# LT-3300 Series Installation Guide

#### Caution

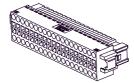
Be sure to read the "Warning/Caution Information" on the attached sheet before using the product.

# **Package Contents**

- (1) LT Unit (1)
- (2) English and Japanese Installation Guides (one of each) <This Guide>
- (3) Warning/Caution Information (1)
- (4) English and Japanese EX Module Hardware Manual \*1 (1)
- (5) Installation Gasket (1, attached to the LT unit)
- (6) Installation Fasteners (Set of 4)



(7) DIO Connector (1)



(8) Power Connector (1)



\*1 The EX module is an extension I/O unit for the LT 3000 series. To use the EX module, be sure to read the supplied manual.

(9) USB Cable Clamp (1 set) (Holder: 1, Cover: 1)



(10) EX module \*1 Hook (only for LT-3300 Series) (1)



This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local LT distributor immediately.

### **About the Manual**

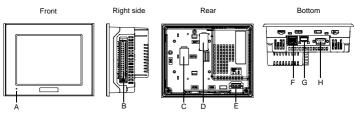
For the detailed information on LT3000 series, refer to the following manual.

- LT3000 Series Hardware Manual
- · Maintenance/Troubleshooting
- GP-Pro EX Reference Manual "Controlling External I/O"
- Device/PLC Connection Manual

LT3000 Series Hardware Manual can be selected from the help menu of GP-Pro EX or downloaded from Pro-face Home Page.
URL

http://www.pro-face.com/otasuke/

# **Part Names and Functions**



|   | A B  |   |         | 0 5              |                             |  |
|---|--|---|---------|------------------|-----------------------------|--|
|   | Name   |   |         |                  | Description                 |  |
|   |  |   |         |                  |                             |  |
|   |  |   | Color   | Indicator        | Operation Mode<br>(Drawing) | Logic execution mode<br>(when logic is<br>enabled) |
|   |  |   | ON      | OFFLINE          | _                           |  |
| A | Status LED                                   |   | Green   |                  | In operation                | RUN  |
| ^ | Status LED                                   |   |         | Flashing         | In operation                | STOP   |
|   |  |   | Red     | ON               | · ·                         | er is turned on.                                   |
|   |  |   |         | Flashing         | In operation                | Major Error  |
|   |  |   | Orange  | ON               |                             | ght burnout  |
|   |  |   |         | Flashing         | During so                   | oftware startup                                    |
| В | DIO Interface (DIO)                          | The interface to external I/O equipment   |         |                  | ment                        |  |
| С | AUX Unit Interface/<br>Expansion Unit (EXT2) | Used to connect additional units (communication function, etc.).  |         | communication    |                             |  |
| D | EX Module Interface (EXT1)                   | ) Used to connect the Pro-face's EX Module  |         | ( Module         |                             |  |
| Ε | Power Plug Connector                         |   |         |                  | _                           |  |
| F | Ethernet Interface<br>(10BASE-T/100BASE-TX)  | Α   | n RJ-45 | type mod         | dular jack conne            | ector (8-pole) is used.                            |
| G | USB Host Interface (USB)                     | 1 port Conforms to USB1.1. (TYPE-A conn.) Power Supply Voltage: DC5V ±5% Output Current: 500mA (at maximum) The maximum communication distance is 5m. |         | um)              |                             |  |
| Н | Serial Interface (COM1)                      | D-sub 9-pin plug type connector.<br>Communication method (RS232C/RS422/RS485) is<br>switched via software.  |         | /RS422/RS485) is |                             |  |

# **General Specifications**

# ■ Electrical Specifications

|                       | Input Voltage             | DC24V  |
|-----------------------|---------------------------|--|
| >                     | Rated Voltage             | DC19.2 to 28.8V  |
| Supply                | Allowable<br>Voltage Drop | 3ms (max.)   |
| Power                 | Power<br>Consumption      | 27W (max.)   |
|                       | In-Rush<br>Current        | 30A (max.)   |
| Voltage Endurance     |                           | AC1000V 20mA for 1minute (between charging and FG terminals) |
| Insulation Resistance |                           | DC500V 10MΩ (min.) (between charging and FG terminals)       |

