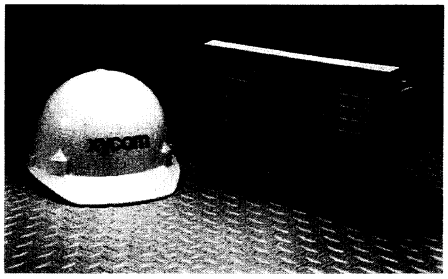
xycom®

3100



P/N 99746-001A

FOCAL POINT INDUSTRIAL WORKSTATION

Printed in U.S.A.

XYCOM REVISION RECORD

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A	Manual Released	6/95

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Part Number: 99746-001A

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United States FCC Part 15, Subpart B, Class A EMI Compliance Statement

Note: 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.

For Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n´ émet pas de bruits radioélectiques dépassant les limites applicables aux appareils numériques de Class A prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Electromagnetic Compatibility WARNING

The connection of non-shielded equipment interface cables to this equipment will invalidate FCC EMI and European Union EMC compliance and may result in interference and/or susceptibility levels which are in violation of relevant regulations. It is the responsibility of the system integrator and/or user to obtain and use shielded interface cables and equipment used with this device as described within this manual. If this equipment has more than one connector, do not leave cables connected to unused interfaces. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Chapter 1–Introduction

Product Overview

Xycom's Focal Point 3100 Industrial Workstation System can be easily configured as a flexible operator interface for a variety of PLCs, incorporating a rugged enclosure and a 5.9" monochrome or color LCD flat panel display. The front display and keypad panel are sealed to NEMA 4/4X/12 standards, with a dual-scan LCD display protected by an impact-resistant shield.

The powerful SoftScreen Windows Development System uses a fill-in-the-blank configuration which involves no programming. A Windows-based graphics builder and pull-down menus further simplify the creation of graphical interface screens and animation.

Three different expansion options make it easy to tailor the Focal Point to meet your application's hardware requirements:

- *Memory and I/O cards* may be added via the Type I-and II-compatible PC Card (also known as PCMCIA) slot.
- *Internal PC/104 cards* may be added to control peripherals and networks.

or

A half-length PC/XT-compatible expansion card can be mounted in the 3100 using an optional adapter.

Standard Features

- 320 x 240 LCD flat-panel display (5.9-inch diagonal)
- One RS-232 and one RS-485 serial port for download and device interface
- PC Card 2.1 card interface (Type I or Type II)
- AT keyboard interface (MicroDin connector)
- 16 relegendable function keys
- Full numeric keypad with cursor control keys
- NEMA 4/NEMA 12 or IP65 standards (Flat Panel is protected with an impact resistant shield)

Optional Features

- Analog touch screen (resistive membrane)
- Color display
- Expansion kit for PC/XT or PC/104
- Additional memory (PC Card, also known as PCMCIA)
- Keyboard converter cable (MicroDin to Din PC/AT style)

Specifications

Hardware

Mechanical

Height	8.0" (203.2 mm)
Width	12.0" (304.8 mm)
Depth	4.0" (101.6 mm) mounting 4.625" (117.5 mm) with PC Card
Weight	5.0 lbs. (2.27 kg)

Electrical

90-250 VAC, auto-sensing
47-63 Hz, .6 A maximum
54 Watts maximum
(185 BTU/HR)

Electromagnetic Compatibility

Emissions: FCC 47CFR, Part 15, Subpart B, Class A

Immunity: IEC 801-2: 1991 /EN 50082-2 8KVCD, 15KVAD; IEC 801-3: 1984 /EN 50082-2 10 V/M 27-500 Mhz; IEC 801-4: 1987 /EN 50082-2 1KV signal, 2KV ac

Mounting

5.66" x 10.55" panel cutout, 6 (#8-32) nuts

Display

5.9" color or mono

Agency Approval

UL (pending)
CUL (pending)
TUV Rheinland

Environmental

Temperature

Operating	0° to 50°C (32° to 122°F) mono
	0° to 40°C (32° to 104°F) color
Non-operating	-20° to 60°C (-4° to 140°F) both

Humidity

Operating	20 to 80% RH, non-condensing
Non-operating	5 to 90% RH, non-condensing

Shock

Operating	15 g peak acceleration
	11 msec duration
Non-operating	30 g peak acceleration
	11 msec duration

Vibration

Operating	5 to 2000 Hz
	.006" peak-to-peak displacement
	1.0 g maximum acceleration
Non-operating	5 to 2000 Hz
	.015" peak-to-peak displacement
	2.5 g maximum acceleration

Altitude

Operating	Sea level to 10,000 ft. (3048 m)
Non-operating	Sea level to 40,000 ft. (12192 m)

NOTE: See Chemical Compatibility in Chapter 6.

Chapter 2–Unpacking the 3100

Parts Verification

When you remove the 3100 system from its shipping carton, verify that you have the parts listed below. It is a good idea to save the box and inner wrapping in case you need to reship the unit.

- 3100 unit
- Documentation kit which includes:

  -Power connector

  -3100 Hardware Manual

  -Mounting hardware (eight #8-32 mounting nuts)

  -Cable clamp and #8 self-tapping screw

  -Two #4 self-tapping screws (spare)

  -Business reply card

System Components

This section describes the 3100's front and rear view components to familiarize you with the Workstation's features.

Front Panel

Display

The 5.9-inch display is protected from breakage by impact- resistant shield. If the touch screen option is installed, the impact-resistant shield is replaced by a touch panel.

Function and User-Defined Keys

These 16 relegendable keys provide easy access to familiar routines. Ten of these keys are prelabeled F1 through F10, and the remaining six keys are user-defined (prelabeled with pointers). Refer to Chapter 4 for more details on customizing your inserts,

Numeric/Cursor Control Keypad

The purpose of data entry keypads are for entering data and moving the cursor. The full numeric keypad includes five cursor control keys, several global function keys, and the Enter key. Refer to Figure 1.

Touch Screen

Touch screen is a factory-installed option. This industrial resistive membrane touch screen lets you select on-screen objects by pressing directly on the touch screen. With this analog based touch screen, graphic objects can be easily placed on the screen without specific touch zones.

Logo Area

Refer to Chapter 3, Figure 7 for dimensions and recommended requirements for a customized label.

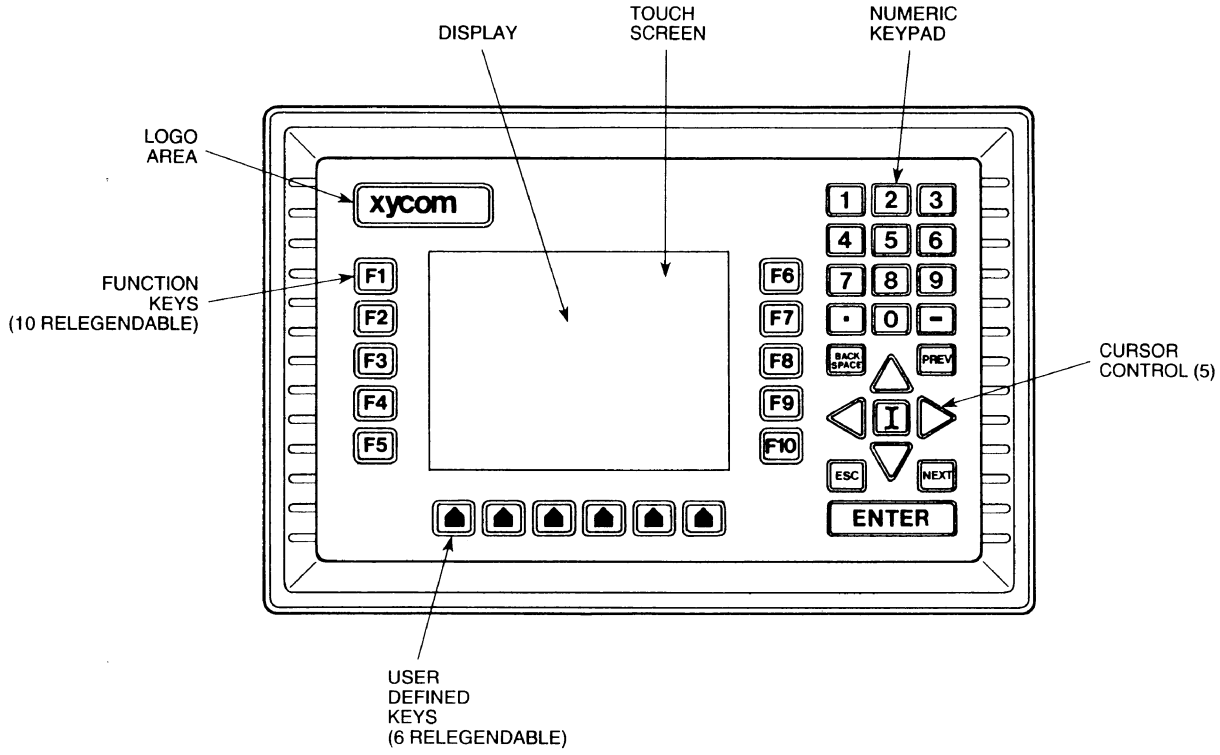


Figure 1. Front Panel

Rear View

Power Connector

The power receptacle is labeled L1 L2/N GND on the bottom side of the unit. The input range for the supply is 90-250 AC volts, 47-63 Hz.

Power Cable

This is not supplied with the unit. See Creating a Power Cable in Chapter 3.

Keyboard Port

This standard MicroDin connector is PC/AT compatible to access data entry functions. This port is labeled KEYBD on the bottom side of the unit. Refer to Chapter 4.

RS-232/RS-485 Ports

The 3100 supports both RS-232 and RS-485 external termination serial ports. (Refer to Figure 2 for locations of the ports, and Chapter 8 for pinout and cable information.)

PC Card Slot

This memory expansion interface supports memory cards that are Type I and II size formats only.

PC Card Retainer Clip

This clip holds down your PC Card once installed.

Spare PC Card Holder

This slot is designed to hold a spare card.

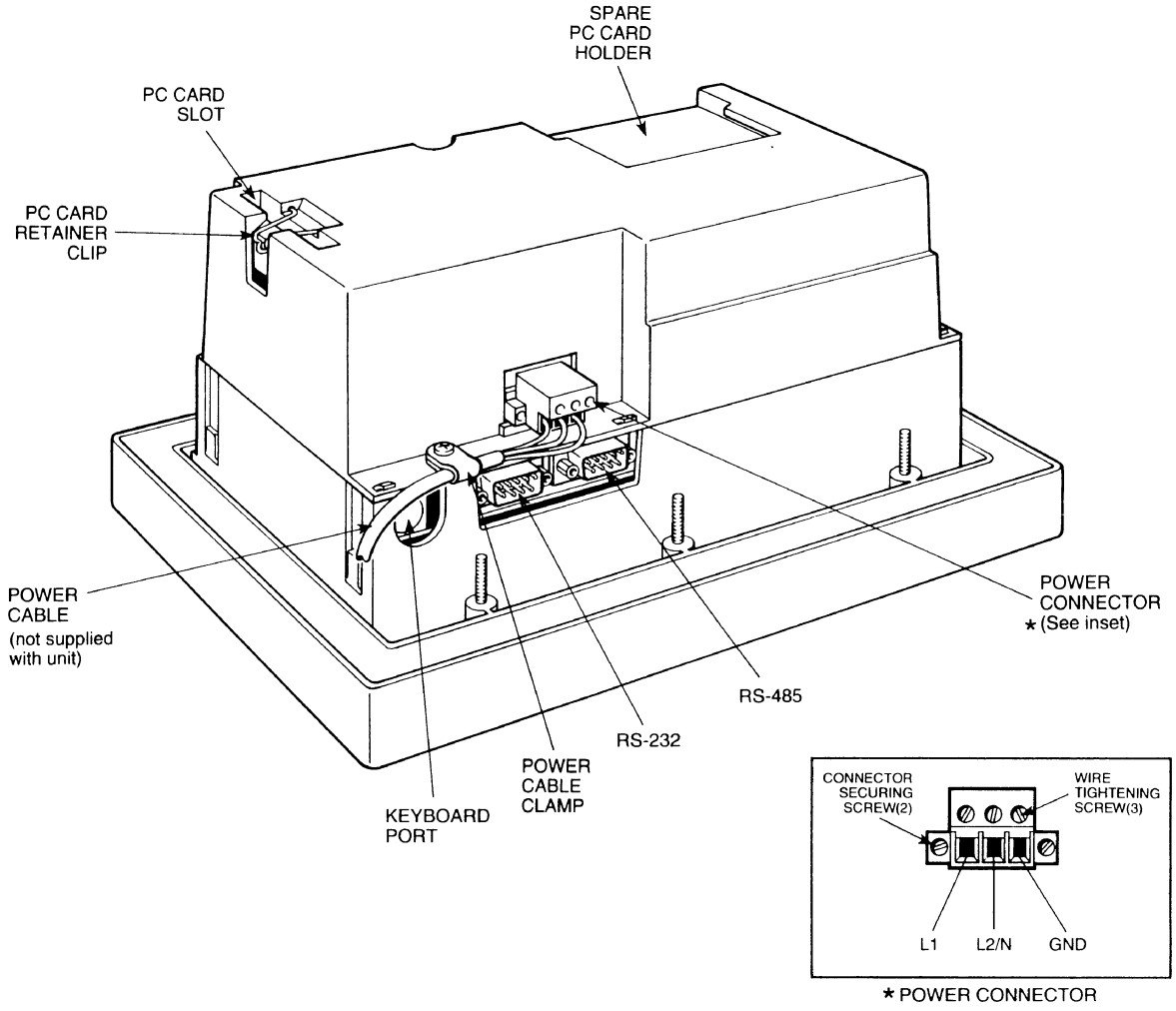


Figure 2. Rear View

Chapter 3–Installation

Warning

Disconnect power before performing any internal adjustments or modifications.

