

## Operation Manual

Variable Speed AC Motor Drive

# DV700T SERIES

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### Important User Information

Because of the variety of uses for this equipment and because of the differences between this solid state equipment and electromechanical equipment, the user of and those responsible for applying this equipment must satisfy themselves that as to the acceptability of each application and use of the equipment.

IN NO EVENT will Panasonic be responsible or liable for indirect or consequential damages resulting from the use or the application of this equipment.

The illustration shown in this manual are intended to solely illustrate the text of this manual. Because of the many variables and requirements associated with any particular installation, Panasonic cannot assume responsibility or liability for actual use upon the illustrated uses and applications.

No patent liability is assumed by Panasonic with respect to use of information, circuits or equipment described in this text.



Shock Hazard labels may be located on or inside the equipment to alert people to hazard if service procedures are not followed properly.

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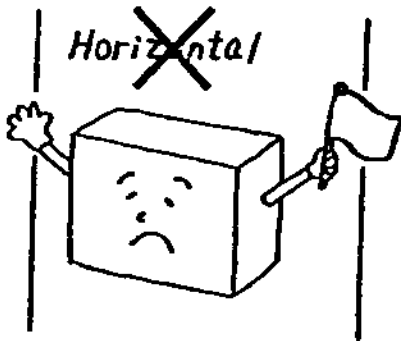
## Chapter 1-Pre-installation

### 1.0 Caution

- Please handle the Inverter carefully.
- Please do not apply a force to a terminal cover.

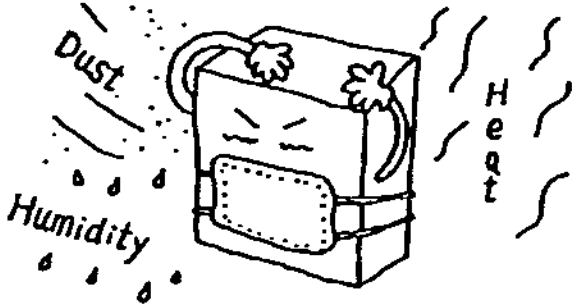
### 1.1 Installation

- Please install vertically and allow enough open space for a better ventilation.

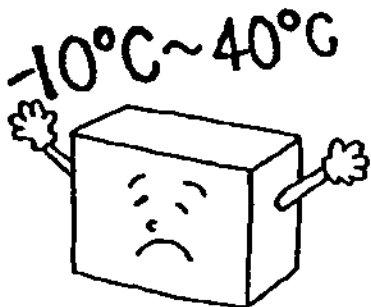


- Note) ◇ Please use a mounting plate of the Inverter base with bolt or screw.  
◇ Use M4 size(DV700T400), M5 size (DV700T750~2260) bolt or screw.  
◇ Please refer the mounting dimension to our drawing.  
◇ Please mount on an incombustible material(metal) for a better heat dissipation.

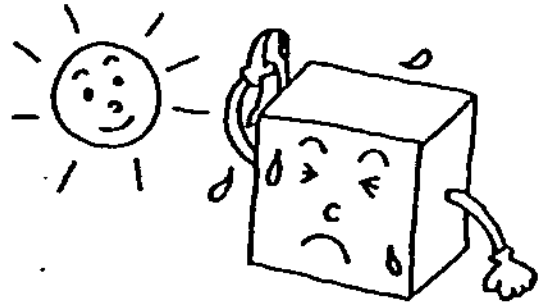
- Please avoid high temperature, humidity, or dusty place.



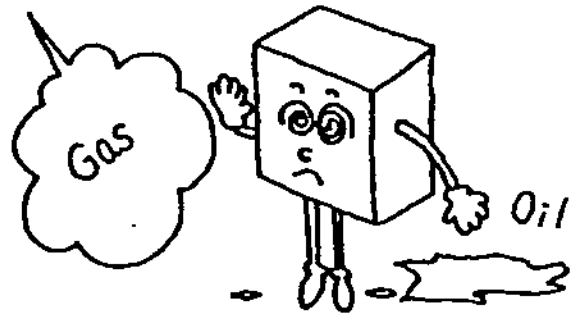
- Please make sure ambient temperature is within  $-10^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$ .



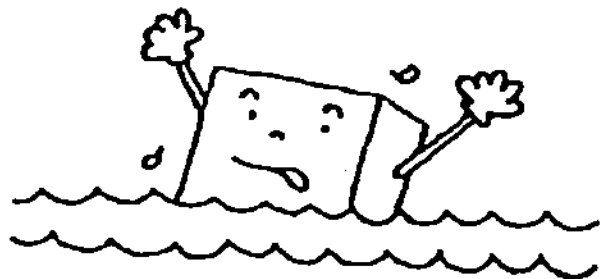
- Please avoid the direct sunlight.



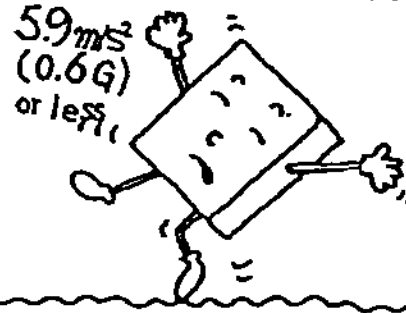
- Please do not subject the Inverter to corrosive gas or oil.



- This Inverter is not Water Proof. Please avoid using outdoors.



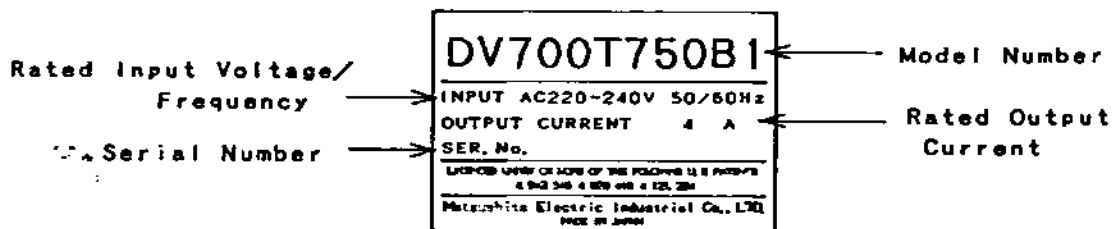
- Please install at a stable location, or avoid using the Inverter continuously in the place with the vibration near the resonance frequency.



Chapter 2-Name plate data

2.0 Name plate identification

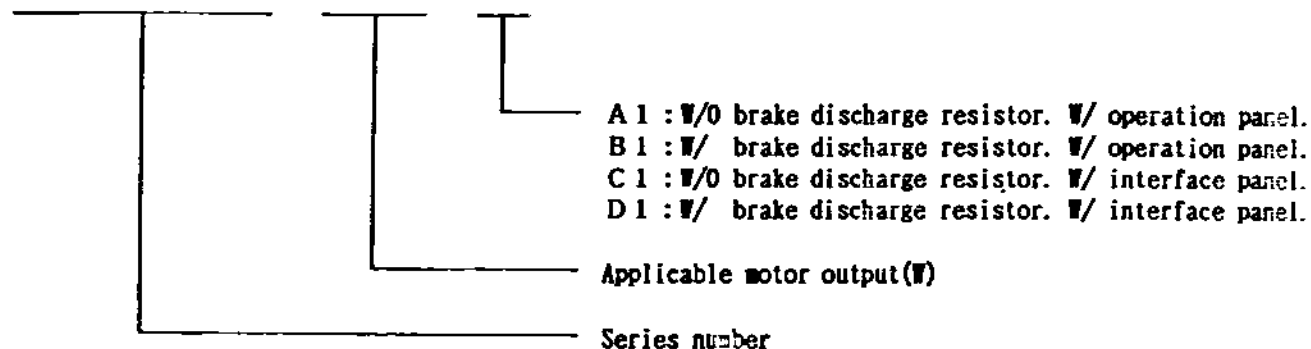
<e.g.> DV700T750B1 type



2.1 Model identification

<e.g.>

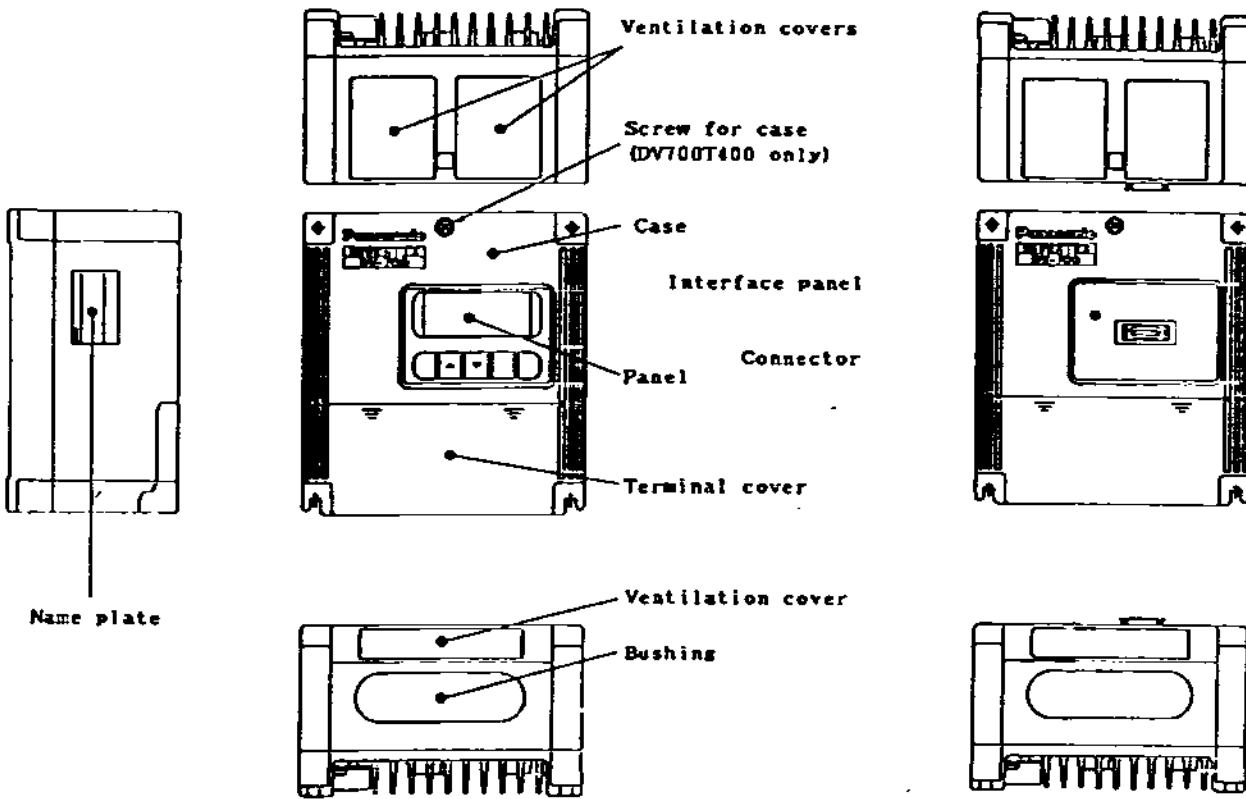
D V 7 0 0 T 7 5 0 B 1



**2.2 Construction**

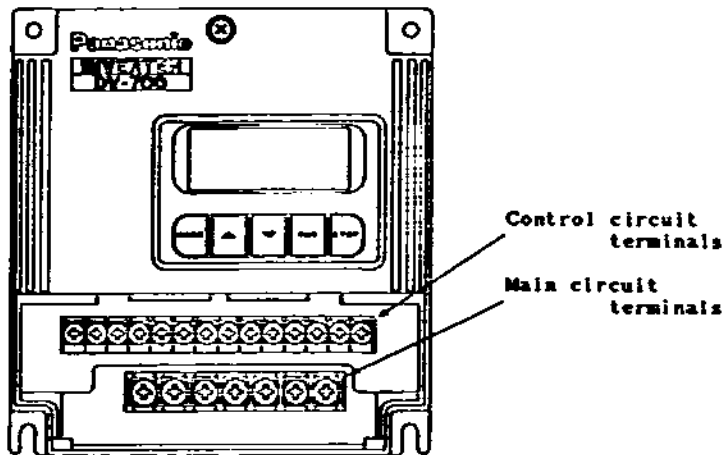
**■ A1, B1 type (w/ operation panel)**

**■ C1, D1 type (w/ interface panel)**



\* Ventilation covers are installed when shipping the Inverter.

<<when the terminal cover is taken out>>



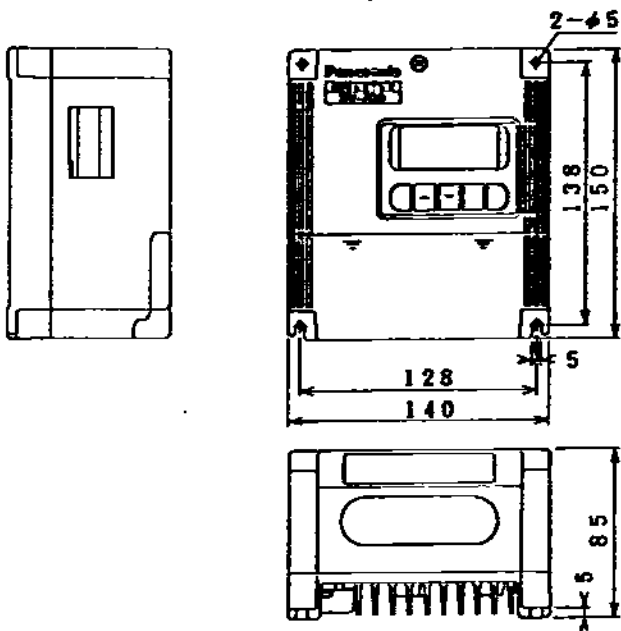
Chapter 3-Specification  
3.0 Standard specifications

Type designation*1		DV700T400 A1, B1, C1, D1	DV700T750 A1, B1, C1, D1	DV700T1500 A1, B1, C1, D1	DV700T2200 A1, B1, C1, D1	
Output ratings	Applied motor (kW)**	0.4	0.75	1.5	2.2	
	Output capacity (kVA)**	1.0	1.7	2.9	4.2	
	Rated output current (A)	2.5	4.0	7.0	10.0	
	Rated output voltage**	3 phase, AC 220~240V				
Power source	Voltage/Frequency	Single phase, AC 220~240V 50/60Hz				
	Allowable voltage range	± 10%				
	Allowable frequency range	± 5%				
Control spec.	Control system	Sine wave PWM (Constant carrier frequency)				
	Output frequency range	1.0~120Hz (Start/Stop from 1Hz) ± 0.5%				
	Frequency accuracy	± 0.5% (at 25°C ± 10°C)				
	Frequency resolution	<digital>:0.1Hz <analog>:Frequency range/1000Hz (Min.:0.06Hz)				
	Frequency command signal	DC 0~+5V, 0~+10V, 4~20mA				
	V/F pattern	Base frequency: 30~240Hz(1Hz step). Max.output volt.: 0~100% Torque boost, Squared reduced torque pattern, 2nd.V/F pattern				
	Overload current rating	150% for 1min.**				
	Regenerative brake torque	Type A1, C1	20%			
		Type B1, D1	250% or more	150% or more	150% or more	100% or more
	DC dynamic brake	Free setting of Starting frequency, Brake time, Brake torque				
	Acceleration/ deceleration time**	0~3600secs(0~10secs:0.1secs step, 10~3600secs:1sec. step) Time to change up to 50Hz. Up to 4th. accel./decel. time. Linear and 2-"S" shaped acceleration/deceleration.				
	Jogging frequency range	0~30Hz				
	Operation mode	2-speed mode, 4-speed mode, 8-speed mode, 16-speed mode				
	Others	Selectable retry function, Parameter lock				
Protective function	Undervoltage protection, Overvoltage protection, Overcurrent protection, Instantaneous power failure protection, Regenerative overvoltage stall prevention, Beatsink thermal protection** Auto restart prevention, Self-diagnosis trip (memorizes causes of last 5 trips)					
Ambient	Ambient temperature	-10°C~+40°C				
	Ambient humidity	Max.90%RH (non-condensing)				
	Atmosphere	Indoors (to be free from corrosive gas, dust)				
	Altitude	Up to 1000m without de-rating				
	Vibration	5.9m/s <sup>2</sup> (0.6G) or less (10~60Hz)				
Protective construction	Enclosed type**					
Cooling	self cooling	Fan cooling				
Mass (kg)	1.4	2.3	3.6	3.6		

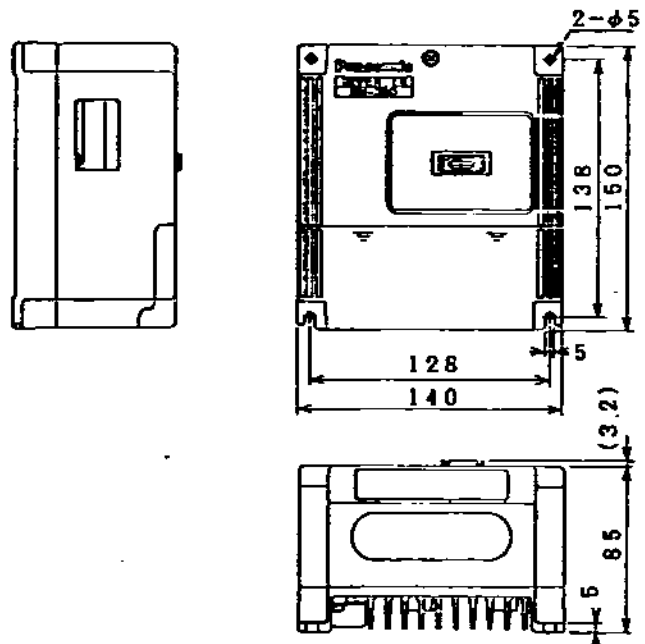
- \*1) Please refer to Chapter [2.0 Name plate identification] for distinction.  
\*2) Please select the proper motor which does not exceed the rating of the Inverter.  
\*3) Output capacity is a value at 240V of the rated output voltage.  
\*4) Please note that the output voltage of the Inverter will not exceed the power source voltage.  
\*5) In the case of 0(zero)sec. setting, actual acceleration/deceleration time will be 0.05sec.  
\*6) DV700T1500, DV700T2200 only.  
\*7) Except the connector of the interface panel.  
\*8) Please note that DV700T Inverter will not trip after 1min., beyond which we cannot guarantee the integrity of the motor or the Inverter without a thermal protection device.  
(Not are protective function.) Please see for Page 6.

