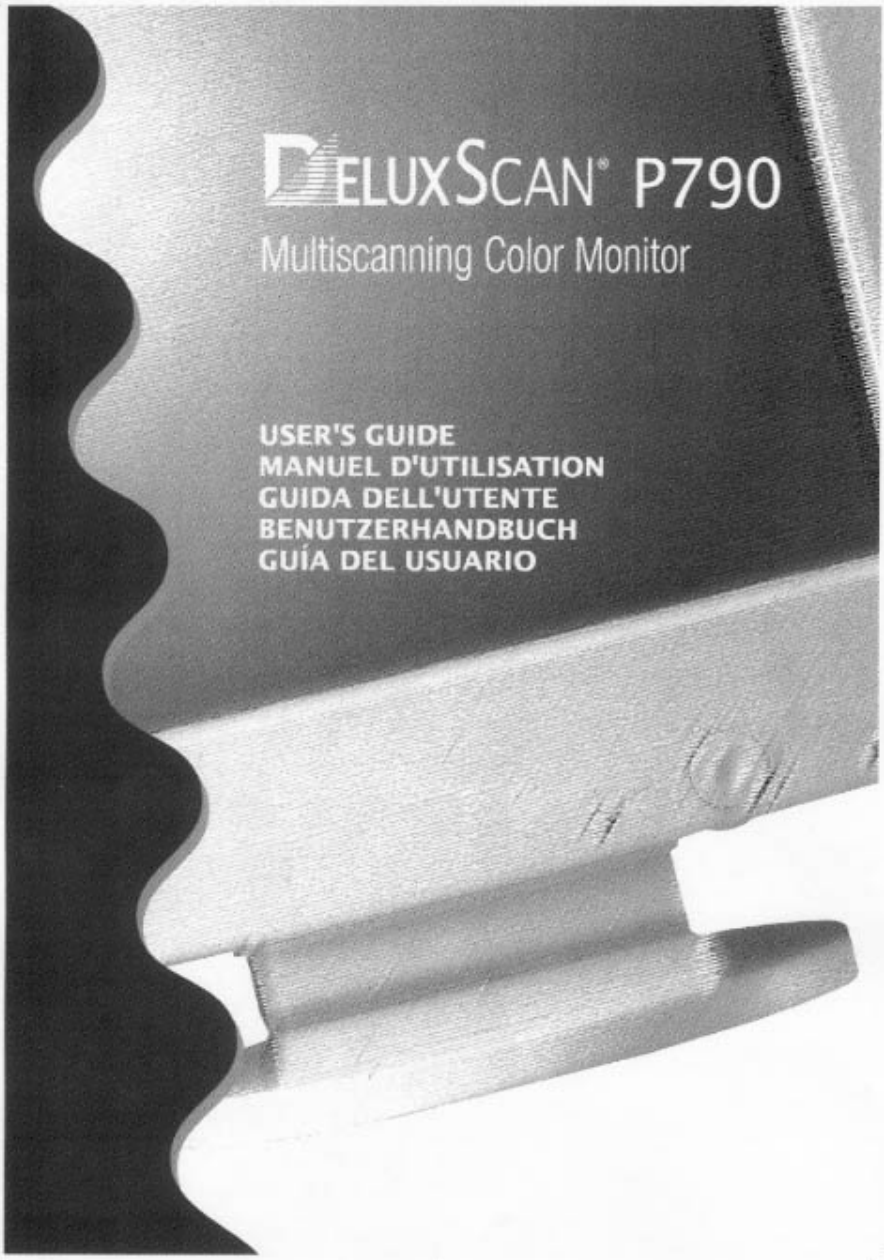
ATTACHMENT E. USERS MANUAL



DELUXSCAN® P790

Multiscanning Color Monitor

USER'S GUIDE
MANUEL D'UTILISATION
GUIDA DELL'UTENTE
BENUTZERHANDBUCH
GUÍA DEL USUARIO

U.S.A.

U.S.FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT
INFORMATION TO THE USER

NOTE : This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet of a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
Connecting of peripherals requires the use of grounded, shielded signal cables.

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Table of Contents

Introduction

This manual describes the most suitable procedures for installing and setting up the monitor. It also indicates the main technical specifications and operating features. Read this guide carefully before installing and using the monitor, in order to avoid problems.

Conventions Used in This Guide

Associated with particularly important information, or information that is useful under some circumstances.

Marks the start of a series of instructions to carry out in order to complete an operation.

