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VT-WIN

Printed Circuit Board Inspection System



OMRON

Giving you every advantage.

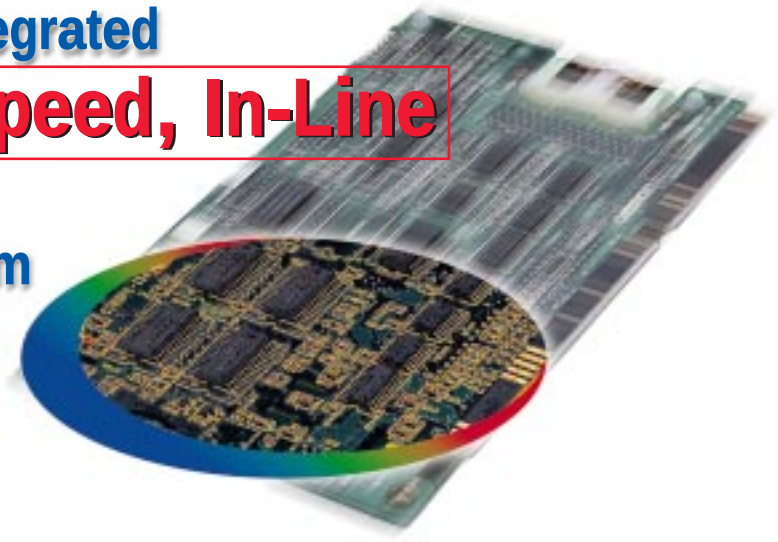
VT-WIN PRINTED CIRCUIT BOARD INSPECTION SYSTEM

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Fully Automated And Integrated

High-Speed, In-Line

PCB Inspection and Verification System



The increasing density and quality requirements of PCBs and intense manufacturing competition leave little room for error. To stay ahead of competition, maximize your resources and increase production efficiency, you will need the help of a proven leader and innovator in completed PCB inspection technology. Omron is the world's leader in completed PCB solder inspection technology with more than 700 high-speed PCB inspection systems operating worldwide. Foreign and domestic companies trust Omron because we have over ten years of success in producing innovative PCB inspection solutions. The new VT-WIN automated PCB inspection system represents a true inspection innovation. It embodies powerful, easy to use software, unique inspection algorithms and the ability to perform 100% detailed inspections at production speeds, minimizing the number of rejected parts and maximizing resources.

Partial client list

Fujitsu
Toshiba
Hitachi
Kyocera
Kenwood
Mitsubishi
Sanyo

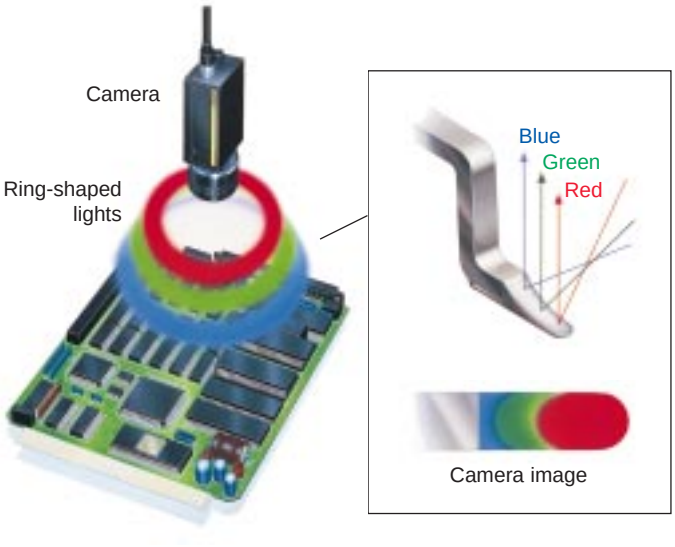


By integrating the VT-WIN into your process, you will improve production and inspection quality, verify process engineering and allow for a more efficient distribution of resources. The benefit-rich inspection system will positively impact multiple areas in your process including:

- Post Paste Print
- Post Component Placement
- Post Wave Solder
- Post Reflow

The VT-WIN combines innovative technologies, unrivaled speed and functionality with ease of use, and national and international support to deliver maximum inspection benefits.

