COGNEX

TREVISTA CI DOME

Best-in-class image formation for AI-based surface inspection

The Trevista® CI Dome is a hardware and software-based image formation and inspection solution. Using the power of VisionPro® software, the Trevista CI Dome enhances inspection processes of parts with shiny or matte surfaces. The built-in Trevista vision tool within VisionPro uses patented “shape from shading” technology to compose high-quality topographical images quickly. Use integrated AI-based vision tools to analyze surface defects and differentiate critical from cosmetic flaws. The CI Trevista Dome solution helps to:

- Decrease scrap rates and costs
- Reduce inspection times
- Catch more flaws, faster

Key features

Easier set up and deployment of vision applications

- Integrated Trevisa shape from shading and AI-based vision tools
- Built-in acquisition wizard for lighting and camera controls

Tackle a variety of surface inspection challenges

- Multiple diffuse dome options
- Support for area and line scan cameras

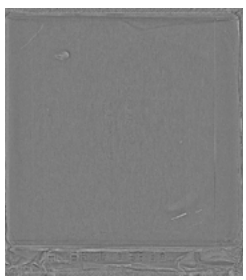
Unmatched image quality

Many shape from shading techniques rely on ring lighting or multiple bar lights, which limit the amount of defect details due to poor lighting angles. The Trevista CI Dome delivers greater detail because it illuminates the component from all angles, revealing more flaws. Using a sequence of images taken from different lighting quadrants, the patented Trevista shape from shading algorithm creates a more detailed set of composite images with higher quality and repeatability, enabling a more robust inspection process.

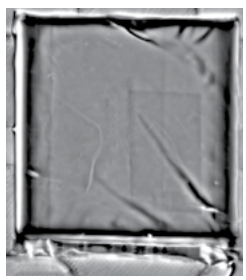
Greyscale

Gradient Horizontal

Gradient Vertical



Contour

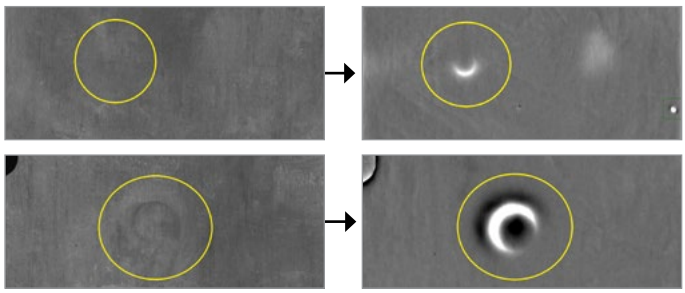


Depth

Faster image processing

High-volume manufacturers require high-speed to keep up with demand, deliver exceptional quality parts, and maximize throughput and efficiency. The Trevista CI Dome increases efficiency and throughput by capturing and processing part images up to two times faster than other computational imaging solutions. Using the shape from shading tool within VisionPro and diffused dome lighting, the Trevista CI Dome composes high-quality topographic images of contoured parts at very high speed, regardless of orientation or position, which reduces the inspection time required per part.

Greyscale images **Depth images**



Greyscale image shows little detail of defects.

Pixel brightness and darkness indicate elevations or depressions in the surface.

Highly detailed surface visualization

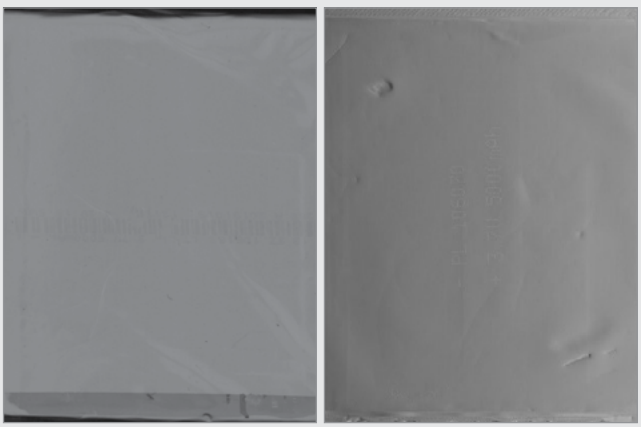
Manufacturers often accept larger-than-desired overkill rates of their parts to ensure quality and throughput targets, which leads to higher scrap and costs.

