CM300xi Probe System

This facility planning guide defines the facility requirements for operation of your FormFactor CM300xi or CM300 probe station. The most recent version of this document can be found at CM300xi Facility Planning Guide. This guide applies to semi-automated and fully-automated configurations with MHU300/MHU301.

Facility requirements for thermal systems are listed in separate facility planning guides for the temperature ranges -60°C to +300°C, -40°C to +300°C, and +20/30°C to +300°C, respectively.

For information specific to the CM300xi-ULN or TESLA300 stations, see the CM300xi-ULN Facility Planning Guide or TESLA300 Facility Planning Guide, respectively.

For definitions of the icons in this document, please refer to the notational conventions described in your user guide.

Probe Station Requirements

Clean Dry Air (CDA)

CDA requirements vary depending on the system configuration and the temperature range in which the system will operate. CDA for General use purposes is always required, and is used for basic system functions like base table damping. CDA for the MicroChamber probing environment (PURGE) is additionally required for shielded and fully-shielded probe stations, such as CM300xi-S, CM300xi-F and CM300xi-ULN. CDA requirements for the thermal system (if applicable) are listed separately.

DANGER | ACHTUNG | DANGER

FormFactor does not endorse or recommend using nitrogen instead of CDA for thermal system operation with any FormFactor system due to the risk of oxygen depletion in the working environment. If your testing configuration requires the use of nitrogen instead of CDA for MicroChamber purge, time in Quick Purge mode should be controlled. Discuss your setup with your safety and facilities departments to ensure that the oxygen flow in your working environment is adequate to dissipate any nitrogen build up. The use of oxygen sensor alarms is also recommended.

FormFactor schreibt die Verwendung von Stickstoff anstelle von reiner Trockenluft nicht vor und spricht hierfür auch keine Empfehlung aus, was die verschiedenen FormFactor-Systeme anbetrifft. Es besteht nämlich das Risiko, dass am Einsatzort der Luftsauerstoff aufgebraucht wird.Wenn Sie sich für die Verwendung von Stickstoff entscheiden, da Ihre Testkonfiguration für die MicroChamber-Spülung die Verwendung von Stickstoff anstelle von reiner Trockenluft erfordert, ist eine Begrenzung der Zeit, in der das System im Schnellspülmodus (Quick Purge) verweilt, erforderlich, da fortlaufend Stickstoff aus dem System an die Umwelt abgegeben wird. Sprechen Sie Ihren Systemaufbau mit Ihren Beauftragten für Arbeitssicherheit und Anlagenmanagement durch um sicherzustellen, dass ausreichend Sauerstoff in der Raumluft Ihrer Arbeitsumgebung vorhanden ist und eine übermäßige Anreicherung der Raumluft mit Stickstoff verhindert werden kann. Darüber hinaus wird die Verwendung eines Alarmsystems mit Sauerstoffsensor empfohlen.

FormFactor n'approuve ni ne recommande l'utilisation d'azote au lieu d'air sec propre sur aucun de ses systèmes, en raison du risque d'appauvrissement en oxygène que cela peut entraîner en milieu de travail.Si vous décidez d'utiliser de l'azote car votre configuration de contrôle nécessite son emploi au lieu d'air sec propre pour purger le système MicroChamber, vous devez limiter le temps consacré en mode de purge rapide (Quick Purge), car l'azote sera constamment évacué du système vers l'environnement. Discutez de votre configuration avec les services responsables de la sécurité et des installations pour vous assurer que le débit d'oxygène dans l'environnement de travail est suffisamment adéquat pour éviter une accumulation excessive d'azote. L'utilisation d'un détecteur d'oxygène est également recommandée.

CDA (cont'd)	General use (CDA VIT)	• ISO 8573.1 Class 1.4.1 (3°C pressure dew point, oil less than 0.01 mg/m3) • 8 mm OD push-in tube connection • 6-10 bar (87-145 psi) absolute, 5-9 bar (72-130 psi) gauge • CM300xi-S, -F, -ULN: – Flow rate for semi-automated prober: max. 10 l/min – Flow rate for fully-automated single prober with MHU301/MHU300 (1 loadport): max. 40 l/min – Flow rate for fully-automated dual prober system with MHU300 and 2 loadports: max. 80 l/min • CM300-O: – Flow rate for semi-automated prober: max. 30 l/min – Flow rate for fully-automated single prober with MHU301/MHU300 and 1 load-port: max. 70 l/min – Flow rate for fully-automated dual prober system with MHU300 and 2 loadports: max. 110 l/min
	MicroChamber probing environment (PURGE) (Not applicable for CM300-O)	• ISO 8573.1 Class 1.x.1 (required pressure dew point is dependent on operating temperature, oil less than 0.01 mg/m3), 7-10 bar (102-145 psi) absolute, 6-9 bar (87-130 psi) gauge – Required pressure dew point of PURGE air is dependent on operating temperature range: ○ Thermal system operated down to +20°C: ≤-20°C at SATP* -> ISO8573.1 class 1.3.1 ○ Thermal system operated down to -40°C: ≤-50°C at SATP* -> ISO8573.1 class 1.1.1 ○ Thermal system operated down to -60°C: ≤-70°C at SATP* -> ISO8573.1 class 1.1.1 • Semi- and fully-automated systems: – Max flow: 240 l/min (8.5 CFM) at SATP* – Continuous flow: 80 l/min (2.8 CFM) at SATP* • Dual-prober systems (two stations): – Max flow: 480 l/min (17 CFM) at SATP* – Continuous flow: 160 l/min (5.6 CFM) at SATP* **NOTE | HINWEIS | REMARQUE** *Lower available peak flow may extend cooling and conditioning times.* *Ein niedrigerer verfügbarer Spitzenfluss kann die Kühl- und Konditionierungszeiten verlängern.* *Un débit de pointe plus faible peut prolonger les temps de refroidissement et de conditionnement.* • 12 mm OD push-in tube connection (3 m max tube length)
	* Standard Ambient Temperature And Pressure (SATP)	
Vacuum	• Wafer hold on chuck and positioners: – Required: < 250 mbar (7.4 inHg) absolute/ < -760 mbar (-22.5 inHg) gauge at SATP*. Absolute vacuum pressure must not increase for leakage rates up to 10 l/min (0.35 CFM). – 10 mm OD push-in tube connection (3 m max tube length) • Wafer hold only (while under test to ensure measurement performance): – Vacuum pressure stability: ± 10 mbar (0.3 inHg)	

