

DELTA ELECTRONICS, INC.
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SPECIFICATION FOR APPROVAL

Customer:

Description:	EC FAN		
Customer P/N:		REV:	
Delta Model NO.:	GTB036EUD25R	Safety Model NO.:	GTB036EUD25
Sample Rev:	X03	Issue NO:	
Sample Issue Date:		Quantity:	

1. SCOPE:

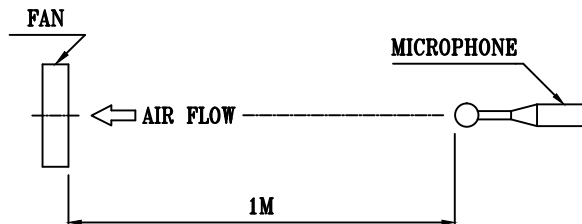
THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THIS CENTRIFUGAL FAN.

2. NOMINAL DATA:

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

ITEM	DESCRIPTION
NOMINAL VOLTAGE	1 ϕ 230 VAC 50/60Hz
NOMINAL VOLTAGE RANGE	1 ϕ 200 - 277 VAC
INPUT POWER @ FREE-AIR	550 W
INPUT POWER @ MAX. LOAD	800 W
INPUT CURRENT (MAX)	4.00 A
SPEED	2030 R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	4752 (MIN. 4277) M ³ /H 2797 (MIN. 2517) CFM
MAX. AIR PRESSURE (AT ZERO AIR FLOW)	697.4 (MIN. 564.9) Pa 2.800 (MIN. 2.268) inchH ₂ O
ACOUSTICAL NOISE (AVG.) @ FREE-AIR	78.5 (MAX 83.5) 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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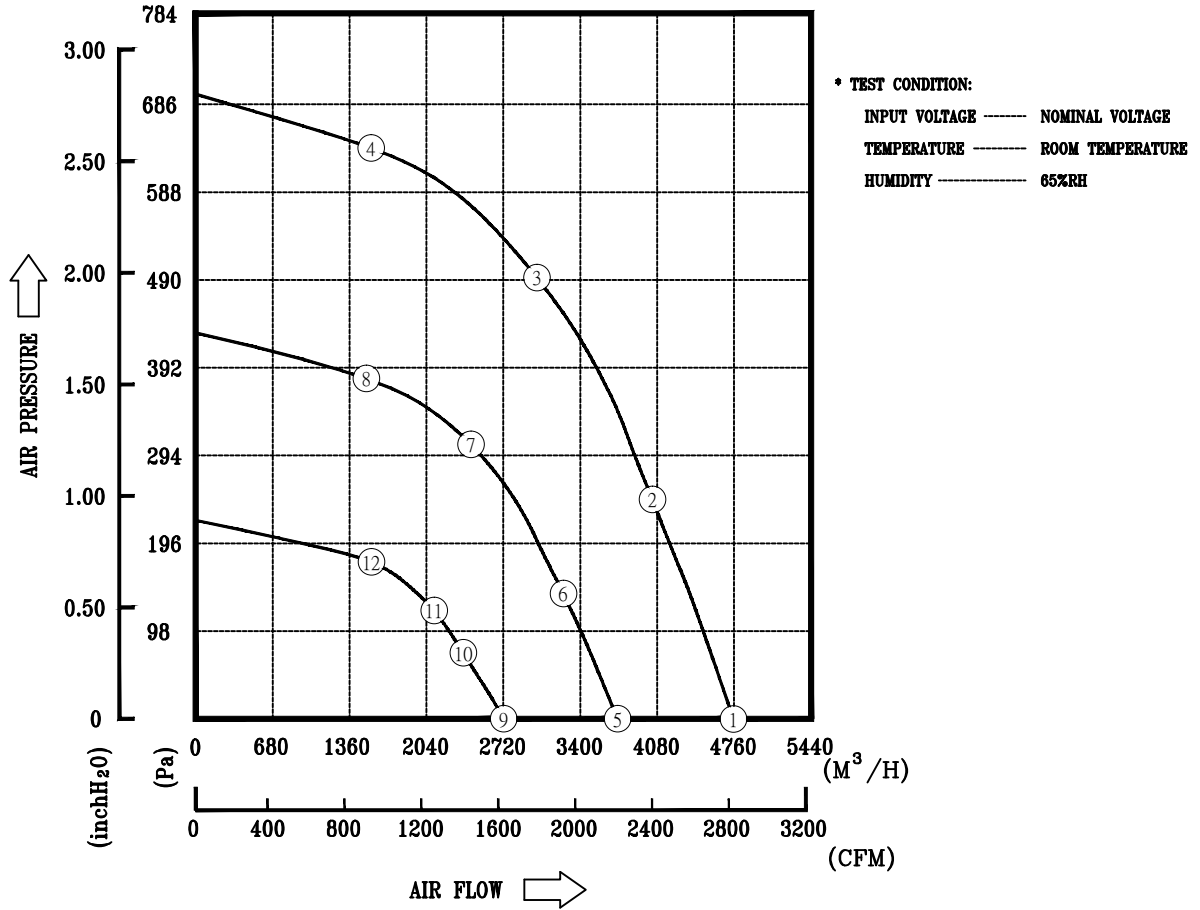
3. FEATURES:

