



8SEFB-0031(0)

SPECIFICATION

Micro Blower

PN: TF037C-2000-F

Part No **TF037E-2000-F**
TF037C-2100-F
TF037C-2000-F
TF037F-2000-F



AERO DYNAMIC BEARING TECHNOLOGY, our proprietary technology, is used to TF037 series Micro Blower. The results are super low vibration, super long bearing's lifetime and no high temperature degradation characteristics, which enable to maximize efficiency and performance and gain high power even on small size FAN.

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BEFORE USE OF THIS PRODUCT, CAREFULLY READ THE SECTION OF HANDLING PRECAUTION, AND INSTALL AND USE PRODUCT ACCORDING TO THE SPECIFIC MECHANICAL ELECTRONICAL PROPERTIES REQUIRED BY PRODUCT.

THIS PRODUCT IS DESIGNED ONLY FOR VENTILATION PURPOSE, FOR REQUEST TO USE PORDUCT FOR OTHER PURPOSE, PLEASE CONTACT SALES REPRESENTATIVE

TF037 Series SPECIFICATION
■ PRODUCT OVERVIEW

Product	TF037E-2000-F	TF037C-2100-F	TF037C-2000-F	TF037F-2000-F
Suited for	Fuel Cell or Industrial use			Medical e.g. CPAP *1)
Resin Material	UL94 V0 Standard (Flame Resistant)			FDA Standard
Airtightness	Yes*2)	No		
Air Vent Joint	Yes	No		
Fixing Leg	Yes		No	
Mass	165g	94g	90g	72g
Drawing	6404-00655-01	6404-00697-01	6404-00705-01	6404-00635-01
Material List	6404-00600-00	6404-00673-01	6404-00673-01	6404-00718-01

*1) Do not use for applications that may cause harm to human life and personal injury.

*2) Designed to a sealed structure which is no air leakage other than the Air vent

■ OPERATING CONDITION

Usable Gas	Normal Air*1)
Recommended Mounting Position	Axis Vertical (Plate Downward)*2)
Rotation Speed Range	6,000 ~ 45,000 rpm*3)
Minimum Flowrate	5L/min
Operating Temperature And Humidity	(-)10 ~ 60°C, 10 ~ 95 %RH*4)
Storage Temperature Humidity range	(-)20 ~ 60°C, 10 ~ 95 %RH*4)
Operating Ambient Pressure	770 ~ 1,060 hPa

Use in the range beyond limit listed above may cause damage or characteristics change to device.

Please contact our sale representative if you need to use the product in condition beyond the range above.

*1) Do not use to any corrosive gas.

*2) Avoid vibration and shock while the product is operating. It may damage product

*3) Rotation Speed = Hole Sensor Frequency×15

*4) Condensation may cause damage to product

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■ MECHANICAL SPECIFICATION

Motor Type	3 phase 8 pole Brushless (Y Connection)
Bearing Type	Aero Dynamic Bearing
Rotation Direction	Counterclockwise viewing from the air vent side
Rotor Inertia	TF037E-2000-F, TF037F-2000-F : $1.9 \times 10^{-6} \text{ kg} \cdot \text{m}^2$ TF037C-2000-F, TF037C-2100-F : $2.1 \times 10^{-6} \text{ kg} \cdot \text{m}^2$
Torque Constant	0.0025 N·m/A

■ ELECTRICAL SPECIFICATION

Operating Voltage Range	10 ~ 30 V
Power Supply Current	Max 0.9 A ^{*1)}
Power Consumption	Max 21.6 W ^{*1)}
Input Coil Current	Max 3.0A ^{*2)}
Coil Resistance	0.5 Ω @20°C, Between 2 phase
Coil Inductance	20 μH @20°C, 10 kHz, Between 2 phase
Insulation Grade	E grade (JIS C 4003 Cable for Coil)
Insulation Resistance	Min 20MΩ between Coil terminal and Plate at 500V DC (JIS C 4003)
Insulation Pressure Resistance	Leak Current: Max 1 mA At min 600V AC between coil terminal and plate more than one second (JIS C 4003)

*1) @3.0 kPa 100L/min Temperature: 23±5°C, Humidity: 45~85%RH, Air pressure: 101.3kPa

*2) In case, the rotor is lock up, the coil may be destroyed by surge current. The protection circuit to prevent surge current must be installed for safety.

■ EXPECTED DURABILITY AND NOISE LEVEL

Continuous Operation Life Time	Min 100,000 hour ^{*1)}
ON/OFF Operation Life Time	Min 400,000 times ^{*1)}
Noise Level	65 dB(A) ^{*2) *3)}

*1) Ambient Temperature 60°C with the recommended Mounting Direction

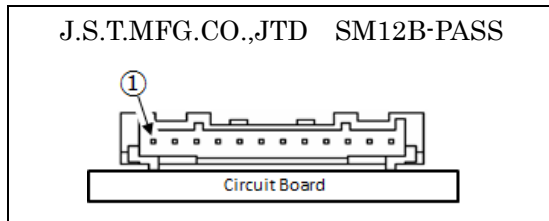
*2)@3.0 kPa 100L/min Temperature: 23±5°C, Humidity: 45~85%RH, Air Pressure: 101.3kPa

*3)Measured 1 m away from the intake vent (Including dark noise as 15 dB)

TF037 Series SPECIFICATION

INTERFACE

CONNECTOR



HARNESS SIDE

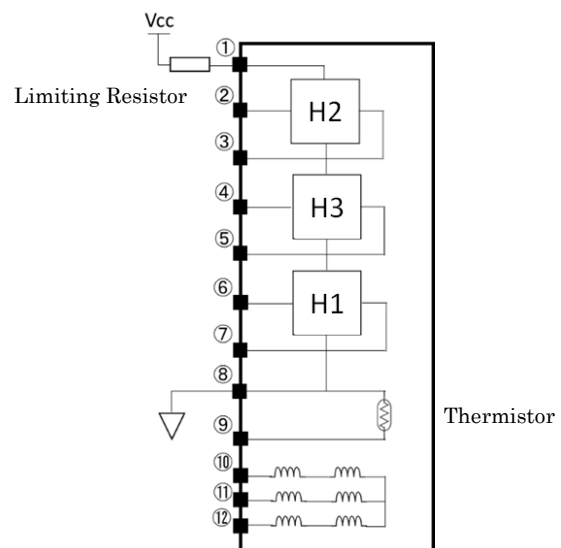
J.S.T.MFG.CO.,JTD SM12B-PASS	
Pressure Welding	12PAF-6S (Retainer: PAFS-12V-S)
Crimping	PAP-12V-S (Contact: SPHD-001T-P0.5)

- Both pressure welding and crimping are available.
- Recommended size: AWG#22

TERMINAL ARRAY

①	Vcc	Power for Hall Sensor
②	H2-	Output of Hall 2
③	H2+	
④	H3-	Output of Hall 3
⑤	H3+	
⑥	H1-	Output of Hall 1
⑦	H1+	
⑧	GND	GND
⑨	TH	Thermistor
⑩	V	Coil (V)
⑪	W	Coil (W)
⑫	U	Coil (U)

INTERNAL CIRCUIT / LIMITING RESISTOR



The current into the hall sensor must be restricted within the rating listed below by using a resistor.