Power	Single prober	(Includes power for the probe station and 4 additional AC outlets [on the back side], available for customer test equipment [limited by 6.3 A fuse]). • Single phase: 100-127 VAC or 208-240 VAC 50/60 Hz • Maximum 1500 VA • Short circuit current rating (SCCR): 5 kA (UL508A) • Main connector: Grounded IEC appliance inlet C14, according to IEC 60320,UL 498, CSA C22.2 no. 42 (for cold conditions) pin-temperature 70°C, 10 A, protection class I. A region dependent power cord connects IEC C14 to common local power plug (1 phase, grounded). • Facility power line fuse: semi-automated 1x 16A IEC60269 class gG or 1x 15A UL248 class J (lead fuses)
		• Circuit breaker minimum rating: 10,000 AIC
		• Overvoltage: – Transient overvoltage: Category II (IEC 60364-4-443) – Main supply voltage fluctuations not to exceed ± 10% of the nominal voltage
		• AC power line harmonics: – Fundamental power line frequency to 50th harmonic – Total harmonics <3%
		For information on other optional components, refer to the data sheet for the particular item.
	MHU301	• Single phase: 100-240VAC ±10%, 50/60 Hz • Maximum 1500 VA • Short circuit current rating (SCCR): 5 kA (UL508A) • Main connector: – Grounded IEC appliance inlet C14, according to IEC 60320,UL 498, CSA C22.2 no. 42 (for cold conditions) pin-temperature 70°C, 10 A, protection class I. – A region dependent power cord connects IEC C14 to common local power plug (1 phase, grounded). • Facility power line fuse: 1x 16A IEC60269 class gG or 1x 15A UL248 class J (lead fuses) • Protection class: I (IEC 61140)
	Fully automated configuration: Single prober with MHU300	(Includes 1 CM300xi probe station, the MHU300, and 1 thermal system. The MHU300 supplies the connected CM300 probe station and thermal system with power, CDA VIT, PURGE, and vacuum.) • 3 phase: 120/208 VAC 60 Hz, 230/400 VAC 50 Hz, or 200 VAC 50/60 Hz • Maximum: 8100 VA • Short circuit current rating (SCCR): 10 kA (UL508A) • Main connector: – North America: NEMA L21-30P 30A/208V/3~ grounded mains plug – Europe: IEC 60309 32A/400V/3~ grounded mains plug – Asia: IEC 60309 32A/400V/3~ grounded mains plug – Japan: NEMA L15-30P 30A/250V/3~, 4 wire grounding • Facility power line fuse: – 3 x 32A IEC60269 class gG or 3 x 30A UL248 class J (lead fuses) – System input contains a 3x 30 A fuse according to UL 489

Power (cont'd)	Fully automated configuration: Dual prober with MHU300	(Includes 2 CM300xi probe stations, the MHU300, and 1 thermal system. The MHU300 supplies the connected CM300 probe stations and 1 connected thermal system with power, CDA VIT, PURGE, and vacuum. The second thermal system is independently powered and integrated in the probe station EMO.) • 3 phase: 120/208 VAC 60 Hz, 230/400 VAC 50 Hz, or 200 VAC 50/60 Hz • Maximum: 8100 VA • Short circuit current rating: 10 kA (UL508A) • Source: – North America: NEMA L21-30P 30A/208V/3~ grounded mains plug – Europe: IEC 60309 32A/400V/3~ grounded mains plug – Asia: IEC 60309 32A/400V/3~ grounded mains plug Japan: NEMA L15-30P 30A/250V/3~, 4 wire grounding	
Thermal systems	Refer to the facility preparation guide for your thermal system.		
Environmental conditions	Operating	• Indoors only • Altitude up to 2000 m	
	Temperature	• Operating range: +18°C to +24°C • Max. temperature variation: +/- 1 K	
	Relative humidity	• 20% to 60% (20% to 50% with sub-ambient thermal system)	
	IP rating	• X0	
	Pollution degree	• 2	
	Ambient vibration (including floor)	The probe station is intended for use in an environment having background vibrations at or below the ISO operating theatre level: • Maximum level 4000 micro-in./sec, measured using the 1/3-octave-band velocity spectra method. This is equivalent to 100 µm/s of displacement velocity, or 100 µg (g = 9.8 m/s²), and equivalent to a displacement acceleration of 100 µm/ s².	
	Clean room class	• Class ISO 7 corresponding to ISO 14644-1 (equivalent class 10,000 per US FED STD209E)	
Dimensions (WxDxH)	Probe station(s)	See Dimensions on page 6 for details on dual prober, fully- and semi-automated system configurations.	
	Joystick	• 102 x 150 x 150 mm (4 x 6 x 6 in.), with connector installed • Located on the control console. Alternate placement may require an additional table.	
	Clearance	Front	• 800 mm (32 in.) for operator/installation during installation or service
		Back	• 1000 mm (39 in.) for service access • 800 mm (32 in.) when using optional holders for monitor, keyboard or test instrument
		Left/right	• 200 mm (8 in.) for cables, maximum 450 mm (18 in.) for use of control console • 800 mm (32 in.) during installation or service, or permanently when using optional holders for monitor, keyboard or test instrument
		Top	• 400 mm (16 in.)
		Additional clearance may be required for thermal system cooling units.	

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Weight	Probe station	Dual-prober	• Max. 2800 kg (6170 pounds)
		Fully-automated	• With MHU300 = max.1650 kg (3640 pounds) • With MHU301 = max. 1300 kg (2870 pounds)
		Semi-automated	• Max. 1150 kg (2540 pounds)
	Actual weight depends on configuration. A forklift is required for moving/unpacking the station(s) and MHU300.		
Shipping dimensions (WxDxH)	Station crate(s)	• 1430 x 1930 x 2050 mm (56 x 76 x 81 in.)	
	Loader crate	• MHU300 = 1400 x 1950 x 1850 mm (55 x 77 x 73 in.) • MHU301 = 740 x 1180 x 1590 mm (29 x 46 x 63 in.)	
	Accessories, up to 5 boxes	• Max. size: 1400 x 1500 x 1600 mm (55 x 59 x 63 in.)	
Shipping weight	Station crate(s)	• ≈1350 kg (2980 pounds)	
	Loader crate	• MHU300 = ~500 kg (1100 pounds) • MHU301 ≈ 200 kg (440 lb)	
	Accessories, up to 5 boxes	• Maximum weight depends on system configuration	

