

SpectorBOX



Mek SpectorBOX Bottom Up and Top Down Modular AOI System

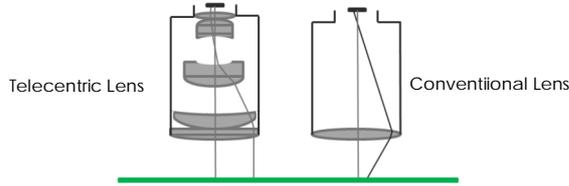
✓ Optimized for THT Components- and Post Wave and Selective Soldering Inspections	<i>AOI Solution For Wave & Selective Soldering Of THT & SMT Components</i>
✓ Bottom-up and/or Top-down Inspection	<i>Inspects PCB's From Below a Conveyor Belt or Chain</i>
✓ Solder Frame Compatible	<i>Designed to Inspect PCB's Inside Solder Frames Directly From The Conveyor</i>
✓ Ultra Slim Design Inspects Down To 280mm Above Factory Floor	<i>Save Production Space! Fits Below Existing Return and/or Feed Conveyers</i>
✓ Modular Inspection Possibilities: Bottom, Top or Top + Bottom	<i>Possibility to Combine Two SpectorBOX Systems For Simultaneous Top+Bottom AOI</i>
✓ Main Frame Compatibility	<i>Multiple 3rd Party Turn Key Solutions Readily Available. Spector-BOX Systems Fit Conveniently Inside these Main Frames</i>
✓ Up to 18 Cameras	<i>Choose between 1 or 9 camera's per inspection side (up to 18 cameras in Top+Bottom configuration)</i>
✓ In Z-Axis Moving Optical Head(s)	<i>Focus and Position Optimally For Varying PCB Distances Or Warp-age (Applicable To Certain Models With Z-Axis)</i>
✓ General Purpose I/O	<i>Configurable I/O to Be Controlled By Existing PCB Handling Systems</i>
✓ Post Defect Classification and Reporting Scenarios	<i>Inspect your PCB's Automatically Now, Classify/Report Defects Later Whenever Convenient</i>

SpectorBOX

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: FDLz and FDAz.

	Angular Camera's	Z-Axis
FDLz	NO	YES
FDAz	YES	YES



High grade Telecentric Lens

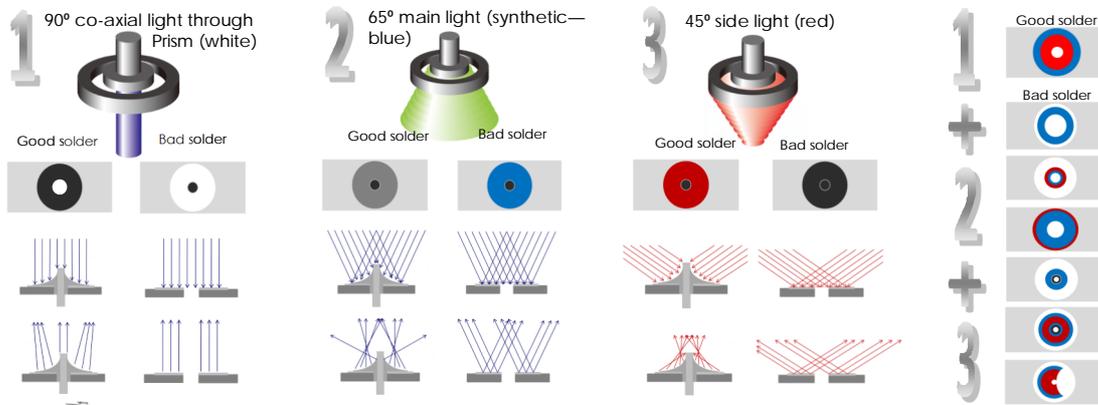
Parallel image over the whole sensor/lens Field of View — No parallax effect

Large pixel image capturing sensor

18,8µ² pixel size — smooth and detailed image with great dynamic range — Japanese built