Introduction

This chapter discusses how to get your 3100 installed and running. The figures in this chapter show the internal components, external components, and cutout dimensions of the 3100 to help you locate features, and determine measurements relevant to installation.

As you prepare your system for use, refer to the following figures for locations of the various components of the 3100:

- *Figure 1, page 2-3* - Front View
- *Figure 2, page 2-5* - Rear View
- *Figure 3, page 3-14* - Front Panel Interior View of Keypad Slots
- *Figure 4, page 3-15* - Internal System Components
- *Figure 5, page 3-16* - 3100 System Dimensions
- *Figure 6, page 3-17* - Panel Cutout Dimensions
- *Figure 7, page 3-18* - Logo Label Dimensions

Preparing the System for Use

1. Install any user optional equipment by following the instructions in the next few sections.
2. Do a panel cutout. Use Figure 6 for exact dimensions.
3. Mount the 3100 and properly secure the unit into the panel
4. Attach the input power cord to the power connector.

Installing Internal Hardware Options

PC Card Installation (also known as PCMCIA)

Note

It is recommended to turn the power off. However, you may insert the card with the power on.

1. Unlatch the PC card retainer over the slot (a small screw driver may be needed to pry the clip up). See Chapter 2, Figure 2.
2. Install the card (keyed side down, card will be facing the unit) into the slot. Push the PC card clip over the card to secure it. If the card is inserted incorrectly, the clip will not fit over the card.
3. Be sure the card is fully engaged and slip the PC card clip over the card to secure it.
4. Reverse the steps for removing the card.

Expansion Options

Note

The 3100 will hold either a half-length PC/XT with adapter card *or* up to two PC/104 cards.

PC/104

The PC/104 connector supports a 16-bit interface. The connectors are placed on the board so that the PC/104 stack-through interface boards can be used.

You will need the #4-40 locking screws or stand-offs contained in the expansion kit before installing this card.

Expansion kit contents:

- one #6-32 locking screw
- one PC/104 - PC/XT assembly
- one blank ORB
- two #4 self-tapping .5-inch screws
- four #4-40 locking screws
- four #4-40 x .625-inch male-female standoffs

Note

Installation of PC/104 cards may void EMC compliance. This is a function of the PC/104 card design and verification of compliance after installation of any given card is the responsibility of the system integrator/user.

Always use the locking screw to attach the PC/104 cards to prevent vibration failures.

Follow the steps listed below to install the PC/104 card.

1. Remove the power cord and cable clamp (if used). If a PC Card is installed, it must also be removed at this time.
2. Unscrew the back cover.
3. Squeeze the tabs (at arrows) to open the rear cover.
4. The PC/104 connectors are to the right of the power supply (see Figure 4 for location) The four standoffs required for card attachment are preinstalled. The contents of the expansion kit should be used to attach one or two PC/104 cards.
5. If the cards need to connect to something outside the unit, the break-away area, (on the side of the rear cover) will need to be removed (see Figure 4). A razor knife or cutters are needed to score and remove this area.
6. Cables can then be passed through this area or the blank ORB supplied in the expansion kit can be used to mount connectors.

ORB Mounting

This is a mechanical mounting option for the PC/104.

1. Set the ORB in place, with the bottom of it positioned on the outside of the ground bracket (in the lower right hand corner of the unit).
2. Use the #6-32 locking screw to connect the ORB to the ground bracket. When the rear cover closes, it will support and lock the top of the ORB into position.
3. Close the cover until the plastic latches on each side of the rear cover engage in the rear frame. Install a #4 self-tapping screw in the top middle of the rear cover.
4. Reinstall the power cable, cable clamp and any other interface connectors. The unit is ready for operation.

Note

Installation of PC/XT cards may void EMC compliance. This is a function of the PC/XT card design and verification of compliance after installation of any given card is the responsibility of the system integrator/user.

PC/XT

You will need the optional expansion kit before installing this card.

Expansion kit contents:

- one #6-32 locking screw
- one PC/104 - PC/XT assembly
- one blank ORB
- two #4 self-tapping .5-inch screws
- four #4-40 locking screws
- four #4-40 x .625-inch male-female standoffs

Follow the steps listed below to install the PC/XT card.

1. Remove the power cord and cable clamp (if used). If a PC Card is installed, it must also be removed at this time.
2. Unscrew the back cover screw.
3. Squeeze the tabs (at arrows) to open the rear cover.
4. Plug the adapter card into the PC/104 connectors on the CPU. Make sure that the pins are properly aligned and insert into the PC/104 connectors.
5. Screw the adapter card down to the plastic using the #4 self-tapping screws supplied in the expansion kit.
6. The break-away area on the side of the rear cover needs to be scored and then bent inward (see Figure 4). A razor or knife cutters should be used to remove this area.
7. Position the PC/XT card so that it plugs into the card edge connector, and so that the ORB sits into its groove with the ORB on the outside of the ground bracket.

8. In a rare case, the ORB contains a connector near the top, the card may have to be slightly tilted to clear the plastic tab at the top of the ORB groove. Use the #6-32 locking screw to connect the ORB to the ground bracket. When the rear cover closes, it will support and lock the top of the ORB into position.
9. Close the cover until the plastic latches on each side of the rear cover engage in the rear frame. Install a #4 self-tapping screw in the top middle of the rear frame.
10. Reinstall the power cable, cable clamp and any other interface connectors. The unit is ready for operation

Installing External Hardware Options

Installing Keypad Inserts

Refer to Chapter 4 for keypad insert dimensions, and ordering information.

1. Unplug the power connector. Remove the PC card, and cable clamp and screw (if used).
2. Unscrew the back cover screw, and the two screws holding the rear frame to the front panel.
3. Squeeze the tabs (at arrows) to open the back cover.
4. Disconnect the keypad cable (and touch screen cable, if present) and close rear cover while holding up cables. Gently pull the rear frame assembly away from the front panel by lifting the retaining latch. Set rear frame assembly aside.
5. There are two vertical insert locations and one horizontal insert location; remove the relegendable keypad strips.
6. Reverse the steps for installing the new inserts.
7. Reattach the rear frame to the front panel while holding keypad and/or touch screen cables up.
8. Install the #4 self-tapping screw in the top left and right of the rear frame.
9. Open cover and reattach keypad and/or touch screen cables.

10. Close the cover until the plastic latches on each side of the rear cover engage in the rear frame. Install a #4 self-tapping screw in the top middle of the rear cover.
11. Reinstall the power cable, cable clamp, and any other interface connectors. The unit is ready for operation again.

Custom Logo Option

Refer to Figure 7 for the dimensions and recommended requirements for a customized label. Once a custom label is procured, it is placed over the "Xycom" in the upper left-hand corner of the keypad. (Fits inside the ring embossment.)

Installing the 3100 into a Panel

The 3100's rugged design allows it to be installed in most industrial environments. The 3100 is placed in a NEMA 4/4X/12 or IP65 enclosure to protect against contaminants such as dust, moisture, etc. Metal enclosures also help minimize the effects of electromagnetic radiation that may be generated by nearby equipment. Follow the guidelines in the next few paragraphs for installing your 3100.

Mounting Considerations

Once you have found a location for the 3100, install it in the enclosure according to the instructions that follow these next few sections. Consider the following points and precautions before placing the 3100 inside an enclosure:

Points and Precautions

- Select an enclosure that will allow access to the 3100 ports.
- Account for the unit's depth as well as the PC Card expansion when choosing the depth of the enclosure.
- Mount the 3100 so that it gets proper cooling.
- Place the 3100 at a comfortable working level (usually at shoulder height).
- Consider locations of accessories such as AC power outlets and lighting (interior lighting and windows) for installation and maintenance convenience.
- To allow for maximum cooling, avoid obstructing the air flow.
- Place any fans or blowers close to the heat generating devices. If using a fan, make sure that outside air is not brought inside the enclosure unless a fabric or other reliable filter is also used. This filtration prevents conductive particles or other harmful contaminants from entering the enclosure.
- To provide a NEMA 4 Seal, the unit must be mounted in an approved enclosure with a 14 gage .075" (1.9mm) thick steel or .125" (3.2 mm) thick aluminum front face
- Do not select a location near equipment that generates excessive eletromagnetic interference (EMI) or radio frequency interface (RFI) (equipment such as high power welding machines, induction heading equipment, and large motor starters)
- Place incoming power devices (such as isolation or constant voltage transformers, local power disconnects, and surge suppressors) away from the 3100.
- The proper cable routing of incoming power lines keeps power wire runs as short as possible, and minimizes electrical noise transmitted to the 3100.
- Make sure the location does not exceed the 3100's temperature specifications.

System Power

It is always a good idea to use isolation transformers on the incoming AC power line to the 3100. An isolation transformer is especially desirable in cases in which heavy equipment is likely to introduce noise onto the AC line. The isolation transformer can also serve as a step-down transformer to reduce the incoming line voltage to a desired level. The transformer should have a sufficient power rating (units of volt-amperes) to supply the load adequately.

Proper grounding is essential to all safe electrical installations. Refer to the National Electric Code (NEC), article 250, which provides data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. The code specifies that a grounding path must be permanent (no solder), continuous, and able to safely conduct the ground-fault current in the system with minimal impedance. The following practices should be observed:

- Terminate protective Earth Ground to the enclosure chassis near the point of entry. In a noisy environment, local ground rod may be necessary.
- All electrical racks or chassis and machine elements should be grounded to a central ground bus (a "star" ground bus is best).
- The enclosure should be properly grounded to the ground bus. Make sure a good electrical connection is made at the point of contact with the enclosure.

Excessive Heat

To keep the temperature in the range, the cooling air at the base of the system must not exceed 40°C for color, and 50°C for monochrome. Proper spacing must also be allocated between internal components installed in the enclosure.

When the air temperature is higher than 50°C in the enclosure, use a fan or air conditioner.

Electrical Noise

Noise can cause temporary malfunctions due to operating errors, which can result in hazardous machine operation in certain applications. Noise

may be present only at certain times, may appear as widely-spread intervals, or in some cases may exist continuously.

Noise usually enters through input, output, and power supply lines. This usually results from the presence of high voltage or long, closed-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use braid/foil shielded cables to help minimize noise. Terminate the shields directly to chassis ground. Do not rely on drain wires to chassis ground. Potential noise generators include relays, solenoids, motors, and motor starters, especially when operated by hand contacts like push buttons or selector switches. In accordance with National Electric Code specifications, it is recommended that the high voltage and low voltage cabling be separated and dressed apart. In particular, the AC cables and switch wiring should not be in the same conduit with the PLC communication cables.

Line Voltage Considerations

The power supply section of the 3100 is built to sustain line fluctuations of 90-250 VAC and still allow the system to function within its operating margin. As long as the incoming voltage is adequate, the power supply provides all the logic voltages necessary to support the processor, memory, and I/O.

In cases in which the installation is subject to unusual AC line variations, a constant voltage transformer can be used to prevent the system from shutting down. However, a first step toward the solution of the line variations is to correct any possible feed problem in the distribution system. If this correction does not solve the problem, a constant voltage transformer must be used.

The constant voltage transformer stabilizes the input voltage to the 3100 by compensating for voltage changes at the primary in order to maintain a steady voltage at the secondary. When using a constant voltage transformer, check that the power rating is sufficient to supply the 3100.

Panel Mounting

Once the considerations in the preceding paragraphs have been met, mount the 3100 by following the instructions below:

1. Locate a position for your 3100 that meets the required specifications.
2. Cut the hole according to the cutout dimensions in Figure 6.
3. Make sure the area around the cutout is clean and free from metal burrs.
4. Insert the workstation into the hole created in Step 2 from the front of the panel.
5. Hold the workstation against the panel and secure it with the mounting nuts.
6. Tighten the six #8-32 nuts to 21-inch pounds (2.4 Newton-meters).
7. Attach the power cord to the 3100.

Warning

Do not exceed 21-inch pounds (2.4 Newton-meters) when tightening #8-32 mounting nuts.

Creating a Power Cable

A power cable must be created to supply power to the 3100. The materials needs are:

- Cable clamp (supplied, 0.25" (6 mm) max. nominal I.D.)
- 3-position power connector (supplied)
- 14 (1.6 mm), 16 (1.3 mm) or 18 (1.0 mm) gage solid or stranded wire within a braid/foil shielded cable.

Note

The cable sheild should be terminated to protective Earth Ground at the power source end of the cable.

1. Cut wire cable to the desired length. It is good practice to make the protective earth ground wire 1/4-inch (6.35 mm) to 1/2-inch (12.7 mm) longer than the line and neutral wires.
2. Strip .39-inch (10 mm) of insulation from the end of the cable. No bare wire should be exposed when the cable is connected to the workstation.
3. Tin the wire ends with solder if using stranded wire. This will keep the wire from fraying.

Note

If stranded wire is used, wire ends should be tinned with solder to keep the wire from fraying.

