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Specifications

Model No.	TF037F-2000-F
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Issuing Date	Aug.1, 2017
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1. Scope

This document applies to Blower TF037F-2000-F (hereinafter referred to as "PRODUCT"), a product of NIDEC COPAL ELECTRONICS CORP. (hereinafter referred to as "NCEL").

Reference driving circuit :NCEL's standard driving circuit

2. Specification

(Note1) Unless otherwise specified, the environmental conditions are 23°C±5°C, normal humidity, and atmospheric pressure range 90 to 106kPa.

(Note2) Measuring conditions :

Driving circuit = NCEL's standard driving circuit,

Supply voltage = DC24V, measurement equipment = NCEL's standard equipment

(Note3) The below specifications specify the characteristics of the Blowers at the time of shipment.

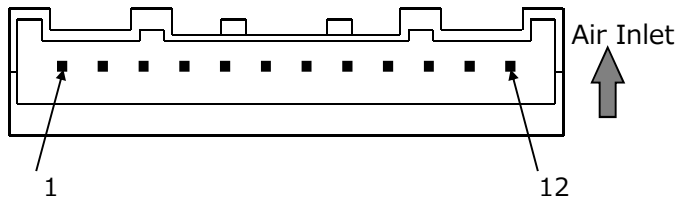
(Note4) Please contact us if you'd like to operate the PRODUCT outside of specifications.

No.	Items	Specification	Remarks
1	Rated Voltage	DC 12 ~24 V	
2	Direction of Rotation	CCW (Counter-Clockwise)	Looking down from the air inlet.
3	Kind of Gas	Air	Noncorrosive gas
4	Configuration	Motor with Centrifugal Blade	Without driving circuit
5	Type of Motor	DC Brushless Motor	
6	Number of Poles	8 Poles (4 pole pairs)	
7	Drive System	3 Phase, Bipolar	
8	Bearings	Aero-Dynamic Bearings	
9	Impeller	Centrifugal Turbo Blade	
10	Outline	Drawing : 6404-00635-00	Please refer to attached drawing.
11	Mounting Direction	Shaft vertical to ground, air inlet facing upwards	No vibration, shock, or gyration is to be applied during operation.

No.	Items	Specification	Remarks
12	Max. Input Coil Current	3.0 A rms max.	Excluding inrush current.
13	Rated Power Supply Current	0.67 A max.	at 2.0kPa, 100L/min, DC 24V
14	Rated Power Consumption	16.1 W max.	at 2.0kPa, 100L/min, DC 24V
15	Rated Air Flow	100 L/min	at 2.0kPa
16	Minimum Air Flow	10 L/min	
17	Rated Pressure	2.0 kPa	at 100L/min
18	Maximum Pressure	4.5 kPa	Absolute maximum pressure.
19	Rated Rotation Speed	31,000 r/min (reference value)	at 2.0kPa, 100L/min
20	Min. Rotation Speed	10,000 r/min	
21	Max. Rotation Speed	45,000 r/min	<u>Pressure-air flow must be within the "area of use" specified in "5. Operating Range" on P.5.</u>
22	Torque Constant	0.0020~0.0026 N·m/A (reference value)	
23	Acoustic Audible Noise	65.0 dB(A) max.	at 2.0kPa, 100L/min. Measured at 1m from air inlet. Include background noise 15dB(A).
24	Coil Resistance	0.36~0.66 ohm (reference value)	at 20°C (Between 2 phase)
25	Coil Inductance	17~23 μH (reference value)	at 20°C, 10kHz (Between 2 phase)
26	Insulation Class	Class E	JIS C 4003
27	Insulation Resistance	1M ohm min.	DC500V, between terminal pins and plate JIS C 4003
28	Dielectric Strength	Leak current to be less than 1mA.	AC600V for 1sec. between terminal pins and Plate. JIS C 4003
29	Weight	72 g (reference value)	
30	Rotor Inertia	19 g·cm ² (reference value)	
31	Max. Axial Loading	3N max.	Maximum axial force applying to the intake (upper housing)

No.	Items	Specification	Remarks
32	Operating Temperature Range	0 to 50°C	
33	Operating Humidity Range	10 to 95%RH	No condensation
34	Storage Temperature Range	-20 to 60°C	
35	Storage Humidity Range	10 to 95%RH	No condensation
36	Resistance to Vibration	The Blower shall satisfy Specification No.12 ~ 28 after the following test.	
		Kind of Vibration	Sweep
		Frequency Range	10~22Hz @ amplitude 1mm
			22~50Hz @ acceleration 19.6m/s ² (2G)
		Sweep	To-and-fro, approx. 5min.
Test Time	X, Y, Z directions, 60min. each		
37	Resistance to Shock	The Blower shall satisfy Specification No.12 ~ 28 after the following test.	
		Acceleration	294m/s ² (30G)
		Pulse Width	6ms
		Shock Wave	Semi-sinusoidal wave
		Number of Shock	X, Y, Z, directions, once per each direction

3. Interface



Manufacturer	J.S.T. Mfg. Co. Ltd.
Part No.	SM12B-PASS

[Mating Connector]

Manufacturer	J.S.T. Mfg. Co., Ltd.
Part No.	12PAF-6S (insulation displacement connector) (retainer : PAFS-12V-S)
	PAP-12V-S (crimp type) (contact : SPHD-001T-P0.5)

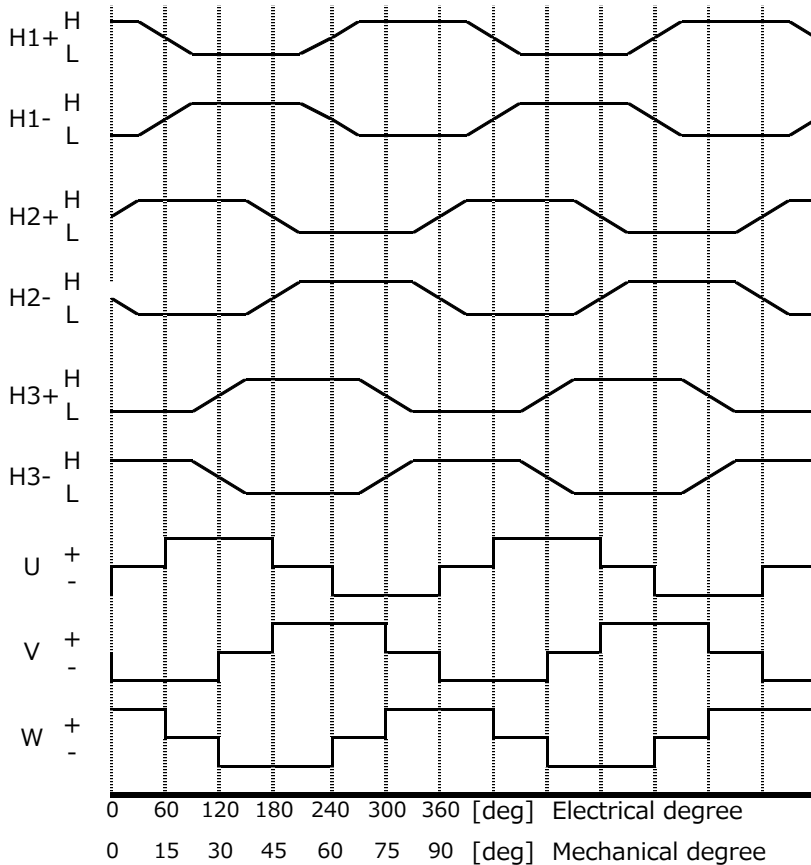
(Note4) Either IDC or crimp type can be used as a mating connector.