General Features

- P790 17"(16" max viewable area)P990/910 19" (18" max. viewable area) colour, multifrequency, digital-controlled monitor.
- Anti-glare and anti-static screen.
- Low electromagnetic emission, in compliance with the TCO recommendations.
- Removable tilt-and-swivel support which enables you to position the monitor according to your own needs.
- OSD (on-screen display) for regulating contrast, brightness, etc., via controls on the front of the monitor.
- Possibility of restoring the factory settings, power button and LED indicator.
- 22 memory locations (refer to the video mode table further on in the text).
- +/- synchronizing polarities, in any combination.
- Controlled power consumption.
- DDC Feature (Plug and Play).
- Universal 100-240 V AC power supply.

Instructions for Use

This section provides a list of the precautions to be adopted and some tips to be followed when installing or using the monitor, to avoid electrical shocks and operating problems.

- The soft power key does not disconnect the monitor from the mains power. In order to disconnect from the mains power, unplug the power cord from the connector on the rear of the monitor.
- The power outlet must be located near the monitor and should be easily accessible.
- Never open the monitor cabinet. This is dangerous due to presence of high voltages. Any adjustment that involves opening the monitor must be carried out by specialized technical staff.
- Make sure that the monitor is connected to a mains voltage with the characteristics indicated in the technical specifications section.

- Do not place heavy objects on the power cable: this could damage the cable or cause electrical shocks.
- Do not install the monitor in damp, dusty or dirty environments, near heat sources, in direct sunlight or where light from other sources shines on to the screen. The latter precaution will reduce eye strain.
- Never expose the monitor to rain or spill anything on it: if liquid penetrates, serious damage could be caused to the electrical circuits.
- The monitor ventilation inlets are designed so that the heat generated during use can easily be dispersed; it is therefore of fundamental importance that these inlets remain free. Ensure that the installation area is surrounded by sufficient ventilation space.
- Before moving the monitor, check that the video signal cable and the power cable are disconnected from the computer and from the power supply respectively.

Ergonomic Positioning of the Monitor

The monitor does not damage health, but should always be used correctly. Therefore it is advisable to adhere to the following guidelines. Position the monitor at least 50 cm from the eyes, an operation that also allows the keyboard to be positioned correctly, that is at least 15 cm from the edge of the table. Locate it in front of you, avoiding unnecessary and damaging rotation of the body and head. Only locate the monitor to one side when it is necessary to concentrate on the document rather than on the text displayed. To avoid unsuitable positions, do not place the monitor on the basic unit, but place it directly on the table.

Illumination

The computer images displayed must be easy to read, without reflections from artificial light sources or windows. For this purpose, position the monitor perpendicularly to a window to avoid working against the light source. Adjust the contrast and brightness according to environmental light conditions. A number of adjustments could be required during daylight hours. Do not stare at the screen for too long; every so often glance away and focus on another object in the room.

Posture

Hold your back straight, leaning the lower back against a backrest. Adjust the chair height so that your feet rest comfortably on the floor without having to bend your thighs. Do not maintain the same position for too long: get up at least once an hour.

Cleaning and Maintenance

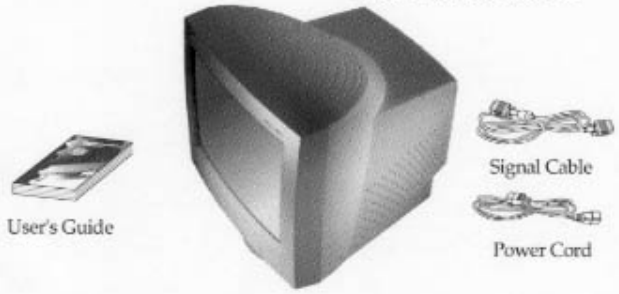
The monitor must be switched off and the power supply cable disconnected during all cleaning operations.

- Use a damp cloth for cleaning the monitor.
- Do not touch the screen with your fingers, as the natural oils from your body leave smears on the screen and tend to attract dust.
- Do not use petrol, alcohol, solvents or abrasives for cleaning the monitor. These substances could corrode the external parts.

Packing List

P990 colour monitor

P790/P910 colour monitor



! Above power cord can be changed upon different voltage areas.