3.1 Dimensions (in mm)

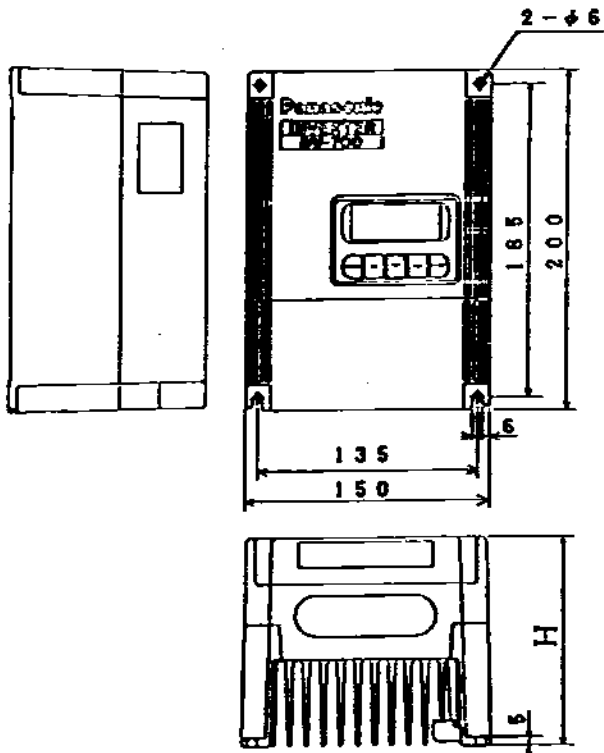
●DV700T400A1, B1



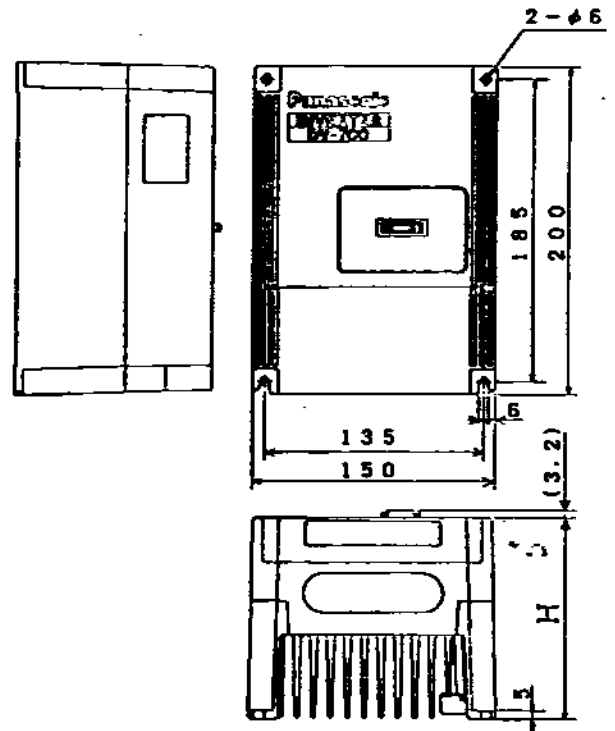
●DV700T400C1, D1



●DV700T750A1, B1  
●DV700T1500A1, B1  
●DV700T2200A1, B1



●DV700T750C1, D1  
●DV700T1500C1, D1  
●DV700T2200C1, D1



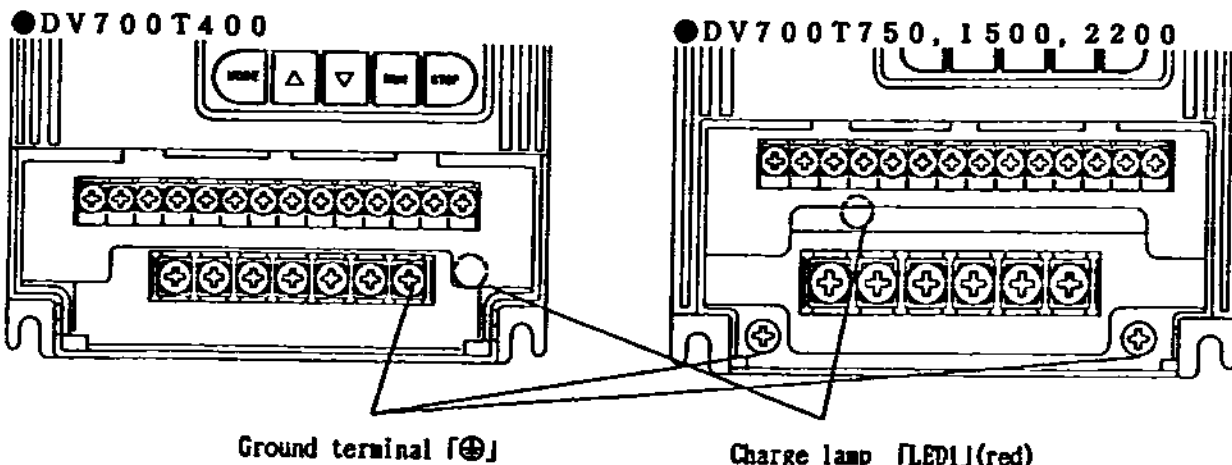
Model Number	H
DV700T750A1, B1, C1, D1	120
DV700T1500A1, B1, C1, D1	165
DV700T2200A1, B1, C1, D1	165

## Chapter 4-Installation

### 4.0 Safety caution

- Please get "Power off" absolutely when connecting and disconnecting the wire to the terminal of the main circuit, the earth and the control circuit.
- Please do not touch the PCB portion since a high voltage runs.
- Power portion of the terminals is covered by a detachable plastic cover. Please put on the plastic cover after connecting the wires.
- Please ground the terminal [⊕] of the Inverter and the motor.  
(Recommended grounding is 100Ω or less, φ1.6mm or larger)
- Circuit portion will hold a charge for approx. 20secs after the power is turned off. Whenever you test or check the circuit, please turn off the power and make sure that the charge lamp [LED1](red) on PCB is off.
- Please note that you cannot turn off the power even if you stop the Inverter through the operation by [STOP] switch or the switch connected to the terminals board.
- Please turn off the power if the Inverter is not in use for long periods.
- When you operate the Inverter at the output frequency of more than 60Hz, please take enough care about the safety of the motor load.
- Please install the Inverter onto an incombustible material such as metal, since temperature of the chassis will increase.
- You must connect per Chapter [4.4 Standard wiring diagram] and use Non-Fuse Breaker and Thermal Relay which matches to the motor rating.
- Please prevent any dust or metal particle from entering the Inverter.
- If you select [Retry], please note the Inverter will resume the operation after preset time even if the Inverter trips.
- When the motor is driven by the Inverter, RFI noise is generated from I/O power line of the Inverter or the motor, which may affect the other electrical apparatus. In the case, install the filter between the input/output of the Inverter, or put the wiring into the grounding duct to suppress the noise to some extent.
- Depending on the combination of the motor and Inverter, the current to the motor might cause the unusual vibration to cause large vibration or noise from the motor. This vibration or noise may be reduced by adjusting the V/F pattern or the load.

We make every effort to ensure the quality of this product, but unanticipated external noises, static electricity, and improperly wired terminals might cause problems not related to our product's design. Please use your machine safely, carefully and correctly.





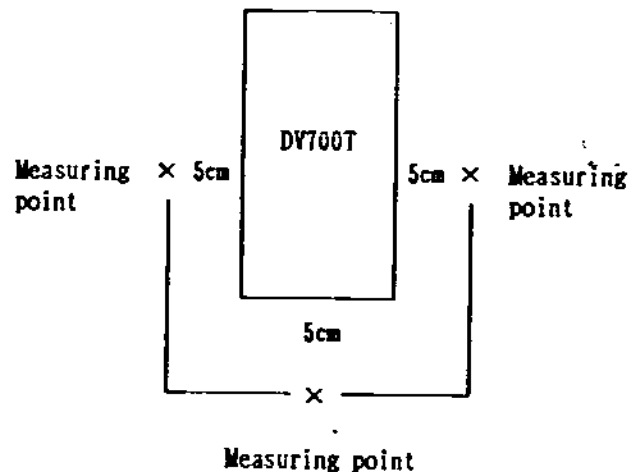
#### 4.1 Proper use of the Inverter

Misuse of the Inverter leads to a wrong operation or sometimes results in damage to the Inverter. Please read the following for proper use of the Inverter.

- Please do not input higher voltage than rating to the line terminals(L1,N). Please do not connect the line to other than [L1] and [N] terminals. (refer to Chapter [3.0 Standard specifications])
- Please use the power supply of capacity from 150% of the capacity of the Inverter to 500kVA. When the power supply of capacity which exceeds 500kVA is used and the Phase-advance capacitor of the power supply is switched, please set up the suitable power factor correction Reactor for the capacity of the Inverter on the line side of the Inverter.
- Higher ambient temperature may influence the life of the Inverter. Please try to use at lower temperature as much as possible.
- Please do not install Electromagnetic Contactor between the motor and the Inverter in order start/stop the motor. Please start/stop the motor with [RUN]/[STOP] switches on the operation panel or with input terminals of the Inverter ([I1], [I2]).
- Please do not connect Phase-advance capacitor to output side of the Inverter.
- When you perform [Megger test], please follow procedure as described in Chapter [7.2 Megger test].
- Please avoid an overload operation which exceeds the capacity of the Inverter.
- Please ensure the sensitivity current is 30mA or more on the line side of the Inverter if you use an Earth Leakage Circuit Breaker.
- Leakage current will be increased when the motor is driven by the Inverter, and may activate Earth Leakage Circuit Breaker unnecessary. Use the breaker for high frequency at own or other control system.
- Continuous permissible working range of the motor varies depending on the type of the motor, as well as running frequency. Consult with the motor manufacture regarding the continuous permissible working range.
- When you operate more than one motor by using an Inverter, please do not choose the Inverter on the basis of total motor output, but rather on a sum of rated motor currents less than the rated current of the Inverter.

#### Note

- Ambient temperature may affect the life of the Inverter. Please make sure that the ambient temperature will not exceed permissible temperature.
- Make sure that temperature at marked place will not exceed permissible temperature.



( Permissible temperature )

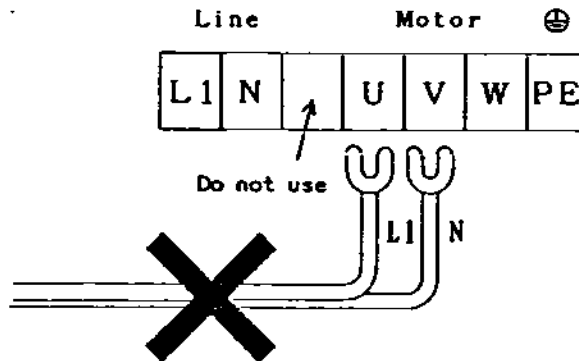
● -10°C ~ +40°C : with ventilation covers & bushing (Factory setting)

## 4.2 Wiring

### 4.2-1 Caution on wiring

#### Main Circuit

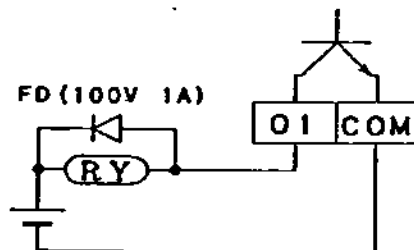
- Please do not make reverse connection between line terminals(L1,N) and motor output terminals(U,V,W).



- Please do not ground the motor output terminals(U, V, W).
- Please do not short circuit each of the motor output terminals.
- Please use NFB(Non-Fuse Breaker) and TH-RY(Thermal Relay) per [4.4 Standard wiring diagram]. Please select a rating of NFB and TH-RY which conforms to the motor rating.
- Please use the ground terminal [⊕] for the Inverter with 100Ω or less. (Recommended grounding is  $\phi 1.6\text{mm}$  or larger)
- Please remove any existing Phase-advance capacitor.
- Please use a pre-insulated, solderless, crimp-on terminal when you connect to the main circuit terminals(L1, N, U, V, W).

#### Control Circuit

- Please do not apply more than DC 24V, 50mA to the output signal terminals([O1],[COM]) or do not apply the reversed polarity voltage.
- Please do not apply the voltage to the input terminals ([I1]~[I6]) except a frequency setting input terminal [FIN].
- Please do not short the frequency setting power terminal([FY]) and the control ground terminals([G]).
- Please install FD (Flywheel Diode), when you directly drive a relay from the output terminals([O1],[COM]).



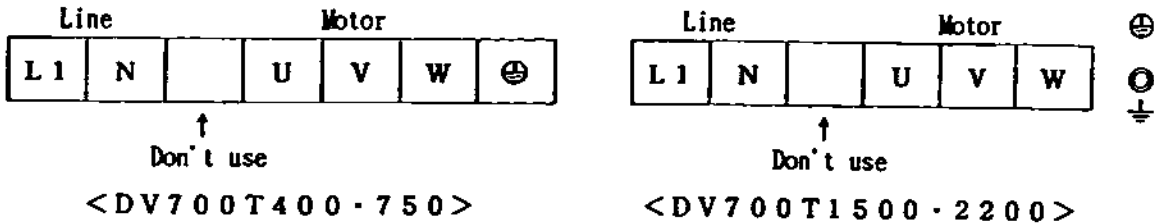
- Please use a twisted wire or shielded wire when you connect to the control circuit.
- Please ground the shield drain wire per [4.4 Standard wiring diagram].
- Please separate the connecting wire to the control circuit from the power line.

### 4.3 Terminal functions

#### <Control circuit>

O1	COM	O2	5V	FIN	G	FOUT	I1	I2	I3	I4	I5	I6	G
----	-----	----	----	-----	---	------	----	----	----	----	----	----	---

#### <Main circuit>



- ◆ Input terminals from [I1] to [I6] are pulled up from +5V by 4.7kΩ. You can control with a contact or an open collector output.
- ◆ Please do not touch the control circuit terminals while the power is on. This may cause malfunction due to static electricity.

