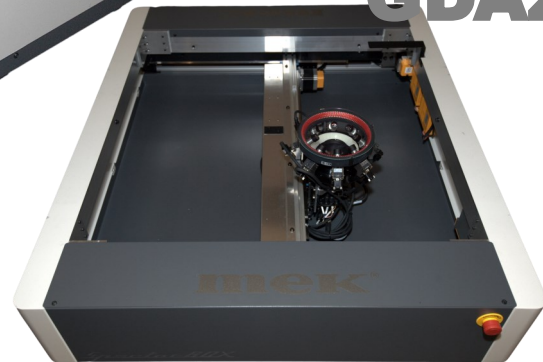


SpectorBOX



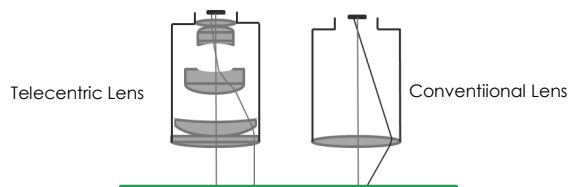
GTAz
GTz
GWAz
GWz
GDAz

Mek SpectorBOX Bottom Up and Top Down Modular AOI System

✓ Now featuring the G series Head	2x field of view for main camera for up to 50% reduction of inspection cycle time, and Selective 3D for GTAz models
✓ Optimized for THT Components- and Post Wave and Selective Soldering Inspections	AOI Solution for Wave & Selective Soldering Of THT & SMT Components
✓ Bottom-up and/or Top-down Inspection	Inspects PCB's from below a Conveyor Belt or Chain
✓ Solder Frame Compatible	Designed to Inspect PCB's inside Solder Frames Directly from the Conveyor
✓ Second generation mechanical design	Improving on the success of the SpectorBOX with 80mm Z-axis and accompanying drive systems
✓ Modular Inspection Possibilities: Bottom, Top or Top + Bottom	Possibility to combine 2 SpectorBOX systems for simultaneous Top+Bottom AOI (optional)
✓ Main Frame Compatibility	Multiple 3rd party Turn-key Solutions readily available. SpectorBOX Systems fit conveniently inside these main frames
✓ Up to 18 Cameras	Choose between 1 or 9 camera's per inspection side (up to 18 cameras in Top+Bottom configuration)
✓ In Z-Axis Moving Optical Head(s)	Focus and Position optimally for varying PCB & Component distances or warpage
✓ General Purpose I/O	Contact closing I/O for Module control by existing PCB handling systems or PLC's
✓ Post Defect Classification and Reporting Scenarios	Inspect your PCB's In-Line, Classify/Report/Analyze Defects later whenever convenient

1. Bottom Up Features:

The Mek SpectorBOX bottom up modular AOI is optimized for the inspection of THT solder joints and detection of solder bridges and solder balls. It is designed to inspect PCB's inside solder frames directly from the conveyor system. With its totally newly developed mechanical platform, it is the only modular AOI in the market that can be equipped with 9 cameras: 1 top and 8 side cameras. The bottom up SpectorBOX is configurable with one of two different optical units: GTz and GTAz.



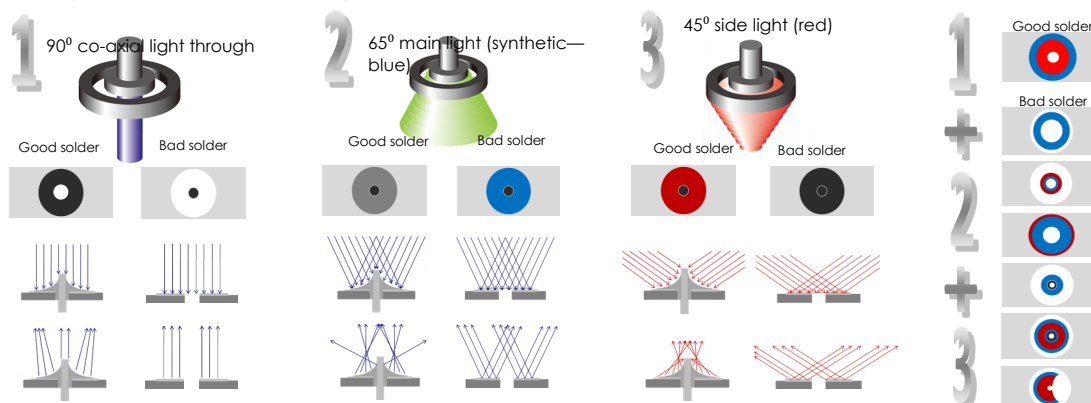
High grade Telecentric Lens

Parallel image over the whole sensor/lens Field of View —

New Generation 90fps Large pixel image capturing sensor
 18,8μ² pixel size — 2x field of view over previous generation
 smooth and detailed image with great dynamic range —
 New Lightbridge fibre optic thunderbolt interface no capture card required.

