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KPM(T) Monitor Series

Flat Panel Industrial Monitors

User Manual for the
5012KPM(T) and
5015KPM(T)
models

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C	Clarified front panel frame, glass and overlay in Tables 1-1 & 1-2	08/04
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For European Users – WARNING:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

INSTALLATION – 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 electromagnetic interference and/or susceptibility levels which are in violation of regulations applying to the legal operation of this device. It is the responsibility of the system integrator and/or user to apply the following directions relating to installation and configuration:

All interface cables must include shielded cables. Braid/foil type shields are recommended. Communication cable connectors must be metal, ideally zinc die-cast backshell types, and provide 360-degree protection about the interface wires. The cable shield braid must be terminated directly to the metal connector shell; ground drain wires alone are not adequate.

Protective measures for power and interface cables as described within this manual must be applied. Do not leave cables connected to unused interfaces or disconnected at one end. Changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment..

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Chapter 1 – Introduction

Product Overview

Pro-face/Xycom industrial flat panel monitors offer state-of-the-art performance and features while meeting the rigorous requirements of the plant floor. Pro-face/ Xycom's 5012KPM(T) and 5015KPM(T) high-resolution flat panel displays reflect the latest technology and are contained within a rugged housing with a resistive membrane touch screen, an integral pointing device, and an integral full alphanumeric keypad. The 5012KPM(T) and 5015KPM(T) are UL508 listed, CE compliant and UL listed for use in Class I & II Division 2 Hazardous Locations.

The front panel is sealed to NEMA TYPE 4/4x/12 (UL 50) standards and is protected by an impact-resistant shield. UL listed for Hazardous Locations: Class I, Division 2, Groups A, B, C; Class II, Division 2, Groups F and G (pending).

Standard Features

The KPM(T) monitor comes with the following standard features:

- Rear IBM® PS/2 keyboard port and mouse port
- Front PS/2 keyboard/mouse port and front USB port
- Diagnostic LEDs
  - Power
  - Input
- Analog RGB video interface
- Analog resistive touch screen with RS-232 interface
- Die-cast aluminum front bezel
- Shallow mounting depths – 2.32"on 5012KPM(T) and 2.17" on 5015KPM(T)
- 100-240V AC or optional 24V DC input power
- Front panels meet NEMA 4/4X/12 and IP65 specifications when panel mounted
- UL Listed for use in Class I and Class II, Division 2 Hazardous Locations, Groups A, B, C, D, F, and G
- UL 508 Listed
- 40 relegendable function keys (74 with the F/A function)
- Numeric, PC control, and alpha keypads
- Integrated mouse

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The 5012KPM(T) has a 12.1" TFT SVGA color LCD, which supports resolutions up to 800x600 @75Hz. The 5015KPM(T) has a 15” TFT XGA, which supports resolutions up to 1024x768 @ 75Hz.

The figures and tables on the next several pages illustrate the internal and external components of the front and back panels to help you locate the features of the KPM(T) monitors.

Front Panel Controls

Figure 1-1 shows the front panel controls for the KPM(T) monitors. Table 1-1 outlines the front panel control functions.

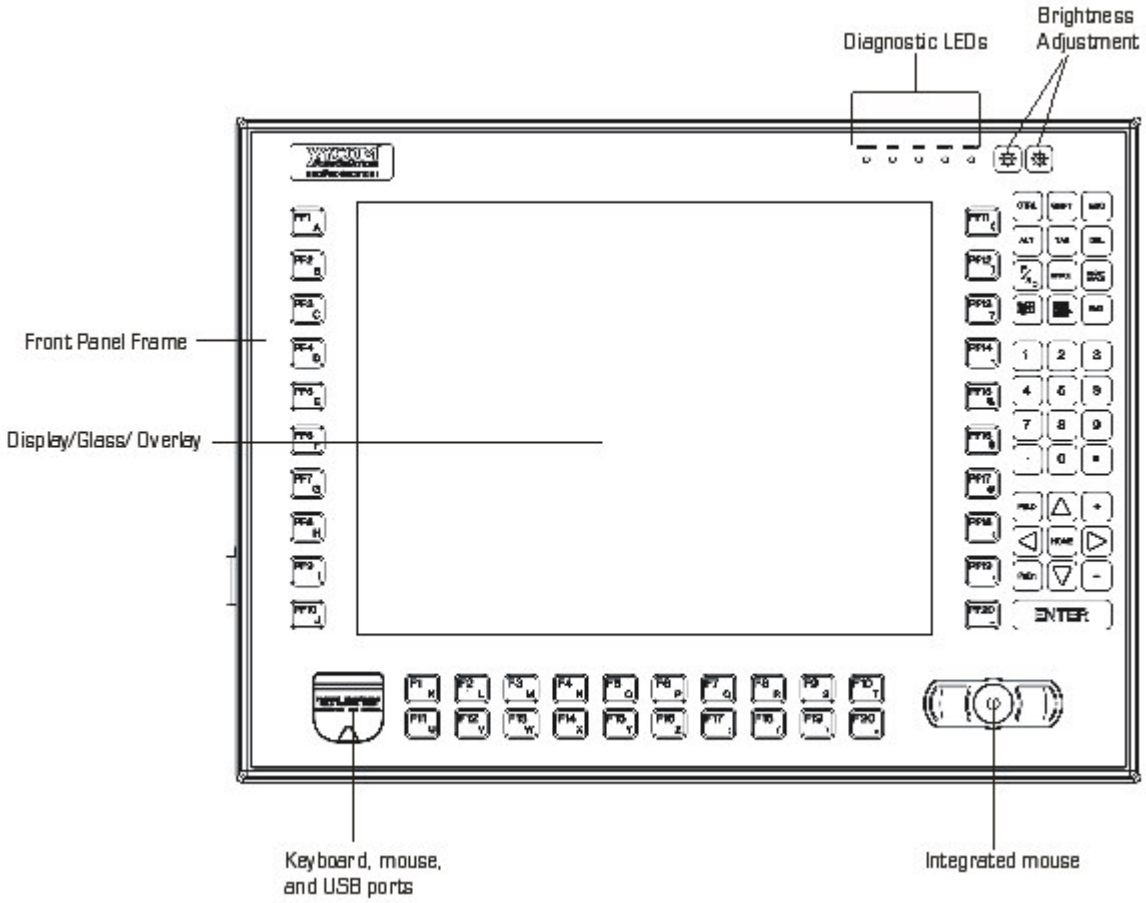


Figure 1-1. 5012KPM(T)& 5015KPM(T) Front Panel Controls

The 5012KPM(T) and 5015KPM(T) feature function keys on either side of the flat panel display (PF1-PF20), function keys below the display (F1-F20), a numeric keypad, window keys, a curser control keypad, power LED, input LED, industrial

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mouse/keyboard and USB ports. All keypad keys are reprogrammable[1], except the F/A key, and all function keys are relegendable[2]. See Chapter 5 for more details.

> **Caution**
>
> Leaving your TFT LCD display on constantly can result in temporary image retention (TIR). TIR can be avoided by using a screen saver, enabling the idle/doze timeout feature, or by turning off the display when it is not in use.

Table 1-1. 5012KPM(T) & 5015KPM(T) Front Panel Controls Functions

Feature	Description
Front Panel	The front panel has four components: a display; strengthened glass covering the display; a frame in which the display and the glass are mounted; and the polyester overlay attached to both the glass and the frame. The 5012KPM(T) has a 12.1" TFT LCD flat panel. The 5015KPM(T) has a 15" TFT LCD flat panel. The strengthened glass covering the display is intended to withstand normal operating conditions. In the event of damage to the glass, the overlay will protect the user from any glass shards. For more information abut the frame or the overlay, see Chapter 6 – Maintenance.
Diagnostic LEDs	Following is a description of the diagnostic LEDs and their meanings: Power GREEN when the system has power. Disk LED is not active on the 5012KPM(T) and 5015KPM(T). COM LED is not active on the 5012KPM(T) and 5015KPM(T). Input GREEN when the unit has a touch screen (LED gets brighter when a touch input is detected) or a key is pressed. Fault LED is not active on the 5012KPM(T) and 5015KPM(T).
Brightness Control	These buttons adjust the brightness of the backlights. The right button increases the brightness and the left button decreases the brightness.
Port Access	The 5012KPM(T) and 5015KPM(T) feature front panel access to a PS/2 keyboard/mouse port and a USB 1.1 or 2.0 port (depending on capabilities of the host). **These front access connections on the 5012KPM(T) and 5015KPM(T) are nonincendive circuits and may be used safely in Class I Division 2, Groups A, B, C, & D and in Class II Division 2, Groups F & G applications in which the peripheral electrical characteristics comply with the Hazardous Locations Control Drawing on page 29.**

[1] All keypad keys can be programmed to perform any function necessary.
[2] You are able to create your own, custom keypad inserts to reflect any reprogramming you may have done.

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Table 1-1. 5012KPM(T) & 5015KPM(T) Front Panel Controls Functions

Feature	Description
74-Key Keypad	The 5012KPM(T) and 5015KPM(T) keypads feature: • Alpha, numeric and control keys • 40 relegendable function keys • All keys reprogrammable (except the F/A key)
Integrated Mouse	The 5012KPM(T) & 5015KPM(T) feature a 2-button integrated mouse.

See Chapter 5, *Keypad Utility Program*, for detailed instructions on programming the keypad. See Chapter 2, *Installation*, for detailed instructions on creating custom keypad inserts.

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Back Panel

Figure 1-2 shows a view of the KPM(T) monitor back panel. Figure 1-3 shows the bottom edge of the back panel, where the connectors are located.

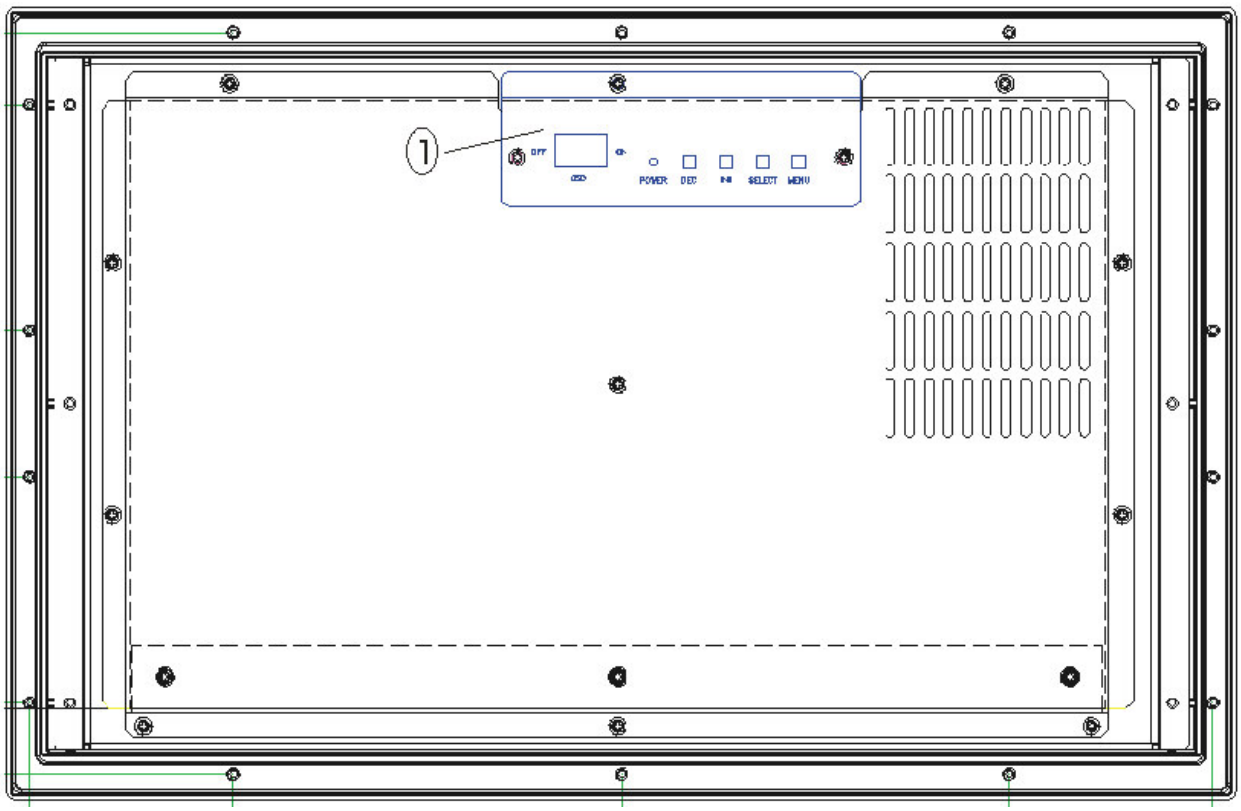


Figure 1-2. 5012KPM(T) & 5015KPM(T) Back Panel, straight view

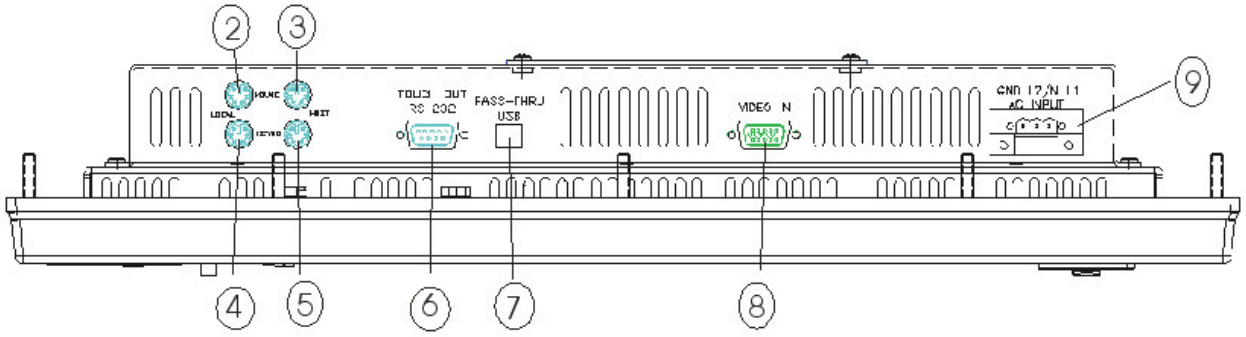


Figure 1-3. 5012KPM(T) & 5015KPM(T) Back Panel, bottom view

The back panel contains the OSD controls, the power connector, a video input connector, a pass-thru USB port (B-style connector), the serial touchscreen output connector, and the local and host ports for an external mouse and keyboard. The input range for the power supply is 100-240 VAC, 50-60 HZ, or 18-32 VDC. Appendix A contains more information about the power connector pinouts.

