

SPECIFICATIONS


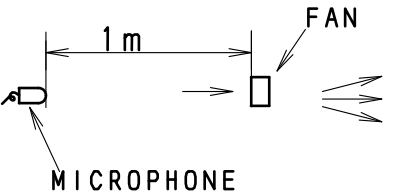
THESE SPECIFICATIONS ARE DEFINED FOR MODEL:R40W12BGNL9-07 OF THE DC BRUSHLESS TUBE AXIAL FAN.

1. MECHANICAL SPECIFICATIONS

- 1-1 EXTERNAL DIMENSIONS :REFER TO DWG No. F980672400B
- 1-2 HOUSING MATERIAL :PLASTIC (UL V-0)
- IMPELLER MATERIAL :PLASTIC (UL V-0)
- 1-3 BEARING :BALL TYPE
- 1-4 MASS :ABOUT 105g

2. ELECTRICAL SPECIFICATIONS

| No | ITEMS | STANDARD | REMARKS |
|-----|----------------------|--|---|
| 2-1 | RATED VOLTAGE | 12 VDC | |
| 2-2 | OPERATING RANGE | 10.8~13.2VDC | |
| 2-3 | CONSUMING CURRENT | MAX. 3.87 A 3.52 A (NOMINAL) | IN FREE AIR AT RATED VOLTAGE (NOTE 2&NOTE 6) |
| 2-4 | CONSUMING POWER | MAX. 46.4 W 42.2 W (NOMINAL) | IN FREE AIR AT RATED VOLTAGE |
| 2-5 | RATED SPEED | MIN. 27900 min ⁻¹ 31000 min ⁻¹ (NOMINAL) MAX 34100 min ⁻¹ | IN FREE AIR AT RATED VOLTAGE INLET SIDE |
| | | MIN. 25200 min ⁻¹ 28000 min ⁻¹ (NOMINAL) MAX 30800 min ⁻¹ | IN FREE AIR AT RATED VOLTAGE OUTLET SIDE |
| 2-6 | MAX. AIRFLOW | MIN. 0.94 m ³ /min (33.5 CFM) 1.11 m ³ /min (NOMINAL) (39.2 CFM) | AT RATED VOLTAGE AT ZERO STATIC PRESSURE |
| 2-7 | MAX. STATIC PRESSURE | MIN. 1823 Pa (7.32 inch-H ₂ O) 2369 Pa (NOMINAL) (9.51 inch-H ₂ O) | AT RATED VOLTAGE AT ZERO AIRFLOW |

| No | ITEMS | STANDARD | REMARKS |
|------|---|---|--|
| 2-8 | SOUND LEVEL  | MAX. 78.0 dB (A) 74.0 dB (A) (NOMINAL) | IN FREE AIR AT RATED VOLTAGE (A SCALE, SLOW)  |
| 2-9 | OPERATING TEMPERATURE | -10℃~70℃ NORMAL HUMIDITY | |
| 2-10 | STORAGE TEMPERATURE | -40℃~75℃ NORMAL HUMIDITY | STANDARDS FOR ITEMS 2-3~2-8 SHOULD BE MET WHEN MEASURED AFTER HAVING SAT FOR 24 HOURS AT ROOM TEMPERATURE FOR FANS SUBJECT TO SPECIFIED TEMPERATURE RANGE FOR 100 HOURS. |
| 2-11 | DIRECTION OF ROTATION | INLET: CW OUTLET: CCW FROM EXHAUST SIDE | |
| 2-12 | DIRECTION OF AIRFLOW | LABEL SIDE DISCHARGE | |
| 2-13 | INSULATION RESISTANCE | MIN. 10 Mega Ohm | AT 500 VDC BETWEEN FRAME AND LEAD WIRES |
| 2-14 | DIELECTRIC STRENGTH | MUST WITHSTAND 500VAC 1min | MAX. 1mA BETWEEN FRAME AND LEAD WIRES (USUALLY INSPECT AT 600V AC, 1sec, 1mA) |
| 2-15 | PROTECTION | CURRENT LIMIT PROTECTION | (NOTE 3) |
| | | REVERSE POLARITY PROTECTION | (NOTE 4) |
| | | HOT SWAP | |

