



SPECIFICATION FOR APPROVAL

Customer _____

Description DC FAN

Part No. _____ **Rev.** _____

Delta Model No. GFC0412DS-TP01 **Rev.** 02

Sample Issue No. _____

Sample Issue Date. Feb 06, 12

PLEASE SEND ONE COPY OF THIS SPECIFICATION
BACK AFTER YOU SIGNED APPROVAL FOR PRODUCTION
PRE-ARRANGEMENT.

APPROVED BY : _____

DATE : _____

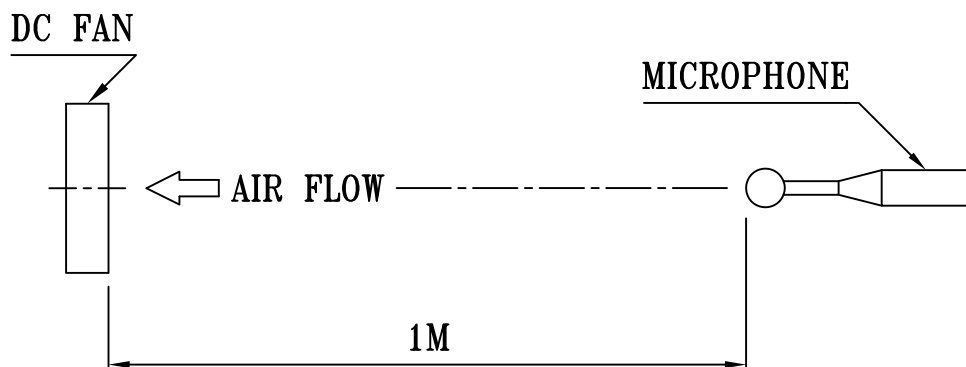
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PART NO:

DELTA MODEL: GFC0412DS-TP01

INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)
EXTERNAL COVER	OPEN TYPE
LIFE EXPECTANCE	L10, 70000 HOURS AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	TWO FANS ROTATE IN COUNTER DIRECTIONS SHOWED IN THE NAME PLATE SIDE
OVER CURRENT SHUT DOWN	THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR.
LEAD WIRE	UL 1061 -F- AWG #28 FRONT FAN(FIVE BLADES): REAR FAN(FOUR BLADES): RED WIRE POSITIVE(+) ORANGE WIRE POSITIVE(+) BLACK WIRE NEGATIVE(-) BROWN WIRE NEGATIVE(-) BLUE WIRE FREQUENCY(-F00) YELLOW WIRE FREQUENCY(-F00) GREEN WIRE (-PWM) WHITE WIRE(-PWM)

- NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. THE VALUES WRITTEN IN PARENS , (), ARE LIMITED SPEC.
3. THE CHARACTERS SHOWED IN PAGE 1 IS THE CONDITION OF BOTH FANS RUN.
4. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED 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. MECHANICAL:

- 3-1. DIMENSIONS ----- SEE DIMENSIONS DRAWING
- 3-2. FRAME ----- PLASTIC UL: 94V-0
- 3-3. IMPELLER ----- PLASTIC UL: 94V-0
- 3-4. BEARING SYSTEM ----- FOUR BALL BEARINGS
- 3-5. WEIGHT ----- 90 GRAMS

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE ----- -10 TO +70 DEGREE C
- 4-2. STORAGE TEMPERATURE ----- -40 TO +75 DEGREE C
- 4-3. OPERATING HUMIDITY ----- 5 TO 90 % RH
- 4-4. STORAGE HUMIDITY ----- 5 TO 95 % RH

5. PROTECTION:

5-1. LOCKED ROTOR PROTECTION

PROTECTS MOTOR FROM FIRE IN 96 HOURS
OF LOCKED ROTOR CONDITION AT THE RATED VOLTAGE.

5-2. POLARITY PROTECTION

BE CAPABLE OF WITHSTANDING IF REVERSE CONNECTION FOR POSITIVE
AND NEGATIVE LEADS.

6. RE OZONE DEPLETING SUBSTANCES:

- 6-1. NO CONTAINING PBBs, PBB0s, CFCs, PBBEs, PBDPEs AND HCFCs.

7. PRODUCTION LOCATION

- 7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR THAILAND OR TAIWAN.