Omnidirectional multi angle, multi color LED lighting

3D color profile of solder meniscus — accurate defect decision by the software algorithms — Detect all visual defects of THT solder joints and easily detect bridges and solder balls

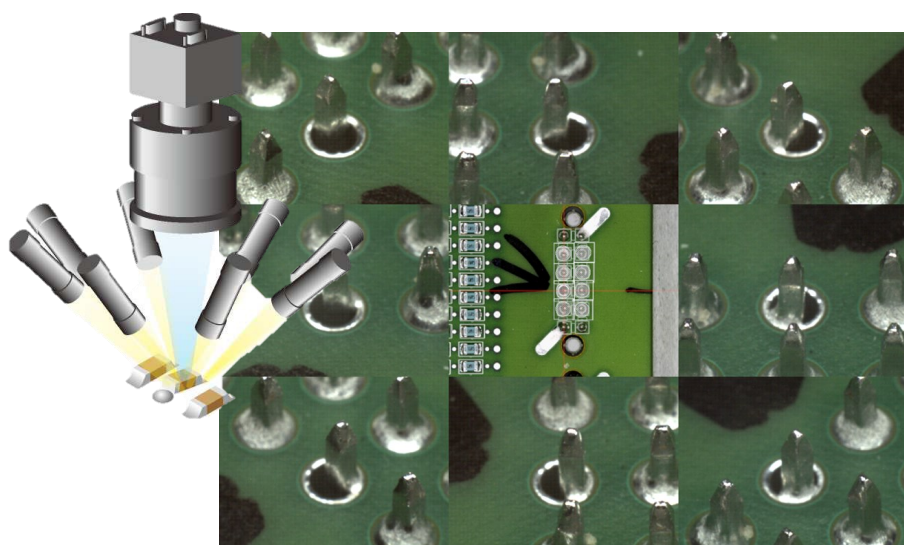


In Height Adjustable Optical Head

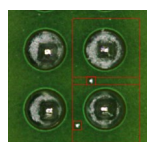
In Z-Axis moving Top Camera, Light and Side View cameras — Adaption to any PCB Thickness — PCB Warp Compensation — Inspection of "Sandwich" assemblies without need of jigs and multiple inspections. Up to 80mm Z stroke length.

8x Angular Side Sensors (Only available for GTAz models) and selective 3D for components

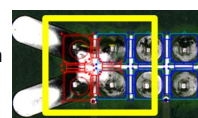
Simultaneously operating, multiplexed side view sensors with USB3 vision interface — 45/45 arrangement — Triple use: Active automatic inspection, classification and repair — clear 9 angles defect review — high magnification 50x (10μm/pixel) — Full Color — Auto highlight — Large sensor pixels — Additional side camera lighting — 9 view images also in backup database



Powerful algorithms for solder bridge detection

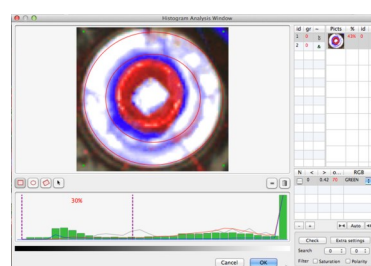


Dedicated algorithms for solder balls detection



Histogram Analysis algorithms

Condition based decision — Tolerances can be set tightly — Close to zero false alarms

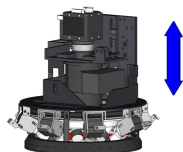


2. Top Down Features:

The Mek SpectorBOX Top Down modular AOI is optimized for the inspection of THT components to find any visual defect like presence/absence, wrong polarity, colour, type, bent pins etc. It has a top clearance of 130mm (5.12") so inspection can be done even when the tallest components are placed. It is designed to inspect PCB's inside solder frames directly from the conveyor system. The SpectorBOX Top Down module can be equipped with one top camera and 8 wide field of view side camera's. Available optical units are GTz and GWAz.