Warning

When inserting the wire ends of the power cable into the block plug, be sure that no bare wire is exposed. Trim the wire ends of the cable or cut a new cable if necessary.

4. Insert the three wire ends of the power cable into the three holes of the block plug, as shown in Chapter 2, Figure 2. The Ground (PE), L1 and L2/N wires should be inserted into the corresponding holes, as indicated in Figure 2 also. Be sure that no bare wires are exposed.
5. Tighten the three screws above the wires to hold them firmly in place.

Warning

Never tighten the three screws of the block plug when the cable is connected to a power source. The screws are conductive and have full contact with the cable wire.

6. A cable clamp (supplied) and #8 self-tapping screw should be used to secure and strain-relief the power cable. When installing the power cable to the unit, use the securing screws on each side of the plug.

7. Once the power and other optional interface cables are installed, installation is complete.

Warning

When disconnecting the power cord from the unit, be sure to completely loosen the two securing screws on the plug.

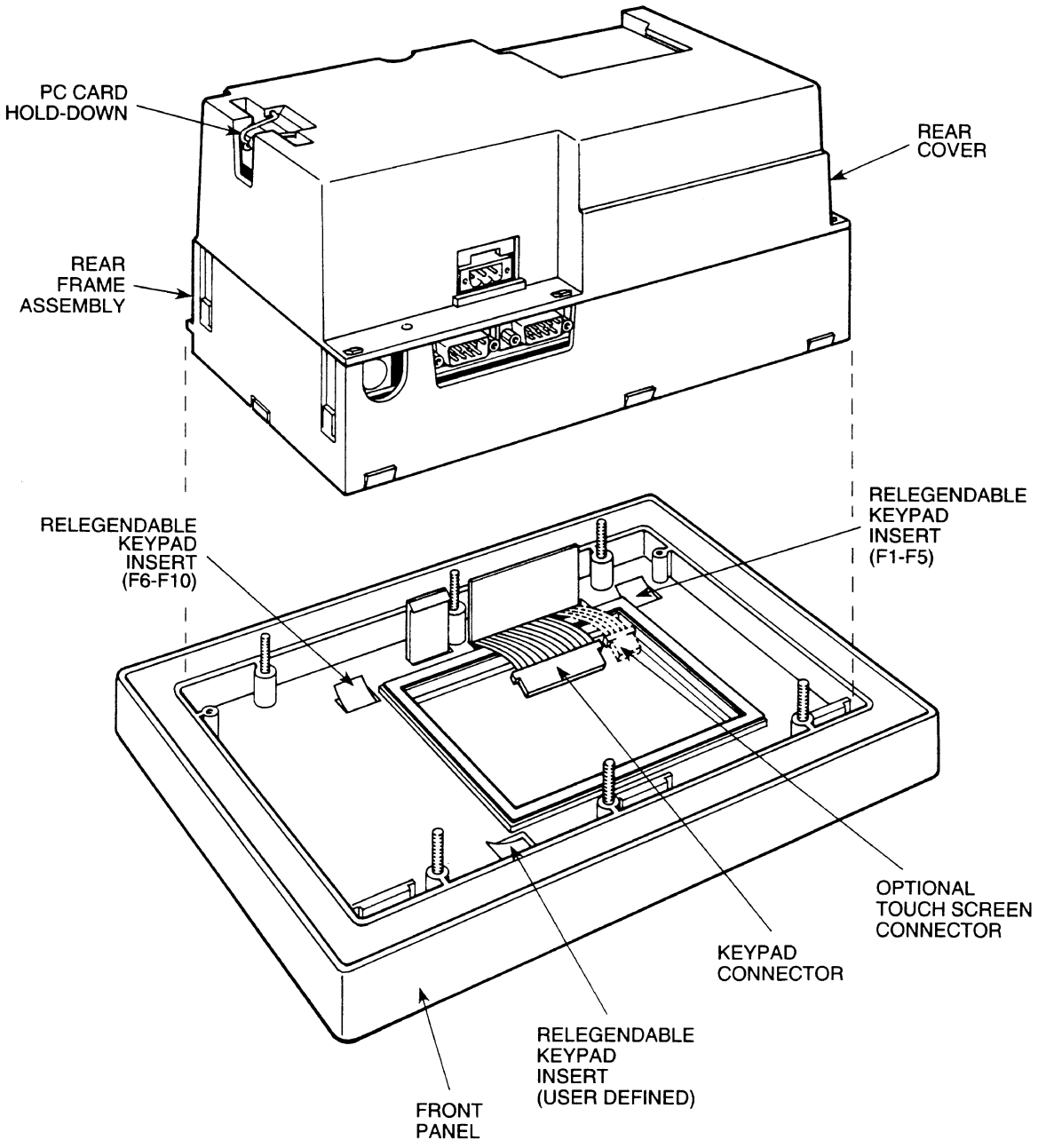


Figure 3. Front Panel Interior View of Keypad Slots

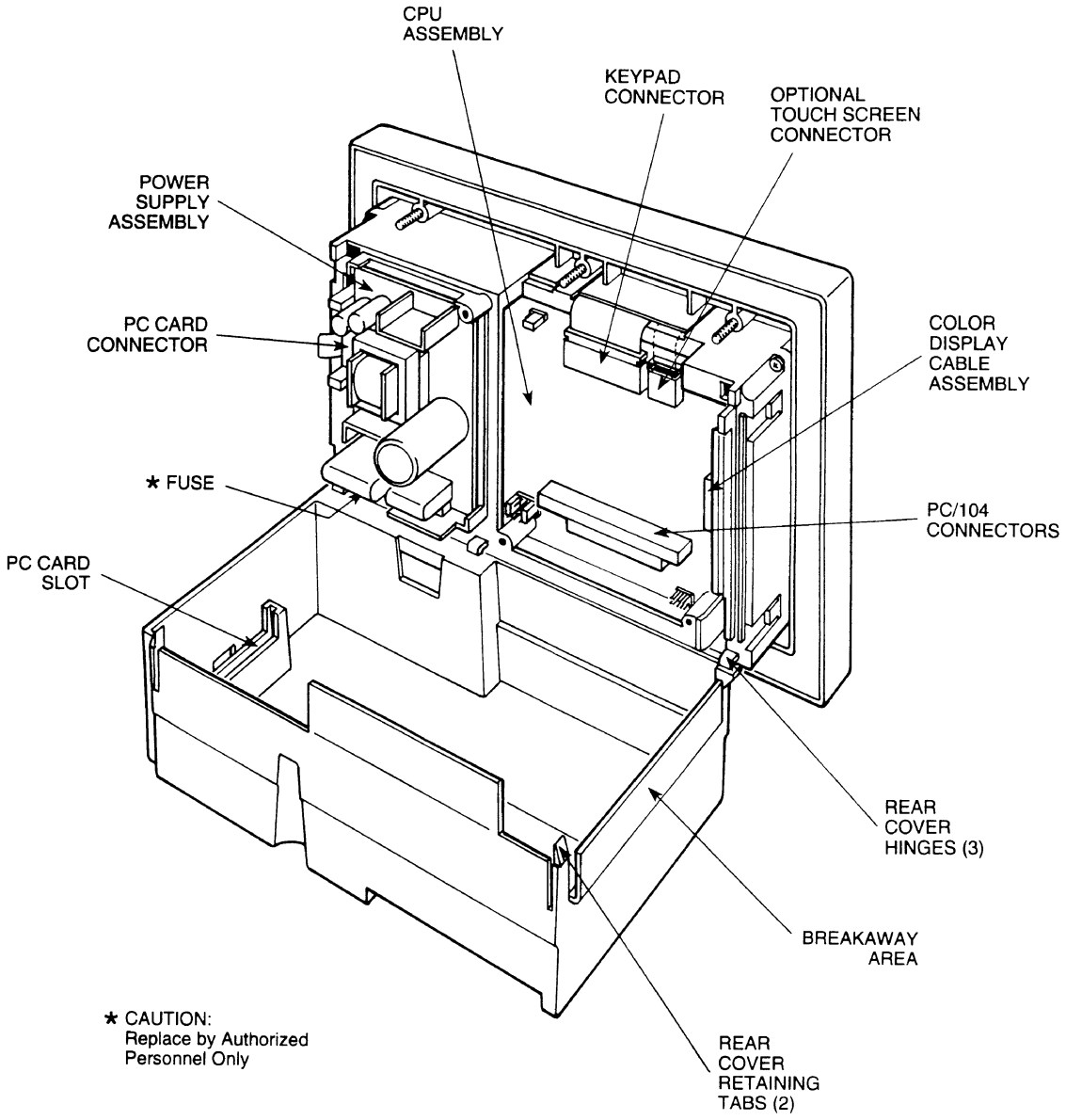


Figure 4. Internal System Components

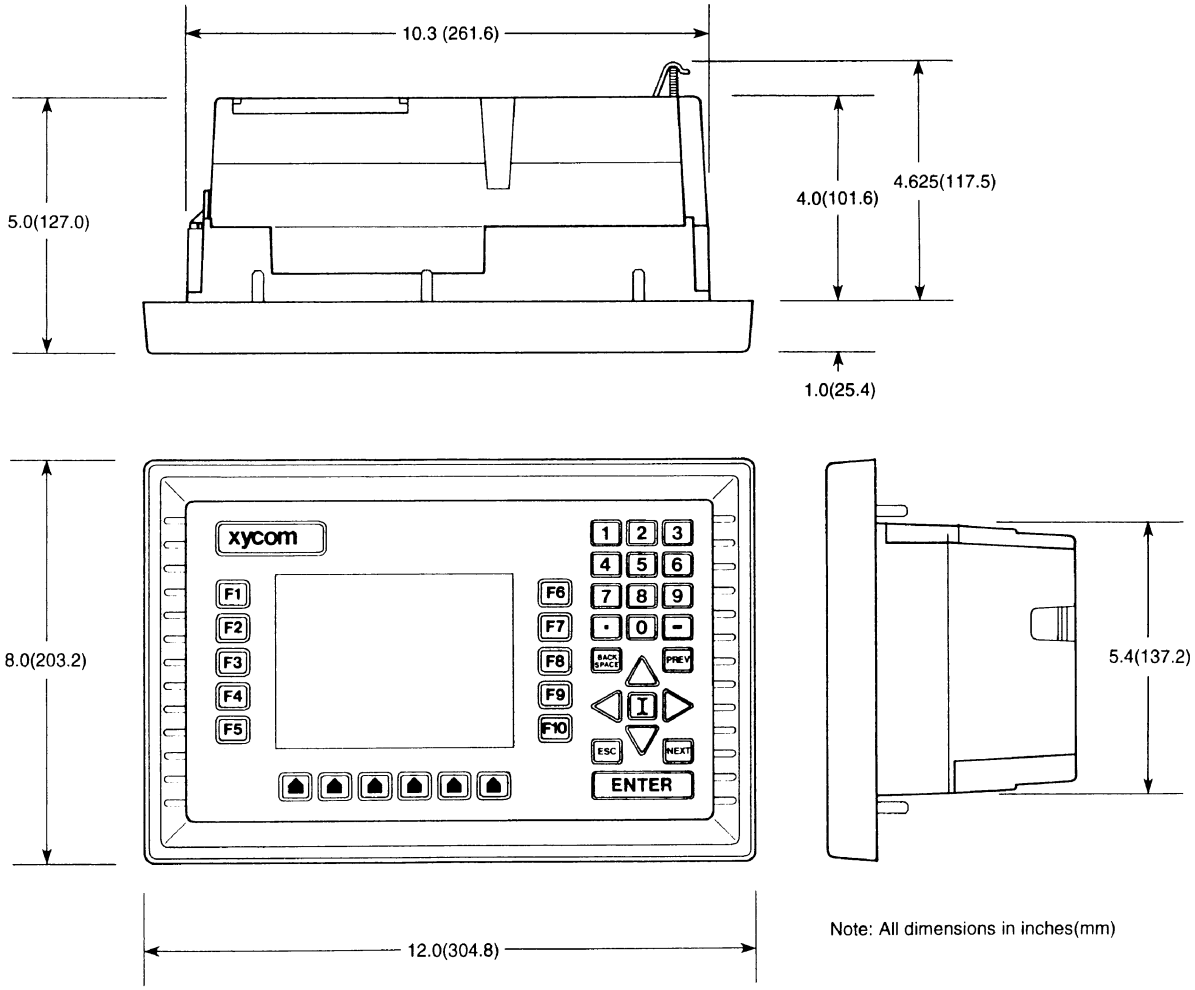


Figure 5. 3100 System Dimensions

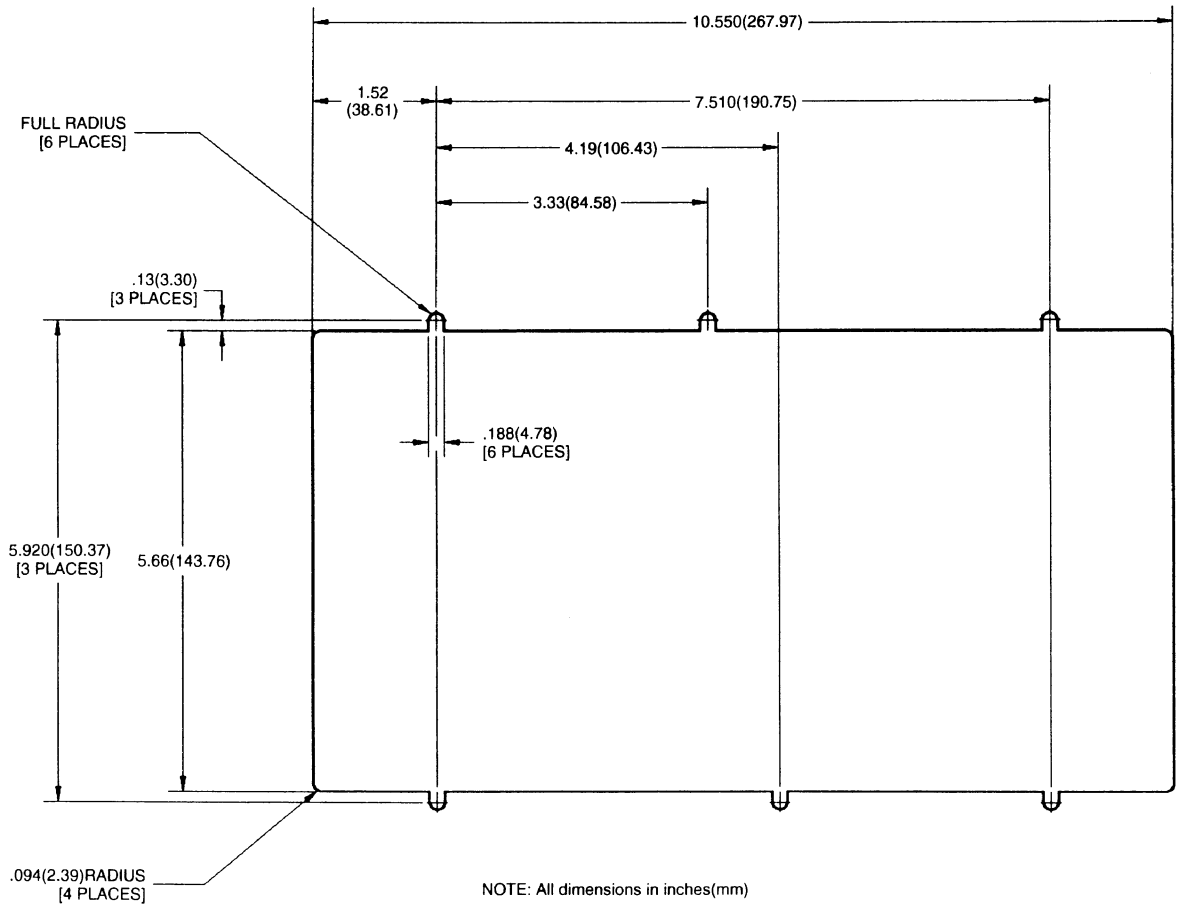
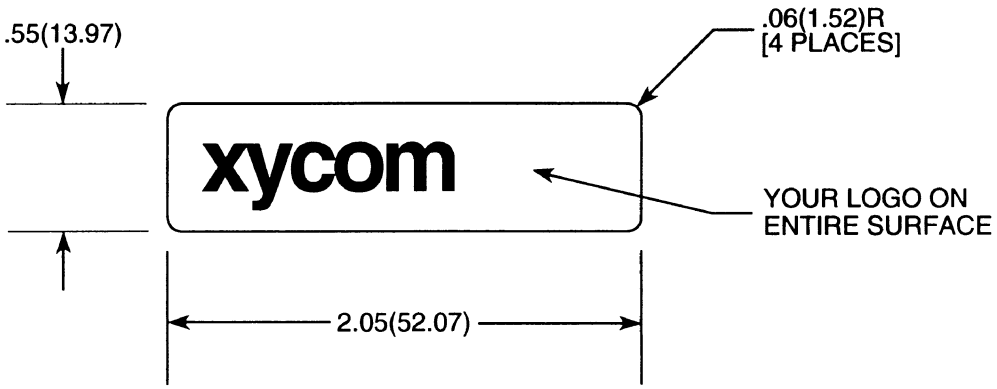


Figure 6. Panel Cutout Dimensions



NOTE: All dimensions are in inches(mm)

RECOMMENDED MATERIAL: .007(.178) thick polyester with 3M #468 adhesive on far side

Figure 7. Logo Label Dimensions

Chapter 4–Keypad

Keypad Features

The 3100 features 16 relegendable keys (ten of which are prelabeled F1 through F10) and the remaining six keys are user defined. You may also use graphic displays (via labels or preprinted designs) to customize your keypad inserts. All inserts are textured on the back side so you can write on them. Refer to Figures 8 and 9.

