

GLC150-BG41-DNM-24V



DANGERS

When Designing Your LT System

- Be sure to design your LT control system so that in the event of a main power supply failure or an LT accident, this system's overall safety integrity will be maintained. If this is not done, incorrect output signals or an LT malfunction may cause an accident.
 1. Interlock and other circuits, designed to interrupt or oppose normal machine movement (e.g., Emergency Stop, General Protection, forward and reverse rotation), as well as those designed to prevent machine damage (for upper, lower and traverse movement limit positioning, etc.) should all be designed external to the LT.
 2. Whenever the LT generates a "Watchdog Timer Error," LT operation will halt. Also, when an error occurs in Input/Output control areas that the LT cannot detect, it is possible for unexpected equipment operation to occur there. To prevent unsafe or unexpected equipment operation, you should create a "Failsafe Circuit" that is completely external to the LT.
 3. If an external unit's relay or transistor malfunctions, causing an output (coil) to remain either ON or OFF, a major accident can occur. To prevent this, be sure to set up external watchdog circuits that will monitor vital output signals.
- Be sure to design a circuit that will supply power to the LT unit's I/O unit(s) before starting up the LT. If the LT unit's internal program enters RUN mode prior to the I/O unit's load control power turning ON, an incorrect output (signal) or malfunction could cause an accident to occur.
- Be sure to design a program that will ensure the safety of your system in the event of an LT display or control unit malfunction, or in the event of either a data transmission error or power failure between the LT and any connected unit(s). These types of problems can lead to an incorrect output (signal) or malfunction, which could thereby cause an accident to occur.
- Do not create touch panel switches which may endanger the safety of humans or equipment. This is due to the possibility of a malfunction in the LT or its cable(s), causing the output of a signal that could result in a major accident. Designate all of a system's major, safety-related switches to operate separately from the LT.
- Do not use the LT with aircraft control devices or medical life support equipment, central trunk data transmission (communication) devices, nuclear power control devices, or medical life support equipment, due to these devices' inherent requirements of extremely high levels of safety and reliability.
- When using the LT with transportation vehicles (trains, cars, and ships), disaster and crime prevention devices, various types of safety equipment, non-life support related medical devices, etc., be sure to use redundant and/or failsafe system designs to ensure the proper degree of reliability and safety.

INSTALLATION GUIDE



WARNINGS

- After the LT unit's backlight burns out, unlike the LT unit's "Standby Mode," the touch panel is still active. If the operator fails to notice that the backlight is burned out and touches the panel, a potentially dangerous machine operation error can occur.
 1. If your LT is not set to "Standby Mode" and the screen has gone blank, your backlight is burned out.
 2. Or, if your LT is set to Standby Mode, but touching the screen does not cause the display to reappear, your backlight is burned out.

Also, to prevent an accidental machine operation error, Pro-face suggests you use the LT unit's built-in "USE TOUCH PANEL AFTER BACKLIGHT BURNOUT" feature, that will automatically detect a burnout and disable the touch screen.

Installation

- High voltage runs through the LT. Except for changing the backlight, do NOT attempt to open, and never disassemble the LT, since there is a possibility of an electric shock.
- Do not modify the LT unit. Doing so may cause a fire or an electric shock.

Wiring

- To prevent electric shock or equipment damage, prior to installing or wiring the LT, be sure that the LT unit's power cord is unplugged from the power supply.
- Be sure to reattach the LT terminal block's plastic cover after completing any terminal wiring. If this cover is not reattached, an electric shock could easily occur.
- Do not use power levels with the LT that are outside of the LT unit's specified power range. Doing so may cause a fire, electric shock or damage the LT.

Operation and Maintenance

- Do not touch a live power terminal. This could cause a shock or machine malfunction.
- Due to the danger of an electric shock, be sure to confirm that the LT unit's power cord is unplugged before either cleaning the LT or attaching/detaching the power terminal block screws.
- When replacing the LT unit's backlight, be sure to unplug the unit's power cord to prevent a shock, and wear gloves to prevent being burned.
- The LT uses a lithium battery for backing up its internal clock and control memory data. If the battery is incorrectly replaced (i.e. the + and - sides are reversed), the battery may explode. Therefore, before changing the battery, Pro-face recommends that you contact your local Pro-face distributor for battery replacement instructions.
- Do not modify the LT unit's internal parts or wiring, since doing so may lead to either a shock or fire.