Dimensions

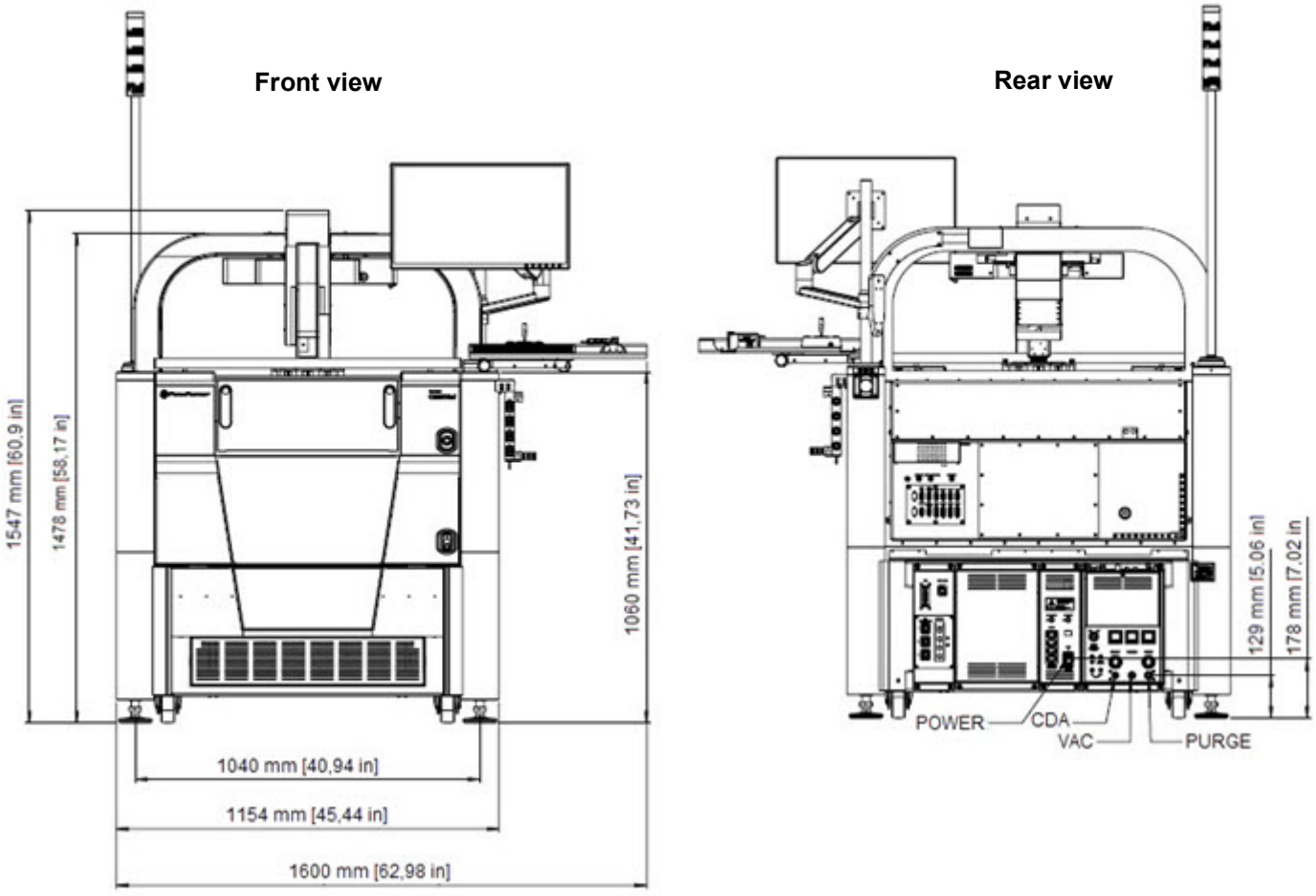
NOTE

Maximum height is shown. Actual height is determined by light tower type. Microscope transport type varies depending on system configuration.

Die maximale Höhe wird angezeigt. Die tatsächliche Höhe hängt vom Typ des Lichtmasts ab. Der Transporttyp des Mikroskops variiert je nach Systemkonfiguration.

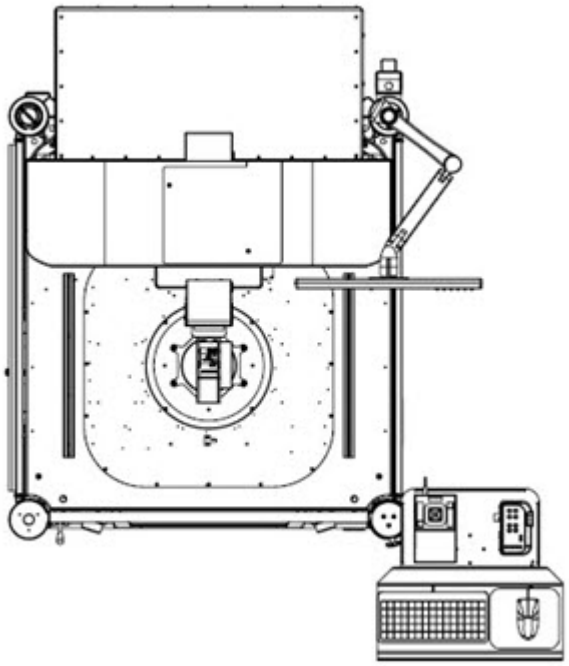
L'illustration montre la hauteur maximale. La hauteur réelle est déterminée par le type de tour d'éclairage. Le type de transport du microscope varie en fonction de la configuration du système.

