

Specifications

Model No. TF029B-1001-D

Issuing Date

Aug.1, 2017

1. Scope

This specification is for the driver kit[TF029B-1001-D] dedicated to the Micro Blower [TF029 series], a product of NIDEC COPAL ELECTRONICS CORP.(hereinafter referred to as "NCEL").
Contents of the kit are Driver board and Harness .

2. Specification

(Note1) Environmental conditions : 23±5°C, normal humidity, atmospheric pressure range 90 to 106kPa (unless otherwise specified).

(Note2) Measuring conditions :

Blower = TF029B-1000-F, measurement equipment = NCEL's standard equipment

(Note3) Measuring conditions (unless otherwise specified) : supply voltage = DC24V, pressure = 2.0kPa, air flow = 100L/min

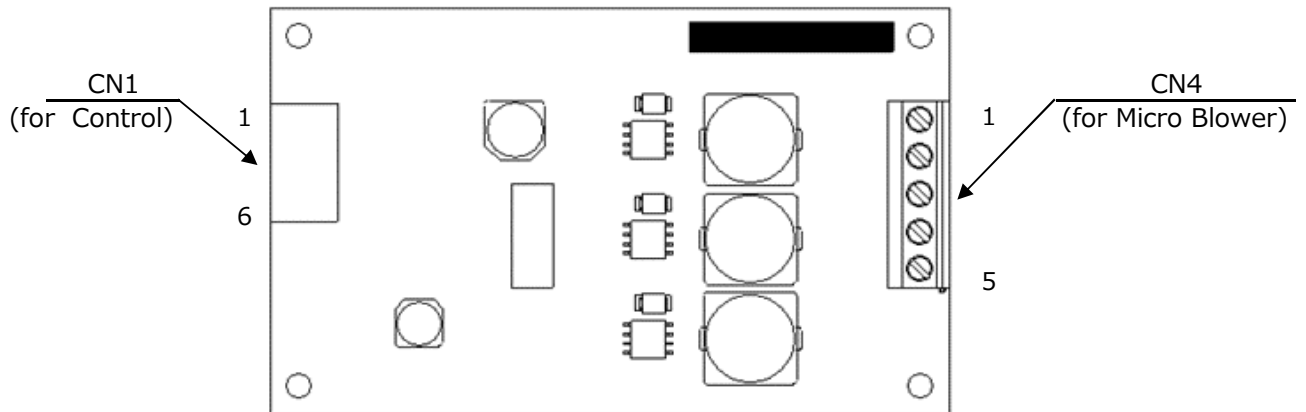
(Note4) It is the specification at the time of shipment and is not applied with the characteristics change by the time-dependent change.

No.	Items	Specification	Remarks
1	Configuration	Drivers	Dedicated to the Micro Blower (TF029 series)
2	Rotational Speed	36,000 r/min (reference value)	at 2.0kPa, 100L/min
3	Power Consumption	14.9W _{max.}	at 2.0kPa, 100L/min
4	Rated Voltage	DC 24 V±10%	
5	Max. Input Current	2.0 A _{max.} (DC)	Excluding inrush current.
6	Readiness time	5 sec _{max.}	From power on to motor start
7	Running Current	0.62 A _{max.}	at 2.0kPa, 100L/min
8	Weight	40 g _{max.}	
9	Operating Temperature	-10~50 °C	
10	Operating Humidity Range	10~90 %RH	No condensation
11	Storage Temperature	-20~60 °C	
12	Storage Humidity Range	10~90 %RH	No condensation

No.	項目	仕様	備考
13	Resistance to Vibration	To meet the Spec 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	
14	Resistance to Shock	To meet the Spec 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	
15	Outline	Drawing : 6405-00164-01	