# ■ Environmental Specifications

|          | Surrounding Operating<br>Temperature | 0 to +50°C*1  |
|----------|--------------------------------------|---|
|          | Storage Temperature                  | -20 to +60°C  |
| Physical | Ambient Humidity                     | 10 to 90% RH<br>(Wet bulb temperature: 39°C max no condensation.) |
| Ph       | Storage Humidity                     | 10 to 90% RH<br>(Wet bulb temperature: 39°C max no condensation.) |
|          | Dust                                 | 0.1mg/m <sup>3</sup> and below (non-conductive levels)            |
|          | Pollution Degree                     | For use in Pollution Degree 2 environment                         |

<sup>\*1</sup> When using in an environment where the temperature becomes or exceeds 40°C for an extended period of time, the screen contrast level may decrease from its original level of brightness.

## **External Interfaces**

#### **IMPORTANT**

- For instructions on how to connect to other devices, always refer to the "GP-Pro EX Device/PLC Connection Manual".
- Always connect the #5 SG (Signal Ground) of the LT unit to the connected device, especially if the connected device is also not isolated. Failure to do so may damage the RS232C/RS422/RS485 circuit.

## NOTE

 When isolation is necessary, you can use the RS232C isolation unit (CA3-ISO232-01) on COM1.

#### ■ COM1

| Recommended Cable Connector | XM2D-0901 <made by="" corp.="" omron=""></made> |
|-----------------------------|---|
| Recommended Jack Screw      | XM2Z-0073 <made by="" corp.="" omron=""></made> |
| Recommended Cable Cover     | XM2S-0913 <made by="" corp.="" omron=""></made> |
| Interfit Bracket            | #4-40 UNC screws are used.                      |

| Pin#  |             | RS232C  | I           | RS422/RS485                      |
|-------|-------------|---|-------------|----------------------------------|
| FIII# | Signal Name | Meaning   | Signal Name | Meaning                          |
| 1     | CD          | Carrier Detect                                  | RDA         | Receive Data A(+)                |
| 2     | RD(RXD)     | Receive Data                                    | RDB         | Receive Data B(-)                |
| 3     | SD(TXD)     | Send Data                                       | SDA         | Send Data A(+)                   |
| 4     | ER(DTR)     | Data Terminal Ready                             | ERA         | Data Terminal Ready A(+)         |
| 5     | SG          | Signal Ground                                   | SG          | Signal Ground                    |
| 6     | DR(DSR)     | Data Set Ready                                  | CSB         | Clear to Send B(-)               |
| 7     | RS(RTS)     | Request to Send                                 | SDB         | Send Data B(-)                   |
| 8     | CS(CTS)     | Clear to Send                                   | CSA         | Clear to Send A(+)               |
| 9     | CI(RI)/VCC  | Called status display/<br>+5V±5% Output 0.25A*1 | ERB         | Data Terminal Ready B(-)         |
| Shell | FG          | Frame Ground<br>(Common with SG)                | FG          | Frame Ground<br>(Common with SG) |

<sup>\*1</sup> The RI/VCC selection for Pin #9 is switched via software. The VCC output is not protected against overcurrent. To prevent damage or unit malfunctions, use only the rated current.

## ■ DIO Interface (Connector)

## IMPORTANT |

 When preparing the cable to connect the wiring, check the pin numbers inscribed on the DIO Connector.