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

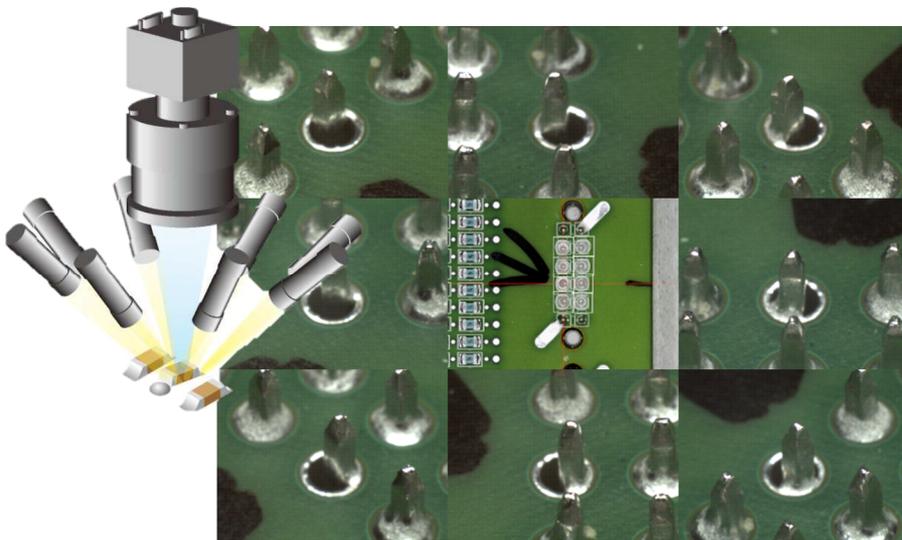


In Height Adjustable Optical Head

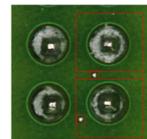
In Z-Axis moving Top Camera, Light and Side View cameras — Adaption to any PCB Thickness — PCB Warp Compensation — Inspection of "Sandwich" assemblies without need of jigs and multiple inspections

8x Angular Side Sensors (Only available for FDA and FDAz models)

Simultaneously operating, multiplexed side view sensors with CameraLink 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 — 9 view images also in backup database



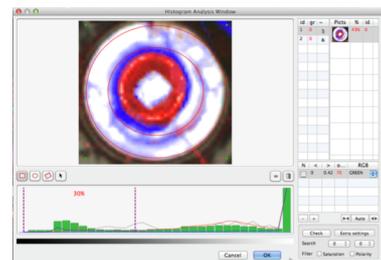
Powerful algorithms for solder bridge detection



Dedicated algorithms for solder balls detection

Histogram Analysis algorithms

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



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Spector BOX

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 FWz and FWAz.

	Angular Camera's	Z-Axis
FWz	NO	YES
FWAz	YES	YES

Large pixel image capturing sensor

18,8µ² pixel size — smooth and detailed image with great dynamic range — Japanese built

