# 1 7200M3 INVERTER MAIN UNIT

The 7200M3 is an all-digital inverter of compact size and low noise. Two types of models are available: with digital operator (JNEP--13) and with analog operator (JNEP--14). Using the digital operator realizes optimum drive and monitoring by changing the control constant setting. The model provided with the analog operator is used for simple applications where no complicated constant setting necessary. Free kit operator (JNEP--15) is also available for sample applications.

## 1.1 PARTS NAMES OF 7200M3

• With Digital operator

PROTECTIVE COVER
TERMINAL COVER
DIGITAL OPERATOR (JNEP--13)
DIE-CAST CASE

• With analog operator

External dimensions and mounting Method of analog operator are the same as for digital operator.

ANALOG OPERATOR (JNEP--14)

• Free Kit operator

Dimensions are the same as As for digital operator.

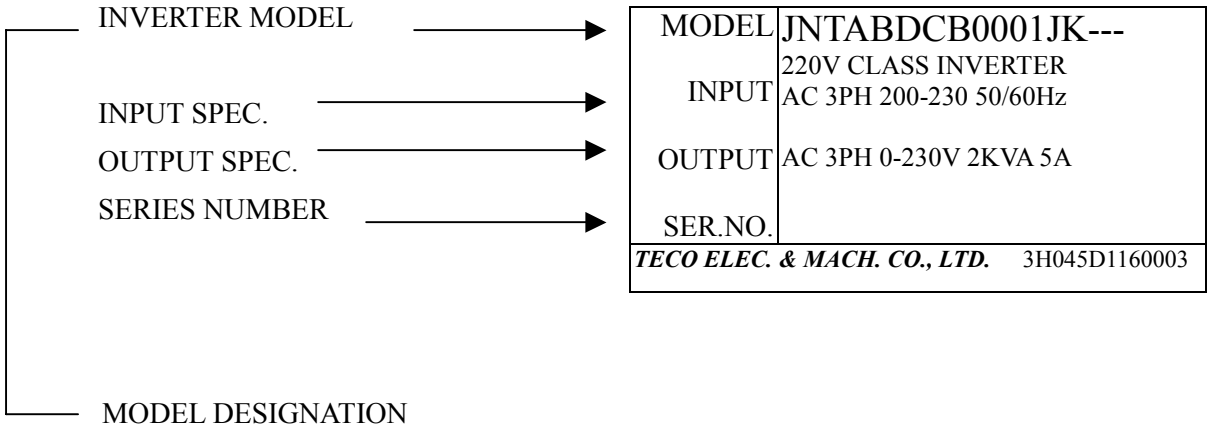
## 1.2 RECEIVING

This 7200M3 has been put thorough demanding tests at the factory before shipment. After unpacking, check for the following.

- Verify the part numbers with the purchase order sheet and/or packing slip.
- Transit damage

  If any part of 7200M3 is damaged or missing, immediately notify the shipper.

# NAMEPLATE DATA




MODEL DESIGNATION

JNT A BD B B 0001 JK ---

7200M3 SERIES

Input Voltage
A:Three-phase
B:Single-phase

Specifications
BD:Domestic standards
BE:UL listed component (planning)

Operator type
B:Digital Operator (JNEP--13)
C:Analog Operator (JNEP--14)
D:Free Kit (JNEP--15)

Enclosures and mountings
A:Open chassis type (IEC IP00)
B:Enclosed ,Wall-mounted type (NEMA-1)

Applicable max. motor Output
R500:0.5HP
0010:10HP

Voltage
JK:200 to 230V
AZ:400 to 460V

Reserved

# 1.3 INSTALLATION

> CAUTION:
>
> • Handle with care so as not to damage the inverter during transportation
> • Do not hold only the faceplate (plastic section) but the die-cast section.

## LOCATION

Location of the equipment is important to achieve proper performance and normal operating life.

The 7200M3 units should be installed in areas where the following conditions exist.

•Ambient temperature:

-10 to +40°C ,+14 to 104°F (For enclosed type) ,

-10 to +45ºC ,+14 to 113ºF (For open chassis type)

•Protected from rain or moisture.

•Protected from direct sunlight.

•Protected from corrosive gases or liquids.

•Free form airborne dust or metallic particles.

•Free form vibration.

•Free form magnetic noise.

## MOUNTING SPACE

Unit : mm

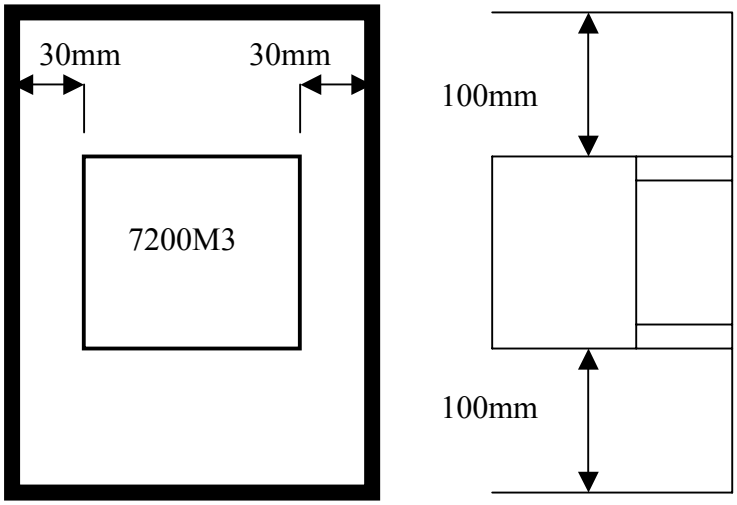



Fig 1.1 Mounting Space

## 1.4 WIRING

Connect main circuit and control circuit wiring securely as descrined in the following.

### 1.4.1 Terminal Cover Mounting/Removing

Please see the 7200M3 manual page 4.

For removing terminal cover, first remove the operator, then press the cover in direction of 1 (on both sides) and, at the same time, lift in direction of 2 . For mounting, reverse the procedure. The figure below shows how to unlock (in direction of 1 ) and lock (in direction of 2 ) the ribbon cable between the digital operator and the inverter.

Please see the 7200M3 manual page 4.

## 1.4.2 Standard Wiring Diagram

Models with digital operator can be operated from the digital operator (JNEP--13) only by main circuit wiring. When these models are operated by control circuit terminals, control constant change is required. For details, refer to NSTOPOCEDURE SELECTION" on page 68. Models with analog operator (JNEP--14) re preset in operation mode from control circuit terminals at the factory prior to shipping.

(1) Run by digital operator

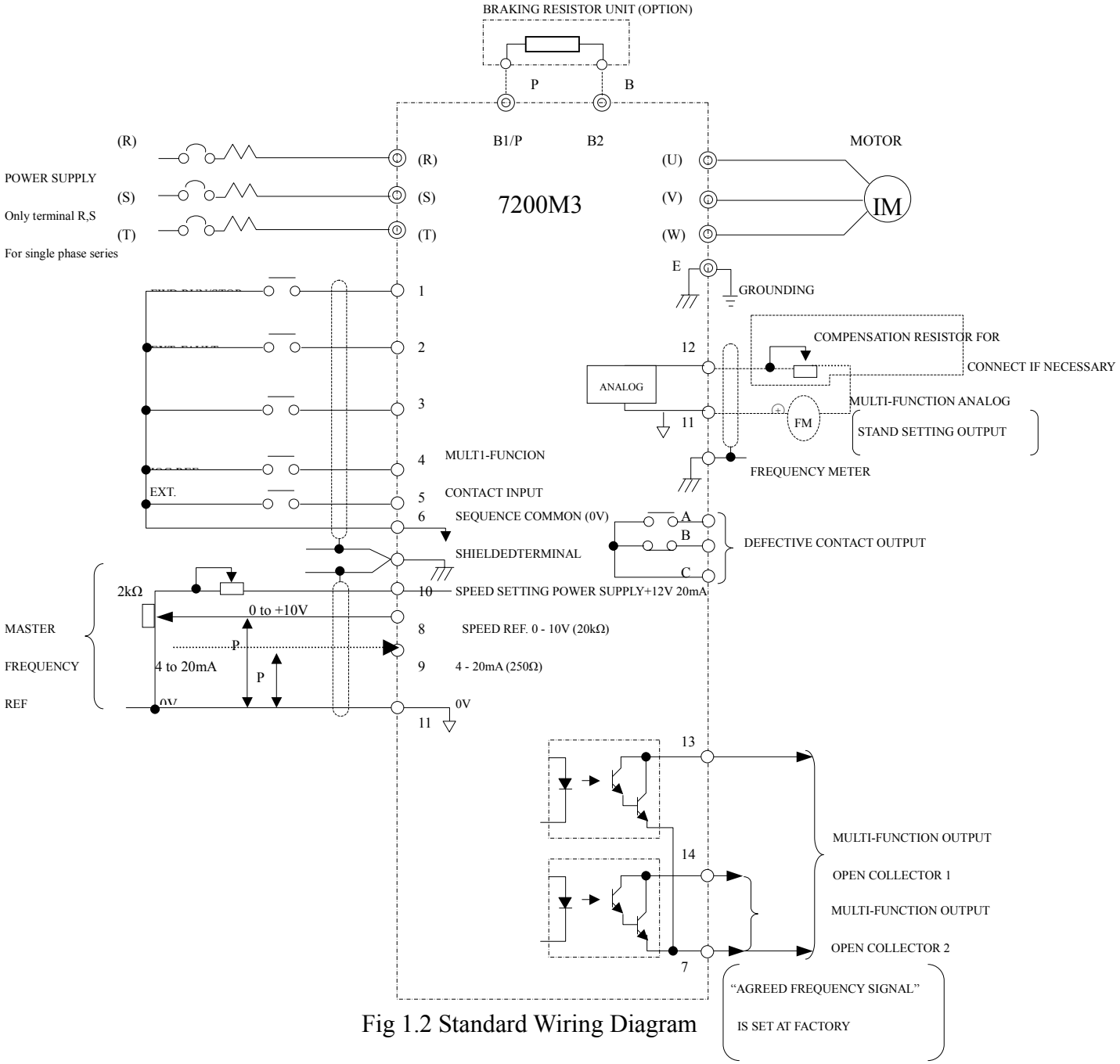



Fig 1.2 Standard Wiring Diagram

(Digital Operator)

