



**OPTOMECH**  
Your Quality Our Vision



Opto Vertical



Opto Horizontal

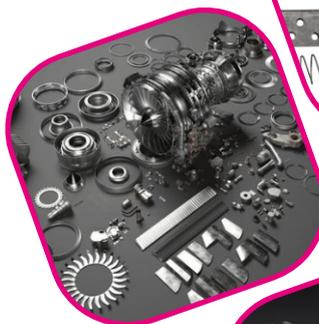


Opto Vertical - Horizontal

Defence



Aerospace



Metal Injection Moulding



Automobiles



Petpreforms



Glass Bottles



Aluminium Extrusion



**Quick Measuring Machine**

The Opto series Quick Measuring Systems are advanced tools used for non-contact measurement and inspection of component dimensions.

The camera and machine vision-based Optical Measuring Systems offer precise, fast, and versatile solutions for dimensional measurement.

These systems can perform measurements quickly, often in seconds, which significantly increases throughput in production environments.

## Operating Principal

The Opto series of equipment's are camera and machine vision-based optical measuring systems.

These systems leverage high-resolution cameras and lenses along with sophisticated software.

The software captures images and employ algorithms to automatically, identify features, measure their geometry in real time and generate results against predefined specifications.

## How does the OPTO Quick Measuring System Work

### STEP 1 : Create Template

Opto precision v1.0 has an unique tool for easy and fast detection of the contour segments you want to measure, one simply needs to draw a box around the edge of the part as seen in the image on the screen, the software automatically detects the edge, creates hundreds of points over the entire edge and then calculates the average and automatically creates the geometric primitives.

After all the features have been identified, the inspector can specify the nominal dimensions and the tolerances.

### STEP 2 : Measure and Validate

The operator can simply place the production part on the OPTO1200 and press a button, then the following events takes place.

#### Align Template

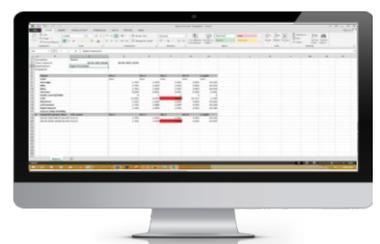
The software captures an image and automatically recognizes its shape, and aligns the image of the part with the template.

#### Validate

The OPTO1200 instantly measures all the dimensions specified in the earlier created template and validates the part for acceptance or rejection. The part can be validated for hundreds of dimensions precisely at the click of a button.

#### Report

Since all the tolerances are already specified while preparing the template, the dimensional report is made and is automatically saved as in the database. The OPTO1200 is now ready for the measurements of the next part. At the end of the day we can generate a summary report which gives all the statistical data like Average, Min, Max, Std Dev, CPK, etc.



# Hardware and Software Features to achieve speed, accuracy and repeatability

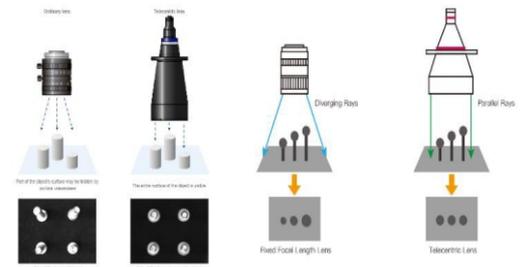
## High Resolution Machine

Vision Camera The 20 Mp large format machine vision camera is especially suited for applications in inspection and quality control. Images are captured in high resolution, processed and analysed using our advanced computer vision algorithms.



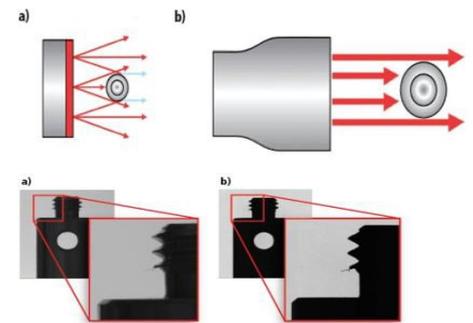
## Precision Telecentric Lens

Opto uses double telecentric lenses which removes lens distortion drastically which enables the entire surface of the object to be visible, without distortion. Opto uses double telecentric lenses with large depth of field which makes image in software to remain in focus for small height variation in the inspected parts.