#### Input/output terminal function

Symbol/terminal title	Description																	
L1, N /Line input terminals	Connect to the power source of AC 220~240V, 50/60Hz.																	
U, V, W /Motor output terminals	Connect to the 3-phase induction motor.																	
⊕ /Ground terminal	Frame ground: Please ground w/o fail (100Ω or less, φ1.6mm or larger).																	
5V /Freq. setting source	DC +5V is applied.																	
FIN /Analog frequency setting input	You can make a frequency setting with the input of DC 0~5V (or DC 0~10V, 4~20mA) between [FIN] and [G]. This is valid when [17] Frequency command selection is set to <span style="border: 1px solid black; padding: 2px;">0-5</span> or <span style="border: 1px solid black; padding: 2px;">0-10</span> . <span style="border: 1px solid black; padding: 2px;">4-20</span> . Input impedance: 50~70kΩ for 0~5V <sub>DC</sub> & 0~10V <sub>DC</sub> , 400~600Ω for 4~20mA																	
G /Control signal ground	Common for the control signal.																	
FOUT /Frequency meter output	Outputs the voltage in proportion to the output frequency between [FOUT] and [G]. Connect the frequency meter of full scale with 100μA. You can output the pulse which synchronizes with the output frequency by changing [54] FOUT selection]. Output impedance : 390kΩ																	
I1 /Forward run command I2 /Reverse run command	<ul style="list-style-type: none"> <li>● [I1] - [G]/short : Forward run, [I1] - [G]/open : Stop</li> <li>● [I2] - [G]/short : Reverse run, [I2] - [G]/open : Stop</li> </ul> You can make [I1] as run/stop and [I2] as forward/reverse command by changing [45] I1-I2 function selection].																	
I3, I4 /Selectable function(1) - Jogging command - Freq. setting select I5, I6 /Selectable function(2) - Free-run command - 2nd. accel./decel. time - Outer trip - Freq. setting select	You can select following functions per [5.7 Operation mode] <table border="1" style="margin-left: 20px; width: 100%;"> <thead> <tr> <th>Operation mode</th> <th>I3</th> <th>I4</th> <th>I5</th> <th>I6</th> </tr> </thead> <tbody> <tr> <td>2-speed mode</td> <td>Fwd. jogging</td> <td>Rev. jogging</td> <td colspan="2" rowspan="3" style="text-align: center; vertical-align: middle;">           - Free-run command            - Outer trip command            - 2nd. accel./decel. time         </td> </tr> <tr> <td>4-speed mode</td> <td colspan="2" rowspan="2" style="text-align: center; vertical-align: middle;">           Frequency setting selection         </td> </tr> <tr> <td>8-speed mode</td> </tr> <tr> <td>16-speed mode</td> <td colspan="2"></td> </tr> </tbody> </table>	Operation mode	I3	I4	I5	I6	2-speed mode	Fwd. jogging	Rev. jogging	- Free-run command - Outer trip command - 2nd. accel./decel. time		4-speed mode	Frequency setting selection		8-speed mode	16-speed mode		
Operation mode	I3	I4	I5	I6														
2-speed mode	Fwd. jogging	Rev. jogging	- Free-run command - Outer trip command - 2nd. accel./decel. time															
4-speed mode	Frequency setting selection																	
8-speed mode																		
16-speed mode																		
G /Control signal ground	Common for the control signal.																	
O1 (Collector) COM (Emitter) /Output signal	Open collector output terminal (does not hold when the power is off.) You can select the function through [5] Output signal selection]. Factory setting is trip signal. I <sub>c</sub> max. = 50mA, V <sub>ce</sub> max. = DC 24V																	
O2	Reserved. Do not use.																	

Note:

\*1) The priority of the terminal function is given as follows:

DC brake < Normal operation < Jogging operation < Free-run stop < Trip

- (e.g.) ① When you give the run command during DC brake mode, the Inverter starts running.  
 ② When you give the free-run stop command during jogging, the Inverter starts free-run stop.  
 ③ The Inverter will not follow the normal run command even if you give the free-run stop.

If you give the contradicting command (e.g. Both forward and reverse run command), the Inverter sees it as the stop command.

\*2) When you enter both forward run and reverse run during the trip, you can release the trip. Please release the trip only after the cause of the trip is remedied. Refer to Chapter [8.1 Protective functions(How to release the trip)].

(How to select a frequency at Multi-speed operation)

- ① When you select **1b 1f** (1 bit) at [45 Multi-speed input selection].  
 Select one frequency corresponding to each terminal. You can select up to 3 speeds at 4-speed mode, 4 speeds at 8-speed mode and 5 speeds at 16-speed mode.  
 (e.g.) 16-speed mode

I 3	I 4	I 5	I 6	Freq. setting
open	open	open	open	0-speed freq.
short	x	x	x	1st. speed freq.
open	short	x	x	2nd. speed freq.
open	open	short	x	3rd. speed freq.
open	open	open	short	4th. speed freq.

- open/short represents the relation between [G] terminal  
 - x means don't care

- ② When you select **b 1n** (Binary) at [45 Multi-speed input selection].

Select one frequency interpreting [Frequency setting selection terminal] with binary method.

< 4-speed mode >

I 3	I 4	Freq. setting
open	open	0-speed freq.
short	open	1st. speed freq.
open	short	2nd. speed freq.
short	short	3rd. speed freq.

< 16-speed mode >

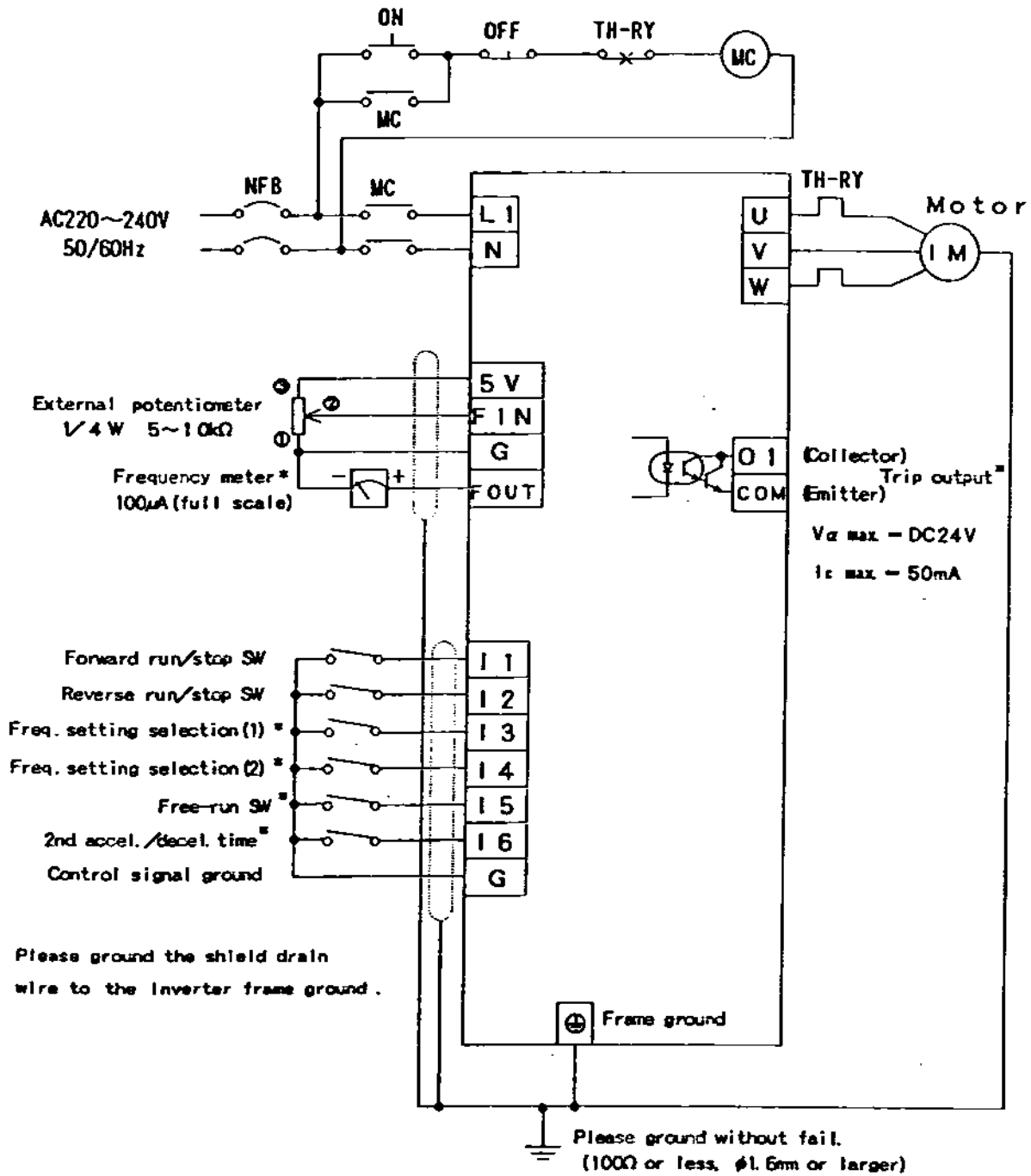
I 3	I 4	I 5	I 6	Freq. setting
open	open	open	open	0-speed freq.
short	open	open	open	1st. speed freq.
open	short	open	open	2nd. speed freq.
short	short	open	open	3rd. speed freq.
open	open	short	open	4th. speed freq.
short	open	short	open	5th. speed freq.
open	short	short	open	6th. speed freq.
short	short	short	open	7th. speed freq.
open	open	open	short	8th. speed freq.
short	open	open	short	9th. speed freq.
open	short	open	short	10th. speed freq.
short	short	open	short	11th. speed freq.
open	open	short	short	12th. speed freq.
short	open	short	short	13th. speed freq.
open	short	short	short	14th. speed freq.
short	short	short	short	15th. speed freq.

< 8-speed mode >

I 3	I 4	I 5	Freq. Setting
open	open	open	0-speed freq.
short	open	open	1st. speed freq.
open	short	open	2nd. speed freq.
short	short	open	3rd. speed freq.
open	open	short	4th. speed freq.
short	open	short	5th. speed freq.
open	short	short	6th. speed freq.
short	short	short	7th. speed freq.

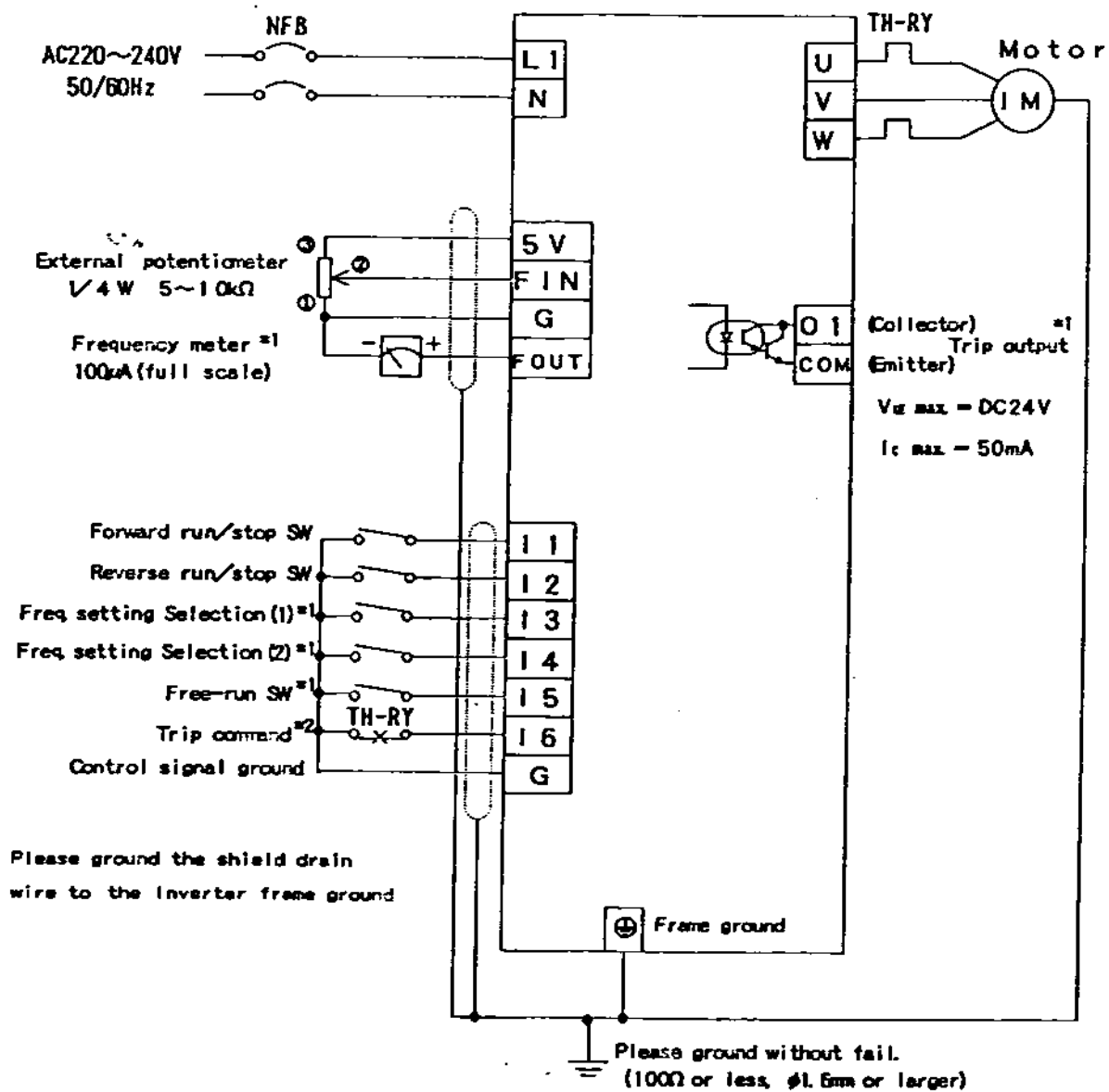
#### 4.4 Standard wiring diagram

<< At factory setting >>



\* Factory setting

<< When only the output of the Inverter is shut off by Thermal Relay >>



#1 Factory setting

#2 Set [48: I6 function selection] to

THr

## Chapter 5-Operation

### 5.0 Prior to operation

After you install and finish wiring, please check the following points before the operation.

- (1) Right wiring ? (Especially line input terminals [L1] and [N], and output terminals, [U],[V] and [W])
- (2) Right input ? (Single phase, 220~240V, 50/60Hz)
- (3) Any short circuit ?
- (4) Any loose screw or termination ?
- (5) Any short circuit or grounding at load ?

### 5.1 How to operate

You can enter the frequency command and the run command by the following 6 ways through the operation panel or the terminal board:

	Frequency command		Run command		Note
	panel	board[FIN]	panel	board	
1	○		○ *1	○ *1	[Factory setting]
2		○	○ *1	○ *1	Change parameter, [15] Run command selection] or [27] Frequency command selection] (Please refer to Chapter [6.1 Parameter functions])
3	○		○		
4		○	○		
5	○			○	
6		○		○	

- \*1) The command through the terminal board is given a priority when the command is entered through both the panel and the terminal board. [RUN] switch is valid only when both [11], forward run switch and [12], reverse run switch is [OFF]. If either or both of [11] or/and [12] of the terminal board is turned on, the command through the run switch of the panel will be cancelled.

☆ You can operate following additional functions through [13]~[16]:

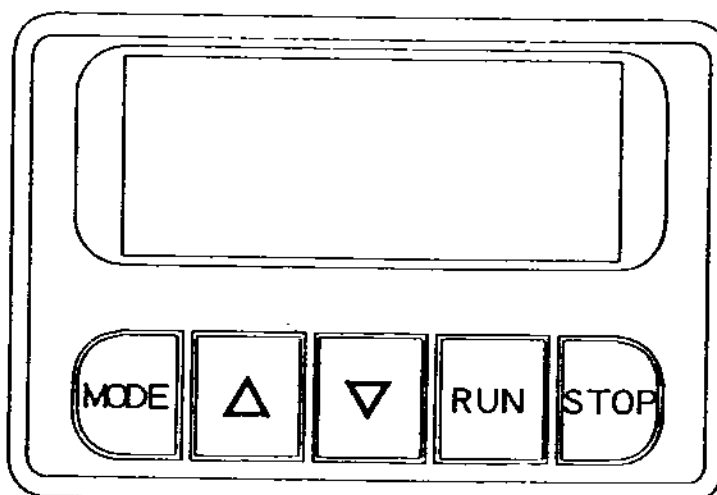
- Multi-speed operation up to 16 speeds
- Forward/reverse jogging
- Free-run command
- Acceleration/deceleration time selection up to 4
- Trip command

## 5.2 Operation panel

### (1) Outline of the function

You can operate Forward Run/Stop, Change/Confirmation of parameter, display of the Inverter condition (output frequency, preset frequency, malfunction etc.) and release of trip.