| REV | ISSUE | ECO No. | OE | Fig. | No. | PART No. | PART NAME | NOTE | Q'ty | UNIT | MARKS/MTL |
|-----|----------|---------|--------------|------------|-----|----------|----------------------------|------|------|------|-------------------------|
| | ISSUE | | OE | Fig. | 1 | | TOLERANCE | | | | MTL. |
| | APPROVED | | H. KAWAKAMI | 2021-12-22 | | | UNLESS OTHERWISE SPECIFIED | | | | MODEL |
| | DESIGNED | | N. HINO | 2021-12-20 | | | LINEAR | | | | PARTS |
| | APPROVED | | H. TAKESHITA | 2019-11-23 | | | ~ ± | | | | DWG. |
| | CHECKED | | H. TAKESHITA | 2019-11-23 | | | ~ ± | | | | Specification of DC Fan |
| | DESIGNED | | H. KAWAKAMI | 2019-11-20 | | | ~ ± | | | | Specification of DC Fan |
| | DRAWN | | H. ISOZAKI | 2019-11-20 | | | ANGULAR ± | | | | |
| | | | | | | | CORNER | | | | |
| | | | | | | | OUTSIDE: C | | | | |
| | | | | | | | INSIDE: R | | | | |
| | | | | | | | UNIT | | | | |
| | | | | | | | mm | | | | |
| | | | | | | | SCALE | | | | |
| | | | | | | | ∕ | | | | |
| | | | | | | | A3 | | | | |
| | | | | | | | DWG. No. | | | | |
| | | | | | | | F982672600E | | | | |

| No | ITEMS | STANDARD | REMARKS |
|------|-----------|--|---------|
| 2-16 | VIBRATION | RADIAL DIRECTION MAX. 28.8m/s ² ※ FUNDAMENTAL FREQUENCY AXIAL DIRECTION MAX. 33.0m/s ² ※ FUNDAMENTAL FREQUENCY PICK UP: PV-90B (RION) VIBRATION METER: VM-83 (RION) NOTE:FAN SHALL BE MEASURED BY HANGING IT UP BY HOLE. THE CONDITION OF VIBRATION METER. ·HPF:20Hz ·LPF:10kHz ·RMS | |

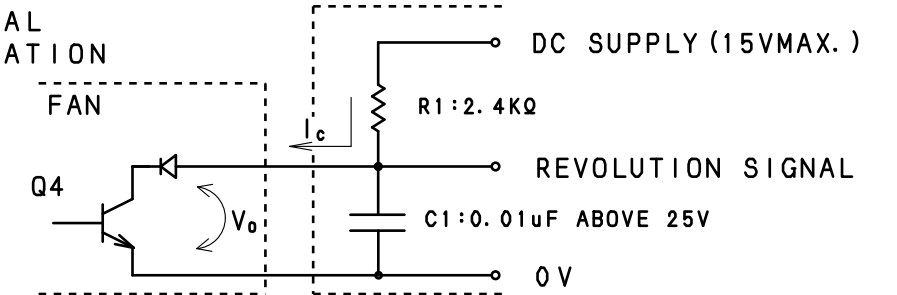
- NOTE1: THE STANDARDS SHOULD BE THE SPECIFIED VALUE AT NORMAL TEMPERATURE (23°C) AND NORMAL HUMIDITY (60~65%) UNLESS OTHERWISE NOTICE. AS TO THE VALUE OF ITEM 2-3~2-8, IT SHOULD BE MEASURED AFTER 10 MINUTES OPERATION.
- NOTE2: CONTROL SIGNAL (BLUE AND GREEN LEAD WIRE) SHOULD BE APPLIED 2.0~4.0V, OR SHOULD BE OPEN.
- NOTE3: IN THE CASE THAT POWER IS TURNED ON DURING FAN ROTOR IS LOCKED, THE FAN SHALL ATTEMPT TO RESTART AT A TYPICAL REPETITION RATE (TEMPERATURE RISE WILL BE PREVENTED). THE FAN WILL AUTOMATICALLY RESTART WHEN THE LOCKED ROTOR CONDITION IS RELEASED.
- NOTE4: POWER SUPPLY VOLTAGE MUST NOT BE APPLIED BETWEEN SIGNAL OUTPUT LINE AND ANY OTHER LINE DIRECTLY. REVERSE POLARITY PROTECTION IS EFFECTIVE TO JUST SWITCH THE POSITIVE AND NEGATIVE POWER LINE.
- NOTE5: 10.8V~13.2V OPERATING VOLTAGE IS FOR CONTINUOUS DC VOLTAGE. POWER SUPPLY VOLTAGE RIPPLE 5% MAXIMUM.
- NOTE6: THE MAX VALUE OF CONSUMING CURRENT DOES NOT REPRESENT THE PEAK VALUE.