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Table 1-2. 5012KPM(T) & 5015KPM(T) Back Panel Functions

No.*	Feature	Description
1	OSD controls	Used to access, navigate and execute the OSD menu. The controls include the selector switch, and Menu, Select, Increase and Decrease buttons
2	Mouse Local	Used to plug in external mouse
3	Mouse Host	Used to send both external mouse and integrated mouse signals to the computer (host), whether the optional external mouse is plugged into the local port on the back of the monitor or into the port on the front of the monitor
4	Keyboard Local	Used to plug in external keyboard
5	Keyboard Host	Used to send the external keyboard and integrated keypad signals to the computer (host), whether the optional external keyboard is plugged into the local port on the back of the monitor or into the port on the front of the monitor
6	Touch Out RS-232	Used to send touch screen output to the computer (host)
7	Pass-Thru USB**	Used only as a pass thru port for USB signals to and from the host
8	Video In (VGA)	Used to receive video input signal from computer (host) VGA port.
9	AC Input (DC option)	100-240 VAC auto-ranging (18-30 VDC on DC models)

** See diagrams on previous page.*

*** USB devices plugged directly into this connector will not function.*

The OSD controls are explained further in Chapter 3, Monitor Settings.

There must be an external cable connecting the “mouse host” port to the host computer for the integrated mouse to work. An external mouse can be plugged into either the front port or the “mouse local” port on the back of the KPM(T) monitor. If you are using an external mouse, there must be a cable going from the “mouse host” port to the host computer.

There must be an external cable connecting the “keyboard host” port to the host computer for the integrated keypad to work. An external keyboard can be plugged into either the front port or the “keyboard local” port on the back of the KPM(T) monitor. If you are using an external keyboard, there must be a cable going from the “keyboard host” port to the host computer.

A Y cable may be used to connect both an external keyboard and an external mouse to the front port.

Caution

Do not connect either a mouse or keyboard cable from the PS/2 host port to the PS/2 local port. Damage can occur to either the host computer or the KPM(T) monitor.

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The Touch Out RS-232 is used when the touch screen option is utilized. A cable in this port sends the signals from the touch screen to the computer.

There is a USB port on the front of the monitor that can be used at any time. This is a pass-through only; there is no local USB activity on your KPM(T) monitor. To make your device work, you must have a cable going out to the computer from the USB port on the back of the monitor.

Caution

The USB cable that is used to connect the USB device cannot be more than 5 meters in length from the host computer, or the device will not work correctly. Pro-face ships a 3M USB cable with the 5012KPM(T) monitors and 5015KPM(T) monitors.

As a basic part of the initial setup of your KPM(T) monitor, you will connect a cable to both the AC port and the Video In port. The cable from the computer to the Video In port provides the signal connection for the monitor. An RS-232 cable sends touch screen signals to the computer. A PS/2 cable connected to the 'host keyboard' port sends keypad (or an optional external keyboard) signals to the computer. A PS/2 cable connected to the 'host mouse' port sends integral mouse (or an optional external mouse) signals to the computer.

Unpacking the Unit

When you remove the KPM(T) monitor from its shipping box, verify that you have the parts listed below. Save the box and inner wrapping in case you need to reship the unit.

- 5012KPM(T) or 5015KPM(T) monitor
- Documentation kit, which includes
  - 10-32 hex nuts (12)
  - Analog RGB Cable (10 ft.)
  - RS-232C Cable (10 ft.)
  - Two PS/2 cables (10 ft.)
  - USB Cable (3 m)
  - Documentation and Support Library CD-ROM, which contains this manual and all drivers required by this unit

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Quick Startup

This section gives you the steps to get the system up and running without explaining the capabilities and options.

Warning

Remove power from the unit and disconnect the power cord before making any adjustments to the inside or outside of the monitor.

Warning

For Hazardous Locations installation, review *Hazardous Locations Installation* in Chapter 2 before startup.

To prepare the system for use, perform the following steps.

1. Attach optional keyboard to the keyboard port.
2. Attach optional mouse to the mouse port.
3. Attach other optional equipment following the instructions in Chapter 2.
4. Attach the power cord from the power receptacle to a properly grounded 100-240 VAC, 50-60 Hz, or an optional 18-30 VDC power source. (See *System Power* in Chapter 2 for more information.)
5. Turn on power to the KPM(T) monitor (via an outlet power switch if applicable). Then turn on power to the host computer. The system will boot up into the operating system.
6. If the unit is equipped with a touch screen, install drivers on the host computer via the floppy, the CD-ROM, or the network, as applicable.

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Chapter 2 – Installation

This chapter offers detailed installation instructions and outlines the options for the 5012KPM(T) & 5015KPM(T). It also includes the guidelines for preparing your unit for installation and use.

Installation Overview

> **Warning**
>
> For Hazardous Locations installation, review the *Hazardous Locations Installation* section in this chapter before startup.

The rugged design of the KPM(T) monitors allows the unit to be installed in most industrial environments. The system is generally placed in a NEMA 4/4X/12 enclosure to protect against contaminants such as dust, and moisture. Metal enclosures also help minimize the effects of electromagnetic radiation that nearby equipment can generate. Class II Hazardous Locations always require a Type 12 (dust-proof) minimum enclosure rating.

Read the following sections carefully to be sure that you are complying with all the safety requirements.

1. Select a NEMA rated enclosure and place the unit within the enclosure to allow easy access to the system ports (see other sections in this chapter and Appendix A).
   - To assure a NEMA 4 seal, choose an approved enclosure that has a 14-gauge (0.075 in/1.9 mm thick steel or 0.125 in/3.2 mm thick aluminum) front face.
   - Be sure to account for the unit's depth when choosing the depth of the enclosure.
2. Create a cutout in the enclosure (see Figure 2-1 and Figure 2-2 in *System Cutout Dimensions*).
   - Be sure to place the unit at a comfortable working level
   - Make sure the area around the cutout is clean and free from metal burrs
3. Mount the unit in an upright position and properly secure the unit into the panel.
   - Tighten the fourteen #10 nuts to 25 inch-pounds (2.8 Newton-meters / 28Kgf cm).
4. Attach one end of the power cord to the power receptacle on the unit and the other end to a properly grounded 100-240 VAC, 50-60 Hz outlet, or optional 18-30 VDC power source.

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5. Turn on power to the KPM(T) monitor, and then to the host computer. The system will boot up the installed operating system.
6. Install the application software via a floppy drive, CD-ROM, or the network.

Additional aspects to take into account when mounting your KPM(T) monitor:

- Consider locations of accessories such as AC power outlets and lighting (interior lighting and windows) for installation and maintenance convenience
- Prevent condensation by installing a thermostat-controlled heater or air conditioner
- To allow for maximum cooling, avoid obstructing the airflow
- Place any fans or blowers close to the heat generating devices. If using a fan, make sure that outside air is not brought into the enclosure unless a fabric or other reliable filter is used. This filtration prevents conductive particles and other harmful contaminants from entering the enclosure.
- Do not select a location near equipment that generates excessive electromagnetic interference (EMI) or radio frequency interface (RFI). Examples of these types of equipment are: high power welding machines; induction heating equipment; and large motor starters.
- Place incoming power line devices (such as isolation or constant voltage transformers, local power disconnects, and surge suppressers) away from the system. The proper location of incoming line devices keeps power wire runs as short as possible and minimizes electrical noise transmitted to the unit.
- Make sure the location does not exceed the unit's shock, vibration, and temperature specifications
- Install the unit in the rack or panel in such a way as to ensure that it does not cause a hazard from uneven mechanical loading
- Incorporate a readily-accessible disconnect device in the fixed wiring on permanently connected equipment
- Avoid circuit overloading of the supply circuit

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System Cutout Dimensions

Figure 2-1 shows the cutout dimensions for the 5012KPM(T). Figure 2-2 shows the cutout dimensions for the 5015KPM(T).

5012KPM(T)

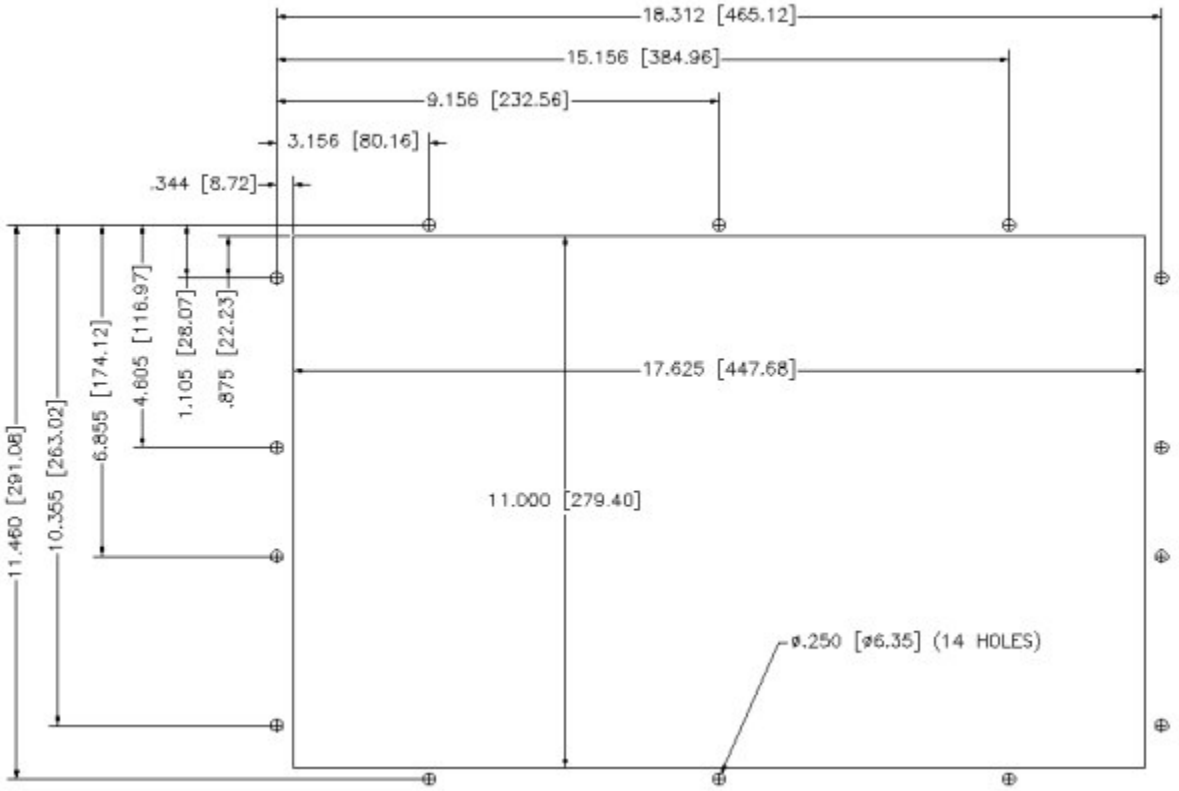


Figure 2-1. 5012KPM(T) system cutout dimensions (inches [mm])

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5015KPM(T)