(2) Run by analog operator

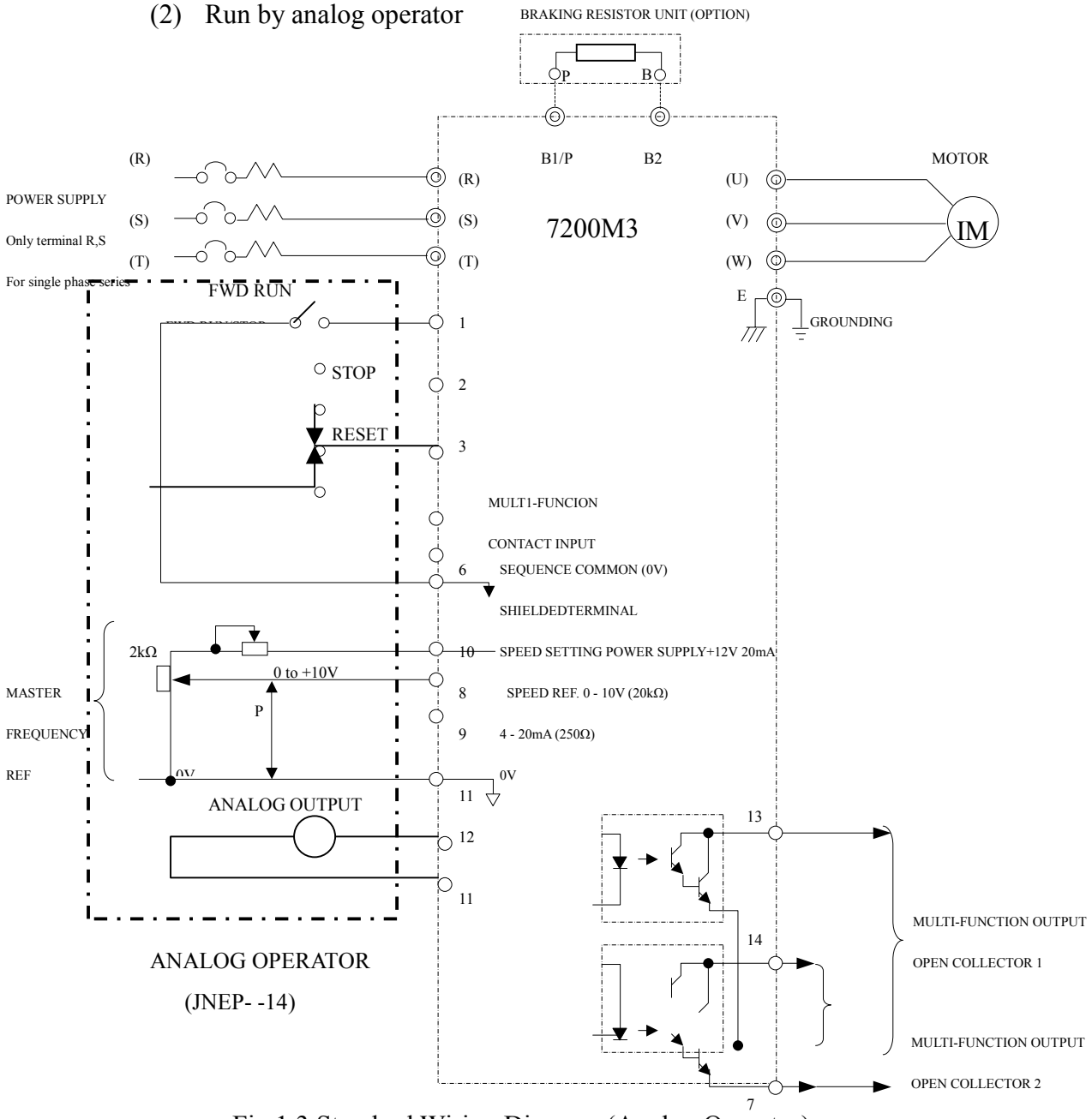



Fig 1.3 Standard Wiring Diagram (Analog Operator)

Notes:

1. Indicates shielded leads and p twisted-pair shielded leads.

2.External terminal (10) of +12V has maximum output current capacity of 20 mA.

3.Terminal Symbols: ◎ shows main circuit; ○ shows control circuit.

*Set thermal overload relay between braking resistor and inverter when using braking resistor (type ERF-150WJ) to protect braking resistor from overheating.

Also, use sequencer to break power supply side on thermal overload relay trip contact when using braking resistor.

## 1.4.3 Main Circuit

(1) Main circuit wiring

Connect wiring as shown in Fig.1.4

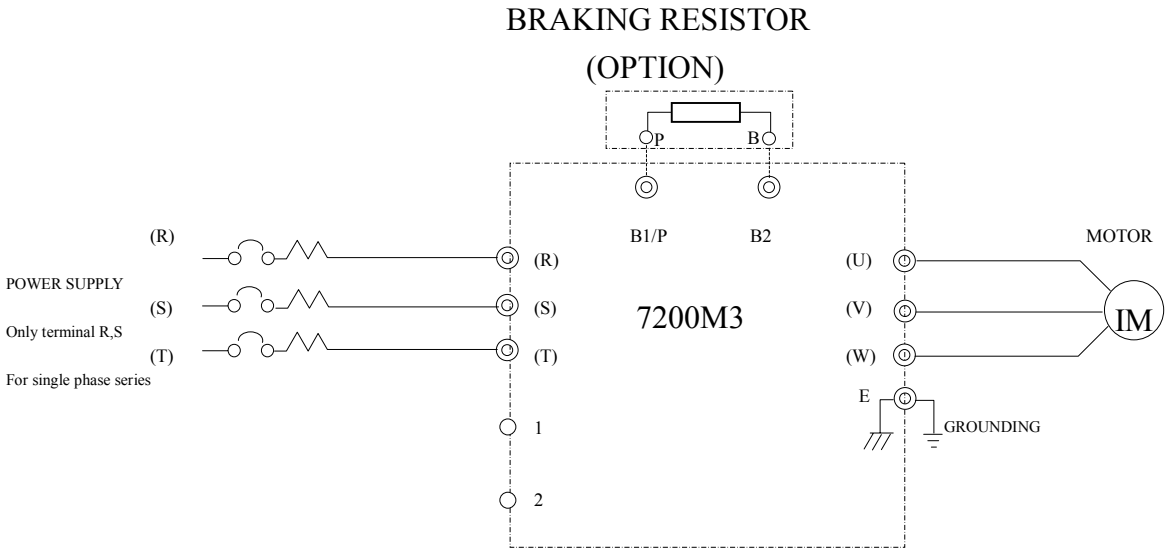



Fig.1.4 Main Circuit Wiring

(2) Main circuit terminals

Table 1.1 7200M3 Main Circuit Terminals

| Terminal | Description |
|---|---|
| R | Main circuit power input<br>R , S are used for single-phase input specifications. |
| S | |
| T | |
| U | Inverter output |
| V | |
| W | |
| B1/P | Braking resistor (options) |
| B2 | |
| E* | Grounding (ground resistance should be 100 ohms or less) |

* Use screw for frame ground.

## • Main circuit terminal arrangement

3-Phase series (all models )

| R | S | T | B1/P | B2 | U | V | W |
|---|---|---|---|---|---|---|---|

220V single-phase series

| R | S | | B1/P | B2 | U | V | W |
|---|---|---|---|---|---|---|---|

BLANK

(3) Molded-case circuit breaker (MCCB) and power supply magnetic contactor. (MC)

Be sure to connect MCCBs between AC main circuit power supply and 7200M3, input terminals R , S , T, to protect wiring. Recommended MCCBs are listed in Table1.2.

When a ground fault interrupter is used, select one not influenced by high frequency. Setting current should be 200mA or more and operating time, 0.1sec or more to prevent malfunctions.

Table 1.2 Molded-case Circuit Breakers and Magnetic Contactors

•220V Class (3-Phase & Single-Phase Input Series)

| Voltage Class | 220V 3-phase | | | | | | | 220V Single-phase | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inverter model | JNTABDCB □ JK--- | | | | | | | JNTBBDCB □ JK--- | | | | |
| | R500 | 0001 | 0002 | 0003 | 0005 | 7R50 | 0010 | R500 | 0001 | 0002 | 0003 | 0005 |
| Capacity KVA | 1.4 | 2.1 | 2.7 | 4.1 | 6.9 | 10.3 | 13.7 | 1.4 | 2.1 | 2.7 | 4.1 | 6.9 |
| Rated Output Current A | 3.2 | 4.8 | 6.5 | 9.6 | 16 | 24 | 32 | 3.2 | 4.8 | 6.5 | 9.6 | 16 |
| MCCB | 5A | 10A | 20A | 20A | 30A | 50A | 60A | 10A | 20A | 20A | 40A | 50A |
| TAIAN Magnetic Contactors Model | CN-11 | CN-11 | CN-11 | CN-11 | CN-16 | CN-18 | CN-25 | CN-11 | CN-11 | CN-16 | CN-18 | CN-25 |

•440V Class (3-Phase Input Series)

| Voltage Class | 440V 3-phase | | | | | | |
|---|---|---|---|---|---|---|---|
| Inverter model | JNTABDCB □ AZ--- | | | | | | |
| | R500 | 0001 | 0002 | 0003 | 0005 | 7R50 | 0010 |
| Capacity KVA | 1.4 | 2.2 | 3.4 | 4.1 | 6.9 | 10.3 | 13.7 |
| Rated Output Current A | 1.6 | 2.6 | 4 | 4.8 | 8 | 12 | 16 |
| MCCB | 5A | 10A | 10A | 10A | 20A | 20A | 30A |
| TAIAN Magnetic Contactors Model | CN-11 | CN-11 | CN-11 | CN-11 | CN-18 | CN-18 | CN-25 |

(4) Surge absorber

The surge absorbers should be connected to the coils of control rekays , magnetic connntactors ,magnetic valves ,or magnetic brake used for the 7200M3 periphery. Otherwise ,large surge voltage occurs at switching and may cause devices to be damaged or to malfunction. Select type from Table 1.3.