3. PROVISION OF REVOLUTION SIGNAL

3-1 OUTPUT OF REVOLUTION SIGNAL

· OUTPUT TYPE OPEN COLLECTOR TYPE

· ELECTRICAL SPECIFICATION



REMARK: AS FOR MEASURING V_{OL}, IT IS NECESSARY TO PUT CR LOW PASS FILTER WHICH IS CONSTRUCTED OF R1 AND C1. THE TIME CONSTANT OF R1 × C1 IS TO BE MORE THAN 24μs SUCH AS R1=2.4kΩ C1=0.01μF.

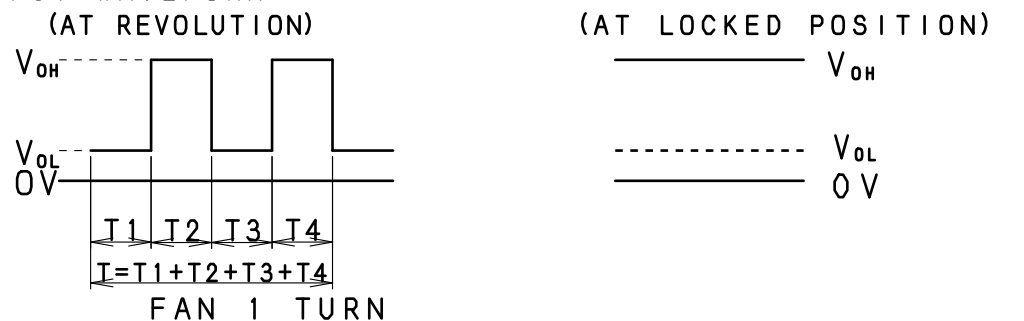
ABSOLUTE MAXIMUM SPECIFICATION

COLLECTOR CURRENT I_c = 10mA MAX.
 RELEASE VOLTAGE V_{OH} = 15V MAX.

ELECTRICAL CHARACTERISTICS

SATURATION VOLTAGE V_{OL} = 0.8V MAX.
 AT I_c = 5mA

OUTPUT WAVEFORM



REMARK: AT LOCKED POSITION, OUTPUT BECOMES V_{OH} OR V_{OL}.
 $T = T_1 + T_2 + T_3 + T_4 = 60/N$ (SEC)

DUTY = $\frac{T_1}{T_1 + T_2} = 50 \pm 10\%$

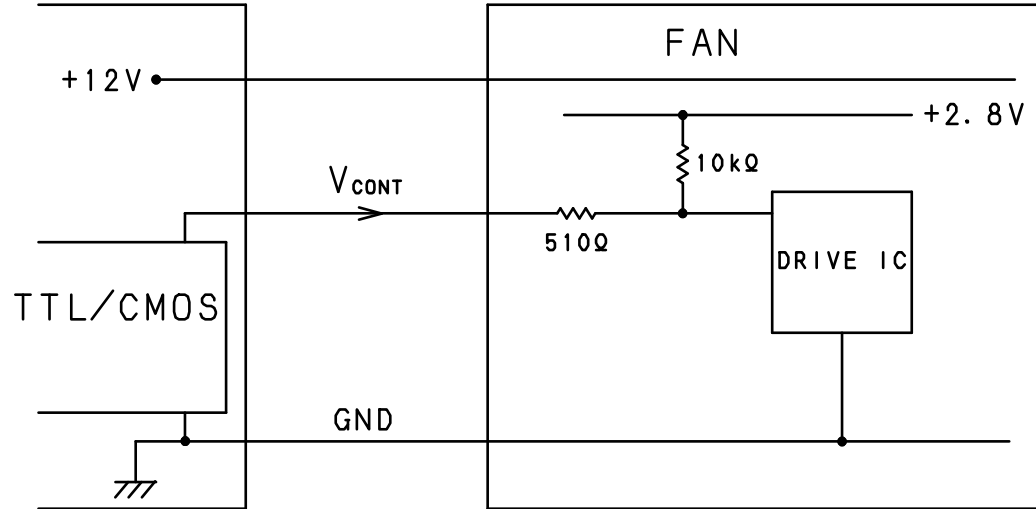
3-2 ⚠ CAUTION

PLEASE BE CAREFUL THAT REVOLUTION SIGNAL LEAD WIRE (YELLOW & WHITE LEAD WIRE) SHALL NOT HAVE ANY VOLTAGE DIRECTLY APPLIED. (IT SHOULD DAMAGE INNER CIRCUIT.)