| Applicable connector    | 2-1871940-9 <tyco amp.="" electronics=""><br/>CA7-DIOCN5-01 <pro-face></pro-face></tyco> |                      |         |                      |
|-------------------------|--|----------------------|---------|----------------------|
| Pin Arrangement         | Pin No.  | Signal Name          | Pin No. | Signal Name          |
|                         | A1   | IN1                  | B1      | IN0 (CT0)            |
|                         | A2<br>A3   | IN3                  | B2      | IN2 (CT1)            |
|                         |  | IN5                  | B3      | IN4 (CT2)            |
| A1 (0 [[] (1) B1        | A4   | IN7                  | B4      | IN6 (CT3)            |
|                         | A5   | IN9                  | B5      | IN8                  |
|                         | A6   | IN11                 | B6      | IN10                 |
|                         | A7   | IN13                 | B7      | IN12                 |
|                         | A8   | IN15                 | B8      | IN14                 |
|                         | A9   | NC                   | B9      | COM                  |
|                         | A10<br>A11<br>A12  | Sink: NC             | B10     | Sink: +24V           |
|                         |  | Source: +24V         |         | Source: +24V         |
|                         |  | Sink: 0V             | B11     | Sink: 0V             |
|                         |  | Source: NC           |         | Source: 0V           |
|                         |  | OUT1                 | B12     | OUT0                 |
|                         |  | (PLS1, PWM1)         |         | (PLS0, PWM0)         |
|                         | A13  | OUT3<br>(PLS3, PWM3) | B13     | OUT2<br>(PLS2, PWM2) |
| A19 6 11 6 B19          | A14  | OUT5                 | B14     | OUT4                 |
| 404                     | A15  | OUT7                 | B15     | OUT6                 |
| (Cable connection side) | A16  | OUT9                 | B16     | OUT8                 |
|                         | A17  | OUT11                | B17     | OUT10                |
|                         | A18  | OUT13                | B18     | OUT12                |
|                         | A19  | OUT15                | B19     | OUT14                |

# NOTE

Parenthesized signal names ( ) indicate when Pulse output (PLS\*), PWM output (PWM\*), or Counter Input (CT\*) are used.

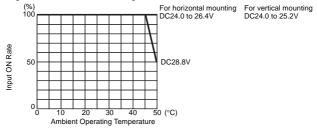
### ◆ Input Specifications

| 9                         |             | DC24V                                       |  |
|---------------------------|-------------|---|--|
| Maximum Allowable Voltage |             | DC28.8V                                     |  |
| Input Method              |             | Sink/Source Input                           |  |
| Rated Current             |             | 6.5mA (DC24V) (IN0, IN2, IN4, IN6)          |  |
| reacca ourient            |             | 4.1mA (DC24V) (Other input)                 |  |
| Input Resistance          |             | Approx. 3.7kΩ (IN0, IN2, IN4, IN6)          |  |
| input resistance          | '           | Approx. 5.9kΩ (Other input)                 |  |
| Input Derating            |             | SEE→ •Input Derating (6 page)               |  |
| Input Points              |             | 16  |  |
| Common Lines              |             | 1   |  |
| Common Design             |             | 16 points/1 common line                     |  |
| Operation                 | ON Voltage  | DC19V or more                               |  |
| Range                     | OFF Voltage | DC5V or less                                |  |
| Input Delay<br>Time*1     | OFF to ON   | 0.5 to 20ms*2                               |  |
| Time <sup>*1</sup>        | ON to OFF   | 0.5 to 20ms*2                               |  |
| Input Signal Display      |             | No LED indicators                           |  |
| Status Display            |             | None  |  |
| Isolation Method          |             | Photocoupler Isolation                      |  |
| External Connection       |             | 38-pin connector (used with Output section) |  |
| External Power S          | Supply      | For Signal: DC 24V                          |  |

<sup>\*1</sup> In the case of INO, IN2, IN4, and IN6, the input delay time generates a 5µs delay. For example, in the case of a 0.5ms-cycle sampling: 5µs (ON to OFF) + 0.5ms (sampling cycle) + 5µs (OFF to ON) = 0.51ms A minimum 0.51ms-restriction is imposed on the input pulse width. In the case of IN1, IN3, IN5, and from IN7 to IN15, the input delay time generates a 0.5ms-delay. For example, in the case of a 0.5ms-cycle sampling: 0.5ms (ON to OFF) + 0.5ms (Sampling cycle) + 0.5ms (OFF to ON) = 1.5ms A minimum 1.5ms-restriction is imposed on the input-pulse width.

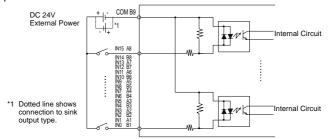
#### Input Derating

Using LT input voltage that exceeds the rated voltage, the input ON voltage, the number of input points or the LT's temperature can effect. Also, the LT's input section could overheat, which could lead to an accident or malfunction. Refer to the following drawing and perform Input Derating within the LT unit's rated range.



<sup>\*2</sup> Digital filter can be set at intervals of 0.5 ms.