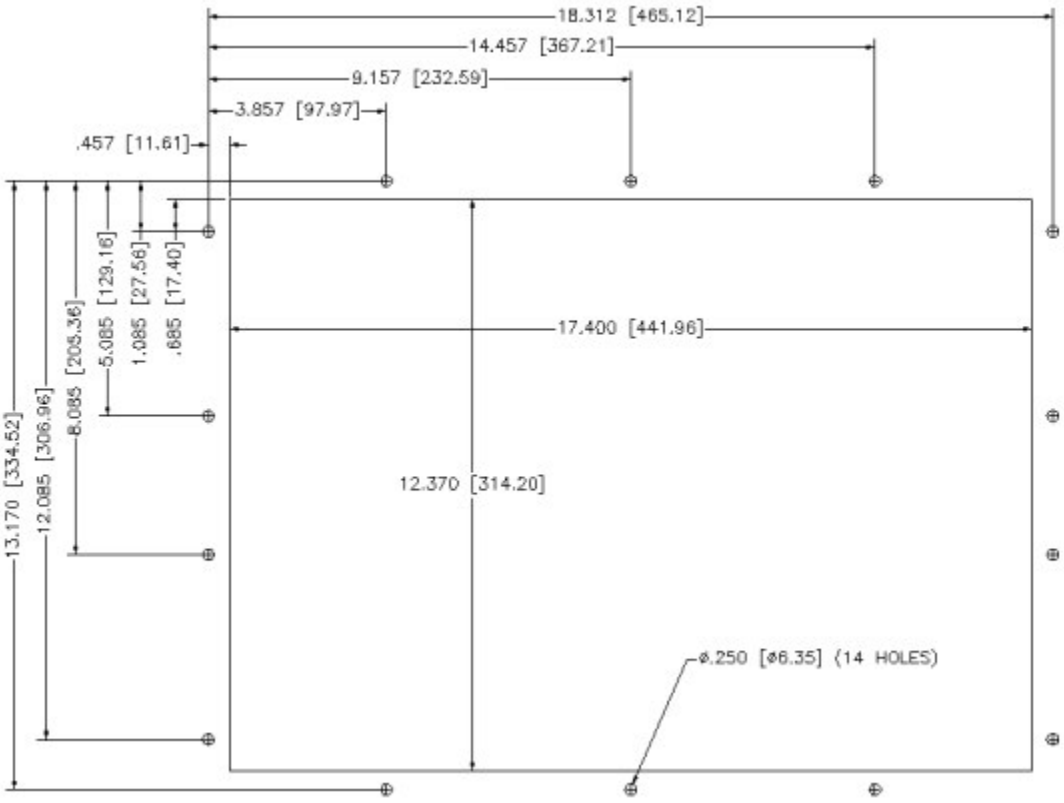


Figure 2-2. 5015KPM(T) system cutout dimensions (inches [mm])

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Power Management

The monitor is based on the VESA DPMS and the DVI DMPM standards. To activate the monitor's Power Management function, both the video card and the computer **must** conform to the VESA DPMS standard and the DVI DMPM standard.

System Power

It is a good practice to use isolation transformers on the incoming AC power line to the system. 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 relevant federal, state/provincial, and local electric codes, which provide 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 (minimum wire required is 18 AWG, 1 mm).

Observe the following practices:

- Separate the power and ground (P. E., or Protective Earth) cable from signal cables at the point of entry to the enclosure. To minimize the ground wire length within the enclosure, locate the ground reference point near the point of entry for the plant power supply.
- All electrical racks or chassis and machine elements should be Earth Grounded in installations where high levels of electrical noise can be expected. The rack/chassis should be grounded with a ground rod or attached to a nearby Earth structure such as a steel support beam. Connect each different apparatus to a single Earth Ground point in a "star" configuration with low impedance cable. Scrape away paint and other nonconductive material from the area where a chassis makes contact with the enclosure.

The following figures diagram the power input terminal blocks for the KPM(T) monitors.

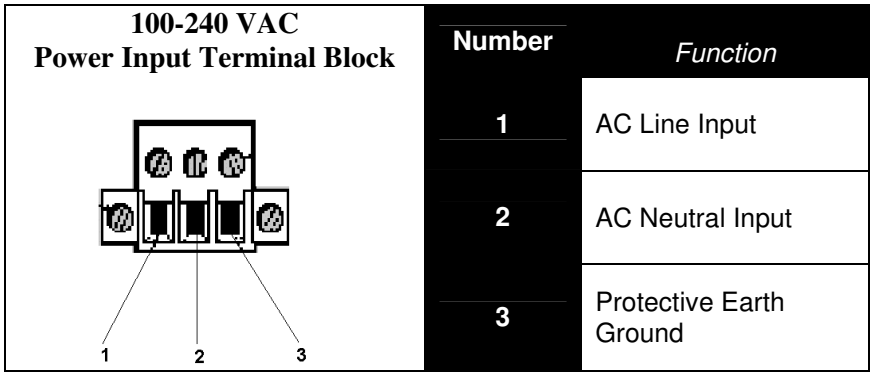
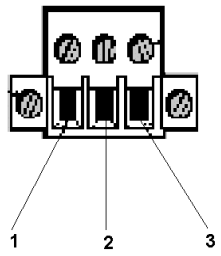


Figure 2-3 100-240 VAC Power Input Terminal Block

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18-30 VDC Power Input Terminal Block



Number	*Function*
1	+ DC Line Input
2	– DC Return Input
3	Protective Earth Ground

Figure 2-4. 18-30 VDC Power Input Terminal Block

Caution

Use 18 AWG (1mm) wire or greater for the monitor power cable

Isolate the AC main circuit line, I/O signal lines, and power cord. Do not bind or group them together.

Excessive Heat

To keep the temperature in range, the cooling air at the base of the system must not exceed the maximum temperature specification (see *Environmental Specifications* in Appendix A). Allocate proper spacing between internal components installed in the enclosure. When the air temperature is higher than the specified maximum in the enclosure, use a fan or air conditioner to lower the temperature.

Electrical Noise

Electrical noise is seldom responsible for damaging components, unless extremely high energy or high voltage levels are present. However, noise can cause temporary malfunctions that can result in hazardous machine operation in certain applications. Noise may be present only at certain times, may appear at widely spread intervals, or in some cases, may exist continuously.

Noise commonly enters through input, output, and power supply lines, and may also be coupled through the capacitance between these lines and the noise signal carrier lines. This usually results from the presence of high voltage or long, close-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use shielded cables to help minimize noise. Potential noise generators include switching components, relays, solenoids, motors, and motor starters.

Refer to the relevant Federal, State/Provincial, and local electric codes, which provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. It is recommended that high- and low-voltage cabling be separated and dressed apart. In particular, AC cables and switch wiring should not be in the same conduit with all communication cables.

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Line Voltage Variation

The power supply section of the unit is built to sustain the specified line fluctuations 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 monitor unit.

Unusual AC line variations may cause undesirable system shutdowns. As a first step to reduce line variations, correct any possible feed problems in the distribution system. If this correction does not solve the problem, use a constant voltage transformer. The constant voltage transformer stabilizes the input voltage to the systems 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 unit.

General Compatibility Issues

Listed below are general compatibility issues that apply to the 5012KPM(T) and 5015KPM(T):

- The KPM(T) monitor must be powered up before the host computer is powered up so that the host can determine if a keyboard and mouse are connected. If the KPM(T) monitor is not powered up first, the host will determine that there is no mouse or keyboard available.
- Once the complete system is up and running, the KPM(T) monitor can be power cycled at any time without affecting the host. It is the initial power up of the host that requires the power up sequence.
- If an operating system is loaded on the host computer, the KPM(T) monitor should not be used as the host mouse or keyboard during the loading of the operating system. Instead, a mouse and keyboard can plug directly into the host for the loading of an operating system. The KPM(T) monitor can be used for the monitor only during the loading of the operating system.
- The IBM specification for PS/2 ports defines both a Type I and Type II interface. The KPM(T) monitor is a Type II interface. Pro-face has determined that not all PS/2 compatible devices are Type II compatible. The user can try any standard PS/2 device, but Pro-face only guarantees the approved list.
- Non-standard devices should not be used with the KPM(T) monitor. If a device does not meet the standard PS/2 definition, and does not use the standard PS/2 driver that comes with the operating system, it will not work reliably with the KPM(T) monitor. For example, if a device requires its own separate driver it probably will not work because it was written to expect that the device would be plugged directly into the computer's host port. In the case of the KPM(T) monitor, this is not true.

Table 2-1. Known compatible and incompatible devices

Compatible	Microsoft®PS/2 Mouse
Incompatible	Logitech® Mouse
	Dell® Mouse

- Daisy-chaining two or more KPM(T) monitors is not supported.

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- Special functions, such as Capslock and Numlock, cannot be part of a programmed keypad macro sequence.
- Hot unplug of a full-travel keyboard or mouse from the KPM(T) monitor is not supported.
- Using the Pro-face/Xycom models 33XX/34XX as a host is not supported.

Note

Maximum total USB cable length between the host and the USB device cannot exceed 5M. Example: 3M USB cable from the host computer to the KPM(T) monitor and a 2M USB cable from the front of the KPM(T) monitor to the USB device.

XVME Compatibility Issues

Listed below are XVME compatibility issues that apply to the 5012KPM(T) and 5015KPM(T):

- If you are going to connect a KPM(T) monitor to a Pro-face/Xycom XVME-660 or XVME-661 processor board, the CPU module must have BIOS revision 1.3 (or higher). The Pro-face/Xycom BIOS revision number will appear at the top of the screen briefly during system boot-up. If you do not see the Pro-face/Xycom BIOS revision number for the CPU module, enable the Boot Time Diagnostic Screen in the Advanced menu of the BIOS setup (see the XVME-660 or XVME-661 manual for more details). Older Pro-face/Xycom processor boards (i.e. XVME-654, XVME-655, and older) have not been validated to work with the 5012KPM(T) or the 5015KPM(T).
- Using the XVME-653, 656, 658 or 659 as a host is not supported.

To get a copy of the new BIOS revision, call Pro-face technical support at 734-944-0482, or email support@profaceamerica.com

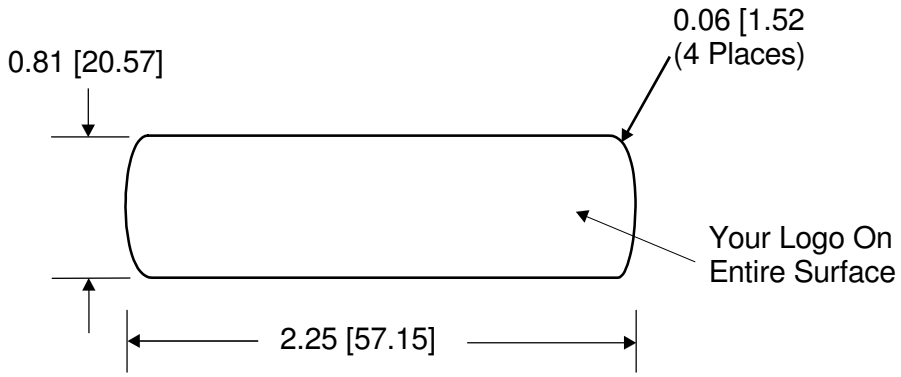
Using a Touch Screen

Pro-face/Xycom's touch screen complies with environmental specifications and maintains a NEMA 4 seal when panel mounted. The touch screen controller emulates a Microsoft PS/2 mouse. For more information about your touch screen, see Chapter 4, *Operator Input*.

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Custom Logo

You have the option to place a custom label on your unit. Refer to Figure 2-5 for the dimensions and recommended requirements for a customized label. Once a customized label is procured, place the new label over the “Pro-face/Xycom" label.



NOTE: All dimensions are in inches [mm]

Recommended material: 0.007 [0.176] thick polyester with 3M #468 adhesive on far side.

Figure 2-5. Logo Label Dimensions

Creating Custom Keypad Inserts

You can customize your keypad with keypad inserts to match the function keys that you program. Refer to Figure 2-6 and Figure 2-7 for insert dimensions for the 5012KPM(T). Refer to Figure 2-8 and Figure 2-9 for insert dimensions for the 5015KPM(T). Refer to Figure 2-10 for a keypad insert installation diagram.

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5012KPM(T) Keypad Inserts

The following figures show the dimensions for the 5012KPM(T) keypad inserts.