Table 1.3 Surge Absorbers

| Coils of Magnetic Contactor and Control Relay | | Surge Absorber* | |
|---|---|---|---|
| | | Model DCR2- | Specifications |
| 200V to 230V | Large-size Magnetic Contactors | 50A 22E | 220 VAC<br>0.5uF 200 ohm |
| | Control Relay<br>MY-2,-3(OMRON)<br>HH-2, -23(FUJI)<br>MM-2,-4(OMRON) | 10A 25C | 250 VAC<br>0.1uF 100 |
| 380 to 460 V Units | | 50D 100B | 1000 VDC<br>0.5uF 220 ohm |

*Made by MARCON Electronics.

(5)Wire and terminal screw sizes

Table 1.4 shows wire sizes and types.

Table 1.4 Wire Size

• 220V Class 3-phase Input Series

| Circuit | Model JNTAABD-CB ☐ | Inverter Capacity (KVA) | Terminal Symbol | Terminal Screw | Wire Size | | Wire Type |
|---|---|---|---|---|---|---|---|
| | | | | | AWG | mm² | |
| Main Circuit | R500JK--- | 1.4 | R, S, T, B1/P, B2, U, V, W<br>E | M4 | 1 4 –10<br>14 -10 | 2 to 5.5<br>2 to 5.5 | Power cable: 600V vinylsheathed lead or equivalent |
| | 0001JK--- | 2.1 | R, S, T, B1/P, B2, U, V, W<br>E | M4 | 1 4 –10<br>14 -10 | 2 to 5.5<br>2 to 5.5 | |
| | 0002JK--- | 2.7 | R, S, T, B1/P, B2, U, V, W<br>E | M4 | 12 -10<br>14 -10 | 3.5 to 5.5<br>2 to 5.5 | |
| | 0003JK--- | 4.1 | R, S, T, B1/P, B2, U, V, W<br>E | M4 | 12 -10<br>14 -10 | 3.5 to 5.5<br>2 to 5.5 | |
| | 0005JK--- | 6.9 | R, S, T, B1/P, B2, U, V, W<br>E | M4 | 12 -10<br>14 -10 | 3.5 to 5.5<br>2 to 5.5 | |
| | 7R50JK--- | 10.3 | R, S, T, B1/P, B2, U, V, W<br>E | M5 | 10 -8<br>14 -10 | 5.5 to 8<br>2 to 5.5 | |
| | 0010JK--- | 13.7 | R, S, T, B1/P, B2, U, V, W<br>E | M5 | 10 -8<br>14 -10 | 5.5 to 8<br>2 to 5.5 | |
| Control Circuit | Common to All Models | | 1 ~ 14 , A , B , C | M3.5 | 20 -14 | 0.5 to 2 | Shielded lead or equivalent |

Table 1.4 Wire Size (Cont'd)

## 220 V Class Single-phase Input Series

| Circuit | Model JNTBB DCB□ | Inverter Capacity(KVA) | Terminal Symbol | Terminal Screw | Wire Size | | Wire Type |
|---|---|---|---|---|---|---|---|
| | | | | | AWG | mm² | |
| Main Circuit | R500JK--- | 1.4 | R, S, T, B1/P B2, U, V, W | M4 | 14 –10 | 2 to 5.5 | Power cable: 600V vinylsheathed lead or equivalent |
| | | | E | | 14 –10 | 2 to 5.5 | |
| | 0001JK--- | 2.1 | R, S, T, B1/P B2, U, V, W | M4 | 14 –10 | 2 to 5.5 | |
| | | | E | | 14 –10 | 2 to 5.5 | |
| | 0002JK--- | 2.7 | R, S, T, B1/P B2, U, V, W | M4 | 14 –10 | 2 to 5.5 | |
| | | | E | | 14 –10 | 2 to 5.5 | |
| | 0003JK--- | 4.1 | R, S, T, B1/P B2, U, V, W | M4 | 12 -8 | 3.5 to 8 | |
| | | | E | | 14 –8 | 2 to 8 | |
| | 0005JK--- | 6.9 | R, S, T, B1/P B2, U, V, W | M4 | 10 -8 | 5.5 to 8 | |
| | | | E | | 14 –8 | 2 to 8 | |
| Control Circuit | Common to All Models | | 1˜ 14, A, B, C | M 3.5 | 20 -14 | 0.5 to 2 | Shielded lead orequivalent |

- 440V Class 3-phase Input Series

| Circuit | Model JNTAB DCB□ | Inverter Capactiy (KVA) | Terminal Symbol | Terminal Screw | Wire Size | | Wire Type |
|---|---|---|---|---|---|---|---|
| | | | | | AWG | mm² | |
| Main Circuit | R500AZ--- | 1.4 | R, S, T, B1/P B2, U, V, W | M4 | 14 -10 | 2 to 5.5 | Power cable:600V vinylsheathed lead or equivalent |
| | | | E | | 14 -10 | 2 to 5.5 | |
| | 0001AZ--- | 2.2 | R, S, T, B1/P B2, U, V, W | M4 | 14 -10 | 2 to 5.5 | |
| | | | E | | 14 -10 | 2 to 5.5 | |
| | 0002AZ--- | 3.4 | R, S, T, B1/P B2, U, V, W | M4 | 14 -10 | 2 to 5.5 | |
| | | | E | | 14 -10 | 2 to 5.5 | |
| | 0003AZ--- | 4.1 | R, S, T, B1/P B2, U, V, W | M4 | 14 -10 | 2 to 5.5 | |
| | | | E | | 14 -10 | 2 to 5.5 | |
| | 0005AZ--- | 6.9 | R, S, T, B1/P B2, U, V, W | M4 | 14 -10 | 2 to 5.5 | |
| | | | E | | 14 -10 | 2 to 5.5 | |
| | 7R50AZ--- | 10.3 | R, S, T, B1/P B2, U, V, W | M5 | 12 -10 | 3.5 to 5.5 | |
| | | | E | | 14 -10 | 2 to 5.5 | |
| | 0010AZ--- | 13.7 | R, S, T, B1/P B2, U, V, W | M5 | 12 -10 | 3.5 to 5.5 | |
| | | | E | | 14 -10 | 2 to 5.5 | |
| Control Circuit | Common to All Models | | 1˜ 14, A, B, C | M3.5 | 20 -14 | 0 .5 to 2 | Shielded lead or equivalent |

## ***NOTE***

Lead size should be determined considering voltage drop of leads.Voltage drop can be obtained by the following equation:selectsuch lead size that voltage drop will be within 2% of normal rated voltage.

Phase-to-phase voltage drop(V)= $\sqrt{3}\times$ lead resistance(ohm/km)×wiring distance(m) ×current(A) ÷ $10^{3}$ .

- Insertion of power supply coordination AC reactor

  When the power supply capacity exceeds 600 KVA, connect an AC reactor at the inverter input side for power supply coordination. This reactor is also effective for power factor improvement of the power supply.

- Wiring length between inverter and motor

  If total wiring distance between inverter and motor is excessively long and inverter carrier frequency (main transistor switching frequency) is high, harmonic leakage current from the cable willincrease to affect the inverter unit or peripheral devices. If the wiring distance between inverter and motor is long, reduce the in verter carrier frequency as shown below. Carrier frequency can be set by constant Pn-40. For details, refer to “CARRIER FREQUENCY SETTING” on page 89. Carrier frequency is set to 10 KHz at the factory prior to shipping.

| Wiring Distance between Inverter and motor | Up to30 m | Up to50 m | Up to 100 m | 100 m or more |
|---|---|---|---|---|
| Allowable Carrier Frequency (Constant Pn40 Set Value) | 15KHz or less(6) | 10KHz or less(4) | 5KHz or less(2) | 2.5KHz or less(1) |

(6) Wiring

(a)Main circuit input/output

(1)Phase rotation of input terminals R, S, T is available in either direction, clockwise or counterclockwise.

(2)When inverter output terminals U, V, W are connected to motor terminals (U, V, W) respecctively, motor rotates counterclockwise, when viewed from opposite driveend, upon forward run command.To revrese the rotation, interchange any two of the motor leads.

(3)Never connect AC main circuit power supply to output terminals U, V, W. Inverter may be damaged.

(4)Insert an L noise filter to the 7200M3 output, but never connect power factor correction capacitor, LC or RC to 7200M3 output.

(5) Be sure to tighten the main circuit terminal screws.

(6) Be sure to separate the main circuit wiring from inverter and peripheral device control lines.Otherwise, it may cause the devices to malfunction.

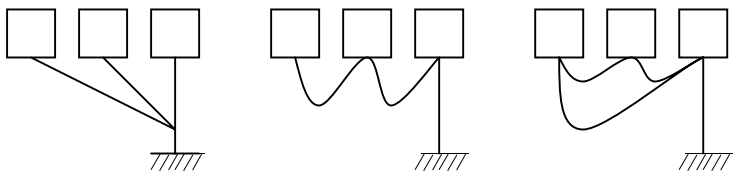
(b)Grounding

(1)Ground the casing of the 7200M3 using ground terminal E. Ground resistance should be 100ohm or less.

(2)Never ground 7200M3 in common with welding machines, motors, or other large-current electrical equipment,or a ground pole. Run the ground lead in aconduit separate from leads for large-current electrical equipment.

(3)Use the ground leads which comply with A WG standarrrds and make the length as short as possible.

(4)Where several 7200M3 units are used side by side, allthe units should be grounded as shown in (a) or (b) of Fig 1.5. Do not from a loop with the groundleads as shown in (c).