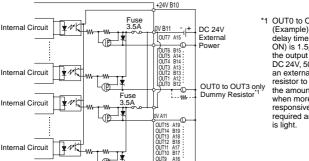
# • Input Circuit



# ◆ Output Specifications

| Output Terminal       |                 | OUT0 to OUT3                              | OUT4 to OUT15                               |  |  |
|-----------------------|-----------------|---|---|--|--|
| Rated Voltage         |                 | DC24V                                     |   |  |  |
| Allowable Voltag      | je Range        | DC20.4V to DC28.8V                        |   |  |  |
| Output Method         | LT330*-*1-D24-K | Sink Output                               | Sink Output                                 |  |  |
| Output Metriod        | LT330*-*1-D24-C | Source Output                             |   |  |  |
| Maximum Load          | Voltage         | 0.2A /point, 1.6A /commo                  | on  |  |  |
| Min. Load Curre       | nt              | 1mA                                       | 1mA (Pulse/PWM output unavailable)          |  |  |
| Output Voltage I      | Orop            | DC0.5V or less                            |   |  |  |
| Output Delay          | OFF to ON       | 5μs or less (With output at DC24V, 200mA) | 0.5ms or less (With output at DC24V, 200mA) |  |  |
| Time                  | ON to OFF       | 5μs or less (With output at DC24V, 200mA) | 0.5ms or less (With output at DC24V, 200mA) |  |  |
| Voltage Leakage       | (when OFF)      | 0.1mA or less                             |   |  |  |
| Clamp Voltage         |                 | 39V ± 1V                                  |   |  |  |
| Type of Output        |                 | Transistor Output                         |   |  |  |
| Common Lines          |                 | 2   |   |  |  |
| Common Design         | 1               | 8 points/1 common line >                  | 8 points/1 common line x2                   |  |  |
| External Connec       | ction           |   | 38-pin connector (also used for Input)      |  |  |
| Output Protection     | n Type          | Output is unprotected                     |   |  |  |
| Internal Fuse         |                 | 3.5A, 125V Chip fuse x2 (not replaceable) |   |  |  |
| Surge Control Circuit |                 | Zener diode                               |   |  |  |
| Output Points         |                 | 16  |   |  |  |
| Output Signal D       |                 | No LED indicators                         |   |  |  |
| Status Display E      |                 | None                                      |   |  |  |
| Isolation Method      |                 | Photocoupler Isolation                    |   |  |  |
| External Power        | Supply          | For Signal: DC 24V                        |   |  |  |

### LT330\*-\*1-D24-K Output Circuit (Sink type)

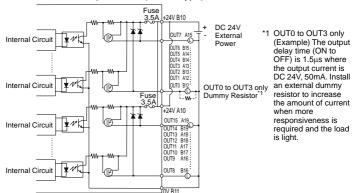


\*1 OUT0 to OUT3 only (Example) The output delay time (OFF to ON) is 1.5 us where the output current is DC 24V. 50mA, Install an external dummy resistor to increase the amount of current when more responsiveness is required and the load

#### NOTE

Since the output terminals are not electrically protected, an output line might be short-circuited or a connection fault might burn the external devices and LT. Be sure to install an applicable fuse for each output terminal if there should be the risk for the current running over the rating.

### LT330\*-\*1-D24-C Output Circuit (Source type)



### NOTE

Since the output terminals are not electrically protected, an output line might be short-circuited or a connection fault might burn the external devices and LT. Be sure to install an applicable fuse for each output terminal if there should be the risk for the current running over the rating.

## ◆ High-Speed Counter / Pulse Catch Input Specifications

DIO Standard Input/Output is used as a High-Speed Counter Input. The setup is done by the GP-Pro EX. (SEE-) GP-Pro EX Reference Manual "Controlling External I/O"

|                                       | Counter   |  | Pulse Catch           |
|---------------------------------------|---|--|-----------------------|
|                                       | DC24V Open Collector                                |  | DC24V                 |
| Input                                 | Single Phase (4 points)                             | 2 Phase<br>(1 point or 2 points)   | Open Collector        |
| Input Points                          | CT0 (IN0),<br>CT1 (IN2),<br>CT2 (IN4),<br>CT3 (IN6) | CT0 (IN0), CT1 (IN2) (used as pair)<br>CT0: A Phase, CT1: B Phase<br>CT2 (IN4), CT3 (IN6) (used as pair)<br>CT2: A Phase, CT3: B Phase | IN0, IN2,<br>IN4, IN6 |
| High Speed Count<br>Frequency         | 100Kpps   | 50Kpps   | _                     |
| Marker Input<br>(Counter Value Clear) | None  | IN3, IN7   |                       |