3. Interface

【Driver Board】



CN1 : Connector for Control

Manufacturer	J.S.T. Mfg. Co., Ltd.
Part No.	SM06B-PASS

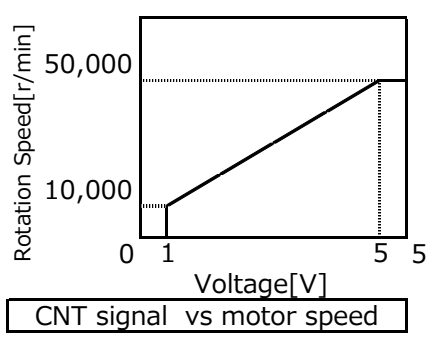
CN4 : Connector for Micro Blower

Manufacturer	Phoenix contact
Part No.	1729157

Pin No.	Symbol	Signal
1	Error	Error Output
2	FG	Rotational Speed Signal Output (FG)
3	BR	Short brake Input
4	CNT	Control Voltage Input
5	Vcc	Power Supply Voltage Input
6	GND	GND

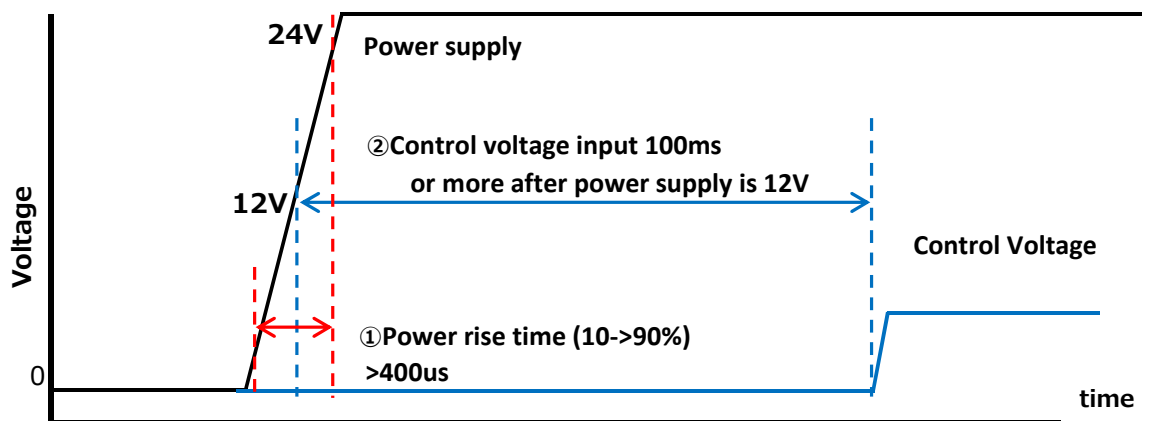
Pin No.	Symbol	Wire Color	Signal
1	TH(+)	Green	Thermistor Output (+)
2	TH(-)	Yellow	Thermistor Output (-)
3	W	Orange	Motor Coil (W)
4	V	Red	Motor Coil (V)
5	U	Brown	Motor Coil (U)

4. CN1(Connector for Control)Specification

Pin No	Input/output	Signal name	Specification
1	Output	ERROR	Error Output Detection Undetected Open Collector Output (Max. Voltage : 10V, Max Current : 10mA)
2	Output	FG	Rotational Speed Signal Output (FG) Open Collector Output (Max. Voltage : 50V, Max Current : 10mA) FG signal 1 pulse = 10rev.
3	-	NC	Not Connected
4	Input	CNT	Control Voltage Input Input voltage range -0.5~5.5V Valid control voltage 0.5~4.5V For CNT signal vs motor speed, refer to below 
5	-	VIN	Power Supply
6	-	GND	GND

5. Power supply, Control voltage input

To avoid high inrush current and protect driver, follow below chart at power up and CNT signal input sequence.



- ① Keep power rise time(10->90%) is more than 400us.
If high rate power is applied, inrush current will be so huge.
- ② Wait more than 100ms after power exceeds 12V to apply CNT signal.

6. Protective Functions

Attached Driver Board[TF029B-1000-D] is featured with the following protective functions.