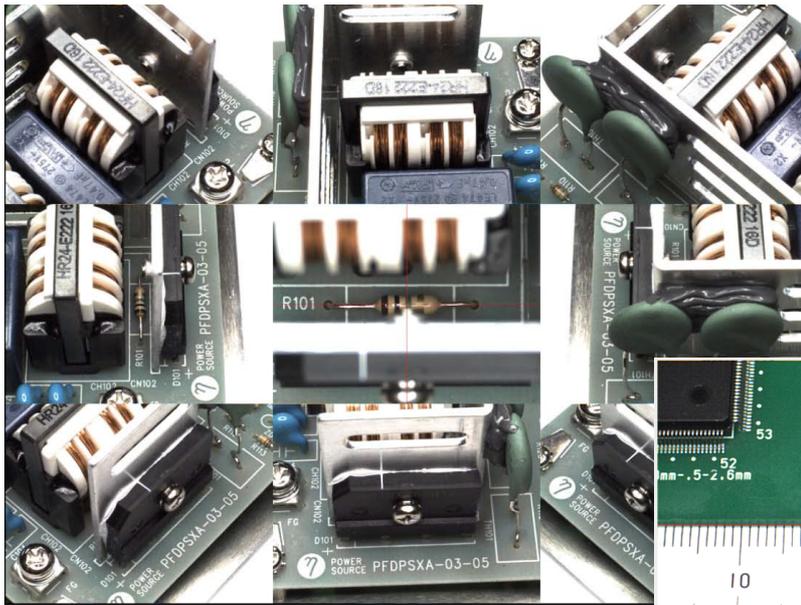


In Height Adjustable Optical Head

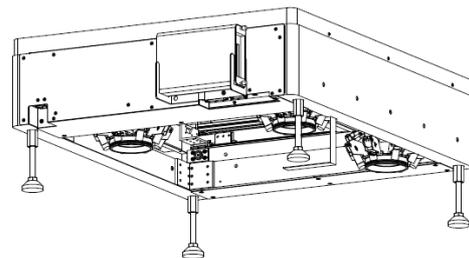
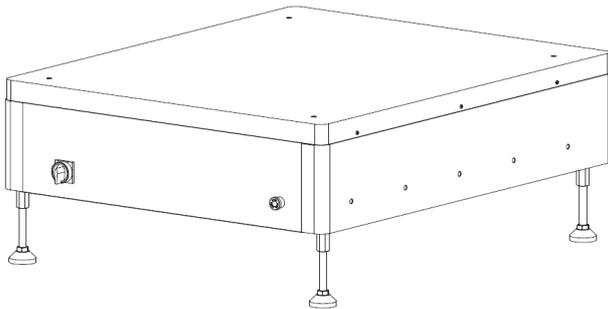
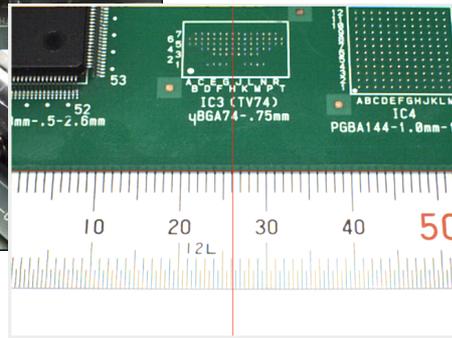
In Z-Axis moving Top Camera, Light and Side View cameras — Adaption to any PCB Thickness — PCB Warp Compensation — Reliable text and/or polarity inspection on tall components — Inspection of "Sandwich" assemblies without need of jigs and multiple inspections

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

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



Large Side Camera Field of View



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SpectorBOX

Bottom Up

FDL

SpectorBOX FDLz 550	
Maximum PCB Size	550x520mm (21.7" x 20.5")
Characteristics	
Product type	Automatic Optical Inspector
Camera movement	X+Y Direction
PCB movement	Stationary
Parts inspection	Soldering, Bridges, Solder Balls
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits
Imaging parameters	Brightness, Hue, Saturation via Filters
Specifications	
Main Camera type	Digital with CameraLink
Main Camera Field Of View/ Resolution	36x20mm/18.75µm or 19.2x10.8mm/10µ
Lens	Telecentric lens with built in prism for DOAL Lighting
Lighting system	Omnidirectional Triple LED rings: Side, Main, Line Sourced DOAL Diffused On Axis Lighting (Coaxial)
Minimum inspection object size	80µ (3.15 mils)
Positioning accuracy	Pixel related Feedback Loop
Component clearance	+40mm (1.57")
Side Cameras	No side cameras
Z-Axis movement range	30mm (2.4")
Movement speed	720mm/s
Inspection capacity typical	1500cps/min
Mains	100-240 Vac / 150W
Interfacing	
Control PC type	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface
Control interface	USB
Data interface	CameraLink
Communication	General Purpose I/O, RS232
General	
Operating temperature	15-30 degr C (59-86 degr F)
Operating humidity	15-80 % RH
External size	W750 x D842 x H256 (29.5" x 33.2" x 10.1")
Weight	50kg (110lbs)
	W900 x D1056 x H251 (35.5" x 41.6" x 9.9")
	100kg (220lbs)

