Cascade

CM300xi

300 mm Semi-/ Fully-automated Probe System

Overview

The CM300xi is a wafer probe station for wafer sizes up to 300 mm (12 inch). It meets the measurement challenges brought on by extremely complex requirements, such as unattended testing on small pads over time and at multiple temperatures.

The CM300xi provides lab automation capabilities and enables critical precision electrical measurements for device characterization, high-volume engineering and extremely challenging applications. It is also ideally suited in customized solutions, niche production applications, and emerging markets.

The CM300xi offers measurement accuracy and reliability in a solution that is completely modular – whether it is I-V/C-V, RTN and RF measurements in one semi-automated system, or a fully-automated dual-prober system that handles any combination of 200 mm and 300 mm wafers.

Contact Intelligence™ is a unique technology which guarantees to make and hold wafer contact with constant high quality. A powerful combination of innovative system design and smart software algorithms provides an automated solution to achieve highly-reliable measurement data. It reduces test cycle times and provides faster time to data, regardless of which application you are addressing.

Contact Intelligence™

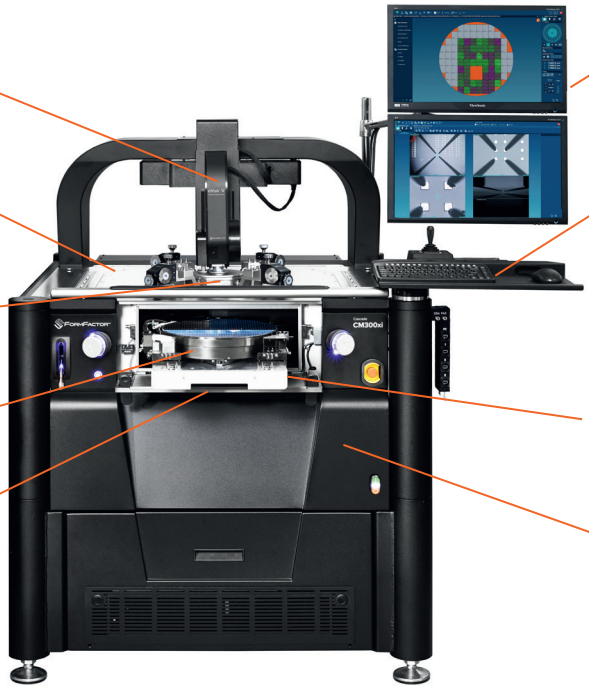
Features / Benefits

Higher efficiency and lower cost of test	• Scalable from semi-automated operation to fully-automated prober or dual-prober system
High accuracy and repeatability	• Superior low-leakage and low-noise measurements • Safe and accurate hands-off testing with reliable and repeatable contact
Automated test	• Contact Intelligence enables unattended tests on small pads • Thermally induced drift can be automatically corrected, enabing automated temperature transitions over the full temperature range using VueTrack or ReAlign (the effective temperature range and minimum obtainable pad size depend on probe card and probe card holder or positioner used)
Test productivity	• Fast delivery of a wide variety of precise model parameters to enhance process and device development
Flexibility	• DC, AC and RF/microwave device characterization, 1/f, WLR, FA and design debug • Full thermal range of -60°C to +300°C, supported by high thermal stability design • Usage of manual and motorized positioners, probe cards within EMI-shielded environment

Note: For physical dimensions and facility requirements, refer to the CM300xi Facility Planning Guide. If not otherwise mentioned, the specified values are given for a temperature range from +18°C to +24°C and relative humidity of 20% to 50%.

FormFactor™

System Components



Programmable Chuck Stage

	X-Y Stage	Z Stage	Theta Stage
Travel	301 mm x 501 mm (11.9 in. x 19.7 in.)	10 mm (0.4 in.)	± 3.75°
Resolution	0.2 µm (0.008 mils)	0.2 µm (0.008 mils)	0.2 µm (0.008 mils)*
Repeatability	≤ 1 µm (0.04 mils)	≤ 1 µm (0.04 mils)	≤ 1 µm (0.04 mils)*
Accuracy	≤ 2 µm (0.08 mils)	≤ 2 µm (0.08 mils)	≤ 2 µm (0.08 mils) ≤ 5 µm (0.2 mils) (Movements >2°)
Speed	50 mm/s (2 in./s)	20 mm/s (2 in./s)	
Lifting capacity (in excess of chuck)	-	20 kg (44 lbs.)	-
Probe-force deflection	-	≤ 0.0007 µm/µm slope per 10 kg load	-