DIRECTION OF ROTATION	CLOCKWISE, SEEN ON ROTOR
BEARING SYSTEM	BALL BEARINGS
WEIGHT	9.5 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	$\leq 3.5 \text{ mA}$
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 CONTINOUS 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:

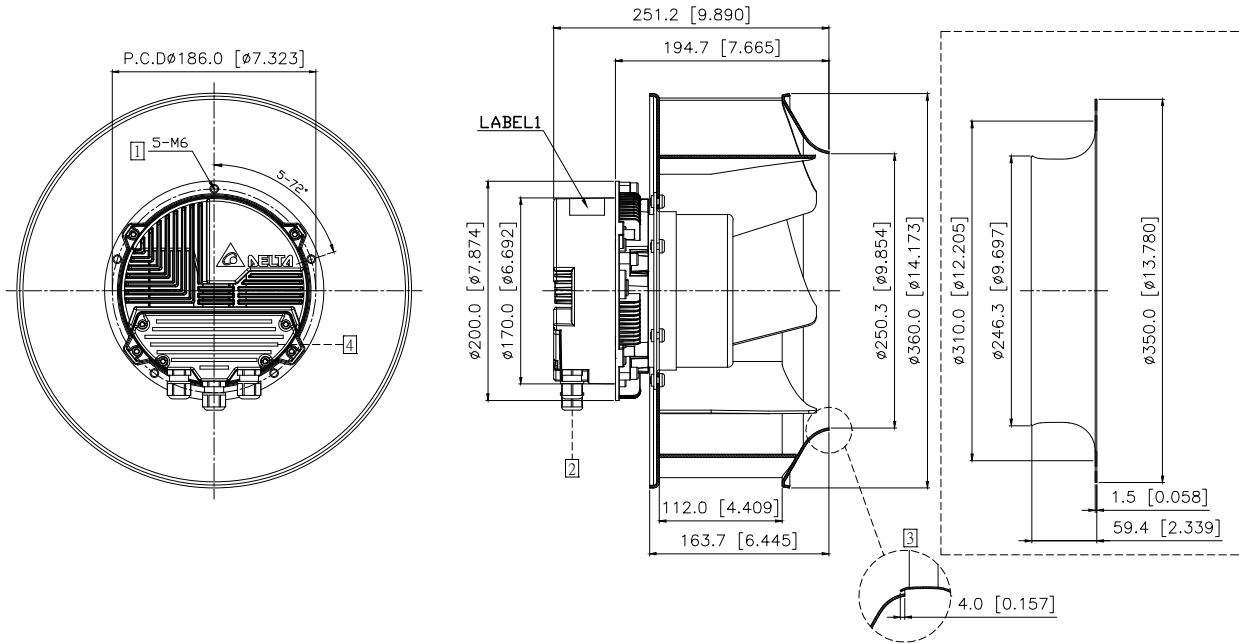
	P	Q	N	P1	I	Lp
	[Pa]	[M ³ /H]	[R.P.M.]	[W]	[A]	[dB(A)]
1	0	4754	2027	532	2.36	78.5
2	246.2	4035	2024	683	3.00	
3	491.5	3034	2019	755	3.32	
4	633.7	1774	2032	681	2.99	
5	0	3729	1620	285	1.30	72.5
6	151.1	3205	1620	357	1.62	
7	301.3	2478	1620	394	1.78	
8	386.8	1569	1620	367	1.66	
9	0	2721	1197	124	0.63	64.5
10	74.56	2361	1197	147	0.75	
11	121.6	2110	1194	159	0.81	
12	175.6	1644	1195	166	0.85	

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5. DIMENSION DRAWING:

LABEL 1



UNIT: mm [INCH]