HALL SENSOR CHARACTERISTIC

Input Current	Max 10 mA	At maximum operating load at temperature 60°C
Input Resistance	250 ~ 450Ω	Per one Hall sensor
Differential Output	Min 300mV p-p	VH = (VH+) - (VH-) at 10mA in Input current

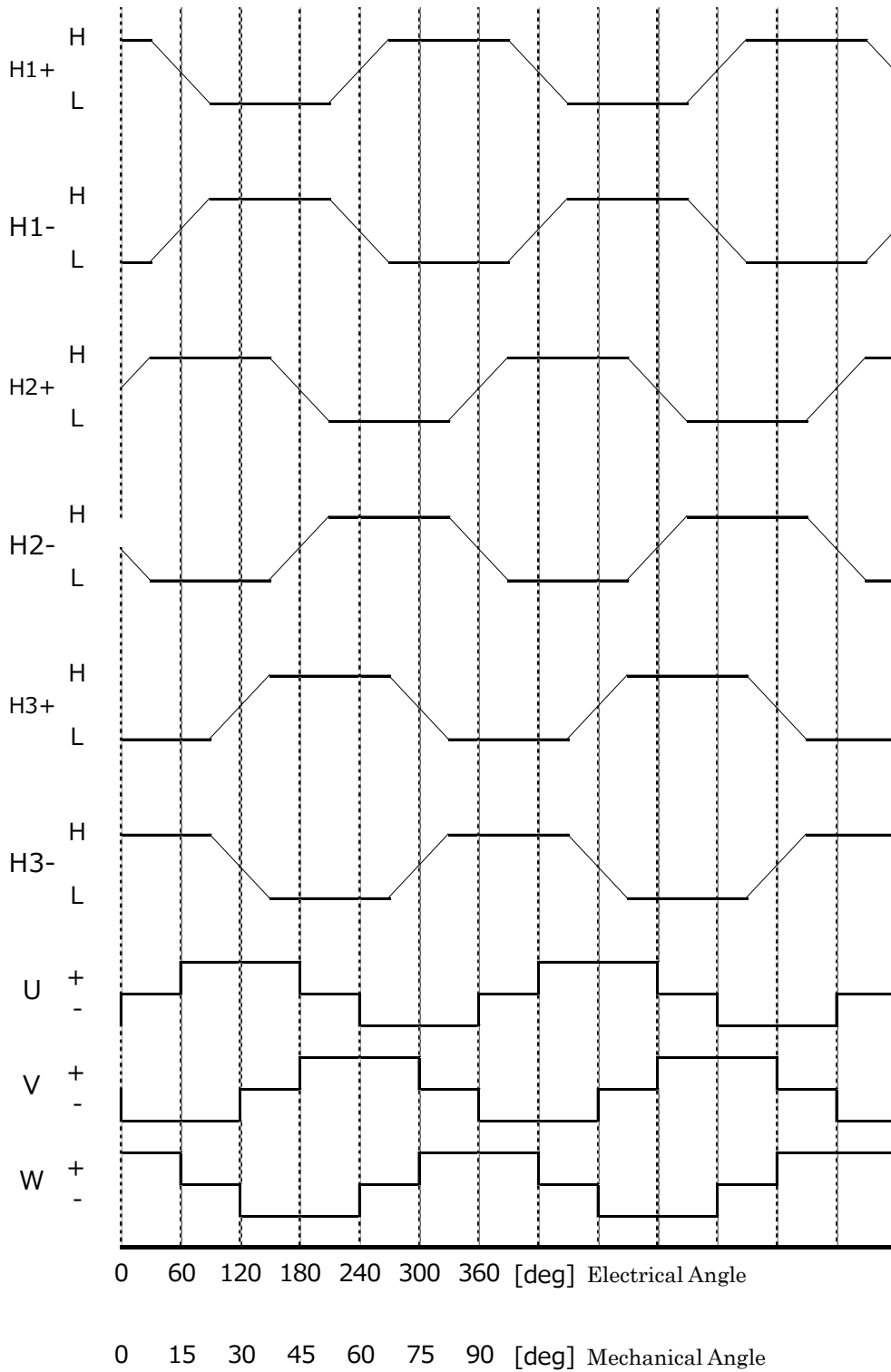
· Equivalent of ASAHI KASEI Electronics HW-105A

THERMISTOR CHARACTERISTIC

Reference Resistance 25°C	10kΩ
Operating Current 25°C	0.31 mA
B Constant[25/85°C]	4,100 K
Maximum Temperature	86 °C (Thermistor Resistance: 0.97kΩ)

· Equivalent of TDK NTCG164BH103JT

■ TIMING CHART

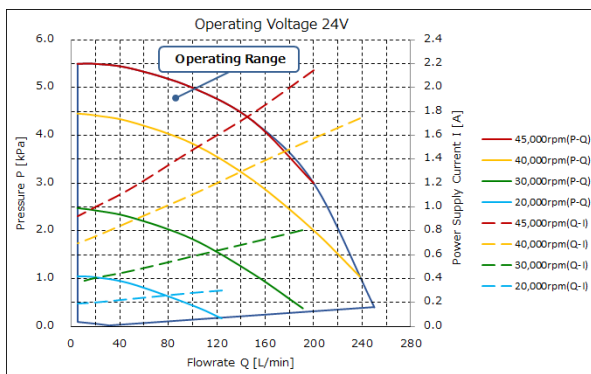


TF037 Series SPECIFICATION

OPERATING RANGE IN P-Q & Q-I RATING

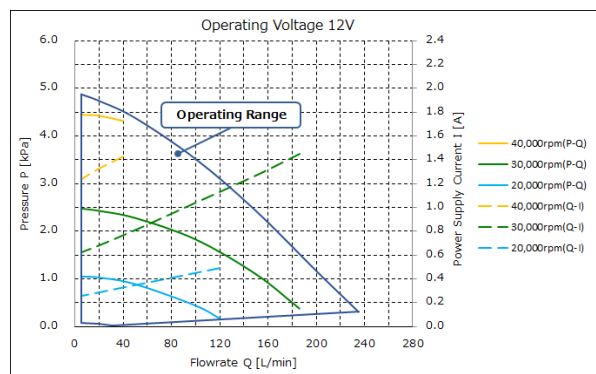
- P-Q and Q-I conditions must not exceed the ratings listed below.
- The general purpose driver TF037E-1000-D is setup to the configuration for general use. In using the general purpose driver, the output may not reach the maximum ratings listed below
- P-Q and Q-I characteristics are for reference purpose only. The driver must be configured properly by measuring the actual condition before use.

- The characteristics below are measured with our company’s driver at axis vertical position.