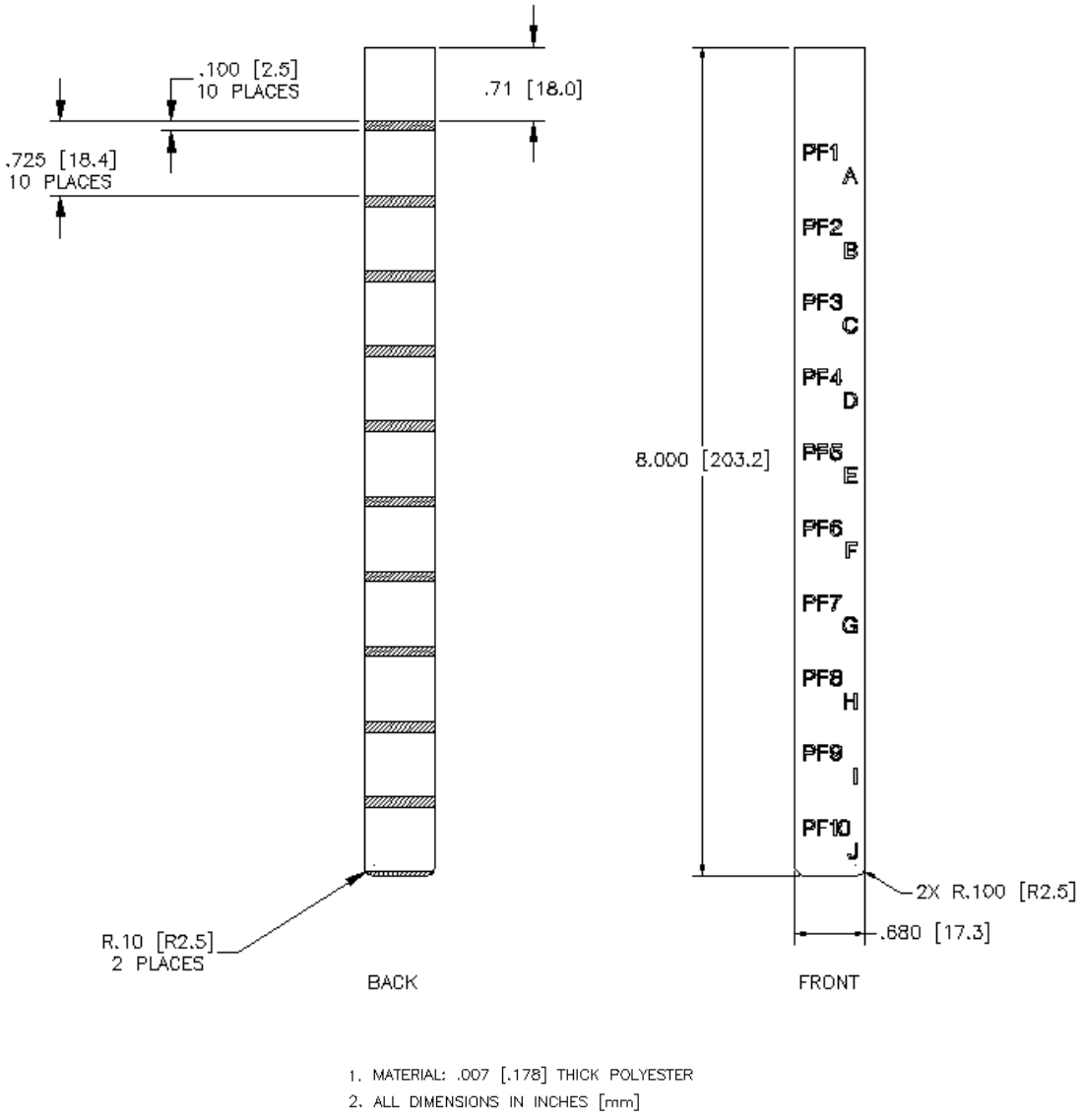


Figure 2-6. 5012KPM(T) Keypad Inserts with Dimensions (PF1 – PF10)

Note : The PF11-PF20 insert has the same dimensions

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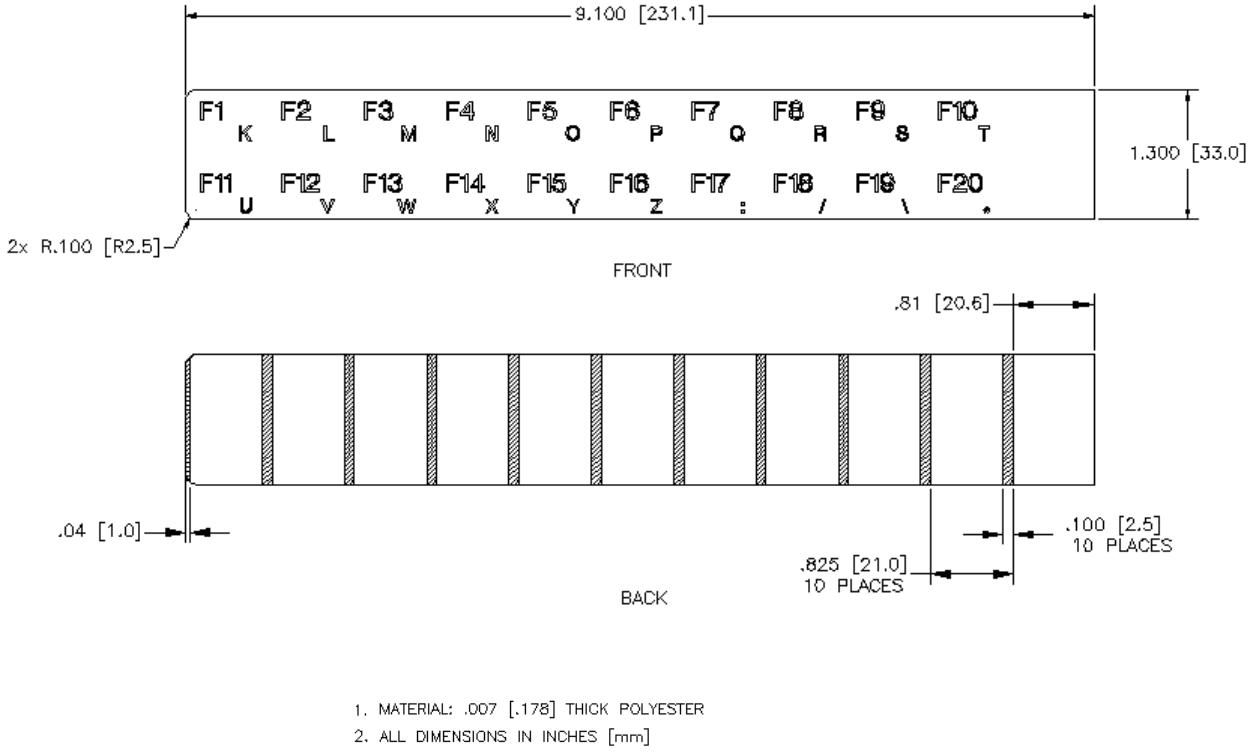


Figure 2-7. 5012KPM(T) Keypad Insert with Dimensions (F1 - F20)

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5015KPM(T) Keypad Inserts

The following figures show the dimensions for the 5015KPM(T) keypad inserts.

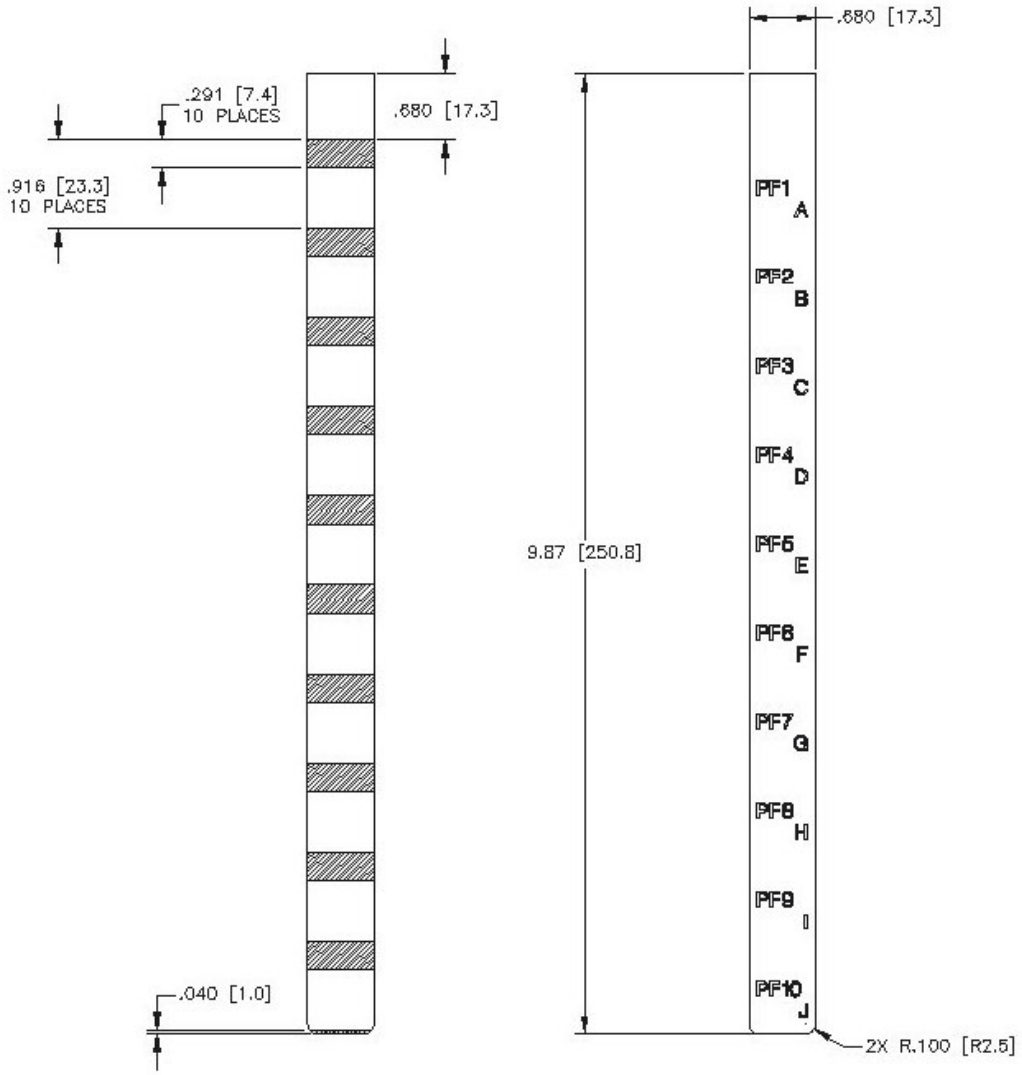


Figure 2-8. 5015KPM(T) Keypad Inserts with Dimensions (PF1 – PF10)

Note : The PF11-PF20 insert has the same dimensions

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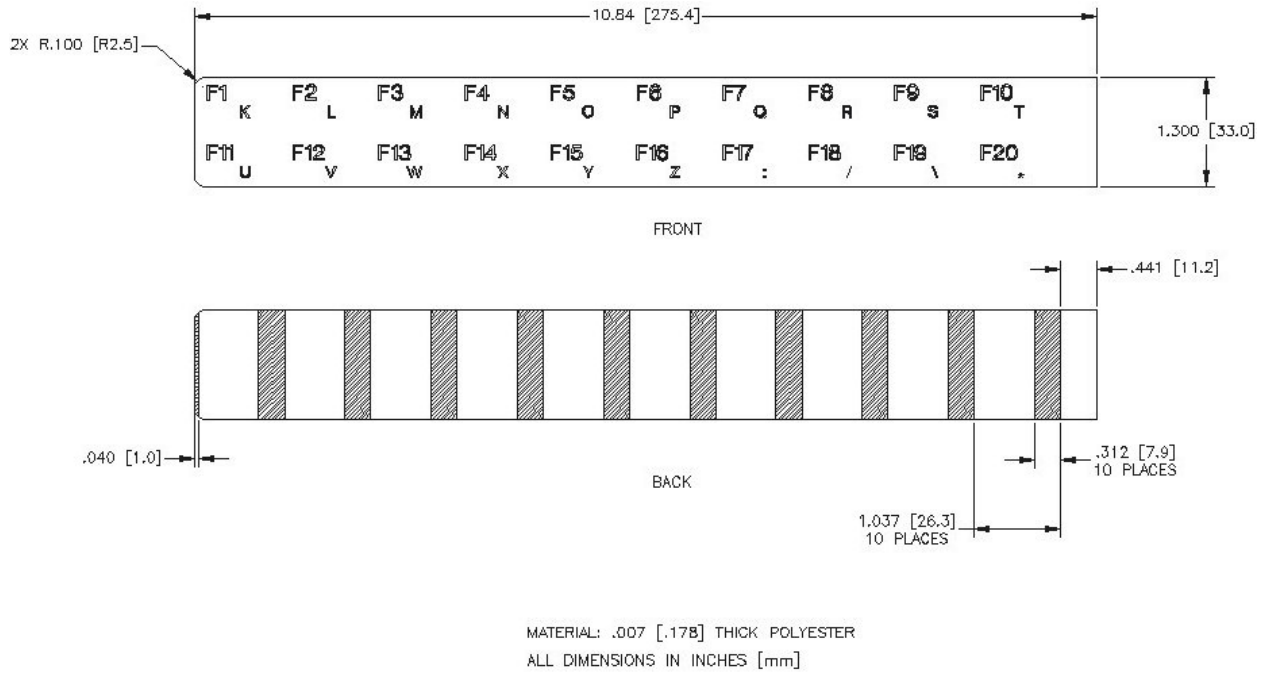


Figure 2-9. 5015KPM(T) Keypad Insert with Dimensions (F1 - F20)

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Keypad Installation Diagram

The following figure shows how to insert the custom keypads you have created.