Semi-automated Probe Station without MHU

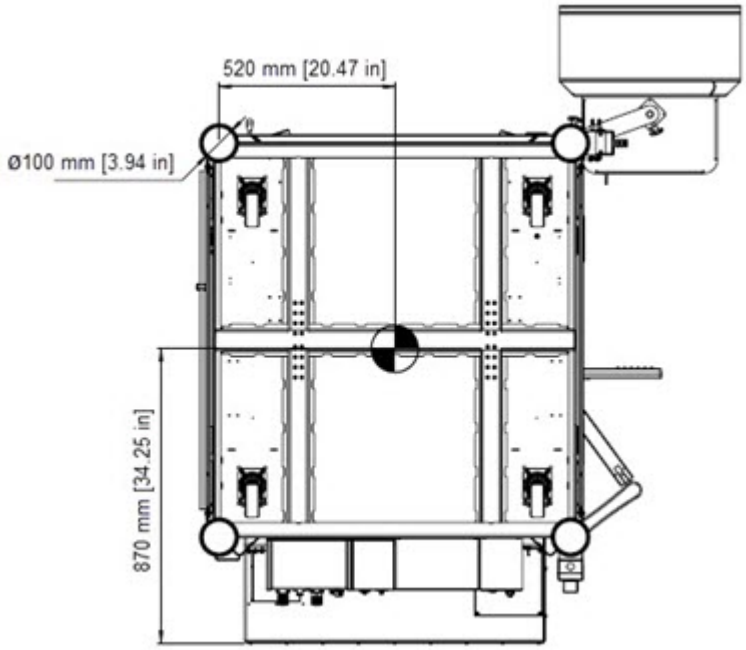


CM300xi Probe System

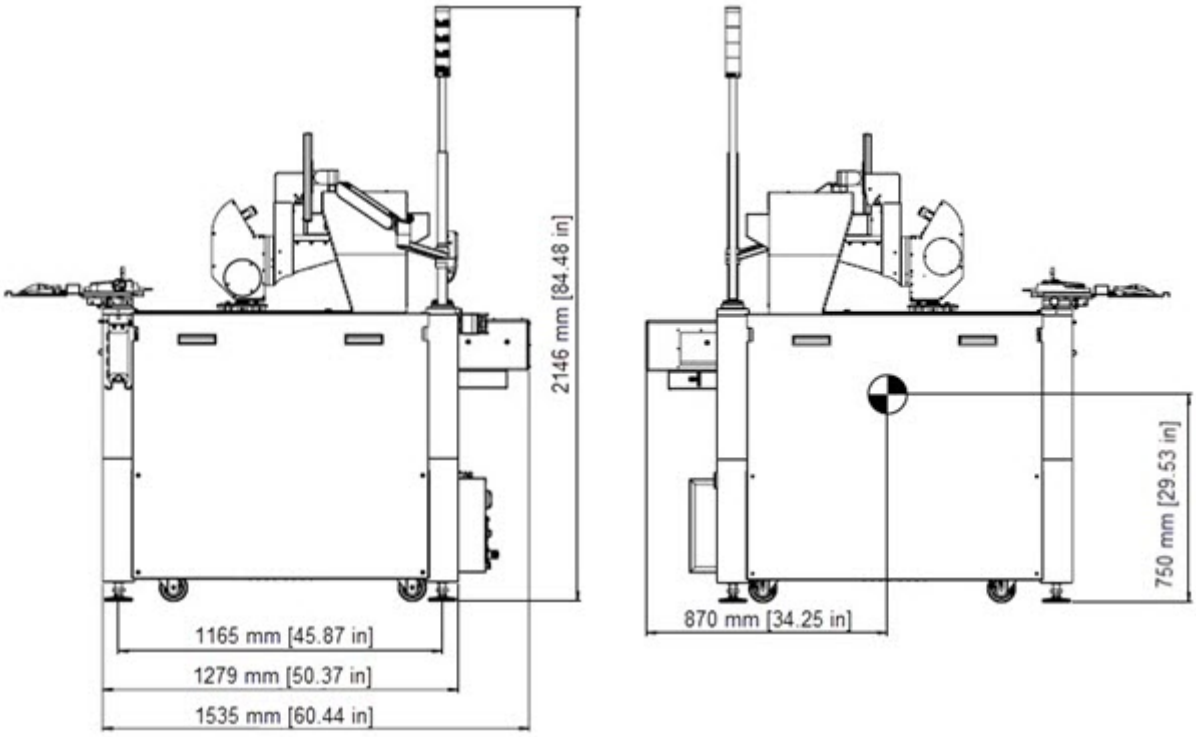
Top view



Bottom view



Side views