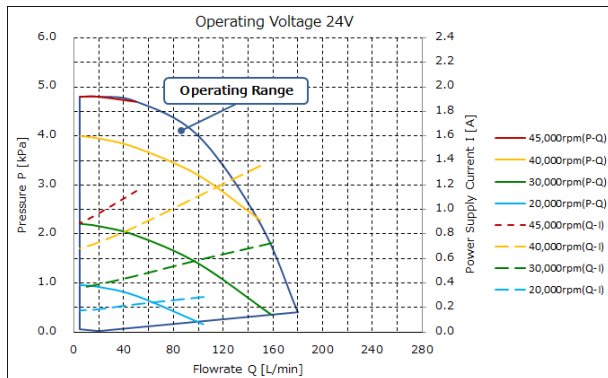
24V P-Q/Q-I Characteristic

Ambient Temperature: 25°C, Barometric Pressure: 101.3kPa



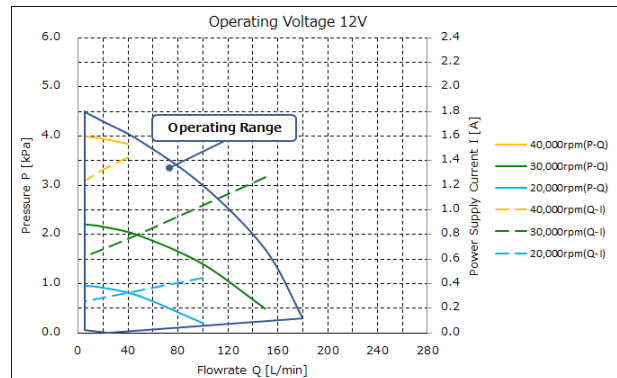
12V P-Q/Q-I Characteristic

Ambient Temperature: 25°C, Barometric Pressure: 101.3kPa



24V P-Q/Q-I Characteristic

Ambient Temperature: 60°C, Barometric Pressure: 101.3kPa



12V P-Q/Q-I Characteristic

Ambient Temperature: 60°C, Barometric Pressure: 101.3kPa

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RELIABILITY TEST

High Temperature Storage	60°C 2,000 hour	
Low Temperature Storage	(-)20°C 1,000 hour	
High Temperature High Humidity Storage	60°C 95%RH for 1,000 hour	
Thermal Shock	(-)40~80°C 1,000 cycle for 30 min	
Vibration Durability	Vibration Type	Frequency change 10 to 50Hz
	Acceleration	19.6 m/s ² (2G)
	Sweep	Round trip about for 5 min
	Period	X·Y·Z direction for 60 min
	Condition	In non-operation
Shock Durability	Acceleration	588 m/s ² (60G)
	Pulse width	6 ms
	Shock waveform	Half sine wave
	Shock Times	One times to each X·Y·Z direction
	Condition	In non-operation
Packing Drop	Drop Direction	1 corner, 3 ridge, 6 face
	Drop Height	0.6 m
Packing Transport	Frequency Range	10~40 Hz acceleration 0.75G
	Sweep	Round trip for 1 min
	Cycle Times	Each X·Y·Z direction for 60 min
High Temperature High Humidity in Operation	60°C 95%RH × 24 hour	
Low Temperature in Operation	(-)10°C × 24 hour	
Dust Test in Operation*1)	Dust Type JIS Z8901 11 type Density 60,000 mg/m ³ Continuous Stirring For 30 sec every ON/OFF, 10,000 Cycle	

The test result shall meet the ratings of Power supply current, Power consumption and Noise level listed in this specification.

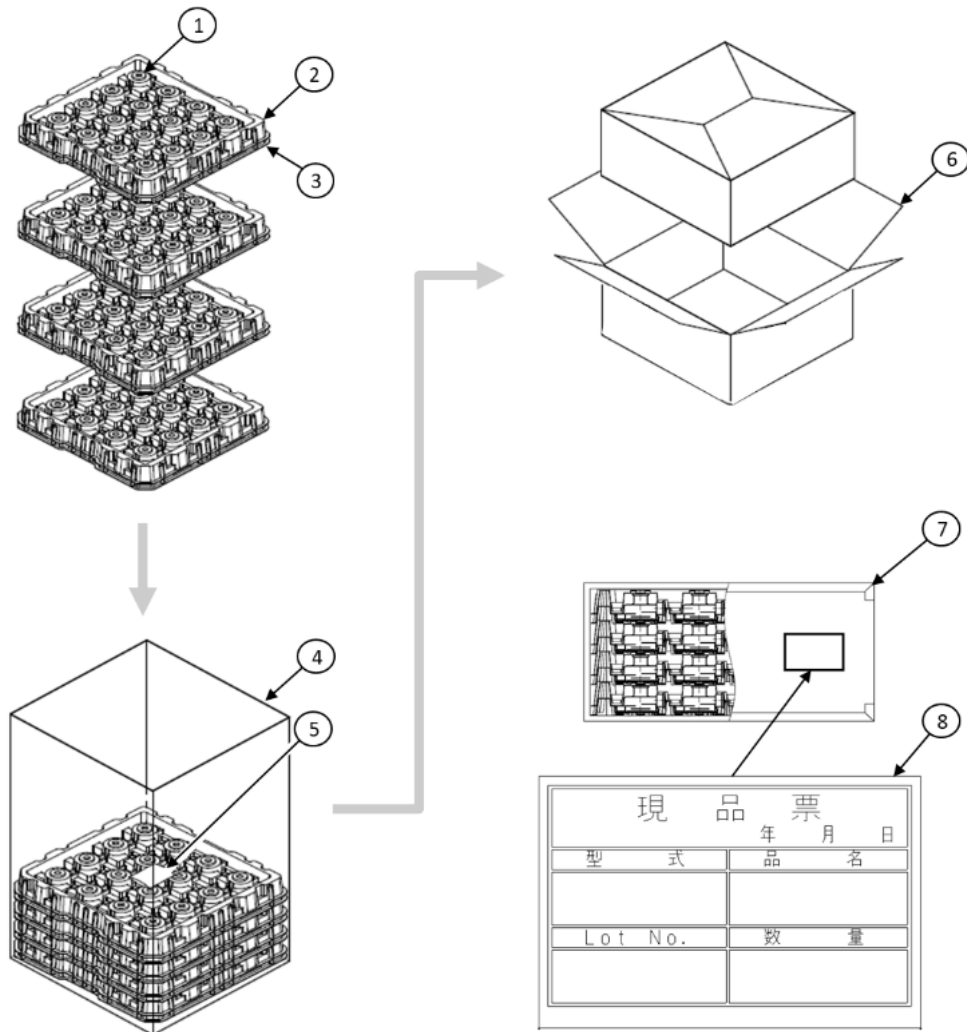
*1) The condition in the dust test is made for just measuring the limit. Do not put the product into such a severe condition