## ◆ Pulse/PWM Output Specifications

DIO Standard Input/Output is used as a Pulse Output or PWM Output. The setup is done by the GP-Pro EX. (SEE-) GP-Pro EX Reference Manual "Controlling External I/O"

|   | Pulse Output  | PWM Output                                  |  |
|---|---|---|--|
| Output Points                             | 4 P   | oints                                       |  |
| Output Method                             | PLS0 to PLS3 (OUT0 to OUT3) defined by user             | PWM0 to PWM3 (OUT0 to OUT3) defined by user |  |
| Load Voltage                              | DC24V   |   |  |
| Min. Load Current                         | 1mA   |   |  |
| Max. Output Frequency                     | Up to 65kHz possible per point (set through software)*1 |   |  |
| Pulse Acceleration/<br>Deceleration Speed | Available   | _   |  |
| ON Duty                                   | 50% ± 10% (at 65kHz)*2                                  | 19 to 81% (at 65kHz)*3                      |  |

<sup>\*1</sup> A limit of maximum output frequency is imposed on the pulse outputs with regard to the number of channels used and with high-speed counter to be used together.

(SEE=) GP-Pro EX Reference Manual "Controlling External I/O" Restrictions

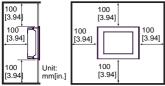
<sup>\*2</sup> The ON Duty error (10%) will be reduced if the Output frequency is low.

<sup>\*3</sup> The ON Duty (effective range) will be widened if the Output frequency is low.

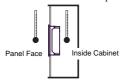
## Installations

#### 1. Installation Requirements

 For easier maintenance, operation, and improved ventilation, be sure to install the LT at least 100 mm [3.94 in.] away from adjacent structures and other equipment.



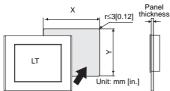
 Be sure that the surrounding air temperature and the ambient humidity are within their designated ranges. (Surrounding air temperature: 0 to 50°C, Ambient humidity: 10 to 90%RH, Wet bulb temperature: 39°C max.) When installing the LT on the panel of a cabinet or enclosure, "Surrounding air temperature" indicates both the panel face and cabinet or enclosure's internal temperature.



 Be sure that heat from surrounding equipment does not cause the LT to exceed its standard operating temperature.

#### LT Installation

Create a Panel Cut following the dimensions in the table below.

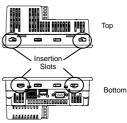


| LT                    | Х   | Y  | Panel<br>thickness           |
|-----------------------|---|--|------------------------------|
| LT-<br>3300<br>Series | 156.0 <sup>+1</sup> <sub>-0</sub><br>[6.14 <sup>+0.04</sup> <sub>-0</sub> ] | 123.5 <sup>+1</sup> <sub>-0</sub> [4.86 <sup>+0.04</sup> <sub>-0</sub> ] | 1.6[0.06]<br>to<br>5.0[0.20] |

(2) Confirm that the installation gasket is attached to the LT unit and then place the LT unit into the Panel from the front.

#### IMPORTANT

- It is strongly recommended that you use the installation gasket, since it absorbs vibration in addition to repelling water.
   For the procedure for replacing the installation gasket, refer to "LT3000 Series Hardware Manual".
- (3) The following figures show the four (4) fastener insertion slot locations. Insert each fastener's hook into the slot and tighten it with a screwdriver. Insert the installation fasteners securely into the insertion slot recess.



Insertion Slot Recess

Hook the fastener on the Recess,

Panel Installation Fastener

and secure the fastener on the panel with a screw.