Monitor Installation

Check that the computer is switched off before installing the monitor. The monitor is equipped with a cable for connection to the computer. The cable for connection to the power supply is provided with the computer. Follow the procedure described below to make the monitor operational :

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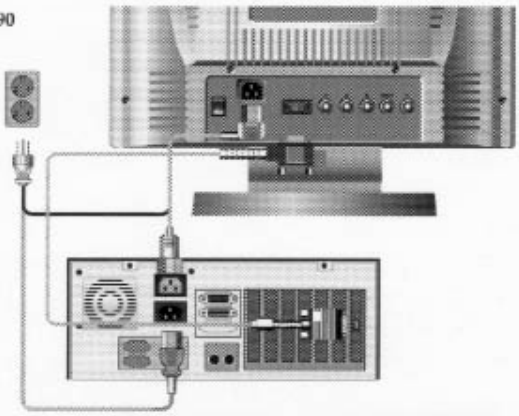
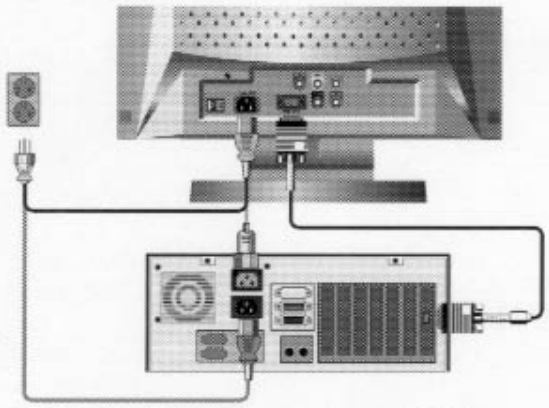
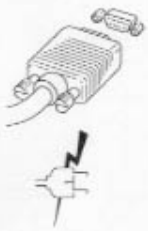
■ P/C P790/P990



■ P/C (P910)





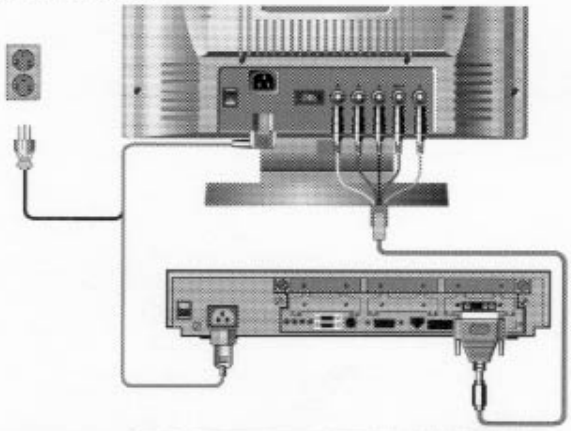
Connect the video signal cable (15-pin connector) to the connector on the video board inside the computer, usually located on the rear panel of the computer.

Connect the power supply cable to the monitor and then to the power supply.

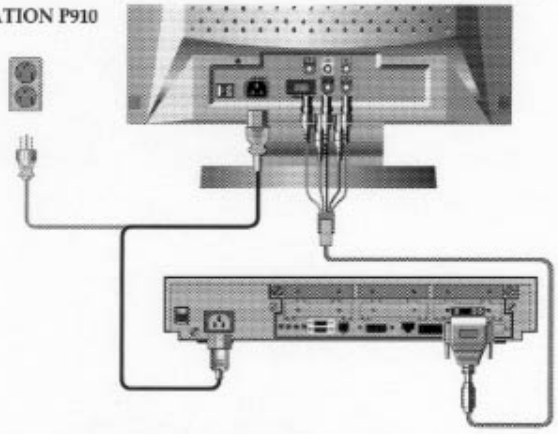
! Remember to turn off the power of PC before installing this monitor to it.

After powering on the computer, wait for 30 seconds, then adjust the display using the various controls provided (see later). For further information on the installation procedure, refer to the operating guide of the computer being used.

■ **WORKSTATION P790/P990**



■ **WORKSTATION P910**



! Remember to turn off the power of workstation before installing this monitor to it.

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Video Memory Modes

The monitor can recognise, and therefore automatically set itself to, one of the video modes indicated in the following table. It is also possible to display any other video mode with scanning frequencies within the following ranges:

- P790 : 30- 15KHz horizontal frequency
- P990 : 30- 95 KHz horizontal frequency
- P910 : 30-107 KHz horizontal frequency
- 50-150 Hz vertical frequency

The system can recognize a total of 22 video modes. Of these 12 are supplied already preset by the factory as shown in the table. Other modes can be added as they are detected by the video card.