TF037 Series SPECIFICATION

PACKIG SPECIFICATION

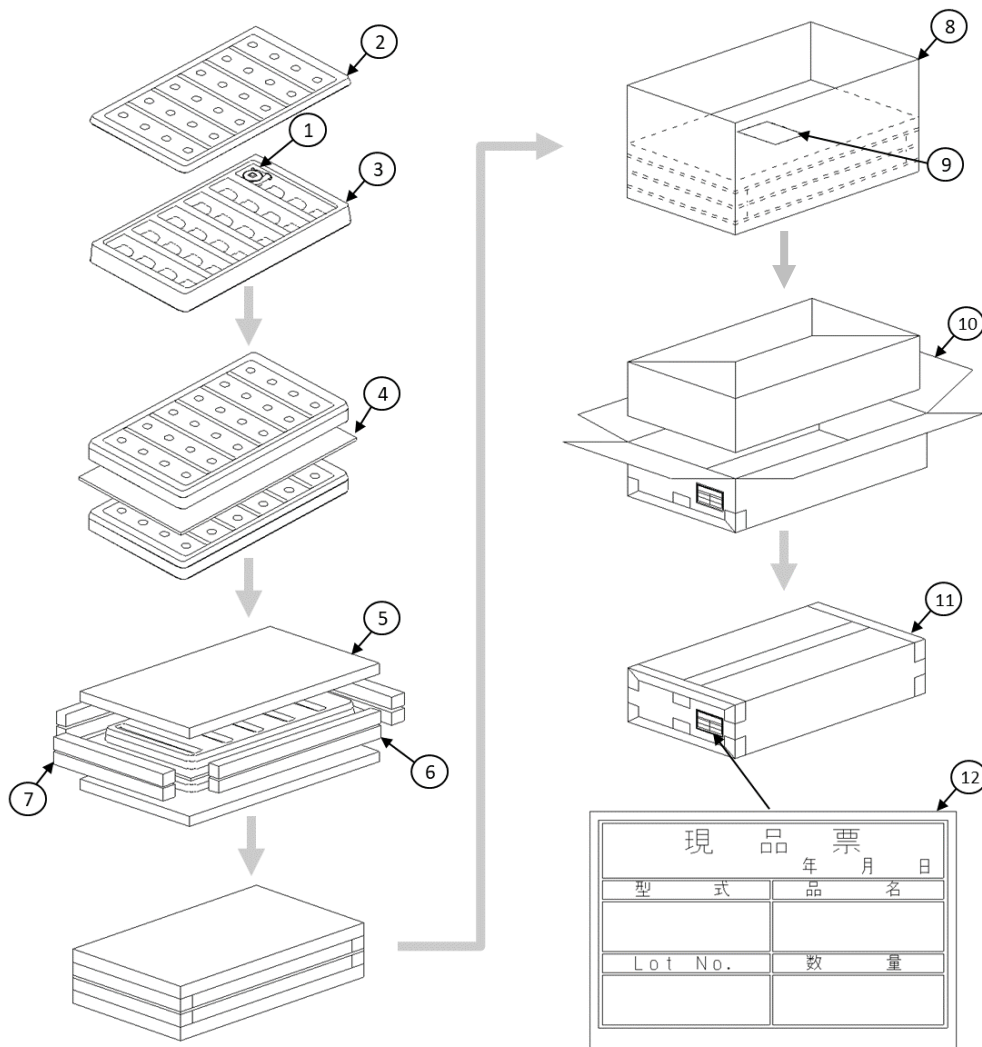
TF037E-2000-F

No	Contents	QTY	Material	Remark
1	TF037E-2000-F	64	-	One tray : 4×4 = 16 set
2	Lid of Tray	4	PET(Polyethylene terephthalate)	
3	Tray	4	PET(Polyethylene terephthalate)	
4	Inner bag	1	PE(Polyethylene)	
5	Desiccant	1	-	
6	Outer box	1	Cardboard	Size 485(L)×460(W)×245(H)
7	Adhesive tape	Unspecified	-	
8	Contents List	1	Paper	



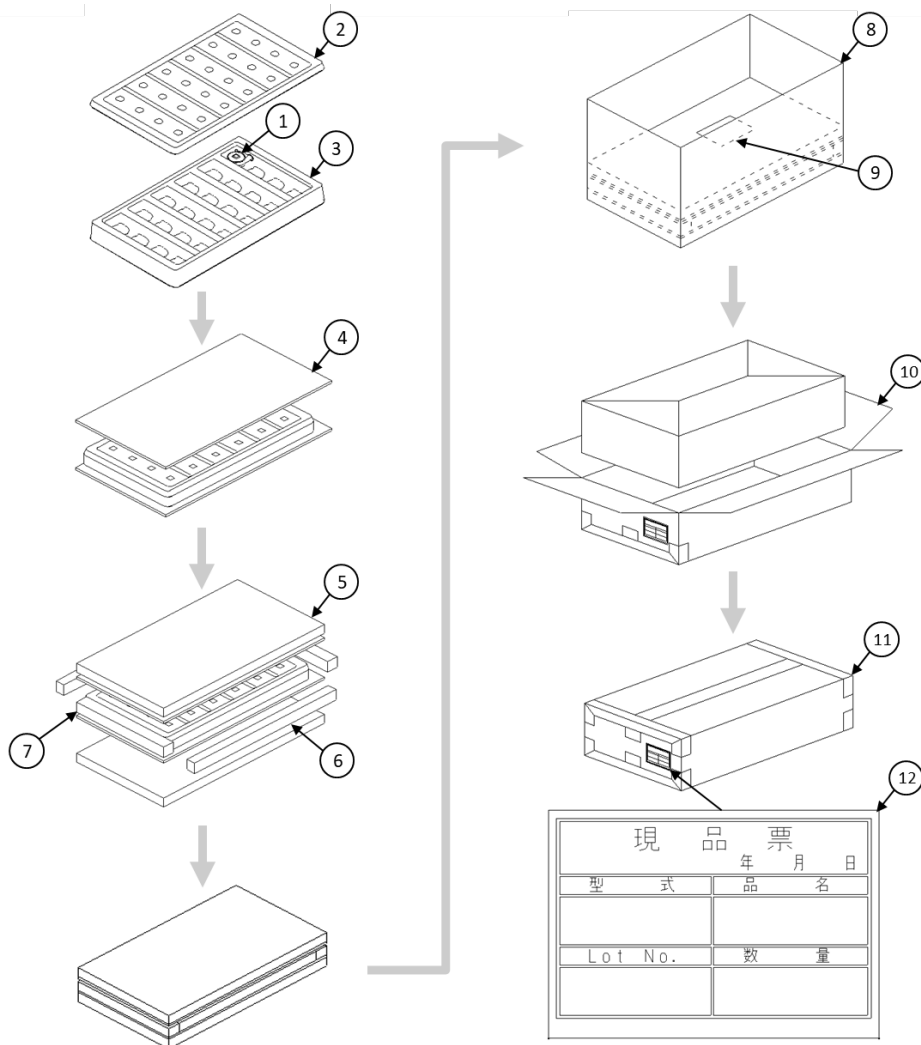
Two tray 48 pcs packing for TF037C-2000-F, TF037C-2100-F, TF037F-2000-F

No	Contents	QTY	Material	Remark
1	TF037F, C	48	-	One tray: 4×6 = 24 pcs
2	Lid of Tray	2	PET(Polyethylene terephthalate)	
3	Tray	2	PET(Polyethylene terephthalate)	
4	Partition	1	Cardboard	
5	Sponge	2	-	
6	Sponge	4	-	
7	Sponge	4	-	
8	Inner Bag	1	PE(Polyethylene)	
9	Desiccant	1	-	
10	Outer Box	1	Cardboard	Size 540(L)×310(W)×161(H)
11	Adhesive tape	Unspecified	-	
12	Contents List	1	Paper	