The diffuse light of the dome captures light reflections from every angle, illuminating concave or convex shapes more effectively, which more accurately captures surface slope information. AI-based vision tools use this information to classify surface defect severity. Assessing and classifying defect severity helps reduce overkill, decrease scrap rates, and lower costs.

Ideal applications

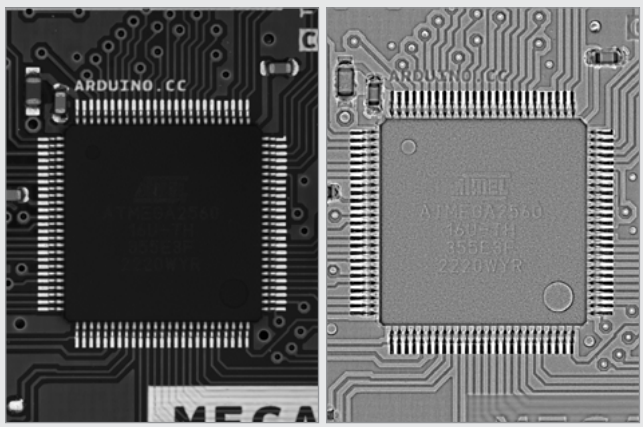
The Trevista CI Dome detects subtle defects on reflective and matte surfaces using powerful “shape from shading” technology. The Trevista CI Dome is ideal for inspection applications of shiny or matte parts with tolerance ranges, such as electric vehicle (EV) batteries and electronics.

Electric Vehicle (EV) Battery Inspection



Identify surface defects on pouch batteries and classify defects as critical or cosmetic.

Electronics Printed Circuit Board (PCB) Inspection



Verify the correct orientation of IC chips mounted on printed circuit boards (PCBs).

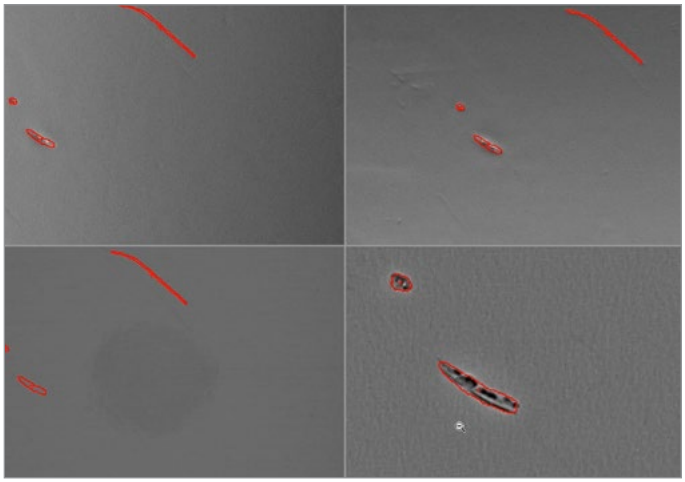
Seamless integration with Cognex VisionPro software

Leverage the power of Cognex VisionPro to analyze images generated using the Trevista CI Dome.

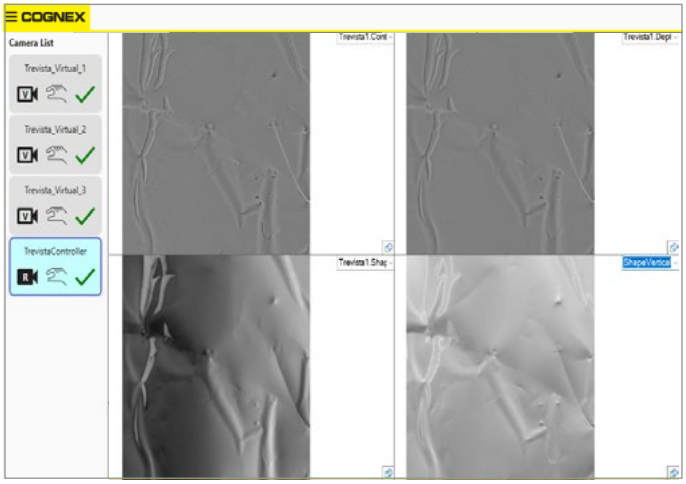
Quickly configure camera and light controller settings within VisionPro using the built-in Trevista Acquisition Wizard.

Generate high-quality topographic images using the embedded Trevista shape from shading algorithm.

Assess defect severity using Trevista composite images with integrated AI-based tools for defect detection and classification.