Mode			Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Interlaced Mode (Yes/No)	Synch. Polarity V/H(+/-)
P790	P910	P910					
*	*	*	720 × 400	31.46	70	No	+/-
*	*	*	640 × 480	31.46	60	No	- /-
	*		640 × 480	43.26	85	No	- /-
*	*	*	640 × 480	63.65	120	No	- /-
*	*	*	800 × 600	53.67	85	No	+/+
*	*	*	1024 × 768	68.67	85	No	+/+
*	*	*	1024 × 768	81.84	100	No	+/+
*	*	*	1152 × 864	67.50	75	No	+/+
*	*	*	1280 × 1024	79.97	75	No	- /-
*	*	*	1280 × 1024	91.14	85	No	+/+
	*		1600 × 1200	75.00	60	No	+/+
*	*	*	1600 × 1200	93.75	75	No	+/+
		*	1600 × 1200	106.25	85	No	+/+

User setting area

The user can add nonstandard modes. If you adjust display image, the image is saved automatically. Then the microcontroller always detects and displays the last mode stored in the user setting area when the monitor is turned on.
The user setting area maintains the last 10 display modes set by the user in its memory. When the user setting area is full (10 modes are registered), if new nonstandard timing is registered, the oldest timing settings will be deleted.

Factory presetting area

There are 12 display modes stored in this area. These display modes are already preset by the factory and include most of the display modes currently available.
You can also retrieve the factory preset mode by selecting the RECALL menu.

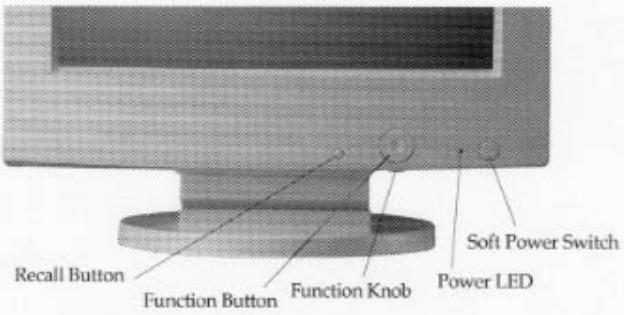
Automatic save

The monitor automatically saves the new setting after 1 second of inactivity.

DDC (Display Data Channel)

This monitor includes the DDC feature, according to VESA standards. DDC is a communication channel through which the monitor automatically informs the host system of its characteristics (for example each supported resolution with its corresponding timing). DDC uses a formerly unconnected signal pin in the 15-pin VGA connector. The system will only be "Plug and Play" if both monitor and computer include the DDC feature.

On screen controls and LED indicator



Soft Power Switch

The soft power switch is used to put the monitor directly into Power-Saving (Off) mode. To enter Power Saving mode, press the Soft Power Switch for one second. To return the monitor to normal operation, press the Soft Power Switch for two seconds.

Contrast Dial (OSD function off)

The contrast dial adjusts the brightness of the screen' s foreground. To increase the screen' s contrast, rotate the dial clockwise; rotate counterclockwise to decrease.

Function Knob

The adjust dial is used to select an OSD control from the OSD control menu, and to tune the OSD control selected if it has intermediate values.

Function Button

Horizontal, vertical, distortion, and color adjustment are made by invoking the On Screen Display(OSD). Pressing the function button will cause the five menus of adjustments options contained in the OSD to be displayed one page at a time.
The OSD allows many adjustments to be made on the monitor by using only the select and adjust dial and the function button on the control panel.

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Recall Button

The recall button adjusts the video mode to one of the factory-preset modes for horizontal and vertical sync rate. If none of the 12 factory-preset modes matches the computer' s video card sync rates.

Power LED

When both the Main Power Switch on the rear panel and the Soft Power Switch on the front panel are switched on, this LED lights in green. This LED indicates different status when this unit operates in different Power Saving Modes.

Exit main menu

Press recall key once.

Auto exit

The OSD images are disappeared automatically according to the setting time of OSD display time (5, 8, 12, 20, 30 sec)

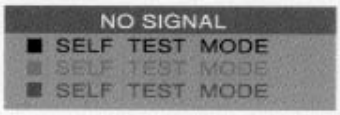
Auto save

This monitor automatically saves the new setting after 1 second.

Out of range

When an unsuitable signal is detected, the OSD images, OUT OF RANGE, is displayed.
Check your system or setup video mode again.