*Measured at the edge of 300 mm chuck

MicroChamber

Electrical	CM300xi-F	CM300xi-S
EMI shielding	> 30 dB (typical) @ 1 kHz to 1 MHz	> 20 dB (typical) @ 1 kHz to 1 MHz
Light attenuation	≥ 130 dB	≥ 130 dB
Spectral noise floor*	≤ -170 dBVrms/rtHz (≤ 1 MHz)	≤ -150 dBVrms/rtHz (≤ 1 MHz)
System AC noise**	≤ 5 mVp-p (≤ 1 GHz)	≤ 15 mVp-p (≤ 1 GHz)

* *Typical results. Actual values depend on probe / test setup. Test setup uses triaxial thermal chuck, 50 Ω termination, high quality LNA, and DSA/DSO instrument.*

** *Test setup: Station power ON, Thermal system ON (40°C), MicroChamber® closed. Instrument setup: Time domain digital scope (DC to 1 GHz), 50 Ω input impedance, cable to chuck BNC connector. Measurement: Peak-Peak Noise Voltage (acquire 1000 data points, and calculate mean of Vp-p data).*

Air-Purge Management[1]	
Purge	Clean dry air (CDA)
Purge Control	Automated flow control using dew point sensor.
Purge Flow	By default, the microchamber purge flow rate is automatically regulated to the lowest possible value required to ensure a frost-free environment. Experienced customers may also choose to control the CDA flow manually or via scripting (not recommended).
Typical Purge Flow Rates	80 l/min (2.8 SCFM) at chuck operating temperatures of -40°C to +300°C and during standby
	100 l/min (3.5 scfm) at chuck operating temperatures below -40°C
	240 l/min[2] (8.5 scfm) (max. purge flow), temporarily for cooling down to temperatures below -40°C or during wafer loading and unloading

[1] See Facilities Planning Guide for detailed specification of facilities requirements.

[2] In case the max. purge flow is not made available, this might result in longer temperature transition times.

Platen System

Outer Platen	
Dimensions	1058 mm (W) x 866 mm (D) x 25 mm (T)
Platen-to-chuck height	43.0 ± 0.5 mm (1.69 ± 0.02 in.)
Accessory mounting	Universal Rail System: 53 cm (21 in.) Left / Right Rail, 70 cm (28 in.) Rear Rail
Platen mount	Fixed height, High Thermal Stability kinematic mount
HTS Thermal Management	Integrated laminar-flow air-cooling for thermal expansion control

Inner Platen	
Dimension	720 mm x 720 mm x 38 mm (incl. guard for fully-shielded version)
Weight	47 kg (104 lb.)
Material	Steel for magnetic positioners
Surface finish	Fine ground for vacuum positioner high stability

Platen Insert	
Diameter	344 mm (13.5 in.)
Standard interfaces	TopHat™, probe card holders and IceShield™

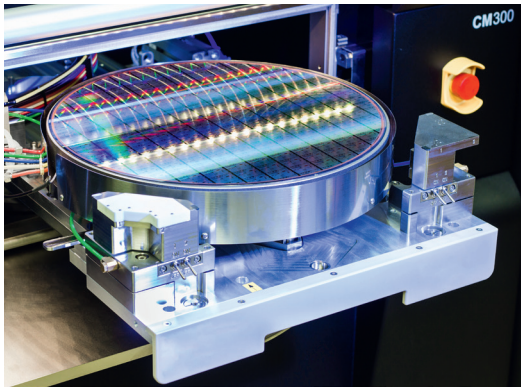
Probe Card Holder*	
Probe card shape	Rectangular
Probe card width	114.5 mm (4.5 in.)
Max. probe card length (standard)	284 mm (11.18 in) /142 mm (5.59 in) from probe center to front/rear
Max. probe card length (HTS)	160 mm (6.30 in) / 80 mm (3.15 in) from probe center to front/rear
Tip drop**, (standard)	3.0 mm to 5.0 mm (0.12 in. to 0.20 in.)
Tip drop** (High Thermal Stability)	4.7 mm (0.185 in.)

* *For more details, please see the Probe Station Accessory Catalog.*

** *Tip drop corresponds to the vertical distance between mounting level of probe card and needle tips. Field of view of ContactView (side view) camera within +/- 0.5 mm from nominal value (4.7 mm)*

Wafer Chuck

Diameter	305 mm (12 in.)
Material	Nickel- or gold-plated aluminum
DUT sizes supported	Shards (10 mm x 10 mm or SEMI-M1 compliant wafers up to 300 mm / 12 in.)
Vacuum rings	7 mm, 66 mm, 130 mm, 180 mm, 280 mm
Vacuum-ring actuation	Software controlled (Center, 200 mm, 300 mm)
Planarity incl. stage movement (with active z-profiling)	+/-5 µm (0.2 mils)