Build inspection applications using Cognex Vision Software.



TREVISTA CI DOME HARDWARE AND SOFTWARE SPECIFICATIONS

	Small dome (S)	Medium dome (M)	Large dome (L)
			
Diameter of measuring field/scan width[1]	Up to 30 mm (1.18")[1] (application-specific)	Up to 75 mm (2.95")[1] (application-specific)	Up to 250 mm (9.84")[1] (application-specific)
Working distance between lens and inspection plane	Typ. 72 mm (2.83")	Typ. 158 mm (6.22")	Typ. 300 mm (11.81")
Working distance between bottom edge and inspection plane	Typ. 2 mm (0.08")	Typ. 10 mm (0.39")	Typ. 47 mm (1.85")
Dimensions (W x D x H)	246 x 160 x typ. 259 mm (9.69" x 6.30" x typ. 10.20")	388 x 330 x typ. 348 mm (15.28" x 12.99" x typ. 13.70")	669 x 610 x typ. 453 mm (26.34" x 24.02" x typ. 17.83")
Weight (without cable)	4.1 kg (9.04 lb)	6.9 kg (15.21 lb)	16.2 kg (35.71 lb)
Material	Aluminum	Aluminum/Plastic	Aluminum/Plastic
RoHS Certified	Yes		
Approvals	EU EN61326-1:2013 US 47 CFR Part 15, UL 61010-1:2012/R:2019-07 CAN IECS-003, Issue 5 CSA C22.2 No. 61010 TUV IEC 61010-1:2010/AMD1:2016, IEC62471:2006 KS C 9610-6-4:2017, KS C 9610-6-2:2019		
Software	VisionPro		

[1] Depending on the camera, optics, and surface properties of the test part.

LIGHT CONTROLLER SPECIFICATIONS

	
Weight	6.4 kg (14.11 lbs.)
Material	Aluminum-zinc
Electrical power supply	100-240 V AC +/-10%, 50-60 Hz, 550 VA
Ambient conditions	
Installation site	Dry interiors
Ambient temperature	5–40° C (41–104° F)
Relative humidity	40–70 %
Height	Max. 2000 m (6561.68 ft)
Degree of contamination	2
Overvoltage category	2

Product IDs and descriptions

TREVISTA CI DOME MODULES (NO CAMERA) - AREA SCAN

Product ID	Dome size	Encoder
TVS-AS-L	Large	Not included
TVS-AS-M	Medium	
TVS-AS-S	Small	

TREVISTA CI DOME MODULES (NO CAMERA) - LINE SCAN

Product ID	Dome size	Encoder
TVS-LS-L	Large	Programmable encoder (up to 36k CPR)
TVS-LS-M	Medium	
TVS-LS-S	Small	

TREVISTA CI DOME KIT OPTIONS - AREA SCAN

Product ID	Dome size	Camera resolution	Lens	Camera connectivity	Encoder
TV-A-L-BM24-16	Large	24MP	C-mount, Min. Aperture: 1.8, FL: 16 mm	10 GigE	Not included
TV-A-L-BM12-25		12MP	C-mount, Min. Aperture: 1.8, FL: 25 mm	GigE	
TV-A-L-BM5-16		5MP	C-mount, Min. Aperture: 1.8, FL: 16 mm		
TV-A-M-BM24-25	Medium	24MP	C-mount, Min. Aperture: 1.8, FL: 25 mm	10 GigE	
TV-A-M-BM12-16		12MP	C-mount, Min. Aperture: 1.8, FL: 16 mm	GigE	
TV-A-M-BM12-25		12MP	C-mount, Min. Aperture: 1.8, FL: 25 mm	GigE	
TV-A-M-BM5-23	Small	5MP	C-mount, Min. Aperture: 1.4, FL: 23 mm		
TV-A-S-BM12-25		12MP	C-mount, Min. Aperture: 1.8, FL: 25 mm	GigE	

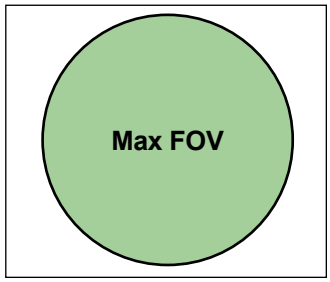
TREVISTA CI DOME KIT OPTIONS - LINE SCAN