Pin No.	Symbol	Signal
1	Vcc	Hall Element Power Supply (+12V)
2	H2-	Hall Element 2 Output
3	H2+	
4	H3-	Hall Element 3 Output
5	H3+	
6	H1-	Hall Element 1 Output
7	H1+	
8	GND	GND
9	TH	Thermistor Output
10	V	Motor Coil (V)
11	W	Motor Coil (W)
12	U	Motor Coil (U)

(Note5) Parts used for thermistor output;
 Manufacturer : TDK Corp.
 Part No. : NTCG164BH103JT

(Note6) Parts used for hall element output;
 Manufacturer : Asahi Kasei EMD Corp.
 Part No. : HW-105A

4. Timing Chart



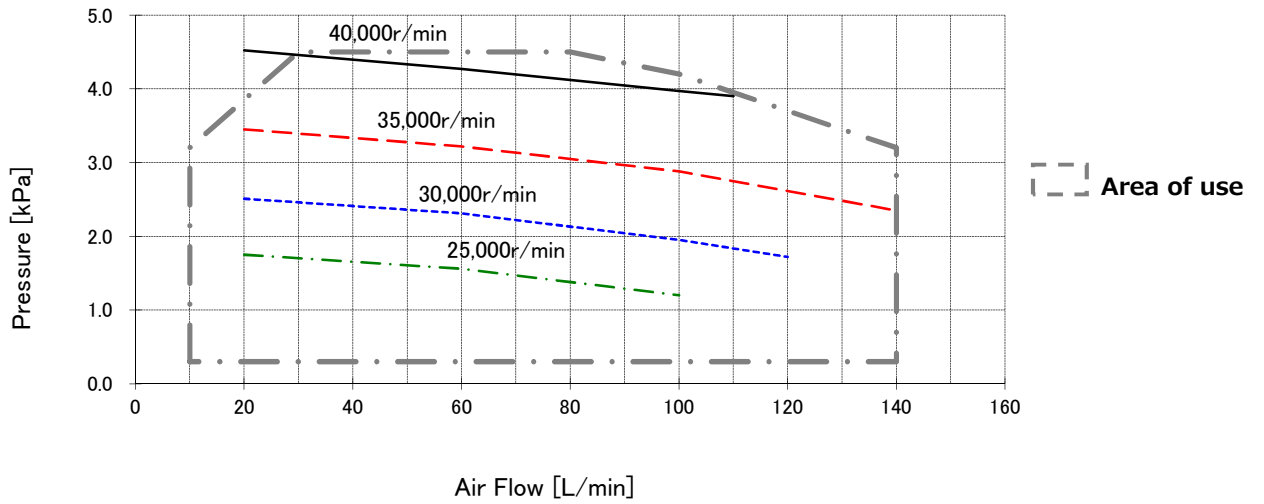
5. Operating Range

The following graph is provided for reference only. Values are not guaranteed.

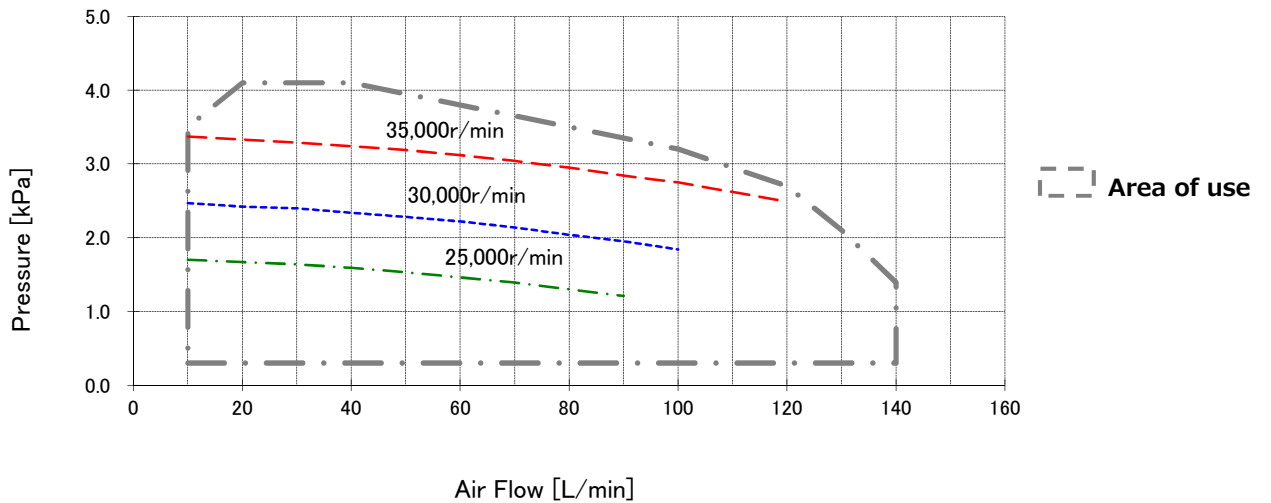
Conditions: Ambient temperature $23\pm 5^{\circ}\text{C}$, normal humidity, atmospheric pressure ($100\pm 2\text{kPa}$).