(a) GOOD (b) GOOD (c) POOR

Fig.1.5 Grounding of Three 7200M3 Unit

## 1.4.4 Control Circuit

(1)Control circuit wiring

Fig.1.6 shows the relation between the I/O signals (factory pre-set values) and screw terminal numbers. The control signals are connected by screws. The terminal functions shown in the figure indicate standard setting prior to shipping. Since operation mode from the digital operator is set for the model with the digital operator, it is necessary to change the control constants when operation is performed from the control circuit terminals.

For the model with analog operator (JNEP--14) operation mode from the control circuit terminals is the standard setting preset at the factory prior to shipping.

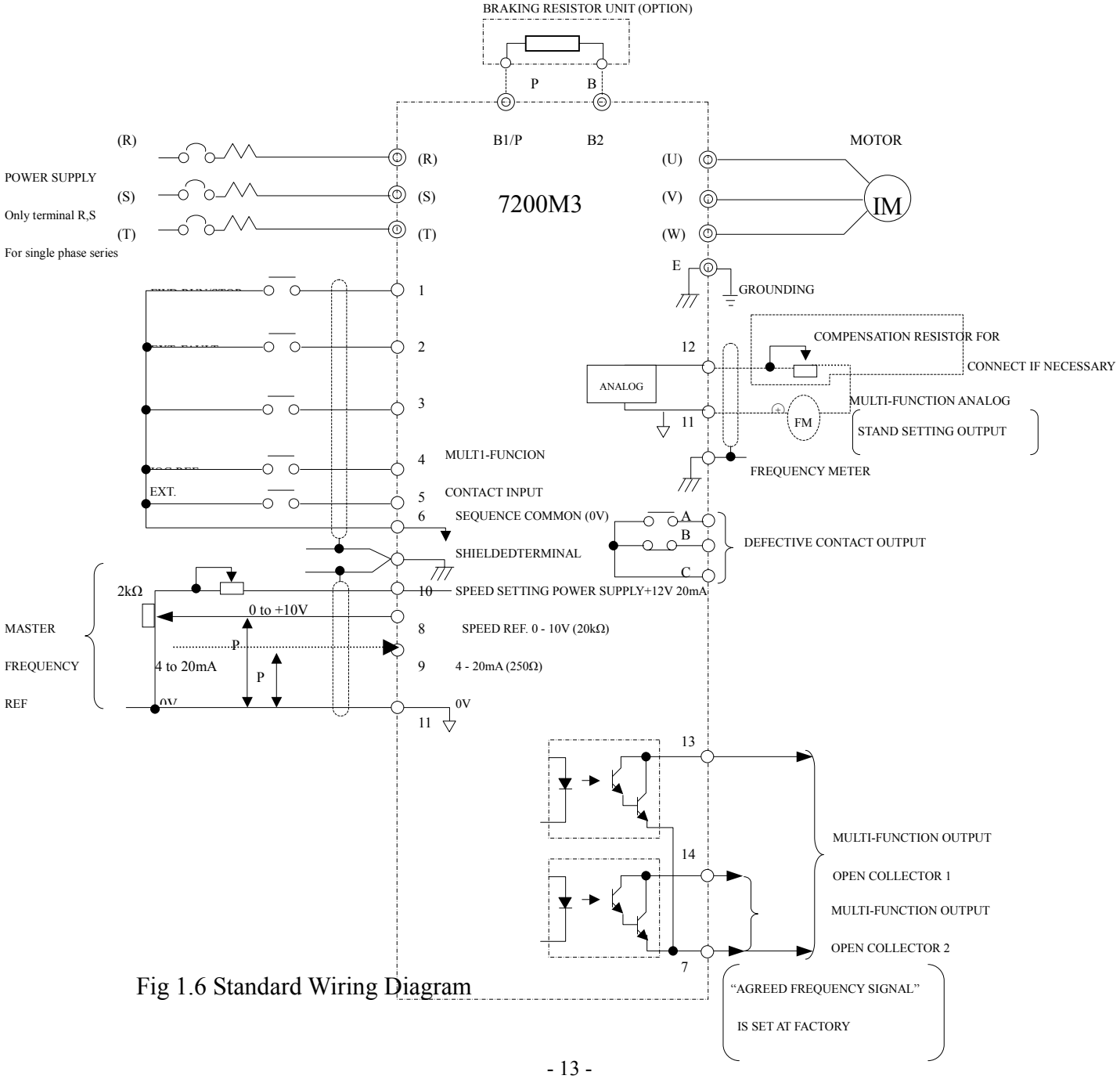



Fig 1.6 Standard Wiring Diagram

(2) Control circuit terminals (factory preset)

## ■ CONTROL CIRCUIT

| Classi-fication | Termina l | Signal Name | Function | | Signal level |
|---|---|---|---|---|---|
| Sequence Input Signal | 1 | Forward operation-stop signal | Forward run at closed, stop at open | | Photo-coupler insulation input +24V DC 8mA |
| | 2 | Reverse operation-stop signal | Reverse run at closed, stop at open | | |
| | 3 | Fault reset input | Reset at closed | | |
| | 4 | External fault input | Fault at closed | Multifunction contact input: Two signals available to select. (Note 1) | |
| | 5 | Multi-step speed ref. 1 | Effective at "closed" | | |
| | 6 | Sequence control input common terminal | ---------- | | |
| Analog Input Signal | 10 | Power supply terminal for speed ref. | Speed ref. power supply | | +12V (Allowable current 20mA max.) |
| | 8 | Speed frequency ref. | 0 to +10V/ Max. Output freq. | | 0 to +10V (20kΩ) |
| | 9 | | 4 to 20Ma/ Max. Output freq.. | | 4 to 20Ma (250Ω) |
| | 11 | Common terminal for control circuit | 0 v | | ---------- |
| Sequence Output Signal | 13 | During running (NO) | "L" level at Run | Multifunction contact input: Two signals available to select. (Note 2) | Open collector output +48V 50Ma or less |
| | 14 | Speed agreed detection | "L" level at set. Frequency = output fre. | | Open collector output +48V 50Ma or less |
| | 7 | Open collector output common | | | --------- |
| | A | Fault contact output common (NO, NC) | Fault at closed between terminals A and C<br>Fault at open between terminals B and C | | Dry contact<br>Contact capacity:<br>250VAC 1A or less<br>30VDC 1A or less |
| | B | | | | |
| | C | | | | |
| Analog Output signal | 21 | Frequency meter output | 0 to 10V/ Max. output frequency. Possible to select current meter output. (Note 3) | | 0 t0 11 V max. 2 mA or less |
| | 22 | Common | | | |

NOTE: 1. For details, refer to "MULTIFUNCTION CONTACT INPUT FUNCTION SELECTION" on page84.

2. For details, refer to "MULTIFUNCTION PHOTO-COUPLER OUTPUT FUNCTION SELECTION" on page 86.

3. For details, refer to "MULTIFUNCTION ANALOG MONITOR SETTING on page 76.

• Control circuit terminal arrangement

| A | B | C |
|---|---|---|

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

(3) Precautions on control circuit wiring

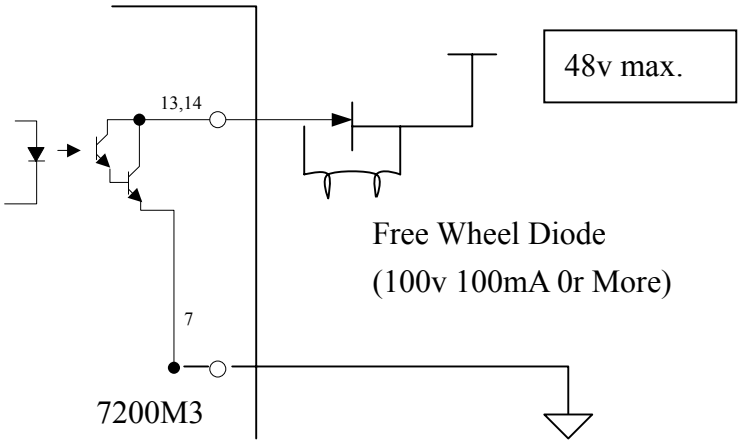
• Separate the control signal line from power lines. Otherwise, it may cause a malfunction.

• For frequency setting signal (analog), use shielded lead and conduct termination sufficiently.

• Wiring length of the control signal line must be 50 m or less.

• To drive the contact input signal by transistor, use one having ratings of 50V 50m A or more. Circuit leakage current at signal OFF must be 100 A or less.

• To drive an inductive load (relay coil, etc.) by multifunction photo coupler output, be sure to insert a free wheel diode.



# 1.5 OPERATION

## 1.5.1 Pre-operation Check

Check the following items after completion of installation and wiring:

(1) No fault in wiring.

Never connect AC main circuit power supply to output terminal (U, V, W)

(2) No short circuit because of wiring contamination (dust, oil, etc.)

(3) Screws and terminals are tightened. Wiring is proper.

Load status is good.

(4) For safe operation, the motor must be able to operate alone by separating it from the coupling of belt which connects the motor and the machine. Pay close attention when the motor is operated with the machine directly connected.

(5) Wiring is not grounded.

(6) Run command is not input.

When the forward/reverse run command is input in the operation mode (factory setting for the model with blind cover) from the control circuit terminal, the motor is activated automatically after the main circuit power supply is turned on. Turn on the inverter power supply after checking that the run command is not input.

## 1.5.2 Pre-operation Setting

Since the standard inverter models are provided with the values indicated in Par. 2.8 (see page 58 and beyond), the digital operator (JNEP--13) must be used in order to change the constants from the initial values to the values in accordance with the load specifications.

The following describes the functions and initial constant set values which ere often used for operation.

### Output frequency and accel / decel time

The maximum output frequency is set to 60 Hz and accel/decel time to 10 seconds at the factory prior to shipping .To change the values, refer to "ACCEL/DECEL TIME SETTING" on page 71.