CAUTIONS

Wiring Layout

- Be sure that all LT input/output signal lines are isolated from all power wiring or power cables, via a separate wiring duct. This is to prevent excessive noise, which can cause a unit malfunction.

Installation

- Be sure all data cables attached to the LT are securely connected. If all connector pins do not make complete contact, incorrect input or output signals can result.

General Wiring

- To prevent shocks or malfunctions, LT unit's FG (earth) wire should be grounded according to the following:
 1. Be sure to use a grounding resistance of 100 ohms max.
 2. Use a grounding wire of 2mm² min.
- Be sure to confirm that the LT unit's operating voltage and wiring terminal locations are correct. If either is incorrect, it can cause a fire or accident.
- Be sure to secure all wiring terminal screws in place with the designated torque. Screws and terminals that become loose can cause a short circuit, fire, or accident.
- Be sure that metal filings or wiring remnants do not fall inside the LT, since they can cause a fire, accident, or malfunction.

Operation and Maintenance

- Be sure to read the LT unit's manual and on-line help information carefully before performing program changes, forced output, or utilizing the RUN, STOP, or PAUSE commands while the LT is in operation. Mistakes concerning the use of these items can cause an accident or equipment or damage.
- The LT unit's liquid crystal display contains a powerful irritant and if for any reason the panel is damaged and this liquid enters your eye, flush your eye for 15 minutes with running water and contact a physician.

Unit Disposal

- Be sure to dispose of the LT unit in a manner appropriate to your country's industrial machinery disposal standards.

UL/C-UL(CSA) APPLICATION NOTES

The GLC150-BG41-DNM-24V is a UL/c-UL (CSA) listed product.

(UL file No. E214883)

This unit conforms to the following standards:

- UL508: Industrial Control Equipment
- UL1604: Electrical Equipment for Use in Class I and II Division 2 and Class III Hazardous (Classified) Locations
- CAN/CSA-C22.2, No.1010: Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use
- CAN/CSA-C22.2, No.142-M1987: Process Control Equipment
- CAN/CSA-C22.2, No.213-M1987: Non-incendive Electrical Equipment for Use in Class I Division 2 Hazardous Locations

GLC150-BG41-DNM-24V

<Cautions>

- If the LT is installed so as to cool itself naturally, be sure to install it in a vertical panel. Also, be sure that the LT is mounted at least 100mm away from adjacent structures and other equipment, otherwise, the heat generated by the LT unit's internal components may become higher than that allowed by UL standard requirements.
- Separate the LT from the mains by double or reinforced insulation.

UL1604 Conditions of Acceptability and Handling Cautions

1. Power, input and output (I/O) wiring must all be in accordance with Class I, Division 2 wiring methods, Article 501-4 (b) of the National Electrical Code, NFPA 70, or as specified in Section 18-152 of the Canadian Electrical Code for units installed within Canada, and in accordance with that location's authority.
2. Suitable for use in Class I, Division 2, Groups A, B, C, and D; and Class II, Division 2, Groups F and G hazardous locations, or nonhazardous locations only.
3. WARNING: Explosion hazard - substitution of components may impair suitability for Class I, Division 2, and Class II, Division 2.
4. WARNING: Explosion hazard - do not disconnect equipment unless power has been switched OFF or the area is known to be nonhazardous.
5. WARNING: Explosion hazard - when in hazardous locations, turn OFF power before replacing or wiring modules.

CE MARKING NOTES

The GLC150-BG41-DNM-24V is a CE marked, EMC compliant product that conforms to the EMC Directive 89/336/EEC and amending directives.

Reference For detailed CE marking information, contact your local Pro-face distributor.

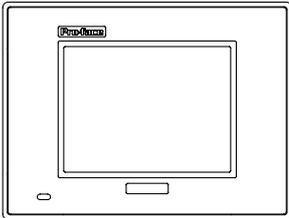
FCC NOTES

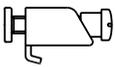
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

PACKAGE CONTENTS

The following items are included in the LT package. Before using this unit, please confirm that all items shown here are present.

- **LT Type-D (GLC150-BG41-DNM-24V) (1)**



- **Installation Guide (this guide) (1)**
 - **Installation Fasteners (4)**
- 
- **Installation Gasket**
 - **DeviceNet Master Resource CD-ROM (1)**
 - **DeviceNet Connector**

This unit has been carefully packed, with special attention to quality. However, should you find any of the items shown here to be damaged or missing, please contact your local Pro-face distributor immediately.