Make sure the thermistor temperature does not exceed 80°C during blower operation. (Thermistor resistance value $R_{(80\text{ deg C})}=1.177\text{k}\Omega$)

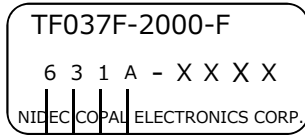
Operating Range at DC24V (1atm)



Operating Range at DC12V (1atm)



6. Manufacturing Code



- Control no. : alphabet (A-Z)
- Date of manufacture : refer to Chart 1
- Month of manufacture : refer to Chart 2
- Year of manufacture : last digit of the year (A.D.)

【Chart 1】

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	J	K	L

Date	21	22	23	24	25	26	27	28	29	30	31
Code	M	N	P	Q	R	T	U	V	W	X	Y

【Chart 2】

Month	1	2	3	4	5	6	7	8	9	10	11	12
Code	1	2	3	4	5	6	7	8	9	O	N	D

7. Warranty

7-1. Warranty Period

Warranty period of the PRODUCT is 1 year from delivery.

7-2. Warranty Scope

(1) In case a defect is found in the PRODUCT during the above warranty period and NCEL is responsible for the defect, NCEL will either repair or replace the defected PRODUCT free of charge.

However, in the following cases, the PRODUCT will not be covered by warranty.

- Defects caused by inappropriate conditions, environments, handlings, and use which are not specified in this specification.
- Defects caused by your equipments and/or software.
- Defects caused by modifications and/or repairs which were not done by NCEL.
- Defects which could have been avoided if the PRODUCT was used accordingly to this specification.
- Defects which were unpredictable with the scientific or technical level of NCEL at the time of shipment.
- Defects caused by external factors such as natural hazards (fire, earthquakes, floods) or electrical surges.

- (2) NCEL will be responsible for the PRODUCT only in which the coverage will be limited to Clause 7-2. (1). NCEL shall not be liable for customer's equipment damages, opportunity losses, or lost earnings caused by defects of the PRODUCTS. The user shall indemnify NCEL and hold NCEL harmless from any liability or damage whatsoever arising out of any action not in accordance with this specification.