New Generation 90fps Large pixel image capturing sensor

18,8µ² pixel size — 2x field of view over previous generation smooth and detailed image with great dynamic range — New Lightbridge fibre optic thunderbolt interface no capture card required.



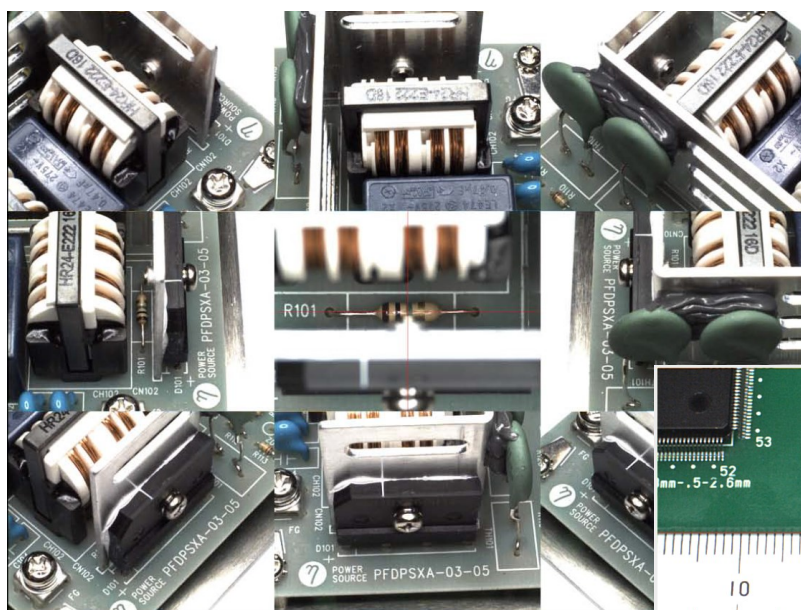
In Height Adjustable Optical Head

In Z-Axis moving Top Camera, Light and Side View cameras — Adaption to any PCB Thickness — PCB Warp Compensation — Reliable text and/or polarity inspection on tall components — Inspection of "Sandwich" assemblies without need of jigs and multiple inspections Up to 80 mm stroke length.

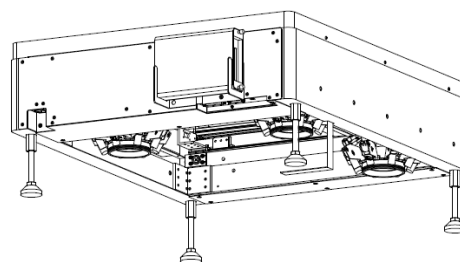
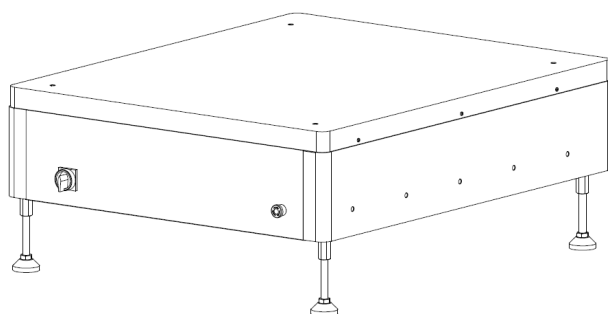
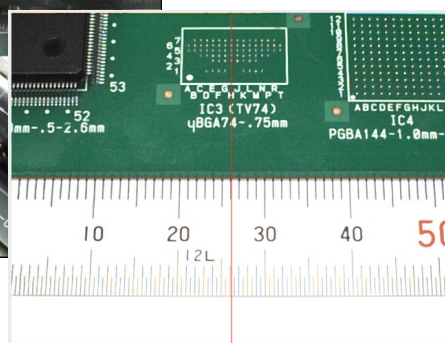


8x Angular Side Sensors (Only available for the GWAz model)

Simultaneously operating, multiplexed side view sensors with USB3 vision interface — 45/45 arrangement — Triple use: Active automatic inspection, classification and repair — clear 9 angles defect review — Full Color — Auto highlight — Large sensor pixels — 9 view images also in backup database



