

SPECIFICATION FOR APPROVAL  
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Customer:

Description:	EC FAN		
Customer P/N:		REV:	
Delta Model NO.:	GTB040EUD24R N1	Safety Model NO.:	GTB040EUD24
Sample Rev:	X04	Issue NO:	
Sample Issue Date:		Quantity:	

1. SCOPE:

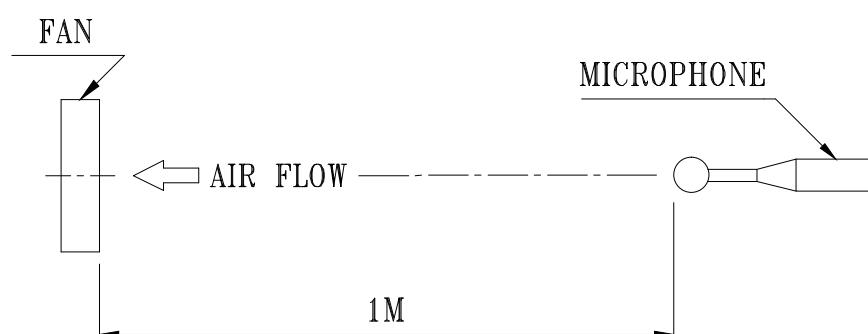
THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THIS CENTRIFUGAL FAN.

2. NOMINAL DATA:

UNLESS SPECIFIED, ALL READINGS AND TESTS ARE BASED ON 25 DEG C, 65% RH.

ITEM	DESCRIPTION
NOMINAL VOLTAGE	1 $\phi$ 230 VAC 50/60Hz
NOMINAL VOLTAGE RANGE	1 $\phi$ 200 - 277 VAC
INPUT POWER @ FREE-AIR	490 W
INPUT POWER @ MAX. LOAD	800 W
INPUT CURRENT (MAX)	4.00 A
SPEED	1845 R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	4373 ( MIN. 3936) M <sup>3</sup> /H 2574 ( MIN. 2317) CFM
MAX. AIR PRESSURE (AT ZERO AIR FLOW)	707.2 ( MIN. 572.8) Pa 2.839 ( MIN. 2.300) inchH <sub>2</sub> O
ACOUSTICAL NOISE (AVG.) @ FREE-AIR	77.0 (MAX 82.0) dB(A)

- NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.  
 2. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.  
 3. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT NOMINAL VOLTAGE IN FREE AIR IN ANECHOIC CHAMBER WITH B & K SOUND LEVEL METER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