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8. BASIC RELIABILITY REQUIREMENT :

8-1. THERMAL CYCLING LOW TEMPERATURE: -40°C
 HIGH TEMPERATURE: +80°C
 SOAK TIME: 30 MINUTES
 TRANSITION TIME < 5 MINUTES
 DUTY CYCLES: 5

8-2. HUMIDITY EXPOSURE TEMPERATURE: +25°C ~ +65°C
 HUMIDITY: 90-98% RH @ +65°C
 FOR 4 HOURS/CYCLE
 POWER: NON-OPERATING
 TEST TIME: 168 HOURS

8-3. VIBRATION TEMPERATURE: +25°C
 ORIENTATION: X, Y, Z
 POWER: NON-OPERATING
 VIBRATION LEVEL: OVERALL gRMS=3.2

FREQUENCY(Hz)	PSD(G ² /Hz)
10	0.040
20	0.100
40	0.100
800	0.002
1000	0.002

TEST TIME: 2 HOURS ON EACH ORIENTATION

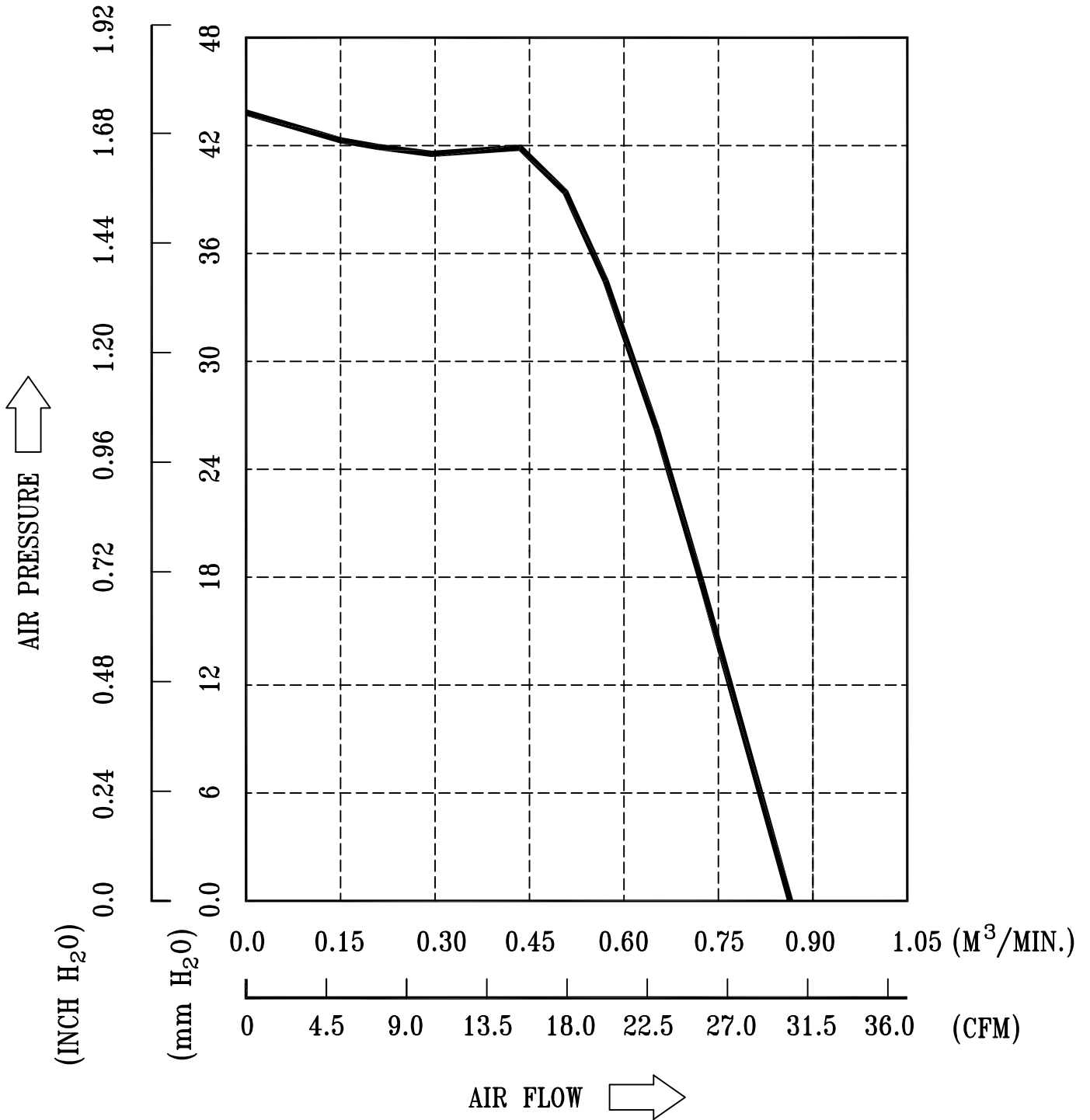
8-4. MECHANICAL SHOCK TEMPERATURE: +20°C
 ORIENTATION: X, Y, Z
 POWER: NON-OPERATING
 ACCELERATION: 20 G MIN.
 PULSE: 11 ms HALF-SINE WAVE
 NUMBER OF SHOCKS: 5 SHOCKS
 FOR EACH DIRECTION