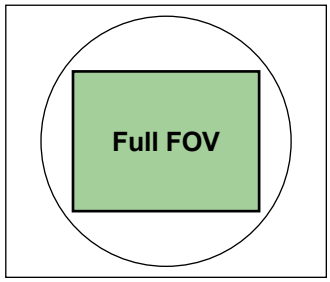
Product ID	Dome size	Camera resolution	Lens	Camera connectivity	Encoder
TV-L-L-DL8-60	Large	8k	V38-mount, Min. Aperture: 4, FL: 60 mm	CameraLink	Programmable encoder (up to 36k CPR)
TV-L-L-DL4-28		4k	C-mount/TFL-mount, Min. Aperture: 2, FL: 28 mm		
TV-L-M-DL8-60	Medium	8k	V38-mount, Min. Aperture: 2.8, FL: 60 mm		
TV-L-M-DL4-40		4k	V38-mount, Min. Aperture: 4, FL: 40 mm		
TV-L-S-DL4-60	Small	4k	C-mount/TFL-mount, Min. Aperture: 2, FL: 60 mm		

Optical specs of pre-configured Trevista CI Dome kits

AREA SCAN

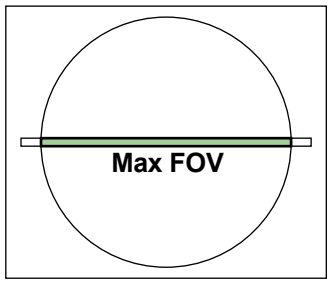
Product ID	FOV type	Recommended max FOV	Spatial resolution	Max frame rate
TV-A-L-BM24-16	Max	ø 230 mm[1]	55 µm	5 fps[2]
TV-A-L-BM12-25	Full	174 mm x 128 mm	43 µm	1.8 fps[2]
TV-A-L-BM5-16	Full	164 mm x 138 mm	67 µm	4.3 fps[2]
TV-A-M-BM24-25	Full	95 x 82 mm	18 µm	5.0 fps[2]
TV-A-M-BM12-16	Max	ø 75 mm[1]	38 µm	1.8 fps[2]
TV-A-M-BM12-25	Full	93 mm x 68 mm	23 µm	1.8 fps[2]
TV-A-M-BM5-23	Max	65 mm x 54 mm	27 µm	4.3 fps[2]
TV-A-S-BM12-25	Full	48 mm x 35 mm	12 µm	1.8 fps[2]

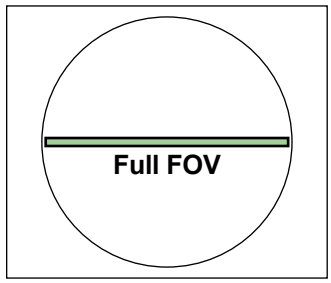




LINE SCAN

Product ID	FOV type	Recommended max FOV	Spatial resolution	Max scan speed
TV-L-L-DL8-60	Full	247 mm	30 µm	550 mm/sec
TV-L-L-DL4-28	Max	250 mm[1]	72 µm	1300 mm/sec
TV-L-M-DL8-60	Full	75 mm[1]	14 µm	260 mm/sec
TV-L-M-DL4-40	Full	75 mm[1]	24µm	440 mm/sec
TV-L-S-DL4-60	Full	29 mm	7 µm	120 mm/sec