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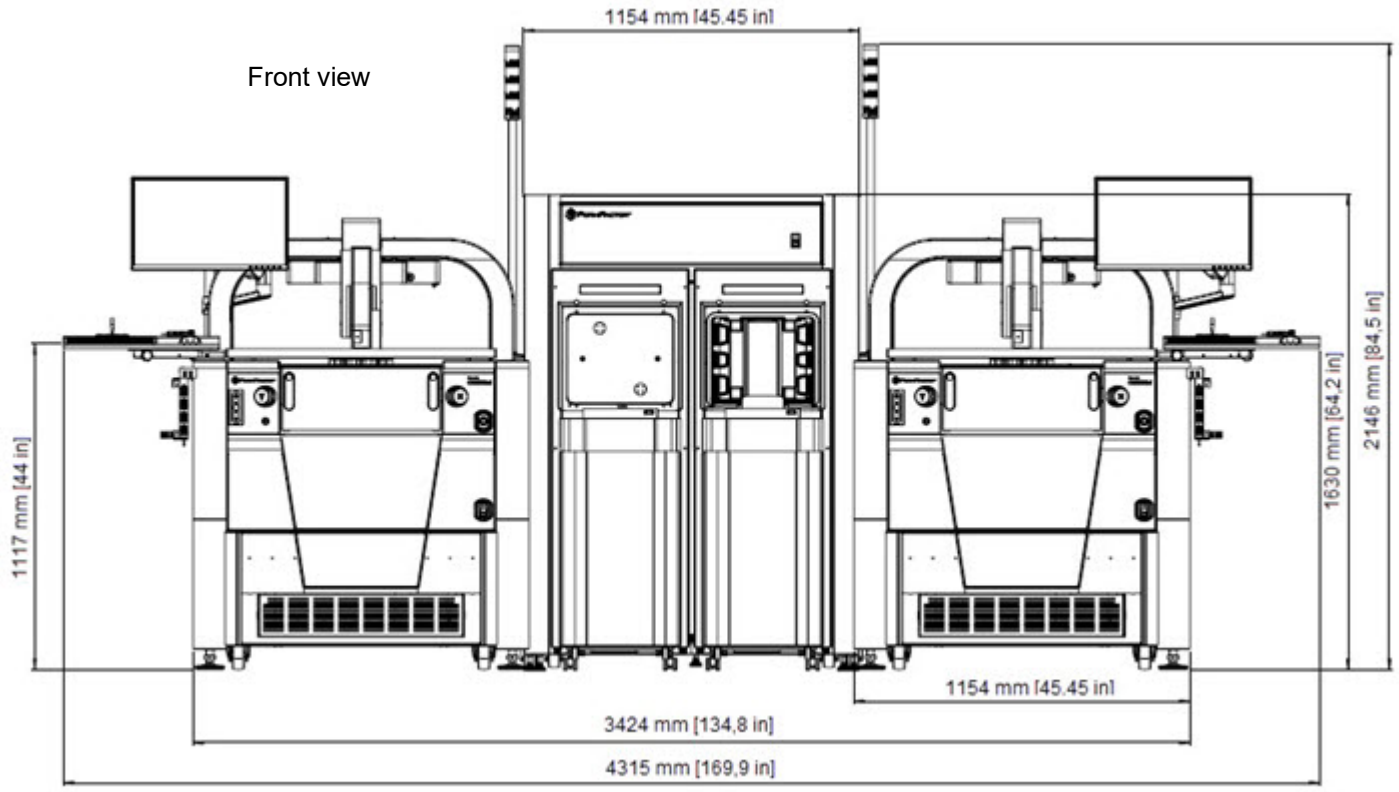
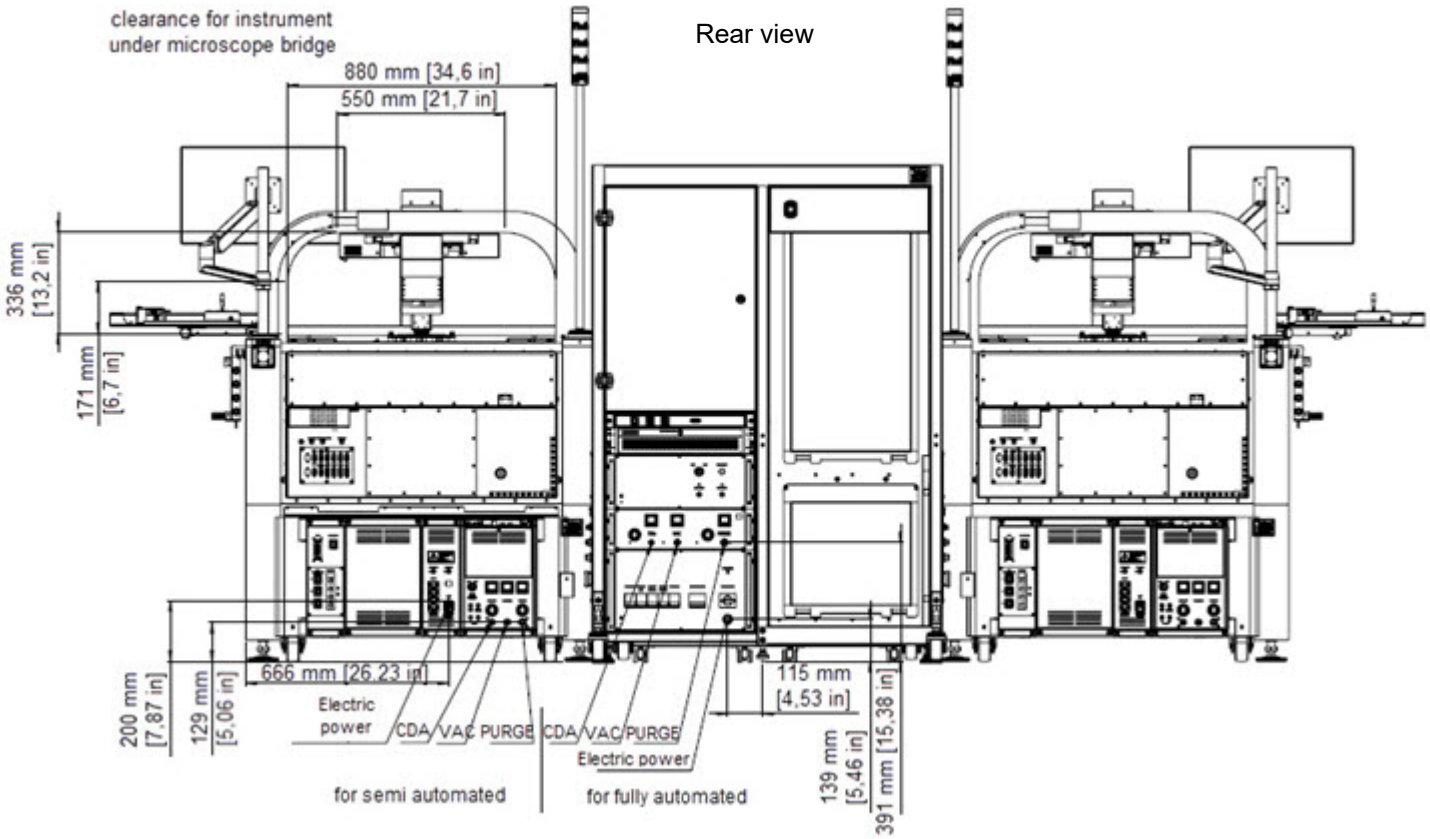
Fully-Automated Dual Probe Station with MHU300