The data entry keypad is a full-numeric keypad including cursor control keys, several global function keys, and the Enter key. The 3100 keypad remains operational even up to three million touches (minimum). Refer to Chapter 2, Figure 1.

Keypad Inserts

You can customize your keypad with keypad inserts. The keypad inserts may be ordered through Xycom or through the company of your choice. If ordering through another company, please refer to Figures 8 and 9 for the insert dimensions, and Chapter 3 for installing your keypad inserts.

When ordering standard keypad inserts through Xycom, use the following part numbers:

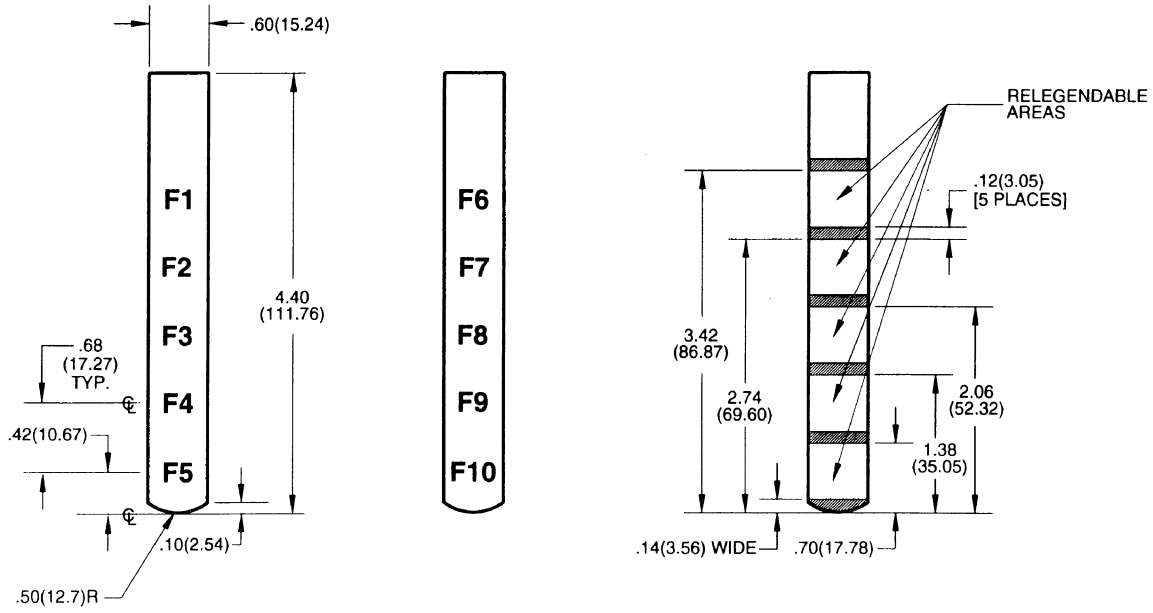
1. 99762-001 Keypad Insert F1 through F5
2. 99764-001 Keypad Insert F6 through F10
3. 99766-001 Keypad Insert Arrow Keys

Keyboard Port

You may use any standard keyboard if desired. The keyboard port, located on the bottom side of the unit, is a standard MicroDin connector with a standard pinout to easily connect with a PC/AT keyboard.

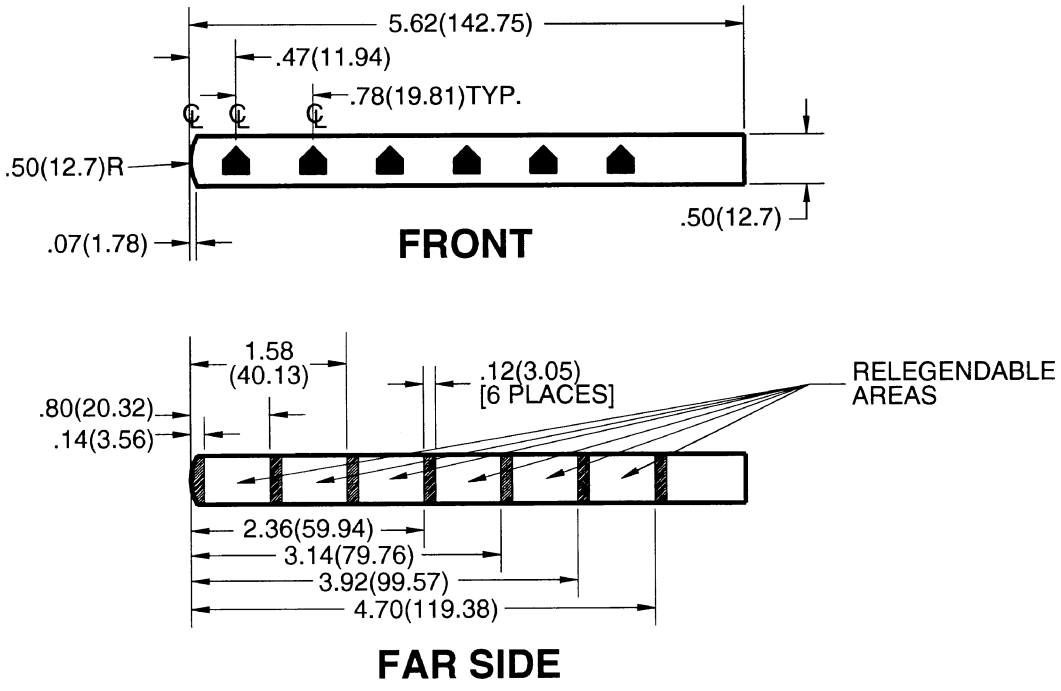
Note

The keyboard must have a shielded cable which provides shield termination to the 3100 Din connector. Failure to do so may void EMC compliance.



NOTE: All dimensions in inches(mm)
MATERIAL: .007(.178) thick polyester

Figure 8. Keypad Inserts with Dimensions (F1 - F10)



NOTE: All dimensions in inches(mm)
MATERIAL: .007(.178) thick polyester

Figure 9. Keypad Insert with Dimensions (User-defined Keys)

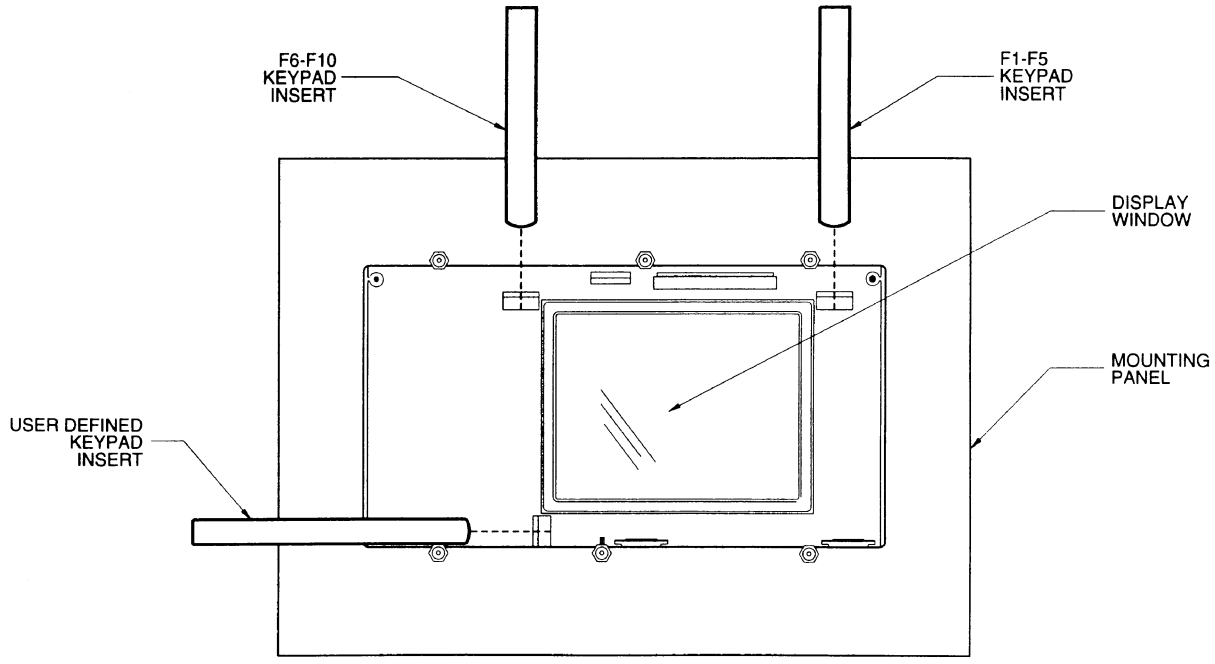


Figure 10. Keypad Insert Position

Chapter 5–Touch Screen

Introduction

The analog touch screen is a factory installed option. This industrial touch screen lets you select on-screen objects by pressing on the touch screen. Since this is analog based, the graphic objects are more easily placed on the screen without specific touch zones.

Xycom's analog touch screen is based on resistive membrane technology and consists of two thin sheets of polyester with transparent, conductive coatings on the facing sides. Finger or stylus pressure causes the outer sheet to make electrical contact with the inner sheet. Xycom's touch screen complies with the complete environmental specifications and remains operational even up to two million touches (minimum).