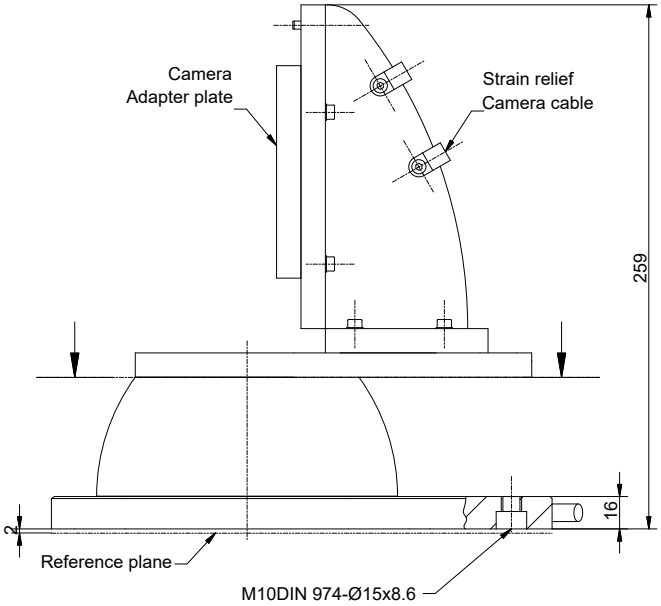




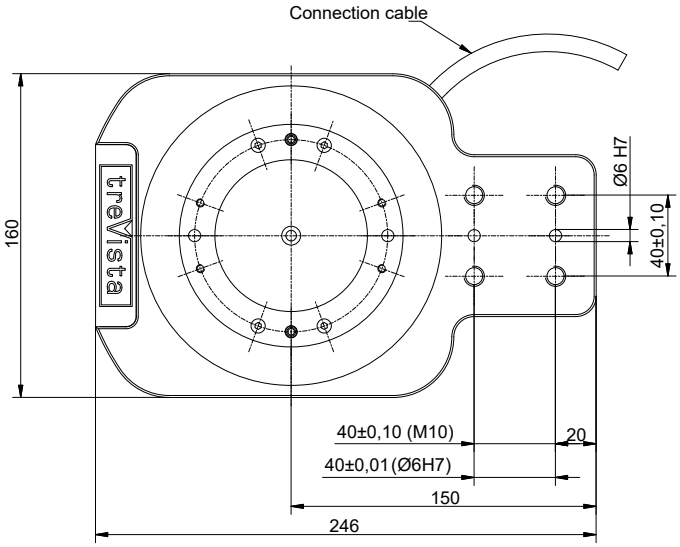
1 Max FOV reduced to recommended illumination field.
2 Topographic image frame rate resulting from 4 acquired interlaced images.

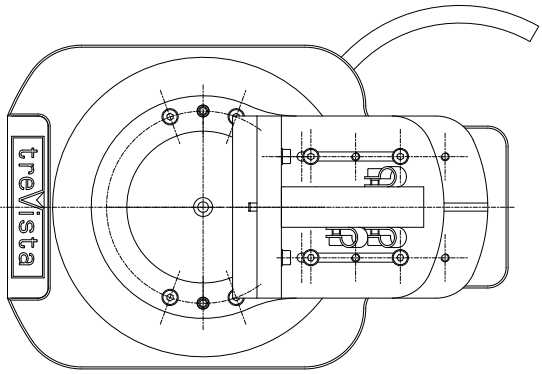
Dimensions

Small dome

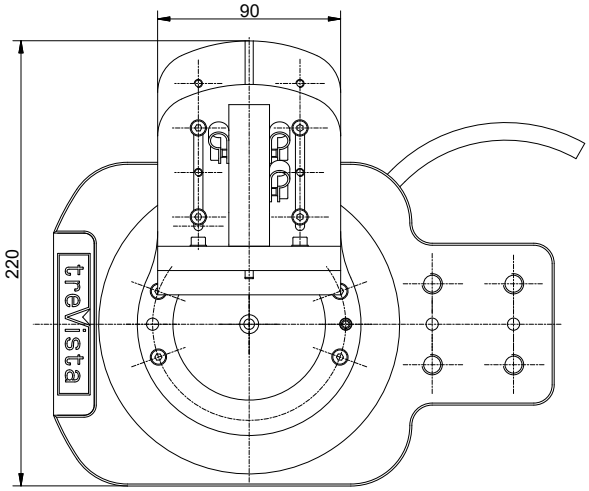


X1 (View without camera mount)

