ElectroForce™ Apex 1

Site Preparation Guide

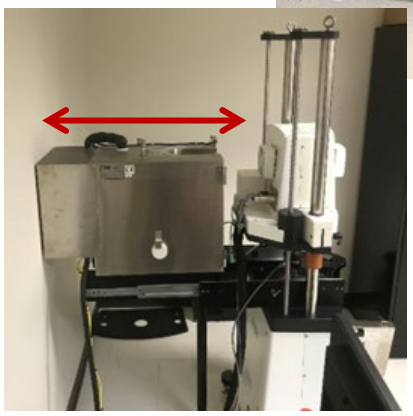
Revision B Issued April 2025

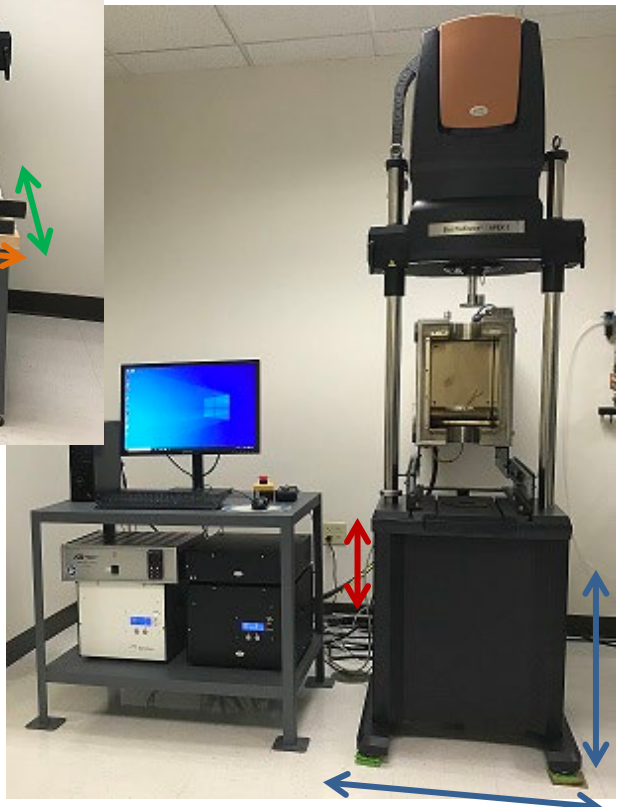
Table of Contents

Ideal Setup

IDEAL PLACEMENT AND BENCH MEASUREMENTS

Select a location with adequate floor and ceiling space and a rigid laboratory bench that is level and is in a vibration-free environment. Bench must be rated to support several hundred pounds.





Distance from the wall: 15.24 cm (0.5 ft) min.