Innovative Technology



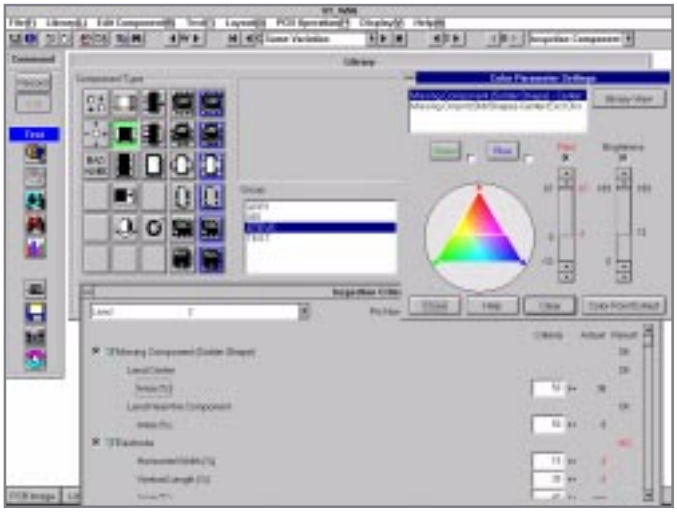
Data Acquisition and Interpretation

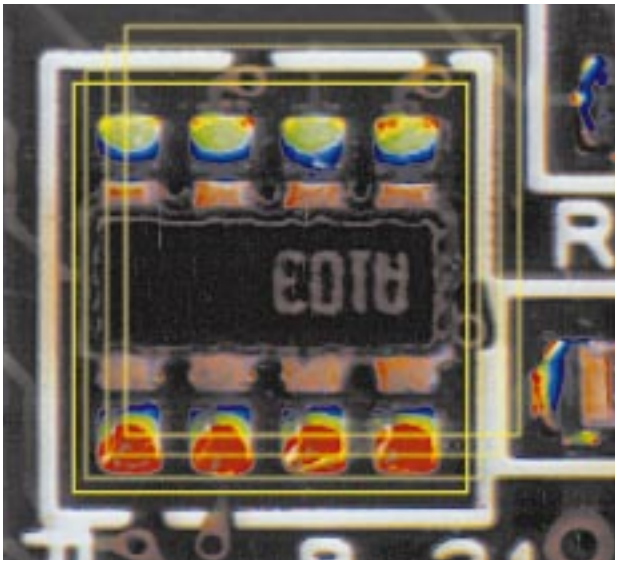
The VT-WIN provides unparalleled inspection quality by using Omron's patented ***Color Highlight System***. This system works by using a fluorescent light source to project red, green and blue light on to the PCB at different angles. The camera captures these colors as they reflect off the board's surface, producing a two dimensional image that conveys three dimensional information. This image allows the VT-WIN to detect solder defects including insufficient, excess and missing solder, bridging, solder balls and non-wetting. The system also clearly identifies defects in component placement, including polarity errors, missing components, bent leads, shifting, tombstones and lead lifting all in great detail.

This patented system allows the VT-WIN to detect minute flaws that would ordinarily be missed.

Color Extraction Process

Omron's exclusive Color Extraction Process greatly simplifies system setup and customization of Omron's patented ***Color Highlight System***. The Color Extraction Process uses a GUI (graphical user interface) developed by Omron that allows an operator to define color values by pointing to a desired object and assigning it a color with a click of a mouse. Compared to gray scale inspection methods, which involve defining solder fillet image settings with numerical values for brightness and contrast, Omron's Color Extraction Process is infinitely easier and greatly reduces errors due to misinterpretation of data or colors.





Self-Adjusting Inspecting Window

The VT-WIN automatically adjusts for minute changes in component location and position compared to inspection window location. When the inspection windows are not where they should be, the system automatically locates the component and repositions inspection windows. This feature, exclusive to the VT-WIN, increases accuracy while decreasing teaching time.