Large Side Camera Field of View





Bottom Up

GTz | GTAz

	SpectorBOX GTz550	SpectorBOX GTAz550
Maximum PCB Size	550x520mm (21.7" x 20.5")	
Characteristics		
Product type	Automatic Optical Inspector	
Camera movement	X+Y+Z Direction	
PCB movement	Stationary during inspection, Transport designed by system integrator	
Parts inspection	Soldering, Bridges, Solder Balls, Components	
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Imaging parameters	Brightness, Contrast, Hue, Saturation via Filters	
Specifications		
Main Camera type	Digital CL with Lightbridge Thunderbolt	
Main Camera FoV/Resolution	38.5x38.5mm/18.75µm or 19.5x19.5mm/10µm	
Lens	Telecentric lens with built in prism for DOAL Lighting	
Side cameras	n.a.	8 side cameras CL/USB3 Vision with Tilt-Shift custom lenses in 45/45 degree configuration
Lighting system	Omnidirectional Quad LED rings: Side, Main, Line Sourced DOAL (Diffused On Axis Light (Coaxial)) Side Camera White	
Minimum inspection object size	80µ (3.15 mils)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance	30-65mm (1.2-2.6"") factory preset	30mm (1.2")
Z-Axis movement range	80mm (3.1")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min	
Interfacing		
Control PC type (not included)	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface	
PC Control & Imaging interface	USB, USB3 Vision, Thunderbolt	
Programming interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (option) (Windows 7/8/10 based)	
3rd party Interfacing (MES-if) & Data Storage	Enterprise SQL DB/XML Files/Socket (by optional Mek Catch System)	
External Control ; External Bar Code interfacing	Contact Closure General Purpose I/O ; RS232/USB/XML	
General		
Mains Voltage	100-240 Vac / 150W	
Operating temperature	15-30 degr C (59-86 degr F)	
Operating humidity	<80 % RH	
Min. Construction Height (Distance Module bot-tom to PCB surface, incl focus range)	347-427mm (13.7-16.6") @Z=0-80mm (0-3.1")	
External size	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")	
Weight	100kg (220lbs)	

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Top Down

GWz | GWAz

	SpectorBOX GWz550	SpectorBOX GWAz550
Maximum PCB Size	550x520mm (21.7" x 20.5")	
Characteristics		
Product type	Automatic Optical Inspector	
Camera movement	X+Y+Z Direction	
PCB movement	Stationary during inspection, Transport designed by system integrator	
Parts inspection	Presence/Absence, Type, Polarity, Colour, Text, Offset	
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Imaging parameters	Brightness, Contrast, Hue, Saturation via Filters	
Specifications		
Main Camera type	Digital CL with Lightbridge Thunderbolt	
Main Camera FoV/Resolution	38.5x38.5mm/18.75µm	
Lens	Focal & Aperature Adjustable Macro Lens	
Side cameras	n.a.	8 side cameras CL/USB3 Vision in 45/45 degree configuration
Side cameras FoV/Resolution	n.a.	50x39mm/70µm(1.96x1.54")
Lighting system	Omnidirectional White Ring Light	
Minimum inspection object size	80µ (3.15 mils)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance	130mm (5.1")	130mm (5.1")
Z-Axis movement range	80mm (3.1")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min	
Interfacing		
Control PC type (not included)	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface	
PC Control & Imaging interface	USB, USB3 Vision, Thunderbolt	
Programming interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (option) (Windows 7/8/10 based)	
3rd party Interfacing (MES-if) & Data Storage	Enterprise SQL DB/XML Files/Socket (by optional Mek Catch System)	
External Control ; External Bar Code interfacing	Contact Closure General Purpose I/O ; RS232/USB/XML	
General		
Mains Voltage	100-240 Vac / 150W	
Operating temperature	15-30 degr C (59-86 degr F)	
Operating humidity	<80 % RH	
Min. Construction Height (Distance Module bot- tom to PCB surface, incl focus range)	469-549mm (18.5-21.6") @Z=0-80mm (0-3.1")	
External size	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")	
Weight	100kg (220lbs)	