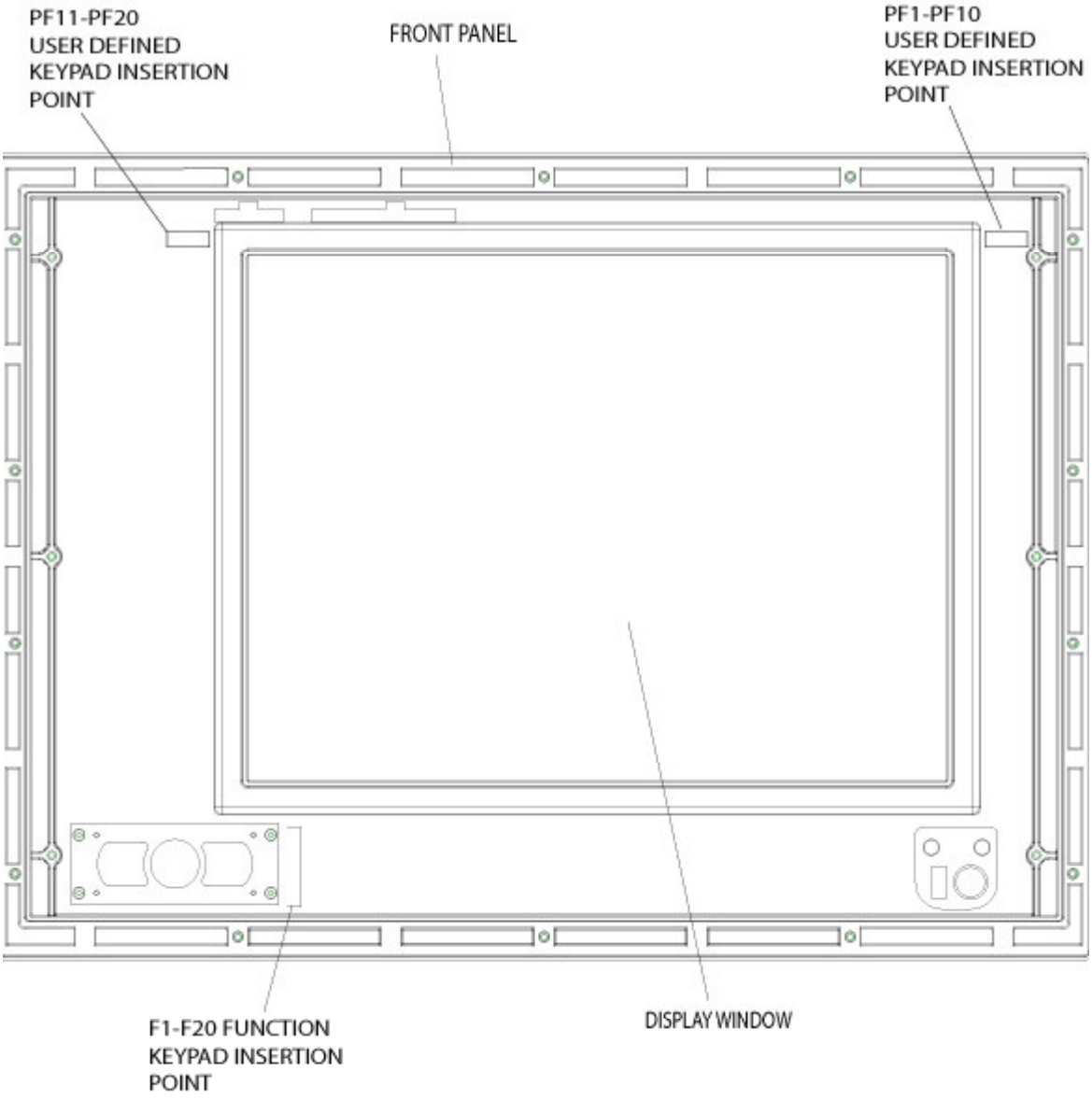


Figure 2-10. Rear View of KPM(T)Monitor Bezel, with Keypad Insertion Points Marked

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Hazardous Locations Installation

Pro-face designed the KPM(T) monitors to meet the requirements of Class I and II, Division 2 Hazardous Locations applications. Division 2 locations are those locations that are normally non-hazardous, but could become hazardous due to accidents that may expose the area to flammable vapors, gases or combustible dusts.

These systems have been designed 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 Pro-face design intent. Pro-face accepts no responsibility for installations of this equipment or any devices attached to this equipment in Division 1 locations.

Note

When additional cards are added, it is the customer's responsibility to ensure that the cards chosen meet operating conditions for Class I and II, Division 2 Hazardous Locations. Additions and/or modifications without express consent from UL and/or Pro-face will void Hazardous Locations compliance.

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 the correct rating for that hazardous location.

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. Only technically qualified personnel should install, service, and inspect these systems.

Warning

In order to maintain a safe condition, do not use an external keyboard or mouse when the unit is operating in a hazardous environment.

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Safety Agency Approval

The Pro-face systems have the following approvals:

- *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 (UL Listed, File E180970)
- *Underwriters Laboratories Inc., UL 508,* "Industrial Control Equipment" (UL Listed, File E107636)
- *Canadian Standard Association, Specification C22.2 No. 213-M1987.* Non-incendiary electrical equipment for use in Class I, Division 2 Hazardous Locations (cUL Listed, File E180970)
- *Canadian Standards Association, Specification C22.2 No. 142*, Process Control Equipment (cUL Listed, File E107636)

Warning

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.

Avertissement – 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 the power has been switched off or the area is known to be non-hazardous.

Avertissement – Risque d'Explosion

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

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Warning – Explosion Hazard

When in Hazardous Locations, turn off power before replacing or wiring modules.

Avertissement – Risque d'Explosion

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

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). The definitions are not complete and are included here only for a general description for those not familiar with generic Hazardous 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 mechanical failure or abnormal operation of machinery or equipment; or
- Combustible dusts of an electrically conductive nature may be present in hazardous quantities.

Note

Pro-face systems are not suitable for installation within Division 1 locations.

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Note

Electrical equipment cannot be installed in Division 1 locations unless they are intrinsically safe, installed inside approved explosion-proof enclosures, or installed inside 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: 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 that 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.

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Enclosures

The systems are 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 6X) enclosures are strongly recommended.

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. Tighten the nuts on the mounting studs to 25 inch-pounds.

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

Power Switch

The KPM(T) monitors do not have a power switch. The amount of input power required by these systems classifies a power switch as an incendiary device because the voltage and current across the make/break device are 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.

Use suitable UL listed and/or CSA Certified Class I, Division 1 switches 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.

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Cable Connections

Division 2 Hazardous Locations' regulations require that all cable connections be provided with adequate strain relief and positive interlock. Front panel keyboard/mouse and USB ports may be used in Hazardous Locations with appropriate ratings if their electrical load characteristics comply with the Control Drawing on 29.

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.

Warning

Never connect or disconnect the communication cables while power is applied at either end of the cable. This may result in an incendiary spark and permanent damage to the workstation communication components may occur.

Note

This warning does not apply to the front panel keyboard and USB interface connectors. These connections are nonincendive circuits. Please refer to the Hazardous Locations control drawing on page 29.

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Hazardous Locations Control Drawing

Warning

The following control drawing applies to front panel ports only.

Class I, Division 2, Groups A, B, C and D, and Class II, Division 2, Groups F and G
Hazardous (Classified) Locations



Notes:

1. Nonincendive Circuit Parameters:

USB Port (Pins 1 to 4)	PS/2 Port (Pins 3 to 4)
V_{oc} = 5 VDC	V_{oc} = 5 VDC
I_{sc} = 3.3 A	I_{sc} = 3.3 A
C_a = 10 uF	C_a = 10 uF
L_a = 16 uH	L_a = 4 uH

2. Selected nonincendive Field Wiring Apparatus shall satisfy the following:

Nonincendive Field Wiring Apparatus		Pro-face/Xycom Models 5012KPM(T) and 5015KPM(T)
V_{max}	≥	V_{oc}
I_{max}	≥	I_{sc}
$C_i + C_{cable}$	≤	C_a
$L_i + L_{cable}$	≤	L_a

3. If the electrical parameters of the cable are unknown, the following values may be used:
   Capacitance – 60 pF/ft
   Inductive – 0.20 uH/ft

4. Nonincendive Field Wiring must be installed in accordance with Article 501.4(B)(3) of the National Electrical Code ANSI/NFPA 70.

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Operation and Maintenance

The KPM(T) monitors have been designed for compliance with relevant spark ignition tests. However, please note that the workstation front panel contrast adjustment tactile switches 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, never use an external keyboard or mouse connected to side ports when the unit is operating in the presence of a hazardous environment. Use of the front panel USB/keyboard ports is safe only if the control drawing criteria is satisfied as indicated on the control drawing on page 29, and if the device is approved for use in the classified Hazardous Location.

With respect to Hazardous Location installations, always observe the following rules:

1. Always install the workstations 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, keep enclosure doors or openings closed at all times, to avoid the accumulation of foreign matter inside the workstation.
3. Never subject the unit to any installation or service procedures unless power has been 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. Only technically qualified service personnel should perform all installation and service. These workstations are designed to require no service in the course of normal operation by an operator.

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Chapter 3 – Monitor Settings

On Screen Display (OSD) Switch

The OSD Select switch is located on the back panel and offers two choices: OFF or ON. The OSD keys can be locked-out by setting the OSD switch to OFF, or unlocked by setting the OSD switch to ON. Setting this switch to the OFF position will help prevent accidental changes to the settings. The OSD switch is next to the Menu, Select and Increase/Decrease buttons (see Figure 3-1).

Caution

Touch data is transmitted to host computer while OSD menu is displayed.

Mode and Image Adjustment

Not all video controllers produce exactly the same video output levels or the same timing. The KPM(T) monitors use onscreen configuration menus to make setup and adjustment easy. The menus are selected and the menu items are adjusted using the buttons located on the back panel of the monitor (see Figure 3-1). You need only tap the buttons to activate each one. Table 3-1 outlines the functions of these controls.

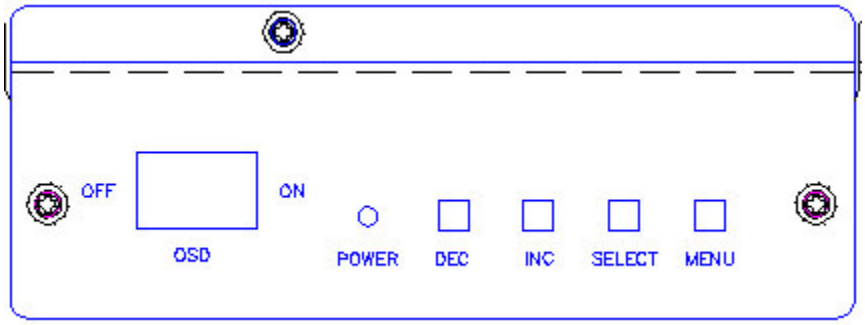


Figure 3-1. Back Panel Control Buttons

Table 3-1. Back Panel Control Button Functions

Controls	Function
MENU	Turns OSD menu On or Off (includes auto time-off)
SELECT	Select functions; saves changes
INC	Increases setting/moves cursor to next item
DEC	Decreases setting/moves cursor to previous item

With the OSD enabled, use the back panel control buttons to navigate through the adjustment menus and make adjustments. Press MENU to view the onscreen OSD

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Functions menu. Use INC or DEC to highlight one of the adjustment menus, and SELECT to access it. The adjustment menus are explained in Figure 3-2.

> **Note**
>
> The OSD will time out if you do not complete a task within a specified time period. The default setting is 15 seconds, but you can change the setting in the OSD Timeout submenu, under Miscellaneous.

OSD Functions

OSD Functions

	Brightness	Increase/decrease brightness level. Press – or + (- [redacted] + nn), Range : 0 – 63
	Contrast	Increase/decrease panel contrast level. Press – or + (- [redacted] + nnn), range: 0 to 200
	Color ▸	Turn on color sub-menu
	Position ▸	Turn on position sub-menu
	Image ▸	Turn on image sub-menu
	Auto Setup	Auto setting the display, e.g. positions, image size, tuning, etc. Yes/No
	Miscellaneous ▸	Turn on miscellaneous submenu
	DOS text/ Graphics	Select the DOS text or graphic mode
	System Info	Show board, BIOS, panel and input source information
	Language	Select the OSD display language Press + or – to select English / French.

Items marked ▸ have sub menus.
Press SELECT to save the setting chosen

Figure 3-2.OSD Functions menu

Press MENU to select the highlighted adjustment menu; the first adjustment option in the menu will be highlighted. Use INC or DEC to select a submenu, and then press SELECT to access the submenu. Use INC or DEC to adjust the value of the highlighted option. Press SELECT to save the changes or MENU to cancel. Repeat the instructions above for selecting another adjustment menu. Press MENU again to exit the OSD adjustment menus.

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Note

To adjust the brightness of the backlights on the monitor, use the  or  keys on the monitor's keypad, not the brightness adjustment submenu in the OSD.

The Brightness and Contrast menus allow you to change the display on your flat panel monitor. Once the unit is mounted in a rack, however, the back panel controls will be less accessible. The Brightness control features on the front panel should be used instead.

Figures 3-3 through 3-7 show the adjustment options in the submenus for the color menu, the RGB menu, the position menu, the image menu, and the miscellaneous menu.

Note

In the following tables, the INC button is referred to as "+", and the DEC button is referred to as "-".

The color submenu offers three options: Auto Balance; RGB; and Color temperature. Figure 3-3 outlines the functions of these choices.

Auto Balance	Auto RGB calibration
RGB ‣	Turn on the RGB submenu
Color temperature	Adjust color temperature 5000K/6000K/7000K/8000K/9000K/10000K

Figure 3-3. Color submenu

The RGB submenu allows you to adjust the Red, Green and Blue on the monitor. Figure 3-4 explains how these options work.

Red	Adjust red color level Press – or + (- [redacted] + nnn), range: 0 to 127
Green	Adjust green color level Press – or + (- [redacted] + nnn), range: 0 to 127
Blue	Adjust blue color level Press – or + (- [redacted] + nnn), range: 0 to 127

Figure 3-4. RGB submenu

The Position submenu offers three options as well: Image Horizontal Position; Image Vertical Position; and Auto Center. Figure 3-5 explains these options.