High Speed

Inspection Speed and PCB Magnification

The VT-WIN has seven different magnification levels for maximum speed and efficiency in inspecting PCBs with varying density. The VT-WIN does not restrict you to one magnification. The optional zoom lens allows the operator to customize the manner of inspection depending on the individual component size. There are seven different magnification levels, including 13, 15, 20, 25, 30, 35 and 50µm resolutions. At 13µm resolution, it is possible to perform 0.3mm pitch QFP (quad flat pack) and 0402 inch chip component inspections accurately. The zoom lens allows any two different magnifications to be utilized when inspecting PCBs. The VT-WIN will automatically change between programmed magnifications, maximizing inspection speed, depending on solder fillet size. The VT-WIN's superior speed is the result of three computers (a Windows® NT™ Pentium, a 32-bit RISC [reduced instruction set computing] and a motion control computer) working together to maximize total system throughput. The VT-WIN generally inspects PCBs at a rate of 20msec. per component or 250msec. per screen, depending on the PCB's size and density.

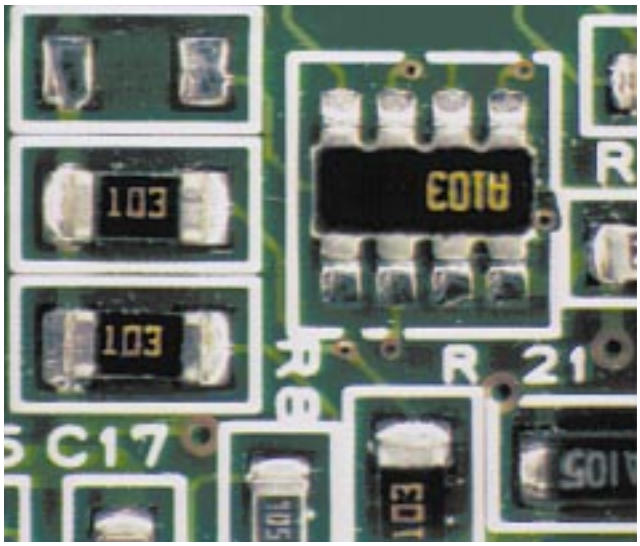
Advanced Fault Detection

The VT-WIN can inspect solder and component defects on virtually all types of wave and reflow components, including J-Lead devices and rotated components with options.

Defects that the VT-WIN can detect include:

Solder Defects
- Bridging
- Wettability
- Presence/Absence
- Excessive Solder
- Insufficient Solder
- Blow Holes
- Solder Balls

Component Defects
- Presence/Absence
- Shift/Skew
- Lifting
- Un-Inserted
- Upside-Down/Backward
- Polarity Marking
- Pin One Marking
- Lead Bending