Allow additional 86.36 cm (34 in) from the wall for optional hot/cold chamber

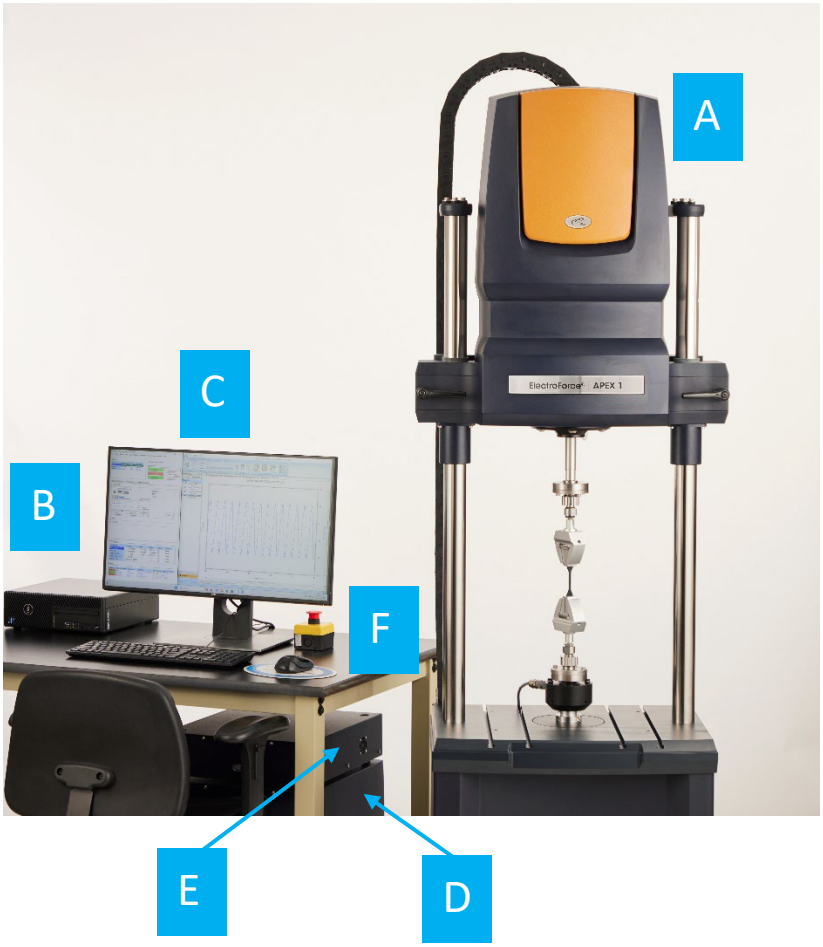
Table width: 152.4 cm (5 ft)

Table depth: 121.92 cm (4 ft)

Floor space: 91.44 cm x 91.44 cm (3 ft x 3 ft)

System Components

MAIN SYSTEM COMPONENTS



A Test Instrument	**D Power Supply**
B Computer Tower	**E Controller**
C Computer Monitor	**F Emergency Stop**

Instrument Measurements

APEX 1 – FLOOR STANDING FRAME

Max Height: 247.65 cm (97.5 in)
Min Height: 203.2 cm (80 in)

Width: 68.58 cm (27 in)

Depth: 68.58 cm (27.0 in)

Weight (Axial only): 257 kg (567 lbs)
Weight (Axial-Torsion): 290 kg (639 lbs)

APEX 1 – BENCHTOP

Max Height: 179.1 cm (70.5 in)
Min Height: 134.6 cm (53 in)

Width: 62 cm (27 in)

Depth: 53.3 cm (21 in)

Weight: 201 kg (443 lbs)

Instrument Measurements

AXIAL POWER SUPPLY FOR APEX 1

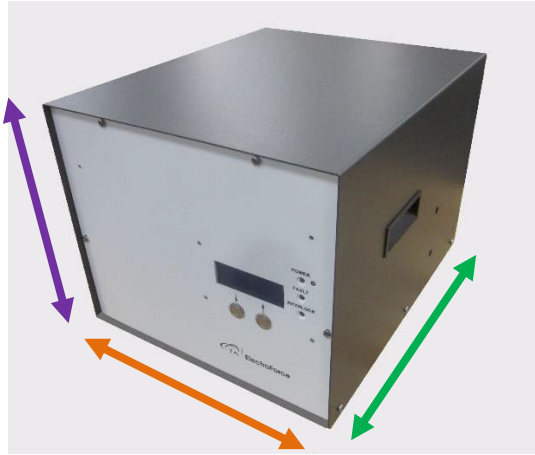
Height: 40.64 cm (16 in)

Width: 38.1 cm (15 in)

Depth: 40.64 cm (16 in)

Weight: 21.8 kg (48 lbs)

TORSION POWER SUPPLY FOR APEX 1



Height: 30.48 cm (12 in)

Width: 33 cm (13 in)

Depth: 40.64 cm (16 in)

Weight: 14.3 kg (31.5 lbs)