OPTIONAL ITEMS (SOLD SEPARATELY)

- **Data Transfer Cable: GPW-CB02 or GPW-CB02 E (Xycom)**
- **DeviceNet Master Resource CD-ROM (includes the Logic Program Development Software and the PDF manuals)**

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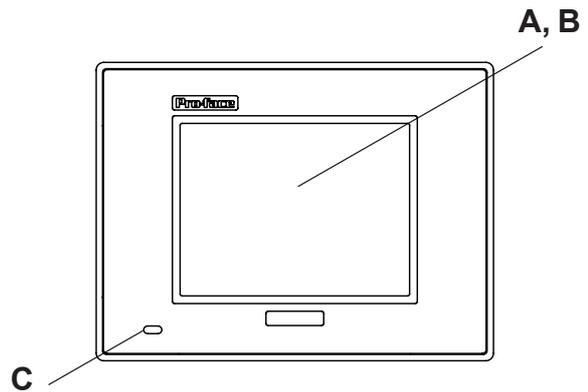
Part Names

A: Display

Displays user-created screen data.

B: Touch Panel

Performs touch-initiated operations.



C: Status LED

Operation Mode ^{*1}	Controller Operation Mode ^{*2}	LED Color
OFFLINE	STOP	Green – Constant
In Operation	RUN	Green – Constant
In Operation	STOP	Green – Flashing
In Operation	Backlight burnout has occurred	Green / Red – Constant
In Operation	Major Error (STOP)	Red – Constant

1. Operation Mode includes display and touch key features.

2. Controller Operation Mode includes the performance of logic program features.

D: Power Input Terminal Block

The input and ground terminals for the DC power cable.

E: Tool Connector

Data Transfer cable is connected here.

F: RUN/STOP Switch

RUN – Enables the logic program to operate. (LED lights up.)

STOP – Stops the logic program.

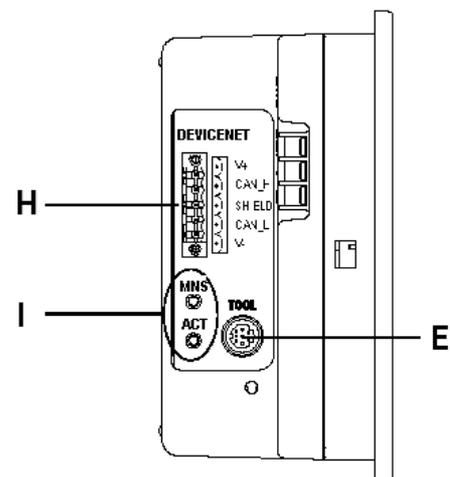
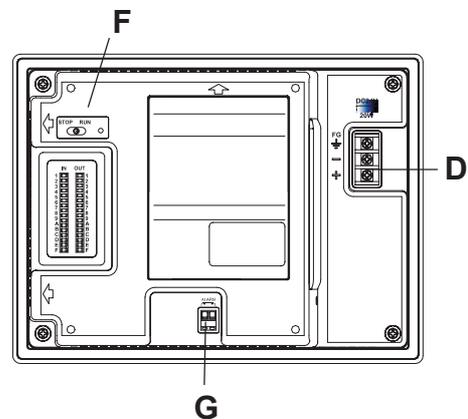
G: Alarm Output

Turns the relay contact OFF (opens the circuit) when a major or watchdog error occurs.

Reference See ■ AlarmOutputCircuit.

H: DeviceNet Connector

Connects data and power signals to the DeviceNet network.



I: Status LEDs

LED	State	Description
MNS (Module/ Network Status)	Off	Not powered, or not online
	Green	Powered, online, and connected
	Red	Critical communication fault
	Flashing Green	Online, operating, but not connected
	Flashing Red	Minor Communication Fault, or Connection Timed-out
	Flashing Green / Red	Communication Faulted; "Identify Comm Fault Request" received
ACT (Activity)	Off	Initialization not started yet, or internal failure
	Green	Initialization succeeded
	Red	Initialization in process or failed
	Flashing Green	NA Reserved
	Flashing Red	NA Reserved

■ Alarm Output Circuit

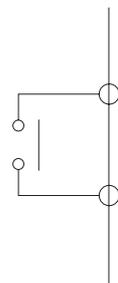
Turning the LT Type-D unit ON starts the unit's system software and closes the alarm output circuit's relay. When a major error or a watchdog timeout occurs, however, this relay will turn OFF. Since an undefined LT input or output condition can occur, be sure to design an external failsafe circuit that will monitor the output of this relay.