Natural image without Color Highlight System

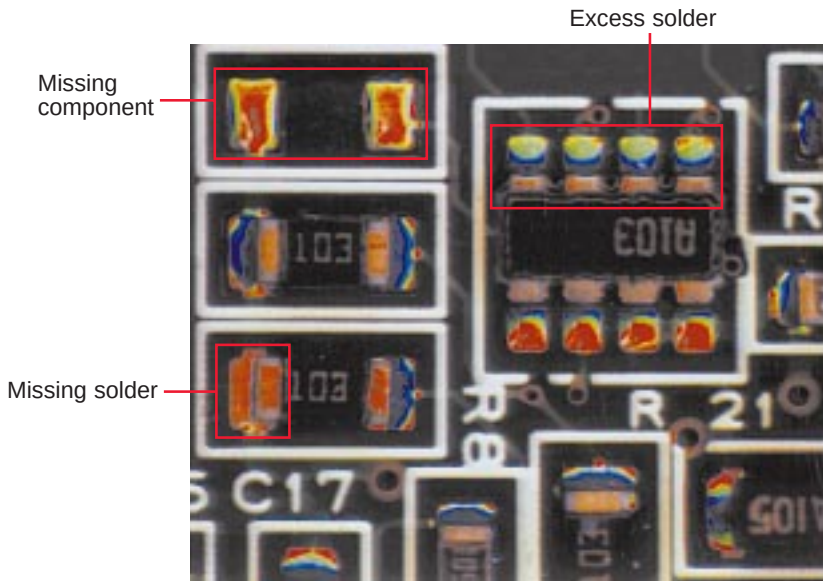


Image with Color Highlight System

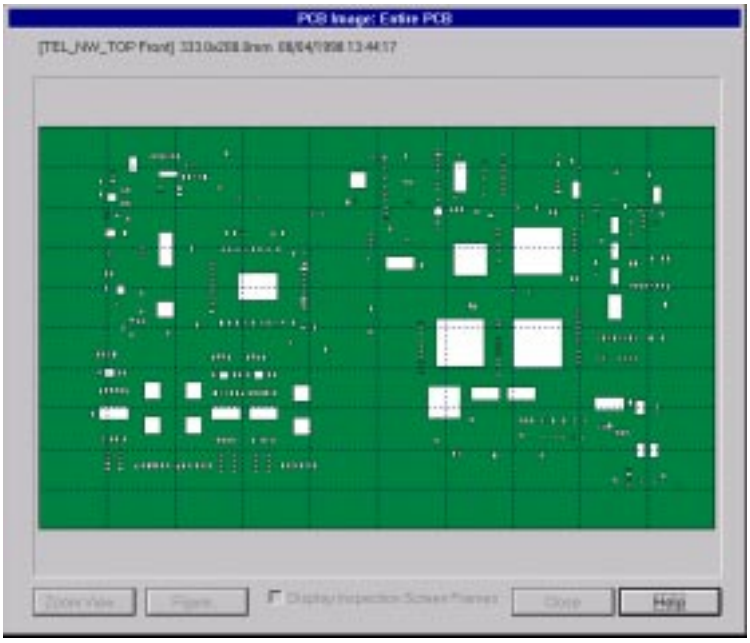
Ease of Use

Easy Programming and Set Up

Operators can quickly set up and teach the VT-WIN their particular component library. For each type of component used, the VT-WIN provides pre-defined inspection windows (chip components, transistors, QFPs, etc). The operator defines the size of the inspection window and color patterns of each inspection item (solder joint, component body color, placement markings, etc.) from a camera image of the component displayed on the monitor.

When the component library is established, the user can either manually place the components using the library or merge their placement data with the component library using the Teaching Interface Software option. This option automatically defines the inspection routine. The information used from the placement data is as follows: component type, reference designator, X-Y centroid and theta rotation. The data must be presented in ASCII, delimited format (a very common format). The last step requires the operator to tune the acceptability criteria using additional production boards.



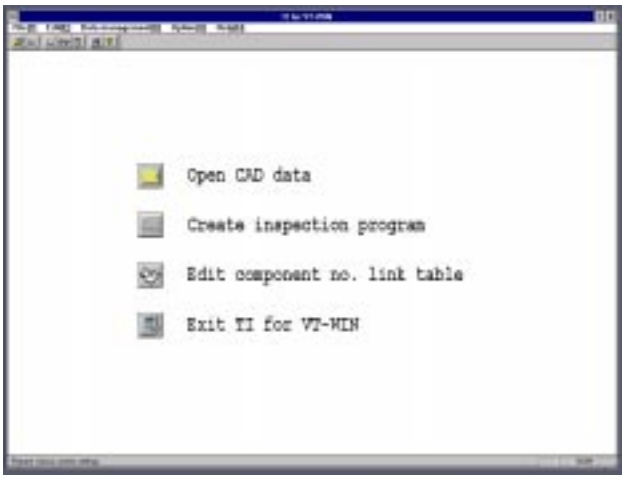




Hardware/Software Options

Teaching Interface Software

Quickly and easily develop inspection programs offline using Omron's Teaching Interface (TI) Software. The software automatically correlates the CAD and/or placement machine data with the inspection settings for each component type contained in the VT-WIN's component library to produce an inspection routine. To develop subsequent inspection routines, only enter the new CAD/placement data. The TI software retains the information from the component library for future reference.



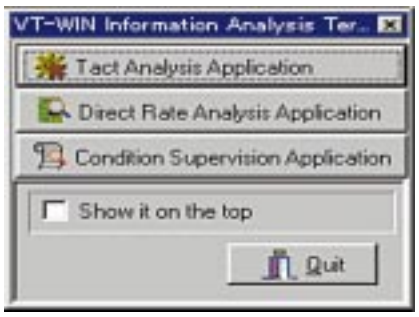


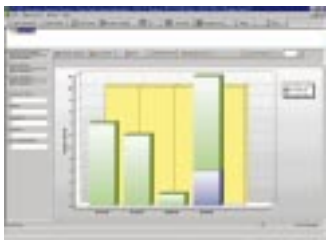
Remote Teaching System

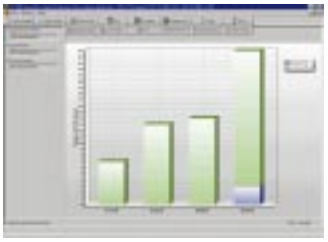
Get the greatest amount of inspection time from the VT-WIN by using the Remote Teaching System (RTS) to perform the necessary programming offline. The RTS can acquire images from the VT-WIN via an RS-232 port, Ethernet connection or magneto optical disk (MO) and process and interpret them using the included Teaching Interface Software (TI). All necessary programming can be done at a remote location and the images can also be used for training purposes.