Instrument Measurements

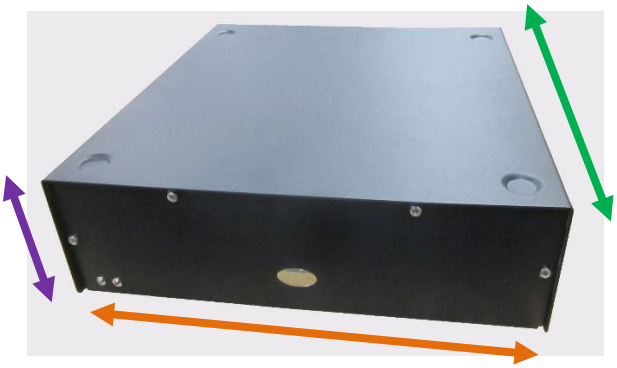
CONTROLLER FOR APEX 1

Height: 11.43 cm (4.5 in)

Width: 38 cm (15 in)

Depth: 40.64 cm (16 in)

Weight: 4.1 kg (9 lbs)



Utility Requirements

POWER

Item	Requirement
Power Supply	• Axial: 208–230V, 50–60 Hz, 10A • Torsion: 208–230V, 50–60 Hz, 2A • Neutral to Ground (NG) voltage max 0.5 volt • Safety ground per local regulation • Single phase
Controller Power	• 207–230V, 50–60 Hz Hz, 1.2A
Power cords provided	• 6-20P plug for 230V systems in North America and Japan • International: Line power cord provided is based on country


6-20P

CAUTION **Use power cords with plugs appropriate for your circuit.**

CAUTION Supply voltages lower than indicated may result in a degradation of performance.

CAUTION Ensure that the mains assigned do not also supply power to noise generating equipment nearby, such as motors, welders, transformers, etc.

Circulator Power Cooling Gas LN_2 Fluid Light Hardware Software Temp Lab Customer

Utility Requirements

GAS

Item	Requirement
System gas	Air
Pressure	552–621 kPa (80–90 psig) **NOTE**: Air gauge provided with system
Flow	45.3 L/min (1.6 CFM)
Connections	¼-inch push-to-connect or ¼-inch NPT female to filter/dryer/regulator with ¼-inch push-to-connect removed[1]

Conditions

	ISO8573-1:2010 Class	Solid Particulate				Water		Oil
		Maximum number of particles per m^3			Concentration	Vapor	Liquid	Total oil (aerosol, liquid, & vapor)
		0.1 – 0.5 micron	0.5 – 1 micron	1 – 5 micron	mg/m^3	Pressure dewpoint	g/m^3	ppm (mg/m^3)
	1	≤ 20,000	≤ 400	≤ 10	-	≤ -94°F (-70°C)	-	0.008 (0.01)
	2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40°F (-40°C)	-	0.08 (0.1)
Recommended →	3	-	≤ 90,000	≤ 1,000	-	≤ -4°F (-20°C)	-	0.83 (1)
Minimum Specs →	4	-		≤ 10,000	-	≤ +37°F (3°C)	-	4.2 (5)
	5	-		≤ 100,000	-	≤ +45°F (7°C)	-	-
	6	-	-	-	≤ 5	≤ +50°F (10°C)	-	-

[1] Interconnection between the system and the supplied filter/regulator equipment is via ¼-inch push-to-connect fittings; use supplied tubing.

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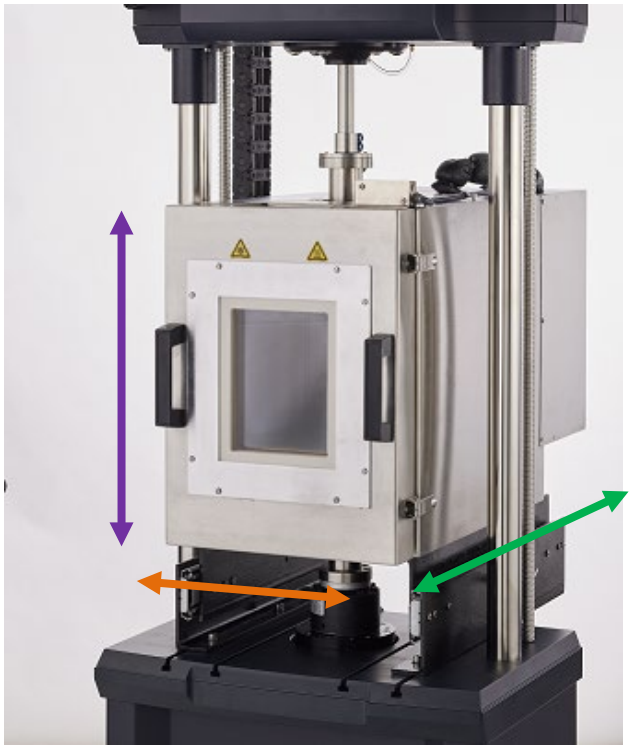
Accessories