Aux Chuck

Left-side Aux Chuck	Ceramic vacuum chuck optimized for RF calibration
	Two 22 x 22 mm^2 substrates
	Stop pins as alignment aid
Right-side Aux Chuck	Steel vacuum chuck optimized for cleaning
	Two 16 x 14.5 mm^2 substrates, 38.1 x 38.1 mm^2 area for self-adhering gel pad
	Stop pins as alignment aid
Planarity	+/- 5 µm, adjustable
Thermal isolation	Air gap, > 10 mm
Positional repeatability	2 µm (0.08 mils) after rollout event
Vacuum actuation	Independent manual vacuum switches

Platform

Active Vibration Isolation System

Attenuation*	0 dB @ 6Hz, 5 dB per octave @ 6Hz to 48Hz, 15 dB above 48Hz
Stage damping	15 dB in less than 1500 m sec

Sound level

Constant level	< 60 dB (A)
Peak level	< 72 dB (A)

* *Please see facilities planning guide for minimum requirements concerning background vibrations.*

Communication Ports

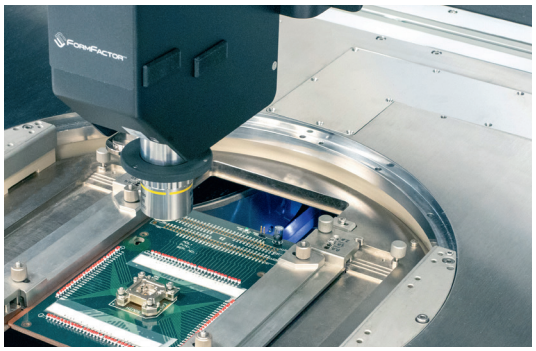
Type	Qty	Location	Notes
USB 3.0	2	IPC front	For access to USB devices
GPIB IEEE 488.2	1	Rear connection panel	For test instrument control
LAN	1	Rear connection panel	For integration into measurement environment and local network
USB 3.0	1	Front	For access to USB devices (IntelliControl option)
USB 2.0	3	Font and rear	For connecting customer equipment (IntelliControl option)
LAN	3	Rear connection panel	For connecting customer equipment and local network (IntelliControl option)

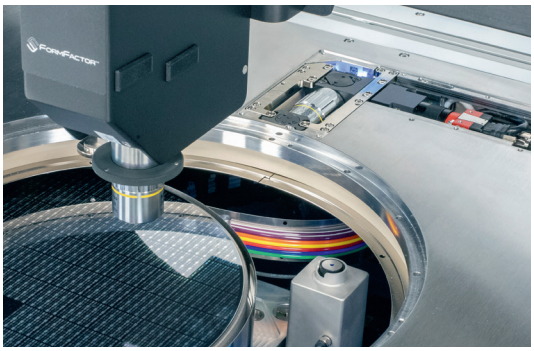
Contact Intelligence Technology

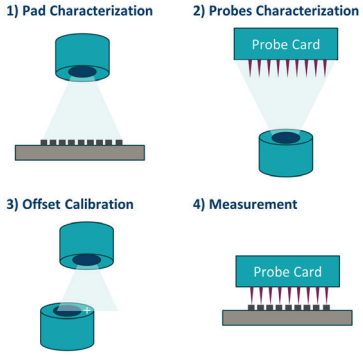
The CM300xi provides the lab automation capabilities needed to make critical precision electrical measurements. With Contact Intelligence technology, CM300xi adapts to temperature variance and provides automated drift correction for unattended testing on small pads over time and temperature. Contact Intelligence technology is enabled by the following features:

- VueTrack™ closed-loop positioning capability minimizes the need of manual re-adjustment when probing small pads across multiple temperatures.
- Velox probe station software provides a single command interface for automated temperature transitions continuously managing the separation between probes and pad during temperature ramp.
- Velox probe station software provides the ability to optimize the soak time after a temperature transition or when stepping across the wafer based on the temperature variance.
- ReAlign offers the capability to perform automated probe to pad alignment and unattended testing over temperature using probe cards that do not allow unlimited top microscope view of probes and pads.
- High Thermal Stability (HTS) microscope bridge enables automated over-temperature measurements.
- HTS platen provides stability over a wide thermal probing range.
- HTS probe card holder ensures EMI-shielded and light-tight environment, achieving accurate and reliable small-pad probing (option).
- As an additional option, motorized positioners allow automatic drift correction for each probe individually and facilitate unattended testing on small pads across multiple temperatures using Vuetrack Pro or Auto RF. Motorized positioners are part of the Autonomous DC and Autonomous RF Measurement Assistants.