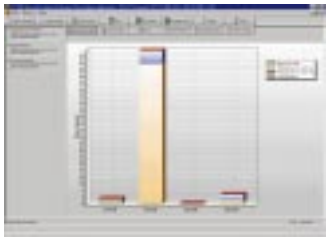
Data Analysis Software

Use the Data Analysis Software to obtain various types of manufacturing information in real time. The software can monitor the operating status of multiple VT-WINs simultaneously. It can also track the amount and type of defects, using stored inspection results to identify manufacturing trends. The information obtained can be displayed to reflect the entire production process or tailored to show the performance of individual VT-WINs.









Support

Omron Electronics, Inc., (OEI) located in Illinois coordinates a national staff of engineers dedicated to VT-WIN support. Service is also available via telephone modem. Programming training can be accomplished in a week. You have the option of attending training at OEI's headquarters in Schaumburg, Illinois, or holding it at your site. Omron will provide an engineer for training on-site. Spare parts are stocked in Illinois and there is an available 24-hour dispatch hot line.

System Specifications

Hardware Specifications

Image Signal Input Unit	Video Camera	Triple Element CCD Camera
	Light Source	3-Ring-Shaped Fluorescent Lamps with automatic brightness control
	Image Resolution	13, 15, 20, 25, 30, 35, 50µm
Main Unit	PCB Handling	Edge Belt Conveyor
	Rail Conveyer Width Adjustment	Automatic
PCB Fixturing Method	Outer frame or tooling pin (optional). Can be selected when shipped from factory.	
Power Supply	AC 120V ± 10%. Over 3KVA. 1 minute UPS	
Air	60 - 90 PSI	
Room Temperature	50 - 95° F (10 - 35° C)	
Room Humidity	30 - 80% RH (non-condensing)	
Weight	**Med.** - 2,204.6 lbs. (under 1000 kg.) **Lrg.** - 2,695.2 lbs. (under 1200 kg.)	
Dimensions	**Medium Frame** 57.21 in (W) x 46.54 in (D) x 70.98 in (H) [1453 mm (W) x 1182 mm (D) x 1802 mm (H)]	
	Large Frame 67.05 in (W) x 51.69 in (D) x 70.98 in (H) [1703 mm (W) x 1313 mm (D) x 1803 mm (H)]	

Options

Zoom	13, 15, 20, 25, 30, 35, 50µm resolution selectable
J-Lead Inspection	Can inspect PLCs, SOJs and other J-Bends
45° Rotated Component Inspection	Can inspect components at various angles (increments of 45°)