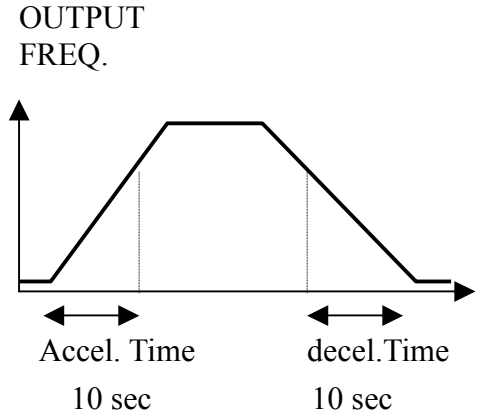



Fig. 1.7 Output Frequency and Accel/Decel Time

### Frequency setting signal and output frequency

Fig 1.8 shows the inverter output frequency for control circuit terminal master frequency reference voltage. To change the value, refer to "FREQUENCY COMMAND GAIN/BIAS" on page 78.

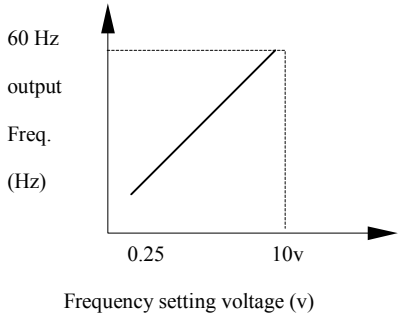
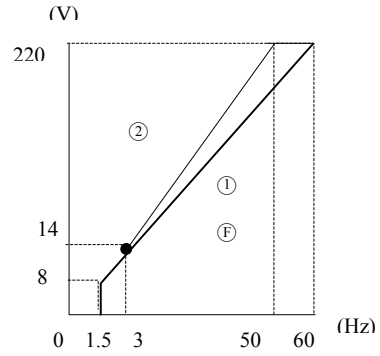



Fig. 1.8 Frequency Setting Signal and Output Frequency

## V / F characteristics

Fig. 1.9 shows the output voltage for inverter output frequency. Wen its characteristic (max.voltage/frequency) differs from that of the optimum motor, refer to “V/f CHARACTERISTIC SETTING” on page 69.




*For 440 V class, the value is twice that of 220 V class.

Fig. 1.9 V/f Characteristics

## Motor rated current setting

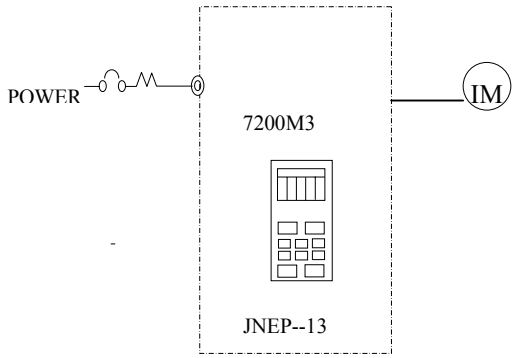
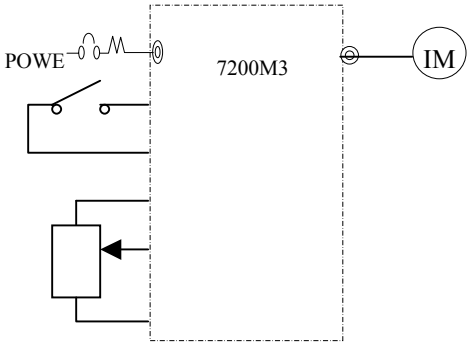
Since the inverter is provided with an electronic thermal overload protective function in order to protect the motor from overheating, set the rated current value described on the motor nameplate to constant (Pn-19). TECO standard 4-pole motor current value is set as the initial value .For details, refer to “ELECTRONIG THERMAL OVERLOAD FUNCTION” on page 74.

Note:

Provide a thermal overload relay or thermal protector for each motor when more than two motors are operated simultaneously.

## 1.5.3 Test Run Method

The inverter can be operated in the following two ways .The model with digital operator is set to “OPERATION MODE BY DIGITAL OPERATOR” and the model with analog operator (JNEP--14) is set to “OPERATION MODE FROM CONTROL CIRCUIT TERMINAL” prior to shipping.

| Run by digital operator (Standard setting of model with digital operator ) | Run by control circuit terminal input ( Standard Setting of model with analog operator) |
|---|---|
| This method is to operate the inverter by using the RUN (run command) key, etc. of the digital operator.<br>Since this operation mode is set at the factory prior to shipping, operation can be performed only by main circuit wiring.<br>For details of the operation method, refer to Section 2 beginning on page 43. | This method is to operate the inverter by frequency setter or operation switch connected to the control circuit terminal.<br>To perform operation by control circuit terminal input of the model with digital operator, change the operation mode to “ OPERATION FROM CONTROL CIRCUIT TERMINAL” (Pn-01=0000). |
|  |  <br>JNEP--14 |

POWER ON

| | Operation by digital operator (Standard setting of models with digital operator ) (Note 2) | Operation by control circuit (Standard setting of models with analog operator) |
|---|---|---|
| Operation Method Selection | Need not to change the mode since operation mode by digital operator is set at the factory. | • Enter the program mode ( depress PRG/DRV key) and set Pn-01 data 0000 by using UP , DOWN Or SHIFT key. Then depress DATA key.<br>• Enter the drive mode. ( depress PRG/DRV key).<br>• After above operation, command from control circuit terminal can be received. (Note) |
| Operation | • Select frequency reference value display ***F000.0*** by depressing DSPL key on digital operator.<br>• Depress DATA key after setting frequency value by using △, ▽ or SHIFT key.<br>• Depress RUN key. | • Turn the frequency setter knob to the left to decrease value fully. (Frequency reference=0)<br>• Turn on FWD or REV run signal.<br>• Turn the frequency setter knob slowly to the right to increase value fully. |
| Stopping | • Depress RUN key. | • Turn the frequency setter knob slowly to the left to decrease value fully.<br>• Turn off FWD or REV run signal. |

Note: 1. Models with analog operator (the standard setting preset at the factory prior to shipping) need not this operation.

2.Refer. to Par.2.2 "DIGITAL OPERATOR OPERATION EXAMPLE" (Page 49) for details of digital operator operation.

### 1.5.4 Inverter Status Display LED

With the model with analog operator or free kit operator, LED provided for the inverter is of help to know the inverter status. This LED can be seen by removing the terminal cover or from the right side without removing the cover. Inverter status can be seen by the LED lighting modes. Table 1.6 shows the LED lighting modes and the contents. Check that the inverter is in the normal status at power ON in the test run stage. Free kit operator (JNEP--15) has are LED on the operator cover also, it display the same inverter status as showing in table 1.6.

Table 1.6 LED Display and Contents

| Inverter Status | LED Display DSI (RED.) | Display Contents | Remarks |
|---|---|---|---|
| Normal | ☀ | Operation ready (during STOP) | |
| | | During normal RUN | |
| Alarm | ☼ | Power supply voltage reduction, external BB inputting. Etc. in STOP status | Automatic recovery by protective operation release |
| Protective operation | ☼ | Inverter external fault (EF is input). | Can be reset by removing the factor. (Hardware fault if not recovered) |
| | | Overload protection such as inverter overload (OL.), fin overheat, etc. | |
| | | Voltage protection such as over voltage (OV) under voltage (UV) | |
| | | Over current protection (OC) | |
| Inverter fault | ● | Digital hardware memory fault (CPF) | Cannot be reset (replace the inverter) (Note 1) |
| | | Hardware fault such as control power supply fault, CPU runaway, etc. | Cannot be reset. (Replace the inverter). |

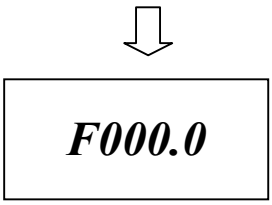
● : LED light off, ☀ : LED blink, ☼ :LED light

Note 1. By initializing control constants using the digital operator, errors may be released. For details of constant initialization, refer to “DISPLAY OF OPERATOR” on page 67.

## 1.5.5 Digital Operator Display

When the inverter power supply is turned ON for the first time, the digital operator displays as shown below. If an alarm is displayed, refer to Par 1.7 “FAULT DISPLAY AND TROUBLESHOOTING” on page 26 to remove the factor.


1. Drive mode display (DRV): Lights.
2. Rotating direction display (FWD): Lights
   (REV): Extinguished
3. EXT mode display (EXT RUN, CMD):
   Extinguished.
4 .During RUN display (RUN):
5. During STOP display (STOP): Lights.
6. 7-segment LED display (5digits):
   Output frequency reference set value




### 1.5.6 Check Points at Test Run

The following describes the checkpoints at test run. If any fault occurs, recheck the wiring and load status. For details, refer to Par. 1.7.3 “Corrective Action for Motor Faults” onpage31.

- Motor rotates smoothly.
- Motor rotates in the proper direction.
- Motor does not have any abnormal vibration or beat.
- Acceleration or deceleration goes smoothly.
- Current suitable for load flows.
- Status display LED or digital operator display is proper.

# ***CAUTIONS***

(1) The motor does not start up if both FWD and REV run signals are turned ON simultaneously. If they are turned ON simultaneously during run, the motor stops according to the stopping method selection of constant (Pn-01) 3 rd digit. (Deceleration to a stop is selected for factory setting.)

(2) When output frequency is reduced to 1.5 Hz (preset value prior to shipping) at deceleration, the DC injection braking operates for 0.5 second (preset value prior to shipping) and metallic noise is generated by the motor. However, this noise is normal. To eliminate this noise, refer to “DC INJECTION BRAKING” on page 80.

(3) If a fault occurs during acceleration or deceleration and the motor coasts to a stop, check the motor stop and then the following items. For details, refer to Par. 1.7 “FAULT DISPLAY AND TROUBLESHOOTING” on page 26.

- Load is not excessively large.
- Accel/decel time is long enough for load.

(4) Resetting must be performed by fault reset input signal (or SHIFT key of the digital operator) or by turning OFF the power supply.

(5) In a sequence where run/stop is performed by the magnetic contactor for main circuit power supply, the repeating time (power ON interval to the inverter) must be one hour or more.