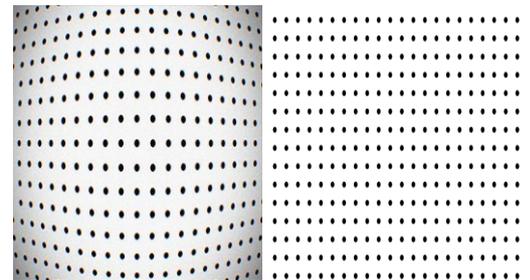
## Telecentric Illumination

While conventional backlight illuminators have rays coming in from sharp angles that strike the front of the object and scatter back into the imaging lens. This causes edge features to brighten and lose contrast. Opto uses telecentric illuminator which provides collimated backlighting which does not diffuse.



## Accuracy & Repeatability

Opto inspects parts with accuracy of +/- 3 microns. Opto has repeatability of +/- 5 microns. 20 Mega Pixel USB 3.0 camera is provided for high resolution image for increased accuracy. Software does distortion correction of image to fix distortion caused by lens using dot pattern calibration grid.



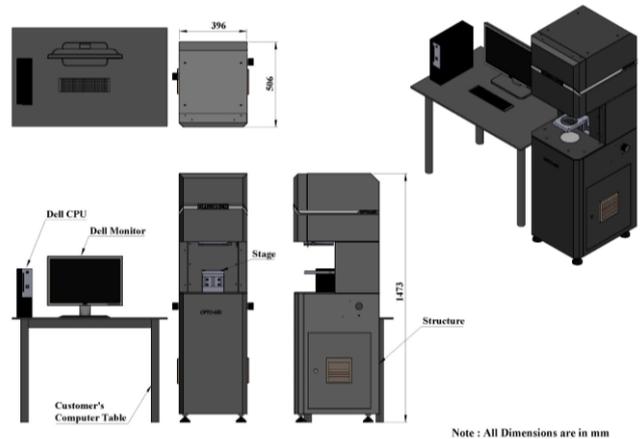
## Robot Integration

Opto can be integrated with high-speed pick and place industrial robots. Cycle time is less than 2 seconds (Inspection time is less than a second and the rest being decided by the speed of the robot). This integration is a step forward in achieving smart manufacturing and automated quality inspection.