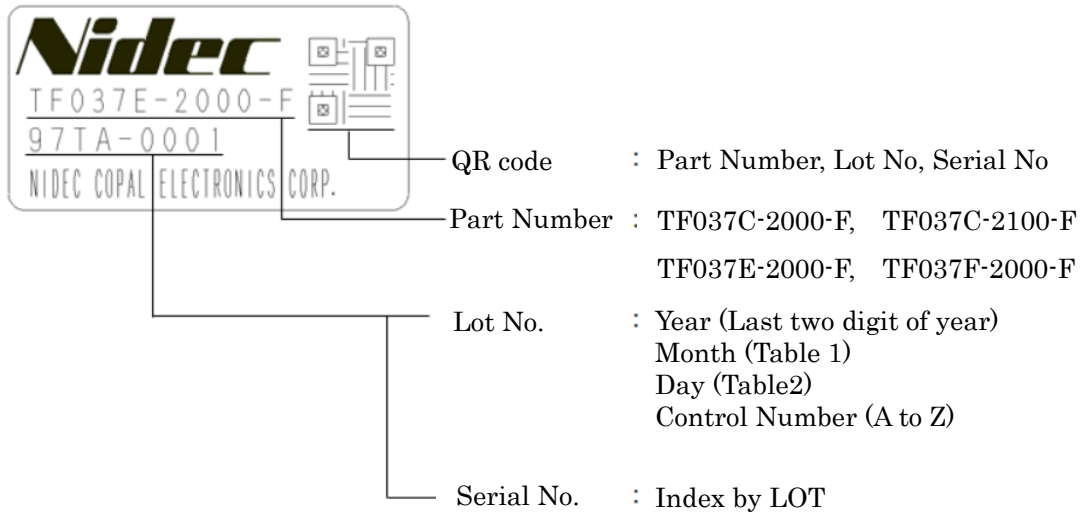
One tray 24 pcs packing for TF037C-2000-F, TF037C-2100-F, TF037F-2000-F

No	Contents	QTY	Material	Remark
1	TF037F, C	24	-	One tray: 4×6 = 24 pcs
2	Lid of Tray	1	PET(Polyethylene terephthalate)	
3	Tray	1	PET(Polyethylene terephthalate)	
4	Partition	2	Cardboard	
5	Sponge	2	-	
6	Sponge	2	-	
7	Sponge	2	-	
8	Inner Bag	1	PE(Polyethylene)	
9	Desiccant	1	-	
10	Outer Box	1	Cardboard	Size 540(L)×310(W)×110(H)
11	Adhesive tape	Unspecified	-	
12	Contents List	1	Paper	



TF037 Series SPECIFICATION

■ LABEL DISCRIPTION



[Table 1]

Month	1	2	3	4	5	6	7	8	9	10	11	12
No.	1	2	3	4	5	6	7	8	9	O	N	D

[Table 2]

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No.	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	J	K	L

Day	21	22	23	24	25	26	27	28	29	30	31
No.	M	N	P	Q	R	T	U	V	W	X	Y

■ WARRANTY

Warranty period of the Product is one year from delivery. In case, defect has been found in the Product during the warranty period and it was found that Nidec Copal Electronics (here in after referred as NCE) is responsible and liable for the defect, NCE shall either repair or replace the defected Product free of charge, provided, however, that foregoing warranty shall be voided and shall not be applied in any instances where

1. Buyer fails to carry out proper handling, operating, installation, testing, service and checkout of the Product and/or to follow NCE's instruction or advice with respect to any of these matters,
2. Buyer utilizes any attachments or interface devices or makes any modification to the product which are not approved in writing by NCE.
3. Buyer incorporates any parts not supplied by NCE into the Product and/or combines any equipment not supplied by NCE with Product.
4. The alleged defect arises out of NCE's compliance with any written request, instruction, design change, drawing or specification (including but not limited to instruction manual, installation manual, and service manual prepared by Buyer) specifically furnished or imposed by Buyer upon Seller.
5. Defect arisen due to reason that it has been unable to be aware of the problem by ordinary scientific and technical knowledge and capability in those days.

In addition, NCE shall not indemnify Buyer against any damages and losses which are alleged to have arisen as a result of and/or caused by defect or malfunction of Product. Buyer must implement a proper protection measure on Buyer's system in preparation for sudden malfunction and out of control of Product.

■ PRECAUTION ON HANDLING

1. Do not give strong stress such as shock, vibration and oscillation to Product. While product is working, such stress may cause Lock-up of rotor which can lead the product to permanent damage .
2. This product doesn't include a driver. Buyer has to install and configure a driver properly according to characteristic, rating and recommendation in this specification.
3. This specification doesn't mean that NCE guarantees Product will not be breakdown or out of order in any case. Buyer has to implement a proper protection measure on Buyer's system in preparation for sudden malfunction and out of control of Product.
4. Product characteristic was measured with NEC's standard measuring equipment*1), therefore the characteristics in actual condition or use at Buyer may different from the characteristic in this specification. Checkout the characteristic results at the actual condition before use.
5. Do not plug and unplug cables while product is powered.
6. Turn power off and stop to use Product immediately in any of following cases
 - 1) any foreign object has got into product 2) the Product have been dropped or got broken 3) the Product becomes inordinately hot, has a strange odor, emits smoke, or makes unfamiliar noises.
7. Do not use or store Product where shock, vibration, static electricity might occurs and with high temperature, humidity, dust, corrosive gas, no ventilation and near splashing water, chemical material or oil
8. Do not seal off or block the air vent and use by connecting products in series.
9. Product has parts rotating at high speed which might cause serious personal injury. Pay attention to handle Product while it works.
10. If you have any questions, please contact our sales representative.

*1) Flowmeter NCE is using is a mass flowmeter of thermal method displaying volume flow rate at 20°C · 1 air pressure.

■ ENVIRONMENT/SAFETY REGULATION RELATED

The Product is compliant with RoHS directives(2011/65/EU and(EU)2016/863) and European Directive for restriction on the use of PFOS in accordance with 2006/122/EC(30th revision of European directive 76/769/ECC).