#### IMPORTANT

- Tightening the screws with too much force can damage the LT unit's plastic case.
- The necessary torque is 0.5N•m.
- Be sure to insert installation fasteners in the recessed portion of a installation fasteners hole. If the fasteners are not correctly attached, the LT unit may shift or fall out of the panel.
- Wiring to the DIO Connector

#### IMPORTANT

- Be sure to remove the DIO Connector from the LT unit prior to starting wiring. Failure to do so may cause an electric shock.
- Items Required to Wire Connectors Screwdriver

Recommended type: 1891348-1 < Tyco Electronics AMP.>

If another manufacturer is used, be sure the part has the following dimensions:

point depth: 1.5mm [0.06in.] point width: 2.4mm [0.09in.]

Point shape should be DIN5264A, and meet Security Standard DN EN60900.

Also, the screwdriver's tip should be flat as indicated in order to access the narrow hole of the connector:



## DIO Cable Specifications

| •                     |                                 |  |
|-----------------------|---------------------------------|--|
| DIO Cable<br>Diameter | AWG24 to 18<br>UL1015 or UL1007 |  |
| Conductor Type        | Stranded Wire*1                 |  |
| Conductor<br>Length   | 7 mm [0.28in]                   |  |

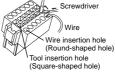
<sup>\*1</sup> If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

#### ■ Connecting the DIO Cable

- Insert a flatShead screwdriver, at an angle, into the tool insertion hole (square-shaped hole) of the connector.
- (2) When inserting the flathead screw driver, be sure that it is perpendicular to the center division wall.

### NOTE

- Make the insertion distance of the flathead screwdriver approximately 4 mm. Inserting forcefully may break the inside of the connector and will a cause of contact defect.
   Also, do not turn the flathead screwdriver while the tip is inside of the tool insertion hole (square-shaped hole).
- (3) The adjacent wire insertion hole (round-shaped hole) will be in an open state. With the flathead screwdriver still inserted, insert the wire into the wire insertion hole (round-shaped hole).



- (4) Remove the flathead screwdriver from the tool insertion hole (square-shaped hole). The wire insertion hole (roundshaped hole) will close and the wire will be secured. In the case of wire removal, remove the desired wire by inserting a flathead screwdriver into the corresponding tool insertion hole (square-shaped hole) following procedures (1) and (2).
- (5) Insert the wired DIO connector straight into the DIO I/F of the LT unit.

### IMPORTANT

 Be sure to strip only the amount of cover required. If too much cover is removed, the end wires may short against each other, or against an electrode, which can create an electric shock. If not enough cover is removed the wire cannot carry a charge.

- Do not solder the wire itself. This could lead to a bad or poor contact.
- Insert each wire completely into its opening. Failure to do so can lead to a unit malfunction or short, either against wire filaments, or against an electrode.
- When wiring, be aware of the installation position, direction, and twisting of
  the wiring as to not develop stress on
  the connector. Fix the cable near the
  LT by cable clamp and set it loosely as
  to not place tension on the connector.

# Wiring

# **↑** WARNING

- To avoid an electric shock, prior to connecting the LT unit's power cord terminals to the power terminal block, confirm that the LT unit's power supply is completely turned OFF, via a breaker, or similar unit.
- Any other power level can damage both the LT and the power supply.
- Since there is no power switch on the LT unit, be sure to attach a breaker switch to its power cord.
- When the FG terminal is connected, be sure the wire is grounded.
- 1. Wiring the DC type power supply cable

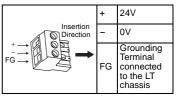
## ■ Power Cord Specifications

Use copper conductors only.

| ese copper conductors only. |                            |  |
|-----------------------------|----------------------------|--|
| Power Cord                  | 0.75 to 2.5mm <sup>2</sup> |  |
| Diameter                    | (18 - 12 AWG)              |  |
| Conductor<br>Type           | Simple or Stranded Wire*1  |  |
| Conductor                   | 7 mm                       |  |
| Length                      | [0.28in]                   |  |

<sup>\*1</sup> If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

## ■ Power Connector (Plug) Specifications



### NOTE

 The power connector (plug) is CA5-DCCNM-01 made by Pro-face or MSTB2,5/3-ST-5,08 made by Phoenix Contact.