# Opto Vertical Series

## Specifications:



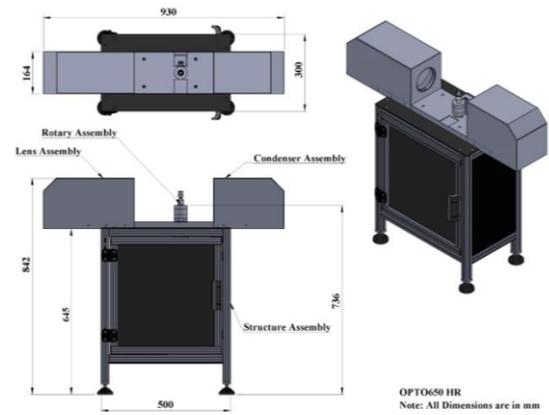
Note : All Dimensions are in mm

MODEL	OPTO 650V	OPTO 900V	OPTO 1200V
<b>IMAGE PICKUP DEVICE</b>	1°, 20 Mega pixel monochrome CMOS	1°, 20 Mega pixel monochrome CMOS	1°, 20 Mega pixel monochrome CMOS
<b>DISPLAY</b>	21.5" LCD monitor (FHD: 1920x1080)	21.5" LCD monitor (FHD: 1920x1080)	21.5" LCD monitor (FHD: 1920x1080)
<b>VIDEO PROJECTION LENS</b>	Double Telecentric Lens	Double Telecentric Lens	Double Telecentric Lens
<b>FIELD OF VIEW</b>	65 mm x 45mm (2.5"x 1.7")78 mm Diagonal	90 mm x 60 mm (3.6"x 2.36") 110 mm Diagonal	120mm x 79mm (5.9"x 3.1")145 mm
<b>LEAST COUNT OF MEASUREMENT</b>	1 $\mu$ m	1 $\mu$ m	1 $\mu$ m
<b>ACCURACY &amp; REPEATABILITY</b>	+/-5 $\mu$ m*	+/-5 $\mu$ m*	+/-5 $\mu$ m*
<b>ILLUMINATION SYSTEM</b>	Telecentric Collimated blue LED illumination	Telecentric Collimated blue LED illumination	Telecentric Collimated blue LED illumination
<b>EXTERNAL REMOTE INPUT</b>	(Optional)	(Optional)	(Optional)
<b>EXTERNAL OUTPUT</b>	24v DC, 0.5 A (optional)	24v DC, 0.5 A (optional)	24v DC, 0.5 A (optional)
<b>INTERFACE</b>	RJ-45 (for Remote Support) USB 3.0	RJ-45 (for Remote Support) USB 3.0	RJ-45 (for Remote Support) USB 3.0
<b>MONITOR OUTPUT</b>	HDMI, Display Port	HDMI, Display Port	HDMI, Display Port
<b>HARD DISK DRIVE, FOR RECORDING MEASUREMENT DATA</b>	512 GB SSD	512 GB SSD	512 GB SSD
<b>MACHINE SIZE</b>	400(W)x500(D)x1470 (H)	550(W)x536(D)x1600 (H)	550(W)x585(D)x1800 (H)
<b>MACHINE CONSTRUCTION</b>	Floor standing machine with antivibration Pads leveling adjustment	Floor standing machine with antivibration Pads leveling adjustment	Floor standing machine with antivibration Pads leveling adjustment
<b>Z STAGE MOVING RANGE</b>	60 mm with Automatic motorized movement on precision guides and ball screw	80 mm with Automatic motorized movement on precision guides and ball screw	80 mm with Automatic motorized movement on precision guides and ball screw
<b>UTILITIES</b>	Electric: Voltage and Current: AC 240V50/60 Hz 1 phase. Power load: 180VA max Power Consumption: 660 watts Pressure requirement 6 to 8 bar	Electric: Voltage and Current: AC 240V50/60 Hz 1 phase. Power load: 180VA max Power Consumption: 660 watts Pressure requirement 6 to 8 bar	Electric: Voltage and Current: AC 240V50/60 Hz 1 phase. Power load: 180VA max Power Consumption: 660 watts Pressure requirement 6 to 8 bar
<b>OPERATING CONDITIONS</b>	Humidity : 20% -90% RH, non-condensing Maximum operating altitude: 1900 m	Temperature: +10 °C to +40°C Humidity : 20% -90% RH, non-condensing Maximum operating altitude: 1900 m	Temperature: +10 °C to +40°C Humidity : 20% -90% RH, non-condensing Maximum operating altitude: 1900 m

In the center of OPTO 650 the FOV 20 x20 mm, with operating ambient temperature range of 23°C + 1°C, Object weight max 2kG on the stage.