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Image Horizontal Position	Move the image position horizontally Press – or + (-[redacted] + nnn), range: 6 to 301
Image Vertical Position	Move the image position vertically Press – or + (-[redacted] + nn), range: 1 to 36
Auto Center	Set the screen to center Yes/No

Figure 3-5. Position submenu

Figure 3-6 shows the three options available in the Image submenu: Phase; Horizontal size; and Auto phase

Phase	Adjust the phase on the screen Press – or + (-[redacted] + nn), range: 0 to 61
Horizontal size	Adjust the image size Press – or + (-[redacted] + nnnn), range: 1264-1392
Auto phase	Auto adjust the phase Yes/No

Figure 3-6. Image submenu

Figure 3-7 explains the three options available in the Miscellaneous submenu: Load Default; OSD Timeout; OSD position.

Load Default	Initialize the setting stored in non-volatile memory
OSD Timeout	Set menu time-out period Press – or + (15/30/45/60) sec
OSD position	H-Position : Move OSD position horizontally Press – or + (-[redacted] + nn), range: 0 to 98 V-Position : Move OSD position vertically Press – or + (-[redacted] + nn), range: 1 to 89

Figure 3-7. Miscellaneous submenu

Reset Factory Default Settings

To reset the factory default settings on your monitor, follow these steps.

1. Navigate to the Miscellaneous menu and highlight *Load Default*.
2. Press SELECT to enter submenu, which will ask you to choose yes or no.
3. Press the INC key to highlight *yes,* and press SELECT to enable your choice.
4. The default settings will be loaded as the submenu is exited.

Analog RGB Interface Specifications

Listed below are the Analog RGB Interface specifications.

- Based on VESA standard, separate analog RGB
- 0.7Vp-p positive true typically
- Input range: 0.5 to 1.0Vp-p typical with terminal resistance of 75Ω
- H sync signal input: TTL level, negative true or positive true
- V sync signal input: TTL level, negative true or positive true

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Graphic Modes

The following table lists the supported graphic modes for the KMP(T) monitors.

Table 3-2. Supported Video Modes

Mode	Resolution	Clk [MHz]	Horizontal freq [KHz]	Vertical freq [Hz]	Sync Mode
E1_70	640x350 70Hz	25.175	31.469	70.087	Digital Separate Sync
E2_70	640x400 70Hz	25.175	31.469	70.087	Digital Separate Sync
T_70	720x400 70Hz	28.322	31.469	70.087	Digital Separate Sync
V_60	640x480 60Hz	25.175	31.469	59.940	Digital Separate Sync
V_72	640x480 72Hz	31.500	37.861	72.809	Digital Separate Sync
V_75	640x480 75Hz	31.500	37.500	75.000	Digital Separate Sync
SV_56	800x600 56Hz	36.000	35.156	56.250	Digital Separate Sync
SV_60	800x600 60Hz	40.000	37.879	60.317	Digital Separate Sync
SV_72	800x600 72Hz	50.000	48.077	72.188	Digital Separate Sync
SV_75	800x600 75Hz	49.500	46.875	75.000	Digital Separate Sync
X_60	1024x768 60Hz	65.000	48.363	60.004	Digital Separate Sync
X_70	1024x768 70Hz	75.000	56.476	70.069	Digital Separate Sync
X_75	1024x768 75Hz	78.750	60.023	75.029	Digital Separate Sync

NOTE

All video modes are non-interlaced.

If the monitor is receiving timing signals that are not compatible, [OUT OF TIMING] will appear. Follow your computer's instruction manual to set the timing so that it is compatible with the monitor.

If the monitor is not receiving any signal, [NO SIGNAL] will appear.

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Chapter 4 – Operator Input

Installing the Touch Screen Driver

In order to use the touch screen on your KPMT monitor, you must install the proper driver on the computer hooked to your monitor.

For computers running Windows® 98, NT, 2000, or XP, you will be installing the driver touchbase_windows_kpmt_mons.exe. This driver can be found in the "Drivers\Touchscreen" folder on the Documentation and Support Library CD that shipped with your monitor. The default setting is serial mode.

1. Create a folder named "Touch" on your desktop or in the root directory of your C: drive, and unzip the files into the folder.
2. Click on the file "setup.exe" and follow the directions. Pro-face suggests that you accept all of the defaults.
3. Calibrate the touchscreen, following the directions in the next section.

Caution

When using MS-DOS®, the mouse driver must be loaded before the touch screen driver if both a mouse and touch screen are to be supported.

For computers running MS-DOS®, you will be installing the driver, touchbase_dos.zip. This driver can be found in the "Drivers\Touchscreen" folder on the Documentation and Support Library CD that shipped with your monitor.

1. Create a directory named "Touch" in the root directory of your C:\ drive and unzip the files into the folder.
2. Run the file "install.exe" in the TB458 subdirectory and follow the directions. Pro-face suggests that you accept all of the defaults.
3. Copy all of the batchfile utilities from the Batch Files subdirectory to C:\
4. Add the command allser.bat to your autoexec.bat file.
5. Re-boot your system.
6. Calibrate the touchscreen, following the directions in the next section.

Caution

It is recommended that you keep all default setting when installing the driver.

The touch screen drivers are located on the Document and Support Library CD, which is shipped with you unit. Drivers can also be downloaded from http://www.profaceamerica.com.

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Calibrating the Touch Screen

You need to calibrate the touch screen in the following cases:

- The cursor does not follow the movement of your finger or pen.
- You adjust the size of the video image or change the video mode.

For computers running Windows® 98, NT, 2000, or XP: Before calibrating your touch screen, Pro-face strongly recommends altering the following default settings in the calibration program.

1. Go to START/PROGRAMS/UPDD/SETTINGS
2. Click on the Calibration tab.
3. Set the Calibration points to 25.
4. Set the Margin Percentage to 1.

Note

If the Margin Percentage is set to 0, the calibration may not be correct at the edges of the screen, causing the cursor to jump unexpectedly.

5. Click on the Settings tab.
6. Set the Averaging to 0.
7. Click Apply.

You are now ready to calibrate your touch screen. Follow the instructions found in the following applet to calibrate the touch screen:

START/PROGRAMS/UPDD/CALIBRATE

Note

The touch screen and controller is a matched pair calibrated at the factory. If touch screen and controllers are interchanged calibration may be needed.

For computers running MS-DOS®, the touch screen drivers must be loaded before you can calibrate. After the drivers are loaded, switch to **C:\Touch**, and run TBCAL.EXE to calibrate the touch screen:

1. Enter the "H" command for hard calibrate
2. Touch the cross hairs as directed by the calibrate utility
3. Save the settings
4. Exit the calibrate utility with the "X" command

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Chapter 5 – Keypad Utility Program

The keypad utility program allows users to redefine any or all of the keypad keys on the unit with new scan codes, using utility software. You must use an external full-stroke PC/AT keyboard to access the utility. This chapter explains how to load the keypad utility, and details how the program's pull-down menus work. Also included in this chapter are the default keypad scan codes.

Note

Your external full-stroke PC/AT keyboard cannot be redefined by running the keypad utility.

Note

The keypad switch arrays are disabled while the keypad utility is running.

Loading the Keypad Utility

Note

Pro-face/Xycom's keypad utility will only run under DOS 3.2 or better. **The keypad utility will not run in a Windows environment.**

The keypad utility is on the "Documentation & Support Library" CD that shipped with your computer. You will find the self-extracting zip file, Keypad Utility 1.1 *142606-001.exe*, in the folder:

DRIVERS\Keypad Software\Keypad Utility 1.1 142606-001

If your computer is running DOS (revision 3.2 or better), create a subdirectory on your hard drive for the files, and extract the files on the disk into that subdirectory. To run the utility, go to the subdirectory and type *kp3util* at the DOS prompt.

If your computer is not running DOS, you will need to extract the files onto a DOS-bootable diskette. The diskette is then inserted into the floppy drive. You will need to reboot your computer for the computer to access the program. To run the utility, type *kp3util* at the DOS prompt.

Using the Keypad Utility

The keypad utility uses a menu bar and pull-down menu system. All menu bars are displayed across the top of the screen. "Proface/Xycom KP3 Utility" and the current menu titles are shown at the bottom of the screen (see Figure 5-1).

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A full-stroke keyboard is needed to enter keystrokes while recording a new key macro, editing an existing macro, or entering utility commands. You can redefine all keys on the keypads, except the F/A (Function/Alpha) key. While the utility is running, the keypads are disabled.

Dialog boxes appear for user prompts, and to display error and user advice messages. Any keys used specifically in each menu are shown at the bottom of each screen (see Figure 5-1).

Two keys allow you to exit the menus:

- ESC moves to the previous menu or out of the utility from the Main Menu
- F1 returns to the current menu headings in some of the menus where Exit can be chosen to exit this menu

Startup

To begin using the keypad utility, type *kp3util* at the prompt (for the floppy drive when no DOS is available, or the subdirectory you created earlier). The program will bring up the main menu. Open the *def3612.pkm* file in the main menu to program the keypad. (This file contains the default keypad settings for the KPM(T) monitors.) Changes to the default file should be saved to a new file with the pkm extension. If you do not open a file, the macros pull-down menu will not be available.

Note

If you make any changes to your keypad and want to set it back to the default settings, open the pkm file for your unit (e.g., def3612.PKM for 5015KPM) from the File/Open menu, and then download it from the download menu.

Caution

Do not save any changes to the default files.

Main Menu

Figure 5-1 shows the Main Menu screen. The functions of the pull-down menus are described in the following sections.

Note

Exit and Download do not have pull-down menus.

Note

Use F1 to access the menu bar options in the *kp3util* program.

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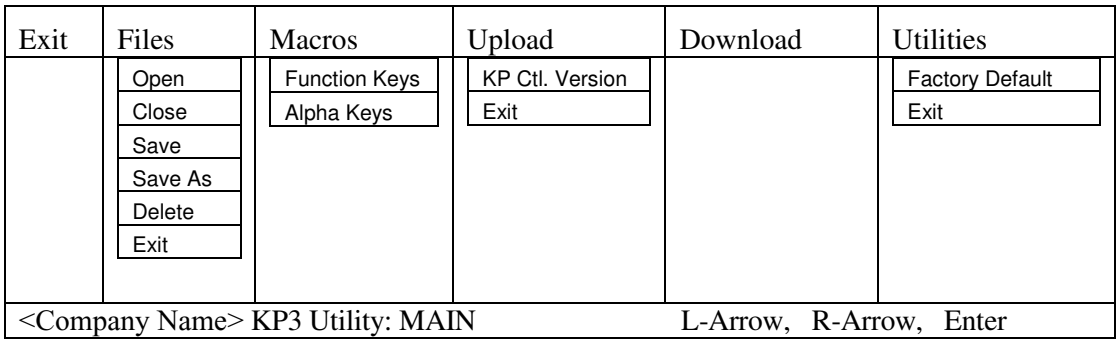


Figure 5-1. Main Menu, showing first-level pull-down menus

Exit

Exit closes any open files and exits the utility. ESC can also be used for this purpose. ESC works for exiting the other menus as well.

Files Menu

When you choose Files, a pull-down menu will display the following choices: Open, Close, Save, Save As, Delete, and Exit. The following table describes these menu commands.

Table 5-1. Files Menu

Command	Description
Open	Opens a file that contains a macro set for the keypad and loads the contents into memory. Any macro set in memory is overwritten. Once loaded, the macro set is available to edit, view, teach, or download to the keyboard controller.
Close	Clears the macro set from memory and closes the file from which the set came.
Save	Copies the macro set from memory back into its original file. The original file contents are overwritten.
Save As	Creates a new file under the specified name and copies the macro set from memory into it. For example, to define different sets of codes, save each set under a different name and download the one you wish to use.
Delete	Deletes a file.
Exit	Returns to the Main Menu.

You can save files containing keypad macro sets (a macro for each key) on disk, and then load them into memory to view, edit, teach, or download to the keyboard controller. Some of these files may be included in the utility package for use in reconfiguring the keypads for different software packages, and as templates for defining completely new keypad macro sets.

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Macros Menu

> **Note**
>
> You must have a macro file in memory before the Macros Menu is available. To load a macro file, select the File/Open menu.

When you select Macros, a keypad type pull-down menu is available. This pull-down menu provides the following choices: Function Keys, Alpha Keys, and Exit. Table 5-2 explains the commands in the Macros Keypad Type menu.

Table 5-2. Macros Keypad Type Menu

Command	Description
Function Keys	Selects the function keys on the keypad to view, edit, or teach.
Alpha Keys	Selects the alpha keys on the keypad to view, edit, or teach.
Exit	Returns to the main menu.

After choosing which keys you want to work with (Function or Alpha), another pull-down menu becomes available. This macros edit menu displays the following choices: Exit, View, Teach, and Edit. Table 5-3 explains the commands in the Macros Edit menu.

Table 5-3. Macros Edit Menu

Command	Description
Exit	Returns to the Main Menu.
View	Lets you view, but not edit, the macro for the selected key. When View is chosen, the Exit option is displayed on the menu bar and a graphic representation of the chosen keypad is shown. To return to the Macros Menu, select Exit from the View Menu. To select a key to view, use the arrow keys to position the cursor on the desired key and press ENTER. The macro is displayed as two lines: ASCII and code. The ASCII line displays each keycode as the keys it represents on the full-stroke keyboard. Special labels are used for certain keys (e.g., Spc for space bar, UAr for up arrow, and bk for the break code prefix). The code line is displayed in either Hex or decimal. There is a one-to-one correspondence between the ASCII and code lines. While viewing the macro, the menu bar displays two options: Exit and Hex/Decimal. To access the menu bar, use F1. Exit returns to the View Menu; Hex/Decimal toggles between displaying the macro in hex or decimal format. When Hex is chosen, the keycodes are displayed as hexadecimal value scan codes. When Decimal is chosen, the keycodes are displayed as the decimal equivalent of the hex codes. For example, the macro *abc* would be displayed as 1C F0 1C 32 F0 32 21 F0 21 in hex, and 28 240 28 50 240 50 33 240 33 in decimal.