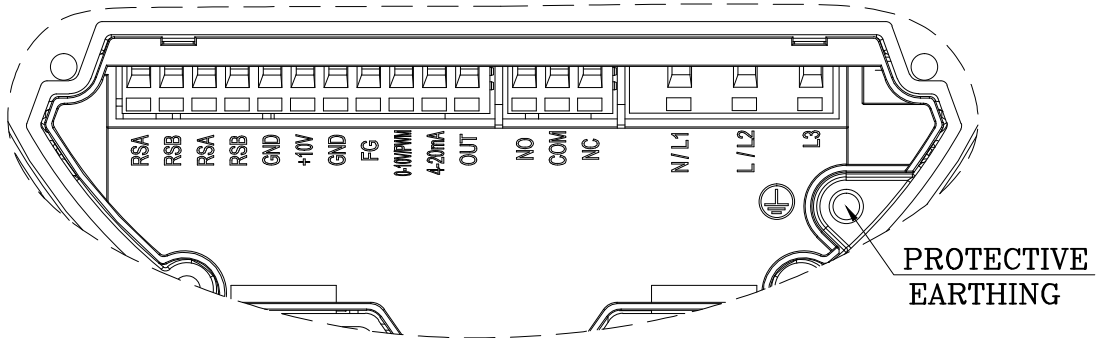
NOTE:

- 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:



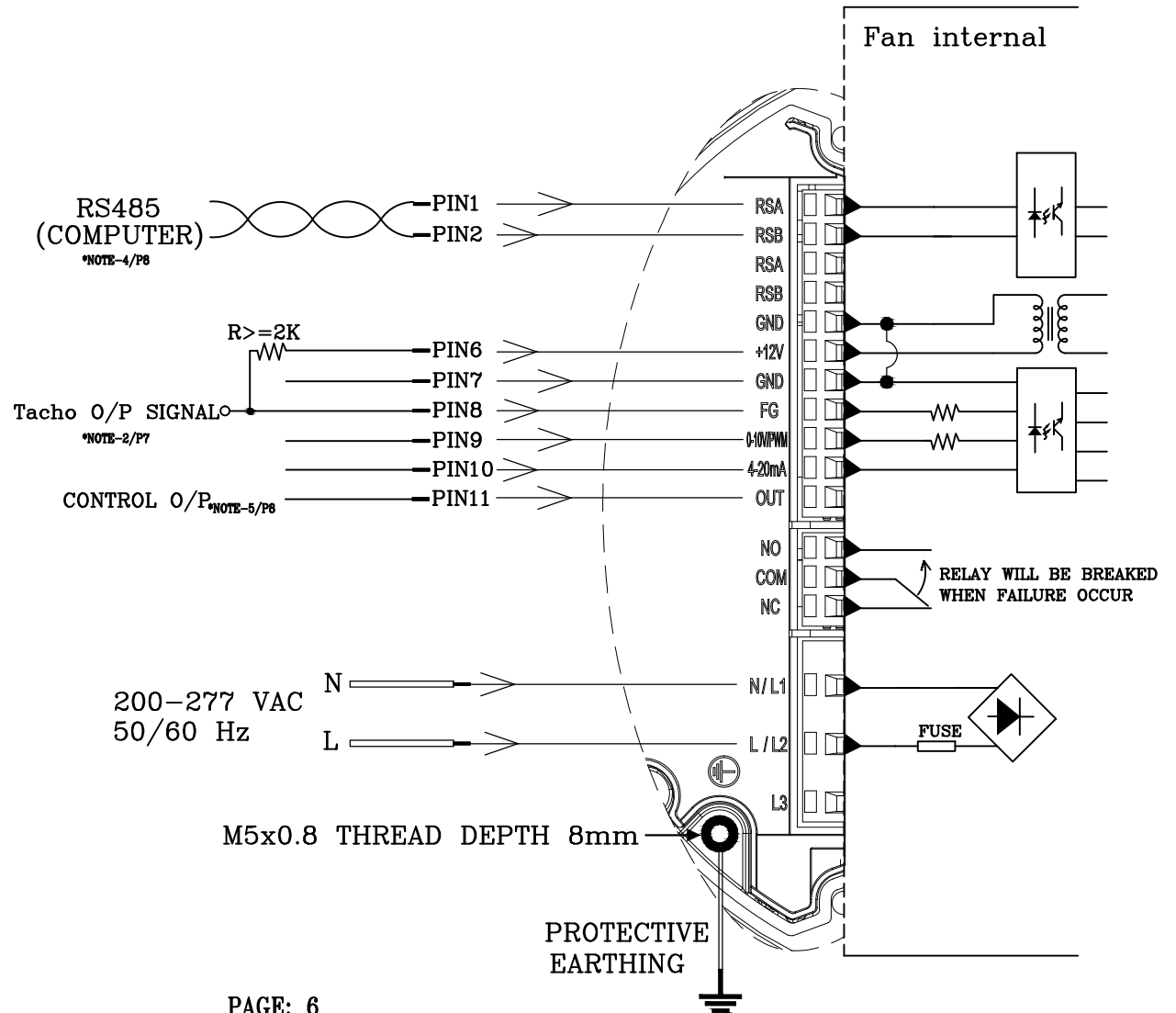
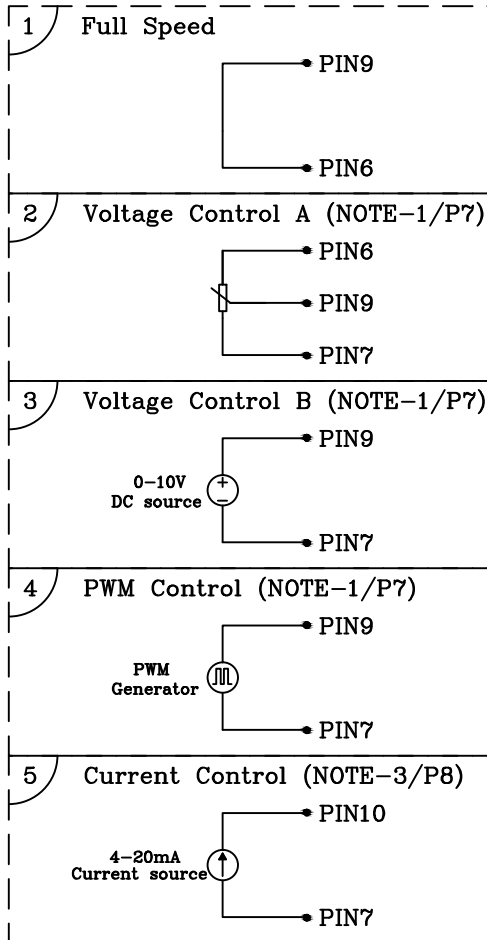
TEXT	FUNCTIONS
RSA	RS485-A
RSB	RS485-B
RSA	RS485-A
RSB	RS485-B
GND	GROUND
+10V	+10V OUTPUT, MAX 10mA (FOR EXTERNAL POTENTIOMETER)
GND	GROUND
FG	FREQUENCY GENERATOR (FG) SIGNAL
0-10V/PWM	SPEED CONTROL, INPUT 0-10VDC
4-20mA	SPEED CONTROL, INPUT 4-20mA
OUT	CONTROL VOLTAGE OUTPUT 0-10VDC (FOR EXTERNAL POTENTIOMETER)
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