ReAlign Off-Axis Probe to Pad Alignment







The optional ReAlign™ feature offers the capability to perform “off-axis” probe to pad alignment (PTPA) independent from the main eVue microscope. ReAlign is the ideal tool for probe cards that do not allow viewing pads and probe tips from above. This is the case e.g. for vertical and Pyramid probe cards.

The ReAlign hardware includes two additional cameras: The downward looking “Platen Camera” is directly integrated into the platen of the CM300xi and is used for observation of the pads. The upward looking “ChuckView Camera” is used for characterization of the probe tips. The ReAlign wizard allows easy and fast setup with predefined algorithms for different probe cards like Pyramid, Apollo, Cantilever, etc.

ReAlign can automatically manage temperature transitions without the need for operator intervention.

Hardware	Downward Looking Platen Camera, integrated into the Platen of the CM300xi
	Upward looking "ChuckView" camera
	"ContactView" camera for observation of wafer and probes from the side
Software	ReAlign software algorithm including ReAlign wizard

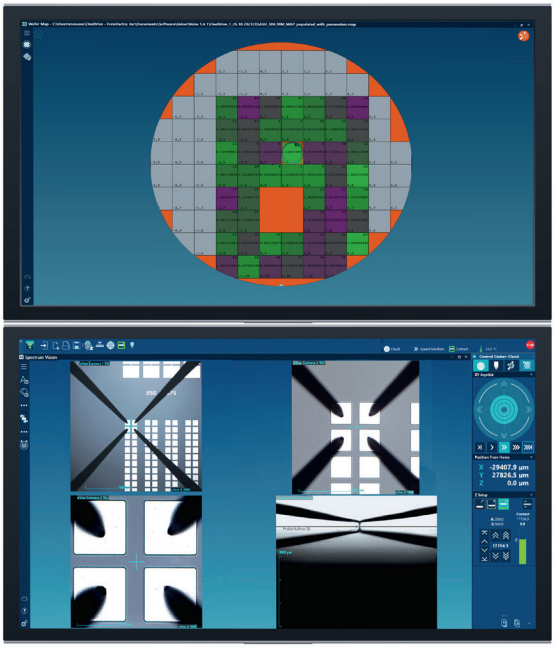
Station Controller PC and Software

The CM300xi is equipped with a high-performance controller PC including Velox probe station control software and Windows 10 operating system.

Velox Probe Station Control Software

Velox software provides all features and benefits required for semi- and fully-automated operation of the probe system, such as:

- **User-centered design:** Minimized training costs and enhanced efficiency.
- **Loader integration:** No need for any additional software. Easy creation of workflows and receipts.
- **Smart automation features:** Faster time to data due to reduced test cycle times.
- **Hundreds of tuneable options:** High flexibility for a large variety of applications.
- **Simplified operation for inexperienced users:** Reduced training costs with Workflow Guide and condensed graphical user interface.
- **Integrated Python Development Environment:** Including Syntax Highlighting, AutoComplete, Debugger, Integrated Documentation.
- **Velox Integration Tool Kit:** Enables integration of the prober into Customer Test Executives, supporting LabView, C++, C#, Visual Basic, MatLab.
- **Velox Interval Backup:** Automated Backup with easy-to-use recovery function. Data is stored on a separate HDD drive.



VeloxPro Package (Optional)

VeloxPro is a SEMI E95-compliant enhancement with test executive capabilities, featuring:

- **SEMI E95-compliant** probe station control software with condensed graphical user interface for simplified operation
- **Test executive software** enabling control of third-party measurement equipment via the probe station

Tester Interface

The CM300xi uses commands through GPIB as a permanent listener. The GPIB interface provides the ability to:

- Request an inventory of all wafers available in the cassettes
- Define a wafer map
- Define a job (out of wafers and recipe)
- Change chuck temperature and initiate re-alignment
- Receive notifications when the wafer is aligned and ready to test

Non-Thermal Chucks

FemtoGuard® Chuck Performance*

Breakdown Voltage	Force-to-Guard	≥ 500 V
	Guard-to-Shield	≥ 500 V
	Force-to-Shield	≥ 500 V
Resistance**	Force-to-Guard	≥ 5 x 10^{12} Ω
	Guard-to-Shield	≥ 1 x 10^{12} Ω
	Force-to-Shield	≥ 5 x 10^{12} Ω
Capacitance***	Force-to-Guard	≤ 800 pF
	Guard-to-Shield	≤ 3000 pF

* *Chuck performance measured inside test chamber at dew point < -70°C.*

** *The chuck resistance is measured in a dry environment. Moisture in the chuck may degrade performance. The chuck layer resistance is measured with a B1500 with HR SMU B1517, the FormFactor program "F-G_R_@10V@50Hz" at defined test conditions.*

*** *The chuck layer capacitance is measured with a B1500 with HR-SMU B1517, the FormFactor program "CAP_F-G-300pA" at defined test conditions.*