7-3. Product Application

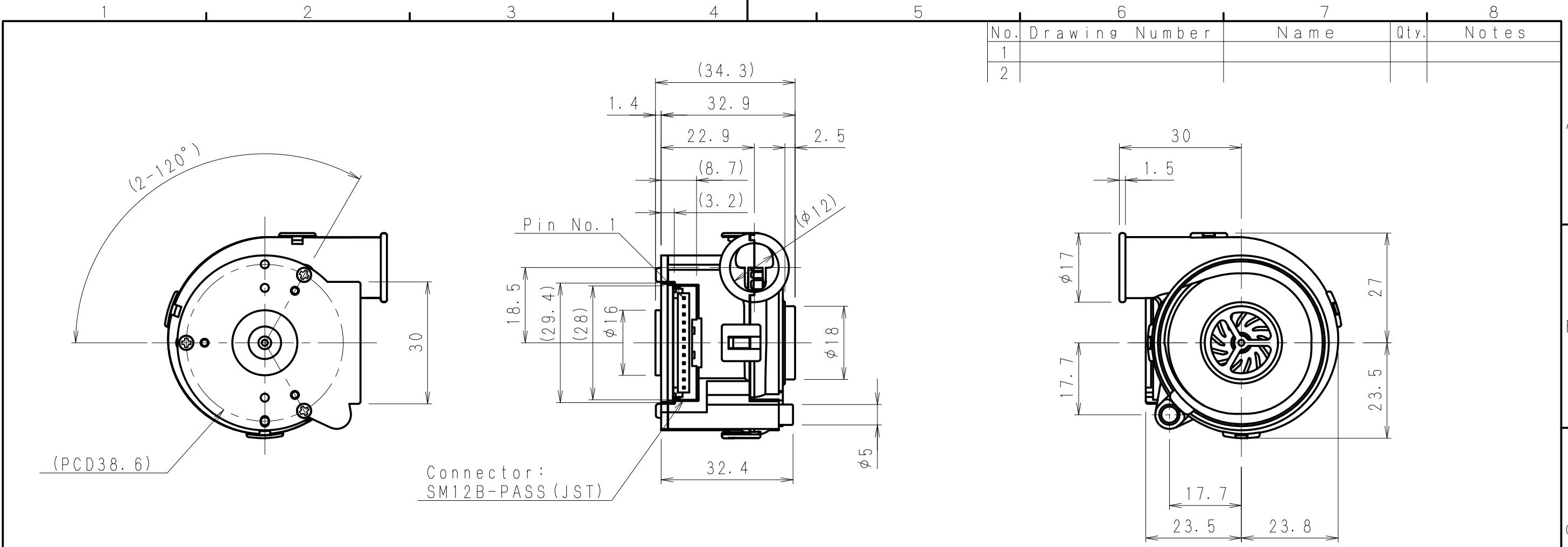
The PRODUCT is designed and manufactured for general-purposes. Please do not use in applications such as nuclear power, aviations, railroads, or medical equipment where great effect to human lives or wealth are expected.

However, if NCEL agree with the customer the usage of the PRODUCT in such applications, NCEL will warrant the PRODUCT in the same scope described in "7. Warranty" in this specification.