### (2) Configuration of the operation panel



[ 0000 ]	Displays an output frequency, preset frequency, value multiplied by the magnification, factor of the malfunction, parameter number and parameter value.						
[ MODE ]	<p>Used to select a monitor mode, parameter number mode, parameter value mode.</p> <p>● Outline of each mode</p> <table border="1"> <tr> <td style="text-align: center;">Monitor mode</td> <td>Displays either an output frequency or preset frequency. You can select by a parameter [50: Monitor mode selection]. This mode appears when the power is turned on.</td> </tr> <tr> <td style="text-align: center;">Parameter number mode</td> <td>Displays a parameter number(00~99) on first 2-digit of LED. (e.g. [ 00 ]) You can select a parameter you want to confirm/change with <math>\Delta</math> <math>\nabla</math> SW.*1 If you do not touch [MODE] <math>\Delta</math> <math>\nabla</math> for more than 3secs, a mode will return to monitor mode. If you push [MODE] SW again, previous parameter number will be displayed.</td> </tr> <tr> <td style="text-align: center;">Parameter value mode</td> <td>Displays parameter contents(preset value) with flashing. Change with <math>\Delta</math> <math>\nabla</math> SW.</td> </tr> </table>	Monitor mode	Displays either an output frequency or preset frequency. You can select by a parameter [50: Monitor mode selection]. This mode appears when the power is turned on.	Parameter number mode	Displays a parameter number(00~99) on first 2-digit of LED. (e.g. [ 00 ]) You can select a parameter you want to confirm/change with $\Delta$ $\nabla$ SW.*1 If you do not touch [MODE] $\Delta$ $\nabla$ for more than 3secs, a mode will return to monitor mode. If you push [MODE] SW again, previous parameter number will be displayed.	Parameter value mode	Displays parameter contents(preset value) with flashing. Change with $\Delta$ $\nabla$ SW.
Monitor mode	Displays either an output frequency or preset frequency. You can select by a parameter [50: Monitor mode selection]. This mode appears when the power is turned on.						
Parameter number mode	Displays a parameter number(00~99) on first 2-digit of LED. (e.g. [ 00 ]) You can select a parameter you want to confirm/change with $\Delta$ $\nabla$ SW.*1 If you do not touch [MODE] $\Delta$ $\nabla$ for more than 3secs, a mode will return to monitor mode. If you push [MODE] SW again, previous parameter number will be displayed.						
Parameter value mode	Displays parameter contents(preset value) with flashing. Change with $\Delta$ $\nabla$ SW.						
$\Delta$ $\nabla$	Used to select the parameter, set/change parameter content. Varies by push and hold. At monitor mode, content of [00: Preset frequency (0-speed)] will be displayed by push and hold $\Delta$ or $\nabla$ switch. If you do not operate $\Delta$ or $\nabla$ for more than 3 secs, changed content will be stored.						
[ RUN ]	Used to run the Inverter.						
[ STOP ]	Used to stop the Inverter.						

\*1) Displays the parameter in order per Chapter [6.0 Parameter list] as a factory setting.



### 5.3 Trial operation

(1) For safety purpose, please proceed as follows;

- ① Make the motor operate alone.
- ② Turn all input to the terminal board to [OFF] (open).
- ③ Turn the external potentiometer to the minimum.

(2) Then turn on the power (turn on the NFB [Non-Fuse Breaker] and the MC [Magnetic Contactor] at input side of the Inverter) and check the following:

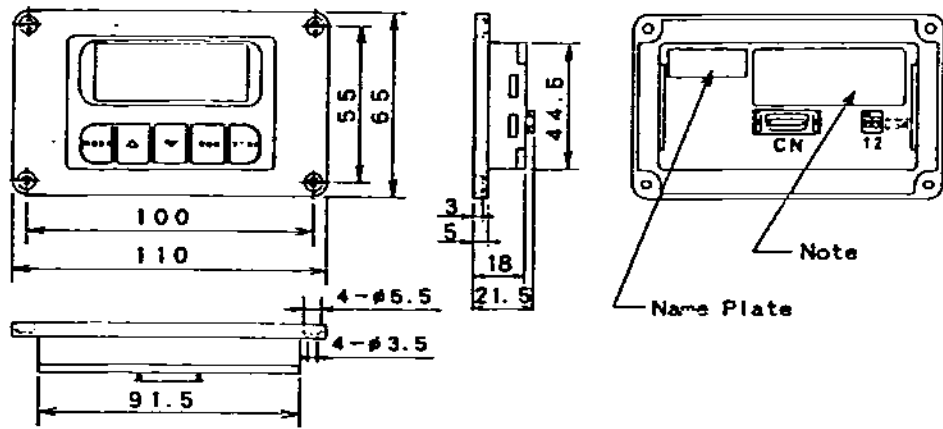
Operation	Operation panel		Note
	SW	4-digit LED	
① Power on			- Monitor mode on turning the power on. (displays the output frequency)
② Set the frequency	- Push  ,		- Displays 0-speed frequency. (Factory setting is 0.0Hz) (returns to the monitor mode if you do not operate SW for more than 3secs. In this case, push  ,  )
	- Set the frequency with  ,		- Set 0-speed to 60.0Hz
③ Return to monitor mode			- Returns to the monitor mode if you do not operate SW for more than 3secs.
④ Run command	- Push		- Varies gradually.
⑤ Stop command	- Push		- Varies gradually.

#### ( Check point at trial operation )

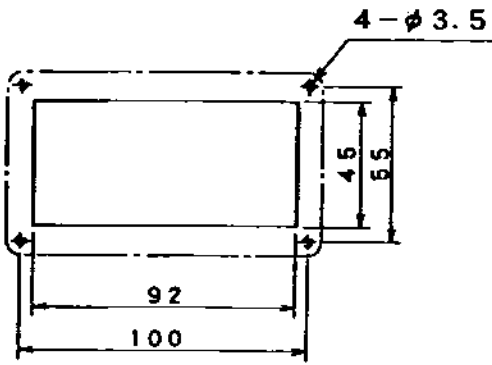
- ① Does the motor run smoothly? Any abnormal noise or vibration?
- ② Is acceleration/deceleration smooth?
- ③ Is rotational direction of the motor correct?

☆ If the Inverter trips or shows any malfunction, please refer to Chapter [8 Troubleshooting]. When the Inverter trips, cause of the trip will be indicated on 4-digit LED of the panel, and the motor becomes [Free-run]. Please refer to Chapter [5.8 Monitoring] for display.

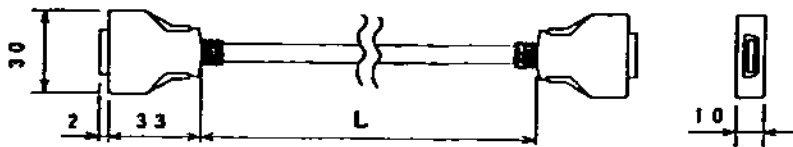
5.4 Remote operation panel(DVOP037)



<<Mounting Dimensions>>



(1) Cable for the remote operation panel(DVOP038- $\odot\odot$ )



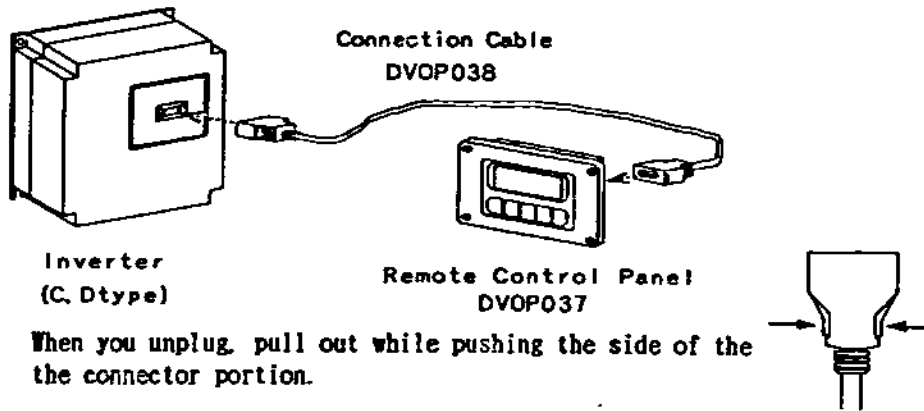
Option model	L (m)
DVOP038-15	1.5
DVOP038-30	3

Notes on safety

- Please turn off the power to the Inverter when you plug-in/unplug the connector or operate with the dip switch in order to avoid any possible malfunction.
- Please do not touch the pin portion of the connector [CN] to avoid mis-contact malfunction.
- Please do not subject the connector to corrosive gas, dust during the storage in order to keep the contact reliability of the connector.

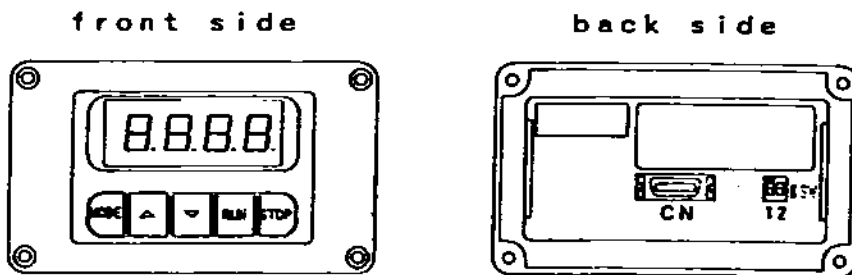
(2) Connection

Plug the one side of the connecting cable(option) into the connector of the Inverter and the other end into the connector of the remote control panel.



Please turn off the power to the Inverter when you plug-in or unplug.

(3) Composition



Front side consists of 4-digit LED **8888**, **MODE** switch, setting switches **△** **▽**, run switch **RUN** and stop switch **STOP**. You can run/stop, confirm/change the parameters, Displays the Inverter's condition (output frequency, preset frequency and malfunction) and release the trip. (Please refer Chapter [5.2 Operation panel])  
Back side consists of the connector [CN] and dip switch [DSW] with which you can prohibit the functions of the switches on the front side. Please follow the below when you want to prohibit the functions of the switches on the front side.

Dip switch	Title	Function	Factory setting
DSW-1	Parameter change prohibition switch	<b>MODE</b> and <b>△</b> <b>▽</b> switch becomes void with this switch.	[ON]
DSW-2	Run/stop command prohibition switch	Run/stop switches becomes void with this switch [OFF].	[ON]

## 5.5 Parameter selection

### (1) Outline of the parameter

DV700T Series have various parameters with which you can operate many functions. You can select the parameters through the operation panel.

DV700T Series have 79 parameters but limit the number of selectable parameters and also have so called [Page 1(one)] function with which you can change the order of necessary parameters.

At a factory setting, the number of selectable parameters is limited to 15.

Please see the below how to change the number of parameters and change the order:

#### ■ How to change the number of selectable parameters.

<e.g.> Change [Number of selectable parameters] from 15 to 79.

Operation	SW	4-digit LED	Note
① Power on			Monitor mode
② Call for [Number of selectable parameters]	Push (MODE).		Displays the parameter number. (returns to monitor mode if you do not operate SW for more than 3secs. In this case, please push (MODE) again.)
	Push (▽).		
	Push (▽) again, and hold for about 10secs.		
③ Change the parameter	Set 79 with (△) (▽)		Set [Number of selectable parameters] to 79.
④ Returns to monitor mode	Push (MODE).		Displays the parameter number. Returns to monitor mode in 3secs.

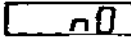

#### ■ How to change the order of the parameters.


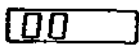
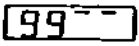

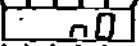
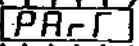
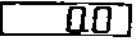
<e.g.> Change [2nd. parameter] from [0] [1st. speed frequency] to [2] [Acceleration time].

Operation	SW	4-digit LED	Note	
① Power on			Monitor mode	
② Call for [99] [Parameter extract]	Push (MODE).		Displays the parameter number. (returns to monitor mode if you do not operate SW for more than 3secs. In this case, please push (MODE) again.)	
	Push and hold (△).			Last parameter is always 99. ( -- means the last.)
	Release (△).			-- disappears.
③ Change the parameter*1	Push (MODE).		Order of display(1st.)	
	Push (△).		Order of display(2nd.)	
	Push (MODE).		Factory setting is [0] [1st. speed frequency] Set 2nd. parameter to [2] [Acceleration time]	
	Set 21 with (△) (▽)			
④ Returns to monitor mode	Push (MODE).		Displays the parameter number. Return to monitor mode in 3secs.	

\*1) When you repeat changing the order of parameters, repeat ③ and ④ procedure.

■ How to lock the parameter.

< e. g. > Change [Parameter lock] from  (no lock) to  ([Page 1] lock).

Operation	SW	4-digit LED	Note
① Power on			Monitor mode
② Choose the number of selectable parameters	Refer the previous section for [Number of selectable parameters] and [How to change the order of parameters].		
③ Call for [Parameter lock]	Push (MODE) .		Displays the parameter number. (returns to monitor mode if you do not operate SW for more than 3secs. In this case, please push (MODE) again.) -- will be displayed. -- will be disappeared. Factory setting is [no lock].
	Push and hold (Δ) . Release (Δ) once.	 	
	Push (Δ) again, and hold for about 10secs.		
④ Change the parameter	Set with (Δ) (▽) .		Set [Parameter lock] to [Page 1] lock.
⑤ Returns to monitor mode	Push (MODE) .		Returns to monitor mode. (Parameter lock becomes valid, and you cannot call for [Number of selectable parameter], [99: Parameter extract], [Parameter lock].)

**(2) Parameter selecting examples**

■ How to set acceleration time.

(e.g.) Set [2] [Acceleration time] to 1.0sec.

Operation	SW	4-digit LED	Note
① Power on		00	Monitor Mode
② Call for [2] [Acceleration time]	Push <b>MODE</b> .	00	Displays the parameter number. (returns to monitor mode if you do not operate SW for more than 3secs. In this case, please push <b>MODE</b> again.)
	Set 21 with <b>Δ</b> .	21	[2] Acceleration time]
③ Set to 1.0sec.	Push <b>MODE</b> .	50	Factory setting is 5secs.
	Set 1 with <b>▽</b> .	10	Set [Acceleration time] to 1.0sec.
④ Returns to monitor mode	Push <b>MODE</b> .	21	Displays the parameter number.
		00	Returns to monitor mode in 3secs.

■ How to set a frequency with an external potentiometer.

(e.g.) Set [17] [Frequency command selection] to 0-5.

Operation	SW	4-digit LED	Note
① Power on		00	Monitor mode
② Call for [17] [Freq. command selection]	Push <b>MODE</b> .	00	Displays the parameter number. (returns to monitor mode if you do not operate SW for more than 3secs. In this case, please push <b>MODE</b> again.)
	Set 17 with <b>Δ</b> .	17	[17] Frequency command selection]
③ Set to [0~5V]	Push <b>MODE</b> .	PnL	Factory setting is operation panel
	Push <b>Δ</b> .	0-5	Set [Frequency command selection] to [0~5V].
	Push <b>MODE</b> .	17	Displays the parameter number.
	Memorize.**	CRU (trip)	Trips for safety.
④ Release the trip**	Push both <b>Δ</b> & <b>▽</b>	00	Monitor mode

\*1) Changed parameter will be stored by pushing **Δ** or **▽** to move the parameter number or by returning to a monitor mode without touching SW for about 3secs.

\*2) You cannot release the trip with **Δ** & **▽** if you push **MODE** before the trip release (this leads to show the trip factor). In this case, please release the trip by returning to a present trip factor mode. (refer to Chapter [5.8 Monitoring])

- How to set upper limit frequency.  
 (e.g.) Set [75: Upper limit frequency] to 120Hz.

Operation	SW	4-digit LED	Note
① Preparation *1			Make [75: Upper limit frequency] selectable.
② Call for [75: Upper limit frequency]	Push <b>MODE</b> .	<b>00</b>	Displays the parameter number. (returns to monitor mode if you do not operate SW for more than 3secs. In this case, please push <b>MODE</b> again.)
	Set 75 with <b>Δ</b>	<b>75</b>	[75: Upper limit frequency]
③ Set to 120Hz	Push <b>MODE</b> .	<b>600</b>	Factory setting is 60Hz.
	Push and hold <b>Δ</b> .	<b>1200</b>	Set [Upper limit freq.] to 120Hz.
④ Returns to monitor mode	Push <b>MODE</b> .	<b>75</b>	Displays the parameter number.
		<b>00</b>	Returns to monitor mode in 3secs.

- \*1) Change [Number of selectable parameter] from 15 (Factory setting) to 79 (All parameter) with how to change the number of selectable parameters.

**Note:**

- You cannot change the parameter while Warning/Malfunction is displayed.
- You can store the changed content of the parameter by shifting the parameter number or returning to a monitor mode without touching SW after you change the parameter value.  
 If the power is turned off while changing the parameter, last instruction will be stored.
- Most of the parameters become valid soon after the change is made except following:

[15: Run command selection],	[47: 15 function selection],
[17: Frequency command selection],	[48: 16 function selection],
[18: Operation mode selection],	[69: Reverse run prevention],
[38: 2nd. V/F type selection],	[70: Automatic restart prevention],
[45: Multi-speed input selection],	[71: Retry selection],
[46: 11-12 function selection],	[73: Frequency at 5V input],
	[74: Frequency at 0V input].

When you change these parameters, the Inverter trips for safety. Please release the trip.

- If you change [6] [Display magnification], displayed value of the following parameter represents the parameter value multiplied by display magnification.