■ DISCLAIMERS

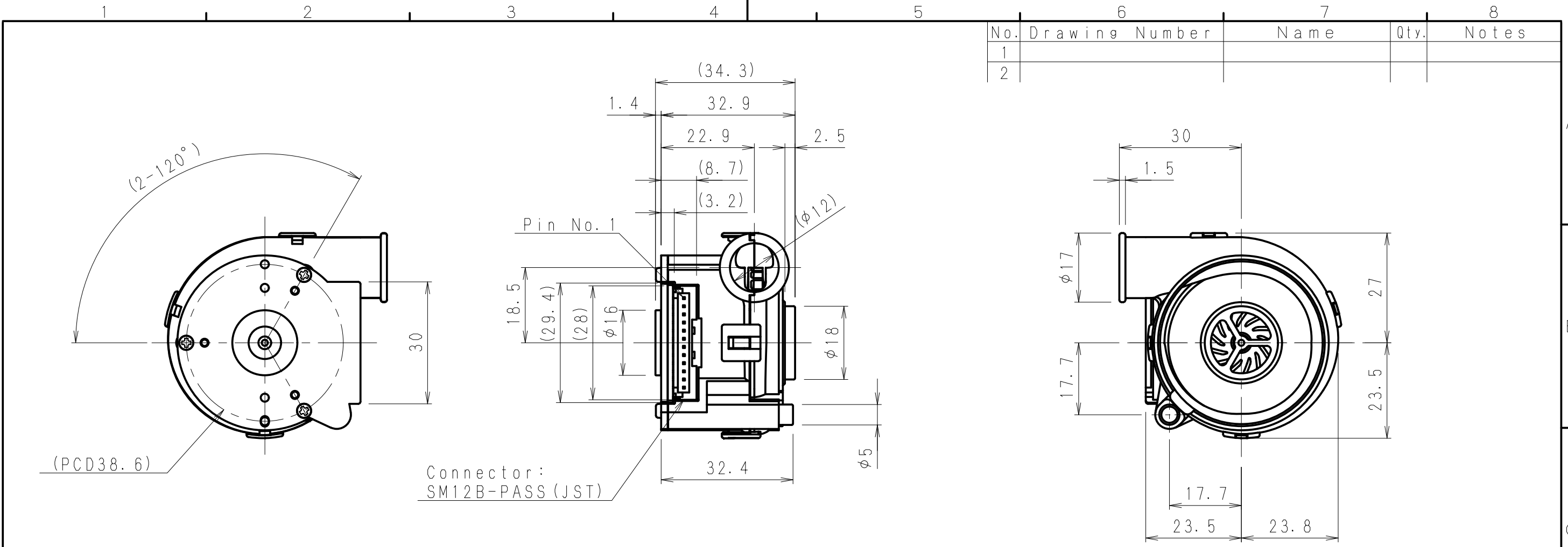
- 1.This Product is not designed to be used as part of any device or equipment that may affect the human body, human life, or assets (such as medical equipment, disaster prevention systems, security systems, combustion control systems, infrastructure control system, vehicle equipment, traffic systems, aviation equipment, aerospace equipment and nuclear-related equipment). Do not apply Product to the above listed device and equipment. NCE is not liable for any losses, damages, claims or demands caused by unauthorized or unspecified use of Product.
2. This product is strictly prohibited from using, providing or exporting for the purposes of the development of weapons of mass destruction or military use. NCE is not liable for any losses, damages, claims or demands caused by any provision or export to the person or entity who intends to develop, manufacture, use or store nuclear, biological or chemical weapons or missiles, or use any other military purposes.
3. All the information described herein(product data, specifications, figures, tables, programs and application circuit examples, etc) is current as of publishing date of this document and is subject to change without notice.
4. This specification doesn't mean that NCE guarantees Product will not be breakdown, out of order and fail in any case. Buyer has to therefore take responsibility to give thorough consideration to safety design to prevent accidents causing injury or damage that may ensue from the Product's failure or malfunction. The entire system in which the Product is used must be sufficiently evaluated and judged whether the Product operates without problems. NCE is not liable for losses, damages, claims or demands which are claimed to have arisen as a result of and caused directly or indirectly by Product's defect, out of order, failure and malfunction.

TF037 Series SPECIFICATION

■ Revision History

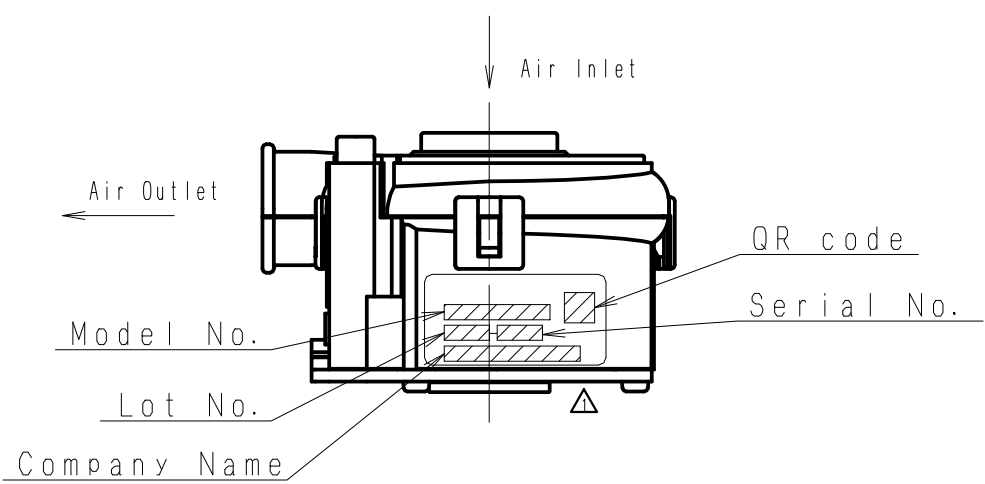
No	Date	Items	Changed Contents
—	15-Oct-19	First edition	

Headquarter Address: NIDEC COPAL ELECTRONICS CORPORATION Nishi-Shinjuku Prime Square Bldg.,
7-5-25 Nishi-Shinjuku, Shinjuku-Ku, Tokyo JAPAN. TEL: +81-3-3364-7071 FAX: +81-3-3364-7091
URL. <https://www.nidec-copal-electronics.com>