This relay remains OFF until the LT unit's system software completes its startup routine. During the startup period, any external failsafe circuit must be informed that the LT is not yet operational. Be sure to design a hold timer circuit that will start operations after the startup routine has completed, or create an alarm monitoring system that will monitor the LT unit's circuits.

Contact Rating	0.15A-AC125V (Resistive Loads) 0.6A-DC24V (Resistive Loads)
Operating Time (Set Time at 20°C)	4ms max.
Recover Time (Reset Time at 20°C)	4ms max.
Minimum Switching Load	1mA/DC5V
Initial Contact Resistance	100 milliohms max.

ALARM



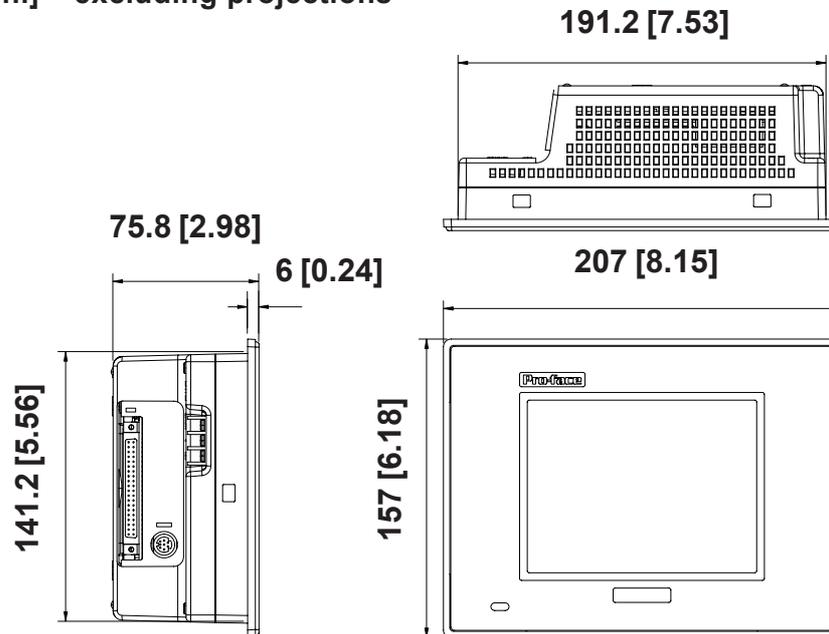
2 General Specifications

Rated Voltage	24Vdc
Rated Voltage Range	20.4Vdc to 28.8Vdc
Allowable Voltage Drop Interval	10ms max.
Ambient Operating Temperature	0°C to 50°C
Ambient Humidity	10%RH to 85%RH (no condensation)
Atmospheric Pressure	800hPa to 1114hPa (2000 meters max.)
Atmosphere	Pollution Degree 2
Fuse Rating	2.5A, 125V OR 3.5A, 12.5V

3 Dimensions

The GLC150-BG41-DNM-24V unit dimensions are as follows.

Unit: mm [in.] – excluding projections



4 Interfaces

■ DeviceNet Network Interface

Connects to a DeviceNet network.

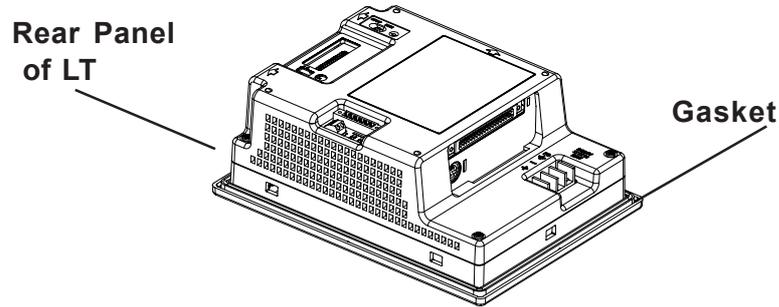
Pin Arrangement	Signal	Wire Color	Pin Number
	V-	Black	1
	CAN_L	Blue	2
	Shield	Bare Wire	3
	CAN_H	White	4
	V+	Red	5

Recommended Connector: 142055 (Xycom)

Reference For further information about the DeviceNet I/F, refer to the LT Type-D DeviceNet User Manual, or the ODVA's DeviceNet Specification.