[00~15: 0-15th speed frequency],	[67: Accord detect width],
[20: Jogging frequency],	[68: Reduced freq. at instantaneous power failure],
[29: DC brake starting frequency],	[73: Frequency at 5V input],
[41~44: Jump frequency],	[74: Frequency at 0V input],
[63: Full scale frequency adjustment],	[75: Upper limit frequency],
[65~66: Comparative frequency],	[76: Lower limit frequency].

- If the Inverter trips while changing the parameter, changed content of the parameter will not be stored. Please re-adjust after releasing the trip.

## 5.6 Operating functions

DV700T Series have the following operating functions. You can command through the switches on the operation panel or the terminal board.

Function	Contents
Normal operation	<ul style="list-style-type: none"> <li>■ Normal operating function with acceleration/deceleration time.</li> <li>■ The Inverter makes soft start by shorting the terminals [F1]-[FG](for forward run), [F2]-[FG](for reverse run).</li> <li>■ You can operate multi-speed(up to 16 speeds) with the frequency setting terminals.</li> <li>■ You can set acceleration/deceleration time to 0~3600secs independently to each other.*1</li> </ul>
Jogging operation	<ul style="list-style-type: none"> <li>■ Operating function with 0(zero)sec. acceleration/deceleration time. Useful for positioning.</li> <li>■ Please select [Operation Mode]** to 2-speed mode for this function.</li> <li>■ The Inverter outputs [Jogging frequency] by shorting the terminals [F3]-[FG](for forward jogging), [F4]-[FG](for reverse jogging).</li> <li>■ You can shift from normal operation to jogging or jogging to normal operation.</li> <li>■ Jogging frequency can be set within 0~30Hz range, but if this is too high, the Inverter may trip due to an overcurrent.**</li> </ul>
Free-run stop	<ul style="list-style-type: none"> <li>■ The Inverter shuts off the output voltage to the motor. Useful for applying mechanical brake. Please note that the output terminals to the motor (U, V, W) are not isolated during a free-run stop. Please be careful for electrical shock.</li> </ul>
DC dynamic brake**	<ul style="list-style-type: none"> <li>■ Braking function by applying DC to the motor while the Inverter shifts from the operation to stop mode. If you enter the forward/reverse run command or the jogging command while the DC dynamic brake is working, the Inverter will stop braking and start the instructed operation mode.</li> </ul>
Positioning DC brake	<ul style="list-style-type: none"> <li>■ If you give a stop command during the normal operation, the Inverter starts braking and soft stop when the output frequency becomes 3Hz(changeable by parameter).</li> <li>■ If you make preset frequency to 0(zero)Hz, a brake starts at an output frequency of 1Hz or lower.</li> <li>■ You can set torque and time by the parameter.</li> </ul>
Immediate DC brake (Full-range)	<ul style="list-style-type: none"> <li>■ Brake starts immediately after you give a stop command during a normal operation. (without making a soft stop)</li> <li>■ You can set torque and time by the parameter.</li> <li>■ Braking time to stop is 2 times that of [Positioning DC brake mode].</li> </ul>

\*1) Time to change up to 50Hz. Please refer to Chapter [5.2 Operation panel] how to set a acceleration/deceleration time.

\*2) Please refer to Chapter [5.7 Operation mode].

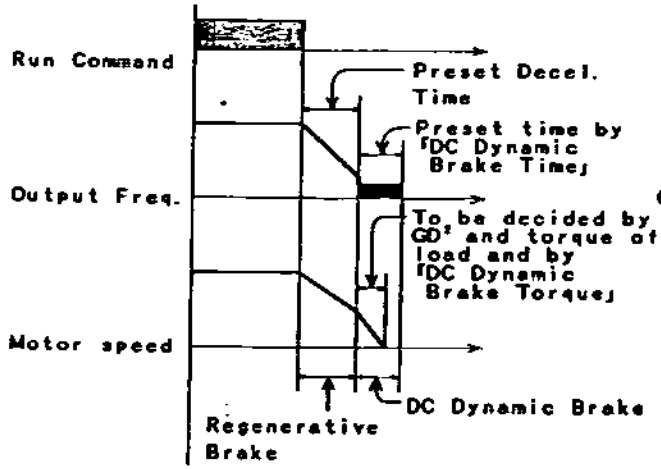
\*3) Please refer to Chapter [5.2 Operation panel] how to set a jogging frequency.

\*4) Please refer to Chapter [5.2 Operation panel] how to set a brake mode selection.

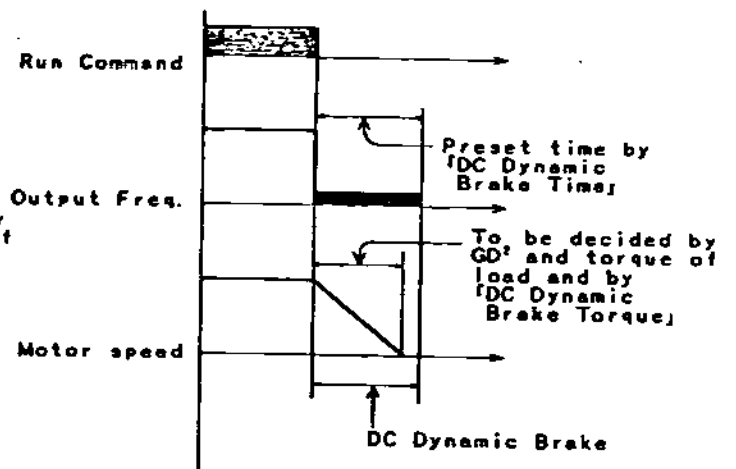


<<Example of DC brake pattern>>

Positioning DC Brake



Immediate DC Brake



### 5.7 Operation mode

DV700T Series have 4 operation modes. You can select a mode by [18 Operation mode selection](refer to Chapter [6.1 Parameter functions]).

Operation mode	Terminal function						Value of [18 Operation mode selection]
	I 1	I 2	I 3	I 4	I 5**	I 6**	
2-speed mode	Forward run	Reverse run	Forward jogging	Reverse jogging	- Free-run - Trip - 2nd. accel./ decel. time	- Free-run - Trip - 2nd. accel./ decel. time	2
4-speed mode	Forward run	Reverse run	Frequency setting selection		- Free-run - Trip - 2nd. accel./ decel. time	- Free-run - Trip - 2nd. accel./ decel. time	4 Factory setting
8-speed mode	Forward run	Reverse run	Frequency setting selection			- Free-run - Trip - 2nd. accel./ decel. time	8
16-speed mode	Forward run	Reverse run	Frequency setting selection				16

\*1) You can select by [47 15 function selection] or [48 16 function selection].

☆ You can operate multi-speed(as below) by open/short the frequency setting terminals. When all terminals are open, 0-speed frequency will be selected and you can set by the parameter [00 Preset frequency (0-speed)] or by an external potentiometer. (select a parameter setting or an outer setting of 0-speed frequency by [17 Frequency command selection])

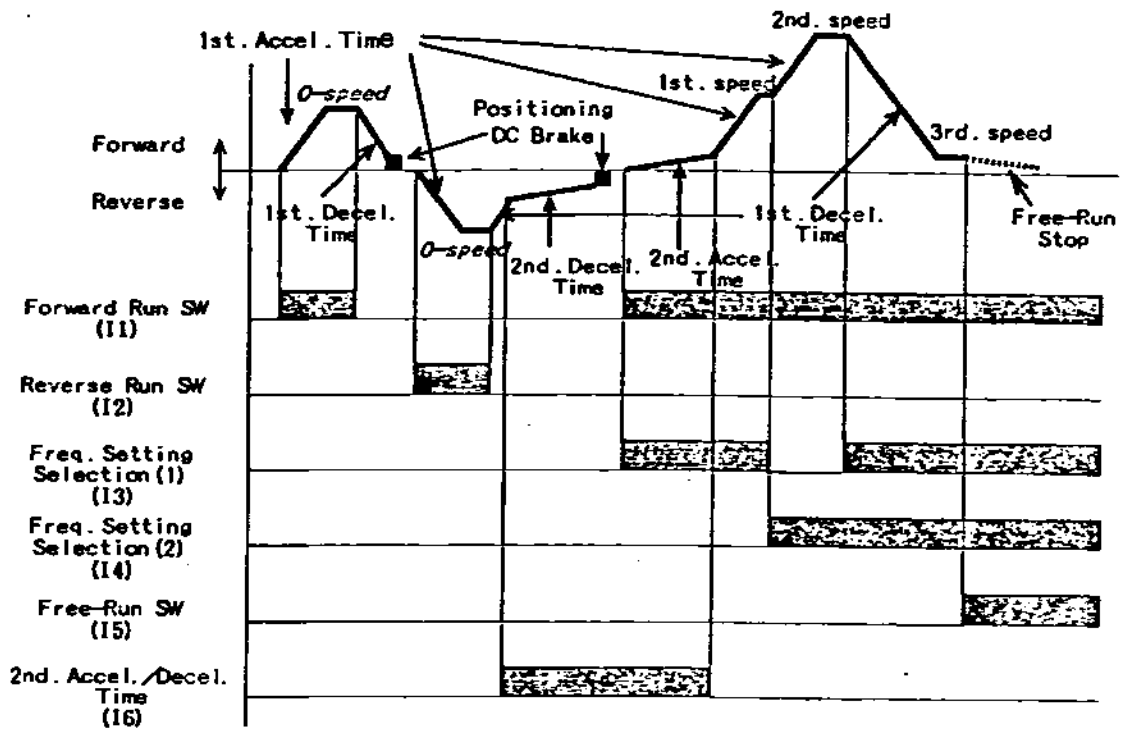
( Frequency setting selection at 4-speed mode(Factory setting) ) \*\*

between [13] and [G]	between [14] and [G]	Frequency setting
open	open	0-speed freq.
short	open	1st. speed freq.
open	short	2nd. speed freq.
short	short	3rd. speed freq.

\*2) Please refer to Chapter [4.3 Terminal functions] for a frequency setting selection at 8-speed mode or 16-speed mode.

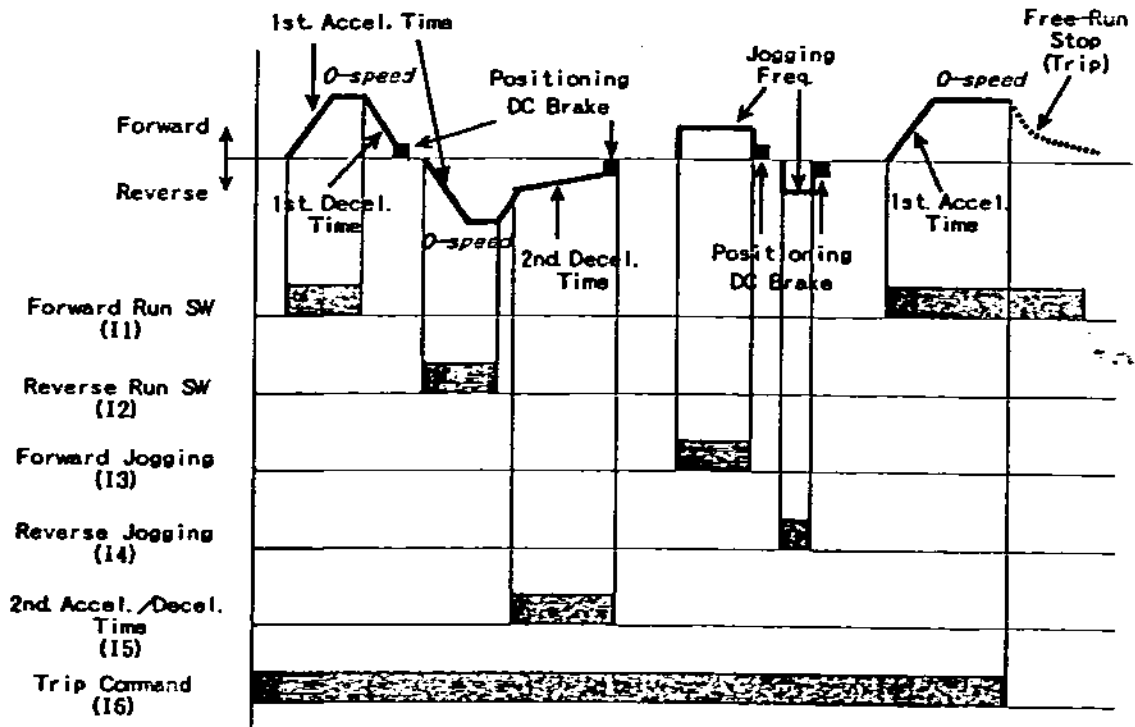
<Example of an operation pattern at 4-speed mode(Factory setting)>

[47 15 function selection] to **FrEE** . [48 16 function selection] to **U-d** :  
 (Free-run command) (2nd. acceleration/deceleration)



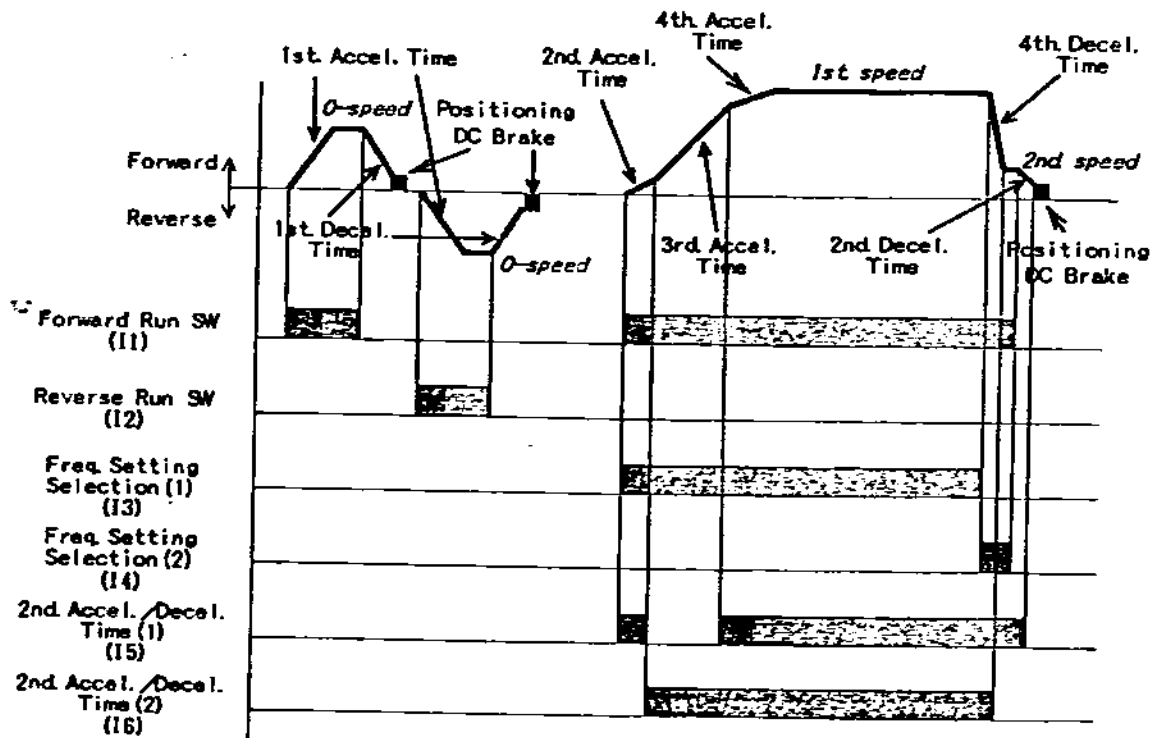
<Example of an operation pattern at 2-speed mode>

[47 15 function selection] to **U-d** . [48 16 function selection] to **ΓHr** :  
 (2nd. acceleration/deceleration) (Trip Command)



<Example of an operation pattern at 4-speed mode>

[47 15 function selection] and [48 16 function selection] to **U-d** :  
 (2nd. acceleration/deceleration)



## 5.8 Monitoring

### (1) Frequency monitoring

The output frequency is always displayed when you turn on the power and run. When in parameter selection mode, the display will automatically return to the output frequency display if none of the panel switches are touched for more than 3secs.

You can display the preset frequency by selecting parameter [E0 Monitor mode selection]).