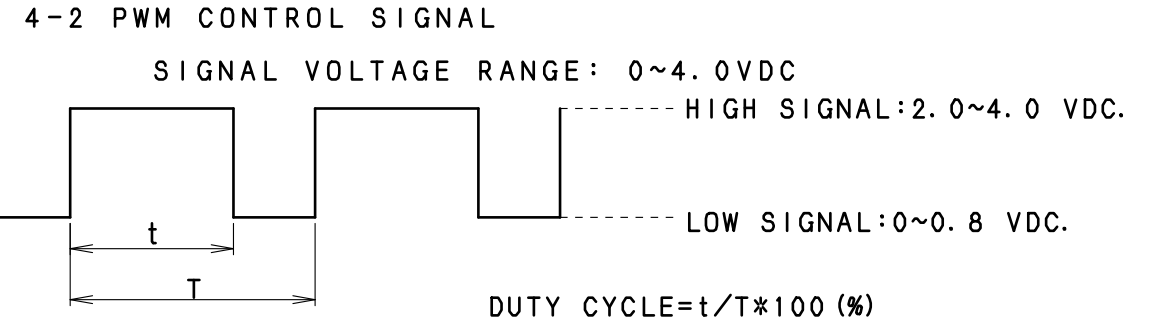
| REV | ISSUE | OE | Fig. | 0 | No. | PART No. | PART NAME | NOTE | Q'ty | UNIT | MARKS/MTL |
|-----|----------|--------------|------------|---|-----|----------|----------------------------|------|------|------|-------------------------|
| | ISSUE | | | | | | TOLERANCE | | | | |
| | ECO No. | | | | | | UNLESS OTHERWISE SPECIFIED | | | | MTL. |
| | APPROVED | H. KAWAKAMI | 2021-12-22 | | | | LINEAR | | | | MODEL |
| | DESIGNED | N. HINO | 2021-12-20 | | | | ~ ± | | | | R40W12BGNL9-07 |
| | APPROVED | H. TAKESHITA | 2019-11-23 | | | | ~ ± | | | | PARTS |
| | CHECKED | H. TAKESHITA | 2019-11-23 | | | | ~ ± | | | | DC Fan |
| | DESIGNED | H. KAWAKAMI | 2019-11-20 | | | | ANGULAR | | | | DC Fan |
| | DRAWN | H. ISOZAKI | 2019-11-20 | | | | CORNER | | | | DWG. |
| | | | | | | | OUTSIDE:C | | | | Specification of DC Fan |
| | | | | | | | INSIDE:R | | | | Specification of DC Fan |
| | | | | | | | | | | | DWG. No. F982672600E |

4. PWM CONTROL
4-1 TYPE

THE METHOD OF ACTIVE/INACTIVE DRIVE MOSFET FOR SPEED CONTROL.



V_{CONT} IS ABOVE 2.0V.....FAN SHOULD RUN FULL SPEED.
 V_{CONT} IS BELOW 0.8V.....FAN SHOULD LOW SPEED.
 THE WIRE OF V_{CONT} IS OPEN...FAN SHOULD RUN FULL SPEED.
 CONTROL SIGNAL SHOULD ACCEPT PWM CONTROL,
 PWM FREQUENCY IS FROM 20kHz TO 30kHz.