Self Test Mode



The monitor has an enhanced level of self-diagnostics. When the signal cable is removed or signal isn't detected, the monitor is operated to OFF Mode. If the menu/select key is pushed on OFF Mode, the system has the ability to generate on demand an RGB test pattern and the following OSD image is displayed on screen.

External Control

1. GEOMETRY : H/V-POSITION, H/V-SIZE, PINCUSHION, TRAPEZOID, PARALLELOGRAM, PIN BALANCE ,CORNER-TOP, CORNER-BOTTOM, ROTATION

1) Press the function button to display the OSD menu.
2) Rotate the function knob to select the GEOMETRY menu. Its color changes into red and it blinks. Press the button.
3) Rotate the knob to select the function you want to adjust. Its color changes into green and it blinks. Press the button.
4) Adjust the function by its numerical calibrator.
5) After the adjustment, press the button to go back to the prior function selection mode.
6) To return to the OSD main menu, select RTN(RETURN) and press the button.
7) Press the recall button once to remove the OSD menu.

2. COLOR : CONTRAST, BRIGHTNESS, 6500, 9300, USER

1) Press the function button to display the OSD menu.
2) Rotate the function knob to select the COLOR menu. Its color changes into red and it blinks. Press the button.
3) Rotate the knob to select the function you want to adjust. Its color changes into green and it blinks. Press the button.
4) Adjust the function by its numerical calibrator.
5) After the adjustment, press the button to go back to the prior function selection mode.
6) To return to the OSD main menu, select RTN(RETURN) and press the button.
7) Press the recall button once to remove the OSD menu.

* At the USER mode, you can adjust red and blue color by rotating the function knob.

3. LANGUAGE

1) Press the function button to display the OSD menu.
2) Rotate the function knob to select the LANGUAGE menu. Its color changes into red and it blinks. Press the button.
3) Rotate the knob to select the language. Its color changes into green and it blinks. Press the button, and the OSD menu is changed to the selected language.
4) To return to the OSD main menu, select RTN(RETURN) and press the button.
5) Press the recall button once to remove the OSD menu.

4. INFORMATION

1) Press the function button to display the OSD menu.
2) Rotate the function knob to select the INFORMATION menu. Its color changes into red and it blinks. Press the button. The using mode is colored magenta.
3) To return to the OSD main menu, select RTN(RETURN) and press the button.
4) Press the recall button once to remove the OSD menu.

5. OSD : H/V-DELAY, TIME

1) Press the function button to display the OSD menu.
2) Rotate the function knob to select the OSD menu. Its color changes into red and it blinks. Press the button.
3) Rotate the knob to select the function you want to adjust. Its color changes into green and it blinks. Press the button.
4) Adjust the function by its numerical calibrator.
5) After the adjustment, press the button to go back to the prior function selection mode.
6) To return to the OSD main menu, select RTN(RETURN) and press the button.
7) Press the recall button once to remove the OSD menu.

6. MISC. : BNC/DSUB, DEGAUSS, MOIRE

1) Press the function button to display the OSD menu.
2) Rotate the function knob to select the MISC. (MISCELLANEOUS) menu. Its color changes red and it blinks. Press the button.
3) Rotate the knob to select the function. Its color changes into green and it blinks. Press the button.
4) To return to the OSD main menu, select RTN (RETURN) and press the button.
5) Press the recall button once to remove the OSD menu.

Power management

This monitor is equipped with a DPMS(Display Power Management Signaling) function which automatically cuts power use to just a little less than 5W, when the computer is left unattended.
Although the monitor can be left in power-saving mode for longer periods, we recommend that you turn it off after your daily work, because degaussing, which occurs every time your power is turned on, helps maintain faultless color purity.

Operation

The DPMS function requires support from the computer system or any software DPMS function applied, currently being used. If the keyboard(or mouse) is left unattended for a certain period, the program or system will set the sync signals to DPMS mode. The DPMS function has three states. The recommended signals, power consumption and recovery times are shown in the table below.

States	Signal			Power Consumption	Recovery Time	LED Indicator
	H.S	V.S	Video			
ON	Pulses	Pulses	Active	• P790 : 120W • P990 : 140W • P910 : 130W	-	Green
Stand-by	No Pulses	Pulses	Blank	•P790 15W Max •P990/P910 Less than 15W	Within 3 sec	Alternating Green (1sec)/ Orange (1sec)
Suspend	Pulses	No Pulses	Blank	• P790 Less than 12W •P990/P910 Less than 15W	Within 3 sec	Alternating Green (0.5sec)/ Orange (0.5sec)
OFF	No Pulses	No Pulses	Blank	Less than 5W	Within 10 sec Within 30 sec	Orange

Video input terminal

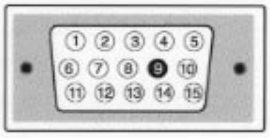
A 15 pin D-sub connector is used as the input signal connector.
Pin and input signals are shown in the table below.