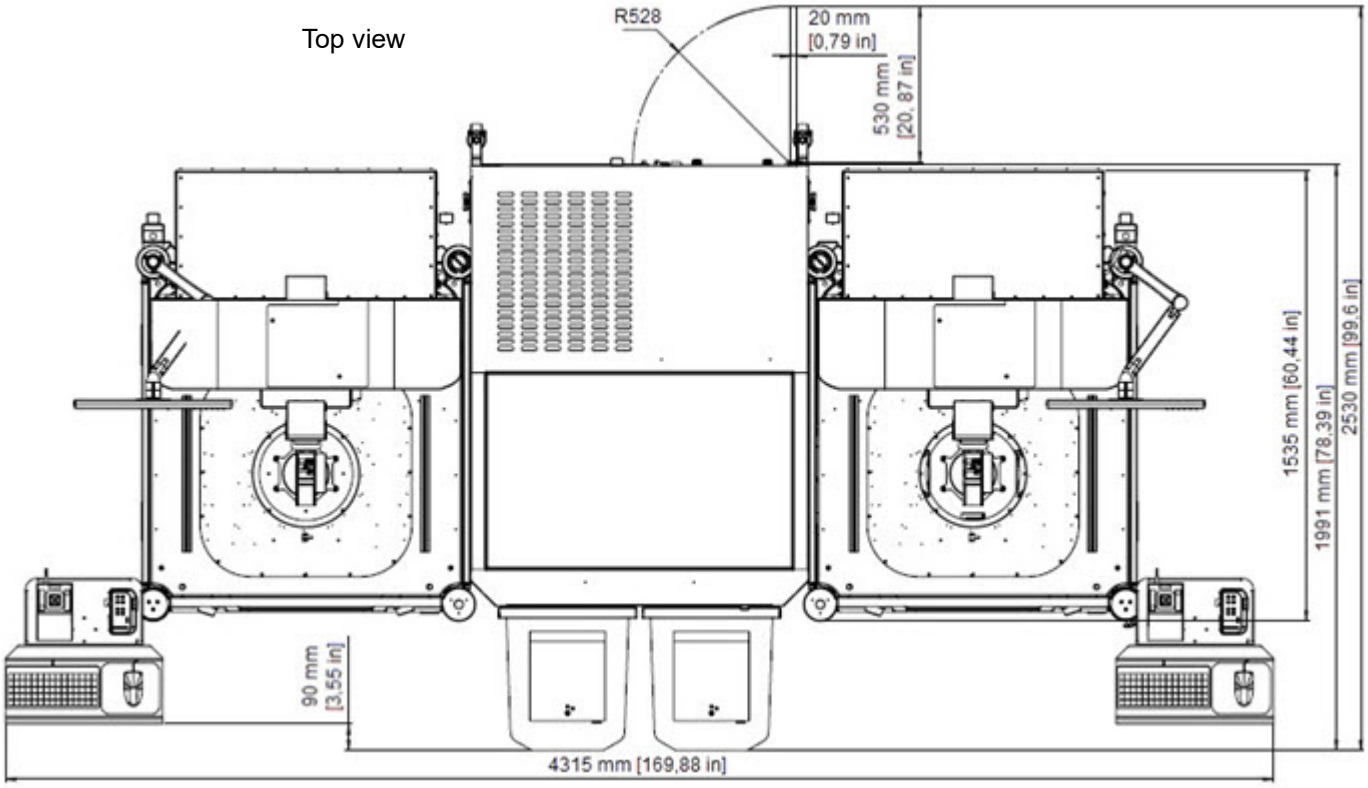


CM300xi Probe System

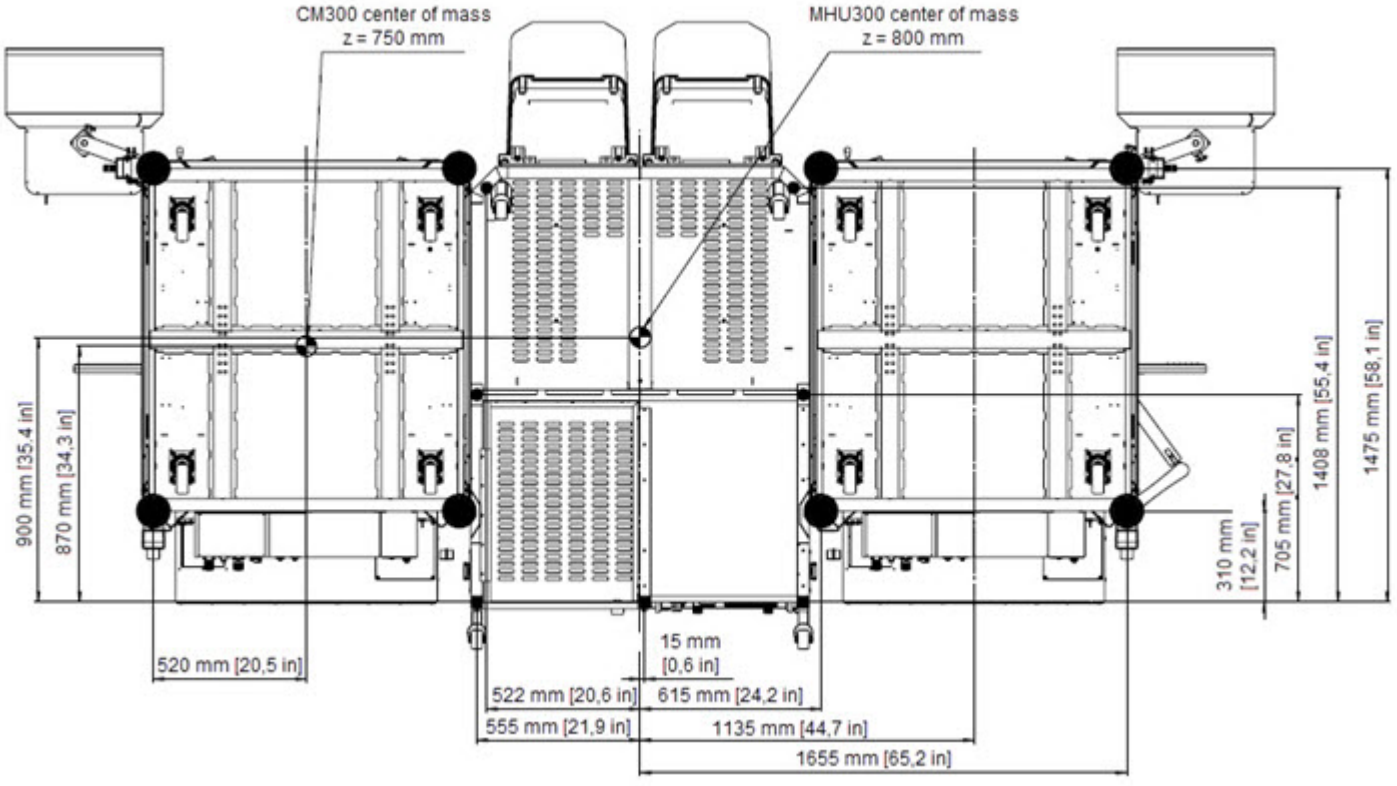


CM300xi Probe System

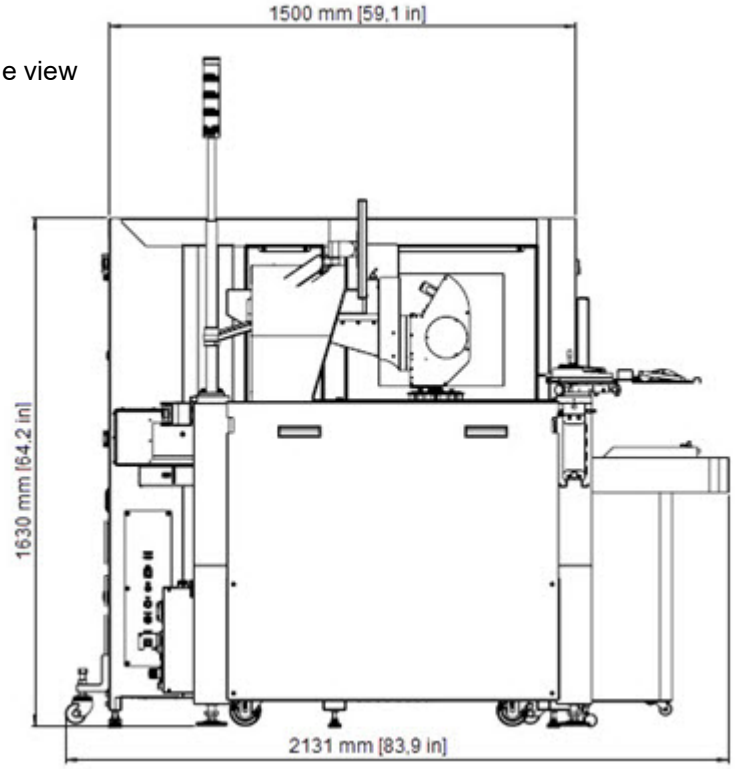
Top view



Bottom view

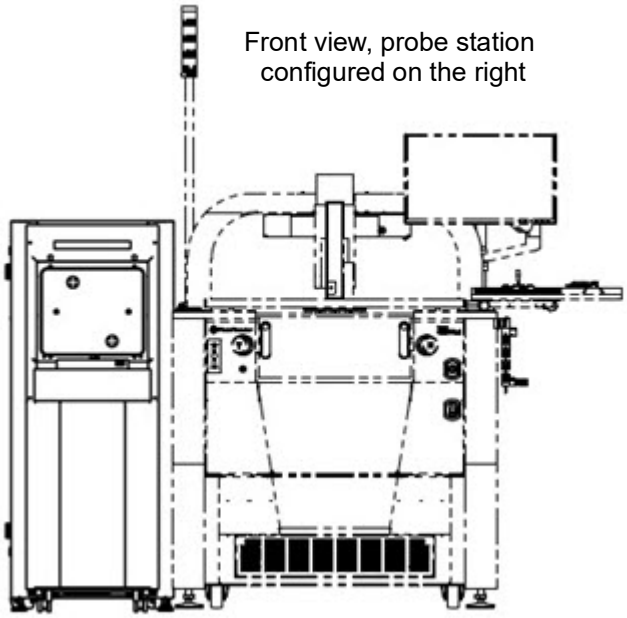


Side view

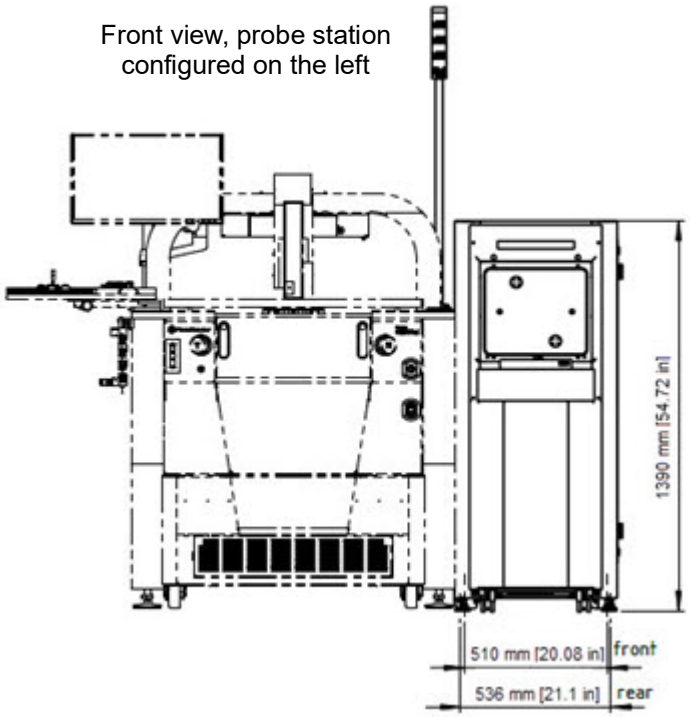


Fully-Automated Probe Station with MHU301

Front view, probe station configured on the right