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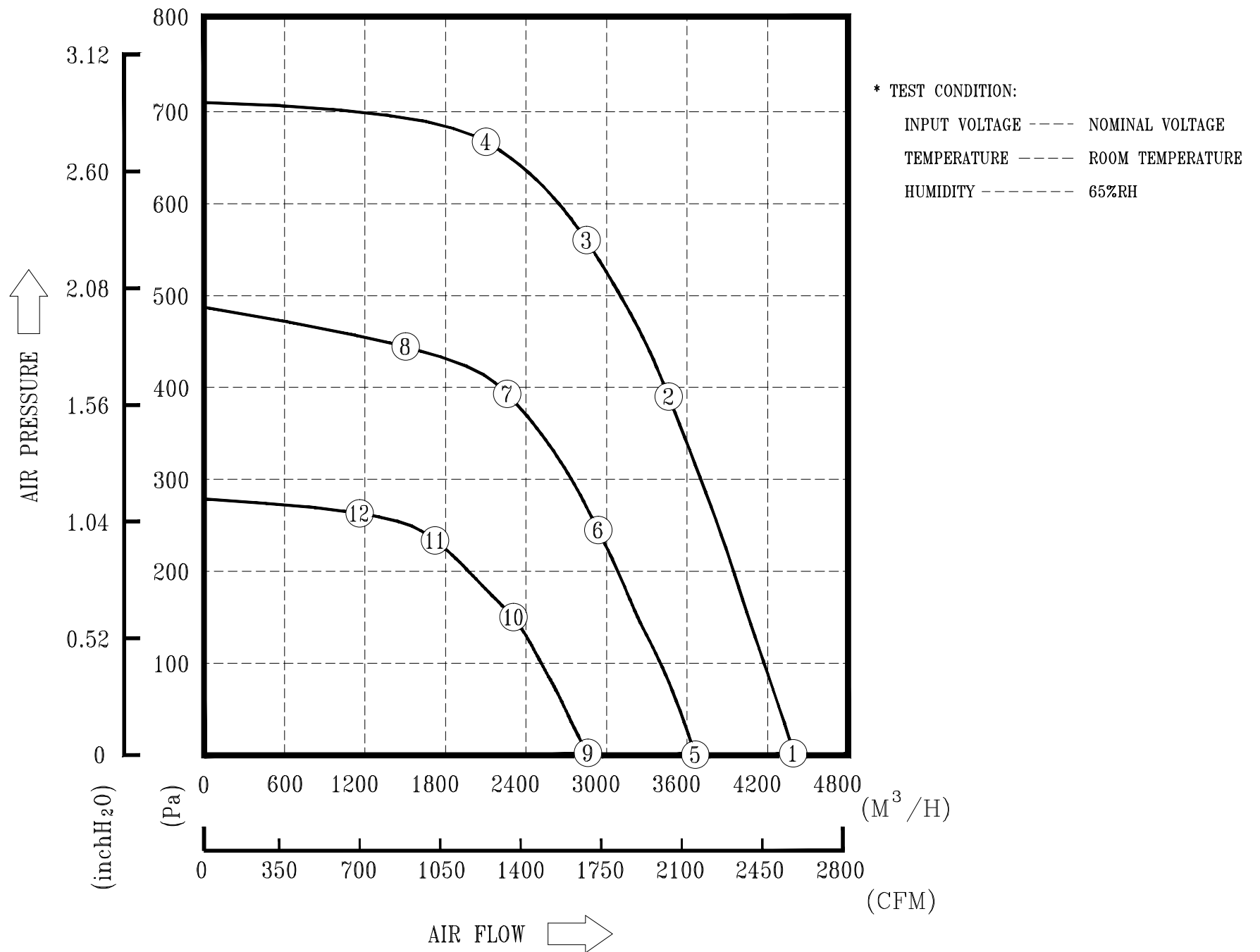
3. FEATURES:

DIRECTION OF ROTATION	CLOCKWISE, SEEN ON ROTOR
BEARING SYSTEM	BALL BEARINGS
WEIGHT	10.5 K.G. (REF.)
MATERIAL OF ELECTRONICS HOUSING	DIE-CAST ALUMINUM
MATERIAL OF IMPELLER	ALUMINUM SHEET
ELECTRICAL LEADS	VIA TERMINAL BLOCK
MOTOR PROTECTION	OVER TEMPERATURE PROTECTED
LEAKAGE CURRENT	$\leq 3.5$ mA
INSULATION CLASS	B
TYPE OF PROTECTION	IP54
PROTECTION CLASS	I
POWER FACTOR CORRECTION	ACTIVE
OPERATING TEMPERATURE	-25~+60 °C (REF.)
STORAGE TEMPERATURE	-40~+70 °C (REF.)
EMC	EN61000-6-2/4 , EN61000-3-2/3
SAFETY	UL , cUL , TUV
LIFE EXPECTANCE	* 60,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
FUNCTIONS	- CONTROL INPUT 0-10VDC or PWM PATTERN or 4-20mA - OUTPUT +10VDC( $\pm 10\%$ ), max. 10mA - CONTROL VOLTAGE OUTPUT, 0-10VDC - RS485 CONTROL BUS - ALARM RELAY, LOCKED ROTOR PROTECTION, SOFT START - SPEED TELLING, FREQUENCY GENERATOR SIGNAL - VOLTAGE/CURRENT MONITORING

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4. P & Q CURVE:



MEASURED DATA:

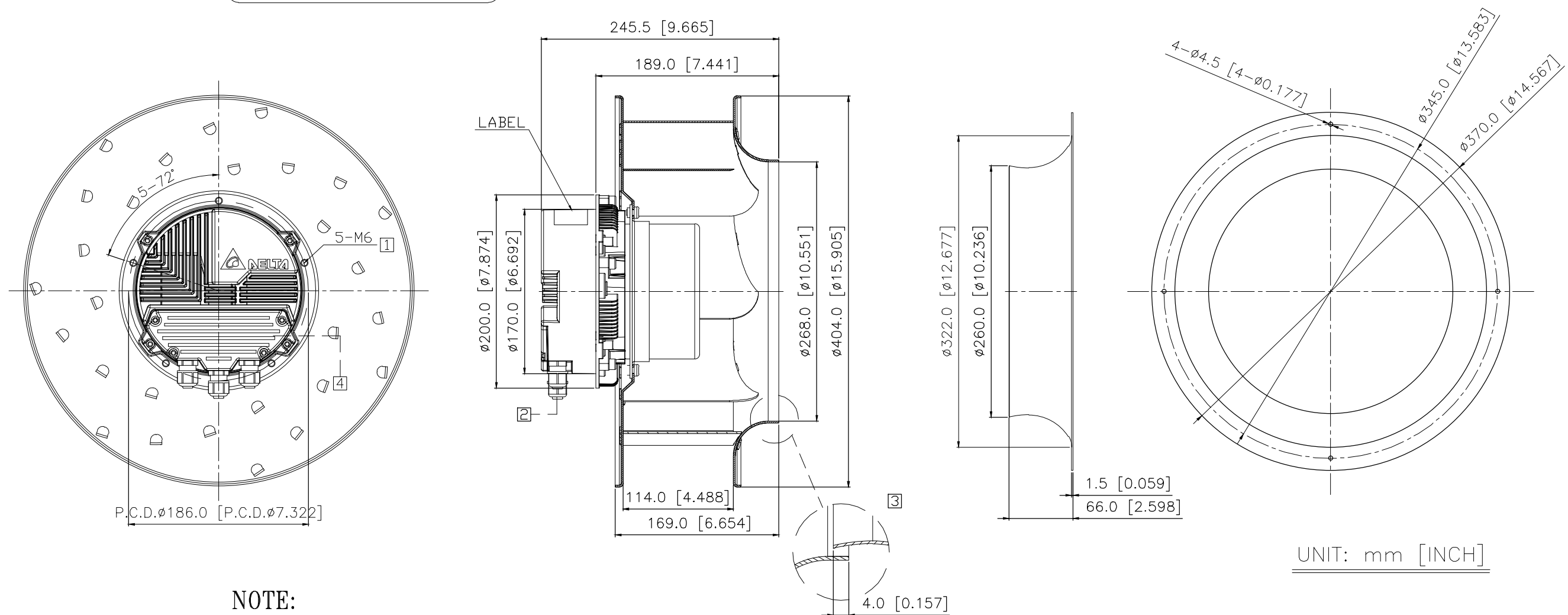
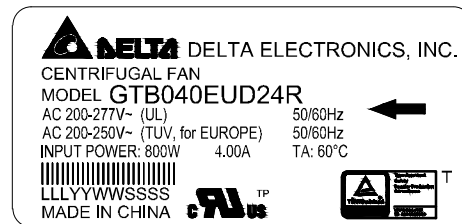
	P	Q	N	P1	I	Lp
	[Pa]	[M <sup>3</sup> /H]	[R.P.M.]	[W]	[A]	[dB(A)]
1	0	4374	1850	490	2.17	77.0
2	383.2	3475	1851	734	3.23	
3	558.6	2847	1851	790	3.47	
4	652.7	2303	1856	776	3.41	
5	0	3646	1550	288	1.32	72.5
6	244.0	2932	1547	430	1.93	
7	392.0	2277	1545	458	2.05	
8	440.0	1894	1552	450	2.02	
9	0	2851	1200	142	0.73	67.0
10	147.8	2328	1196	201	0.97	
11	236.2	1713	1195	220	1.04	
12	265.6	1375	1195	210	1.01	

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5. DIMENSION DRAWING:

LABEL



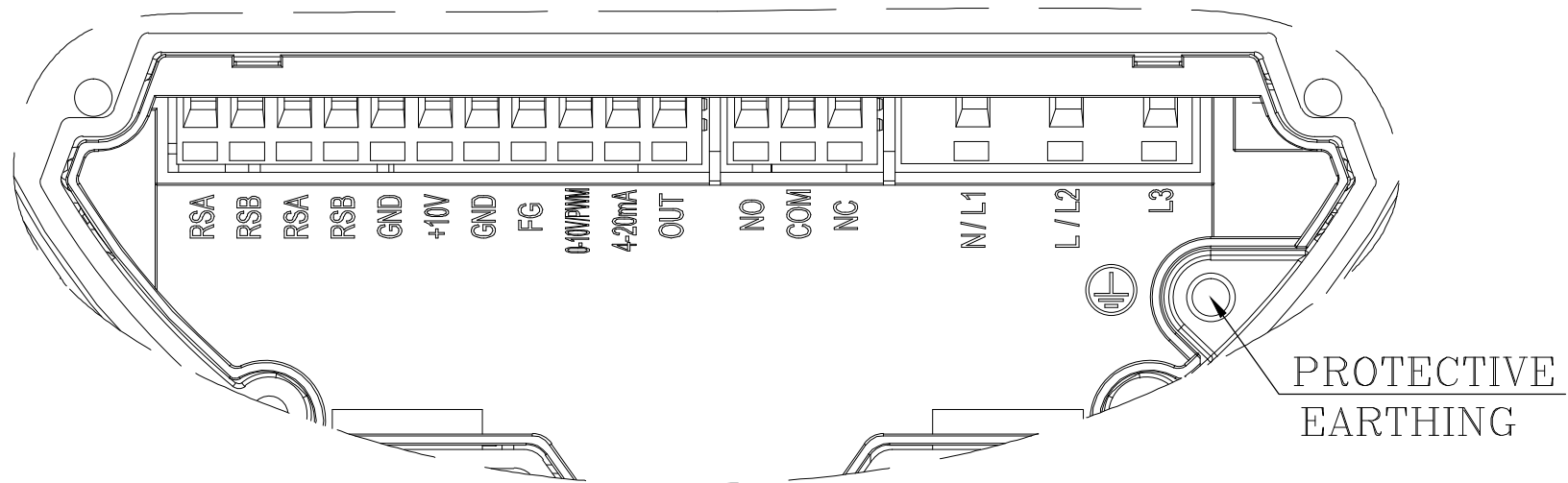
NOTE:

- 1 DEPTH OF SCREW: 12~16mm.
- 2 CABLE DIAMETER:  $\phi 6.0 \sim \phi 10.0$ mm.
- 3 ACCESSORY: INLET NOZZLE, ALL THE PERFORMANCE DATA ARE MEASURED WITH IT.
- 4 OPEN THE COVER AND REFER TO DEFINITION OF TERMINAL BLOCK.
- 5 THIS PRODUCT IS RoHS COMPLIANT.

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6. DEFINITION OF TERMINAL BLOCK:



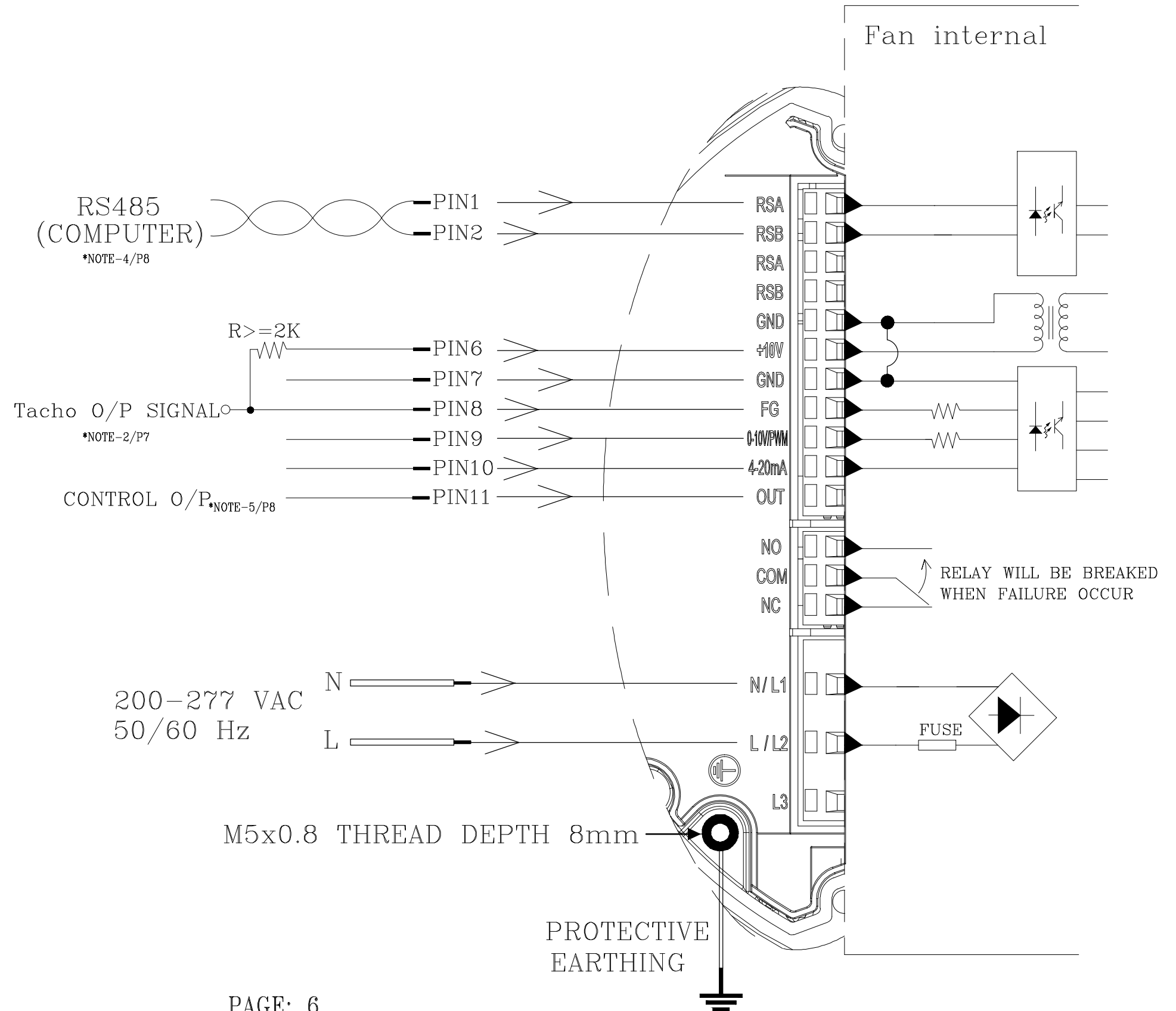
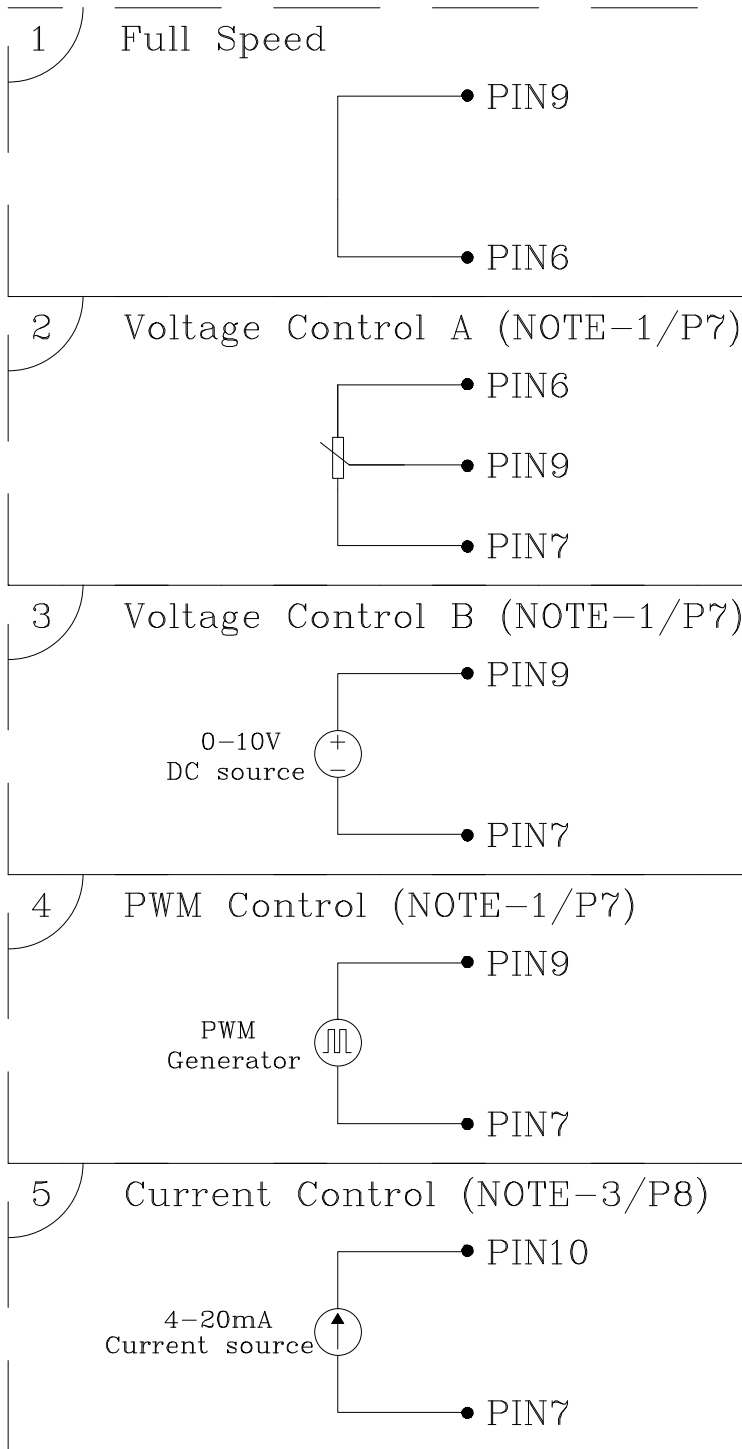
TEXT	FUNCTIONS
RSA	RS485-A
RSB	RS485-B
RSA	RS485-A
RSB	RS485-B
GND	GROUND
+10V	+10V OUTPUT, MAX 10mA (FOR EXTERNAL POTENTIOMETER)
GND	GROUND
FG	FREQUENCY GENERATOR (FG) SIGNAL
0-10V/PWM	SPEED CONTROL, INPUT 0-10VDC
4-20mA	SPEED CONTROL, INPUT 4-20mA
OUT	CONTROL VOLTAGE OUTPUT 0-10VDC (FOR EXTERNAL POTENTIOMETER)
NO	ALARM RELAY, OPEN BY FAILURE
COM	ALARM RELAY, COMMON(2A/250VAC)
NC	ALARM RELAY, CLOSE BY FAILURE
N/L1	NEUTRAL/AC MAINS
L/L2	LINE/AC MAINS
L3	-----