### (2) Warning/Malfunction monitoring

When the Inverter detects warning or trip, this will be displayed on 4-digit LED. This display is given the first priority. (refer to Chapter [8.1 Protective functions])

Alarm/Fault	4-digit LED	Content	Alarm/Fault	4-digit LED	Content
Alarm	[ L ]	Lack of input voltage	Alarm	[ CAU ]	Change/store following parameters [16 Run command selection] [17 Frequency command selection] [18 Operation mode selection] [38 2nd. V/F type selection] [45 Multi-speed input selection] [46 11-12 function selection] [47 15 function selection] [48 16 function selection] [69 Reverse run prevention] [70 Automatic restart prevention] [71 Retry selection] [73 Frequency at 5V input] [74 Frequency at 0V input]
Alarm	[ rEUP ]	Reverse run prevention			
Alarm	[ rP ]	Automatic restart prevention			
Fault	[ OC ]	Overcurrent trip			
Fault	[ OU ]	Overvoltage trip			
Fault	[ OL ]	Outer trip			
Fault	[ OH ]	Overheat trip ** Heatsink thermal			
Fault	[ Err ]	CPU error	Alarm	[ - - - - ]	End of parameter initialization **
Alarm	[ EQU ]	Overvoltage trip on the power on	Alarm	[ CLR ]	End of clearance of trip causes **

\*1) DV700T1500, DV700T2200 only.

\*2) Refer to [B5 Parameter initialization].

\*3) Refer to [B0 Trip causes clearance].

### (3) Cause of past trip monitoring

You confirm causes of up to the last 5 trips from [B1 Trip cause ①] to [B5 Trip Cause ⑤].  
You can confirm per the following method why the inverter trips.

Operation	Operation panel		Note
	SW	4-digit LED	
Trip occurs.		[ OC ]	<e.g.> Overcurrent trip
① Confirm cause of the last trip.	Push [MODE].	[ B1 ]	[B1] Trip cause ①
	Push [MODE].	[ OU ]	For example, cause of the last trip is overvoltage.
② Confirm cause of the 2nd. latest trip.	Push [MODE].	[ B1 ]	Displays parameter number again.
	Push [Δ].	[ B2 ]	[B2] Trip cause ②
	Push [MODE].	[ ]	Displays cause of the 2nd. latest trip(blank if none).
③ Confirm cause of the 3rd. ~5th. latest trip.	Repeat ② procedure.		
④ Return to the present trip display mode. **	Push [MODE].	[ B5 ]	Displays the parameter number.
		[ OC ]	Returns to monitor mode in 3secs.

\*1) You can return to the present trip display mode in about 3secs. If you do not operate SW while the parameter number(B1~B5) is displayed. Please release the trip with both [Δ] and [▽] while the present trip display is on.

Chapter 6-Parameter

6.0 Parameter list

No.	Parameter title	Specification				Order of display
		Adjustable range	Min. unit	Factory set	User setting	
—	Number of selectable parameters	0~79	1	15		—
00	Preset frequency (0-speed)	0, 1.0~Upper limit freq.	0.1Hz	0Hz		0 1
01	1st. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	50Hz		0 2
02	2nd. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	30Hz		0 3
03	3rd. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	15Hz		0 4
16	Run command selection	<input type="checkbox"/> PnL <input type="checkbox"/> TEr <input checked="" type="checkbox"/> bOTH Panel    Terminal    Both		<input checked="" type="checkbox"/> bOTH		0 5
17	Frequency command selection	<input type="checkbox"/> PnL <input type="checkbox"/> 0-5 Preset freq. (0-speed)    DC 0~5V <input checked="" type="checkbox"/> 0-10 <input type="checkbox"/> 4-20 DC 0~10V    DC 4~20mA		<input type="checkbox"/> PnL		0 6
18	Operation mode selection	2, 4, 8, 16-speed mode		4-speed mode		0 7
19	Torque boost	0~100	2	38 (26**)		0 8
21	Acceleration time	0~3600secs	0.1secs	5secs		0 9
31	Deceleration time	0~3600secs	(~10secs)	5secs		1 0
22	2nd. accel. time	0~3600secs	1sec	5secs		1 1
32	2nd. decel. time	0~3600secs	(10secs~)	5secs		1 2
20	Jogging frequency	0, 1.0~30Hz	0.1Hz	7Hz		1 3
30	Carrier frequency	0, 1, 2, 3, 4, 5, 6, 7	—	2		1 4
35	Base frequency	30~240Hz	1Hz	60Hz		1 5

\*1) DV700T1500, DV700T2200 only.

**N.B.**

Above parameter are pre-set at factory, to change order or to select additional at parameters see page 18 section 5.5.

No.	Parameter title	Specification				Order of display
		Adjustable range	Min. unit	Factory set	User setting	
04	4th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		1 6
05	5th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		1 7
06	6th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		1 8
07	7th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		1 9
08	8th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 0
09	9th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 1
10	10th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 2
11	11th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 3
12	12th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 4
13	13th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 5
14	14th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 6
15	15th. speed freq.	0, 1.0~Upper limit freq.	0.1Hz	0Hz		2 7
23	3rd. accel. time	0~3600secs	0.1secs	5secs		2 8
33	3rd. decel. time	0~3600secs	(~10secs)	5secs		2 9
24	4th. accel. time	0~3600secs	1sec	5secs		3 0
34	4th. decel. time	0~3600secs	(10secs~)	5secs		3 1
25	DC brake torque	0~100	2	94(76%)		3 2
26	DC brake time selection	0~3secs : <input type="text" value="POS"/> 0~6secs : <input type="text" value="-POS"/>	0.05secs 0.1 secs	0.5secs		3 3
27	DC brake type selection	<input type="text" value="-POS"/> Immediate <input type="text" value="POS"/> Positioning		<input type="text" value="POS"/>		3 4
28	Start-up DC brake time	0~3secs	0.05secs	0(No active)		3 5
29	DC brake starting freq.	1~120Hz	0.1Hz	3Hz		3 6
36	Maximum output voltage	0~100%	1%	100%		3 7
37	V/F pattern	1.0~2.0(squared)	0.1	1.0		3 8
38	2nd. V/F type selection	<input type="text" value="n0"/> Normal <input type="text" value="UP"/> Upper <input type="text" value="LO"/> Lower		<input type="text" value="n0"/>		3 9
39	2nd. base freq.	30~240Hz	1Hz	60Hz		4 0
40	2nd. torque boost	0~100	2	0		4 1
41	Jump freq. ①-A	0, 1.0~120Hz	0.1Hz	0Hz		4 2
42	Jump freq. ①-B	0, 1.0~120Hz	0.1Hz	0Hz		4 3
43	Jump freq. ②-A	1.0~120Hz	0.1Hz	60Hz		4 4
44	Jump freq. ②-B	1.0~120Hz	0.1Hz	60Hz		4 5
45	Multi-speed input selection	<input type="text" value="1b 1f"/> 1bit <input type="text" value="b 1n"/> Binary		<input type="text" value="b 1n"/>		4 6

\*1) DV700T1500, DV700T2200 only.

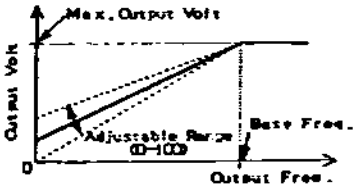
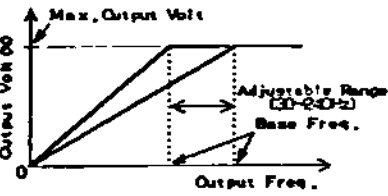
No.	Parameter title	Specification				Order of display	
		Adjustable range	Min. unit	Factory set	User setting		
46	11-12 function selection	<input type="checkbox"/> F5r5	<input type="checkbox"/> r5Fr	<input type="checkbox"/> F5r5		47	
		Ewd.-Stop/Rev.-Stop Run-Stop/Ewd.-Rev.					
47	15 function selection	<input type="checkbox"/> FrEE	Free	<input type="checkbox"/> THr	Trip command (Thermal)	<input type="checkbox"/> FrEE	48
48	16 function selection	<input type="checkbox"/> U-d	2nd. accel./decel. (Up-down)	<input type="checkbox"/> U-d		49	
51	Output signal selection	<input type="checkbox"/> TrIP	<input type="checkbox"/> STbL	<input type="checkbox"/> rUn		50	
		Trip	Stable	Run			
		<input type="checkbox"/> FrEE	<input type="checkbox"/> F	<input type="checkbox"/> r			
		Free	Ewd.	Rev.			
		<input type="checkbox"/> CE-F	Check-Frequency				
55	Output signal polarity selection	<input type="checkbox"/> nOr	Normal	<input type="checkbox"/> rEU	Reverse	<input type="checkbox"/> nOr	51
57	Stall deceleration magnification	1, 2, 4, 8, 16		8		52	
58	Acceleration mode selection	<input type="checkbox"/> Lin	<input type="checkbox"/> S-1	<input type="checkbox"/> S-2		53	
59	Deceleration mode selection	Linear	S-shaped①	S-shaped②		54	
60	Monitor mode selection	<input type="checkbox"/> S-F	Preset freq.	<input type="checkbox"/> Q-F	Output freq.	<input type="checkbox"/> Q-F	55
61	Display magnification	0.1~60.0		0.1	1.0	56	
62	Frequency meter adjustment	—		—	—	57	
63	Full scale freq. adjustment	0~120Hz		1Hz	60Hz	58	
64	[FOUT] selection	<input type="checkbox"/> dIG	Digital	<input type="checkbox"/> AnR	Analog	<input type="checkbox"/> AnR	59
65	Comparative frequency A	0, 1.0~120Hz		0.1Hz	0Hz	60	
66	Comparative frequency B	0, 1.0~120Hz		0.1Hz	0Hz	61	
67	Accord detect width	0~120Hz		0.1Hz	3Hz	62	
68	Reduced frequency at IPF	0~120Hz		0.1Hz	3Hz	63	
69	Reverse run prevention	<input type="checkbox"/> nO	Fwd./Rev.	<input type="checkbox"/> YES	Fwd. only	<input type="checkbox"/> nO	64
70	Automatic restart prevention	<input type="checkbox"/> nO	Auto-restart	<input type="checkbox"/> YES	Manual-restart	<input type="checkbox"/> nO	65
71	Retry selection	<input type="checkbox"/> nO No retry		<input type="checkbox"/> nO		66	
		<input type="checkbox"/> 1 ~ <input type="checkbox"/> 4 Retry					
72	Retry starting time	0~120secs		2secs	4secs	67	



No.	Parameter title	Specification				Order o display
		Adjustable range	Min. unit	Factory set	User setting	
73	Freq. at 5V input	0.1.0~120Hz	0.1Hz	60Hz		6 8
74	Freq. at 0V input	0.1.0~120Hz	0.1Hz	0Hz		6 9
75	Upper limit frequency	Lower limit freq. ~120Hz	0.1Hz	60Hz		7 0
76	Lower limit frequency	0.1.0~Upper limit freq.	0.1Hz	0Hz		7 1
77	Retry after overvoltage trip on power-on	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES		<input type="checkbox"/> NO		7 2
80	Trip causes clearance	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES		<input type="checkbox"/> NO		7 3
81	Trip cause ①	Cause of the last trip	—	—		7 4
82	Trip cause ②	Cause of 2nd. latest trip	—	—		7 5
83	Trip cause ③	Cause of 3rd. latest trip	—	—		7 6
84	Trip cause ④	Cause of 4th. latest trip	—	—		7 7
85	Trip cause ⑤	Cause of 5th. latest trip	—	—		7 8
86	Parameter initialization	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES		<input type="checkbox"/> NO		7 9
99	Parameter extract	01~50	—	—		—
--	Parameter lock	<input type="checkbox"/> NO No lock. <input checked="" type="checkbox"/> ALL Lock all the parameter. <input type="checkbox"/> P A G E Page 1(one) lock.		<input type="checkbox"/> NO		—

Note) When you charge/store the marked parameters, the Inverter trips for safety. Please release the trip to operate again.

## 6.1 Parameter functions(Factory adjustable settings)

No.	Parameter title	Description	Order of display
—	Number of selectable parameters	You can select the number of parameters to be confirmed/changed. Please refer to Chapter [5.5 Parameter selection]	—
00	Preset frequency (0-speed)	You can set a frequency at which you want to run. This is valid when [17 Frequency command selection] is set to <b>PnL</b> .	0 1
01	1st. speed freq.	You can set a frequency at multi-speed operation. This is valid when [18 Operation mode selection] is set to 4-speed mode or more.	0 2
02	2nd. speed freq.		0 3
03	3rd. speed freq.		0 4
16	Run-command selection	You can select a run command from the following: <ul style="list-style-type: none"> <li>● <b>PnL</b> (Panel) : <b>RUN</b> SW on the panel is valid.</li> <li>● <b>TEr</b> (Terminal): Input terminal [11],[12] is valid.</li> <li>● <b>BoTH</b> (Both) : Both panel and terminal is valid.**</li> </ul>	0 5
17	Frequency command selection	You can select 0-speed frequency setting either with [00 Preset frequency] or analog frequency setting (Input terminal [FIN]). <ul style="list-style-type: none"> <li>● <b>PnL</b> : [00 Preset freq. (0-speed)]*: Digital setting</li> <li>● <b>0-5</b> : [FIN] DC0~5V</li> <li>● <b>0-10</b> : [FIN] DC0~10V</li> <li>● <b>4-20</b> : [FIN] DC4~20mA</li> </ul> } : Analog setting	0 6
18	Operation mode selection	You can select an operation mode from the following: <ul style="list-style-type: none"> <li>● <b>2</b> : 2-speed mode</li> <li>● <b>8</b> : 8-speed mode</li> <li>● <b>4</b> : 4-speed mode**</li> <li>● <b>16</b> : 16-speed mode</li> </ul>	0 7
19	Torque boost	You can adjust the output voltage at low frequency. <p>* If you set this too large, the Inverter may trip due to overcurrent.</p> 	0 8
21	Acceleration time	You can adjust varying rate at acceleration/deceleration time. <ul style="list-style-type: none"> <li>- Set with the time to change by 50Hz.</li> <li>- When you set 0sec., actual accel./decel. time becomes 0.05sec.</li> </ul>	0 9
31	Deceleration time		1 0
22	2nd. accel. time	You can adjust varying rate at 2nd. acceleration/deceleration time. This is valid when [47 15 function selection] or [48 16 function selection] is set to <b>U-d</b> (2nd. acceleration/deceleration).	1 1
32	2nd. decel. time		1 2
20	Jogging frequency	You can adjust a frequency at jogging run.	1 3
30	Carrier frequency	You can select a carrier frequency in order to minimize an audible noise. Larger the parameter value, higher the carrier frequency.	1 4
35	Base frequency	You can adjust a base frequency (Maximum frequency at constant torque area) to any frequency between 30 and 240Hz. 	1 5

\*1) Factory setting

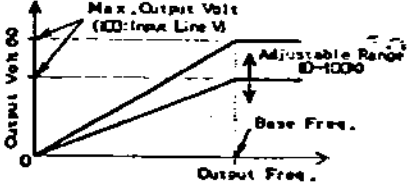
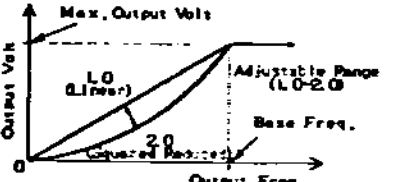
### Note:

Above 15 parameters are adjustable at factory settings. Please set [Number of selectable parameters] before confirming/changing the parameters in the following pages.