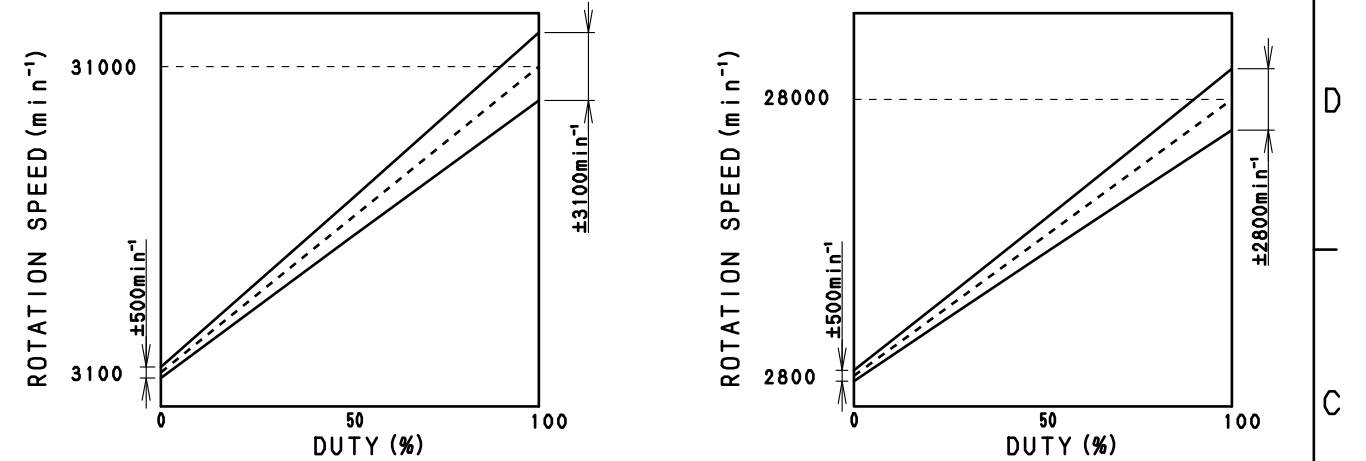


THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT AT 20kHz-30kHz.
 PWM SIGNAL WITH 3.3 VDC TTL/CMOS (OD/OC) LEVEL. THE PREFERRED OPERATING POINT FOR THE FAN IS 25kHz, AND DUTY CYCLE FROM 0% TO 100%.

IF THE PWM CONTROL WIRE CONNECT TO GROUND, THE ROTOR WILL SPIN AT MINIMUM SPEED.

IF THE PWM CONTROL WIRE OPEN, THE ROTOR WILL SPIN AT MAXIMUM SPEED.

4-3 SPEED VS PWM CONTROL SIGNAL, AT RATED VOLTAGE



DETAIL OF PWM CURVE (INLET SIDE) DETAIL OF PWM CURVE (OUTLET SIDE)

NOTE:
 THE STANDARDS SHOULD BE THE SPECIFIED VALUE AT NORMAL TEMPERATURE (21~25°C) AND NORMAL HUMIDITY (60~65%) AND FREE AIR UNLESS OTHERWISE NOTICE.

| DUTY CYCLE (POSITIVE) (%) | SPEED min ⁻¹ | |
|---------------------------|-------------------------|-------------|
| | INLET SIDE | OUTLET SIDE |
| 0 | 3100±500 | 2800±500 |
| 50 | 17050±1705 | 15570±1557 |
| 100 | 31000±3100 | 28000±2800 |

| REV | ISSUE | OE | Fig. | 0 | No. | PART No. | PART NAME | NOTE | Q'ty | UNIT | MARKS/MTL |
|-----|----------|--------------|------------|---|-----|----------|-----------|-------|------|----------|-------------------------|
| | ISSUE | OE | Fig. | 0 | | | | | | | |
| | ECO No. | | | | | | | | | | MTL. |
| | APPROVED | H. KAWAKAMI | 2021-12-22 | | | | TREAT. | | | | MODEL R40W12BGNL9-07 |
| | DESIGNED | N. HINO | 2021-12-20 | | | | | | | | PARTS DC Fan |
| | APPROVED | H. TAKESHITA | 2019-11-23 | | | | FINISH | | | | DC Fan |
| | CHECKED | H. TAKESHITA | 2019-11-23 | | | | UNIT | SCALE | A3 | DWG. | Specification of DC Fan |
| | DESIGNED | H. KAWAKAMI | 2019-11-20 | | | | CORNER | | | | Specification of DC Fan |
| | DRAWN | H. ISOZAKI | 2019-11-20 | | | | OUTSIDE:C | | | | |
| | | | | | | | INSIDE:R | | | | |
| | | | | | | | | | | DWG. No. | F982672600E |

5. SPECIAL TEST

5-1 LIFE EXPECTANCY

MORE THAN 90% MUST RUN AFTER CONTINUOUS OPERATION OF 70,000 HOURS AT RATED VOLTAGE, 40°C AMBIENT TEMPERATURE AND 65% RELATIVE HUMIDITY.

LIFE IS DEFINED WHEN THE MOTOR SPEED DECREASES MORE THAN 30% AGAINST ITS INITIAL SPEED.