Chapter 6–Maintenance

Preventive Maintenance

> **Note**
>
> This product contains a *lithium battery component device*. This should be disposed of properly.

The 3100 Workstation was designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your workstation in good operating condition. Preventive maintenance consists of several basic procedures and checks that will greatly reduce the chances of system malfunction. Preventive maintenance should be scheduled along with the regular equipment maintenance to minimize the down time.

Some preventive measures are listed below:

- Remove dust and dirt from PC components. If dust builds up on heat sinks and circuitry, an obstruction of heat dissipation could cause the unit to malfunction. If dust reaches the electronic boards, a short circuit could occur.
- Check the connections to I/O modules, especially in environments where shock could loosen the connections. Check to see that all plugs, sockets, terminal strips, and module connections are solid.
- Remove unnecessary articles, like drawings or manuals, from the unit. They could obstruct air flow which creates hot spots, which cause the system to malfunction.
- Do not move noise generating equipment too near the Workstation.

Chemical Compatibility

Certain combinations of chemical environments, temperature, and stress can adversely affect parts made from thermoplastic resin. For this reason material which may come in contact with the Focal Point unit should be carefully evaluated under end-use conditions for compatibility. You should also follow the use and compatibility recommendations of the material manufacturer. The following table lists general chemical compatibility guidelines for the 3100 Focal Point.

Chemical Class	Effects
Acids	No effect under most common conditions of concentration and temperature.
Alcohols	Generally compatible at low concentration and room temperature. Higher concentrations and elevated temperatures result in etching and attack evidenced by decomposition.
Alkalis	Generally compatible at low concentration and room temperature. Higher concentrations and elevated temperatures result in etching and attack evidenced by decomposition.
Aliphatic Hydrocarbons	Generally compatible
Amines	Surface crystallization and chemical attack. Avoid.
Aromatic Hydrocarbons	Partial solvents and severe stress cracking agents. Avoid.
Detergents and Cleaners	Mild soap solutions are compatible. Strong alkaline materials should be avoided.
Esters	Causes severe crystallization. Partial solvents. Avoid.
Greases and Oils	Pure petroleum types generally compatible. Many additives used with them are not compatible.
Halogenated Hydrocarbons	Solvents. Avoid.
Ketones	Causes severe crystallization and stress cracking. Partial solvents. Avoid.
Silicone Oil and Greases	Generally compatible up to 185°F. Some contain aromatic hydrocarbons which should be avoided.

Compatible Lubricants

The following table lists known compatible lubricants and the manufacturer's names. If you want to use a lubricant that is not listed below, contact the appropriate manufacturer for compatibility.

Lubricants	Manufacturer
DC® 230 Molykote® 33	Dow Corning Midland, MI 48640 (800) 248-2345
Harmony® 68 Security® 68	Gulf Oil Petroleum Prod. Dept. Pittsburgh, PA 15230 (412) 655-6247
Lubriplate® Aero	Fisher Bros. Refinery 129 Lockwood Street Newark, NJ 07105
Martemp® 2500	E.F. Houghton & Co. 303 W. Lehigh Ave. Philadelphia, PA 19133 (215) 666-4000
Nyogel® 795A Rheolube® 368 Rheolube® 723G Rheolube® 788 Synthetic Oil® 181	Wm. J Nye P.O. Box G-927 New Bedford, MA 02742 (617) 966-6721
SF® 1147 Versilube® F-50	GE Silicone Products Waterford, NY 12188 (518) 237-3330
Terrestic ® 77	Exxon P.O. Box 2180 Houston, TX 77092 (713) 680-5712

Compatible Cleaning Agents

The following table lists known compatible cleaning agents. If you want to use a cleaning agent that is not listed below, contact the appropriate manufacturer for compatibility.

Type	Agents
Aliphatics	Hexane, Heptane, White Kerosene Mineral Spirits, Petroleum Ethers (65° C boiling point).
Alcohols	Methyl, Isopropyl and Isobutyl, 1 + 3 Denatured Alcohol.
Halogenated Hydrocarbons	Freons TF & TE
Detergents and Cleaners	Mild Soap and Water Solution, VM&P Naphtha Fantastik®, Windex®, Joy®, Top Job®, Mr. Clean®, Formula 409®.

The above aliphatics, alcohols, and halogenated hydrocarbons should be used only for wiping or short-term immersion (less than 10 minutes). If parts are in complete immersion, care should be taken to remove last traces of solvent by forced-air drying or rinsing in hot water.

Non-compatible Cleaning Agents

The following list of agents are known to be detrimental to the 3100 unit.

Type	Agents
Bases	25% Ammonium Hydroxide, 10% Potassium Hydroxide, Sodium Hydroxide
Organic Solvents	Laquer Thinner, Toluene, Methyl Cellosolve, Methylethylketone

Color Bulb Replacement

> **Note**
>
> Xycom recommends that you order a color display and carrier assembly (which contains new bulbs) since color bulb replacement is complicated. See Spare Parts List in Chapter 7.

Refer to Figures 11 and 12 (located at the end of these steps). To replace the color bulb:

1. Unplug the power connector. Remove the PC card, and cable clamp and screw (if used).
2. Unscrew the back cover screw and the two screws holding the rear frame to the front panel.
3. Squeeze the tabs (at arrows) and open the back cover.
4. Disconnect the keypad cable (and touch screen cable, if present) while holding up the cable(s), close the cover. Gently pull the rear frame assembly away from the front panel by lifting the retaining latch. Set rear frame assembly aside.
5. Set the unit down with the display facing up and remove the two screws holding the display carrier assembly to the rear frame (Figure 11).
6. Unsnap tabs on each end of the display carrier assembly, pull assembly straight out about an inch and then swivel aside (Figure 11).
7. Disconnect the display connector from the display carrier assembly and the bulb connectors (four white wires) from the rear frame (Figure 11).
8. Unscrew the two screws holding the flat panel display, this also unscrews the ground plate. (Figure 11).
9. Remove flat panel display and pull off the two ground clips (Figure 12).

10. Lay down the flat panel display and remove the white display bulb wires from the cable clamp. Remove the six screws holding the metal display plate and lift off the metal plate (Figure 12).
11. Lift the bulb and diffuser assembly from the back of the display and replace with a new assembly.
12. Screw back the metal display plate.
13. Reseat the white display bulb wires in the cable clamp.
14. Screw the flat panel display back onto the display carrier assembly. Be sure to include the ground plate in the procedure and reinstall the ground clips.
15. Connect the two bulb connectors to the rear frame. The order of the two connections on the rear frame does not matter.
16. Reconnect the display connection to the display carrier assembly.
17. Rejoin display carrier assembly to rear frame. Reconnect with two screws.
18. Reattach the rear frame to the front panel while holding keypad and/or touch screen cables up.
19. Install the #4 self-tapping screw in the top left and right of the rear frame.
20. Open cover and reattach keypad and/or touch screen cables.
21. Close the cover until the plastic latches on each side of the rear cover engage in the rear frame. Install a #4 self-tapping screw in the top middle of the rear cover.
22. Reinstall the power cable clamp, and any other interface connectors. The unit is ready for operation again.

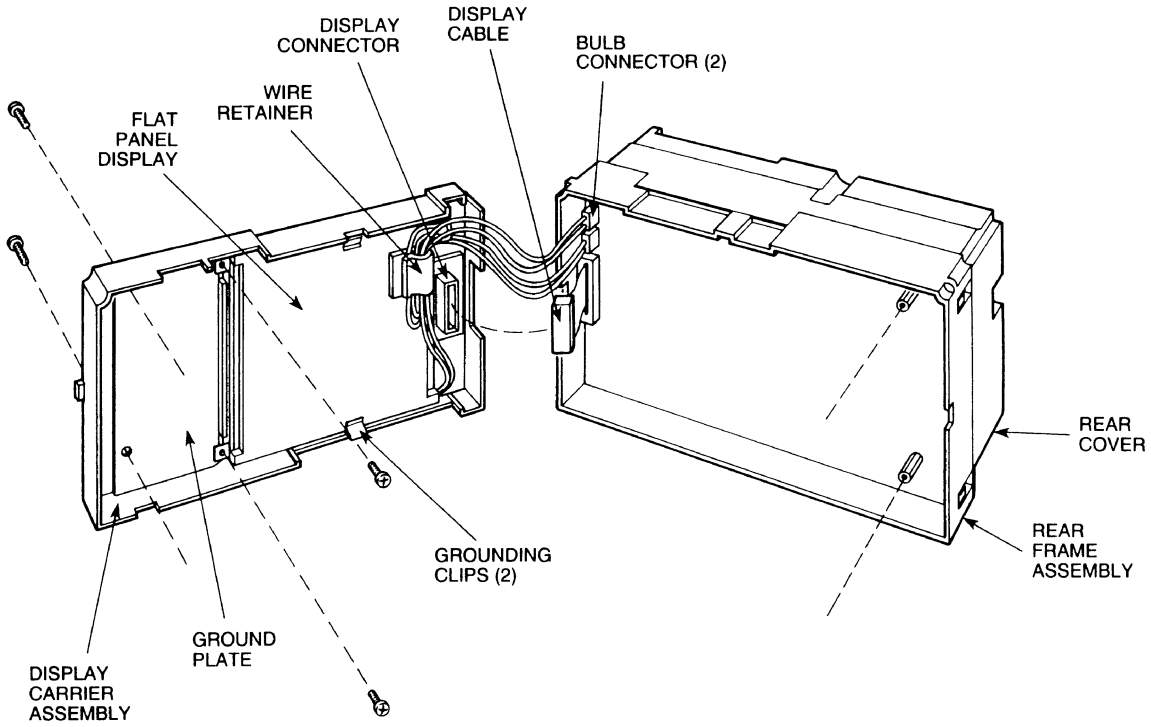


Figure 11. Access to Flat Panel Display and Color Bulb/Connectors

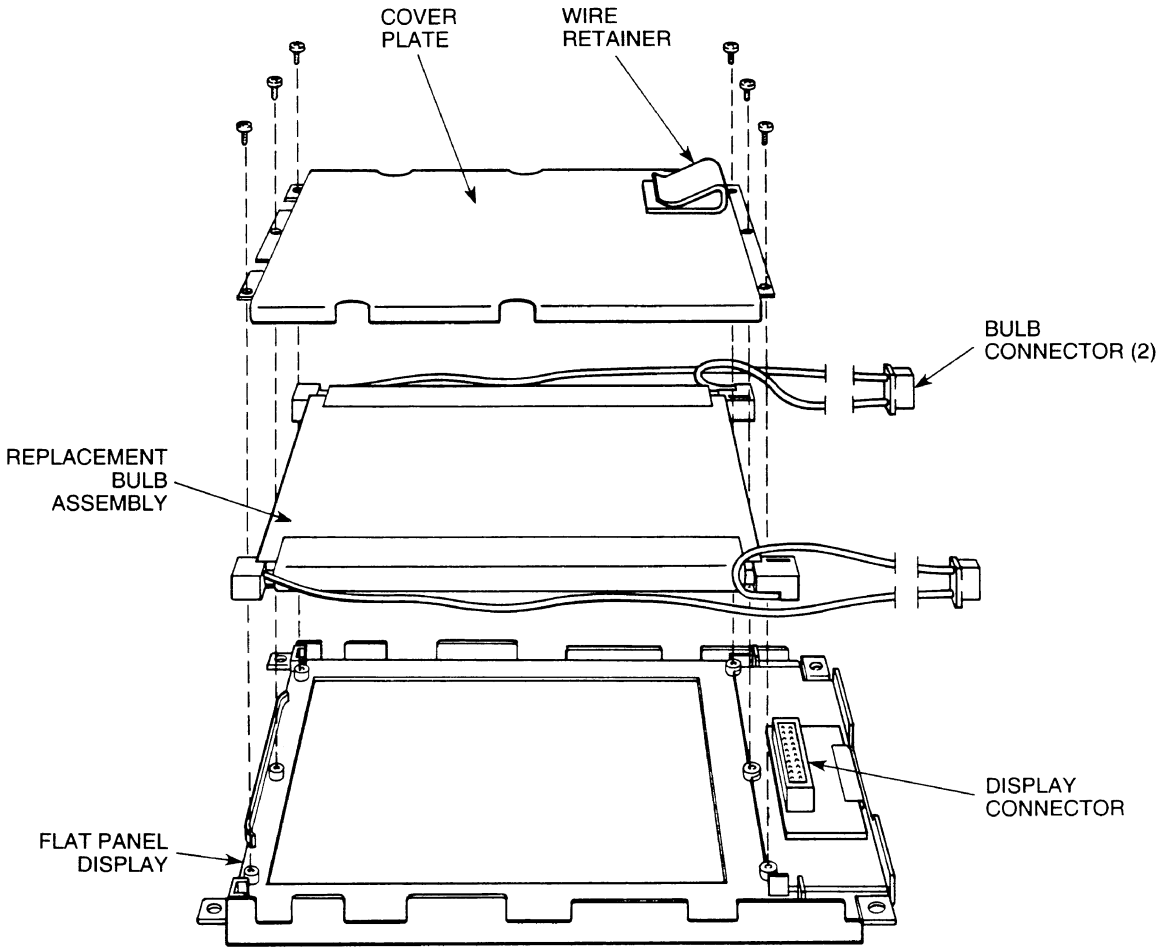


Figure 12. Color Bulb Removal from Flat Panel Display

Monochrome Bulb Replacement

Refer to Figure 13 (located at the end of these steps). To replace the monochrome bulb:

1. Unplug the power connector. Remove the PC card, and cable clamp and screw (if used).
2. Unscrew the back cover screw and the two screws holding the rear frame to the front panel.
3. Squeeze the tabs (at arrows) and open the back cover.
4. Disconnect the keypad cable (and touch screen cable, if present) and close the rear frame cover while holding up the cable(s). Gently pull the rear frame assembly away from the front panel by lifting the retaining latch. Set rear frame assembly aside.
5. Set the unit down with the display facing up and loosen (1/2 to 1 turn) the center screw on the end of the metal display frame (Figure 17).
6. With a small screw driver, disengage the three tabs (at the bottom) on the white bulb retainer.
7. Remove the bulb retainer to expose the bulb.
8. Disconnect the bulb connector (two white wires) from the rear frame.
9. Gently remove the bulb.
10. Replace the bulb and connect the bulb connector to the rear frame.
11. Push down the wires into the space near the bulb connector.
12. Reposition the white bulb retainer, making sure its edge lip fits under the metal display frame; also make sure bulb retainer tabs snap back into place.
13. Retighten center screw on the end of the metal display frame.
14. Reattach the rear frame to the front panel while holding keypad and/or touch screen cables up.
15. Install the #4 self-tapping screw in the top left and right of the rear frame.
16. Open cover and reattach keypad and/or touch screen cables.