8-5. LIFE TEMPERATURE: MAX , OPERATING TEMPERATURE
 POWER: OPERATING
 DURATION: 1000 HOURS MIN.

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9. P & Q CURVE:



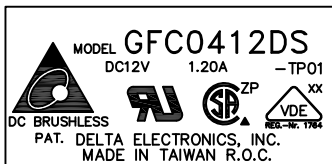
* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ----- ROOM TEMPERATURE
HUMIDITY ----- 65%RH

PART NO:

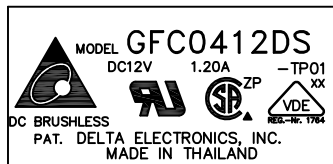
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10. DIMENSION DRAWING:

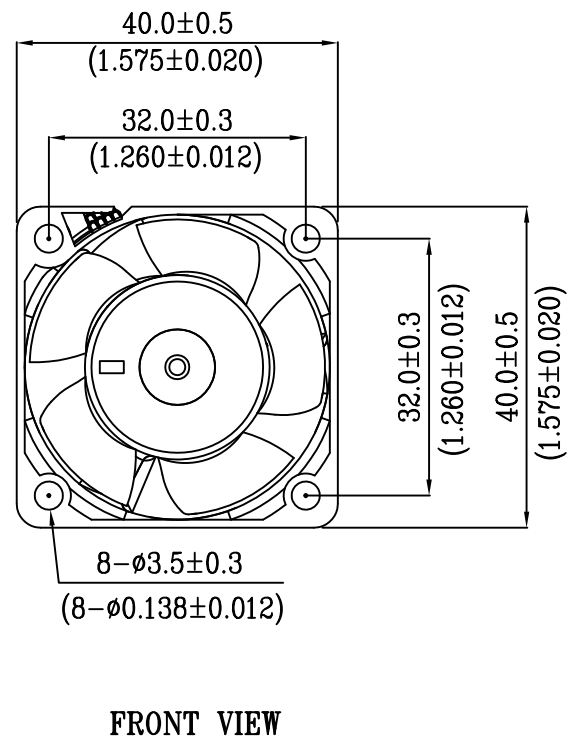
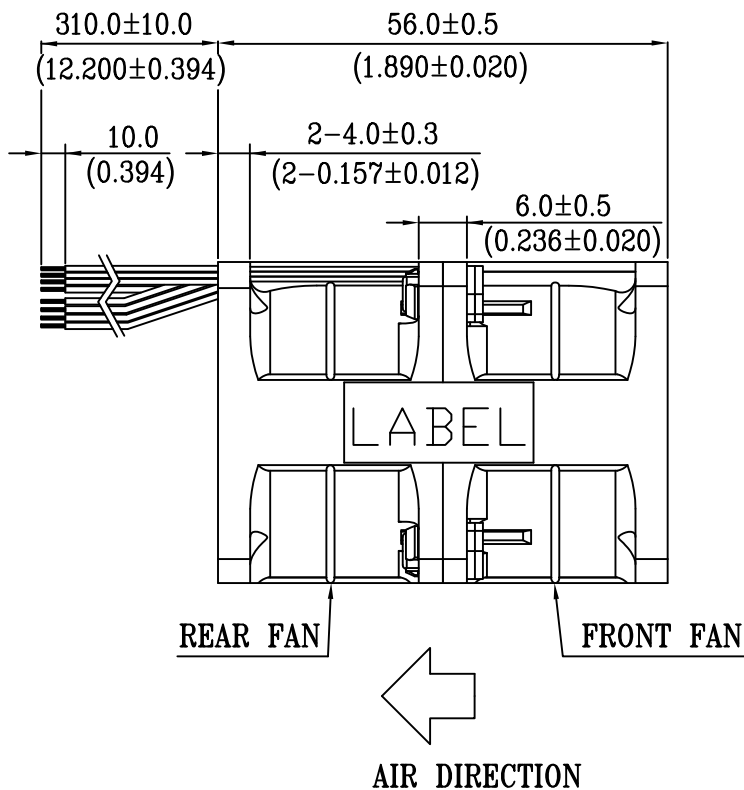
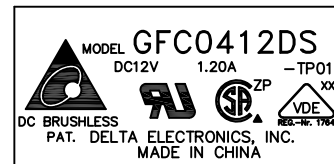
LABEL:



□R



□R



NOTES:

1. WIRE: UL1061 AWG#28

FRONT FAN(FIVE BLADES):

RED WIRE POSITIVE(+)

BLACK WIRE NEGATIVE(-)

BLUE WIRE FREQUENCY(-F00)

GREEN WIRE (-PWM)

REAR FAN(FOUR BLADES):

ORANGE WIRE POSITIVE(+)

BROWN WIRE NEGATIVE(-)

YELLOW WIRE FREQUENCY(-F00)

WHITE WIRE(-PWM)

2. THIS PRODUCT IS RoHS COMPLIANT

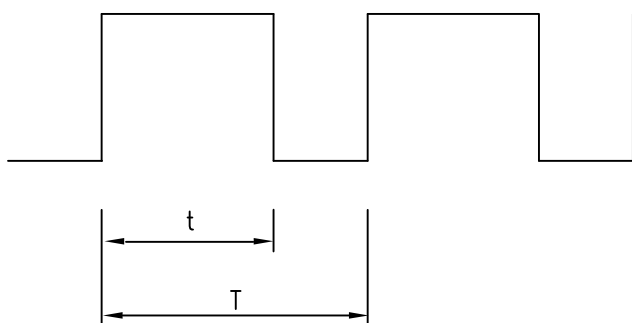
DIMENSION UNIT: MM(INCH)

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12. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: 0~20VDC



----- HIGH SIGNAL: 20 VDC MAX.
2.8 VDC MIN.

----- LOW SIGNAL: 0.8 VDC MAX.
0 VDC MIN.

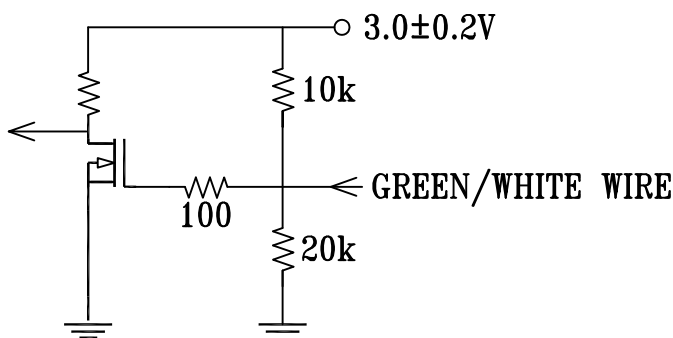
$$\text{DUTY CYCLE} = \frac{t}{T} * 100(\%)$$

- THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT A 30HZ~300KHZ.
- THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.
- AT 25K HZ 30% DUTY CYCLE ,THE FAN WILL BE ABLE TO STAR FROM A DEAD STOP .