5-2 VIBRATION TEST

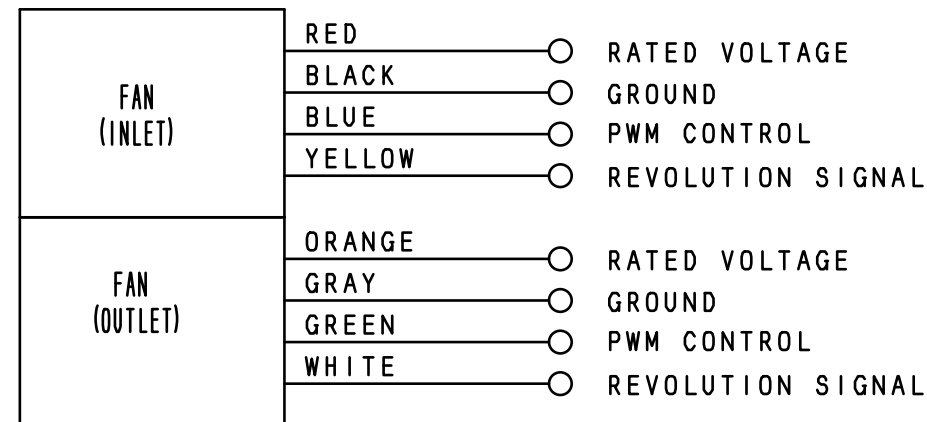
STANDARDS FOR ITEMS 2-3~2-8 AND 6-2 SHOULD BE MET AFTER 30 MINUTES 0.2mm AMPLITUDE, 55Hz VIBRATION IN EACH DIRECTION: UP-DOWN, RIGHT-LEFT, FORWARD-BACK.

5-3 SHOCK TEST

STANDARDS FOR ITEMS 2-3~2-8 AND 6-2 SHOULD BE MET IF THE FANS FALL NATURALLY FROM A HEIGHT OF 30cm IN THE PACKING BOX FOR EACH DIRECTION.

6. OTHERS

6-1 CONNECTION



6-2 LOCKED ROTOR

NO DAMAGE SHALL BE FOUND FOR CONTINUOUS 1 HOUR AT LOCKED ROTOR.

6-3 CAUTIONS IN INSTALLATION OF FAN MOTORS

PLEASE CONSIDER SYSTEM LAYOUT NOT TO PLACE ANY OBSTACLES WITHIN 3mm FROM THE FAN HOUSING EDGE OF INLET SIDE (IMPELLER SIDE).

IN CASE OF SCREWING THE FAN HOUSING, FLATNESS OF INSTALLATION SURFACE SHOULD BE MAX. 0.1, OTHERWISE THE HOUSING MAY TRANSFORM AND INTERFERE WITH THE IMPELLER.

THE FAN SHOULD NOT GET ANY IMPACT OR VIBRATION DURING ROTATION. WHEN VIBRATION OR IMPACT IS APPLIED TO THE FAN DURING ROTATION, THE FAN MAY BREAK BY INTERFERING WITH OBSTACLE IN THE SYSTEM.

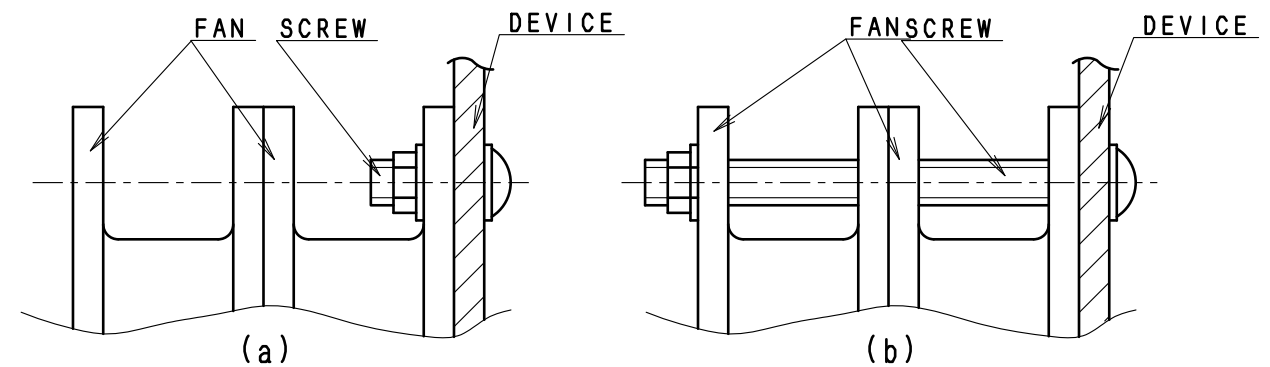
PLEASE FIX THE FAN IN THE SYSTEM SO THAT IT WILL NOT RATTLE. VIBRATION OF THE FAN MAY CAUSE CONTACT BETWEEN THE FAN AND THE SYSTEM, WHICH WILL GENERATE NOISE.