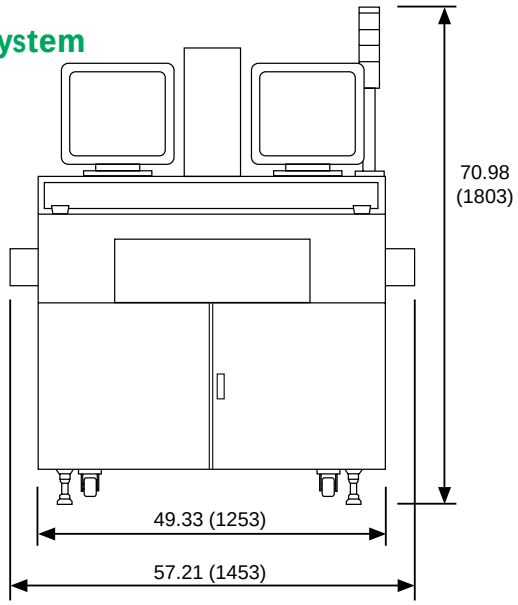
Function Specifications

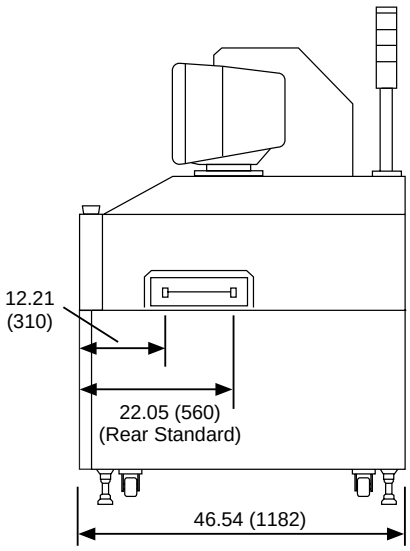
Inspectable PCBs	Solder Process	Wave and Reflow
	Board Sizes	**Medium Frame** 3.14 in x 1.96 in (80 mm x 50 mm) up to 13.08 in x 10.02 in (333 mm x 255 mm)
		Large Frame 3.14 in x 1.96 in (80 mm x 50 mm) up to 19.96 in x 18.04 in (508 mm x 459 mm)
PCB Thickness	0.02 in - 0.08 in (0.05 mm - 2.0 mm)	
Camera Clearance	0.786 in (20 mm) above the PCB and 1.96 in (50 mm) below	
Inspectable Components	Square Chips (0805 mm packages and up), LSI (0.3 mm pitch and up) Special-Shaped Components, Through Hole Components	
Inspection Categories	Solder Defects	Presence/absence of solder; excessive solder; insufficient solder; blow holes; wettability; bridges, solder balls
	Component Defects	Presence/absence; shift/skew; lifting; wrong component; un-inserted; upside-down/backward; polarity marking; pin one marking; lead bending
Number of Inspection Points	Up to 10,000 components/PCB	
PCB Program	Up to 100 PCB types	
Data Storage	1GB HD (Hard Disk), 640 MB MO (Magneto Optical)	
Component Data Library	16 component types x 500 variations (Total of 3,000 variations)	
Inspection Results Output	Faulty component name, faulty pin number, type of fault, PCB graphic (printer, monitor)	
Standard Inspection Speed	20 msec/component (or 250 msec/screen)	
Communications	Ethernet, RS232C, SMEMA	
Process Flow Direction	Left-right, right-left or turn back	

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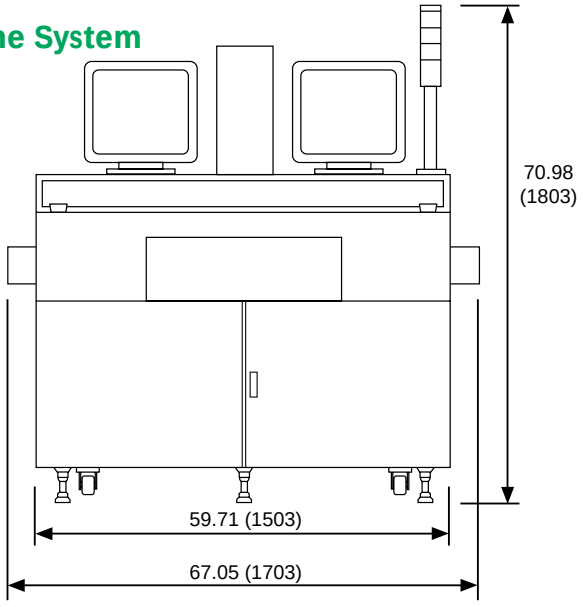
VT-WIN Dimensions inches (mm)

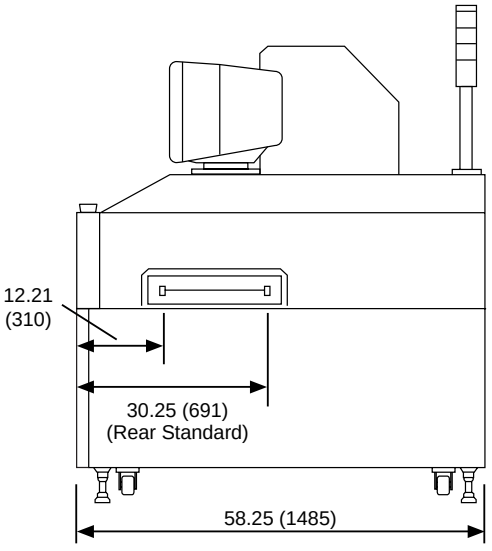
M-Frame System





L-Frame System





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