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Table 5-3. Macros Edit Menu

Command	Description
Teach	Allows you to record up to 105 keystrokes in a macro. When Teach is selected, a graphic representation of the keypad currently in memory displays. Menu bar choices are Exit, ASCII, and Click OFF. To access the menu bar, use F1. As usual, Exit returns you to the Macros menu. ASCII specifies the format to display the keystrokes as they are entered. ASCII is the default setting. The Click OFF choice is not supported. To select a key to define, use the arrow keys to position the cursor on the desired key and press ENTER. After you select a key, the utility records every keystroke made on the external full-stroke keyboard. The keystrokes are saved in a macro assigned to the chosen key. As the keystrokes are entered, they are displayed using the chosen format. ESC stops recording and returns you to the Teach Menu, so you cannot record the ESC key. However, ESC can be included in a macro by using the editor. Changes made to the macros in the Teach Menu are not programmed until you select Download.
Edit	Displays a graphic representation of the keypad in memory and a menu bar displaying Exit and Click OFF. Exit returns to the Macros menu. Click OFF is not supported. To select a key to edit, use the arrow keys to position the cursor on the desired key and press ENTER. In edit mode, the macro is displayed as two lines. The top line displays the macro in either hex or decimal format, and is the line in which the editing takes place. The bottom line displays the macro in ASCII format; this line is not user configurable. The bottom line keeps track of which part of the macro being edited, and is updated by the utility as editing takes place. The insert, delete, and cursor control keys on the full-stroke keyboard are active for editing. When a key is selected from the Edit Macro option, the menu bar displays the following choices: Exit, Cut, Copy, Paste, Codes, Hex, and I/O (Insert/Overtype). The macro for the chosen key is also displayed. To access the menu bar, use F1. Use the Insert key on your full-stroke external keyboard to toggle between insert and overtype mode.
Edit/Cut	Cut deletes a sequence of scan codes from the macro. To select a section to cut:
	1. Place the cursor on the first character to cut. 2. Press F1 (to access the menu bar choices) and select CUT. 3. Press ENTER. Cut should still be highlighted, but the cursor will appear on the Edit line. Move the cursor on the last character to cut and press ENTER. The last character of every macro is the end of the macro (EOM) and cannot be deleted.

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Table 5-4. Macros Edit Menu

Command	Description
Edit/Copy	Copy duplicates a sequence of scan codes from the macro into memory. To select the section to copy:
	1. Place the cursor on the first character to copy. Press F1 and select Copy. 2. Press ENTER. Copy should still be highlighted, but the cursor will appear on the Edit line. 3. Move the cursor to the last character to copy and press ENTER. The copied item does not appear on the screen until you select Paste.
Edit/Paste	Paste inserts a sequence of scan codes (which were saved in memory using Copy) into the macro. To paste a sequence of scan codes that were previously copied, position the cursor where you want the text to appear and then press F1. Select Paste and then press ENTER. Codes displays a table of keys and their scan codes in Hex. See the Codes section in this chapter for a complete code listing. Hex/Decimal toggles between displaying the scan codes in Hex and Decimal formats. I/O allows the user to insert text or type over text in the code(s). Use the Insert key on your full-stroke external keyboard to toggle between insert and overtype mode.

Note

The 5012KPMT and 5015KPMT do not support the programming of special functions such as caps lock, Number lock, or scroll lock.

Upload Menu

Use the Upload Menu to access the keypad version. As illustrated in Table 5-5, the choices in this menu are Keypad Version and Exit.

Table 5-5. Upload Menu

Command	Description
Keypad Version	Commands the keyboard controller to send its firmware revision number.
Exit	Returns to the Main Menu.

Download Menu

Note

Download contains no options. If you select Download, any macro set previously programmed is overwritten.

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Caution

The macros set in memory should be saved before downloading. If the set is not saved, all changes will be lost.

Download should be used only after all the keypad keys have been programmed and saved to a *.pkm file. Selecting Download prior to saving changes will result in a loss of all keypad macro programming.

When you select Download, the program creates a download file called *download.dld* and loads the keypad controller's non-volatile memory with the new macros, which become the new key definitions for the keypad. After the download is complete, the system will prompt the user to cycle power.

Utilities Menu

When the Utilities menu is selected, two choices are displayed: Factory Default, and Exit. Table 5-6 explains these choices.

Table 5-6. Utilities Menu

Command	Description
Factory Default	Reprograms the keypad macros to the factory default settings. After completion, the system will need to be power cycled.
Exit	Returns to the Main Menu.

Utility Batch Mode

The Utility Batch Mode can be used to reprogram keypads on multiple units with the same customized keypad macros. This feature is useful because it allows you to do the reprogramming without having to enter the full keypad utility for each individual unit. After you have programmed the first keypad macros, you will need to create a DOS-bootable diskette to run the Utility Batch Mode.

You will need to extract files from the Documentation and Support Library CD-ROM to for the diskette. The necessary files can be found in the folder,

DRIVERS\Keypad Software\Keypad Utility 1.1 142606-001

Save the following files from the CD-ROM to the root directory on your DOS-bootable diskette:

- H8flash.exe
- KP3util.exe
- H8fload.mot
- *.pkm
- codes.pkm
- symbols.pkm
- download.dld

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Then, insert the diskette into the unit you want to reprogram and reboot it. At the DOS prompt, type the *kp3util *.pkm* to run the reprogramming function. This utility can be used on as many units as necessary.

Note

The **.pkm* file is the macro file you saved in the earlier step. The * indicates the name you selected for the file.

Note

The *download.dld* file was created after the last keypad programming process. This includes both new programming and reprogramming the keypad to the factory default settings.

Keypad Scan Codes

The utility's default keypad keycodes are listed in the following table.

Table 5-7. Default Keypad Keycodes

5012KPM(T) 5015KPM(T)	**F/A Key LED Off (Function Mode)**			**F/A Key LED On (Alpha Mode)**		
Description of Key	*Keyboard Equivalent*	*Make Codes*	*Break Codes*	*Keyboard Equivalent*	*Make Codes*	*Break Codes*
PF1 / A	F21	14 05	F0 05 F0 14	A	1C	F0 1C
PF2 / B	F22	14 06	F0 06 F0 14	B	32	F0 32
PF3 / C	F23	14 04	F0 04 F0 14	C	21	F0 21
PF4 / D	F24	14 0C	F0 0C F0 14	D	23	F0 23
PF5 / E	F25	14 03	F0 03 F0 14	E	24	F0 24
PF6 / F	F26	14 0B	F0 0B F0 14	F	2B	F0 2B
PF7 / G	F27	14 83	F0 83 F0 14	G	34	F0 34
PF8 / H	F28	14 0A	F0 0A F0 14	H	33	F0 33
PF9 / I	F29	14 01	F0 01 F0 14	I	43	F0 43
PF10 / J	F30	14 09	F0 09 F0 14	J	3B	F0 3B
F1 / K	F1	05	F0 05	K	42	F0 42
F2 / L	F2	06	F0 06	L	4B	F0 4B
F3 / M	F3	04	F0 04	M	3A	F0 3A
F4 / N	F4	0C	F0 0C	N	31	F0 31
F5 / O	F5	03	F0 03	O	44	F0 44
F6 / P	F6	0B	F0 0B	P	4D	F0 4D
F7 / Q	F7	83	F0 83	Q	15	F0 15
F8 / R	F8	0A	F0 0A	R	2D	F0 2D
F9 / S	F9	01	F0 01	S	1B	F0 1B
F10 / T	F10	09	F0 09	T	2C	F0 2C
F11 / U	F11	12 05	F0 05 F0 12	U	3C	F0 3C
F12 / V	F12	12 06	F0 06 F0 12	V	2A	F0 2A

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Table 5-7. Default Keypad Keycodes

5012KPM(T) 5015KPM(T)	**F/A Key LED Off (Function Mode)**			**F/A Key LED On (Alpha Mode)**		
Description of Key	*Keyboard Equivalent*	*Make Codes*	*Break Codes*	*Keyboard Equivalent*	*Make Codes*	*Break Codes*
F13 / W	F13	12 04	F0 04 F0 12	W	1D	F0 1D
F14 / X	F14	12 0C	F0 0C F0 12	X	22	F0 22
F15 / Y	F15	12 03	F0 03 F0 12	Y	35	F0 35
F16 / Z	F16	12 0B	F0 0B F0 12	Z	1A	F0 1A
F17 / :	F17	12 83	F0 83 F0 12	:	12 4C	F0 12 F0 4C
F18 / /	F18	12 0A	F0 0A F0 12	/	4A	F0 4A
F19 / \	F19	12 01	F0 01 F0 12	\	5D	F0 5D
F20 / *	F20	12 09	F0 09 F0 12	*	12 3E	F0 12 F0 3E
PF11 / (	F31	11 05	F0 05 F0 11	(	12 46	F0 12 F0 46
PF12 /)	F32	11 06	F0 06 F0 11	)	12 45	F0 12 F0 45
PF13 / ?	F33	11 04	F0 04 F0 11	?	12 4A	F0 12 F0 4A
PF14 / ^	F34	11 0C	F0 0C F0 11	^	12 36	F0 12 F0 36
PF15 / %	F35	11 03	F0 03 F0 11	%	12 2E	F0 12 F0 2E
PF16 / $	F36	11 0B	F0 0B F0 11	$	12 25	F0 12 F0 25
PF17 / @	F37	11 83	F0 83 F0 11	@	12 1E	F0 12 F0 1E
PF18 / <	F38	11 0A	F0 0A F0 11	<	12 41	F0 12 F0 41
PF19 / >	F39	11 01	F0 01 F0 11	>	12 49	F0 12 F0 49
PF20 / ~	F40	11 09	F0 09 F0 11	~	12 0E	F0 12 F0 0E
CTRL	CTRL[1]	14	F0 14	CTRL	14	F0 14
SHIFT	SHIFT[1]	12	F0 12	SHIFT	12	F0 12
ESC	ESC	76	F0 76	ESC	76	F0 76
ALT	ALT[1]	11	F0 11	ALT	11	F0 11
TAB	TAB	0D	F0 0D	TAB	0D	F0 0D
DEL	DEL	E0 12 E0 71	E0 F0 71 E0 F0 12	DEL	E0 12 E0 71	E0 F0 71 E0 F0 12
F/A						
SPACE	SPACE	29	F0 29	SPACE	29	F0 29
BACKSPACE	BACKSPACE	66	F0 66	BACKSPACE	66	F0 66
1	1	16	F0 16	1	16	F0 16
2	2	1E	F0 1E	2	1E	F0 1E
3	3	26	F0 26	3	26	F0 26
4	4	25	F0 25	4	25	F0 25
5	5	2E	F0 2E	5	2E	F0 2E
6	6	36	F0 36	6	36	F0 36
7	7	3D	F0 3D	7	3D	F0 3D
8	8	3E	F0 3E	8	3E	F0 3E
9	9	46	F0 46	9	46	F0 46
.	.	49	F0 49	.	49	F0 49
0	0	45	F0 45	0	45	F0 45
=	=	55	F0 55	=	55	F0 55
PgUp	PgUp	E0 12 E0 7D	E0 F0 7D E0 F0 12	PgUp	E0 12 E0 7D	E0 F0 7D E0 F0 12
up arr	up arr	E0 12 E0 75	E0 F0 75 E0 F0 12	up arr	E0 12 E0 75	E0 F0 75 E0 F0 12

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Table 5-7. Default Keypad Keycodes

5012KPM(T) 5015KPM(T)	**F/A Key LED Off (Function Mode)**			**F/A Key LED On (Alpha Mode)**		
Description of Key	*Keyboard Equivalent*	*Make Codes*	*Break Codes*	*Keyboard Equivalent*	*Make Codes*	*Break Codes*
+	+[2]	79	F0 79	+	79	F0 79
left arr	left arr	E0 12 E0 6B	E0 F0 6B E0 F0 12	left arr	E0 12 E0 6B	E0 F0 6B E0 F0 12
HOME	HOME	E0 12 E0 6C	E0 F0 6C E0 F0 12	HOME	E0 12 E0 6C	E0 F0 6C E0 F0 12
right arr	right arr	E0 12 E0 74	E0 F0 74 E0 F0 12	right arr	E0 12 E0 74	E0 F0 74 E0 F0 12
PgDn	PgDn	E0 12 E0 7A	E0 F0 7A E0 F0 12	PgDn	E0 12 E0 7A	E0 F0 7A E0 F0 12
down arr	down arr	E0 12 E0 72	E0 F0 72 E0 F0 12	down arr	E0 12 E0 72	E0 F0 72 E0 F0 12
-	- [2]	7B	F0 7B	-	7B	F0 7B
ENTER	ENTER [1]	5A	F0 5A	ENTER	5A	F0 5A
END	END	E0 12 E0 69	E0 F0 69 E0 F0 12	END	E0 12 E0 69	E0 F0 69 E0 F0 12
Left Start	Mouse click (windows start menu)	E0 12 E0 1F	E0 F0 1F E0 F0 12		E0 12 E0 1F	E0 F0 1F E0 F0 12
Explorer	Mouse click (windows pop-up menu)	E0 12 E0 2F	E0 F0 2F E0 F0 12		E0 12 E0 2F	E0 F0 2F E0 F0 12

[1]: Use the keyboard buttons located on the left side of the keyboard, i.e. the buttons normally used with the alpha keys

[2]: Use the keyboard buttons located on the right side of the keyboard, i.e. the buttons normally used with the numeric keys

Additional notes:

- F11-F20 = SHIFT F1-F10
- F21-F30 = CTRL F1-F10
- F31-F40 = ALT F1-F10
- END, LEFT START, and EXPLORE keys are available.