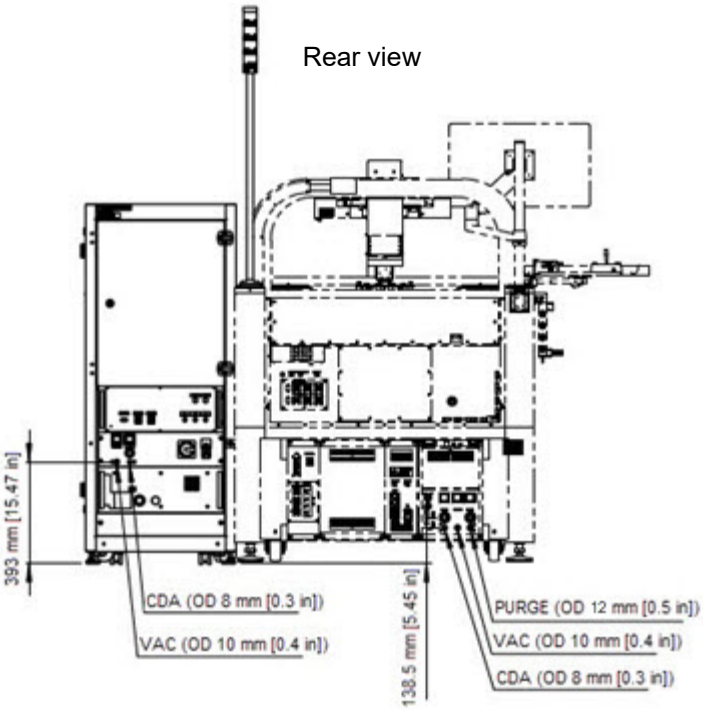


Front view, probe station configured on the left

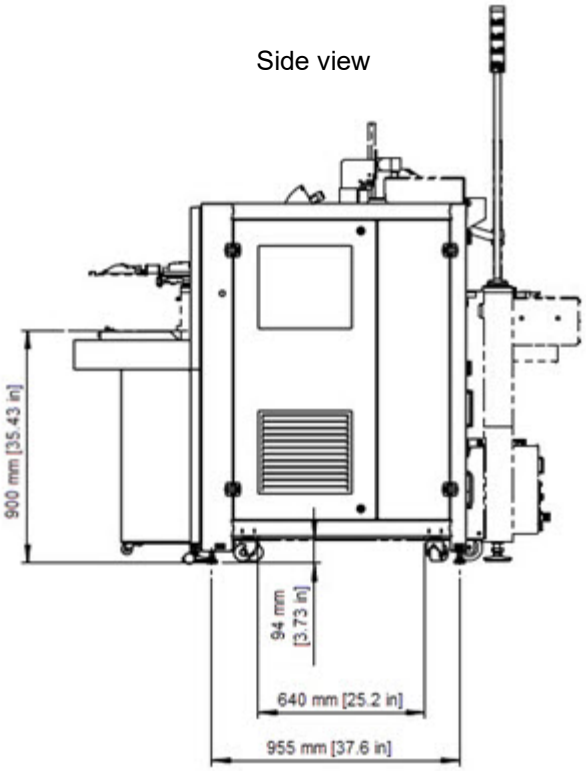


CM300xi Probe System

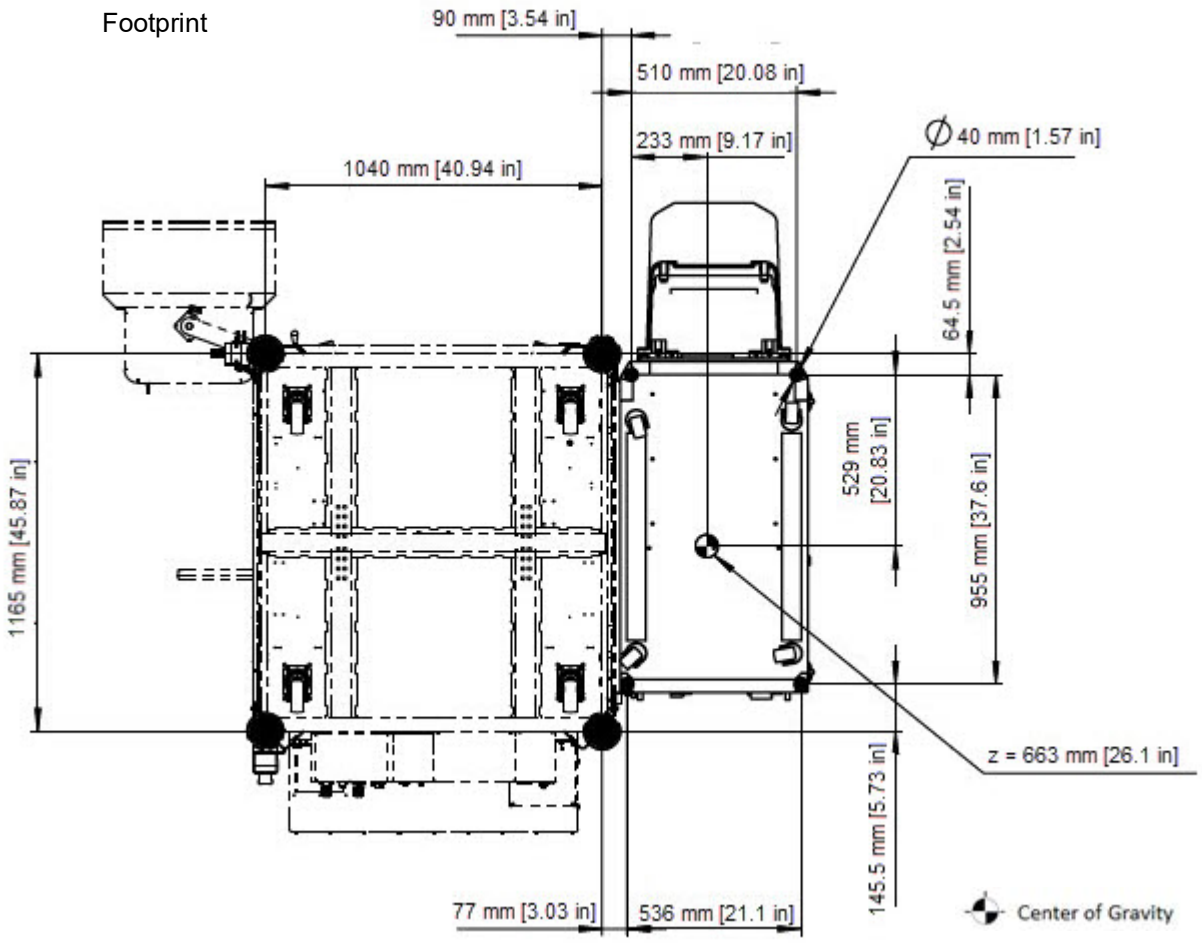
Rear view



Side view

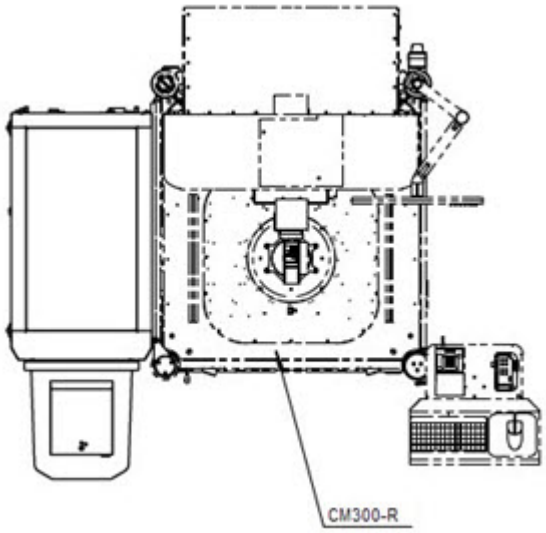


Footprint

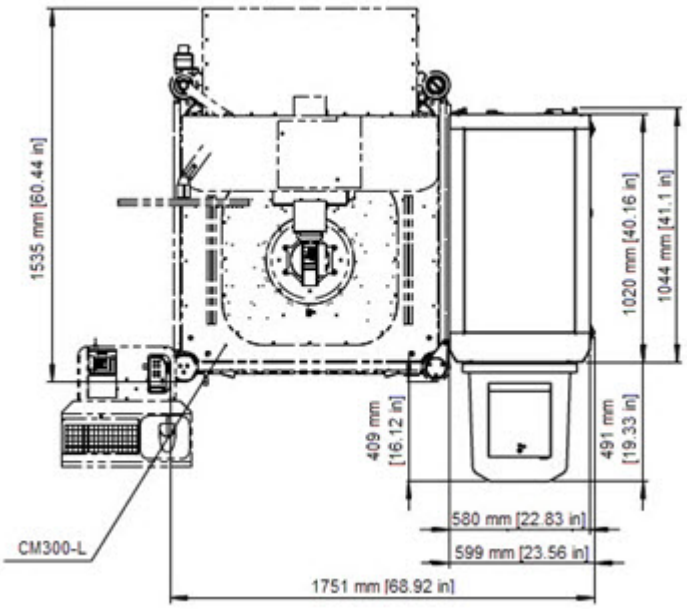

90 mm [3.54 in]
510 mm [20.08 in]
233 mm [9.17 in]
1040 mm [40.94 in]
Ø 40 mm [1.57 in]
64.5 mm [2.54 in]
529 mm [20.83 in]
955 mm [37.6 in]
1165 mm [45.87 in]
z = 663 mm [26.1 in]
145.5 mm [5.73 in]
77 mm [3.03 in]
536 mm [21.1 in]
Center of Gravity

CM300xi Probe System

Top view, configured on the right



Top view, configured on the left



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