## 6.2 Parameter functions(Non factory settings)

### Note:


Please set [Number of selectable parameters] before confirming/changing the following parameters. (refer to Chapter [5.5 Parameter selection])

No.	Parameter title	Description	Order of display																			
04	4th. speed freq.	<p>You can set 4th.~15th. speed frequency when you select 8-speed, 16-speed operation mode at [18 Operation mode selection].</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Operation mode</th> <th colspan="4">Input terminal</th> </tr> <tr> <th>I 3</th> <th>I 4</th> <th>I 5</th> <th>I 6</th> </tr> </thead> <tbody> <tr> <td>8-speed mode</td> <td colspan="2">Frequency setting selection</td> <td colspan="2">2nd. accel./decel. time *1</td> </tr> <tr> <td>16-speed mode</td> <td colspan="4">Frequency setting selection</td> </tr> </tbody> </table>	Operation mode	Input terminal				I 3	I 4	I 5	I 6	8-speed mode	Frequency setting selection		2nd. accel./decel. time *1		16-speed mode	Frequency setting selection				16
Operation mode	Input terminal																					
	I 3		I 4	I 5	I 6																	
8-speed mode	Frequency setting selection		2nd. accel./decel. time *1																			
16-speed mode	Frequency setting selection																					
05	5th. speed freq.		17																			
06	6th. speed freq.		18																			
07	7th. speed freq.		19																			
08	8th. speed freq.		20																			
09	9th. speed freq.		21																			
10	10th. speed freq.		22																			
11	11th. speed freq.		23																			
12	12th. speed freq.		24																			
13	13th. speed freq.		25																			
14	14th. speed freq.		26																			
15	15th. speed freq.	27																				
23	3rd. accel. time	<p>You can set varying rate at 3rd./4th. acceleration/deceleration time. This is valid when both [47 15 function selection] and [48 16 function selection] is set to <input type="checkbox"/> U-d.</p> <p style="text-align: center;">(2nd. acceleration/deceleration).</p>	28																			
33	3rd. decel. time		29																			
24	4th. accel. time		30																			
34	4th. decel. time		31																			
25	DC brake torque	<p>You can adjust torque and time of DC brake while the Inverter shifts from run to stop. Refer to Chapter [5.6 Operating function].</p> <p>- If you set both or either one of torque and time to 0(zero), it becomes free-run.</p>	32																			
26	DC brake time selection		33																			
27	DC brake type selection	<p>You can select the type of DC brake.</p> <p>● <input type="checkbox"/> -POS : Immediate      ● <input type="checkbox"/> POS : Positioning *1 (ramp to stop)</p>	34																			
28	Start-up DC brake time	<p>You can start the Inverter after applying DC brake for a preset time</p> <p>- If you set time to 0(zero), it becomes void (factory setting is 0)</p> <p>- Refer to [25 DC brake torque] about brake torque.</p>	35																			
29	DC brake starting frequency	<p>You can adjust a frequency at which the positioning brake starts.</p> <p>- When you soft-stop by a stop command, brake starts when the output frequency becomes lower than this [DC brake starting frequency].</p> <p>- When the Inverter stops due to the lower preset frequency, brake starts when the output frequency becomes lower than 1Hz, disregarding this parameter.</p>	36																			
36	Maximum output voltage	<p>You can adjust the maximum output voltage.</p> <p>An adjustable range is 0~100% of input line voltage.</p>																				
37	V/F pattern	<p>You can adjust a proper V/F pattern based on the load.</p> <p>● <input type="checkbox"/> 10 : Constant torque *1</p> <p>● <input type="checkbox"/> 20 : Reduced torque</p>		37																		
			38																			

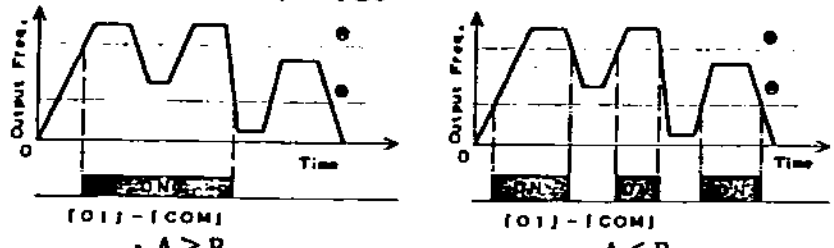
\*1)Factory setting

No.	Parameter title	Description	Order of display																																		
38 39 40	2nd. V/F type selection 2nd. base frequency 2nd. torque boost	<p>You can select three V/F patterns as follows:</p> <p>● <input type="checkbox"/> <b>NO</b> Normal pattern*1    ● <input type="checkbox"/> <b>UP</b> Upper pattern    ● <input type="checkbox"/> <b>LO</b> Lower pattern</p>	3 9 4 0 4 1																																		
41 42 43 44	Jump freq. ① - A Jump freq. ① - B Jump freq. ② - A Jump freq. ② - B	<p>You can set two fully adjustable frequency jump zones (①, ②) in which you cannot set a frequency by analog frequency setting to avoid a mechanical resonance. Set jump zones ① &lt; ②. Frequency [B] will be set when you set frequency between [A] and [B].</p> <p>- While accel./decel., frequency will output even at the jump zone. - When you set [A]=[B]*1, the jump function becomes void.</p>	4 2 4 3 4 4 4 5																																		
45	Multi-speed input selection	<p>You can set a selecting method of frequency at multi-speed operation</p> <p>● <input type="checkbox"/> <b>1b 1f</b> (1 bit) : 1 bit input</p> <p>You can select one frequency per corresponding terminal of [Frequency setting selection terminal]. You can operate up to 3 speeds at 4-speed mode, 4 speeds at 8-speed mode and 5 speeds at 16-speed mode. (e.g.) at 16-speed mode</p> <table border="1"> <thead> <tr> <th colspan="4">Input terminal</th> <th rowspan="2">Freq. setting</th> </tr> <tr> <th>I 3</th> <th>I 4</th> <th>I 5</th> <th>I 6</th> </tr> </thead> <tbody> <tr> <td>open</td> <td>open</td> <td>open</td> <td>open</td> <td>0-speed freq.</td> </tr> <tr> <td>short</td> <td>x</td> <td>x</td> <td>x</td> <td>1st. speed freq.</td> </tr> <tr> <td>open</td> <td>short</td> <td>x</td> <td>x</td> <td>2nd. speed freq.</td> </tr> <tr> <td>open</td> <td>open</td> <td>short</td> <td>x</td> <td>3rd. speed freq.</td> </tr> <tr> <td>open</td> <td>open</td> <td>open</td> <td>short</td> <td>4th. speed freq.</td> </tr> </tbody> </table> <p>- open/short represents the relation to [G] - x means 'don't care'</p> <p>● <input type="checkbox"/> <b>b 1n</b> (Binary) : Binary input*1</p> <p>You can select a frequency by interpreting [Frequency setting selection terminal] as binary digits.</p>	Input terminal				Freq. setting	I 3	I 4	I 5	I 6	open	open	open	open	0-speed freq.	short	x	x	x	1st. speed freq.	open	short	x	x	2nd. speed freq.	open	open	short	x	3rd. speed freq.	open	open	open	short	4th. speed freq.	4 6
Input terminal				Freq. setting																																	
I 3	I 4	I 5	I 6																																		
open	open	open	open	0-speed freq.																																	
short	x	x	x	1st. speed freq.																																	
open	short	x	x	2nd. speed freq.																																	
open	open	short	x	3rd. speed freq.																																	
open	open	open	short	4th. speed freq.																																	
46	11-12 function selection	<p>You can select the function of [11] and [12] as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">46 Setting</th> <th colspan="2">Terminal between [11] and [G]</th> <th colspan="2">Terminal between [12] and [G]</th> </tr> <tr> <th>short</th> <th>open</th> <th>short</th> <th>open</th> </tr> </thead> <tbody> <tr> <td>F S r S*1</td> <td>Forward run</td> <td>Stop</td> <td>Reverse run</td> <td>Stop</td> </tr> <tr> <td>r S F r</td> <td>Run</td> <td>Stop</td> <td>Reverse</td> <td>Forward</td> </tr> </tbody> </table> <p>(F S r S : Fwd.-Stop/Rev.-Stop    r S F r : Run-Stop/Fwd.-Rev.)</p>	46 Setting	Terminal between [11] and [G]		Terminal between [12] and [G]		short	open	short	open	F S r S*1	Forward run	Stop	Reverse run	Stop	r S F r	Run	Stop	Reverse	Forward	4 7															
46 Setting	Terminal between [11] and [G]			Terminal between [12] and [G]																																	
	short	open	short	open																																	
F S r S*1	Forward run	Stop	Reverse run	Stop																																	
r S F r	Run	Stop	Reverse	Forward																																	

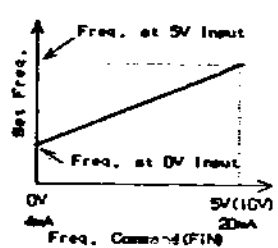
\*1) Factory setting

No.	Parameter title	Description	Order of display															
47	15 function selection -Invalid at 8-speed mode, 16-speed mode	You can select the function of [15] and [16] as follows: <ul style="list-style-type: none"> <li>● <b>FrEE</b> (Free) : short [15]([16]) &amp; [G] → Free-run stop*1</li> <li>● <b>THr</b> (Thermal): short [15]([16]) &amp; [G] → Trip command</li> <li>● <b>U-d</b> (Up-Down): short [15]([16]) &amp; [G] → 2nd. accel./decel.</li> </ul>	4 8															
48	16 function selection -Invalid at 16-speed mode	- When you select <b>THr</b> , short [15]([16]) & [G] in advance. - When you set both 47 and 48 to <b>U-d</b> , you can select 4 acceleration/deceleration times. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>between [15]&amp;[G]</th> <th>between [16]&amp;[G]</th> <th>Accel./decel. setting</th> </tr> </thead> <tbody> <tr> <td>open</td> <td>open</td> <td>Accel./decel. time</td> </tr> <tr> <td>short</td> <td>open</td> <td>2nd. accel./decel. time</td> </tr> <tr> <td>open</td> <td>short</td> <td>3rd. accel./decel. time</td> </tr> <tr> <td>short</td> <td>short</td> <td>4th. accel./decel. time</td> </tr> </tbody> </table>	between [15]&[G]	between [16]&[G]	Accel./decel. setting	open	open	Accel./decel. time	short	open	2nd. accel./decel. time	open	short	3rd. accel./decel. time	short	short	4th. accel./decel. time	4 9
between [15]&[G]	between [16]&[G]	Accel./decel. setting																
open	open	Accel./decel. time																
short	open	2nd. accel./decel. time																
open	short	3rd. accel./decel. time																
short	short	4th. accel./decel. time																
51	Output signal selection	You can select the output signal between [01] & [COM] as follows: <ul style="list-style-type: none"> <li>● <b>TRIP</b> (Trip) : Trip output signal*1 ([ON] at trip)</li> <li>● <b>STBL</b> (Stable) : Reach signal ([ON] at reach)</li> <li>● <b>Run</b> (Run) : Run/stop signal ([ON] at running)</li> <li>● <b>FrEE</b> (Free) : Free-run signal ([ON] at free-run)</li> <li>● <b>F</b> (Fwd.) : Forward run signal ([ON] at forward run)</li> <li>● <b>r</b> (Rev.) : Reverse run signal ([ON] at reverse run)</li> <li>● <b>CE-F</b> (Check-E): Output frequency check signal → Refer to 65 and 66.</li> </ul> - See also [55] Output signal polarity selection.	5 0															
55	Output signal polarity selection	You can reverse the polarity of the output signal. <ul style="list-style-type: none"> <li>● <b>nor</b> (Normal) : [ON] at activated*1</li> <li>● <b>reU</b> (Reverse) : [OFF] at activated</li> </ul>	5 1															
57	Stall deceleration magnification	You can adjust the decel. time while the stall prevention is working - Set with the magnification against the normal setting decel. time	5 2															
58	Acceleration mode selection	You can select among linear, curved(S-shaped) accel./decel. <ul style="list-style-type: none"> <li>● <b>Lin</b> Linear*1</li> <li>● <b>S-1</b> S-shaped ①</li> <li>● <b>S-2</b> S-shaped ②</li> </ul>  <p>Normal accel./decel. mode... accel./decel. time is linear.      Larger inclination at larger torque. smaller inclination at smaller torque.      S-shaped curve between F1 and F2. Smooth accel./decel.</p> <p>- When you select <b>S-1</b> S-shaped①, the Inverter follows to the preset accel./decel. time under the range of base freq., but shows smaller inclination at higher frequency than base freq.</p>	5 3															
59	Deceleration mode selection		5 4															

\*1) Factory setting

No.	Parameter title	Description	Order of display
60	Monitor mode selection	You can select the type of output displayed at 4-digit LED per below value is multiplied by magnification of [5   Display magnification] ● <input type="checkbox"/> S-F : Preset freq. ● <input type="checkbox"/> O-F : Output freq.*1	5 5
61	Display magnification	You can set the magnification and you can display such a frequency of the motor speed or production line speed. For example, if you set to 30.0, synchronous speed of the 4-pole motor will be displayed. ※If you change this parameter, all the displayed value parameter relating frequency represent the value multiplied by display magnification.	5 6
62	Frequency meter adjustment	You can calibrate the frequency meter. Adjust with <input type="checkbox"/> Δ <input type="checkbox"/> ∇ so that the meter reads full scale.	5 7
63	Full scale frequency adjustment	You can select the frequency for full scale of the frequency meter. Factory setting shows the full scale at 60Hz. Please adjust when you operate at more than 60Hz.	5 8
64	[FOUT] selection	You can select the frequency signal at [FOUT] terminal. ● <input type="checkbox"/> DIG Digital frequency counter output ● <input type="checkbox"/> AOA Analog frequency meter output**	5 9
65 66	Comparative frequency A Comparative frequency B	You can set the frequency you want to detect when you select [5   Output signal selection] to <input type="checkbox"/> CF-F (Check frequency). - Activates [ON] ([O1] and [COM]) when the output frequency exceeds [65 Comparative frequency A] and [OFF] when it gets lower than [66 Comparative frequency B].  (O1) - (COM) - A ≥ B (O1) - (COM) - A < B	6 0 6 1
67	Accord detect width	You can adjust the timing of the reach signal output at accel/decel, when you select [5   Output signal selection] to <input type="checkbox"/> SGL. - When the gap between output and preset frequency becomes smaller than [67 Accord detect width], the reach signal will output. - When you set to 0(zero), the reach signal will never output. - While the Inverter stops or brake works or during the switch of forward and reverse, the reach signal will never output. - In case of [29 DC brake starting frequency] < [67 Accord detect width], the reach signal will output just before stopping.	6 2
68	Reduced frequency at Instantaneous power failure (IPF)	You can adjust the output frequency on resuming the power after IPF. - Resuming output frequency is [Last frequency before IPF] - [Reduced frequency]. - If the power shutoff last long and the control circuit is reset, the Inverter starts output from 1Hz as a normal operation.	6 3
69	Reverse run prevention	You can prevent any trouble by reverse run by setting <input type="checkbox"/> YES.	6 4
70	Automatic restart prevention	You can prevent the automatic restart after the power resumption or IPF by setting <input type="checkbox"/> YES.	6 5

\*1) Factory setting

No.	Parameter title	Description	Order of display
71 72	Retry selection Retry starting time	You can automatically release the trip and keep operation after [72 Retry starting time], even the trip occurs. The Inverter tries the preset number of retry, but when no trip occurs for more than 120 min., the number of retry will be initialized. ● [00] no retry** ● [1] ~ [4] Retries the preset times - During the retry, the trip signal will never output.	6 6 6 7
73 74	Freq. at 5V input Freq. at 0V input	You can adjust the frequency range at analog frequency setting([FIN]). -Larger frequency of [73 Frequency at 5V input] or [74 Frequency at 0V input] becomes the max. freq. at analog frequency setting. * This does not limit the frequency entered by the parameter [00 Preset frequency(0-speed)]~[15 15th. speed frequency]. 	6 8 6 9
75 76	Upper limit freq. Lower limit freq.	You can limit the frequency entered by the parameter [00 Preset frequency(0-speed)]~[15 15th. speed frequency]. - [75 Upper Limit Frequency] becomes maximum frequency entered by the parameter. * This does not limit the freq. entered by analog frequency setting.	7 0 7 1
77	Retry after overvoltage trip on power on	You can automatically release the trip and keep operating when DC voltage of converter gets lower than 410V, even the overvoltage trip on power-on occurs, by setting [YES]. - During overvoltage trip on power-on, LED displays [E.O.V.].	7 2
80	Trip causes clearance	You can clear the trip causes. <How to clear> ① Set to [YES] with (Δ) and turn off the power. ② Clear by turning the power on after LED disappear and LED shows [CL]. ③ To operate the Inverter again, turn power off then on again.	7 3
81 82 83 84 85	Trip cause ① Trip cause ② Trip cause ③ Trip cause ④ Trip cause ⑤	The Inverter memorizes causes of last 5 trips. - Refer to Chapter[5.8 Monitoring] for the contents of the display.	7 4 7 5 7 6 7 7 7 8
86	Parameter initialization	You can initialize all parameter to the factory setting. <How to initialize> ① Set to [YES] with (Δ) and turn off the power. ② Initialize by turning the power on after LED disappear and LED shows [---]. ③ To operate the Inverter again, turn the power off then on again.	7 9
99	Parameter extract	You can extract parameters by changing the order of them. - Refer to Chapter [5.5 Parameter selection].	—
—	Parameter lock	You can [lock] the preset parameters. ● [00] No lock.** ● [ALL] Lock all the parameter. ● [PART] Lock the parameters unnecessary to set. - If you select [PART], you can only set the parameter chosen with [Number of selectable parameter] and [99 Parameter extract]. - Refer to [How to lock the parameter].	

\*1) Factory setting

## Chapter 7-Maintenance and inspection

The Inverter is a static apparatus which is based on semiconductors but is subject to environmental changes (temperature, humidity, dust or vibration). In order to avoid unnecessary harm to the life and performance of the Inverter, please maintain and inspect periodically.

### 7.0 Note on maintenance and inspection

- ① Please ensure an authorised operator turns power off/on and prevents other unauthorized people from handling.
- ② Inner circuit will be kept charged at high voltage even after the power is turned off. When you inspect, please turn off the power and make sure that charge lamp([LED1]:red) is [OFF].