When connecting the Power Cord, use the following items when performing wiring. (Items are made by Phoenix Contact.)

| Recommended<br>Driver                     | SZF 1-0.6x3.5<br>(1204517)  |  |
|---|---|--|
| Recommended<br>Pin Terminals              | AI 0.75-8GY (3200519)<br>AI 1-8RD (3200030)<br>AI 1.5-8BK (3200043)<br>AI 2.5-8BU (3200522) |  |
| Recommended<br>Pin Terminal<br>Crimp Tool | CRIMPFOX ZA 3<br>(1201882)  |  |

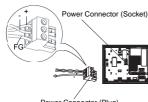
## ■ Connecting the LT Power Cord

- Confirm that the LT unit's Power Cord is unplugged from the power supply.
- (2) Strip the power cord, twist the conductor's wire ends, insert them into the pin terminal and crimp the terminal. Attach the terminal to the power connector (plug).

### **IMPORTANT**

- Use a flat-blade screwdriver (Size 0.6 x 3.5) to tighten the terminal screws.
   The torque required to tighten these screws is 0.5 to 0.6 N•m [5-7Lb•In.].
- Do not solder the cable connection.
   Doing so may damage the unit due to abnormal heat or cause a fire.

Attach the Power connector (Plug) to the Power Connector.



Power Connector (Plug)

## 2. Power Supply Cautions

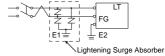
- Input and Output signal lines must be separated from the power control cables for operational circuits.
- To improve the noise resistance, be sure to twist the ends of the power cord wires before connecting them to the Power connector (Plug).
- The LT unit's power supply cord should not be bundled with or kept close to main circuit lines (high voltage, high current), or input/output signal lines.
- To reduce noise, make the power cord as short as possible.
- If the supplied voltage exceeds the LT unit's range, connect a voltage transformer.
- Between the line and the ground, be sure to use a low noise power supply. If there is an excess amount of noise, connect a noise reducing transformer.
- The temperature rating of field installed conductors: 75°C only.

### IMPORTANT

- Use voltage and noise reducing transformers with capacities exceeding Power Consumption value.
- Must be used with a Class 2 Power Supply. (24VDC)
- Connect a surge absorber to handle power surges.

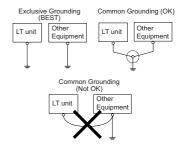
#### IMPORTANT

 Be sure to ground the surge absorber (E1) separately from the LT unit (E2). Select a surge absorber that has a maximum circuit voltage greater than that of the peak voltage of the power supply.



### 3. Grounding Cautions

- Be sure to create an exclusive ground for the Power Cord's FG terminal. Use a grounding resistance of 100Ω, a wire of 2mm<sup>2</sup> or thicker, or your country's applicable standard
- The SG (signal ground) and FG (frame ground) terminals are connected internally in the LT unit.
  - When connecting the SG line to another device, be sure that the design of the system/connection does not produce a shorting loop.
- The grounding wire should have a cross sectional area greater than 2mm<sup>2</sup>. Create the connection point as close to the LT unit as possible, and make the wire as short, as possible. When using a long grounding wire, replace the thin wire with a thicker wire, and place it in a duct.



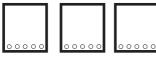
## 4. Input/Output Signal Line Cautions

- All LT Input and Output signal lines must be separated from all operating circuit (power) cables.
- If this is not possible, use a shielded cable and ground the shield.

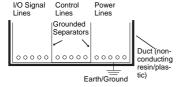
## Wiring Precautions

 To help prevent noise and interference problems, separate all control, communication and power lines by placing them in a separate ducts.

Duct for I/O Signal Lines Duct for Control Duct for Power Lines Lines



If different wires must be placed in the same duct, separate them with an earthed/grounded divider.



### NOTE

 If the lines cannot be separated, use shielded lines and create a ground from the shield line.

## IMPORTANT

- Use noise-reducing external wiring methods to increase overall system reliability.
- To prevent power surges or noise interference, use ducts to separate all DC I/O or current circuit wires from communication cables.

 To prevent malfunctions due to noise, communication cables must be wired separately from high-frequency lines and power lines such as high-voltage lines, high-current lines, and inverters.