# Opto Horizontal Series

## Specifications:

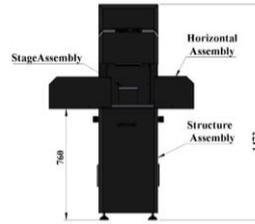
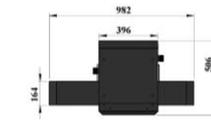


MODEL	OPTO 650H	OPTO 900H	OPTO 1200H
<b>IMAGE PICKUP DEVICE</b>	1°, 20 Mega pixel monochrome CMOS	1°, 20 Mega pixel monochrome CMOS	1°, 20 Mega pixel monochrome CMOS
<b>DISPLAY</b>	21.5" LCD monitor (FHD: 1920x1080)	21.5" LCD monitor (FHD: 1920x1080)	21.5" LCD monitor (FHD: 1920x1080)
<b>VIDEO PROJECTION LENS</b>	Double Telecentric Lens	Double Telecentric Lens	Double Telecentric Lens
<b>FIELD OF VIEW</b>	65 mm x 45 mm (2.5"x 1.7")78 mm Diagonal	90 mm x 60 mm (3.6"x 2.36") 110 mm Diagonal	120 mm x 79 mm (5.9"x 3.1")145 mm Diagonal
<b>LEAST COUNT OF MEASUREMENT</b>	1 $\mu\text{m}$	1 $\mu\text{m}$	1 $\mu\text{m}$
<b>ACCURACY &amp; REPEATABILITY</b>	+/-5 $\mu\text{m}^*$	+/-5 $\mu\text{m}^*$	+/-5 $\mu\text{m}^*$
<b>ILLUMINATION SYSTEM</b>	Telecentric Collimated blue LED illumination	Telecentric Collimated blue LED illumination	Telecentric Collimated blue LED illumination
<b>EXTERNAL REMOTE INPUT</b>	(Optional)	(Optional)	(Optional)
<b>EXTERNAL OUTPUT</b>	24v DC, 0.5 A (optional)	24v DC, 0.5 A (optional)	24v DC, 0.5 A (optional)
<b>INTERFACE</b>	RJ-45 (for Remote Support) USB 3.0	RJ-45 (for Remote Support) USB 3.0	RJ-45 (for Remote Support) USB 3.0
<b>MONITOR OUTPUT</b>	HDMI, Display Port	HDMI, Display Port	HDMI, Display Port
<b>Hard Disk Drive, For Recording Measurement Data</b>	512 GB SSD	512 GB SSD	512 GB SSD
<b>MACHINE SIZE</b>	930(W)x300(D)x842 (H)	1064(W)x300(D)x855 (H)	1162(W)x300(D)x890(H)
<b>MACHINE CONSTRUCTION UTILITIES</b>	Floor standing machine with Pads levelling adjustment Electric: Voltage & Current: AC 240V/50/60 Hz 1 phase. Power Load:180VA max Power Consumption:660 watts	Floor standing machine with Pads levelling adjustment Electric: Voltage & Current: AC 240V/50/60 Hz 1 phase. Power Load:180VA max Power Consumption:660 watts	Floor standing machine with Pads levelling adjustment Electric: Voltage & Current: AC 240V/50/60 Hz 1 phase. Power Load:180VA max Power Consumption:660 watts
<b>OPERATING CONDITIONS</b>	Temperature:+10 °C to +40°C Humidity:20% -90% RH, non-condensing. Maximum Operating Altitude: 1900 m	Temperature:+10 °C to +40°C Humidity:20% -90% RH, non-condensing. Maximum Operating Altitude: 1900 m	Temperature:+10 °C to +40°C Humidity:20% -90% RH, non-condensing. Maximum Operating Altitude: 1900 m

Note : In the center of OPTO 900 the FOV 30x30 mm. with operating ambient temperature range of 23°C  $\pm$ 1°C Object weight max 2kG on the stage.

