Between +10VDC with GND and 0-10V/PWM Turn the variable resistor, can change the '0-10V/PWM' voltage (0...10V).</p>
<p>Voltage Control B</p> 	<p><b>Use voltage source support 0~10VDC voltage</b> DC+ : connector PIN9(+) DC- : connector PIN7(-)</p>
<p>PWM Control</p> 	<p><b>PWM duty control</b> PWM amplitude is 10VDC(+/-5%) Frequency Range is 100Hz...100kHz -PWM duty higher than 15%, fan start up ° -PWM duty lower than 5%, fan stop °</p>
<p>Current Control</p> 	<p><b>4~20mA Current Control</b> Open 0-10V/PWM PIN - Lower than 4.3 mA → Fan Stop - Higher than 6 mA → Fan Start up - Higher than 19.5 mA → Maximum Speed</p>



Signal function													
RS485 control function	<p><b>RS485 control function</b></p> <ul style="list-style-type: none"> <li>-Select the control mode of speed, fixed speed or fixed PWM duty</li> <li>-Speed and power consumption feedback.</li> <li>-Allow multiple FANs control and status patrol.</li> </ul>												
Control O/P	<p>The analog signal level is the derivative of current control level.</p> <table border="1"> <thead> <tr> <th>Current (mA)</th> <th>Control O/P (VDC) (REF)</th> </tr> </thead> <tbody> <tr> <td>4.0</td> <td>0</td> </tr> <tr> <td>6.3</td> <td>1.50</td> </tr> <tr> <td>14.0</td> <td>6.10</td> </tr> <tr> <td>19.5</td> <td>9.38</td> </tr> </tbody> </table>	Current (mA)	Control O/P (VDC) (REF)	4.0	0	6.3	1.50	14.0	6.10	19.5	9.38		
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Alarm state	NC and COM will OPEN; NO and COM will CLOSE.												
FG	<p> <math>V_{CE(sat)} = 0.7V \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>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p> <math>N=R.P.M</math>      1 PULSE PER REVOLUTION  <math>TS=60/N(SEC)</math>      <math>T1=T2=1/2 TS</math> </p> </div>												

## 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	10	VDC
PWM duty	0	5	1	15	20	30	40	50	60	70	80	90	100	%
4~20 mA	4	4.3	5.2	6	6.9	8.5	10.2	11.9	13.6	15.2	16.9	18.6	20	mA