Pin Description

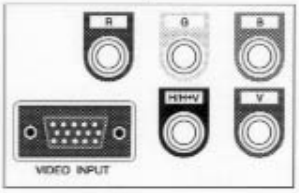
SIGNAL / PIN NO.	SEPARATE/COMPOSITE SYNC
1	RED
2	GREEN/SYNC ON GREEN
3	BLUE
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	N.C (Without contact)
10	LOGIC GROUND
11	GROUND
12	SDA
13	H-SYNC/H+V SYNC
14	V-SYNC(VCLK)
15	SCL

5 BNC: (P790/P990/P910)	
R	RED
G	GREEN/SYNC ON GREEN
B	BLUE
H/H+V	H-SYNC/H+V SYNC
V	V-SYNC

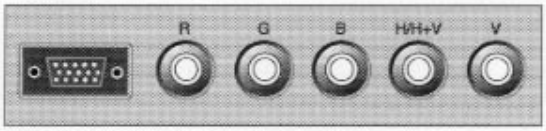
D-Sub miniature connector



5 BNC P910 (Option)



5 BNC P790/ P990 (Option)



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Problems and Solutions

Before calling technical servicing, it is advisable to check the following:

Problem	Action
The power supply LED is off.	Check the power supply connection and the computer cable connection. Set the power supply button to ON position.
There is no image but the power supply LED is on.	The power management system is enabled. Press any key and move the mouse. Check the signals cable connection. Adjust the brightness and contrast control.
The image is not centered.	Adjust the image position/size control.
The image is blurred or illegible.	Try setting a different video mode, using the video controller software.
The image is disturbed by distorted lines, flickering or rolling.	Remove all electromagnetic equipment, such as fans and electric motors, away from the monitor, or move the monitor.

Autodiagnostics and Frequency Detection

This monitor is capable of identifying the absence of an input signal and displays an OSD **Autodiagnostics** message indicating its nature. Furthermore it is capably of advising of the presence of a signal with frequency characteristics that exceed its limit. In these situations a message is displayed showing the horizontal and vertical frequencies (the wrong value blinks).

Technical Specifications

Cathode tube	• P790 : 17 inches (16" viewable area) short lenght Space between triads 0.26 mm
	• P990 : 19 inches (18" viewable area) short lenght Space between triads 0.25 mm
	• P910 : 19 inches (18" viewable area) Space between triads 0.26 mm
Resolution	• P790 : Maximum resolution 1600x1200 non interlaced • P990 : Maximum resolution 1600x1200 non interlaced • P910 : Maximum resolution 1792x1344 non interlaced
Input signals	Analog RGB 0.7V p.p. 75 Ohm
Horizontal sync.	• P790 : Frequency: from 30 to 95 KHz • P990 : Frequency: from 30 to 95 KHz • P910 : Frequency: from 30 to 107 KHz
Vertical sync.	Frequency from 50 to 150 Hz
Pixel Frequency	• P790 /P990 : 202.5MHz • P910 : 229.5 MHz
Video mode recognition	Automatic
Signal connector	• P790 : 15-pin D SUB, 5 BNC (Option) • P990 : 15-pin D SUB, 5 BNC (Option) • P910 : 15-pin D SUB, 5 BNC (Option)
Operating temperature	0° C - 40° C
External controls	Recall, Function Button, Function Knob, Soft Power Switch
Power management	According to VESA DPMS. In accordance with NUTEK A and EPA
Radio frequency disturbance	FCC Class B, CE
Safety	Approved by UL, CSA, DHHS, N, D, FI, S, CE.
Ergonomics	TÜV-GS, ISO-9241-3 and TCO.
Power supply unit	100-240 V AC 50/60 Hz (universal)
Typical absorption	• P790 : 120W •P990 : 140W • P910 : 130W
Size (WxHxD) mm	• P790 : 410x419x447 • P990 : 468x480x419.5 • P910 : 468x491.5x470
Weight	• P790 : 21.0Kg •P990 : 22.0Kg • P910 : 22.5Kg

▶ Specification is subject to change without notice for performance improvement.