PLEASE DO NOT PLACE ANY OBSTACLE NEAR OUTLET AND INLET SIDE OF THE FAN.

PLACING OBSTACLES NEAR THE FAN MAY DETERIORATE AIR FLOW. IT MAY CAUSE COOLING PERFORMANCE REDUCTION AS WELL AS FAN MOTOR LIFE DETERIORATION DUE TO HEAVY LOAD ON THE BEARINGS.

THIS MODEL IS DESIGNED TO BE INSTALLED AS THE SCREW IN FLANGE ONE SIDE (REFER TO FIGURE (a)). IN CASE OF INSTALLATIONS AS THE SCREW THROUGH BOTH FLANGES (REFER TO FIGURE (b)), IT MAY CAUSE DAMAGES ON THE HOUSING AND/OR INTERFERENCE BETWEEN THE IMPELLER AND THE HOUSING BECAUSE OF THE HOUSING DEFORM.

FOR ANY USAGE THAT DOES NOT MEET ABOVE CONDITIONS, PLEASE EVALUATE AT USER'S SIDE OR CONSULT WITH US.



| REV | ISSUE | OE | Fig. | 0 | No. | PART No. | PART NAME | NOTE | Q'ty | UNIT | MARKS/MTL | |
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| | ISSUE | | | | TOLERANCE UNLESS OTHERWISE SPECIFIED | | | | | | MTL. | |
| | ECO No. | | | | LINEAR | | | TREAT. | | | MODEL R40W12BGNL9-07 | |
| | DESIGNED | N. HINO | 2021-12-20 | | ~ ± | | | FINISH | | | PARTS DC Fan | |
| | DESIGNED | H. KAWAKAMI | 2021-12-22 | | ~ ± | | | | | | DC Fan | |
| | APPROVED | H. TAKESHITA | 2019-11-23 | | ~ ± | | | | | | DWG. Specification of DC Fan | |
| | CHECKED | H. TAKESHITA | 2019-11-23 | | ANGULAR ± | | | UNIT mm | SCALE | ∞ | A3 | Specification of DC Fan |
| | DESIGNED | H. KAWAKAMI | 2019-11-20 | | CORNER | | | | | | | Specification of DC Fan |
| | DRAWN | H. ISOZAKI | 2019-11-20 | | OUTSIDE:C | | | | | | | |
| | | | | | INSIDE:R | | | | | | | |
| | | | | | | | | DWG. No. | F982672600E | | | |

6-4 ⚠ USAGE OF FAN MOTOR

PLEASE DO NOT PUT RESISTORS OR OTHER ELECTRONIC COMPONENTS ON THE EXTENTION OF THE FAN MOTOR LEAD WIRES FOR THE PURPOSE OF FAN MOTOR SPEED REDUCTION.

IT MAY MAKE THE VOLTAGE TO THE FAN FLUCTUATE AND BECOME LOWER THAN LOWER LIMIT OF OPERATING VOLTAGE RANGE. IN THIS CASE, THERE MAY BE SUCH FAILURES LIKE NO START OR UNSTABLE ROTATION OF FAN MOTOR.

6-5 ⚠ EARTH·ELECTROSTATIC PROTECTION

ELECTRIFICATION AND LEAKAGE CAN CAUSE MOTOR CIRCUIT OR SEMICONDUCTOR FAILURE.

PROPER GROUNDING IS REQUIRED FOR SOLDERING IRON AND CONVEYER BELT DURING MOTOR TERMINAL OR LEAD WIRE SOLDERING TO MECHANISM OR SET. (±200V OR LESS)

7. SPECIAL ITEMS

7-1 SPECIFICATION CHANGE

ANY CHANGE TO THE PARAMETERS SPECIFIED IN THIS DOCUMENT SHALL BE DETERMINED BY MUTUAL AGREEMENT ON BOTH PARTIES.

7-2 UNCERTAINTY

IN THE EVENT THAT A QUESTION MAY ARISE ABOUT THIS DOCUMENT OR AN AREA NOT SPECIFIED IN THIS DOCUMENT, BOTH PARTIES SHALL DISCUSS AND DETERMINE A SOLUTION IN GOOD FAITH.