Protective Functions	Description
Over voltage	If over voltage detected at power line, Blower will be stopped. Recover: Check and correct supply voltage.
Over current	When power line current exceeds 3A, fuse will be opened and cut off power. Recover: Contact with us.
High temperature	When high Turbo Fan internal temperature, outputs error signal and turn it off. If error is detected, LED will blink at 1Hz Recover: Wait until it's cooled down and try again. (If not solved, contact with us.)
Over speed	When motor speed exceeds limit, outputs error signal and turn it off. If error is detected, LED will blink at 1Hz Recover: Reduce CNT signal voltage and try again.(If not solved, contact with us.)
Over current at motor coil	When motor coil current exceeds limit, outputs error signal and turn it off. Recover: Check motor operation condition.
Abnormal voltage of supplied power	When power supply voltage exceeds limit, outputs error signal and turn it off. If error is detected, LED will blink at 1Hz Recover: Check power supply voltage and try again
Abnormal operation	When any failure is detected on driver, outputs error signal and turn it off. If error is detected, LED will blink at 4Hz Recover: Check power supply voltage and try again.(If not solved, contact with us)

Normal operation : Green LED is ON. (Red is OFF.)
Abnormal condition : Red LED is blinking. (Green is turned off.)

7. Characteristics of Flow Rate - Static Pressure

This data is the value of the Micro Blower [TF037C-2100-F].

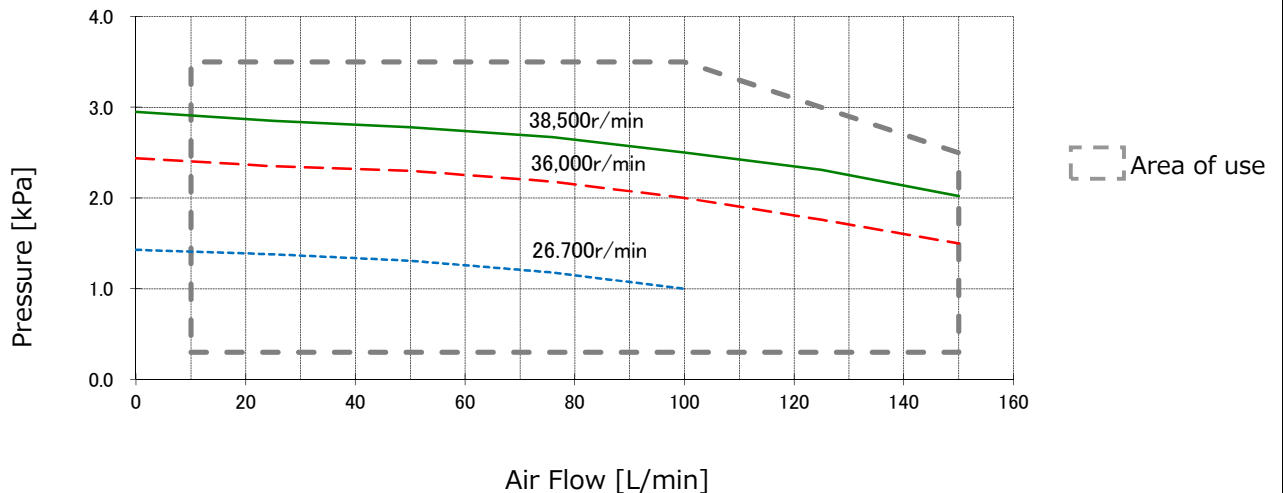
Conditions: Ambient temperature 23±5°C, normal humidity, atmospheric pressure (100±2kPa).

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

Make sure the thermistor temperature does not exceed 86°C during blower operation.