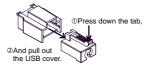
# To prevent the USB cable from coming off

#### **I**MPORTANT

 When using USB Host Interface in Hazardous Locations provided in ANSI/ISA-12.12.01-2007, please fix the USB cable with the USB Holder. If it's not fixed so that the connector on the LT's side and the PLC's side cannot come out, the USB Host Interface cannot be used in the Hazardous Locations

#### Attaching the USB Holder

 Before starting the procedure, pull out the USB cover from the USB holder by holding the top and bottom of the USB holder and pressing down the tab on the USB cover.

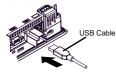


(2) With the main unit display part positioned so that it is facing down, attach the USB holder to the USB host interface. Insert the picks on the top of the USB holder into the attachment holes on the main unit, and then insert the holder into the USB host interface so that the holder is secured in the main unit.

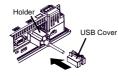




 Insert the USB cable into the USB Host Interface.

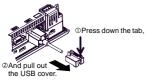


(4) Attach the USB cover to the USB host interface. Hold the USB cover in the orientation shown in the figure and insert it into the USB holder.

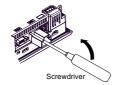


#### IMPORTANT

- Insert the USB cover in the orientation shown in the illustration above.
- Removing the USB Holder
- Pull out the USB cover from the USB holder by pressing down the tab on the USB cover.



(2) Insert the tip of a flat-blade screwdriver into the hole on the bottom of the USB holder and raise the handle so that the USB holder detaches from the USB host interface.



# Installation prerequisites for standards

For the detailed certification's information, refer to the Pro-face Home page.

#### <Cautions>

Be aware of the following items when building the LT into an end-use product:

- The LT unit's rear face is not approved as an enclosure. When building the LT unit into an end-use product, be sure to use an enclosure that satisfies standards as the end-use product's overall enclosure.
- The LT unit must be used indoors only.
- Install and operate the LT with its front panel facing outwards.
- If the LT is mounted so as to cool itself naturally, be sure to install it in a vertical panel.
  Also, it's recommended that the LT should be mounted at least 100mm away from any other adjacent structures or machine parts.
  The temperature must be checked on the final product in which the LT is installed.
- For use on a flat surface of a Type 4X (Indoor Use Only) and / or Type 13 Enclosure.

# Hazardous Locations - Compliance and Handling Cautions\*1

- Suitable for use in Class I, Division 2, Groups A, B, C, and D Hazardous Locations, or Non-Hazardous Locations only.
- (2) "WARNING: Explosion hazardsubstitution of any components may impair suitability for Class I, Division 2"
- (3) WARNING: Explosion hazard-when in hazardous locations, turn OFF power before replacing or wiring modules.
- (4) "WARNING: Explosion hazard-do not disconnect equipment unless power has been switched off or the area is known to be Non-Hazardous".
- (5) In the case of use in Hazardous Locations, be sure to check that the externally connected unit and each interface have been fixed with screws and locked. In Hazardous Locations, it's impossible to

insert or pull the cable from the applicable port. Be sure to check that the location is Non-Hazardous before inserting or pulling it.

\*1 The compliant Rev. with Hazardous Locations are as follows.

LT-3300T : all Rev.

LT-3300S, LT-3300L, LT-3301L : Rev.1
(SEE→) Revision (page 16)

# **CE Marking**

 The following units are CE marked products complying with the EMC Directive.

| LT3300-T1-D24-K | LT3300-T1-D24-C |
|-----------------|-----------------|
| LT3300-S1-D24-K | LT3300-S1-D24-C |
| LT3300-L1-D24-K | LT3300-L1-D24-C |
| LT3301-L1-D24-K | LT3301-L1-D24-C |

For the detailed information, be downloaded and refer the Declaration of Conformity from Pro-face Home Page.

#### Revision

The revision number of the LT is shown in the label affixed to the LT. In the example shown below, an asterisk "\*\*" is displayed in the position where "A" should be, meaning "Rev. A".



#### Inquiry

Do you have any questions about difficulties with this product? Please access our site anytime that you need help with a solution.

http://www.pro-face.com/otasuke/



#### Note

Please be aware that Digital Electronics Corporation shall not be held liable by the user for any damages, losses, or third party claims arising from the uses of this product.

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