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7. LEAD WIRE CONNECTION:

SPEED CONTROL APPLICATION  
(CHOOSE ONE TO USE)



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8. SPEED CONTROL SIGNAL: VOLTAGE CONTROL \*NOTE-1

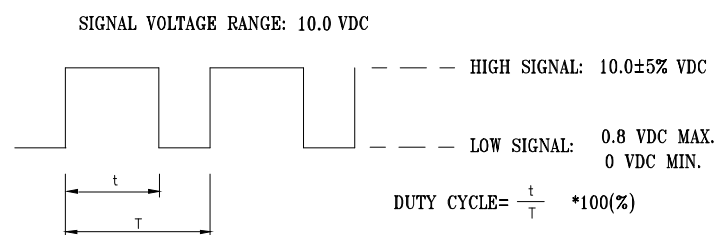
- THERE ARE TWO WAYS TO CONTROL SPEED AND MUST OPEN 4-20mA INPUT.

A. VOLTAGE CONTROL

- CONTROL VOLTAGE RANGE SHALL BE 0-10 VDC.
- VOLTAGE AT 10 VDC THE FAN WILL SPIN AT MAXIMUM SPEED.
- VOLTAGE HIGHER THAN 1.5 VDC, THE FAN WILL START UP.
- VOLTAGE LOWER THAN 0.5 VDC, THE FAN WILL STOP.

B. PWM CONTROL

- THE AMPLITUDE VOLTAGE SHALL BE 10VDC. (100Hz~100kHz)



- PWM DUTY HIGHER THAN 15 % , THE FAN WILL START UP.
- PWM DUTY LOWER THAN 5 % , THE FAN WILL STOP.