## 1.6 MAINTENANCE

### 1.6.1 Periodical Inspection

7200M3 requires very few routine checks .It will function longer if it is kept clean cool and dry, while observing the precautions listed in “Location” (Par.1.3). Check for tightness of electrical connections, discoloration or other signs of overheating. Use Table 1.7 as the inspection guide. Before servicing, turn OFF AC main circuit power and be sure that CHARGE lamp is OFF.

Table 1.7 Periodical Inspection

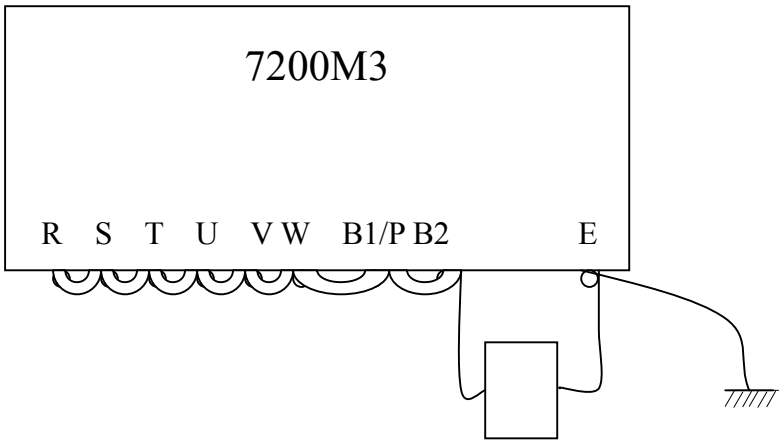
| Component | Check | Corrective Action |
|---|---|---|
| External Terminals, Unit Mounting Bolts, Connectors, etc. | Loosened screws | Tighten |
| | Loosened connectors | Tighten |
| Cooling Fins | Build-up of dust or dirt | Blow with dry compressed air of 392 $\times 10^3$ to 588$\times 10^3$ Pa[57 to 85 1bs.. in² (4 to 6 kg. cm²)]pressure.. |
| Printed Circuit Board | Accumulation of conductive dust or oil mist | Clean the board.<br>If dust and oil cannot be removed, replace the inverter unit |
| Cooling Fan | Abnormal noise or vibration.<br>Whether the cumulative operation time exceeds 20,000 hours or not | Replace the inverter unit. |
| Power Elements | Accumulation of dust or dirt | |
| Smoothing Capacitor | Discoloration or odor | Replace the inverter unit. |

## 1.6.2 High Voltage Test

Use an insulation resistance tester (500V) to conduct insulation resistance test (high voltage test) on the main control circuit as described below.

(1) Remove the inverter main circuit and control circuit terminal wiring and execute the test only between the main circuit terminals and ground [ground terminal E] as shown in Fig.1.10.

(2) The equipment is normal with the insulation resistance tester indicating 1MΩ or more.




Note: Do not conduct high voltage test on the control circuit terminals.

Fig.1.10 High Voltage Test

## 1.7 FAULT DISPLAY AND TROUBLESHOOTING

If a fault occurs and the inverter functions are lost, check for the causes and provide proper corrective actions, referring to the following checking method.

Contact your TECO representative if any fault other than described below occurs, if the inverter itself malfunctions, if any parts are damaged, or if you have any other problems.

### 1.7.1 Checking of Causes

The inverter has protective functions to protect it from faults such as overcurrent or overvoltage. If a fault occurs, the protective functions operate to shut off the inverter output and the motor coasts to a stop. At the same time, the fault contact signal is output.

When the protective functions operate in models with analog operator, LED displays a fault show in table 1.6. Also when the digital operator is used, the fault display is provided as shown in table 1.8.

The operation can be restarted by turning ON the fault reset input signal (or RESET key of the digital operator) or turning OFF the power supply and ON again.

Table 1.8 Fault Display and Contents

| Digital Operator fault display | Contents | Possible Cause/ Corrective Actions |
|---|---|---|
| OC (Over-current) | Inverter output current exceeds 200% of rated current. (Momentary action) | The following cause can be considered: inverter output side short-circuit. Excessive short setting of accel/decel time, [constant Pn-09~12] special motor use, motor start during coasting, start of motor with larger capacity than inverter, inverter output side magnetic contactor ON/OFF. Reset after finding the cause. |
| OV (Over-voltage) | Main circuit DC voltage exceeds 410 V or more for 2220 V class. 820 V or more for 440 V class because of excessive regenerative energy from motor. (Exceeds over voltage protection level.) | Decel time setting is not sufficient. [Constant Pn-10, 12] or minus load (cranes, etc.) is decreasing. Increase decel time or connect a braking resistor (option). |
| UV (Under-voltage) | Under voltage status is entered. [Main control DC voltage becomes approx. 210 V or less (220 V class 3-phase).170 V or less (220 V class single-phase) or 420 V or less (440 V class 3-phase)]. | Input power supply voltage is reduced, phases are opened or momentary power loss occurs, etc. Check the power supply voltage, or check that main circuit power supply wiring is connected properly or terminal screws are tightened well. |
| OH (Cooling Fin Overheat) | Temperature rise caused by inverter overload operation, or intake air temperature rise. Cooling fan r/min is decreased | Load is too large, V/f characteristic are not proper, setting time is too short or intake air temperature exceeds 113°F (45°C), etc. Correct load size, V/f set value [constant Pn-02~Pn-08] or intake air temperature. Check the cooling fan. |

Table 1.8 Fault Display and Contents (Cont'd)

| Digital Operator fault display | Contents | Possible Cause/ Corrective Actions |
|---|---|---|
| OL1 (Motor Overload) | Motor overload protection operates because of electronic thermal overload. | Correct load size, operation pattern or V/f set value [constant Pn-02~08]. Set the rated current value described in the motor nameplate to constant Pn-19. |
| OL2 (Inverter Overload) | Inverter overload protection operates because of electronic thermal overload. | Correct load size, operation pattern or V/f set value [constant Pn-02~08]. Recheck the inverter capacity. |
| OL3 (Overtorque Detection) | Motor current exceeding set value is applied because of machine fault or overload. | Check the machine using status and remove the cause. Or increase the set value up to the machine allowable value [constant Pn-38]. |
| EF4.5 (Note 2) (External Fault) | Inverter accepts external fault input from external circuit. | Check the external circuitry (sequence). |
| CPF (Note 3) (Control Function Fault) | Inverter control functions are broken down | Turn OFF the power supply once and then turn it ON again. Or initialize the control constant by using the digital operator. If the fault still exists, replace the inverter. |
| Digital display is extinguished. | • Main circuit fuse is blown. (For 440V class only)<br>• Control power supply fault<br>• Hardware fault | Replace the inverter. |

Note: 1. For OL3 ( overtorque detection) fault display or alarm display can be selected according to the constant (Pn-37) setting. For details, refer to "OVERTORQUE DETECTION FUNCTION" on page 99.

2. EF4 shows external fault input from multifunction contact input terminal 4,and EF5 from terminal 5.

3. For details of CPF (control function faults) refer to Table 1.9. "Details of CPF Display.

Table 1.9 Details of CPF Display

| Digital Operator fault display | Contents | Possible Cause/ Corrective Actions |
|---|---|---|
| CPF-00 | Digital Operator Communication error 1 | Turn OFF the power supply once and turn it ON again. If the fault still exists, replace the inverter. |
| CPF-01 | Digital Operator Communication error 2 | |
| CPF-04 | E²PROM fault | Record all data, and then make initialization. Turn OFF the power supply once and turn it ON again. If the fault still exists, replace the inverter. For initialization of constants, refer to Par. 2.5.1 “Constant Initialization” on page51. |
| CPF-05 | AD converter fault in CPU | |

## 1.7.2 Alarm Display and Contents

Alarms, among inverter protective functions, do not operate fault contact output and returns to the former operation status automatically when the factor is removed.

The following shows the types and contents.

Table 1.10 Alarm Display and Contents

| Digital Operator fault display | Contents | Possible Cause/ Corrective Actions |
|---|---|---|
| EF<br>(Simultaneous Input of FWD and REV commands)<br>*EF* blinks. | Both FWD and REV commands are "closed" for 500 ms or larger. Inverter stops according to constants Pn-01. | Check the sequence circuit. |
| BB<br>(External Baseblock)<br>*bb* blinks. | External baseblock signal is accepted. Inverter stops output. (Operation restarts by releasing the external baseblock signal.)<br>For the external baseblock signal, refer to "MULTIFUNCTION CONTACT INPUT FUNCTION SELECTION" on page 84. | Check the sequence circuit |
| UV (Main Circuit Under-voltage)<br>*Uv* blinks. | Main circuit DC voltage is reduced less than detection level when inverter is not outputting. | Check the power supply voltage, main circuit power supply wiring connection or terminal screw tightening. |
| OL3<br>(Overtorque Detection)<br>(Note 1)<br>*oL3* blinks | Motor current exceeding the set value flows due to machine fault or overload. Inverter continues operation. | Check the machine using status and remove the cause of the fault.<br>Or increase the set value [constant Pn-38] up to the machine allowable value. |
| OV (Over Voltage)<br>*ov* blinks | Main circuit DC voltage is more than overvoltage detection level. When inverter is not outputting. | Check the power supply voltage |
| OH (Cooling fin Over Heat)<br>*oH* blinks | Intake air temperature rises when inverter is not outputting. | Check the intake air temperature. |

Note: 1. For OL3 (overtorque detection) fault display or alarm display can be selected according to the constant (Pn-37) setting .For details, refer "OVERTORQUE DETECTION FUNCTION" on page 88.

## 1.7.3 Corrective Action for Motor Faults

Table 1.11 shows the check points and corrective actions of motor faults.