13. SPEED VS PWM CONTROL SIGNAL: (AT RATED VOLTAGE & PWM FREQUENCY=25KHZ)

DUTY CYCLE (%)	SPEED R.P.M. (REF.)
100	15300±10%/11300±10%
50	8250±10%/5750±10%
0~12	4400±12%/3000±12%

14. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



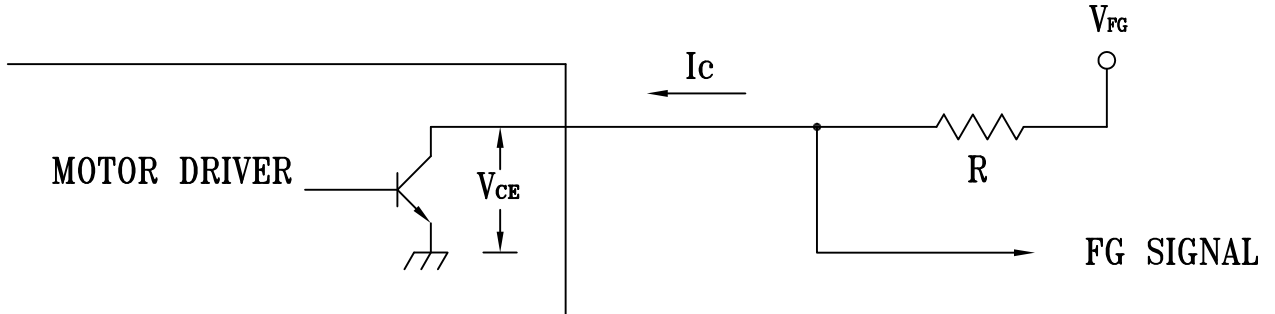
14-1. THE FAN SPEED WILL DEFAULT TO MAXIMUM WHEN THE SPEED CONTROL INPUT IS LEFT UNCONNECTED.

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11. FREQUENCY GENERATOR (FG) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION:

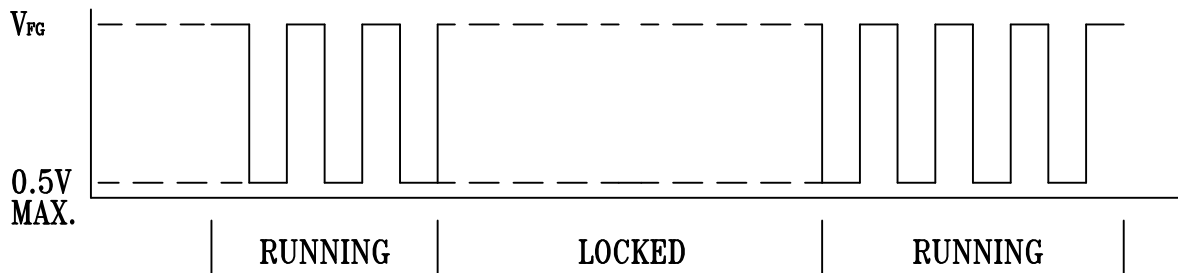
THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

2. SPECIFICATION:

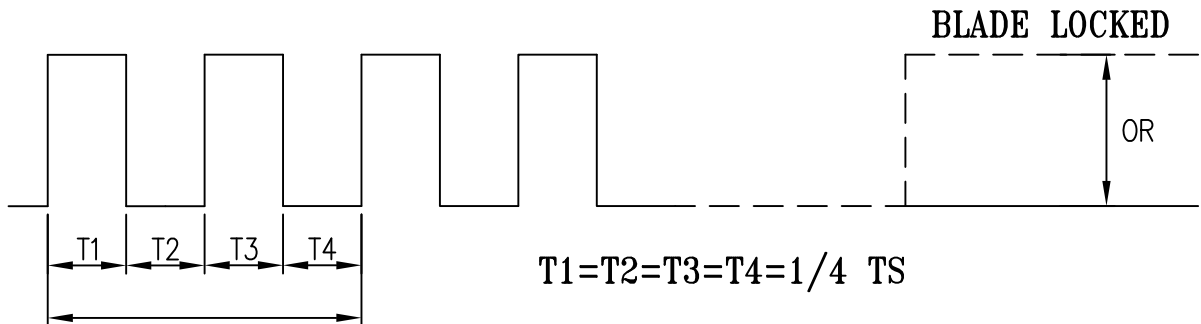
$V_{CE}(\text{sat}) = 0.5V \text{ MAX.}$ $V_{FG} = 12.0 \text{ TYP.}(V_{CC} \text{ MAX.})$

$I_c = 5mA \text{ MAX.}$ $R \geq V_{FG}/I_c$

3. FREQUENCY GENERATOR WAVEFORM:



FAN RUNNING FOR 4 POLES



$N = \text{R.P.M}$ TS

$TS = 60/N(\text{SEC})$

*VOLTAGE LEVEL AFTER BLADE LOCKED

*4 POLES