System Electrical Performance (with non-thermal chuck)	CM300xi-F FemtoGuard	CM300xi-S FemtoGuard	CM300xi-S Coax Chuck
Probe leakage*	≤ 1 fA	≤ 1 fA	≤ 1 fA
Chuck leakage*	≤ 3 fA	≤ 15 fA	≤ 600 fA
Residual capacitance**	≤ 2.5 pF	≤ 75 pF	N/A
Capacitance variation**	≤ 2 fF	≤ 75 fF	≤ 75 fF
Settling time***	≤ 50 fA @ 0.5 sec	≤ 100 fA @ 2 sec	N/A

* *Overall leakage current is comprised of two distinctly separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance. Noise is low-frequency ripple superimposed on top of offset and is due to disturbances in the probe station environment. Noise and leakage are measured with a B1500 with HR-SMU B1517 and the FormFactor program "DCN@10V" at defined test conditions.*

** *The residual (triaxial) chuck capacitance is measured with a B1500 with HR-SMU B1517 with the FormFactor progam "Cap-Trx-3pA" at defined test conditions on a CM300xi with standard TopHat installed.*
This is chuck capacitance variation based upon chuck position anywhere in the 300 mm area, as measured by a stationary DC probe.

*** *Settling time is measured with a B1500 with HR-SMU B1517 and the FormFactor program "ST_10V" at defined test conditions.*

Note: Results measured with thermal chuck at standard probing height (20,500 µm) with chuck in a dry environment. Moisture in the chuck may degrade performance.

Thermal Chucks

FemtoGuard® Chuck Performance*		**Thermal Chuck**				
		@ -55°C	@ -40°C	**@ 25°C**	**@ 200°C**	**@ 300°C**
Breakdown Voltage**	Force -to-Guard	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
	Guard-to-Shield	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
	Force -to-Shield	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
Resistance***	Force -to-Guard	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 1 x 10^{11} Ω
	Guard-to-Shield	≥ 5 x 10^{11} Ω	≥ 5 x 10^{11} Ω	≥ 5 x 10^{11} Ω	≥ 5 x 10^{10} Ω	≥ 1 x 10^{10} Ω
	Force -to-Shield	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 1 x 10^{11} Ω
Capacitance****	Force -to-Guard	≤ 1100 pF	≤ 1100 pF	≤ 1100 pF	≤ 1100 pF	≤ 1200 pF
	Guard-to-Shield	≤ 5000 pF	≤ 5000 pF	≤ 5000 pF	≤ 5000 pF	≤ 5000 pF

* *Chuck performance measured inside test chamber at dew point < -70°C.*

** *Breakdown voltage tested at 500 V DC*

*** *The chuck resistance is measured in a dry environment. Moisture in the chuck may degrade performance. The chuck layer resistance is measured with a B1500 with HR SMU B1517, the FormFactor progam "F-G_R_@10V@50Hz" at defined test conditions.*

**** *The chuck layer capacitance is measured with a B1500 with HR-SMU B1517, the FormFactor progam "CAP_F-G-300pA" at defined test conditions.*

Coaxial Chuck Performance*	Thermal Chuck				
	@ -55°C	@ -40°C	**@ 25°C**	**@ 200°C**	**@ 300°C**
Breakdown Voltage	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
Resistance	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 5 x 10^{10} Ω
Capacitance	≤ 800 pF	≤ 800 pF	≤ 800 pF	≤ 800 pF	≤ 800 pF

* *Chuck performance measured inside test chamber at dew point < -70°C.*

System Electrical Performance (With Thermal Chuck)		**CM300xi-F FemtoGuard**	**CM300xi-S FemtoGuard**	**CM300xi-S Coax**
Probe leakage*	Thermal Controller OFF	≤ 1 fA	≤ 1 fA	≤ 1 fA
	Thermal Controller ON	≤ 5 fA	≤ 10 fA	≤ 10 fA
Chuck leakage* (ATT)	Thermal Controller OFF	≤ 3 fA	≤ 15 fA	≤ 25 pA
	-55°C	≤ 6 fA	≤ 20 fA	≤ 25 pA
	-40°C	≤ 6 fA	≤ 20 fA	≤ 25 pA
	25°C	≤ 3 fA	≤ 20 fA	≤ 25 pA
	200°C	≤ 3 fA	≤ 20 fA	≤ 25 pA
	300°C	≤ 6 fA	≤ 25 fA	≤ 220 pA
Residual capacitance**		≤ 2.5 pF	≤ 75 pF	N/A
Capacitance variation**		≤ 2 fF	≤ 75 fF	≤ 75 fF
Settling time***	All temperatures @ 10 V	≤ 50 fA @ 0.5 sec	≤ 100 fA @ 2 sec	N/A