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Bottom Up

FDA

SpectorBOX FDAz 550	
Maximum PCB Size	550x520mm (21.7" x 20.5")
Characteristics	
Product type	Automatic Optical Inspector
Camera movement	X+Y Direction
PCB movement	Stationary
Parts inspection	Soldering, Bridges, Solder Balls
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits
Imaging parameters	Brightness, Hue, Saturation via Filters
Specifications	
Main Camera type	Digital with CameraLink
Main Camera Field Of View/ Resolution	36x20mm/18.75µm or 19.2x10.8mm/10µ
Lens	Telecentric lens with built in prism for DOAL Lighting
Lighting system	Omnidirectional Triple LED rings: Side, Main, Line Sourced DOAL Diffused On Axis Light (Coaxial))
Minimum inspection object size	80µ (3.15 mils)
Positioning accuracy	Pixel related Feedback Loop
Component clearance	+30mm (1.2")
Side Cameras	8x Digital with CameraLink in 45/45 orientation
Z-Axis movement range	30mm (2.4")
Movement speed	720mm/s
Inspection capacity typical	1500cps/min
Mains	100-240 Vac / 150W
Interfacing	
Control PC type	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface
Control interface	USB
Data interface	CameraLink
Communication	General Purpose I/O, RS232
General	
Operating temperature	15-30 degr C (59-86 degr F)
Operating humidity	15-80 % RH
External size	W750 x D842 x H256 (29.5" x 33.2" x 10.1")
Weight	50kg (110lbs)
	W900 x D1056 x H251 (35.5" x 41.6" x 9.9")
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Top Down

FWz

SpectorBOX FDLz 550	
Maximum PCB Size	550x520mm (21.7" x 20.5")
Characteristics	
Product type	Automatic Optical Inspector
Camera movement	X+Y Direction
PCB movement	Stationary
Parts inspection	Presence/Absence, Type, Polarity, Colour, Text, Offset
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits
Imaging parameters	Brightness, Hue, Saturation via Filters
Specifications	
Main Camera type	Digital with CameraLink
Main Camera Field Of View/ Resolution	36x20mm/18.75µm or 19.2x10.8mm/10µ
Lighting system	Omnidirectional Single Source White Light
Minimum inspection object size	80µ (3.15 mils)
Positioning accuracy	Pixel related Feedback Loop
Component clearance	+130mm (5.12")
Side Cameras	No side cameras
Side Cameras Field of View	N/A
Z-Axis movement range	30mm (2.4")
Movement speed	720mm/s
Inspection capacity typical	1500cps/min
Mains	100-240 Vac / 150W
Interfacing	
Control PC type	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface
Control interface	USB
Data interface	CameraLink
Communication	General Purpose I/O, RS232
General	
Operating temperature	15-30 degr C (59-86 degr F)
Operating humidity	15-80 % RH
External size	W750 x D842 x H256 (29.5" x 33.2" x 10.1")
Weight	50kg (110lbs)
	W900 x D1056 x H251 (35.5" x 41.6" x 9.9")
	100kg (220lbs)

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SpectorBOX

Top Down

FWA

		SpectorBOX FDAz 550	
Maximum PCB Size	550x520mm (21.7" x 20.5")		
Characteristics			
Product type	Automatic Optical Inspector		
Camera movement	X+Y Direction		
PCB movement	Stationary		
Parts inspection	Presence/Absence, Type, Polarity, Colour, Text, Offset		
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits		
Imaging parameters	Brightness, Hue, Saturation via Filters		
Specifications			
Main Camera type	Digital with CameraLink		
Main Camera Field Of View/ Resolution	36x20mm/18.75µm or 19.2x10.8mm/10µ		
Lighting system	Omnidirectional Single Source White Light		
Minimum inspection object size	80µ (3.15 mils)		
Positioning accuracy	Pixel related Feedback Loop		
Component clearance	+130mm (5.12")		
Side Cameras	8x Digital with CameraLink in 45/45 orientation		
Side Cameras Field of View	50x39mm (1.96x1.54")		
Z-Axis movement range	30mm (2.4")		
Movement speed	720mm/s		
Inspection capacity typical	1500cps/min		
Mains	100-240 Vac / 150W		
Interfacing			
Control PC type	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface		
Control interface	USB		
Data interface	CameraLink		
Communication	General Purpose I/O, RS232		
General			
Operating temperature	15-30 degr C (59-86 degr F)		
Operating humidity	15-80 % RH		
External size	W750 x D842 x H256 (29.5" x 33.2" x 10.1")	W900 x D1056 x H251 (35.5" x 41.6" x 9.9")	
Weight	50kg (110lbs)	100kg (220lbs)	