17. Close the cover until the plastic latches on each side of the rear cover engage in the rear frame.
18. Reinstall the power cable clamp, and any other interface connectors. The unit is ready for operation again.

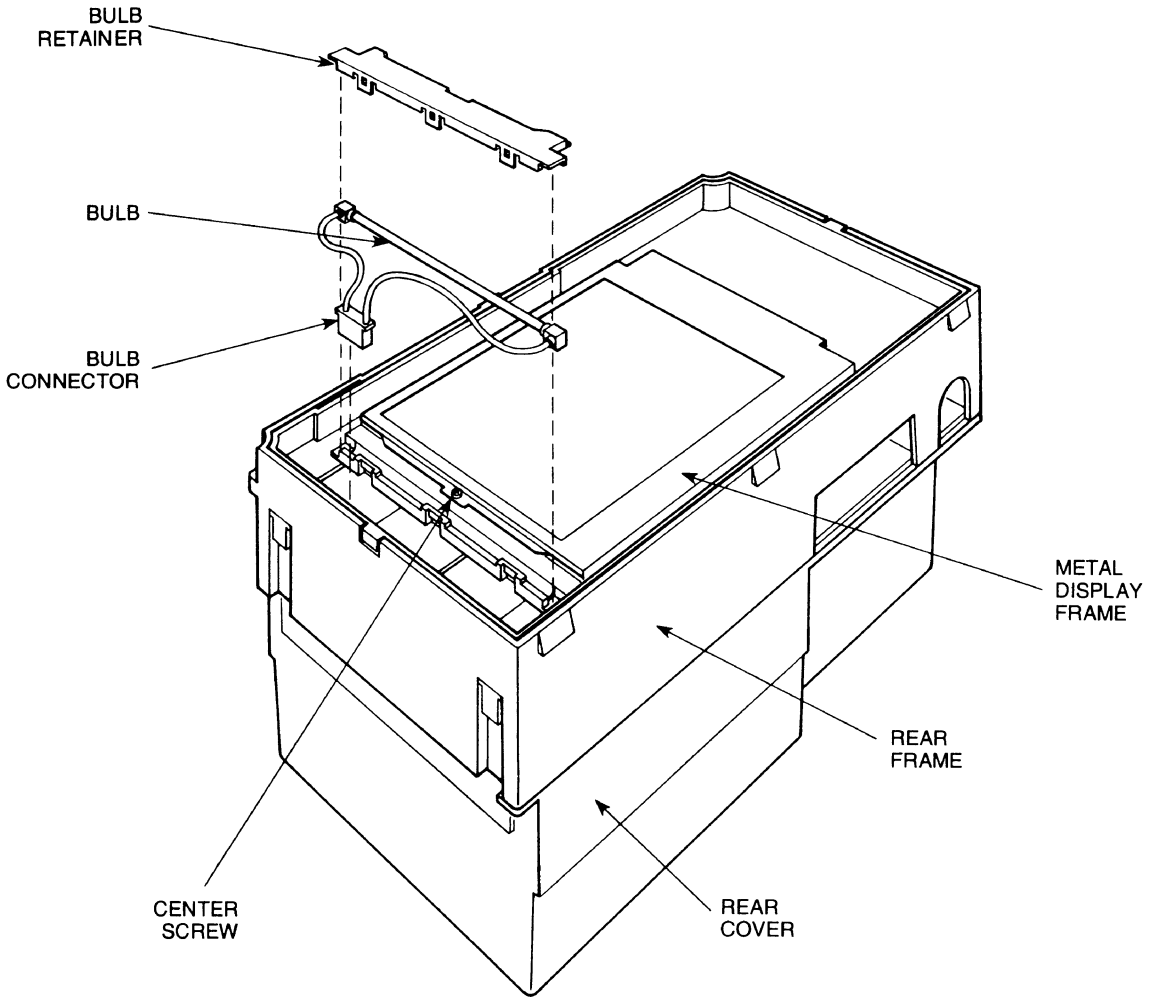


Figure 13. Monochrome Bulb Replacement

Fuse Replacement

Caution

This operation should be performed by authorized personnel only.

Note

Replace only with same type and rating of fuse (5 x 20mm, 250 VAC, 1.6 A, Fast Blow Type F).

Note

Remove the power connector before replacing the fuse.

1. Unplug the power connector. Remove the PC card, and cable clamp and screw (if used).
2. Unscrew the rear cover screw.
3. Squeeze the tabs (at arrows) to open the rear cover.
4. Carefully remove the fuse (located on the lower left side of the power supply). See Figure 4 in Chapter 3.
5. Close the cover until the plastic latches on each side of the rear cover engage in the rear frame.
6. Install the #4 self-tapping screw in the top middle of the rear cover.
7. Reinstall the power cable, cable clamp, and any other interface connectors. The unit is ready for operation again.

Chapter 7–Product Repair

Product Repair

Xycom's Product Repair performs services to restore equipment to normal operating condition and to implement engineering changes which enhance operating specifications. Products returned to Xycom will be tested with standard Xycom test diagnostics. Contact the PR&C department for information on your particular turnaround time.

Preparing the Unit for Shipment

1. Obtain a RMA number for your unit by calling your local Product Repair Department or Xycom Repair Center at *1-800-289-9266*. Have the following information ready:
    - Company name and shipping and billing address.
    - Type of service desired–product repair or product exchange
    - Product model number, part number, quantity, serial number(s), and warranty status
    - Failure mode information
    - Purchase order number or repair order number

You will then receive your RMA number. This number must appear on the outside of the shipping container and on the purchase order

2. To prepare the unit for shipment, make sure the panels are secured by all screws.
3. To speed processing, attach any failure information to the unit.
4. Place the unit securely in original packaging or equivalent.
5. Mark the RMA number on the outside of the box as well as on your purchase order.
6. Send the unit to your local Xycom repair center.

Spare Parts List

3100 Color Replacement Parts

Item Number	Description	Part Number
1	Front Panel Assembly (with mounting gasket included) -without Touchscreen -with Touchscreen Mounting Gasket only	 100322-001 100350-001 99885-001
2	Color Display and Carrier Assembly (includes display) Color Display only	101455-001 101398-001
3	Display Connect Cable	99949-001
4	Replacement Bulb Assembly	101414-001
5	Color CPU Assembly	101427-002
6	Power Supply Assembly	101430-001
7	Input Power Connector	99711-001
8	Screw #6-32 x 5/16 (8 mm) with attached lock washer, six places labeled "A"	94383-001
9	Screw #4 x 1/2 (13 mm), self-tapping type AB, three places labeled "B"	99988-001
10	Screw #4 x 1/4 (6.5 mm), self-tapping type AB, two places labeled "C"	99994-001
11*	Documentation Kit	100670-001
12*	Expansion Kit	99945-001
13*	Fuse, 5 mm x 20 mm, 250 VAC, 1.6 Amp, Fast Blo	99859-001

*Not Shown

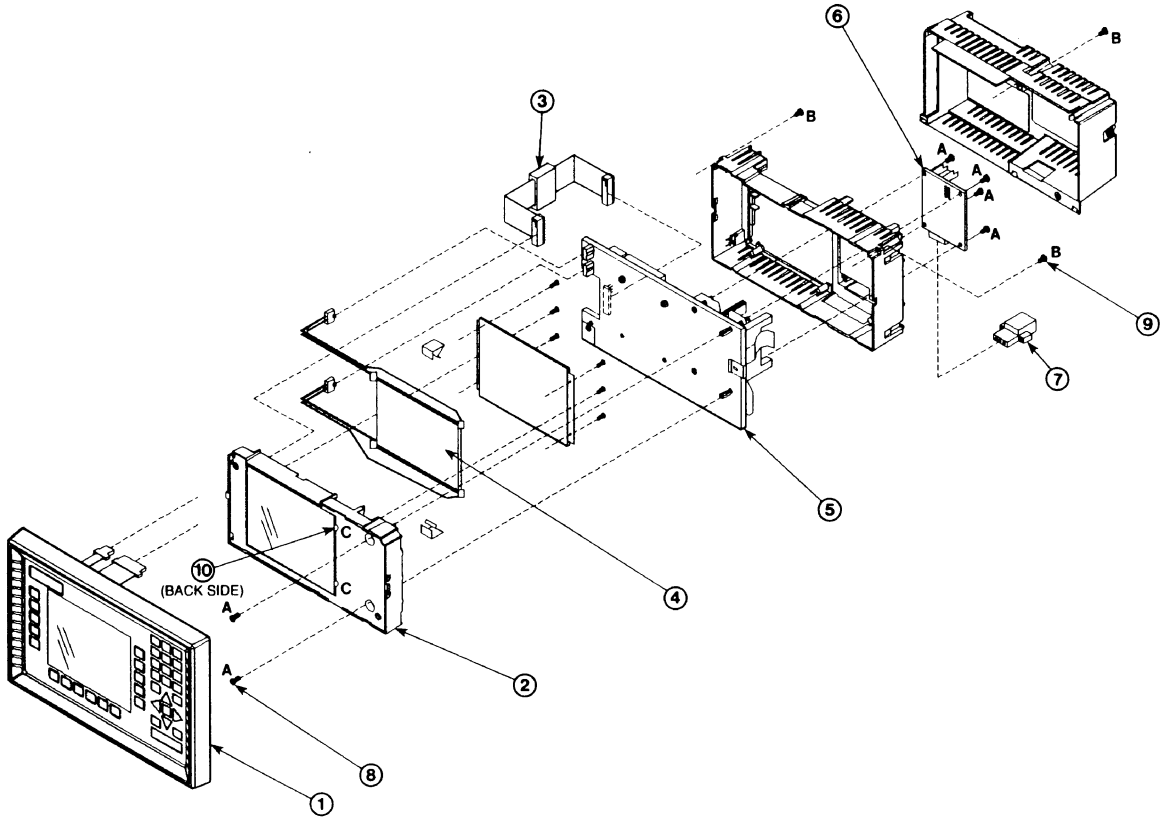


Figure 14. 3100 Color Unit - Numbered Parts

3100 Monochrome Replacement Parts

Item Number	Description	Part Number
1	Front Panel Assembly (with mounting gasket included) -without Touchscreen -with Touchscreen Mounting Gasket only	 100322-001 100350-001 99885-001
2	Monochrome Display and Carrier Assembly (includes display) Monochrome Display only	101442-001 101385-001
3	Replacement Bulb Assembly	101401-001
4	Monochrome CPU Assembly	101427-001
5	Power Supply Assembly	101430-001
6	Input Power Connector	99711-001
7	Screw #6-32 x 5/16 (8 mm) with attached lock washer, six places labeled "A"	94383-001
8	Screw #4 x 1/2 (13 mm), self-tapping type AB, two places labeled "B"	99988-001
9	Screw #4 x 1/2 (13 mm), self-tapping type AB, two places labeled "C"	99994-001
10*	Documentation Kit	100670-001
11*	Expansion Kit	99945-001
12*	Fuse, 5 mm x 20 mm, 250 VAC, 1.6 Amp, Fast Blo	99859-001