* *Overall leakage current is comprised of two distinctly separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance. Noise is low-frequency ripple superimposed on top of offset and is due to disturbances in the probe station environment.Noise and leakage are measured with a B1500 with HR-SMU B1517 and the FormFactor program "DCN@10V" at defined test conditions.*

** *The residual (triaxial) chuck capacitance is measured with a B1500 with HR-SMU B1517 with the FormFactor progam "Cap-Trx-3pA" at defined test conditions on a CM300xi with standard TopHat installed. This is chuck capacitance variation based upon chuck position anywhere in the 300 mm area, as measured by a stationary DC probe.*

*** *Settling time is measured with a B1500 with HR-SMU B1517 and the FormFactor program "ST_10V" at defined test conditions.*

Thermal System Performance

ATT Thermal System

Model	**TS-426-14E/R TS-416-14E/R**	**TS-426-08P/R**	**TS-416-02T**	**TS-416-05T**
Components	Controller, Chiller	Controller, Chiller	Controller	Controller, Booster
Type	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Temperature range	-60°C to 300°C	-40°C to 300°C	+30°C to 300°C	+20°C to 300°C
Temperature control	Pt100 (in Chuck)	Pt100 (in Chuck)	Pt100 (in Chuck)	Pt100 (in Chuck)
Resolution	0.1°C	0.1°C	0.1°C	0.1°C
Wafer temperature accuracy[1,2]	+/- 2.5°C	+/- 2.5°C	+/- 2.5°C	+/- 2.5°C
Thermal uniformity[1,3]	1.0°C @25°C 2.0 °C @-60°C 3.0°C @300°C	1.0°C @25°C 2.0 °C @-40°C 3.0°C @300°C	1.0°C @30°C 3.0°C @300°C	1.0°C @25°C 3.0°C @300°C

ATT Thermal Transition Times[4]

Cooling				
25°C to -40°C	17 min 34 min (Eco[5])	59 min	-	-
25°C to -60°C	53 min	-	-	-
200°C to 25°C	18 min 27 min (Eco[5])	28 min	60 min (200°C to 30°C)	80 min (200°C to 25°C)
300°C to 25°C	33 min 44 min (Eco[5])	35 min	70 min (300°C to 30°C)	90 min (200°C to 25°C)
Heating				
-60°C to 25°C	7 min	-	-	-
-40°C to 25°C	5 min	5 min	-	-
25°C to 200°C	19 min	19 min	17 min (30°C to 200°C)	23 min
25°C to 300°C	35 min	35 min	33 min (30°C to 300°C)	39 min

[1] As measured with type-K thermocouple surface probe. Conditions: 12 mm diameter probe head, closed chamber with minimum recommended purge air, probe centered in probing area, on standard silicon wafer, and chuck at standard probe height. Typical type K thermocouple probe tolerances are ± 2.2°C or ± 0.75% of the measured temperature in °C (whichever is greater).

[2] The test setup can change the wafer temperature accuracy from the calibration by ±5°C (typical). Test setup attributes include open or closed chamber, probe or probe card construction and number of contacts, purge air flow rate, and lab environmental conditions.

[3] Peak-to-peak temperature measurement variation across probing sites.

[4] Typical values, facilities media according to requirements as defined in the Facility Planning Guide.

[5] Eco mode limits the CDA consumption of the chuck to max. 315 l/min

Microscope Bridges/Transports

Progammable High Temperature Stability (HTS) Microscope Bridge for eVue Microscope System	
Travel	75 mm (X) x 75 mm (Y) x 150 mm (Z) (3.0 in. x 3.0 in. x 5.9 in.)
Travel in TopHat	26 mm x 26 mm (1 in. x 1 in.)
Z Lift	150 mm (5.9 in.)
Resolution, X-Y axis	1 µm (0.04 mils)
Resolution, Z axis	0.4 µm (0.016 mils)
Repeatability, X-Y axis	≤ 2 µm (0.08mils)
Repeatability, Z axis	≤ 1 µm (0.04mils)
Accuracy, X-Y axis	≤ 5 µm (0.2 mils)
Accuracy, Z axis	≤ 4 µm (0.016 mils)
Speed	5 mm/sec (0.2 in./sec)