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Top Down

GDz | GDAz

	SpectorBOX GDz550	SpectorBOX GDAz550
Maximum PCB Size	550x520mm (21.7" x 20.5")	
Characteristics		
Product type	Automatic Optical Inspector	
Camera movement	X+Y+Z Direction	
PCB movement	Stationary during inspection, Transport designed by system integrator	
Parts inspection	Soldering, Bridges, Solder Balls, Components	
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Imaging parameters	Brightness, Contrast, Hue, Saturation via Filters	
Specifications		
Main Camera type	Digital CL with Lightbridge Thunderbolt	
Main Camera FoV/Resolution	38.5x38.5mm/18.75µm	
Lens	Telecentric lens with built in prism for DOAL Lighting	
Side cameras	n.a.	8 side cameras CL/USB3 Vision with Tilt-Shift custom lenses in 45/45 degree configuration
Side cameras FoV/Resolution	n.a.	50x39mm/70µm(1.96x1.54")
Lighting system	Omnidirectional Quad LED rings: Side, Main, Line Sourced DOAL (Diffused On Axis Light (Coaxial)) Side Camera White	
Minimum inspection object size	80µ (3.15 mils)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance	60mm (2.3")	50mm (2")
Z-Axis movement range	80mm (3.1")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min	
Interfacing		
Control PC type (not included)	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface	
PC Control & Imaging interface	USB, USB3 Vision, Thunderbolt	
Programming interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (option) (Windows 7/8/10 based)	
3rd party Interfacing (MES-if) & Data Storage	Enterprise SQL DB/XML Files/Socket (by optional Mek Catch System)	
External Control ; External Bar Code interfacing	Contact Closure General Purpose I/O ; RS232/USB/XML	
General		
Mains Voltage	100-240 Vac / 150W	
Operating temperature	15-30 degr C (59-86 degr F)	
Operating humidity	<80 % RH	
Min. Construction Height (Distance Module bot- tom to PCB surface, incl focus range)	469-549mm (18.5-21.6") @Z=0-80mm (0-3.1")	
External size	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")	
Weight	100kg (220lbs)	

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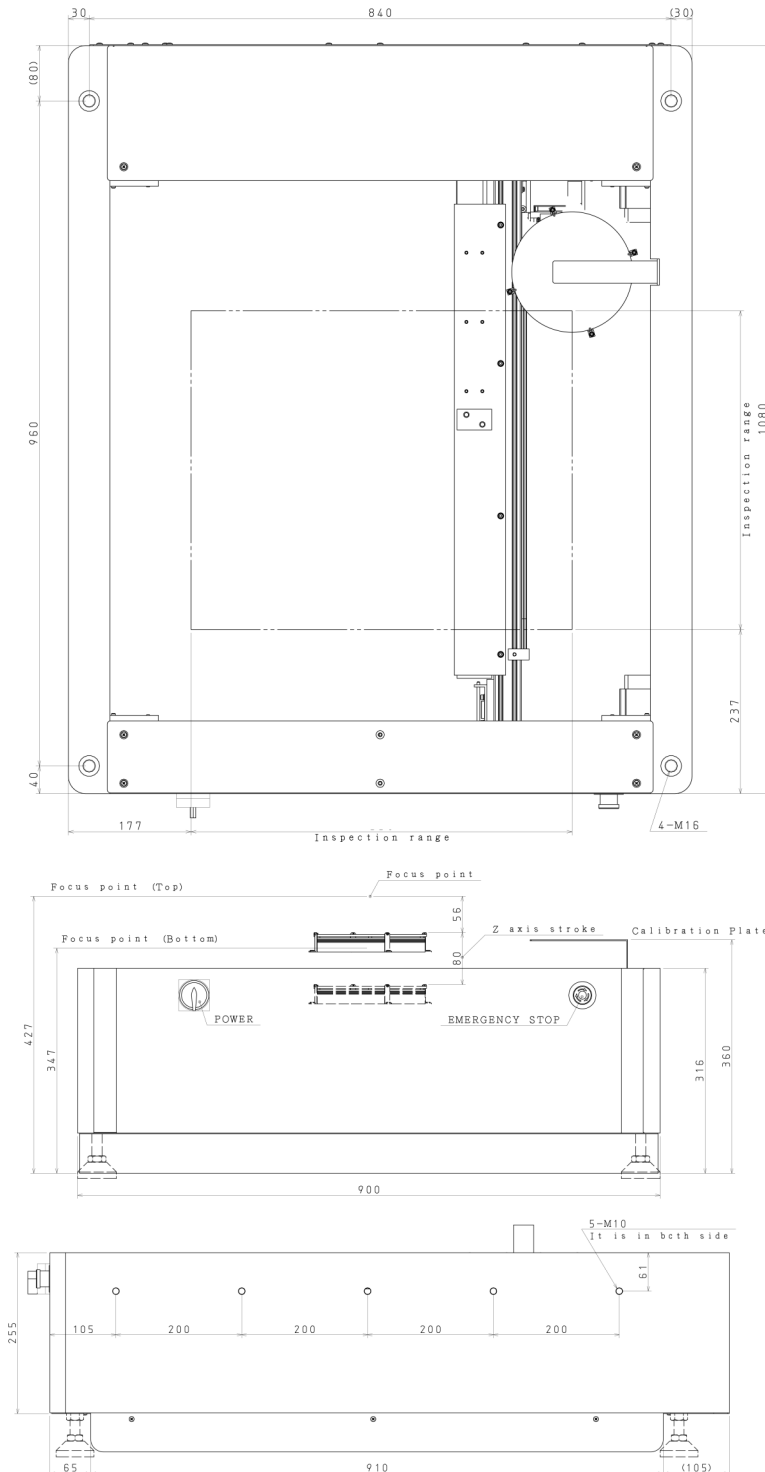
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Bottom Up