5 Installation

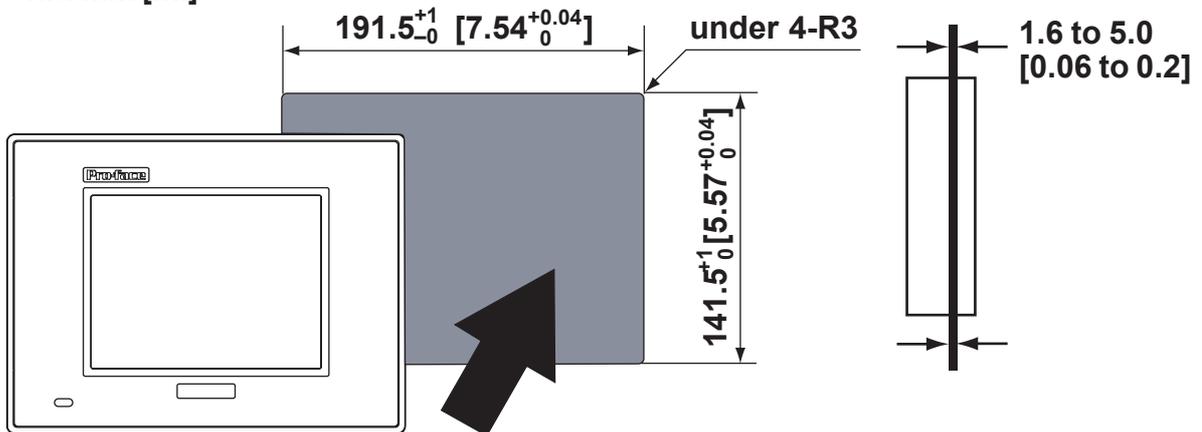
■ Confirm the Installation Gasket's Positioning



Before installing the LT Type-D unit into a cabinet or panel, check that the installation gasket is securely attached to the unit.

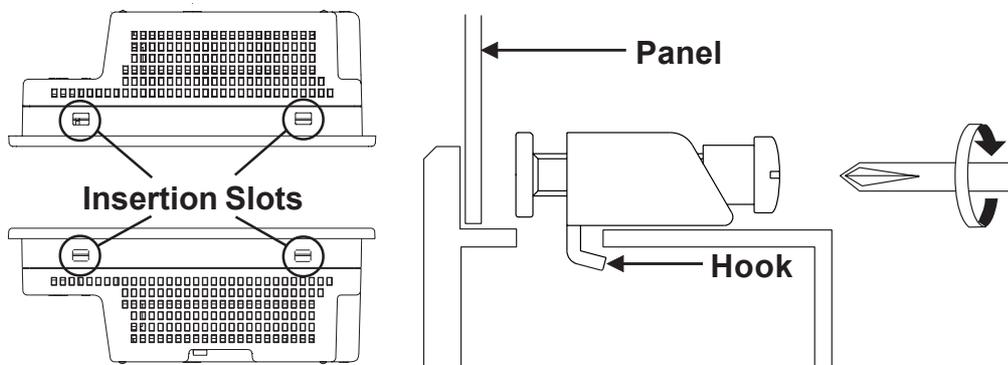
■ Create a Panel Cut and Insert the LT into the Panel from the Front

Unit: mm [in.]



■ Attach the Installation Fasteners from Inside the Panel

Following are the four (4) fastener insertion slot locations. Insert each fastener's hook into the slot and pull it back until the hook catches.



- Tightening the screws with too much force can damage the LT unit's plastic case.
- The necessary torque is 0.5 to 0.6 N•m [4.4 to 5.3 in-lb].