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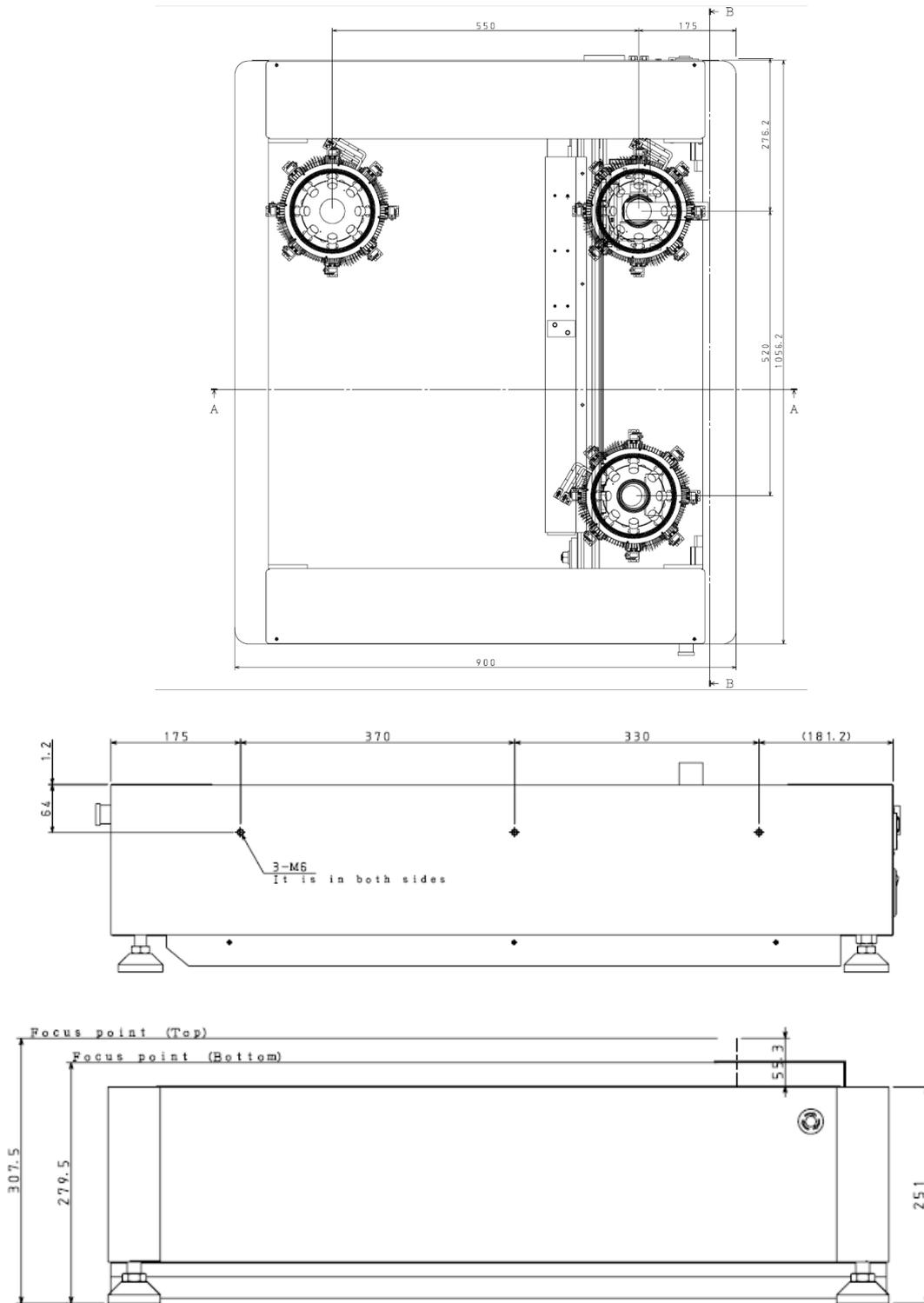
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Spectra A0X