Table 1.11 Motor Faults and Corrective Actions

| Fault | Check point | Corrective Action |
|---|---|---|
| Motor does not rotate. | Power supply voltage is applied to power supply terminals R, S, T.<br>(Check that charge lamp is ON.) | • Turn ON the power supply.<br>• Turn OFF the power supply and then ON again.<br>• Check power supply voltage.<br>• Check that terminal screws are tight. |
| | Voltage is output to output terminals U, V, W (Use rectifier type voltmeter.) | • Turn OFF the power supply and then ON again. |
| | Load is excessively large. (Motor is locked.) | Reduce the load. (Release the lock.) |
| | Fault is displayed. | Check according to Par. 1.7.1. |
| | FWD or REV run command is entered. | Correct the wiring. |
| | Frequency setting voltage is entered. | • Correct the wiring.<br>• Check frequency setting Voltage. |
| | Operation (method selection) mode setting is proper. | Check the operation method Selection mode [constant Pn-01] by using the digital operator. |
| Motor rotating direction is reversed. | Wiring of output terminals U, V, W is correct. | Match them to the phase order of motor U, V, W. |
| | Wiring of FWD and REV run signals is correct. | Correct the wiring. |

| Fault | Check Point | Corrective Action |
|---|---|---|
| Motor rotates but variable speed is not available. | .Wiring of frequency setting circuit is correct | Correct the wiring. |
| | Operation (method selection) mode setting is correct. | Check operation method selection mode [constant Pn-01] by digital operator. |
| | Load is not excessively large. | Reduce the load. |
| Motor r/min is too high (low). | Motor ratings (number of poles, voltage) are proper. | Check the specifications and nameplate. |
| | Accel/decel ratio by speed changer (gears, etc.) is correct. | Check speed changer (gears etc.) |
| | Maximum frequency set value is correct. | Check the max. Frequency set value [constant Pn-02] |
| | Voltage between motor terminals is not excessively reduced. (Use rectifier type Volt-meter) | Check V/f characteristic set value [Constant Pn-02~08] |
| Motor r/min is not stable during operation (Note) | Load is not excessively large. | Reduce the load. |
| | Load variation is not excessively large. | • Reduce the load variation.<br>• Increase the inverter or motor capacity. |
| | 3-phase or single-phase power supply is used. | Connect an Ac reactor to the power supply if single-phase power supply is used. |

Note: Because of motor and load (geared machine) characteristics, motor r/min becomes unstable or motor current ripples. To correct these problems, changing the inverter control constants may be effective. Refer to “FUNCTIONS FOR REDUCTION OF MACHING VIBRATION OR SHOCK” on page 99 for details of control constants to be changed.

## 1.8 SPECIFICATIONS

### 1.8.1 Specifications

| Voltage Class | | 220 3-phase | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Inverter Model | | JNTABDCB□ JK--- | | | | | | |
| | | R500 | 0001 | 0002 | 0003 | 0005 | 7R50 | 0010 |
| Max. Applicable Motor Output HP (KW) *1 | | 0.5(0.4) | 1(0.75) | 2(1.5) | 3(2.2) | 5(3.7) | 7.5(5.5) | 10(7.5) |
| Output characteristics | Inverter Capacity KVA | 1.4 | 2.1 | 2.7 | 4.1 | 6.9 | 10.3 | 13.7 |
| | Rated Output current A | 3.2 | 4.8 | 6.5 | 9.6 | 16 | 24 | 32 |
| | Max. Output Voltage V | 3-phase 200 to 230V , 50/60 Hz (proportional to input voltage) | | | | | | |
| | Max. Output Frequency | 400 Hz (available with constant setting) | | | | | | |
| Power Supply | Rated Input Voltage and Freq. | 3-phase 200 to 230V , 50/60 Hz | | | | | | |
| | Allowable Volt. Fluctuation | ± 10 % | | | | | | |
| | Allowable Freq. Fluctuation | ± 5 % | | | | | | |
| Control Characteristics | Control Method | Sine wave PWM | | | | | | |
| | Freq. Control Range | 0.1 to 400 Hz | | | | | | |
| | Frequency Accuracy | Digital command: 0.01% , Analog command : 0.1% | | | | | | |
| | Freq. Setting Resolution | Digital : 0.1 Hz , Analog : 0.06/60Hz | | | | | | |
| | Output freq. Resolution | 0.1 Hz | | | | | | |
| | Overload Capacity | 150% rated output current for one minute | | | | | | |
| | Freq. Setting Signal | 0 to 10v (20kΩ), 4 to 20 mA (250Ω) | | | | | | |
| | Accel/Decel. Time | 0.1 to 600 sec (accel/decel time setting independently) | | | | | | |
| | Braking Torque | Approx. 20%(up to 150% possible with optional braking resistor) | | | | | | |
| | V/F Characteristic | Possible to set any program of v/f pattern | | | | | | |
| | Stall prevention level | Possible to set operating current | | | | | | |
| Protection Function | Instantaneous OC | Motor coasts to stop at approx. 200% rated current | | | | | | |
| | Overload | Motor coasts to stop for 1 minute at approx. 150% rated output current | | | | | | |
| | Motor overload | Electronic thermal overload relay | | | | | | |
| | Overvoltage | Motor coasts to stop if main circuit voltage exceeds 410v | | | | | | |
| | Undervoltage | Stop when main circuit DC voltage is approx. 210v or less | | | | | | |
| | Momentary Power loss | 15ms or longer *2 | | | | | | |
| | Cooling Fin Overheat | Protected by thermoswitch (only for forced cooling method) | | | | | | |
| | Power Charge Indication | Charge lamp stays on until main circuit DC voltage drops below 50v | | | | | | |

*1. TECO standard 4-pole motor is used for max. applicable motor output

*2. To select "automatic restart after momentary power loss " set the 1st digit of constant (Pn-46) to "1"

Automatic restart is available within approx. 1 second for models of 1HP or less or within approx. 2 seconds for models of 2 HP or more.

## 1.8.1 Specifications (continue)

| Voltage Class | | 220 Single-phase | | | | |
|---|---|---|---|---|---|---|
| Inverter Model | | JNTBBDCB□ JK--- | | | | |
| | | R500 | 0001 | 0002 | 0003 | 0005 |
| Max. Applicable Motor Output HP (KW) *1 | | 0.5(0.4) | 1(0.75) | 2(1.5) | 3(2.2) | 5(3.7) |
| Output characteristics | Inverter Capacity KVA | 1.4 | 2.1 | 2.7 | 4.1 | 6.9 |
| | Rated Output current A | 3.2 | 4.8 | 6.5 | 9.6 | 16 |
| | Max. Output Voltage V | 3-phase 200 to 240V , 50/60 Hz (proportional to input voltage) | | | | |
| | Max. Output Frequency | 400 Hz (available with constant setting) | | | | |
| Power Supply | Rated Input Voltage and Freq. | Single-phase 200 to 240V , 50/60 Hz | | | | |
| | Allowable Volt. Fluctuation | ± 10 % | | | | |
| | Allowable Freq. Fluctuation | ± 5 % | | | | |
| Control Characteristics | Control Method | Sine wave PWM | | | | |
| | Freq. Control Range | 0.1 to 400 Hz | | | | |
| | Frequency Accuracy | Digital command: 0.01% , Analog command : 0.1% | | | | |
| | Freq. Setting Resolution | Digital : 0.1 Hz , Analog : 0.06/60Hz | | | | |
| | Output freq. Resolution | 0.1 Hz | | | | |
| | Overload Capacity | 150% rated output current for one minute | | | | |
| | Freq. Setting Signal | 0 to 10v (20kΩ), 4 to 20 mA (250Ω) | | | | |
| | Accel/Decel. Time | 0.1 to 600 sec (accel/decel time setting independently) | | | | |
| | Braking Torque | Approx. 20%(up to 150% possible with optional braking resistor) | | | | |
| | V/F Characteristic | Possible to set any program of v/f pattern | | | | |
| | Stall prevention level | Possible to set operating current | | | | |
| Protection Function | Instantaneous OC | Motor coasts to stop at approx. 200% rated current | | | | |
| | Overload | Motor coasts to stop for 1 minute at approx. 150% rated output current | | | | |
| | Motor overload | Electronic thermal overload relay | | | | |
| | Overvoltage | Motor coasts to stop if main circuit voltage exceeds 410v | | | | |
| | Undervoltage | Stop when main circuit DC voltage is approx. 210v or less | | | | |
| | Momentary Power loss | 15ms or longer *2 | | | | |
| | Cooling Fin Overheat | Protected by thermoswitch (only for forced cooling method) | | | | |
| | Power Charge Indication | Charge lamp stays on until main circuit DC voltage drops below 50v | | | | |

## 1.8.1 Specifications (continue)

| Voltage Class | | 220 3-phase | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Inverter Model | | JNTABDCB□ JK--- | | | | | | |
| | | R500 | 0001 | 0002 | 0003 | 0005 | 7R50 | 0010 |
| Max. Applicable Motor Output HP (KW) *1 | | 0.5(0.4) | 1(0.75) | 2(1.5) | 3(2.2) | 5(3.7) | 7.5(5.5) | 10(7.5) |
| Environmental characteristics | Mass (Kg) | ---- | 2.5 | 2.5 | 5.0 | 5.0 | 9.5 | 9.5 |
| | Cooling Method | Self-cooling | | | Forced cooling | | | |
| | Protective Configuration | NEMA 1 (open chassis type also available) | | | | | | |
| | Location | Indoor (protected from corrosive gases and dust) | | | | | | |

## 1.8.1 Specifications (continue)

| Voltage Class | | 220 Single-phase | | | | |
|---|---|---|---|---|---|---|
| Inverter Model | | JNTBBDCB□ JK--- | | | | |
| | | R500 | 0001 | 0002 | 0003 | 0005 |
| Max. Applicable Motor Output HP (KW) *1 | | 0.5(0.4) | 1(0.75) | 2(1.5) | 3(2.2) | 5(3.7) |
| Output characteristics | Inverter Capacity KVA | 1.4 | 2.1 | 2.7 | 4.1 | 6.9 |
| | Rated Output current A | 3.2 | 4.8 | 6.5 | 9.6 | 16 |
| | Max. Output Voltage V | 3-phase 200 to 240V , 50/60 Hz (proportional to input voltage) | | | | |
| | Max. Output Frequency | 400 Hz (available with constant setting) | | | | |
| Mass (Kg) | | ----- | 4.6 | 4.6 | 6.7 | 7.4 |
| Cooling Method | | Self-cooling | | Self-cooling | Forced cooling | |
| Protective Configuration | | NEMA 1 (open chassis type also available) | | | | |
| Location | | Indoor(protected from corrosive gases and dust) | | | | |

## 1.8.1 Specifications (continue)

| Voltage Class | | 440 3-phase | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Inverter Model | | JNTABDCB □ AZ--- | | | | | | |
| | | R500 | 0001 | 0002 | 0003 | 0005 | 7R50 | 0010 |
| Max. Applicable Motor Output HP (KW) *1 | | 0.5(0.4) | 1(0.75) | 2(1.5) | 3(2.2) | 5(3.7) | 7.5(5.5) | 10(7.5) |
| Output characteristics | Inverter Capacity KVA | 1.4 | 2.1 | 2.7 | 4.1 | 6.9 | 10.3 | 13.7 |
| | Rated Output current A | 1.6 | 2.6 | 4 | 4.8 | 8 | 12 | 16 |
| | Max. Output Voltage V | 3-phase 380 to 460V , 50/60 Hz (proportional to input voltage) | | | | | | |
| | Max. Output Frequency | 400 Hz (available with constant setting) | | | | | | |
| Power Supply | Rated Input Voltage and Freq. | 3-phase 380 to 460V , 50/60 Hz | | | | | | |
| | Allowable Volt. Fluctuation | ± 10 % | | | | | | |
| | Allowable Freq. Fluctuation | ± 5 % | | | | | | |
| Control Characteristics | Control Method | Sine wave PWM | | | | | | |
| | Freq. Control Range | 0.1 to 400 Hz | | | | | | |
| | Frequency Accuracy | Digital command: 0.01% , Analog command : 0.1% | | | | | | |
| | Freq. Setting Resolution | Digital : 0.1 Hz , Analog : 0.06/60Hz | | | | | | |
| | Output freq. Resolution | 0.1 Hz | | | | | | |
| | Overload Capacity | 150% rated output current for one minute | | | | | | |
| | Freq. Setting Signal | 0 to 10v (20kΩ), 4 to 20 mA (250Ω) | | | | | | |
| | Accel/Decel. Time | 0.1 to 600 sec (accel/decel time setting independently) | | | | | | |
| | Braking Torque | Approx. 20%(up to 150% possible with optional braking resistor) | | | | | | |
| | V/F Characteristic | Possible to set any program of v/f pattern | | | | | | |
| | Stall prevention level | Possible to set operating current | | | | | | |
| Protection Function | Instantaneous OC | Motor coasts to stop at approx. 200% rated current | | | | | | |
| | Overload | Motor coasts to stop for 1 minute at approx. 150% rated output current | | | | | | |
| | Motor overload | Electronic thermal overload relay | | | | | | |
| | Overvoltage | Motor coasts to stop if main circuit voltage exceeds 820v | | | | | | |
| | Undervoltage | Stop when main circuit DC voltage is approx. 420v or less | | | | | | |
| | Momentary Power loss | 15ms or longer *2 | | | | | | |
| | Cooling Fin Overheat | Protected by thermoswitch (only for forced cooling method) | | | | | | |
| | Power Charge Indication | Charge lamp stays on until main circuit DC voltage drops below 50v | | | | | | |

*1. TECO standard 4-pole motor is used for max. applicable motor output

*2. To select “automatic restart after momentary power loss “ set the 1st digit of constant (Pn-46) to “1”

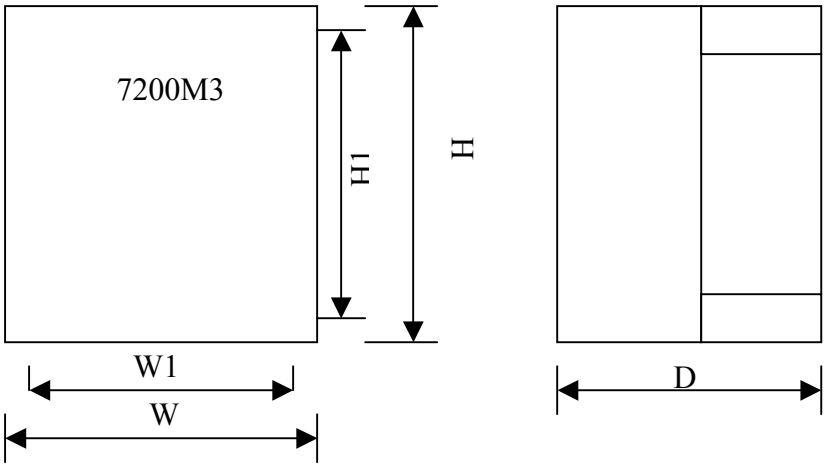
Automatic restart is available within approx. 1 second for models of 1HP or less or within approx. 2 seconds for models of 2 HP or more.

## 1.8.1 Specifications (continue)

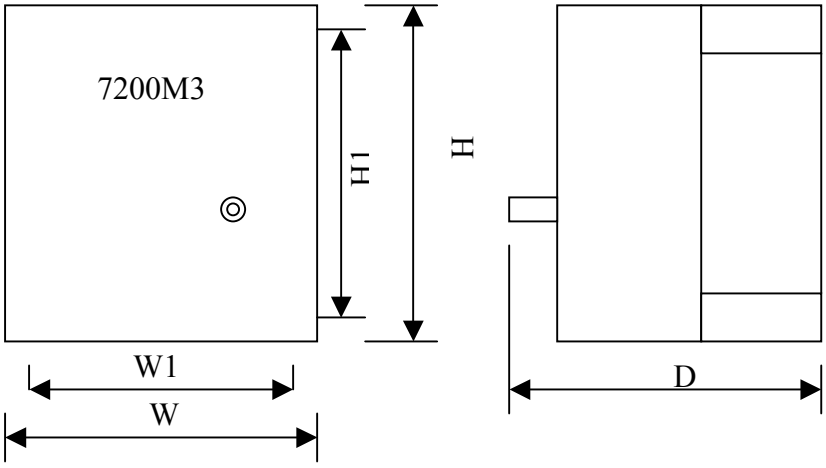
| Voltage Class | | 440v 3-phase | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Inverter Model | | JNTABDCB □ AZ--- | | | | | | |
| | | R500 | 0001 | 0002 | 0003 | 0005 | 7R50 | 0010 |
| Max. Applicable Motor Output HP (KW) *1 | | 0.5(0.4) | 1(0.75) | 2(1.5) | 3(2.2) | 5(3.7) | 7.5(5.5) | 10(7.5) |
| Environmental characteristics | Mass (Kg) | ---- | 4.5 | 4.6 | 6.4 | 6.7 | 9.5 | 9.5 |
| | Cooling Method | Self-cooling | | | Forced cooling | | | |
| | Protective Configuration | NEMA 1 (open chassis type also available) | | | | | | |
| | Location | Indoor (protected from corrosive gases and dust) | | | | | | |

## 1.8.2 Dimensions

(A) Digital Operator Type




(B) Analog Operator Type




Unit : mm

| Operator | Contents | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | W | H | D | W1 | H1 | d |
| Digital | 220V 3Ø 0.5~2 HP | 140 | 150 | 150 | 130 | 140 | M4 |
| | 220V 1Ø 0.5~2 HP<br>3Ø 3~5 HP<br>440V 3Ø 0.5~2 HP | 140 | 250 | 171 | 130 | 240 | M4 |
| | 220V 1Ø 3~5 HP<br>440V 3Ø 3~5 HP | 205 | 305 | 165 | 180 | 285 | M6 |
| | 220V 3Ø 7.5~10 HP<br>440V 3Ø 7.5~10 HP | 205 | 354 | 200 | 180 | 335 | M6 |
| Analog | 220V 3Ø 0.5~2 HP | 140 | 150 | 170 | 130 | 140 | M4 |
| | 220V 1Ø 0.5~2 HP<br>3Ø 3~5 HP<br>440V 3Ø 0.5~2 HP | 140 | 250 | 191 | 130 | 240 | M4 |
| | 220V 1Ø 3~5 HP<br>440V 3Ø 3~5 HP | 205 | 305 | 185 | 180 | 285 | M6 |
| | 220V 3Ø 7.5~10 HP<br>440V 3Ø 7.5~10 HP | 205 | 354 | 220 | 180 | 335 | M6 |

## 1.9 OPTIONS AND PERIPHERAL UNITS

| Name | Model (Code No.) | Function | Installing position | Ref. No (3H358 ) |
|---|---|---|---|---|
| Extension Cable for Digital Operator | 1m 3H300C0820006 3m 3H300C0800005 | This extension cable is used when the digital operator is used after removing from the inverter front cover. The cable is available in 1-m and 3-m lengths. | On the front cover | D0180005 |
| Frequency Meter | 3M901D3760000 | 60Hz/120Hz. | Separately installed | — |
| R .P. M. Meter | 3M901D4250005 | 0~1800RPM | Separately installed | — |
| Digital Operator | JNEP--13 | The 7200M3 operator has two types of models: with digital operator and with analog operators. Models with digital operators can be operated from the digital operator only by main circuit wiring. | On the inverter front cover | — |
| Free kit Operator | JNEP--15 | Models with free kit operator are operated by control circuit terminals. There is only a LED on the operator, can display the inverter status | On the inverter front cover | — |
| Analog Operator Unit | JNEP--16 | An exclusive control panel for remotely setting frequency and for turning the unit ON/OFF using analog commands (distance up too50m). | Separately installed | — |
| Braking Resistor | ERF-150W (3H333C-001 ) | Shortens the motor deceleration time by causing the regenerative energy to be consumed through the resistor. Available at 100% deceleration torque at 3% ED for resistor unit only. | Separately installed | — |
| Frequency Setting potentiometer | 3H300D1260002 | Including 2kΩ potentiometer, knob and scale plate. | On the inverter front cover | — |