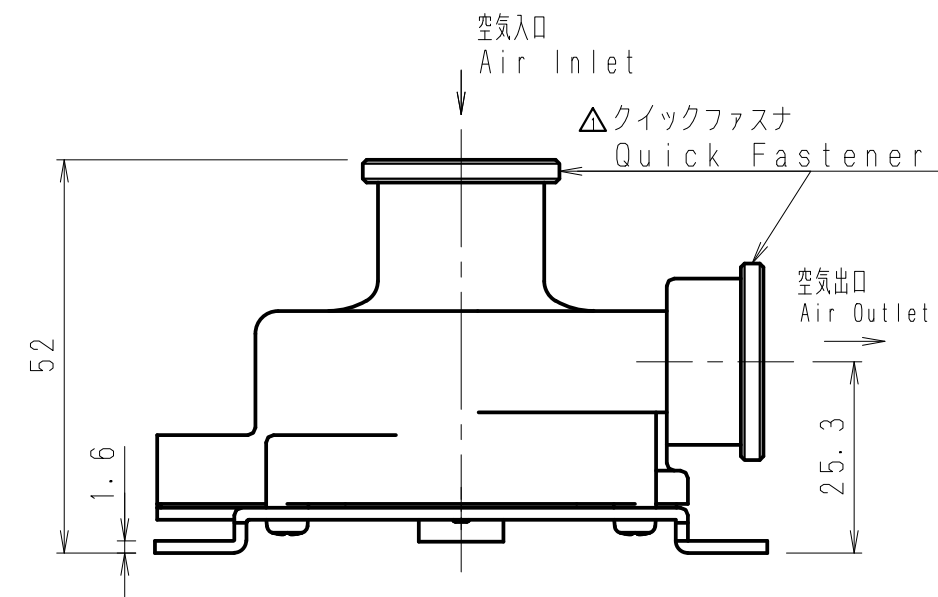
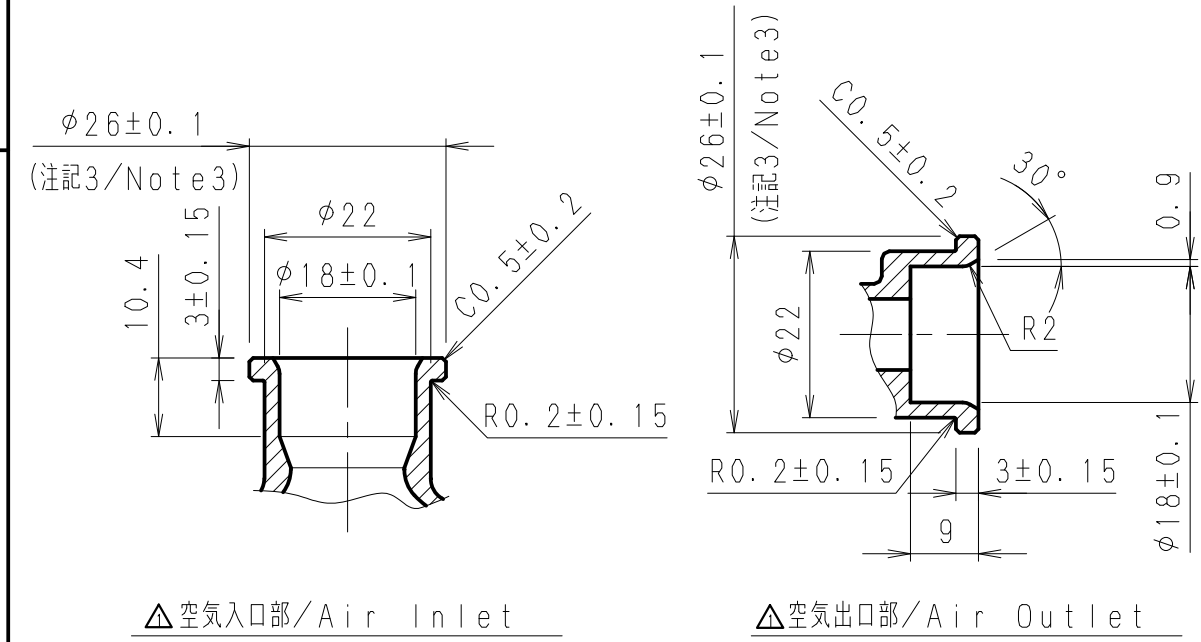
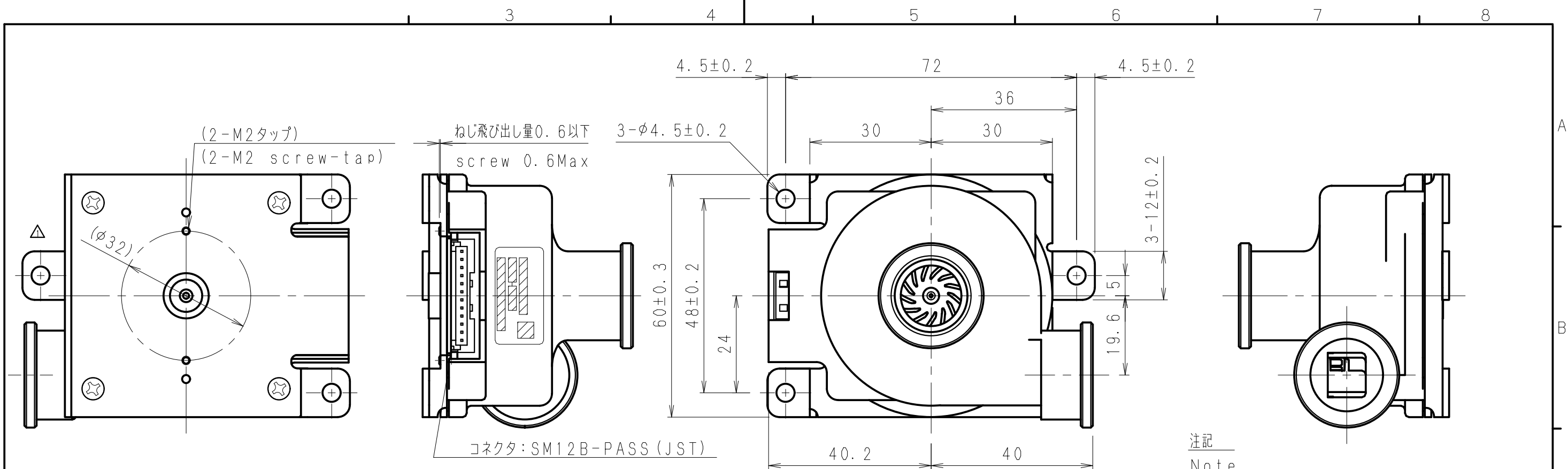
No.	Drawing Number	Name	Qty.	Notes
1				
2				

Note
1) General Tolerances. ± 0.5



ISSUED BY DESIGN GROUP 1
Old figure number: 6404-00635-92
(Dimensions: in mm)

Third Angle Projection Method	Scale	1 : 1	Tolerances	A	B	S	Material	Surface Treatment
Qty.	Finish		0 - 30	± 0.1	± 0.2	\pm		
Date	Angle Tolerances		30 - 120	± 0.15	± 0.3	\pm	Model	Heat Treatment
Oct. 15. '19			120 - 315	± 0.2	± 0.5	\pm	TF037F	
Approved by	Checked by	Designed by	315 - 1000	± 0.3	± 0.8	\pm	-2000-F	
△ Oct. 15. '19	Correction of errors	S. Y.					Name	BLOWER OUTLINE
Mar. 23. '17	First Print	S. Y.					Dwg. No.	6404-00635-01
C. No.	Date	Ecn. No.	Revision				NIDEC COPAL ELECTRONICS CORP.	



注記
Note

1. 指示なき寸法公差は±0.5とする。
General tolerances. ±0.5

2. ロットナンバー表示
Lot No. indication.