Bottom Up

FDLz/FDAz



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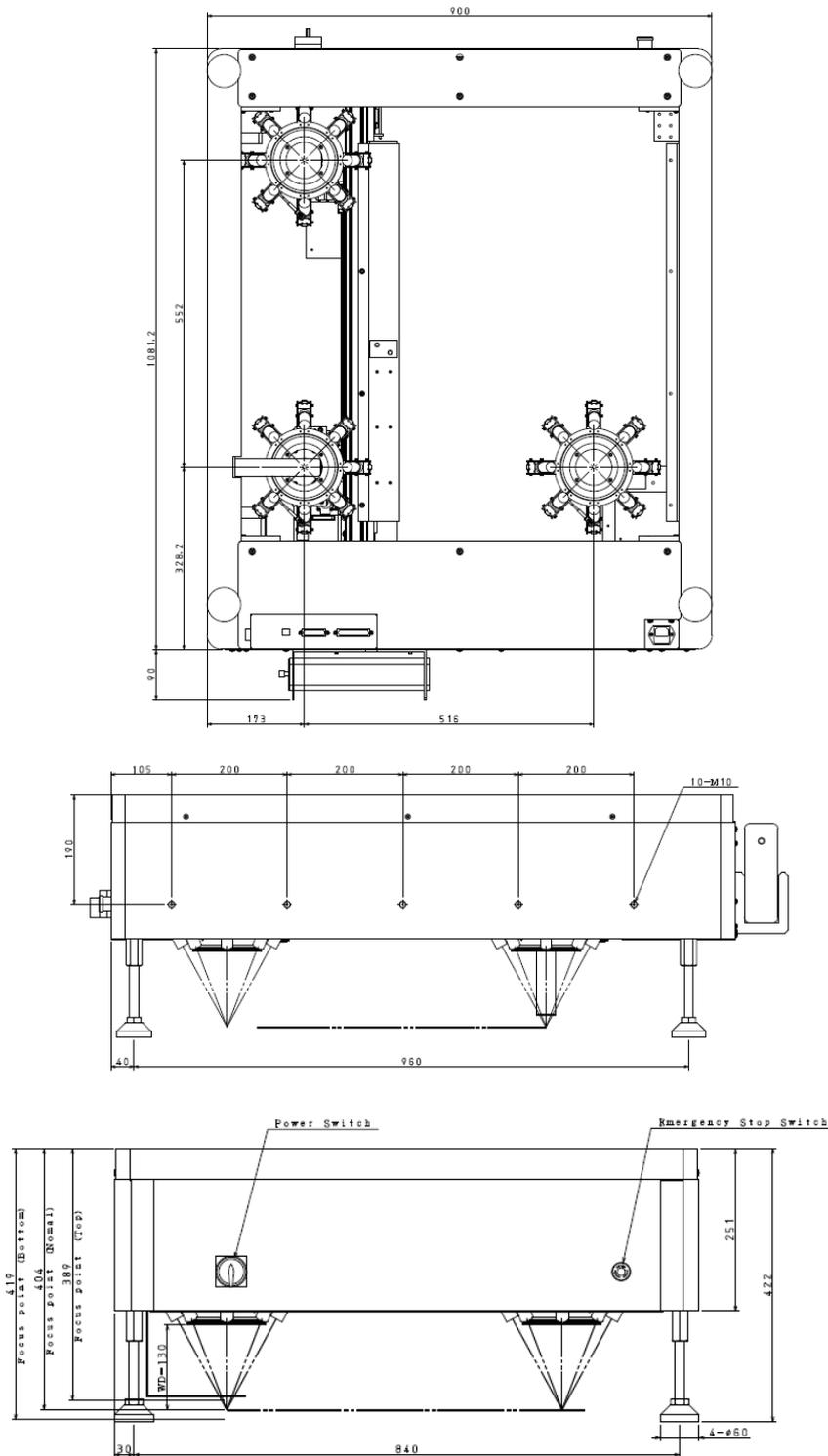
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Spector A0X

Top Down

FWz/FWAz



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