### 7.1 Inspection cycle

Please carry out the following inspection. The cycle of the routine inspection changes depending on the operating condition. The cycle in this table is on the following operating condition.

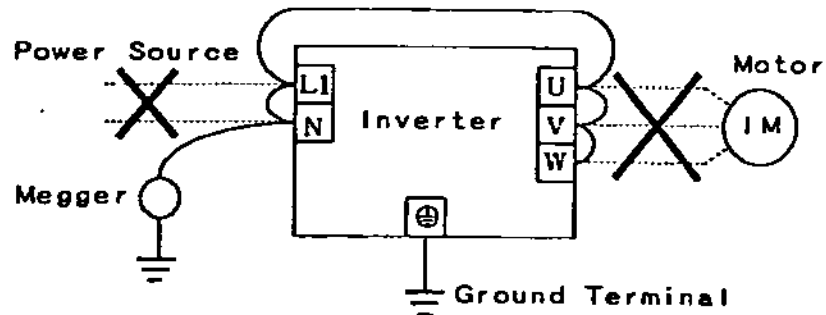
ambient temperature	: avc. 30°C
load ratio	: less than 80%
operation rate	: less than 12 hours/day

Type	Cycle	Item
Routine Inspection	Periodical	<ul style="list-style-type: none"><li>● Ambient temperature, humidity and dust check.</li><li>● Abnormal noise or vibration ?</li><li>● Main circuit voltage ?</li><li>● Panel is clean ?</li><li>● Megger test (between main circuit and ground terminal).</li><li>● Loose screw ?</li><li>● Overheating ?</li><li>● Vibrating noise of relay ?</li><li>● Balance of the output voltage of each phase in the case of the operation without the motor ?</li><li>● Any damage on the operating board ?</li></ul>



## 7.2 Megger test

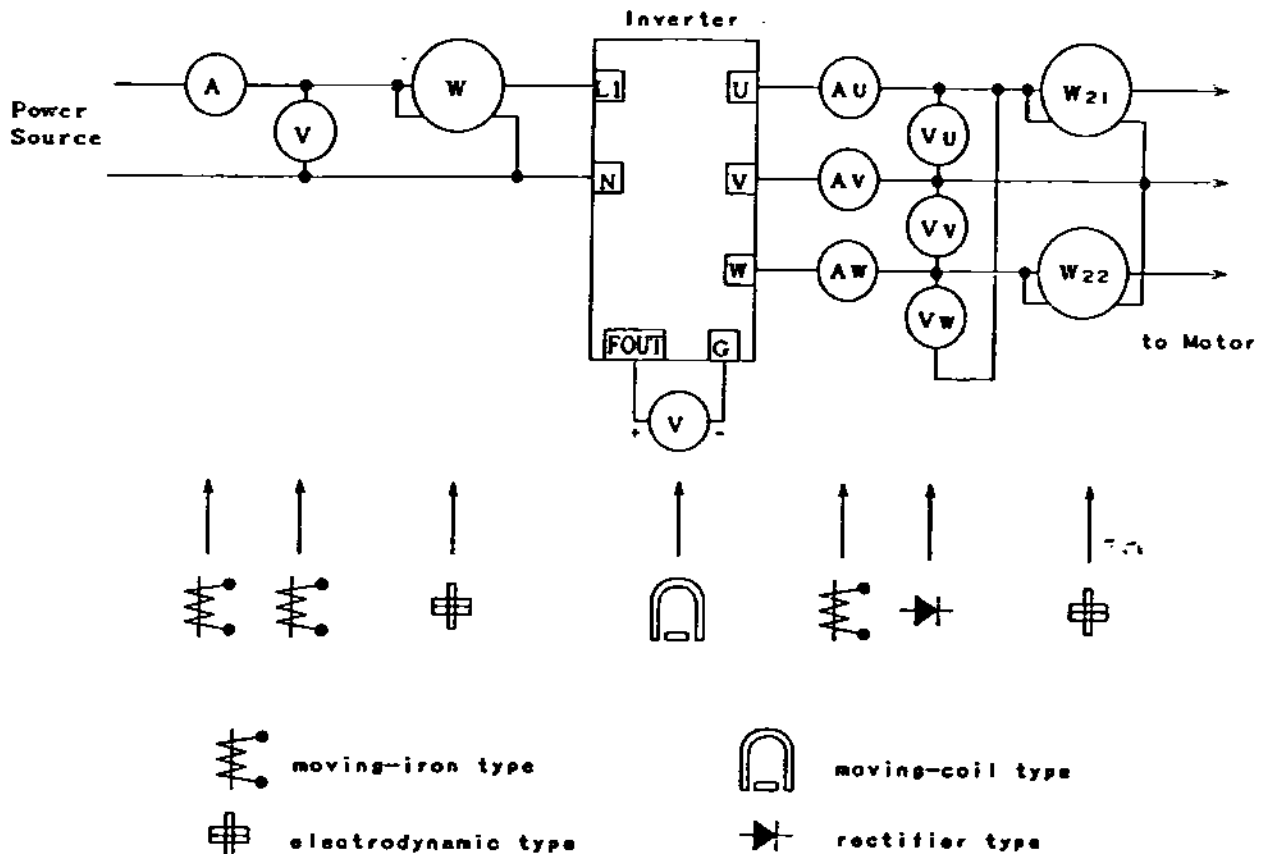
- (1) Please perform the megger test only to the main circuit per the following procedure.  
Please do not apply to the control circuit.
- (2) If you perform this test to the external circuit, please take off all the terminals so that the test voltage may not be applied to the Inverter.
- (3) Please make sure that the megger test is more than  $1M\Omega$  measured with DC 500V class insulation tester.



## 7.3 Selection of meters

If you test, please use the following meters and circuit. Please note that test data may differ based on the different meters since the primary and the secondary voltage and current of the Inverter contain higher harmonics.

### (Test Point/Meter)



## Chapter 8-Troubleshooting

### 8.0 Cause of trouble and check


If any trouble occurs, please check and remedy using the following procedures. Please contact our distributors if you cannot find proper cause or remedy, or if you need service parts. Please make extra care on opening the case since PCB is HIGH VOLTAGE LIVE portion. (refer to Chapter 「4.0 Safety caution」)

Malfunction	Check point	Corrective action
Motor does not start	Any mis-wiring ?	Wire correctly.
	Is the power on to the line terminals (L1, N) ?	Turn the power on. Turn off the power then turn on again.
	Is 4-digit LED on ?	Check as per above.
	Is the input voltage to the line terminals(L1, N) correct ?	Check input voltage.
	Any malfunction displayed ?	Refer to Chapter 「8.1 Protective functions」.
	Is 「Free-run」 SW on ?	Turn 「Free-run」 SW to 「OFF」.
	Is both forward & reverse run SW on ?	Turn one of the switches 「ON」.
	Abnormal frequency setting ?	Check the frequency setting.
	Is the motor locked ?	Release the lock(reduce the load).
	Is the motor overloaded ?	Reduce the motor load. Resize the Motor/Inverter system.
	Is the motor running on all phase ?	Recheck wiring between the Inverter and motor.
Wrong rotating direction	Right phase-order at the output terminals (U, V, W) ?	Correct phase-order of the output terminal to the motor.
Motor does not change speed	Is the motor overloaded ?	Reduce the motor load.
Motor does not reach set speed	Is the motor pole or voltage correct ?	Check the motor specifications and the rating of the name plate.
	Is the max. frequency setting normal ?	Check 「73 Freq. at 5V input」, 「74 Freq. at 0V input」, 「75 Upper limit freq.」 and 「76 Lower limit freq.」.
	Is the terminal voltage of the motor too low ?	Check 「35 Base freq.」, 「36 Max. output voltage」 and 「37 V/F pattern」.
	Is the motor overloaded ?	Reduce the motor load.
Unstable speed	Too much load fluctuation ?	Reduce the load fluctuation. Resize the Inverter/Motor system.

### 8.1 Protective functions

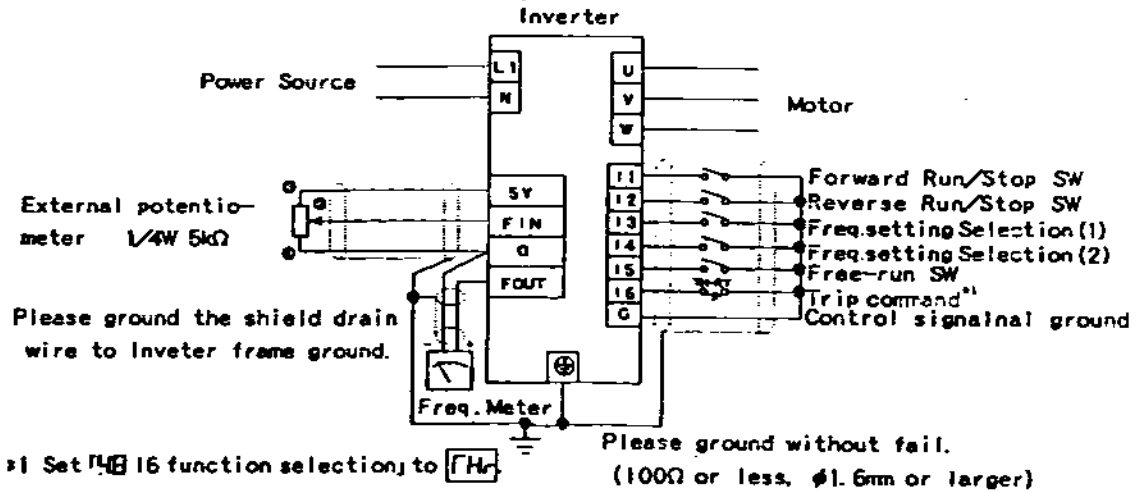
DV700T Series have following classified protective functions:

- ① Avoid the trip but with no warning indication.
- ② Shut off the Inverter output with warning indication.
- ③ Trip for protection. (Trip signal cannot be held when you turn off the power.)

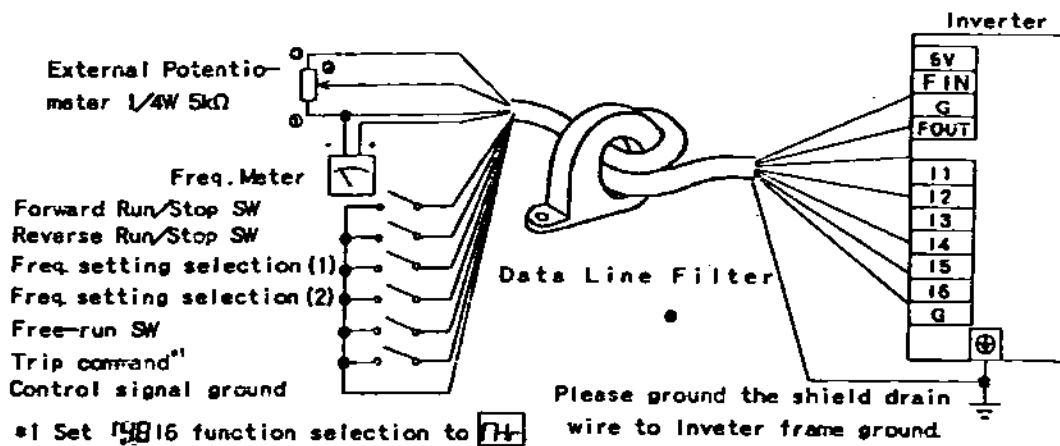
Type	Protective function LED display	Content of protection or possible cause	Corrective action
①	Overvoltage stall prevention  (no indication)	Prevent the trip by making deceleration time longer when DC converter voltage exceeds 390V during deceleration. - You can adjust deceleration time with 「57 Stall deceleration magnification」.	Correct the motor load or extend deceleration time.

### 8.2 Measures to eliminate external noise

- Please separate cables of the control circuit and the power line.



- If you use longer cables for the control circuit, external noise may come in from these cables which may cause the malfunction of the Inverter. In this case, it is recommended to use [Data Line Filter] and make turns of cable around this filter. ( Please install this Filter as close to the Inverter as possible.)

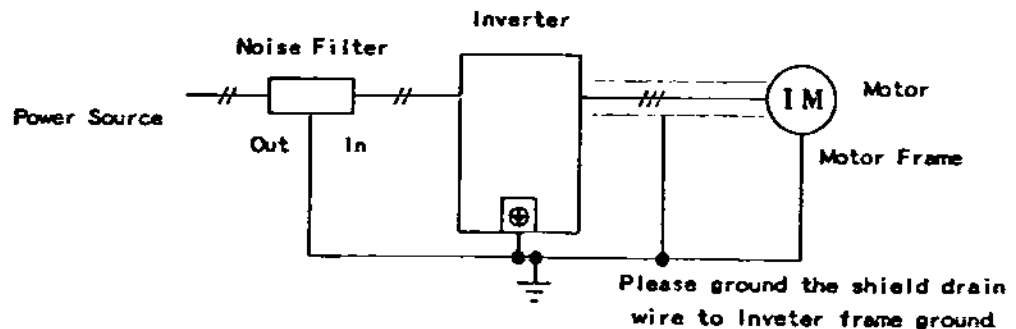


### 8.3 Measures to eliminate R.F. I.

The radio noise is due to the electromagnetic wave radiated from the Inverter or the power supply. The influence of the radio noise grows by frequency band of 10MHz or less (especially the medium frequency band), in the region where the radio wave is weak.

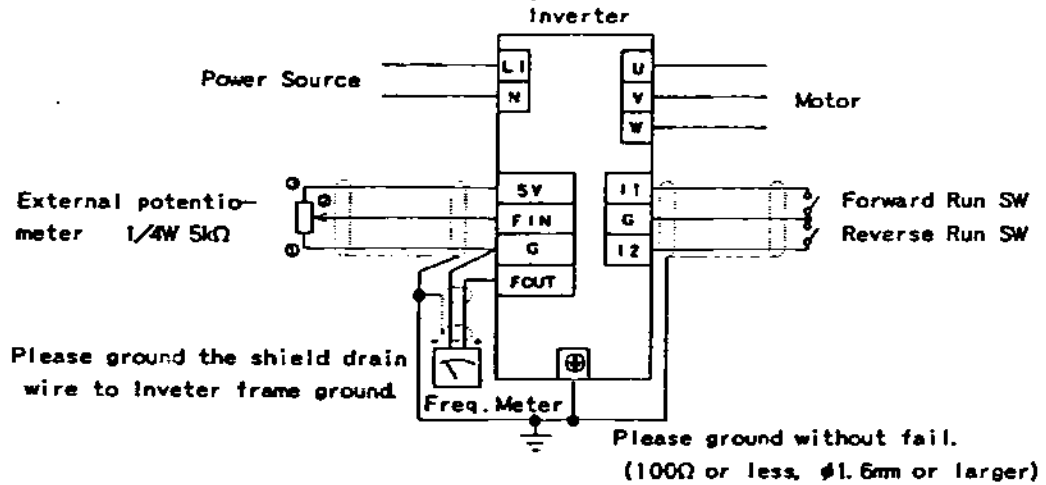
( How to suppress )

Set up the noise filter in the power supply side of the Inverter and shield the output side of the the Inverter. By this you can expect some suppression of the noise. Connect OUT-side of the filter to the power source and IN-side to the Inverter.

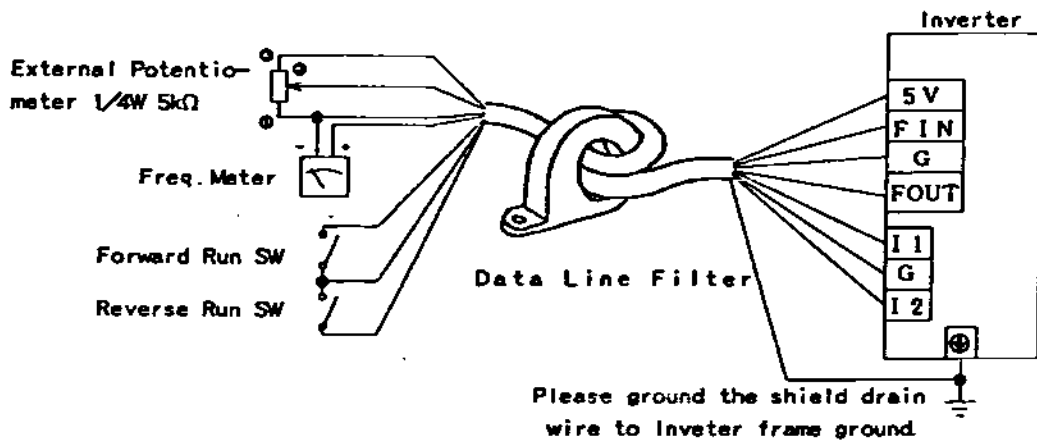


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