*Not Shown

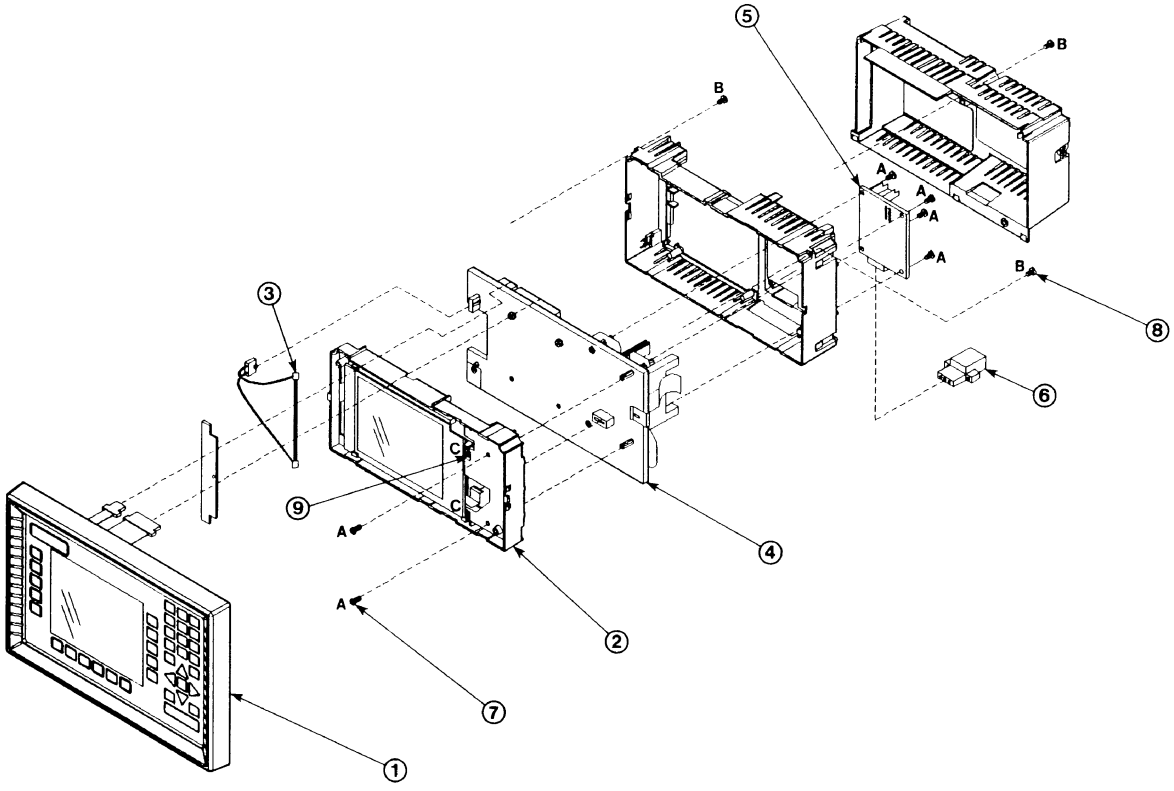


Figure 15. 3100 Monochrome Unit - Numbered Parts

Note

Cables must be of combined braid/foil shielded type. Wire and cable connector backshells must be of molded zinc type. The cable shield must be terminated directly to the zinc backshell. Failure to apply these instructions will increase radio frequency emissions and decrease the units immunity to radiated electrical noise and will subsequently void EMC compliance.

Chapter 8–Quick Reference

Keyboard Connectors

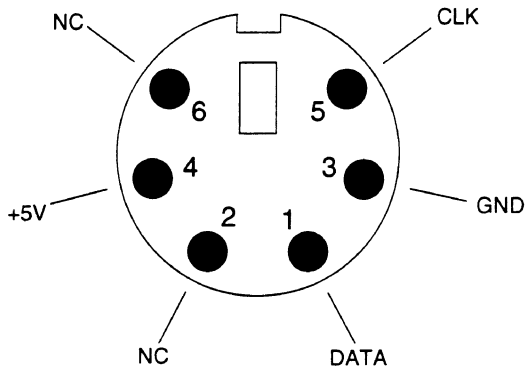


Figure 16. Keyboard Connector Pin Locations

Keyboard Connector Pinouts

Pin	Signal
1	Data
2	NC
3	GND
4	+5V
5	CLK
6	NC

Serial Ports

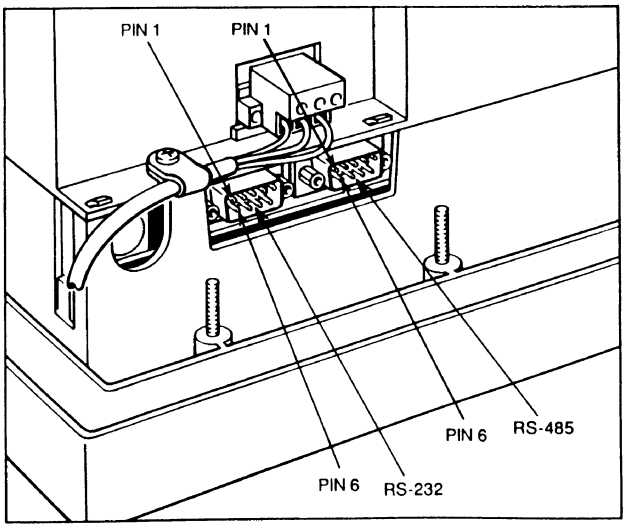


Figure 17. RS-232 and RS-485 Serial Ports

RS-232

Serial Port Pinouts

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

RS-485

Serial Port Pinouts

Pin	Signal	Pin	Signal
1	TXD1-	2	TXD1+
3	330ohm to GND	4	330ohm to VCC
5	GND	6	RXD-
7	RXD+	8	330ohm to VCC
9	330ohm to GND		

Power Connector

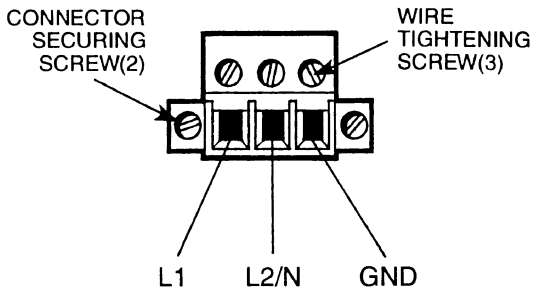


Figure 18. Power Connector

Power Connector Pinouts

Pin	Signal
L1	Line
L2/N	Line/Neutral
GND	Ground

PC/104

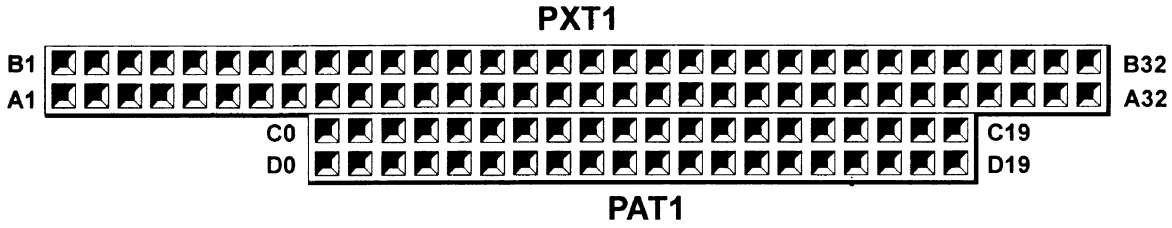


Figure 19. PC/104 Pinout

PC/104 Connector Pinouts

Pin	J1/P1 Row A	J1/P1 Row B	J2/P2 Row C	J2/P2 Row D
0	-	-	GND	GND
1	NC	GND	SBHE*	MEMCS16*
2	SD7	RESERDRV	LA23	IOCS16*
3	SD6	+5V	LA22	NC
4	SD5	IRQ9	LA21	NC
5	SD4	NC	LA20	NC
6	SD3	NC	LA19	NC
7	SD2	-12V	LA18	IRQ14
8	SD1	NC	LA17	NC
9	SD0	+12V	MEMR*	NC
10	IOCHRDY	(KEY)	MEMW*	NC
11	AEN	SMEMW*	SD8	NC
12	SA19	SMEMR*	SD9	NC
13	SA18	IOW*	SD10	NC
14	SA17	IOR*	SD11	NC
15	SA16	NC	SD12	NC
16	SA15	NC	SD13	+5V
17	SA14	NC	SD14	NC
18	SA13	NC	SD15	GND
19	SA12	REFRESH*	(KEY)	GND
20	SA11	SYSCLK	-	-

Pinouts continued on the next page

PC/104 Connector Pinouts (continued)

Pin	J1/P1 Row A	J1/P1 Row B	J2/P2 Row C	J2/P2 Row D
21	SA10	IRQ7	-	-
22	SA9	IRQ6	-	-
23	SA8	IRQ5	-	-
24	SA7	NC	-	-
25	SA6	NC	-	-
26	SA5	NC	-	-
27	SA4	NC	-	-
28	SA3	BALE	-	-
29	SA2	+5V	-	-
30	SA1	OSC	-	-
31	SA0	GND	-	-
32	GND	GND	-	-

Notes:

1. Rows C and D are not used on 8-bit modules.
2. DMA not supported.
3. -5V not supported.
4. IRQ3, 4, 10, 11, 12, 15 not supported.
5. NC = no connect.

Chapter 9–BlockDiagram

Block Diagram

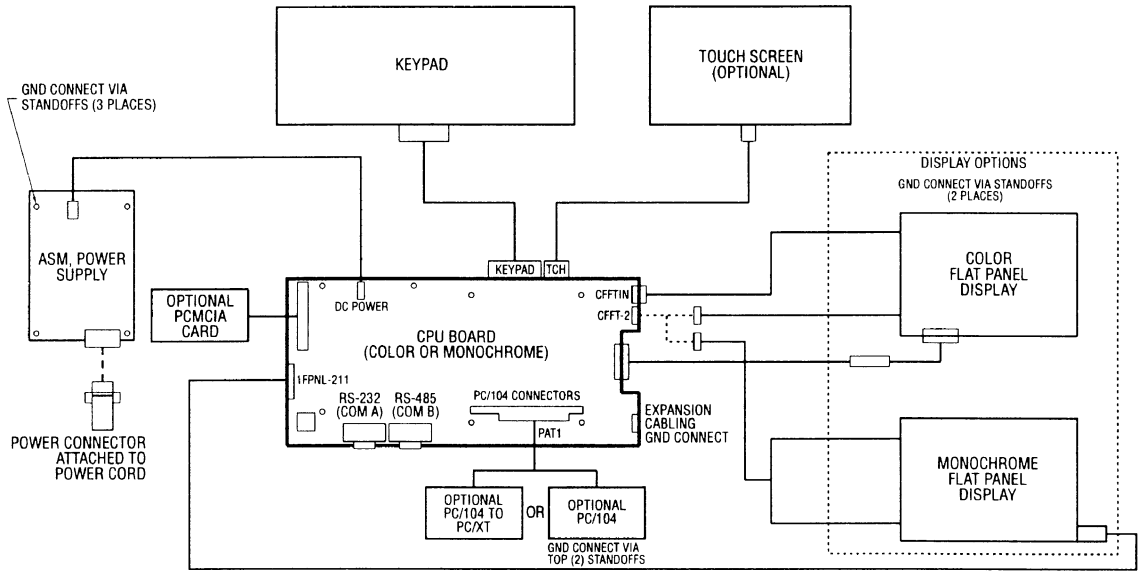


Figure 20. System Block Diagram

Notes

These next few pages are provided for miscellaneous information you may want to note regarding the product, etc.

Index

Publication Change Notice

Date: 6/96

PCN Number: 195

Manual: 3100 Focal Point

Part Number: 99746-001A

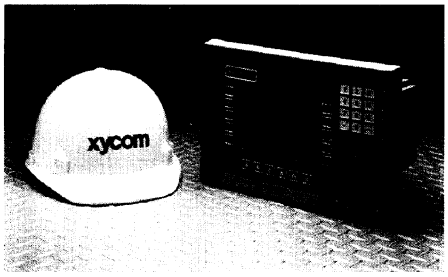
Note

This Publication Change Notice provides updates for the publication specified above. Staple or tape all change pages (listed below) on top of the obsolete pages. Please file this page at the back of your manual to provide a record of the changes.

Pages	Description
Covers	Updated Revision level
ii	Added Hazardous Installation
1-3	Updated Specifications
3-2	Updated Note
3-11	Updated third bulleted item
3-19 through 3-28	Added Hazardous Locations Installations
I-1	Updated with new information

xycom®

3100



P/N 99746-001B

FOCAL POINT™ INDUSTRIAL WORKSTATION

Printed in U.S.A.

XYCOM REVISION RECORD

Revision	*Description*	*Date*
A	Manual Release	6/95
B	Manual Updated (PCN 195)	6/96

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Address comments concerning this manual to:

xycom
Technical Publications Department
750 North Maple Road
Saline, Michigan 48176-1292

Part Number: 99746-001B

Specifications

Hardware

Mechanical

Height	8.0" (203.2 mm)
Width	12.0" (304.8 mm)
Depth	4.0" (101.6 mm) mounting 4.625" (117.5 mm) with PC Card
Weight	5.0 lbs. (2.27 kg)

Electrical

90-250 VAC, auto-sensing
47-63 Hz, .6 A maximum
54 Watts maximum
(185 BTU/HR)

Electromagnetic Compatibility

Emissions:	FCC 47CFR, Part 15, Subpart B, Class A
Immunity:	IEC 801-2: 1991 /EN 50082-2 8KVCD, 15KVAD; IEC 801-3: 1984 /EN 50082-2 10 V/M 27-500 Mhz; IEC 801-4: 1987 /EN 50082-2 1KV signal, 2KV ac

Mounting

5.66" x 10.55" panel cutout, 6 (#8-32) nuts

Display

5.9" color or mono

Agency Approval

UL	1950, 1604, EN60950
CUL	C22.2 No. 950, No. 213

Regulatory Compliance

CE	EN55022, Class A; EN50082-1; EN60950
FCC	47 CFR, Part 15, Class A

Environmental

Temperature

Operating	0° to 50°C (32° to 122°F) mono 0° to 40°C (32° to 104°F) color
Non-operating	-20° to 60°C (-4° to 140°F) both

Humidity

Operating	20 to 80% RH, non-condensing
Non-operating	5 to 90% RH, non-condensing

Shock

Operating	15 g peak acceleration 11 msec duration
Non-operating	30 g peak acceleration 11 msec duration

Vibration

Operating	5 to 2000 Hz .006" peak-to-peak displacement 1.0 g maximum acceleration
Non-operating	5 to 2000 Hz .015" peak-to-peak displacement 2.5 g maximum acceleration

Altitude

Operating	Sea level to 10,000 ft. (3048 m)
Non-operating	Sea level to 40,000 ft. (12192 m)

NOTE: See Chemical Compatibility in Chapter 6.