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Chapter 6 – Maintenance

The KPM(T) monitors are designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your system in good operating condition. Preventive maintenance consists of several basic procedures that will greatly reduce the chance of system malfunction. Schedule preventive maintenance along with the regular equipment maintenance to minimize down time.

General Preventive Maintenance

Here are some preventive measures you can take:

- *Clean the monitor screen* using a non-residue cleaner such as a mild window cleaning solution or CRT screen cleaner. Take care not to scratch the screen face.
- *Base your maintenance schedule* on the type of environment the system is in (i.e., if the area is dusty, you should schedule maintenance more often than if it is a dry, clean area).
- *Check the connections to I/O modules,* especially in environments where vibration could loosen the connections. Check to see that all plugs, sockets, terminal strips, and module connections are solid.
- *Remove unnecessary articles,* such as drawings or manuals, from the unit. They can obstruct airflow and create hot spots, which cause the system to malfunction.
- *Do not place* noise-generating equipment near the KPM(T) monitor.

Fuse Replacement

The KPM(T) monitor has no accessible fuse. Return the unit to the factory for fuse replacement.

Troubleshooting

Pro-face Technical Support offers a variety of support options to answer any questions about Pro-face products and their implementation. You may call Technical Support directly at 734-944-0482, or via email at support@profaceamerica.com.

Before Contacting Technical Support

Before contacting Technical Support, refer to the relevant chapter(s) in your documentation for a possible solution to any problem you may have with your system.

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If you find it necessary to contact Technical Support for assistance, please have the following information at hand:

1. Serial number and model number.
2. The operating system type and version (i.e., Microsoft Windows NT version 4.0 used on host computer).
3. Exact wording of system error messages encountered.
4. Any relevant output listing from the Microsoft Diagnostic utility (MSD) or other diagnostic applications.
5. Details of attempts made to rectify the problem(s) and results.
6. The log number assigned from Pro-face Technical Support if this is an ongoing problem.
7. The name of the Technical Support Engineer with whom you last spoke, if known.

Product Repair Program

Pro-face's Product Repair & Customization Department (PR&C) restores equipment to normal operating condition and implements engineering changes that enhance operating specifications. Pro-face tests products returned to Pro-face with the standard Pro-face test diagnostics.

Follow the steps below to prepare the unit for shipment:

1. Obtain a Return Merchandise Authorization (RMA) number for your unit by calling your nearest Pro-face Repair Department or Xycom Automation, LLC. at 734-429-4971.
2. Please have the following information:
   - Company name, 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 and failure systems
   - Purchase order number or repair order number
3. Make sure the front panel assembly is properly attached to the unit.
4. Attach failure information to the unit to speed processing.
5. Place the unit securely in its original packaging or an equivalent heavy-duty box.
6. Mark the RMA number on your purchase order and on the outside of the box.
7. Send the unit to the address given when you receive your RMA number.

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KPM(T) Monitors Front Panel Frame

The 5012KPM(T) and 5015KPM(T) front panel frames are made of powder-coated aluminum. The key ingredients are pure polyester, TEPIC-G, titanium oxide, barium sulfate, leveling agent, and carbon black.

Chemicals Compatible with Frame

Table 6-1 should be used only as a guide. Specific testing should be conducted to verify that the unit's finish would meet the demands of extreme environments.

Table 6-1. KPM(T) Monitors Front Panel Frame Chemical Compatibility

CHEMICAL	H	C
Acids:		
Acetic, 10%	F	P
Acetic, Glacial	P	P
Benzene Sulfonic, 10%	F	P
Benzoic	E	E
Boric	E	E
Butyric, 100%	F	P
Chloracetic, 10%	E	E
Chromic, 5%	P	P
Citric, 10%	E	E
Fatty Acids	E	E
Fluosilicic	P	P
Formic, 90%	P	P
Hydrobromic, 20%	G	F
Hydrochloric, 20%	G	F
Hydrocyanic	E	E
Hydrofluoric, 20%	P	P
Hypochlorous, 5%	G	F
Lactic, 5%	F	P
Maleic, 25%	E	E
Nitric, 5%	F	F
Nitric, 30%	P	P
Oleic	E	E
Oxalic	E	E
Phosphoric	G	F
Picric	G	F
Stearic	E	E
Sulfuric, 50%	F	P
Sulfuric, 80%	P	N
Tannic	E	E

CHEMICAL	H	C
Alkalies:		
Ammonium Hydroxide	P	P
Calcium Hydroxide	P	P
Potassium Hydroxide	P	P
Sodium Hydroxide	P	P
Acid Salts:		
Aluminum Sulfate	E	E
Ammonium Chloride*	E	E
Copper Chloride*	E	E
Iron Chloride*	E	E
Nickel Chloride*	E	E
Zinc Chloride*	E	E
Alkaline Salts:		
Barium Sulfide	E	E
Sodium Bicarbonate	E	E
Sodium Carbonate	E	F
Sodium Sulfide	E	F
Trisodium Phosphate	G	F
Neutral Salts:		
Calcium Chloride*	E	E
Magnesium Chloride*	E	E
Potassium Chloride*	E	E
Sodium Chloride*	E	E

CHEMICAL	H	C
Solvents:		
Alcohols	E	E
Aliphatic Hydrocarbons	G	G
Aromatic Hydrocarbons	G	F
Chlorinated Hydrocarbons	P	N
Ketones	F	P
Ethers	F	P
Esters	F	P
Gasoline	E	E
Carbon Tetrachloride	G	G
Organics:		
Aniline	P	P
Benzene	F	P
Formaldehyde, 37%	G	G
Phenol, 5%	G	F
Mineral Oils	E	E
Vegetable Oils	E	E
Chlorobenzene	G	F

Key:

E- no attack
F- some attack, but useable in some instances
G - appreciably no attack
P - attacked, not recommended for use
N - rapidly attacked
H - hot, 180°F (82.2°C) or boiling point of solvent
C - cold, 70°F (21.1°C)
* - and nitrate and sulfate

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Front Panel Overlay

The KPM(T) monitor front panel polyester overlay may be adversely affected by combinations of chemical environments, temperature, and stress. For this reason, material that may come in contact with the KPM(T) monitor should be carefully evaluated under end-use conditions for compatibility.

Chemicals Compatible with Overlay

The KPM(T) monitor front panel overlay withstands more than 24 hours of exposure to the chemicals listed in Table 6-2 without visible change.

Table 6-2. Front Panel Overlay Chemical Compatibility

Ethanol Cyclohexanol Glycol Isopropanol Glycerine Methanol	Acetaldehyde Aliphatic hydrocarbons Petrol Toluene Xylene Benzene	Fluorochlorohydrocarbons Perchloroethylene 1.1.1. Trichloroethane Trichloroethylene Ethylacetate Diethyl ether
Acetone Methyl ethyl ketone Dioxan	Formic acid <50% Acetic acid <50% Phosphoric acid <30% Hydrochloric acid <10% Nitric acid <10% Sulphuric acid <10%	Sodium hypochlorite <20% Hydrogen peroxide <25% Potassium carbonate Washing powders Fabric conditioner
Ammonia <2% Caustic soda <2% Alkalicarbonate Bichromate Potassium ferrocyanide/ferricyanide	Cutting oil Diesel oil Linseed oil Paraffin oil Blown castor oil Silicone oil Turpentine substitute	

Compatible Cleaning Agents for Overlay

The following list contains known cleaning agents and household products that are compatible with the KPM(T) monitor front panel overlay. If you want to use a cleaning agent that is not listed below, contact the appropriate manufacturer for compatibility.

Jet Dry®	Ariel®	Downey®	Domestos®
Fantastic®	Persil®	Vim®	Lenor®
Wisk®	Windex®	Vortex®	Formula 409®

Chemicals Not Compatible with Overlay

The following chemicals and household products are known to be non-compatible with the KPM(T) monitor front panel overlay:

Concentrated mineral acids	Benzyl alcohol	Tomato juice
Concentrated caustic solution	Methylene chloride	Lemon juice
High pressure steam over 212ºF(100ºC)		Tomato ketchup

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Appendix A – Technical Specifications

Hardware Specifications

Table A - 1 lists the hardware specifications for the KPM(T) monitors.

Table A - 1. 5012KPM(T) & 5015KPM(T) Hardware Specifications

Characteristic	Specification			
Mechanical	**5012KPM(T)**		**5015KPM(T)**	
Height	Front Panel	12.22 in [310.388 mm]	Front Panel	13.97 in [354.84 mm]
Width	Front Panel	19 in [482.6 mm]	Front Panel	19 in [482.6 mm]
Depth	overall	3.32 in [84.328 mm]	overall	3.17 in [80.52 mm]
	behind front panel	2.32 in [59.93 mm]	behind front panel	2.17 [55.12 mm]
	front panel protrusion	1.00 in [25.4 mm]	front panel protrusion	1.00 in [25.4 mm]
Weight		16.15 lbs [7.33 kg]		18.85 lbs [8.55 kg]
Electrical				
AC Power	100-240 V AC, 1A maximum, 50/60 Hz			
DC Power	18-32 V DC			
Front Panel	NEMA 4/4X/12 and IP65			
Agency Approvals	UL 508 (Listed) Industrial Control Equipment UL 1604 (Listed) Electrical equipment for use in Class I and Class II, Division 2 and Class III Hazardous (classified) locations cUL CSA C22.2, No. 142 (Listed) Process Control Equipment cUL CSA C22.2, No. 213 (Listed) Non-incendiary electrical equipment for use in Class I, Division 2 Hazardous Locations			
Regulatory Compliance	CE EMI EN55022, Class A IMMUNITY EN 61000-6-2 SAFETY EN 60950 HARMONICS EN 61000-3-2 FLICKER EN 61000-3-3 FCC 47 CFR, Part 15, Class A Industry Canada ICES-003, Class A			

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Environmental Specifications

Table A - 2 lists the environmental specifications for the KPM(T) monitors.

Table A - 2. 5012KPM(T) & 5015KPM(T) Environmental Specifications

Characteristic	Specification
Temperature	
Operating	0° to 50° C (32° to 122° F)
Non-operating	-20° to 60° C (-4° to 140° F)
Humidity	
Operating	20% to 80% RH, non-condensing
Non-operating	20% to 80% RH, non-condensing
Altitude*	
Operating	Sea level to 10,000 feet (3,048 m)
Non-operating	Sea level to 40,000 feet (12,192 m)
Vibration 5-2000 Hz	
Operating	0.006” (0.15 mm) peak to peak displacement 1.0g maximum acceleration
Non-operating	0.015” (0.38 mm) peak to peak displacement 2.5g maximum acceleration
Shock	
Operating	15g peak acceleration, 11 msec duration, ½ sine wave
Non-operating	30g peak acceleration, 11 msec duration, ½ sine wave

* Consistent with internal component specifications

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Appendix B – Pinouts

This appendix provides the pinouts for the VGA input, RS232 output, and USB output connectors. **NC indicates No Connection**.

VGA Input Connector

The following table lists the signal definitions for the VGA DB-15 connector.

Table B - 1. VGA Input Connector Pinout

D-Shell (Female)	Signal Name
1	Red
2	Green
3	Blue
4	
5	GND-Digital
6	GND-Red return
7	GND-Green return
8	GND-Blue return
9	DDC 5V
10	GND-Digital
11	
12	DDC SDA
13	Hsync
14	Vsync
15	DDC SCL

Serial Interface

RS-232C

Data Transmission Speed: 9600 bps
Data Length: 8 bits
Stop Bit: 1 bit
Parity: None

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Touch Screen RS-232 Output Connector

The following table lists the connections for the D-sub 9-pin female RS-232 Output Connector. (Set screw: Inch type [4-40 UNC])

Table B - 2. Serial Signal Input Connector Pinout

Number	Signal Name	Function
1	NC	No Connection
2	SD	Send Data
3	RD	Receive Data
4	DTR*	Terminal Ready
5	GND	Signal Ground
6	NC	No Connection
7	RTS*	Request Send
8	NC	No Connection
9	NC	No Connection

* RTS and DTR are connected together inside the KPM(T) monitors.

Note

The KMP(T) monitor has been configured to use a straight through cable to connect the monitor to the PC.

USB Input/Output Connector

The following table lists the descriptions of the 4-pin USB input/output connector.

Table B - 3. Touch Screen USB Output Pinout

Pin	Description
1*	5VFUSE
2	USB–
3	USB+
4	GND

** +5V is not provided on the rear host USB connector.*

Note

The front panel USB connector serves only as a “pass-through” connector and connects directly to the rear panel USB connector.

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