Progammable Large Area Transport/Microscope Bridge	
Travel	300 mm (X) x 300 mm (Y) x 150 mm (Z) (12 in. x 12 in. x 5.9 in.)
Travel in TopHat	26 mm x 26 mm (1 in. x 1 in.)
Z Lift	150 mm (5.9 in.)
Resolution, X-Y axis	1 µm (0.04 mils)
Resolution, Z axis	0.4 µm (0.016 mils)
Repeatability, X-Y axis	≤ 5 µm (0.2 mils)
Repeatability, Z axis	≤ 2 µm (0.08 mils)
Accuracy, X-Y axis	≤ 10 µm (0.4 mils)
Speed	50 mm/sec (2 in./sec)
Planarity compensated	± 5 µm (0.2 mils)

Standard and Optional Features

		CM300xi-F	CM300xi-S
Base	Fully-shielded probe station platform, with MicroChamber, AttoGuard and PureLine technologies	●	-
	Shielded - Probe station platform with MicroChamber	-	●
	Programmable XYZ Theta Chuck stage	●	●
	Velox Controller PC (Windows 10) with dual TFT monitor 27” on ergo arm	●	●
	ContactView™ (side view camera) in East-West direction	◐	◐
	Additional ContactView™ (side view camera) in North/South direction	○	○
	IntelliControl, including Airgun and Vacuum connection at front, additional LAN and USB ports at rear side	●	○
	Active Vibration Dampening System	●	●
	AirGun and Vacuum connection at front	-	○
	GPIB interface	●	●
Microscope Transport	Programmable HTS Microscope Bridge 75 mm x 75 mm	◐	◐
	Large area microscope bridge/transport – programmable 300 mm x 300 mm	○	○
	Manual Microscope Transport 50 mm x 50 mm	-	○
Platen Inserts	EMI- and light-tight shielding with TopHat, AttoGuard technology for accurate IV/CV measurements	●	◐
	EMI- and light-tight shielding with TopHat	-	◐
	IceShield	○	○
	Available probe card holders: open, shielded, HTS shielded	○	○
	4-sided RF-TopHat for RPP positioners and probe arms with inclined angle	○	○
User Interface Options	Velox Dash, tablet with Velox companion app, keyboard, mouse	◐	◐
	Classic user interface with joystick, keyboard and mouse	○	○
	3D Manual Controls, including XY Knobs and Virtual Platen Lift for intuitive, rapid and precise manual control of the stage in X, Y and Z direction	○	○
Automation Options	Semi-automated configuration	◐	◐
	Semi-automated configuration (with possibility to upgrad to fully-automated configuration)	○	○
	Fully-automation configuration for operation with MHU301 or MHU300	○	○
	VueTrack on-axis probe-to-pad alignment solution	◐	◐
	ReAlign off-axis probe-to-pad alignment solution for opaque/vertical probe cards	○	○
Non-Thermal Chucks[1] (300 mm)	FemtoGuard triaxial chuck, non-thermal	○	○
	Coaxial chuck, non-thermal	-	○
	FemtoGuard triaxial chuck, non-thermal, with lift pins for fully-automated operation	-	○
	Coaxial chuck, non-thermal, with lift pins for fully-automated operation	-	○
Thermal Chucks[1] (300 mm)	FemtoGuard triaxial chuck, thermal, -60°C to 300°C (ATT)	◐	○
	Coaxial chuck, thermal, -60°C to +300°C (ATT)	○	◐
	FemtoGuard triaxial chuck, thermal, -60°C to 300°C (ATT), with lift pins for fully-automated operation with MHU301 or MHU300	○	○
	Coaxial chuck, thermal, -60°C to +300°C (ATT), with lift pins for fully-automated operation with MHU301 or MHU300	○	○
Chuck Benefits	Chuck mounted on roll-out stage for convenient and safe manual loading of wafers from the front	●	●
	Aux Chuck Kit including CAL chuck (left) and CLEAN chuck (right)	●	○
Custom Adaptions	Customer specific adaptions are available upon request	○	○

[1] All chucks are available with either nickel or gold plating. Thermal Chucks require a thermal system for operation at a controlled temperature.

● Always included ◐ Default configuration ○ Option

Thermal Systems		Compatibility	
Part Number	**General Description**	**CM300xi-F**	**CM300xi-S**
TS-426-14E	Thermal System, -60°C to 300°C, ATT (220-240 VAC 50 Hz), CDA-saving, requires CDA dew point <-80°C	○	○
TS-426-14R	Thermal System, -60°C to 300°C, ATT (200-220 VAC 60 Hz, 200 VAC 50 Hz), CDA-saving, requires CDA dew point <-80°C	○	○
TS-416-14E	Thermal System, -60°C to 300°C, ATT (220-240 VAC 50 Hz), with air dryer	○	○
TS-416-14R	Thermal System, -60°C to 300°C, ATT (200-220 VAC 60 Hz, 200 VAC 50 Hz), with air dryer	○	○
TS-426-08P	Thermal System, -40°C to 300°C, ATT (200-240 VAC 50/60 Hz), CDA-saving, requires CDA dew point <-70°C	○	○
TS-426-08R	Thermal System, -40°C to 300°C, ATT (208-230 VAC 60 Hz), CDA-saving, requires CDA dew point <-70°C, UL-certified	○	○
TS-416-05T	Thermal System, +20 to 300°C, ATT (100-230 VAC 50/60Hz)	○	○
TS-416-02T	Thermal System, +30 to 300°C, ATT (100-230 VAC 50/60Hz)	○	○

CM300xi fully-automated system with material handling unit MHU301.

CM300xi fully-automated system with material handling unit MHU300, showing dual load port configuration.

Wafer Loaders MHU300 and MHU301

Material handling unit	The footprint-optimized MHU301 or the powerfull MHU300 can be configured to provide fully automated testing. Both offer automated loading of the probe system with 200 mm and 300 mm SEMI spec wafers from FOUP/FOSB cassettes. The MHU301 comes with one SEMI standard load port, whereas the MHU300 can be configured with up to two load ports. Manual loading of wafer fragments (> 10 mm x 10 mm), as well as full wafers, are supported through manual loading of the prober, which bypasses the MHU.
Dual-prober ready	For the MHU300 up to two probe systems can be docked and operated simultaneously to a single central loader.
Wafer Cassettes	SEMI-compliant FOUP/FOSB cassettes (SEMI E47.1 , SEMI M31)*
Wafers	SEMI M1 compliant
Wafer ID Reading	The probe system has the optional ability to automatically identify wafers. Wafers are identified by a barcode [BC 412 (SEMI T1-95 Standard] and IBM 412, OCR text [SEMI M12, M13 and M1.15 Standard], IBM, Triple and OCR-A fonts or 2D code [Data Matrix (T7 and M1.15 Standard)] at the top or bottom side of the wafer.

**Tested on Entegris F300 Autopod (300 mm) and Entegris 198/192 (200 mm)*

Standard and Optional Features	**MHU301**	**MHU300**
Prober Orientation - single configuration with one CM300xi either on left or right side of the MHU	●	◐
Dual Configuration for 2 CM300xi in combination with one MHU	–	○
SEMI-compliant Load Port for 300 mm FOUP/FOSB cassettes	●	●
Additional Load Port for MHU300	–	○
Prealigner	●	●
Horseshoe End Effector for 200 mm and 300 mm wafers	●	●
RFID Reader for RFID tags on 300 mm wafer cassettes	○	○
Adapter for use of open 200 mm Wafer Cassettes	○	○
Adapter for use of open 200 mm Wafer Cassettes, including RFID reader for 200 mm cassettes	○	○
Optical Wafer ID Reader for reading optical codes[1] on top and back side of wafer	○	○
Optical Wafer ID Reader for reading optical codes[1] on top side of wafer	○	–
Optical Wafer ID Reader for reading optical codes[1] on back side of wafer	○	–
Fan Filter Unit for reducing dust pollution level inside MHU	○	○
Quick Access Port: Additional temporary storage slot inside MHU for 2 wafers	○	–
Seismic restraint kit	○	○

[1] OCR: Semi-Font (SEMI M12, M13 or SEMI M1.15), Triple, OCR-A, IBM, Chartered fonts; 2D: T7 Data Matrix (SEMI M1.15), Data Matrix, QR Code; Barcodes: BC 412 (SEMI T1-95), IBM 412

● Always included ◐ Default configuration ○ Option

System Throughput

Semi-automated system

Chuck stepping time	≤ 0.75 sec (200 µm Z down – 1000 µm X-Y – 200 µm Z up)

Fully-automated system*

FOUP cassette load	≤ 30 sec (incl. wafer scan)
Wafer handling cycles @ ambient	≤ 1.3 min (Cassette ➔ PreAligner ➔ Prober ➔ Cassette) ≤ 1.6 min (Cassette ➔ PreAligner ➔ IDReader[1] ➔ PreAligner ➔ Prober ➔ Cassette) < 1 min (Wafer 1: Prober -> Cassette; Wafer 2: Quick Access Port[1] -> Prober)

** Tested on Entegris F300 Autopod*
[1] Optional

Regulatory Compliance

Certification	CE declared, 3rd party tested for CB against IEC 61010 including National Standard CSA C22.2 No. 61010-1-12 / UL 61010-1:2012, certified for US and Canada (cNRTLus), SEMI S2 and S8. Copies of certificates are available on request.

Warranty

Warranty*	Fifteen months from date of delivery or twelve months from date of installation
Service contracts	Single- and multi-year programs available to suit your needs

** All performance metrics identified in this document are valid only when the system is installed and operated within the terms specified in the Facility Planning Guide.*

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