Preparing the System for Use

1. Install any user optional equipment by following the instructions in the next few sections.
2. Do a panel cutout. Use Figure 6 for exact dimensions.
3. Mount the 3100 and properly secure the unit into the panel
4. Attach the input power cord to the power connector.

Installing Internal Hardware Options

PC Card Installation (also known as PCMCIA)

Note

When installed in a Class 1, Division II hazardous location, power must be turned off prior to inserting or removing the PCMCIA card.

1. Unlatch the PC card retainer over the slot (a small screw driver may be needed to pry the clip up). See Chapter 2, Figure 2.
2. Install the card (keyed side down, card will be facing the unit) into the slot. Push the PC card clip over the card to secure it. If the card is inserted incorrectly, the clip will not fit over the card.
3. Be sure the card is fully engaged and slip the PC card clip over the card to secure it.
4. Reverse the steps for removing the card.

Panel Mounting

Once the considerations in the preceding paragraphs have been met, mount the 3100 by following the instructions below:

1. Locate a position for your 3100 that meets the required specifications.
2. Cut the hole according to the cutout dimensions in Figure 6.
3. Make sure the area around the cutout is clean and free from metal burrs.
4. Insert the workstation into the hole created in Step 2 from the front of the panel.
5. Hold the workstation against the panel and secure it with the mounting nuts.
6. Tighten the six #8-32 nuts to 21-inch pounds (2.4 Newton-meters).
7. Attach the power cord to the 3100.

Warning

Do not exceed 21-inch pounds (2.4 Newton-meters) when tightening #8-32 mounting nuts.

Creating a Power Cable

A power cable must be created to supply power to the 3100. The materials needs are:

- Cable clamp (supplied, 0.25" (6 mm) max. nominal I.D.)
- 3-position power connector (supplied)
- 14 (1.6 mm), 16 (1.3 mm) or 18 (1.0 mm) gage solid or stranded copper wire within a braid/foil shielded cable, rated 80°C or better

Hazardous Locations Installations

Xycom designed the 3100 system with the intention of meeting the requirements of Class I, Division 2 Hazardous Locations applications. Class II, Division 2 requirements can also be met when the system is installed in an approved Type 4 enclosure. Division 2 locations are those locations that are normally non-hazardous, but could become hazardous due to accidents which may expose the area to flammable vapors, gases or combustible dusts.

These systems have been UL and CUL listed as non-incendiary devices. They are not intrinsically safe and should never be operated within a Division 1 (normally hazardous) location when installed as described here. Nor should any peripheral interface device attached to these systems be located within Division 1 locations unless approved and/or certified diode barriers are placed in series with each individual signal and DC power line. Any such installations are beyond the bounds of Xycom design intent. Xycom accepts no responsibility for installations of this equipment or any devices attached to this equipment in Division 1 locations.

It is the responsibility of the customer to ensure that the product is properly rated for the location. If the intended location does not presently have a Class, Division, and Group rating, then users should consult the appropriate authorities having jurisdiction in order to determine what the correct rating for that Hazardous Location should be.

In accordance with Federal, State/Provincial, and Local regulations, all hazardous locations installations should be inspected by the appropriate authority having jurisdiction prior to use. These systems are to be installed, serviced, and inspected only by technically qualified personnel.

Safety Agency Approval

The Xycom 3100 is UL and CUL listed and has also been investigated for compliance with the following standards:

- *Underwriters Laboratories Inc., UL 1604 Standard for Safety.* Electrical equipment for use in Class I and Class II, Division 2, and Class III hazardous (classified) locations.
- *Underwriters Laboratories Inc., UL 1950,* Information Technology Equipment.
- *Canadian Standard Association, Specification C22.2 No. 213-M1987.* Non-incendiary electrical equipment for use in Class I, Division 2 hazardous locations.
- *Canadian Standards Association, Specification C22.2 No. 1950,* Information Technology Equipment
- *UL File No. E180970.* 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 non-hazardous locations only.

Warning - Explosion Hazard

Substitution of components may impair suitability for Class I, Class II, Division 2.

Advertissment Risque D' Explosion

La substitution de composants peut rendre ce materiel inacceptable pour les emplamements de classe I, II, Division 2.

Warning - Explosion Hazard

Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Advertissment Risque D' Explosion

Avant de deconnecter l'equipment, coupler le courant ou s'assurer que l'emplacement est designe non dangereux.

Warning - Explosion Hazard

When in hazardous locations, turn off power before replacing or wiring modules.

Advertissment Risque D' Explosion

Dans les situations hasardees, couper la courant avant de remplacer ou de cabler les modules.

Warning

In order to maintain a safe condition, an external keyboard must not be used when the unit is operating in the presence of a hazardous environment.

Definitions

The following Class and Division explanations are derived from Article 500 (Sections 5 and 6) of the United States National Fire Protection Agency National Electric Code (NFPA 70, 1990).They are not complete and are included here only for a general description for those not familiar with generic hazadarous locations requirements.

Persons responsible for the installation of this equipment in Hazardous Locations are responsible for ensuring that all relevant codes and regulations related to location rating, enclosure, and wiring are met.

Class I Locations

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II Locations

Class II locations are those that are, or may become, hazardous because of the presence of combustible dust.

Division 1 Locations

A Division 1 location is one in which flammable or ignitable gasses, vapors, or combustible dusts and particles can exist due the following conditions:

- Normal operating conditions.
- Because of repair, maintenance conditions, leakage, or where mechanical failure or abnormal operation of machinery or equipment might release or cause explosive or ignitable mixtures to be released or produced.
- Combustible dusts of an electrically conductive nature may be present in hazardous quantities.

Note

Xycom 3100 systems are not suitable for installation within Division 1 locations.

Note

Electrical equipment cannot be installed in Division 1 locations un- less they are intrinsically safe, installed inside or approved explo-sion-proof enclosures, or inside of approved purged and pressurized enclosures.

Division 2 Locations

Division 2 locations are listed below:

- Class I volatile flammable liquids or flammable gasses are handled, processed, or used, but confined within closed containers or closed systems from which they can escape only in cases of accidental rupture or breakdown of such enclosures or systems, or in case of abnormal operation of equipment.
- Ignitable concentrations of Class I vapors or gasses are normally prevented by positive mechanical ventilation, but which may become hazardous due to mechanical failure of those ventilation systems.
- Location is adjacent to a Division 1 location.
- Class II combustible dust is not normally in the air in quantities sufficient to produce explosive or ignitable mixtures. Dust accumulations are normally insufficient to interfere with normal operation of electrical equipment or other apparatus. Combustible dust may be in suspension in the air as a result of the following: infrequent malfunctioning of handling or processing equipment; combustible dust accumulations on, or in the vicinity of electrical equipment; may be ignitable by abnormal operation or failure of electrical equipment.

Groups

All electrical equipment which is approved for use in hazardous locations must include a group rating. Various flammable and combustible substances are divided into these groups as a function of their individual maximum experimental safe gap (MESG), explosion pressure, and ignition temperature.

Component temperatures and the potential for spark based upon voltage, current, and circuit characteristics, within electrical equipment, will

determine what the equipment group rating will be. A device approved for installation within Class I, Group A locations may also be used in Groups B, C, or D.

Note

Approved Class I equipment may not be suitable for Class II installations. Class I includes Groups A, B, C, and D. Class II includes Groups F, and G.

Enclosures

The 3100 system is designed for installation within a clean and dry enclosure for both ordinary and hazardous locations. The front panel meets the requirements of UL and CSA Type 4, 4X, and 12 enclosures. The enclosure used for Class I hazardous locations should have a minimum rating of Type 12 (NEMA 12, IP 5X). However, Type 4 (IP X6) enclosures are strongly recommended.

Warning

The keyboard connector cap must be installed securely at all times in order to maintain a proper seal against the intrusion of water and dust.

Panel flatness and rigidity are important if a proper panel seal is to be maintained. If non-metal type enclosures, such as plastic or fiberglass, are to be used, install a rigid metal stiffener behind the front panel. Failure to do so may result in an inadequate panel seal due to flexure of the front panel material between the stud mounts. The nuts on the mounting studs must be tightened to 21-inch pounds.

These systems are UL listed for installation within Class II locations only when installed within UL approved Type 4 enclosures. Failure to do so voids that UL listing.

The requirements for enclosure fittings, conduit, and wiring vary according to the specific rating of the location and the type of flammable or combustible material involved. Those requirements are beyond the scope of this document and it is the responsibility of the customer to

ensure that their installation is compliant with codes and regulations which apply to their specific location. Reference NFPA 70, Article 500 for specific regulations in the United States.

Power Switch

The 3100 system is not provided with a power switch. The amount of input power required by these systems classifies the power switch as an incendiary device. That is, the voltage and current across the make/break device is capable of creating a spark.

Hazardous locations regulations require that a power switch rated for ordinary locations may be used if it is located in an area specified as non-hazardous. However, limits in cable length between the workstation and the power switch may apply. Otherwise the switch must be compliant with Class I, Division 1 requirements (intrinsically safe). These switches are built in a manner that prevents the possibility of a spark when contacts are made or broken.

Suitable UL listed and/or CSA Certified Class I, Division 1 switches must be used in hazardous locations. These switches are available from a wide number of sources. It is the responsibility of the customer to ensure that the power switch selected for their installation has the correct hazardous locations rating for the location in which it is installed.

Cable Connections

Division 2 hazardous locations regulations require that all cable connections be provided with adequate strain relief and positive interlock. A cable should never be connected or disconnected while power is applied at either end of the cable.

Power Cable Connection

The 3100 system is provided with a plastic strain relief on the rear of the chassis for the power cable. The power cable should have an external diameter no less than 0.25" (6 mm) and must be installed within the strain relief. The strain relief must be tight enough so as to ensure that no less than 35 lbs (16 kg.) of force can be tolerated. A small amount of excess wire should be maintained between the strain relief and the input

power terminal block in order to avoid excessive tension on the terminal block connections.

The power cable must always include a third wire for Protective Earth ground (green or green/yellow).

Warning

Failure to connect the Protective Earth ground wire may result in operator exposure to dangerous voltages in the event of an abnormal failure condition. Failure to connect the PE wire will also result in a significant reduction in immunity to electromagnetic transients which can cause unreliable operation or permanent damage to the system.

This Protective Earth ground wire (PE) must be connected to the terminal labeled GND. The PE wire should be at least 0.25" (6 mm) longer than the L1 and L2 wires. This is done in order to ensure that a Protective Earth ground connection is the last connection broken in the event that the wires are accidentally pulled loose from the terminal block.

The three power interconnect wires, L1, L2 (Neutral), and PE should be stripped to expose 0.25" (6 mm) of wire. If the exposed wire is of the stranded type, then a small amount of solder should be applied to the ends to prevent loose strands of wire from being bent back and subsequently not secured by the terminal block.

Communication Cable Interface

All communication cables should include a chassis ground shield. This shield should include both copper braid and aluminum foil. The D-sub style connector housing should be a metal conductive type (e.g. molded zinc) and the ground shield braid should be well terminated directly to the connector housing. Do not use a shield drain wire.

The outer diameter of the cable must be suited to the inner diameter of the cable connector strain relief in order to ensure that a reliable degree of strain relief is maintained. The D-Sub connectors must always be secured to the 3100 workstation mating connectors via the two screws located on both sides.

Warning

The communication cables should never be connected or disconnected while power is applied at either end of the cable. This may result in an incendiary spark. Furthermore, permanent damage to the workstation communication components may occur.

Operation and Maintenance

The 3100 systems have been investigated for compliance with relevant spark ignition tests by UL. However, please note that the workstation front panel membrane keyboard keys and keyboard connector are the only make/break components intended to be exercised by the operator in the course of normal operation.

Warning

In order to maintain a safe condition, an external keyboard must not be used when the unit is operating in the presence of a hazardous environment.

Connections and PCMCIA card interface located at the rear of the workstation should not be operator accessible and should never be adjusted while power is applied in a hazardous location.

With respect to hazardous locations installations, the following rules must always be observed:

1. The workstations must always be installed within an enclosure suitable for the specific application. General purpose enclosures may be acceptable for Class I applications but are never acceptable for Class II applications. Type 4 (IP 65) enclosures are recommended even when not required by regulations.
2. If present, enclosure doors or openings should remain closed at all in order to avoid the accumulation of foreign matter inside of the workstation.

3. The unit should never be subjected to any installation or service procedures unless power is known to be removed and the area is known to be non-hazardous. This includes the installation or removal of power cables, communication cables, or removal of the rear cover of the unit.
4. All installation and service must be performed only by technically qualified service personnel. These workstations are designed to require no service in the course of normal operation by an operator.

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