- THE SPEED COMPARISON WITH CONTROL LEVEL:

VOLTAGE(V)	PWM DUTY(%)	SPEED (R.P.M.) (REF.)
0.0	0	0
1.5	15	320
6.0	60	1220
9.5	95	1845

**\*NOTE-2: FREQUENCY GENERATOR (FG) SIGNAL**

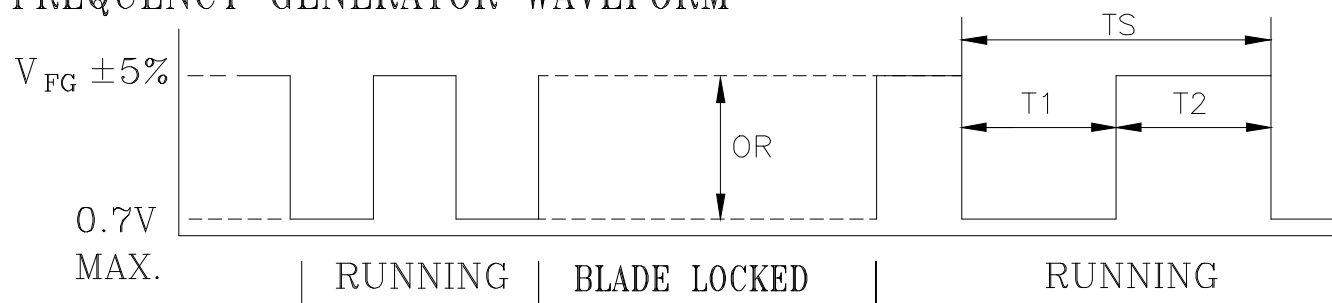
$V_{CE} (sat) = 0.7V \text{ MAX.}$

$V_{FG} = 30.0V \text{ MAX.}$

$I_c = 5mA \text{ MAX.}$

$R \geq V_{FG} / I_c$

FREQUENCY GENERATOR WAVEFORM



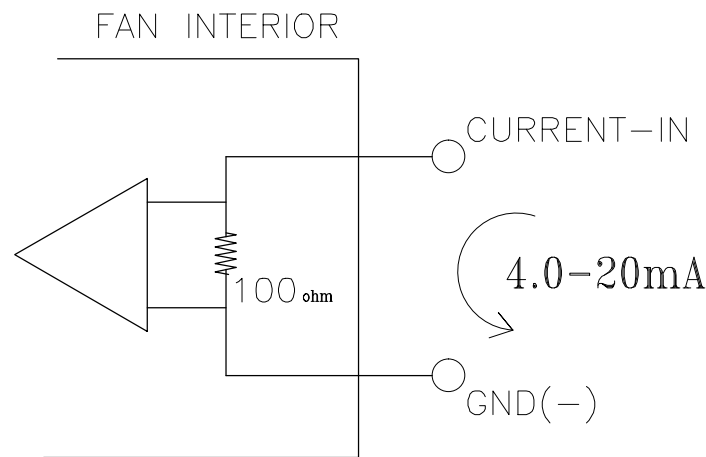
$N = \text{R.P.M}$	1 PULSE PER REVOLUTION
$T_S = 60/N(\text{SEC})$	$T_1 = T_2 = 1/2 T_S$

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9. SPEED CONTROL SIGNAL: CURRENT CONTROL \*NOTE-3

- SPEED CAN BE CONTROLLED BY CURRENT LEVEL AND MUST OPEN 0-10V/PWM INPUT.
  - CONTROL CURRENT RANGE SHALL BE 4.0-20 mA.
  - CURRENT HIGHER THAN 19.5 mA, THE FAN WILL SPIN AT MAXIMUM SPEED.
  - CURRENT HIGHER THAN 6.0 mA, THE FAN WILL START UP.
  - CURRENT LOWER THAN 4.5 mA OR OPEN LEAD WIRE, THE FAN WILL STOP.



- THE SPEED COMPARISON WITH CONTROL LEVEL:

CURRENT(mA)	SPEED (R.P.M.) <sub>(REF.)</sub>
4.0	0
6.3	330
14.0	1240
19.5	1845

10. FUNCTION CONTROL: RS485 CONTROL

**\*NOTE-4: 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.

11. CONTROL O/P \*NOTE-5

- THIS ANALOG SIGNAL LEVEL IS THE DERIVATIVE OF CURRENT CONTROL LEVEL.
- THE SIGNAL WILL BE 0-10 VDC.

VOLTAGE(V)	PWM DUTY(%)	CURRENT(mA)	CONTROL O/P(VDC) <sub>(REF.)</sub>
0.0	0	4.0	0.2
1.5	15	6.2	1.47
6.0	60	13.7	5.96
9.0	90	18.7	8.95
10	100	20.0	9.65



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12. CONTROL LEVEL & SPEED CURVE:

