

# L510

Compact V/F Control Drive



# L510 Series Compact V/F Control Drive



Received prestigious Taiwan Excellence Award 2011 for outstanding design and unique features.



## MAIN FEATURES

- 32 bit CPU design provides high performance, faster A/D conversion and torque compensation.
- Output frequency up to 650Hz.
- Built-in Modbus RS485 communication for one to one and one to many control.
- Communication interface modules for Profibus/ DeviceNet/ Ethernet(TCP/IP)/ CANopen.
- Built-in digital display and keypad including speed adjustment potentiometer.
- RJ45 interface for PC and copy module.
- Built-in EMI filter. For interference suppression in compliance with (IEC) EN61800-3.
- Compact space saving design for side by side installation. Plus optional Din rail mounting kit.
- Cooling without fan design for frame 1. Effectively lower the probability of unknown objects entering and prolong the product life.
- PID functionality
- Auto run. 7 programmable sequences ( single cycle or repeated cycles)
- Auto Carrier frequency change to limit inverter over temperature.
- Full protective functions.

| Power Rating | 0.2kW<br>0.25HP | 0.4kW<br>0.5HP | 0.75kW<br>1HP | 1.5kW<br>2HP | 2.2kW<br>3HP |
|--------------|-----------------|----------------|---------------|--------------|--------------|
| L510         | 100V 1-phase    |                |               |              |              |
|              | 200V 1-phase    |                |               |              |              |
|              | 200V 3-phase    |                |               |              |              |
|              |                 |                | 400V 3-phase  |              |              |

## BASIC SPECIFICATIONS



| Model                                      | 100V Class: Single-phase      |      |      |
|--|-------------------------------|------|------|
|  | L510-□□□-H1-N □*              |      |      |
|  | 1P2                           | 1P5  | 101  |
| Horse Power (HP)                           | 0.25                          | 0.5  | 1    |
| Suitable Motor Capacity (KW)               | 0.2                           | 0.4  | 0.75 |
| Rated Output Current (A)                   | 1.8                           | 2.6  | 4.3  |
| Rated Capacity (KVA)                       | 0.68                          | 1.00 | 1.65 |
| Input Voltage Range(V)                     | Single-phase 100~120V,50/60HZ |      |      |
| Allowable Voltage Fluctuation              | -15%~+10%                     |      |      |
| Output Voltage Range(V)                    | Three-phase 0~240V            |      |      |
| Input Current (A)                          | 9.5                           | 13   | 19   |
| Allowable Momentary Power Loss Time (Sec.) | 1.0                           |      | 1.0  |
| Enclosure                                  | IP20                          |      |      |
| Frame Size                                 | 1                             |      | 2    |

| Model                                      | 200V Class: Single-phase      |      |      |      |      |
|--|-------------------------------|------|------|------|------|
|  | L510-□□□-H1-N □*              |      |      |      |      |
|  | L510-□□□-H1F-P □*             |      |      |      |      |
|  | 2P2                           | 2P5  | 201  | 202  | 203  |
| Horse Power (HP)                           | 0.25                          | 0.5  | 1    | 2    | 3    |
| Suitable Motor Capacity (KW)               | 0.2                           | 0.4  | 0.75 | 1.5  | 2.2  |
| Rated Output Current (A)                   | 1.8                           | 2.6  | 4.3  | 7.5  | 10.5 |
| Rated Capacity (KVA)                       | 0.68                          | 1.00 | 1.65 | 2.90 | 4.00 |
| Input Voltage Range(V)                     | Single-phase 200~240V,50/60HZ |      |      |      |      |
| Allowable Voltage Fluctuation              | -15%~+10%                     |      |      |      |      |
| Output Voltage Range(V)                    | Three-phase 0~240V            |      |      |      |      |
| Input Current (A)                          | 4.9                           | 7.2  | 11   | 15.5 | 21   |
| Allowable Momentary Power Loss Time (Sec.) | 1.0                           |      |      | 2.0  |      |
| Enclosure                                  | IP20                          |      |      |      |      |
| Frame Size                                 | 1                             |      |      | 2    |      |

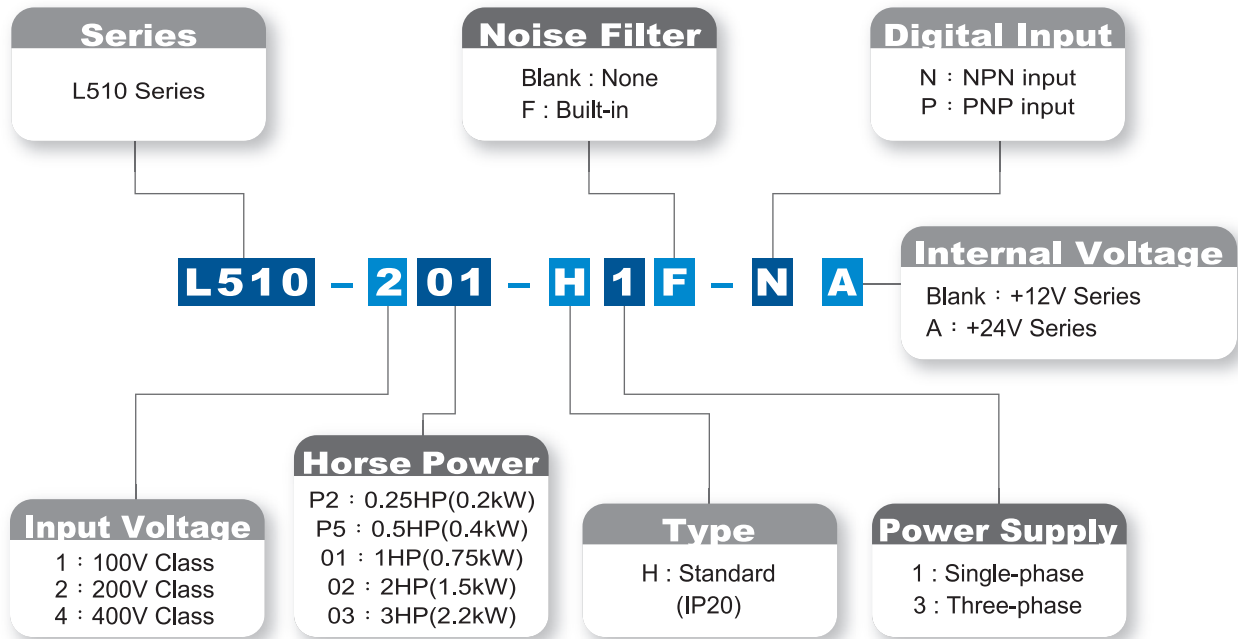
| Model                                      | 200V Class: Three-phase      |      |      |      |      |
|--|------------------------------|------|------|------|------|
|  | L510-□□□-H3-N □*             |      |      |      |      |
|  | 2P2                          | 2P5  | 201  | 202  | 203  |
| Horse Power (HP)                           | 0.25                         | 0.5  | 1    | 2    | 3    |
| Suitable Motor Capacity (KW)               | 0.2                          | 0.4  | 0.75 | 1.5  | 2.2  |
| Rated Output Current (A)                   | 1.8                          | 2.6  | 4.3  | 7.5  | 10.5 |
| Rated Capacity (KVA)                       | 0.68                         | 1.00 | 1.65 | 2.90 | 4.00 |
| Input Voltage Range(V)                     | Three-phase 200~240V,50/60HZ |      |      |      |      |
| Allowable Voltage Fluctuation              | -15%~+10%                    |      |      |      |      |
| Output Voltage Range(V)                    | Three-phase 0~240V           |      |      |      |      |
| Input Current (A)                          | 3.0                          | 4.0  | 6.4  | 9.4  | 12.2 |
| Allowable Momentary Power Loss Time (Sec.) | 1.0                          |      |      | 2.0  |      |
| Enclosure                                  | IP20                         |      |      |      |      |
| Frame Size                                 | 1                            |      |      | 2    |      |

\*If the model is marked A, it means that it is built-in the power supply of 24V; if not, then it is built-in the power supply of 12V.

| Model                                      | 400V Class: Three-phase      |     |     |
|--|------------------------------|-----|-----|
|  | L510-□□□-H3-N A*             |     |     |
|  | L510-□□□-H3F-P A*            |     |     |
|  | 401                          | 402 | 403 |
| Horse Power (HP)                           | 1                            | 2   | 3   |
| Suitable Motor Capacity (KW)               | 0.75                         | 1.5 | 2.2 |
| Rated Output Current (A)                   | 2.3                          | 3.8 | 5.2 |
| Rated Capacity (KVA)                       | 1.7                          | 2.9 | 4.0 |
| Input Voltage Range(V)                     | Three-phase 380~480V,50/60HZ |     |     |
| Allowable Voltage Fluctuation              | -15%~+10%                    |     |     |
| Output Voltage Range(V)                    | Three-phase 0~480V           |     |     |
| Input Current (A)                          | 4.2                          | 5.6 | 7.3 |
| Allowable Momentary Power Loss Time (Sec.) | 2.0                          | 2.0 | 2.0 |
| Enclosure                                  | IP20                         |     |     |
| Frame Size                                 | 2                            |     |     |

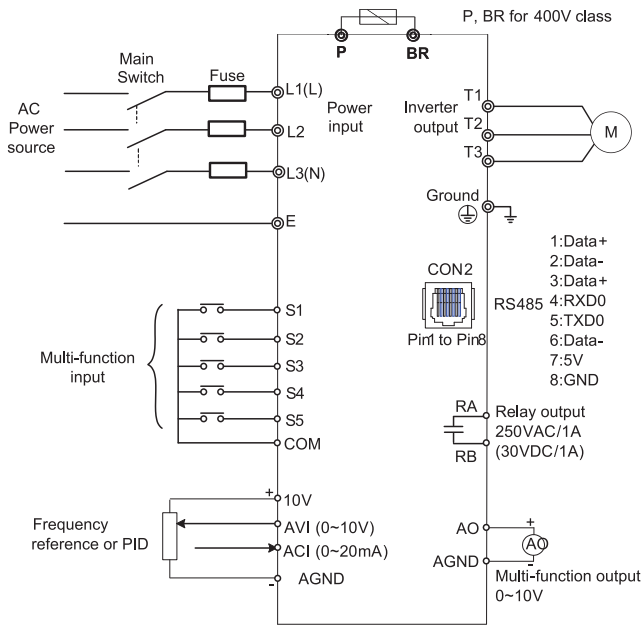
\*Models of 400V machines are all marked A, built-in the power supply of 24V.

## MODEL IDENTIFICATION

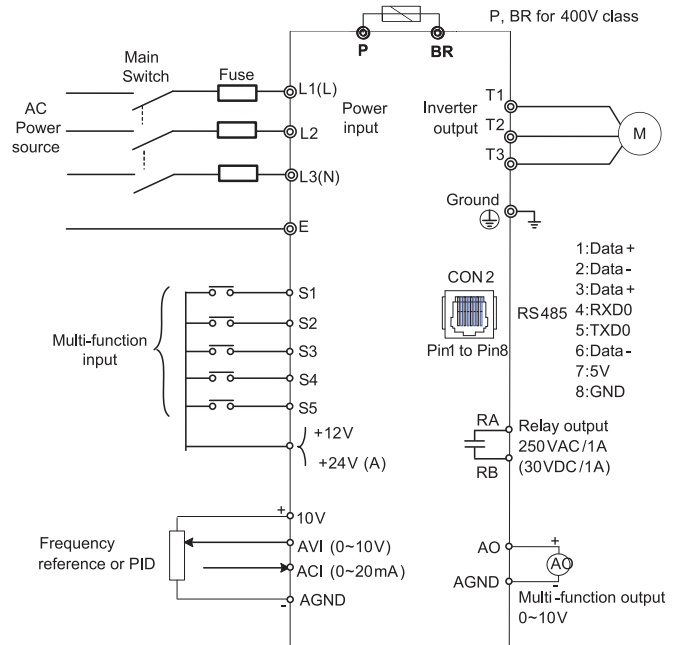


## WIRING DIAGRAM

### ▪ NPN Input



### ▪ PNP Input



| Wiring (AC Input) | Model                      | Power Input Terminal |
|-------------------|----------------------------|----------------------|
| NPN               | 100V / 200V (Single-Phase) | L1 (L) ; L3 (N)      |
|                   | 200V (Three-Phase)         | L1(L) ; L2 ; L3 (N)  |
|                   | 400V (Three-Phase)         | L1 ; L2 ; L3         |
| PNP               | 200V (Single-Phase)        | L1 (L) ; L3 (N)      |
|                   | 400V (Three-Phase)         | L1 ; L2 ; L3         |

## GENERAL SPECIFICATIONS

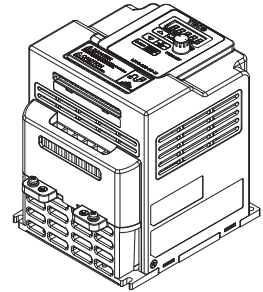
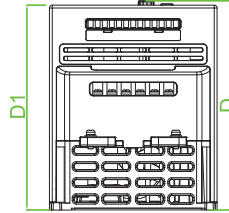
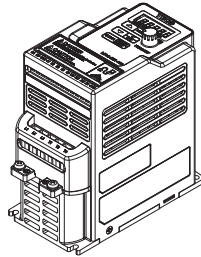
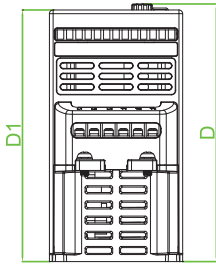
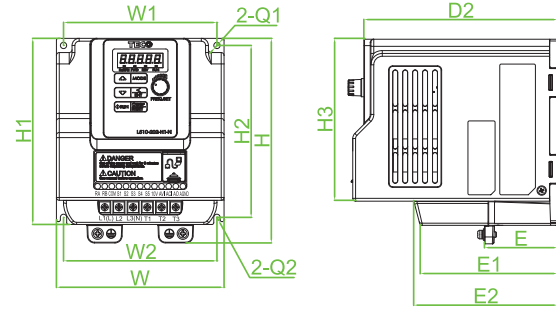
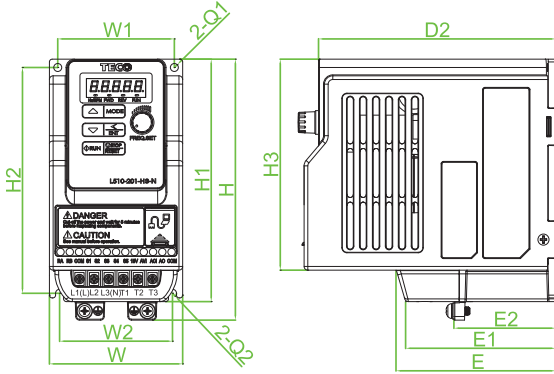


| Item                                  |   | L510   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|---------------------------------------|---|--|-------------------|---|-------------------|-----------------------|---------------------------------------|--|---------------------|--------------|----------------------|--------------|-----------------------------|-------------|----------------|
| <b>Control Mode</b>                   |   | V/F control + Torque compensation function   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| <b>Frequency</b>                      | Range   | 0.01~650.00Hz  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Setting resolution  | Digital input : 0.01Hz<br>Analog input : 0.06Hz/60Hz   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Setting   | Keypad : Set directly with ▲ ▼ keys or the VR on the keypad<br>External terminal: AVI(0-10V/2-10V), ACI(0-20mA/4-20mA) input<br>Up/down function by multifunction inputs and also by communication method  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Frequency limit   | Lower & Upper frequency limits and 3 Skip frequencies  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| <b>Run</b>                            | Operation Set   | Panel : run, stop button control<br>External terminal : Multi-operation-mode 2 / 3 wire selection / Jog operation<br>Communication operation   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | <b>Main Control functions &amp; Features</b>  | <table border="1"> <tr> <td>V/F Curve Setting</td> <td>6 fixed curves and one customized curve</td> </tr> <tr> <td>Carrier Frequency</td> <td>1-16KHz(default 5KHz)</td> </tr> <tr> <td>Acceleration and deceleration control</td> <td>2 sections of acceleration/ deceleration time setting (0.1~3600.0 Sec.)<br/>4 sections of S curve setting</td> </tr> <tr> <td>Multifunction Input</td> <td>19 functions</td> </tr> <tr> <td>Multifunction output</td> <td>14 functions</td> </tr> <tr> <td>Multifunction Analog Output</td> <td>5 functions</td> </tr> <tr> <td>Other features</td> <td>Overload detection, 8 preset speeds, auto-run, two Acc/Dec presets, Main/Alt run and frequency selections, PID control, Torque boost, V/F start frequency and fault reset</td> </tr> </table> | V/F Curve Setting | 6 fixed curves and one customized curve | Carrier Frequency | 1-16KHz(default 5KHz) | Acceleration and deceleration control | 2 sections of acceleration/ deceleration time setting (0.1~3600.0 Sec.)<br>4 sections of S curve setting | Multifunction Input | 19 functions | Multifunction output | 14 functions | Multifunction Analog Output | 5 functions | Other features |
| V/F Curve Setting                     | 6 fixed curves and one customized curve   |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| Carrier Frequency                     | 1-16KHz(default 5KHz)   |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| Acceleration and deceleration control | 2 sections of acceleration/ deceleration time setting (0.1~3600.0 Sec.)<br>4 sections of S curve setting  |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| Multifunction Input                   | 19 functions  |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| Multifunction output                  | 14 functions  |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| Multifunction Analog Output           | 5 functions   |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| Other features                        | Overload detection, 8 preset speeds, auto-run, two Acc/Dec presets, Main/Alt run and frequency selections, PID control, Torque boost, V/F start frequency and fault reset |  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| <b>Display</b>                        | LED   | Display: parameter, parameter value, frequency, line speed, DC voltage, output voltage, output current, PID feedback, input and output terminal status, Heat sink temperature, Program Version, Fault Log  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Status Indicator  | HZ/RPM, Forward/Reverse & FUN ( function display )   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| <b>Protective Functions</b>           | Overload Protection   | Integrated motor overload protection   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Over Voltage  | 100/200V class: > 410V, 400V class: > 820V   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Under Voltage   | 100/200V class: < 190V, 400V class: < 380V   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Momentary Power Loss Restart  | Restart in a short time once running into momentarily power loss   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Stall Prevention  | Stall prevention for Acceleration/ Deceleration and also during Continuous run   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Short-circuit output terminal   | Electronic Circuit Protection  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Grounding Fault   | Electronic Circuit Protection  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Other protection features   | Heat sink over temperature, Auto carrier frequency reduction due to temperature, Fault output, Reverse disable, Direct start on power up disable, Parameter access lock  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| <b>Communication Control</b>          |   | Built-in RS485 Modbus, One to one or One to many control   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
| <b>Environment</b>                    | Operating Temperature   | -10~40°C(-10~50°C with fan)  |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Storage temperature   | -20~60°C   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Humidity  | 95% RH or less (no condensation)   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Shock   | 1.0G, in compliance with IEC 60068-2-6   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |
|                                       | Enclosure   | IP20   |                   |   |                   |                       |                                       |  |                     |              |                      |              |                             |             |                |

# DIMENSIONS

Frame1 | weight:0.9kg

Frame2 | weight:1.6kg



Unit: mm (inch)

| Frame 1            | W      | W1     | W2     | H      | H1     | H2     | H3     | D      | D1     | D2     | E      | E1     | E2     | Q1     | Q2      |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| L510-1P2-H1 (A)    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-1P5-H1 (A)    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-2P2-H1(F) (A) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-2P5-H1(F) (A) | 72     | 63     | 61     | 141    | 131    | 122    | 114    | 141    | 136    | 128.2  | 86.3   | 81.1   | 55     | 4.3    | 2.2     |
| L510-201-H1(F) (A) | (2.83) | (2.48) | (2.40) | (5.55) | (5.16) | (4.80) | (4.49) | (5.57) | (5.35) | (5.05) | (3.40) | (3.19) | (2.17) | (0.17) | (0.086) |
| L510-2P2-H3 (A)    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-2P5-H3 (A)    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-201-H3 (A)    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |

| Frame 2            | W      | W1     | W2     | H      | H1     | H2     | H3     | D      | D1     | D2     | E      | E1     | E2     | Q1     | Q2      |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| L510-101-H1 (A)    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-202-H1(F) (A) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-203-H1(F) (A) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-202-H3 (A)    | 118    | 108    | 108    | 144    | 131    | 121    | 114    | 150    | 144    | 136.4  | 101.3  | 96.7   | 51.5   | 4.3    | 2.2     |
| L510-203-H3 (A)    | (4.65) | (4.25) | (4.25) | (5.67) | (5.16) | (4.76) | (4.49) | (5.92) | (5.68) | (5.37) | (3.99) | (3.81) | (2.03) | (0.17) | (0.086) |
| L510-401-H3(F) A   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-402-H3(F) A   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |
| L510-403-H3(F) A   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |         |

Note:

1. F : Built-in noise filter.
2. The dimension of NPN and PNP types are the same.

## TYPICAL APPLICATIONS

- ◆ Fans & Pumps
- ◆ Package Machines
- ◆ Automatic Door Control
- ◆ Winding Machines
- ◆ Conveyers
- ◆ Textile Machines
- ◆ Feeder Machines
- ◆ PCB Automation



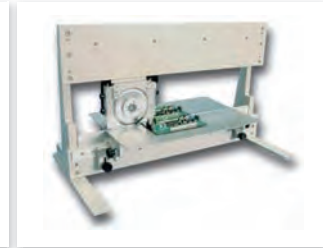
Package Machines



Conveyers



Automatic door control



PCB Automation

## ACCESSORIES

| Accessories                  | Model        | Function   | Notes            |
|------------------------------|--------------|--|------------------|
| Keypad Extension cable       | JN5-CB-01M   | Keypad Extension cable for 510 series  | 1m               |
|                              | JN5-CB-02M   |  | 2m               |
|                              | JN5-CB-03M   |  | 3m               |
|                              | JN5-CB-05M   |  | 5m               |
| NEMA Kits                    | JN5-NK-E01   | Mechanical device consisting of anti-dust cover on the upper part and wiring box on the bottom to meet NEMA 1                                    | Only For Frame 1 |
|                              | JN5-NK-E02   |  | Only For Frame 2 |
|                              | JN5-NK-E03   |  | Only For Frame 3 |
|                              | JN5-NK-E04   |  | Only For Frame 4 |
| Copy module                  | JN5-CU       | ① Duplicating parameters setting in one inverter to another inverter<br>② As a remote keypad to be used<br>③ Using RJ45 line to connect inverter |                  |
| Communication modules        | JN5-CM-PDP   | For connection of Profibus-DP communication protocol   | For 510 series   |
|                              | JN5-CM-TCPIP | For connection of TCP-IP communication protocol  |                  |
|                              | JN5-CM-DNET  | For connection of DeviceNet communication protocol   |                  |
|                              | JN5-CM-CAN   | For connection of CANopen communication protocol   |                  |
| RJ45 to USB connection cable | JN5-CM-USB   | Using the TECO exclusive PC-software line  | 1.8m             |
|                              | JN5-CM-USB-3 |  | 3m               |



### Copy Unit (JN5-CU)

- ※ Duplicating parameters setting in one Inverter to another Inverter.
- ※ As a remote keypad to be used.
- ※ Using RJ45 line to connect inverter.



### RJ45 to USB (JN5-CM-USB)

- ※ Using the TECO exclusive PC-software line.



Distributor



**TECO**  
**TECO ELECTRIC & MACHINERY CO., LTD.**