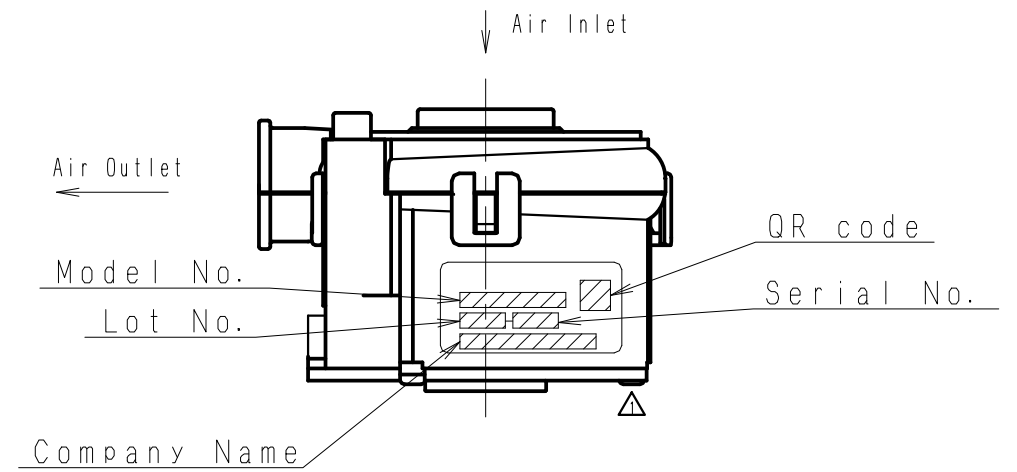
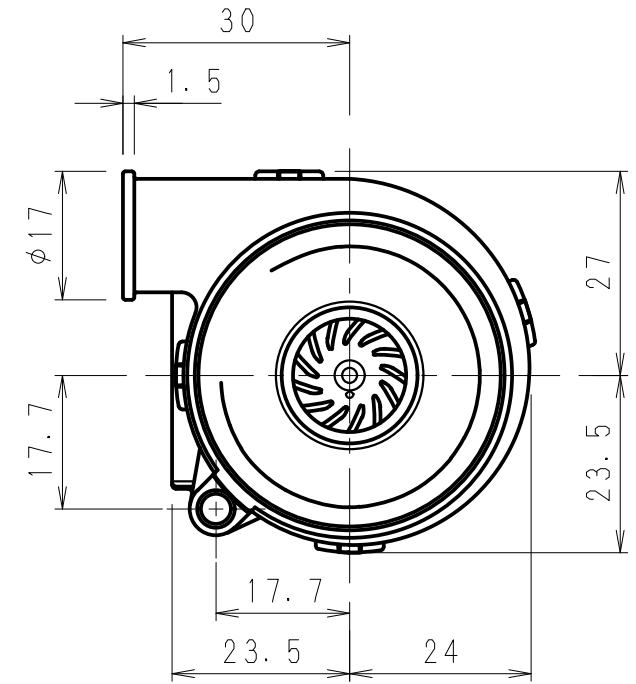
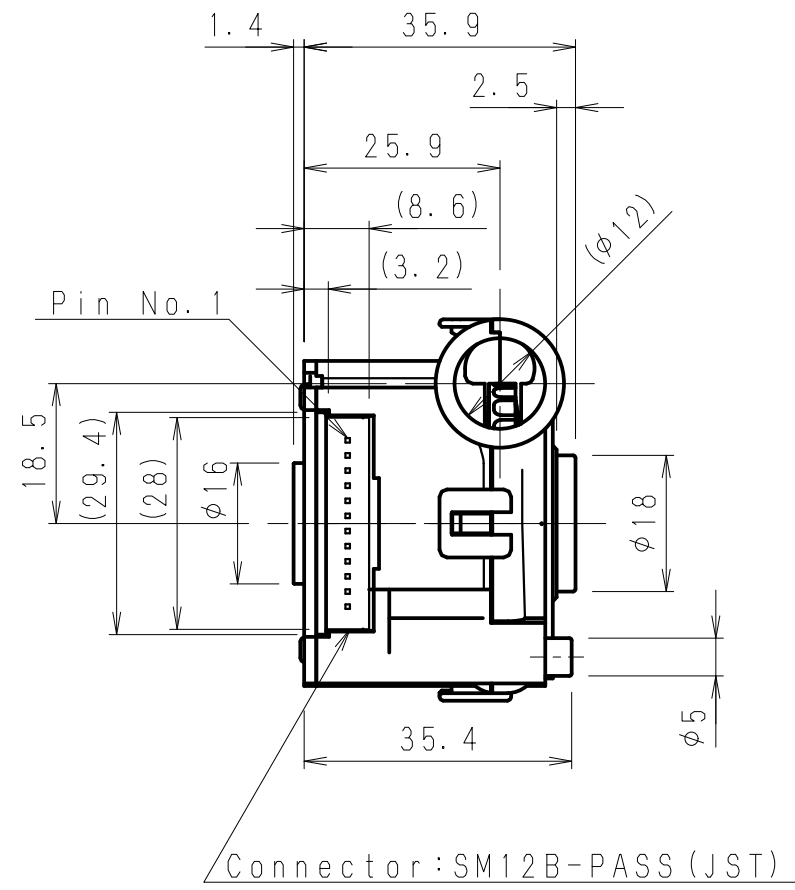
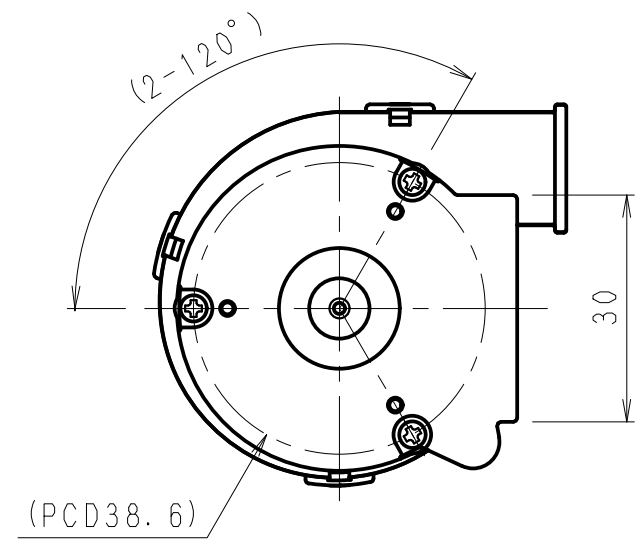
ロットナンバー/Lot No.

型式/model No. QRコード
 QR code
 シリアルナンバー
 Serial No.
 社名/company name

3. バリ高さは0.1以下とする。
The burr height is made less than 0.1
但し、パーティングライン部のバリは除く。
The burr height of parting line is removed.

		発行部門 ISSUED BY		設計1 DESIGN GROUP 1														
..									
..									
..									
△	19.10.15	誤記訂正 Correction of errors																
	16.12.09	初版発行 First Print																
記号 C.No.	年月日 Date	変通番 Fcn No.	変 更	更 記	事 記	事	柳 赤羽根 担当 Name	承認 Approved by	検 査 Checked by	設計 Designed by								
								第三角法 Third Angle Projection Method		尺度 Scale	1:1	普通寸法許容差 Tolerances			材料 Material	表面 Surface Treatment		
								個数 Qty.		1	仕上げ Finish		30以下 0 - 30	±0.1	±0.2	±	表処 Surface Treatment	
								日付 Date		19.10.15 Oct. 15. 19	普通角度許容差 Angle Tolerances		30をこえ120以下 30 - 120	±0.15	±0.3	±	適用 機種 Model	熱処 Heat Treatment
								承認 Approved by			検 査 Checked by						名称 Name	ターボファン外形図 Blowers Outline
								承認 Approved by			検 査 Checked by						図番 Dwg. No.	6404-00655-01
												日本電産コパル電子株式会社 NIDEC COPAL ELECTRONICS CORP.						

No.	Drawing Number	Name	Qty.	Notes
1				
2				



Note
1. General tolerances. ±0.5.

ISSUED BY DESIGN GROUP 1

			Third Angle Projection Method	Scale	1 : 1	Tolerances			Material	Surface Treatment	
			Qty.	1	Finish	-	0 - 30	±0.1			±0.2
			Date	Oct. 15, 2019	Angle Tolerances		30 - 120	±0.15	±0.3	±	
			Approved by	Checked by	Designed by	120 - 315	±0.2	±0.5	±		
						315 - 1000	±0.3	±0.8	±		
△	Oct. 15, 2019	Correction of errors								Name	Blowers Outline
	Feb. 22, 2017	First Print								Model	TF037C-2000-F
C. No.	Date	Ecn. No.	Revision							Name	
										Dwg. No.	6404-00705-01

NIDEC COPAL ELECTRONICS CORP.