# Opto Vertical – Horizontal Series

## Specifications:



OPTO 650VH  
Note: All Dimension are in mm

MODEL	OPTO 650VH	OPTO 900VH	OPTO 1200VH
<b>IMAGE PICKUP DEVICE</b>	1°, 20 Mega pixel monochrome CMOS	1°, 20 Mega pixel monochrome CMOS	1°, 20 Mega pixel monochrome CMOS
<b>DISPLAY</b>	21.5" LCD monitor (FHD: 1920x1080)	21.5" LCD monitor (FHD: 1920x1080)	21.5" LCD monitor (FHD: 1920x1080)
<b>VIDEO PROJECTION LENS</b>	Double Telecentric Lens	Double Telecentric Lens	Double Telecentric Lens
<b>FIELD OF VIEW</b>	65 mm x 43 mm (2.5"x 1.7") 78 mm Diagonal	92 mm x 60 mm (3.6"x 2.36") 110 mm Diagonal	120mm x 79mm (5.9"x 3.1") 145 mm
<b>LEAST COUNT OF MEASUREMENT</b>	1 μm	1 μm	1 μm
<b>ACCURACY &amp; REPEATABILITY</b>	+/-5 μm*	+/-5 μm*	+/-5 μm*
<b>ILLUMINATION SYSTEM</b>	Telecentric Collimated blue LED illumination	Telecentric Collimated blue LED illumination	Telecentric Collimated blue LED illumination
<b>EXTERNAL REMOTE INPUT</b>	(Optional)	(Optional)	(Optional)
<b>EXTERNAL OUTPUT</b>	24v DC, 0.5 A (optional)	24v DC, 0.5 A (optional)	24v DC, 0.5 A (optional)
<b>INTERFACE</b>	RJ-45 (for Remote Support) USB 3.0	RJ-45 (for Remote Support) USB 3.0	RJ-45 (for Remote Support) USB 3.0
<b>MONITOR OUTPUT</b>	HDMI, Display Port	HDMI, Display Port	HDMI, Display Port
<b>HARD DISK DRIVE, FOR RECORDING MEASUREMENT DATA</b>	512 GB SSD	512 GB SSD	512 GB SSD
<b>MACHINE SIZE</b>	9800(W)x500(D)x1470 (H)	1060(W)x540(D)x1600 (H)	1230(W)x590(D)x1765 (H)
<b>MACHINE CONSTRUCTION</b>	Floor standing machine with Pads leveling adjustment	Floor standing machine with Pads leveling adjustment	Floor standing machine with Pads leveling adjustment
<b>Z STAGE MOVING RANGE</b>	60 mm with Automatic motorized movement on precision guides and ball screw	80 mm with Automatic motorized movement on precision guides and ball screw	80 mm with Automatic motorized movement on precision guides and ball screw
<b>UTILITIES</b>	Electric: Voltage and Current: AC 240V50/60 Hz 1 phase. Power load: 180VA max Power Consumption: 660 watts Pressure requirement 6 to 8 bar	Electric: Voltage and Current: AC 240V50/60 Hz 1 phase. Power load: 180VA max Power Consumption: 660 watts	Electric: Voltage and Current: AC 240V50/60 Hz 1 phase. Power load: 180VA max Power Consumption: 660 watts Pressure requirement 6 to 8 bar
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In the center of OPTO1200 the FOV 40x 40 mm, with operating ambient temperature range of 23°C + 1°C, Object weight max 4kG on the stage.

# Reporting

Quick measuring machines generate detailed reports that include precise measurements of components such as lengths, diameters, angles, and tolerances. They also provide statistical data like mean, median, and standard deviation to evaluate manufacturing consistency and reliability. Reports can be tailored to meet specific industry or customer requirements, offering customizable layouts, fields, and formats like PDF or Excel. Users can add details such as part names, serial numbers, and inspection dates for more comprehensive documentation.