6

Wiring



WARNINGS

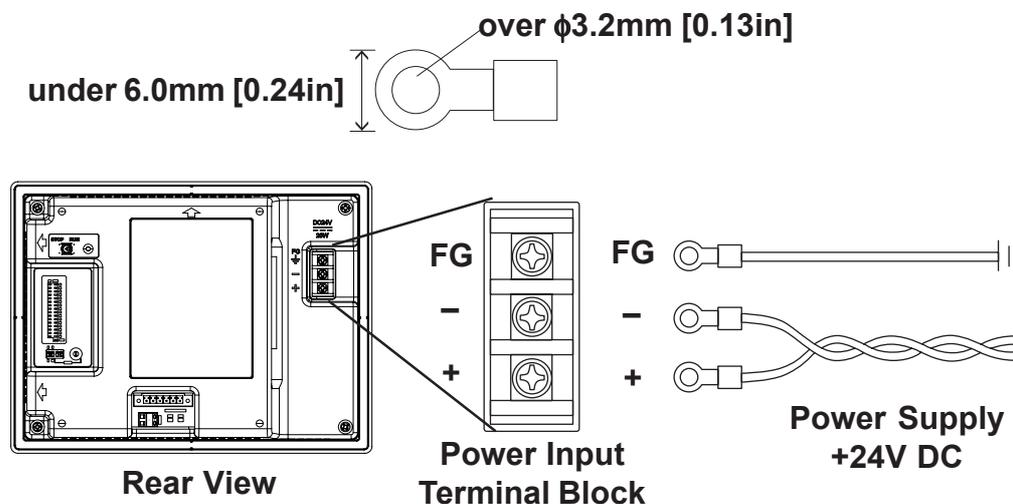
- To prevent an electric shock, prior to connecting the LT unit's power cord terminals to the power terminal block, be sure that the LT unit's power supply is turned OFF, via a breaker or similar unit.
- The LT Type-D unit is designed to use only +24V DC input. Any other power level can damage both the LT unit and the power supply.
- To prevent an electric shock or equipment damage, be sure to reattach the plastic cover to the terminal block after completing any wiring.



- To avoid a short circuit caused by loose ring terminals, be sure to use ring terminals with an insulating sleeve.
Suggested Ring Terminal: V2-MS3 (JST)
- When the FG terminal is connected, be sure the wire is grounded. Not grounding the LT unit may result in unreliable operation.



- Wherever possible, use a wire thickness of 2 mm² min. for power terminals (e.g., 14 AWG), and twist the wire ends before attaching the ring terminals.
- Be sure to use the following size ring terminals.



■ DeviceNet Power Considerations

- The LT Type-D does not require power from the bus.
- The LT Type-D does require a separate DC supply for operation.

■ Connecting the LT Type-D Unit's Power Cord

When connecting the power cord, be sure to follow the procedures given below.

1. Confirm that the LT unit's power cord is unplugged from the power supply.
2. Use a screwdriver to remove the power input terminal block's clear plastic cover.
3. Unscrew the screws from the middle three (3) terminals, align the ring terminals, and reattach the screws.
4. Confirm that the wires are connected correctly.
5. Replace the power input terminal block's clear plastic cover.



Note: The torque required to tighten these screws is 0.5 to 0.6 N•m.

7 Power Supply Cautions

Please pay special attention to the following instructions when connecting the power cord terminals to the LT Type-D unit.

- Be sure to use a low noise power supply between the line and the ground. If an excessive amount of noise continues, connect a noise reducing transformer.
- Input and Output signal lines must be separated from the power control cables for operational circuits.
- To increase noise immunity, be sure to twist the ends of the power cord wires before connecting them to the LT unit.
- 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.
- Connect a surge absorber to handle power surges.
- To reduce noise, make the power cord as short as possible.

8 Input/Output Signal Line Cautions

- All LT Type-D unit 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.

9

Grounding Cautions

- When attaching a wire to the LT Type-D unit's rear face FG terminal (on the power input terminal block), be sure to create an exclusive ground. Use a grounding resistance of 100 ohms max. and a wire thickness of 2mm² min. (e.g., 14 AWG), or your country's applicable standard.
- The FG (Frame Ground) and SG (Signal Ground) terminals are connected to each other inside the LT.
- The grounding electric wire must be independent, not crossing over other wires.
- The DeviceNet Specification stipulates that the shield wire for the entire network must be grounded at only one point.

Reference *For further details, refer to the ODVA's DeviceNet Specification.*

10

Maintenance and Periodic Inspection

When dirt collects on the surface or the frame of the display, soak a soft cloth in water with a neutral detergent, wring the cloth tightly, and wipe the display.



- Do not use paint thinner, organic solvents, or strong acid compounds to clean the unit.
- Do not use hard or pointed objects to operate the touch-screen panel, since this can damage the panel surface.