GTz | GTAz



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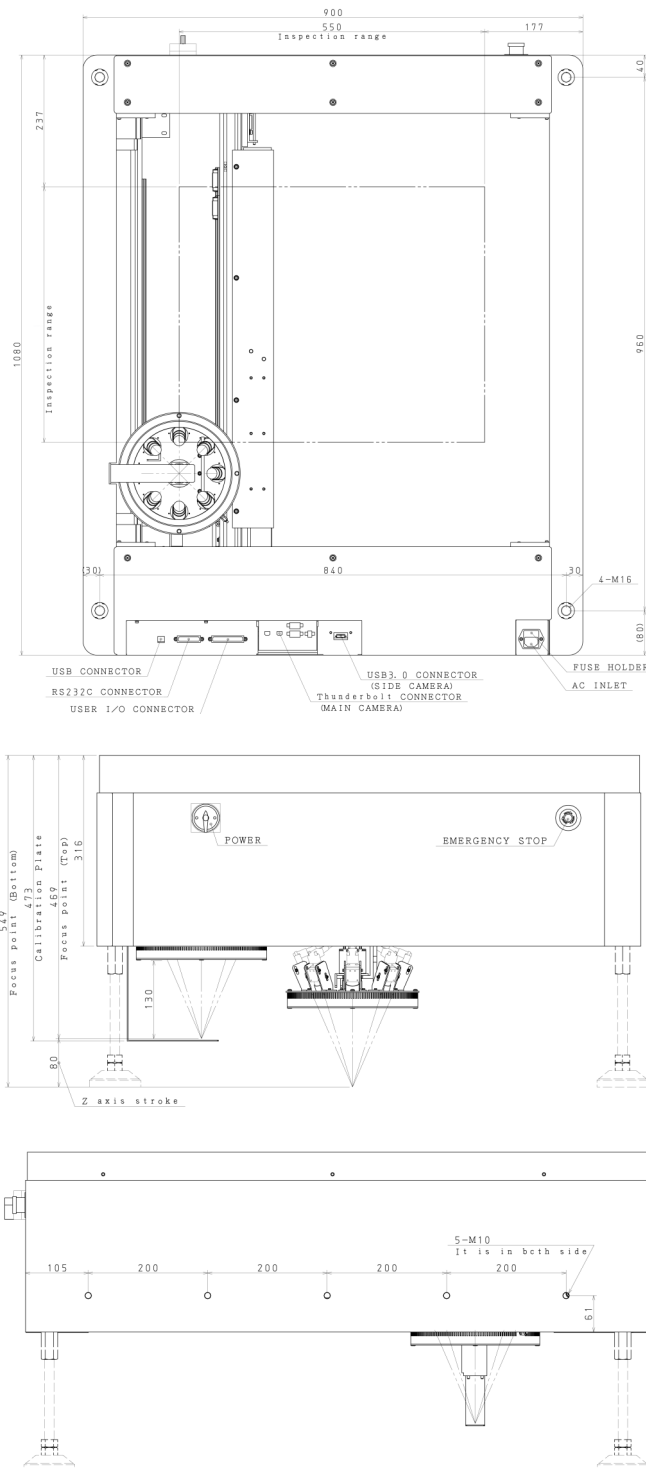
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Spectra BX

Top Down

GWz/GWAz



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