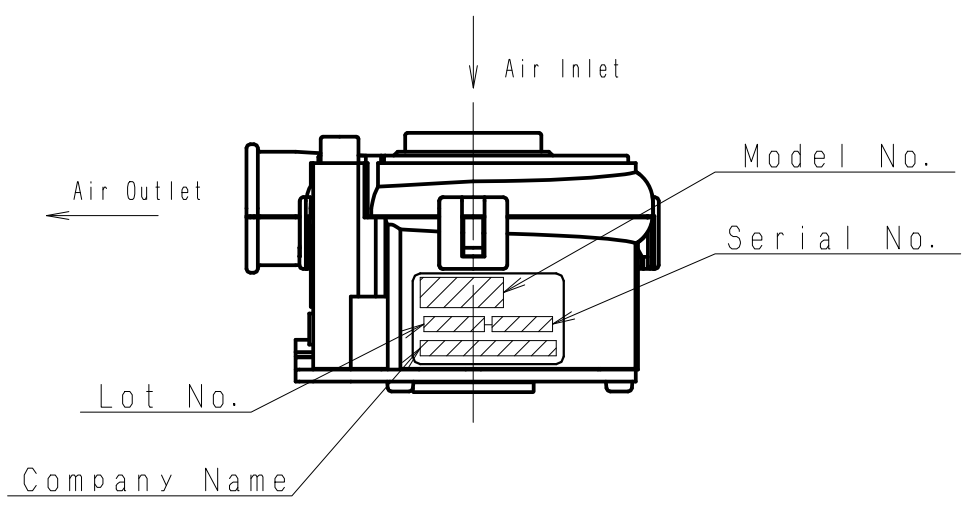
8. Notes

- (1) All values are measured with NCEL's standard equipments unless otherwise specified.
- (2) The PRODUCT is compliant with RoHS directives which went into effect July, 2011. Designated hazardous substances are lead, mercury, cadmium, hexavalent chrome, brominated flame retardants (PBB, PBDE) and its compounds.
- (3) The PRODUCT is compliant with Directive 2006/122/EC of the European Parliament (Council Directive 76/769/EEC (30th amendment)) which restricts the use of PFOS.
- (4) Contents of this document may be changed without notice. The production of the PRODUCT may be discontinued without notice. Please confirm with your local contact before ordering.
- (5) Please check if the PRODUCT operates normally at every start-up and during operation.
- (6) Please provide safety measures to prevent damages in case of product failures.
- (7) Performance cannot be guaranteed in case the PRODUCT is used beyond the specification or the PRODUCT is modified.
- (8) Depending on the conditions or the environment, functions or performances of the PRODUCT may not be satisfied when the PRODUCT is used with other equipments.
- (9) Please do not use the PRODUCT in applications to protect the body.
- (10) Please protect the PRODUCT from condensation.
- (11) Please use the correct supply voltage to operate the PRODUCT.
- (12) Do not disassemble or modify the PRODUCT.
- (13) Turn off the power immediately and stop using the PRODUCT in the following cases.
 - In case water or foreign substances get into the PRODUCT.
 - In case the PRODUCT is dropped or the housing is broken.
 - In case unusual odor, abnormal noise, or smoke are generated from the PRODUCT.

- (14) Do not use or store in the following conditions;
- Humid, dusty, or poorly-ventilated area.
 - Areas where the temperature is expected to rise (direct sunlight, etc.).
 - Areas with corrosive gas or flammable gas in the surrounding air.
 - Areas where vibration, shock, or rocking motion is applied directly to the PRODUCT.
 - Areas where the PRODUCTS may be splashed with water, oil, or chemicals.
 - Areas where static electricity can easily be built up.
- (15) Make sure the wiring is done properly.
- (16) Turn off the power of the PRODUCT and any equipment attached to the PRODUCT when putting on or taking off the cables.
- (17) Install the PRODUCT using cushioning materials such as vibration dampeners. Please contact us if you have any questions regarding installation.
- (18) Do not block the air inlet and outlet (3 places). Please contact us if you have any questions regarding the air inlet and outlet.
- (19) Vibration or audible noise level may change over time due to contamination of the blade. Please provide dust-proof constructions around the PRODUCT.
- (20) Please advise us in case the driving circuit will be designed at the customer's side.
- (21) Please connect and don't use air inlet of this product (2 places) in series.



No.	Drawing Number	Name	Qty.	Notes
1				
2				



Note
1) General Tolerances. ± 0.5

ISSUED BY DESIGN GROUP 3
Old figure number: 6404-00635-92

		Third Angle Projection Method	Scale	Tolerances			Material	Surface Treatment	
..			1 : 1	0 - 30	A	B	S		
..		Qty.	Finish	30 - 120	± 0.1	± 0.2	\pm		
..		Date	Angle Tolerances	120 - 315	± 0.15	± 0.3	\pm		
..		Mar. 23 '17		315 - 1000	± 0.2	± 0.5	\pm		
..		Approved by	Checked by	Designed by	± 0.3	± 0.8	\pm		
..					NIDEC COPAL ELECTRONICS CORP.			Name	BLOWER OUTLINE
..	Mar. 23 '17	First Print	S. Y.	N. Watanabe	Y. Akabane	S. Yanagi	Dwg. No.	6404-00635-00	
C. No.	Date	Ecn. No.	Revision						