HOT/COLD CHAMBER MEASUREMENTS



Height: 30.48 cm (12 in)

Width: 33 cm (13 in)

Depth: 40.64 cm (16 in)

Weight: 14.3 kg (31.5 lbs)

HOT/COLD CHAMBER CONTROLLER MEASUREMENTS

Height: 14 cm (5.5 in)

Width: 45.2 cm (17 in)

Depth: 35 cm (13 in)

Weight: 2.26 kg (5 lbs)

Accessories

HOT/COLD CHAMBER REQUIREMENTS

Item	Requirement
Gas	Liquid nitrogen
Pressure	152–345 kPa (22–50 psig)
Connections	½ -inch SAE, 45 degree flare fitting
Power	230V, 50–60 Hz Hz,9.6A/2200W, 1 ph

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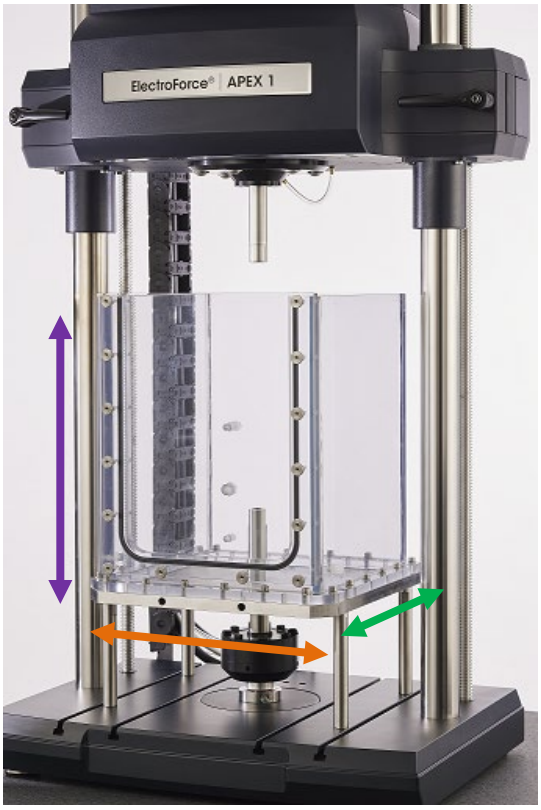
Accessories

ENVIRONMENTAL BATH MEASUREMENTS



Height: 30.48 cm (12 in)

Width: 33 cm (13 in)

Depth: 40.64 cm (16 in)

Weight: 14.3 kg (31.5 lbs)

ENVIRONMENTAL BATH CONTROLLER MEASUREMENTS

Height: 14 cm (5.5 in)

Width: 36.58 cm (14 in)

Depth: 27 cm (10 in)

Weight: 1.36 kg (3 lbs)

Accessories

ENVIRONMENTAL BATH REQUIREMENTS

Item	Requirement
Power	207–230 VAC, 50/60 Hz, 3.0A

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Accessories

AIR CHILLER SYSTEM (ACS-3) MEASUREMENTS

Height: 112 cm (44 in)

Width: 37 cm (14.5 in) WITHOUT Chiller Panel

Width: 56 cm (22 in) WITH Chiller Panel

Depth: 56 cm (22 in)