7-3 WARRANTY

OUR WARRANTY IS LIMITED TO THE REPLACEMENT OF FAILED FAN AT FREE OF CHARGE, IF AND ONLY IF THE FAILURE IS FOUND WITHIN TWO YEARS AFTER IT WAS SHIPPED OUT FROM OUR PRODUCTION FACILITY, AND IF THE CAUSE OF THE FAILURE IS PROVEN TO BE ATTRIBUTABLE TO THE SUPPLIER.

OUR LIABILITY DOES NOT EXTEND TO THE CONSEQUENTIAL DAMAGES CAUSED BY THE FAILED FAN.

7-4 PRODUCTION LOCATION

NIDEC (DALIAN) LIMITED : CHINA (DALIAN)
OR
NIDEC VIETNAM CORPRATION: VIETNAM (HO CHI MINH CITY)
OR
NIDEC (DONGGUAN) LIMITED : CHINA (DONGGUAN)
OR
NIDEC (SHAOGUAN) LIMITED: CHINA (SHAOGUAN)
OR

Ⓞ NIDEC (PHILIPPINES) LIMITED: PHILIPPINES (LAGUNA)
IN CASE OF PRODUCTION FACTORY CHANGE, WE SHALL GET APPROVAL FROM CUSTOMERS BEFOREHAND.

7-5 NOTE

PLEASE CONSIDER HAVING AN INDEPENDENT PROTECTION SYSTEM IN THE CUSTOMER'S INSTRUMENTS IN THE EVENT THAT THE FAN SHOULD STOP OPERATING.

7-6 POWER SOURCE

BRUSHLESS DC FANS ARE DESIGNED TO BE USED AT DC POWER SOURCE WITH BYPASS CAPACITOR. WE WOULD RECOMMEND YOU TO USE DC POWER SOURCE WHICH IS FILTERED RIPPLE AND NOISE.

· FANS ARE DESIGNED TO PERFORM AS EXPECTED WHEN STABLE VOLTAGE IS SUPPLIED.

· FLUCTUATION OF THE VOLTAGE BETWEEN Vcc(+) AND GND WHILE THE FAN IS POWERED MUST BE WITHIN THE SPECIFIED OPERATING VOLTAGE RANGE.

· FLUCTUATION CYCLE OF THE VOLTAGE BETWEEN Vcc(+) AND GND WHILE THE FAN IS POWERED MUST BE LONGER THAN THE FAN'S ROTATION CYCLE.

· GND OF THE FAN MUST BE KEPT BELOW THE VOLTAGE OF ITS Vcc(+) WHEN THE VOLTAGE IS SWITCHED ON/OFF OR THE FAN IS NOT RUNNING.

· DEVICES THAT USE THE FANS ARE SUPPOSED TO BE DESIGNED SO THAT THE VOLTAGE APPLIED ON THE REVOLUTION SIGNAL IS NOT AFFECTED BY POWER ON/OFF.

7-7 ENVIRONMENT-RELATED SUBSTANCES

BASED ON RoHS, CADMIUM, LEAD, MERCURY, AND, COMPOUND OF THESE SUBSTANCES AND HEXAVALENT CHROMIUM COMPOUND, POLYBROMO BI-PHENYL (PBB) AND POLYBROMO DI-PHENYL ETHER (PBDE) ARE NOT INCLUDED IN THIS PRODUCT.

| REV | | No. | PART No. | PART NAME | NOTE | Q' ty | UNIT | MARKS/MTL | |
|----------|-------------------------|-------------|----------|-----------|----------------------------|--------|-------|-------------------------|-------------------------|
| ISSUE | OE Fig. 1 | TOLERANCE | | TREAT. | UNLESS OTHERWISE SPECIFIED | LINEAR | MTL. | | |
| ECO No. | | ~ :± | | | | | MODEL | R40W12BGNL9-07 | |
| APPROVED | H. KAWAKAMI 2021-12-22 | ~ :± | | | | | PARTS | DC Fan | |
| DESIGNED | N. HINO 2021-12-20 | ~ :± | | | | | | | |
| APPROVED | H. TAKESHITA 2019-11-23 | ANGULAR :± | | FINISH | UNIT | SCALE | A3 | DWG. | Specification of DC Fan |
| CHECKED | H. TAKESHITA 2019-11-23 | CORNER | | | | | | | |
| DESIGNED | H. KAWAKAMI 2019-11-20 | OUTSIDE : C | | UNIT | SCALE | A3 | DWG. | Specification of DC Fan | |
| DRAWN | H. ISOZAKI 2019-11-20 | INSIDE : R | | | | | | | |

DWG. No. F982672600E