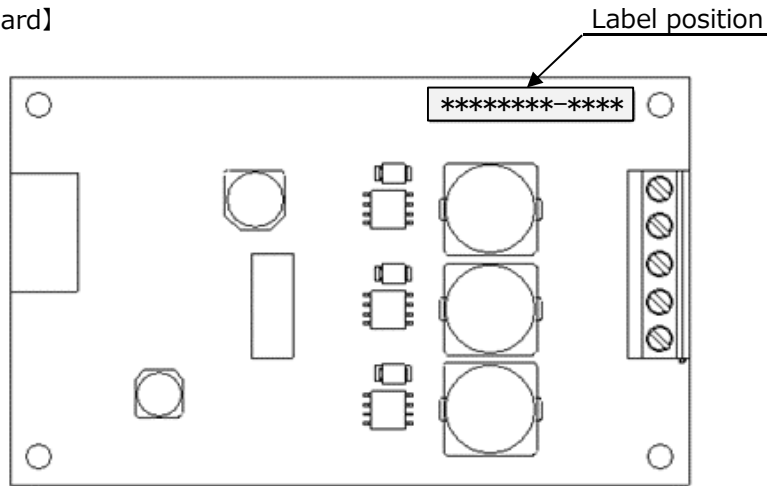
(Thermistor resistance value R(86 deg C)=0.968kΩ)

Operating Range at DC24V (1atm)

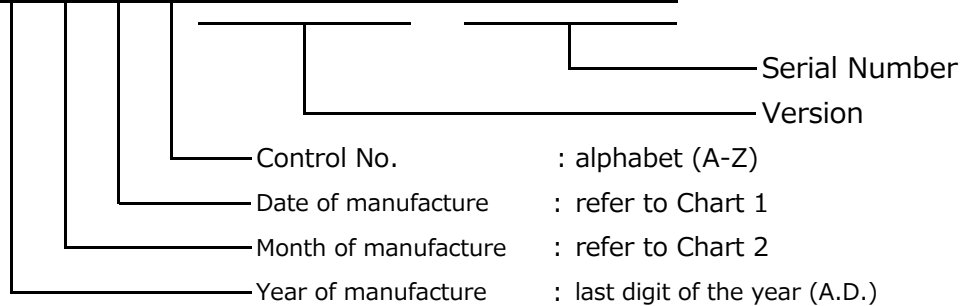


8. Manufacturing Code

[Driver Board]



7 6 1 A X X X X - X X X X



[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

9. Warranty

9-1. Warranty Period

Warranty period of the PRODUCT is 1 year from delivery.

9-2. 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.
- (2) NCEL will be responsible for the PRODUCT only in which the coverage will be limited to Clause 9-2. (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.

9-3. Product Application

The PRODUCT is designed and manufactured for general industrial use 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.