Weight: 121 kg (267 lbs) WITHOUT Chiller Panel

Weight: 128 kg (282 lbs) WITH Chiller Panel

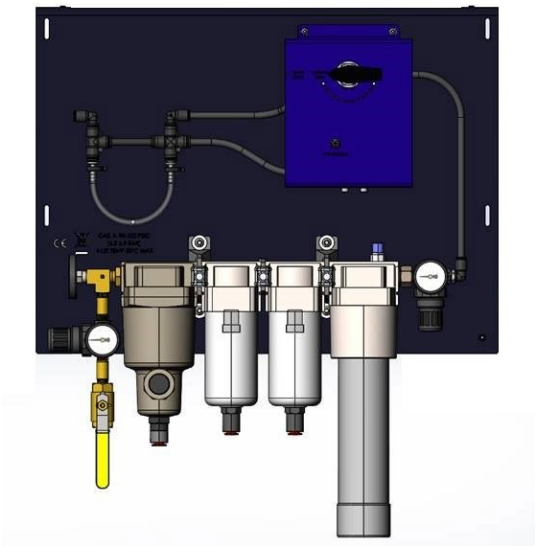
CHILLER PANEL MEASUREMENTS

Height: 64 cm (25 in)

Width: 56 cm (22 in)

Depth: 38.1 cm (15 in)

Weight: 7.25 (16 lbs)



Accessories

AIR CHILLER SYSTEM (ACS-3) REQUIREMENTS

Requirements	
	• 50 Hz: 207–252 VAC (refer to the serial number plate on the rear of the unit. The ACS is line frequency specific.) • 60 Hz: 216–252 VAC (refer to the serial number plate on the rear of the unit. The ACS is line frequency specific.) • 8A, 9A, 9.1A, or 11A (refer to the serial number plate on the rear of the unit) • US sites require an L6-20 single-phase outlet  NEMA L6-20 plug

	• Gas:
	  • Air or nitrogen
	  • Pressure: 6.9 bar (100 psig)
	  • Flow rate: 200 SLPM
	  • Temperature: 20–30°C
	  • Dew point: -40°C (-40°F) **NOTE**: Dew point is specified at operating pressure. Supplying dryer air at a lower dew point will extend continuous operation.

	• Lab Environment (must be below 25°C): 21°C–24°C = Ideal • Leave 20 cm (8 in) of space in the front and back of the ACS for ventilation

Circulator Power Cooling Gas LN_2 Fluid Light Hardware Software Temp Lab Customer

Site Preparation Checklist

ElectroForce Apex 1

Enough bench/floor space for instrument and computer

- ☐ Table width: 1.5 m (5 ft)
- ☐ Table depth: 1.2 m (4 ft)
- ☐ Floor space (for floor standing frame): 91.44 cm x 91.44 cm (3 ft x 3 ft)
- ☐ If optional Hot/Cold Chamber purchased, allow an additional 87.8 cm (34 in) from the wall so the system can slide back when not in use

Power supply is:

- ☐ Axial: 208–230V, 50–60 Hz, 10A
- ☐ Torsion: 208–230V, 50–60 Hz, 2A

Controller power is:

- ☐ 207–230V, 50–60 Hz, 1.2A

Purge gas

- ☐ Air: 552–621 kPa (80–90 psig)
- ☐ Flow rate: 45.3 L/min (1.6 CFM)
- ☐ 5 µm filtered
- ☐ Dew point ≤ 10°C

Optional Hot/Cold Chamber:

- ☐ Gas: Liquid nitrogen
- ☐ Pressure: 152–345 kPa (22–50 psig)

Optional ACS-3:

- ☐ Gas: Air or nitrogen
- ☐ Pressure: 6.9 bar (100 psig)
- ☐ Flow rate: 200 SLMP
- ☐ Dew point: -40°C (-40°F)
- ☐ L6-20 single phase outlet for US sites

- ☐ The Customer assumes responsibility for any damage that occurs when the instrument is moved by someone other than a trained TA Instruments Service Representative.

I hereby acknowledge that all utility requirements have been met per the checklist above and that they will be ready at the agreed time of installation.

<u>If all utility requirements are not met at the agreed time of installation, additional charges may be incurred for a return Service trip.</u>

_____ ___/___/___

Customer *DD* *MM* *YYYY*

_____ _____ _____ _____

Company *City* *State* *Country*

Please send a signed copy of the completed checklist to your local Service representative.

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Revision B Issued April 2025