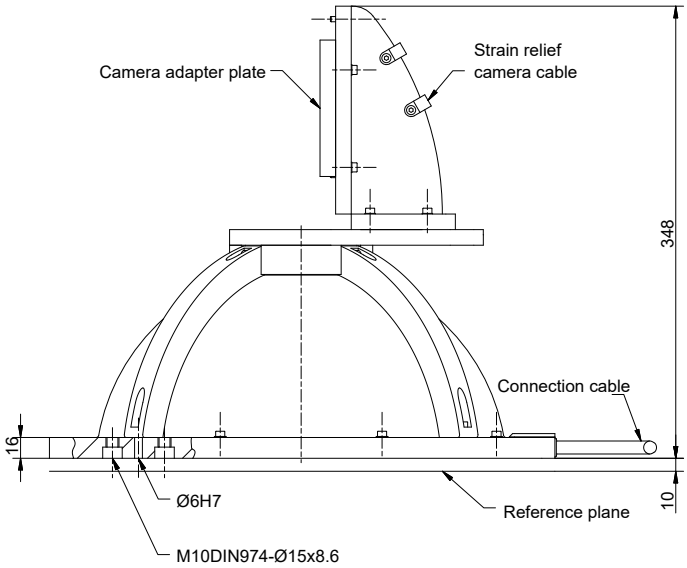


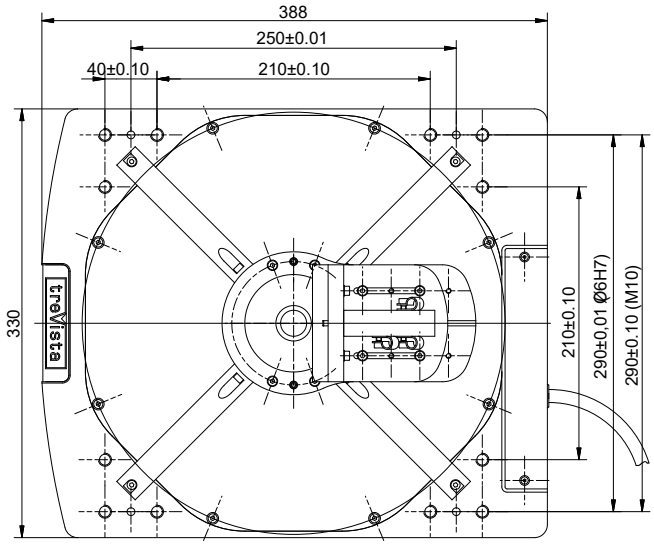


X2 (View with rotated camera mount)

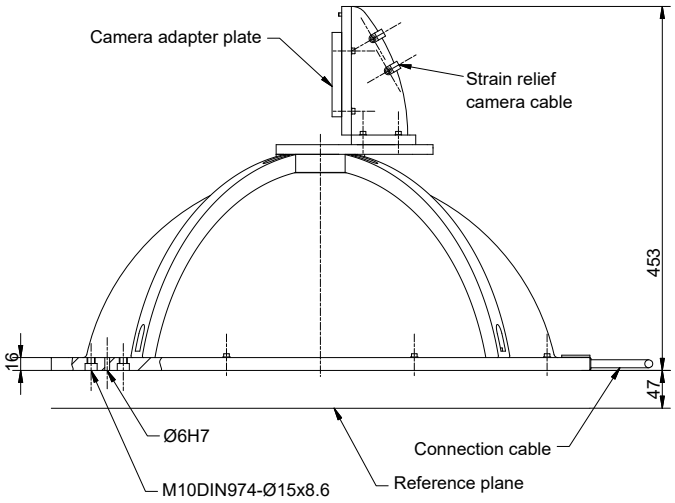


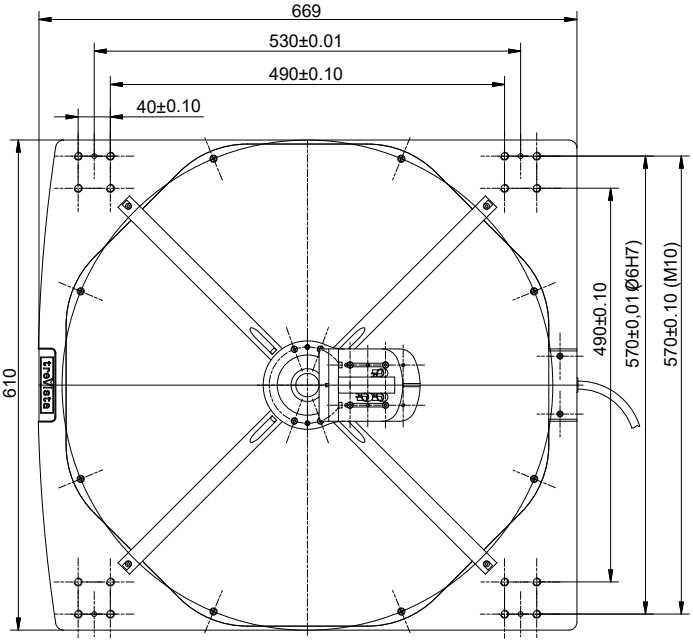
Medium dome





Large dome





COGNEX

Companies around the world rely on Cognex vision and barcode reading solutions to optimize quality, drive down costs and control traceability.

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