Template:	Batch No:								
21-10-2024 10:38	21-10-2024 10:39								
Opto Precision	LOT No:								
Name	Units	T1	D1	D2	Dia	D3	Width	R	
Average	mm	1.799	0.754	0.750	0.125	0.125	0.297		
Min	mm	1.799	0.748	0.748	0.124	0.125	0.297		
Max	mm	1.799	0.756	0.755	0.125	0.126	0.297		
Std Dev	mm	0.000	0.001	0.001	0.001	0.000	0.000		
Delta (Unit/1000)		0	8	7	1	1	0		
CPK		9999.0		1.2		1.3	9999.0		
Nominal		1.800	0.750	0.750	0.125	0.125	0.300		
Left bound		1.790	0.740	0.740	0.121	0.121	0.290		
Right bound		1.810	0.760	0.760	0.127	0.127	0.310		
Import/Capture time	Part ID	Part Number	T1	D1	D2	Dia	D3	Width	R
21-10-2024 10:38:40		1	1.799	0.748	0.751	0.125	0.126	0.297	
21-10-2024 10:38:46		1	1.799	0.756	0.740	0.125	0.125	0.297	
21-10-2024 10:38:55		1	1.799	0.755	0.748	0.124	0.125	0.297	
21-10-2024 10:39:01		1	1.799	0.751	0.750	0.124	0.125	0.297	
21-10-2024 10:39:12		1	1.799	0.754	0.750	0.125	0.125	0.297	

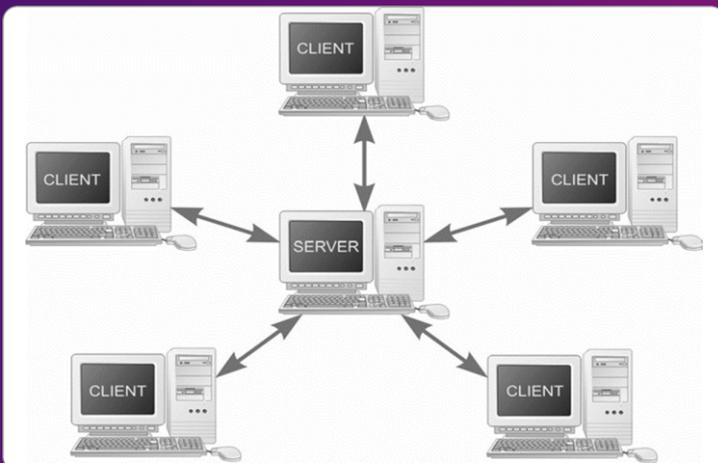
These reports simplify quality assessments by indicating whether components meet specified tolerances, with clear pass/fail results. This ensures quick and accurate evaluation of component acceptability, making them invaluable for maintaining high-quality standards in manufacturing processes.

# Central Database Management

A database in quick measuring machines, plays a vital role in efficiently managing and storing measurement data. This system is designed to streamline data handling and provide reliable access to critical information for quality control and analysis.

The system includes backup functionalities to prevent data loss in case of hardware failures or accidental deletions. Regular backups ensure that data can be restored quickly, minimizing disruptions to the quality control process.

- Templates are stored in Microsoft SQL database which is robust and reliable.
- More than 5000 templates can be made and stored.
- Central database capability.
- Templates can be shared across all the OPTO'S.
- As many as 50 machines can be connected in LAN.
- Measurement reports and all the machine settings can also be on the central server.



## Comparison between Models

S No	Features	PP	VMM	QMM
1	Number of parts can be measure at a time	1	1	10
2	Maximum Size of the Parts ( L x W)	300 x 200	600 x 500	120 x 80
3	Time Taken for measurements	Upto 5min	2 - 3min	Less than 5 sec
4	Speed of measurement	Low	Fast	Very Fast
5	Contour Illumination	Halogen bulb	White LED	Blue light LED
6	Accuracy & Repeatabilty	< 10 mic	< 5 mic	< 5 mic
7	Operator Skill	Skilled	Skilled	Low Skilled

## Our Other Optical Metrology Products



**Optical Profile Projectors**



**Video Measuring Machines**

## Some of Our esteemed customers

**Metal Injection Moulding**



**Glass Bottle**



**Plastic Preforms**



**Rubber Extrusions**



**Precision Machined Components**



**Ceramic Components**



**Exports Agents**



**OPTOMECH**  
Your Quality Our Vision

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We reserve the right to modify the product specifications, in the interest of product development