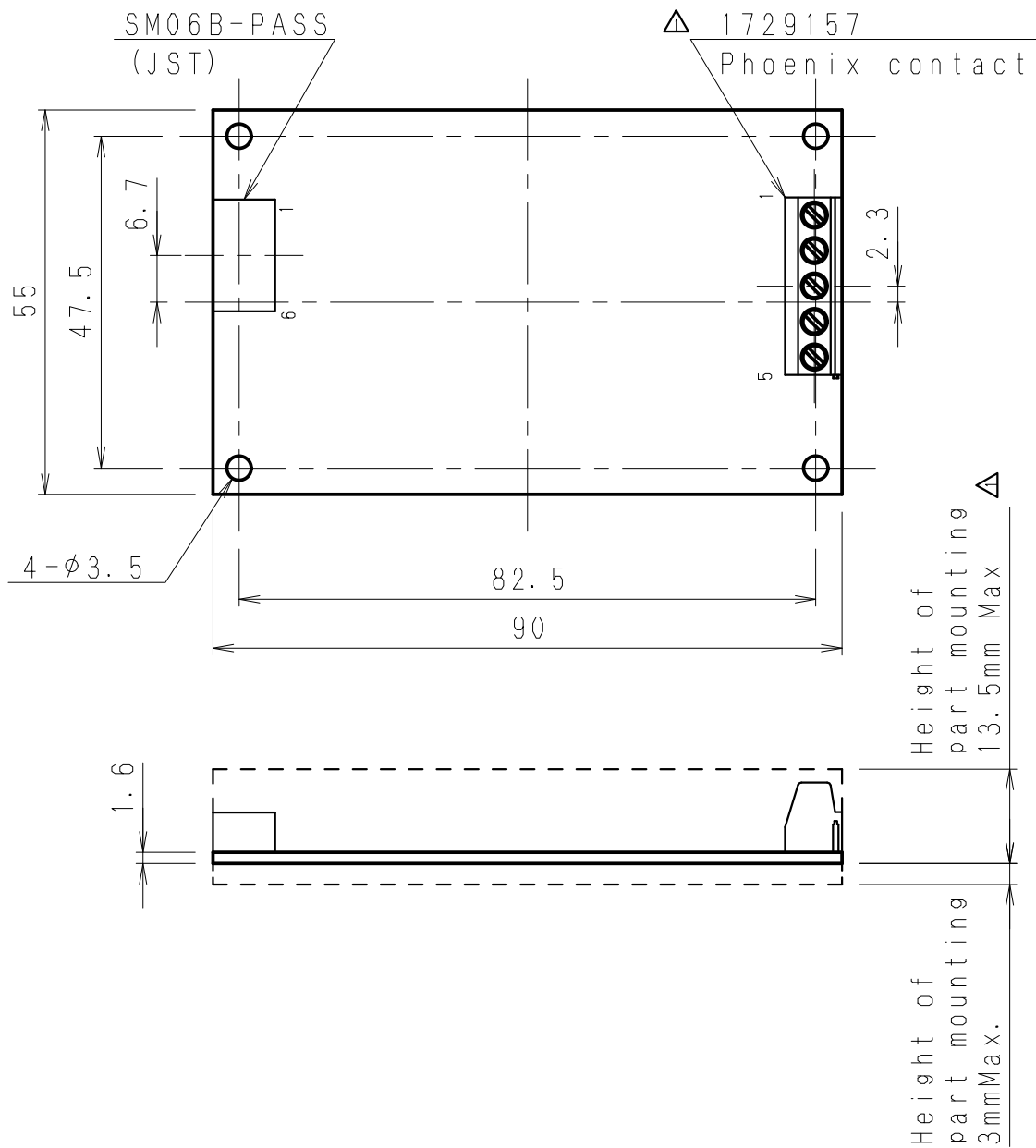
However, if NCEL agree with the customer the usage of the PRODUCT in such applications, NCEL will warrant the PRODUCT in the same scope described in "9. Warranty" in this specification.

10. 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 in well-ventilated environment.
- (18) The PRODUCT does not come with a cover. Make sure the surface of the PRODUCT is kept clean. Do not let conductive foreign substances get on the surface of the PRODUCT.
- (19) Do not bend or stress the PRODUCT.
- (20) Make sure other circuits or wirings do not effect the PRODUCT.
- (21) Reliability of the PRODUCT may decrease rapidly when operated continuously with high load, even if the load is within the specification. Please take this into consideration when designing the equipment which the PRODUCT will be installed.
- (22) IC and other parts of the PRODUCT may get hot due to the compact, dense design.
Do not touch the PRODUCT until it is cooled down.

Note

1. General tolerances. ± 0.5
2. About substrate details as follows.
Layers: 4 layers



ISSUED BY DESIGN GROUP 3
Previous Drawing: 6405-00164-91

(Dimensions: in mm)

					Tolerances	A	B	S	Material	
					0 - 30	± 0.1	± 0.2	\pm	Surface Treatment	
					30 - 120	± 0.15	± 0.3	\pm	Heat Treatment	
					120 - 315	± 0.2	± 0.5	\pm		
Δ	May. 8.'17	8SELB-0879	Dimension change by connector change	Y. A	315 - 1000	± 0.3	± 0.8	\pm		
Δ	May. 8.'17	8SELB-0879	Changing outline by connector change	Y. A	Angle Tolerances	\pm				
	Feb. 13.'17		First Print	Y. A	Finish	Date			Model	TF029B-1000-D
C.No.	Date	Ecn.No.	Revision	Name	Qty.	May. 9.'17				
Approved by	Checked by	Designed by	Third Angle Projection Method	Scale	1 : 1			Name	DRIVER OUTLINE	
N. Watanabe	S. Yanagi	Y. Akabane	NIDEC COPAL ELECTRONICS CORP.			Dwg. No.	6405-00164-01			