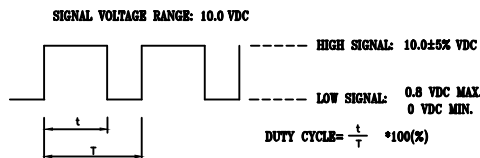
- THERE ARE TWO WAYS TO CONTROL SPEED AND MUST OPEN 4-20mA INPUT.

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	336
6.0	60	1352
9.5	95	2030

*NOTE-2: FREQUENCY GENERATOR (FG) SIGNAL

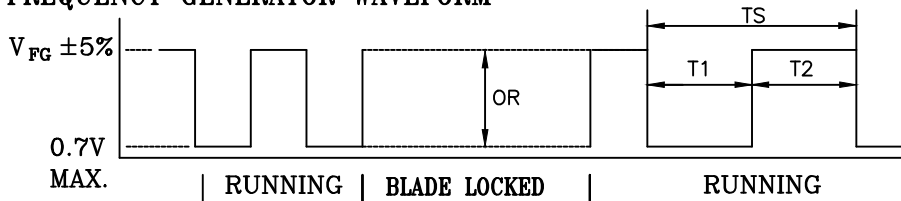
$V_{CE}(\text{sat}) = 0.7V \text{ MAX.}$

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

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

$R \geq V_{FG} / I_c$

FREQUENCY GENERATOR WAVEFORM



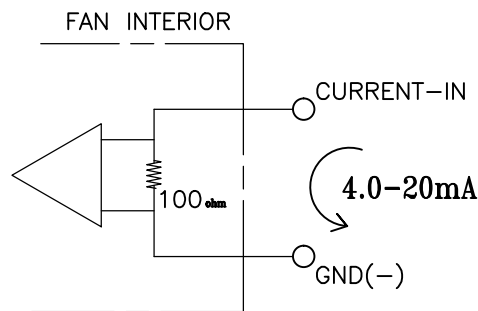
$N = \text{R.P.M}$	1 PULSE PER REVOLUTION
$TS = 60/N(\text{SEC})$	$T1 = T2 = 1/2 TS$

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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.) <small>(REF.)</small>
4.0	0
6.3	339
14.0	1346
19.5	2028

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) <small>(REF.)</small>
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:

