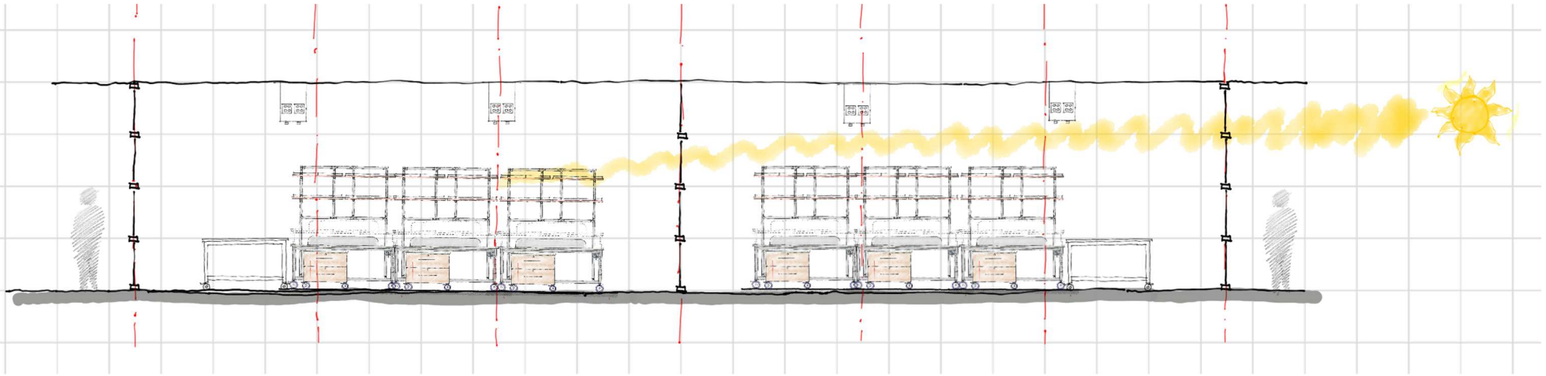
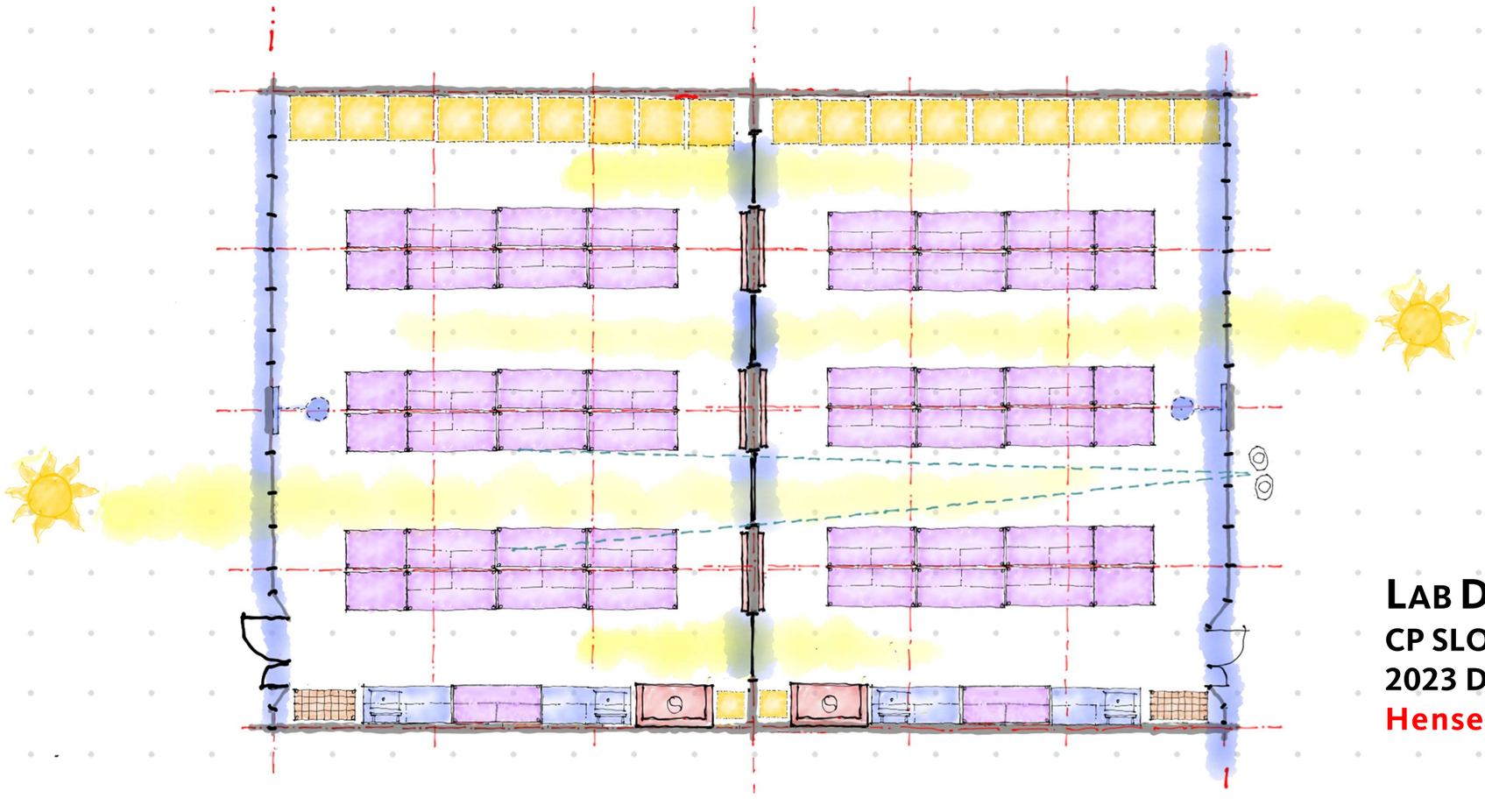


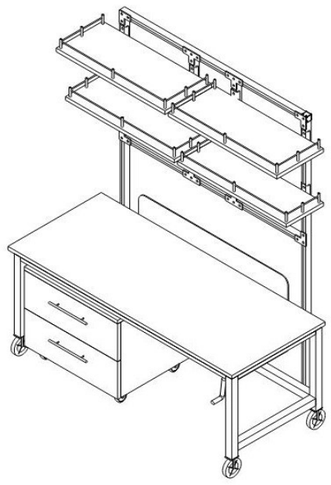


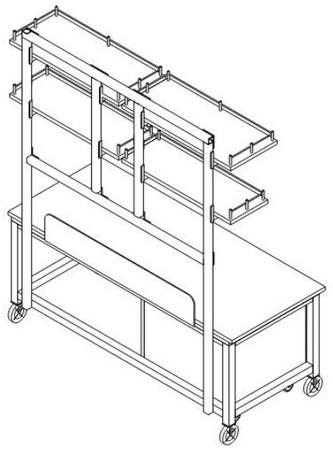
LAB DESIGN CRITERIA

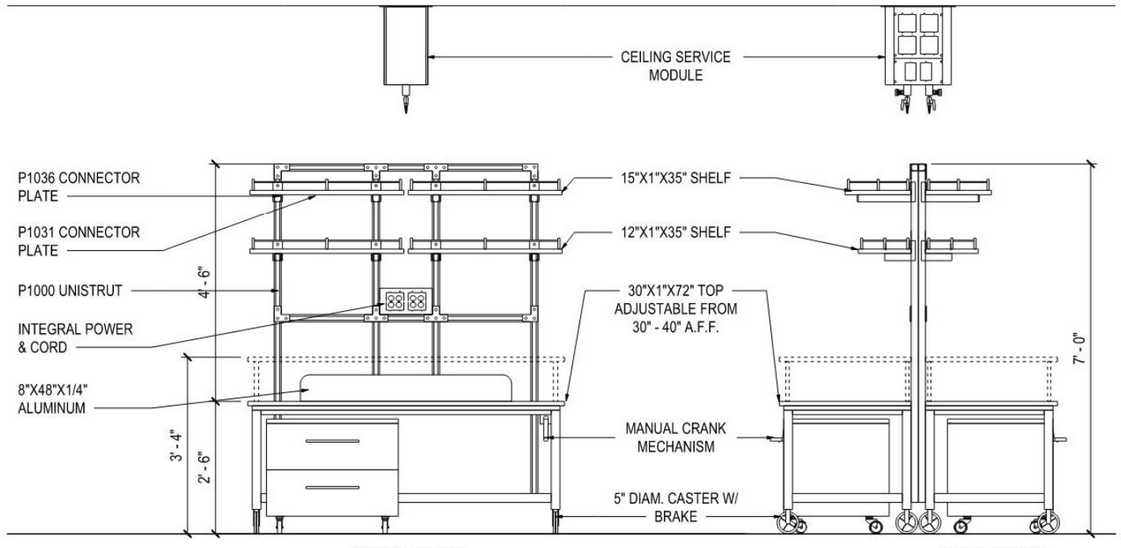
CP SLO Plant Science

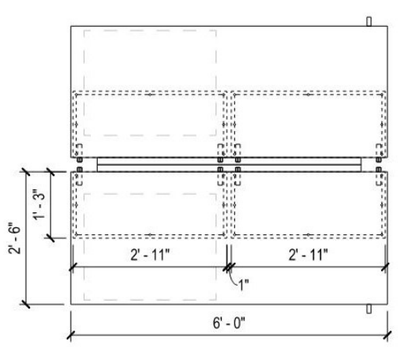
2023 Dec 29

Hensel Phelps/Gensler









PLAN VIEW

FRONT ELEVATION

SIDE ELEVATION

Contents

Summary

This lab design criteria sketchbook describes the research lab concept as discussed to date with CP SLO CAFES research group, and the Hansel Phelps/Gensler design/build team.

The primary consideration in the lab concept design is flexibility. Fixed, built-in lab furnishings are limited to chemical fume hoods and lab sink stations. However, these can be designed as moveable units if desired.

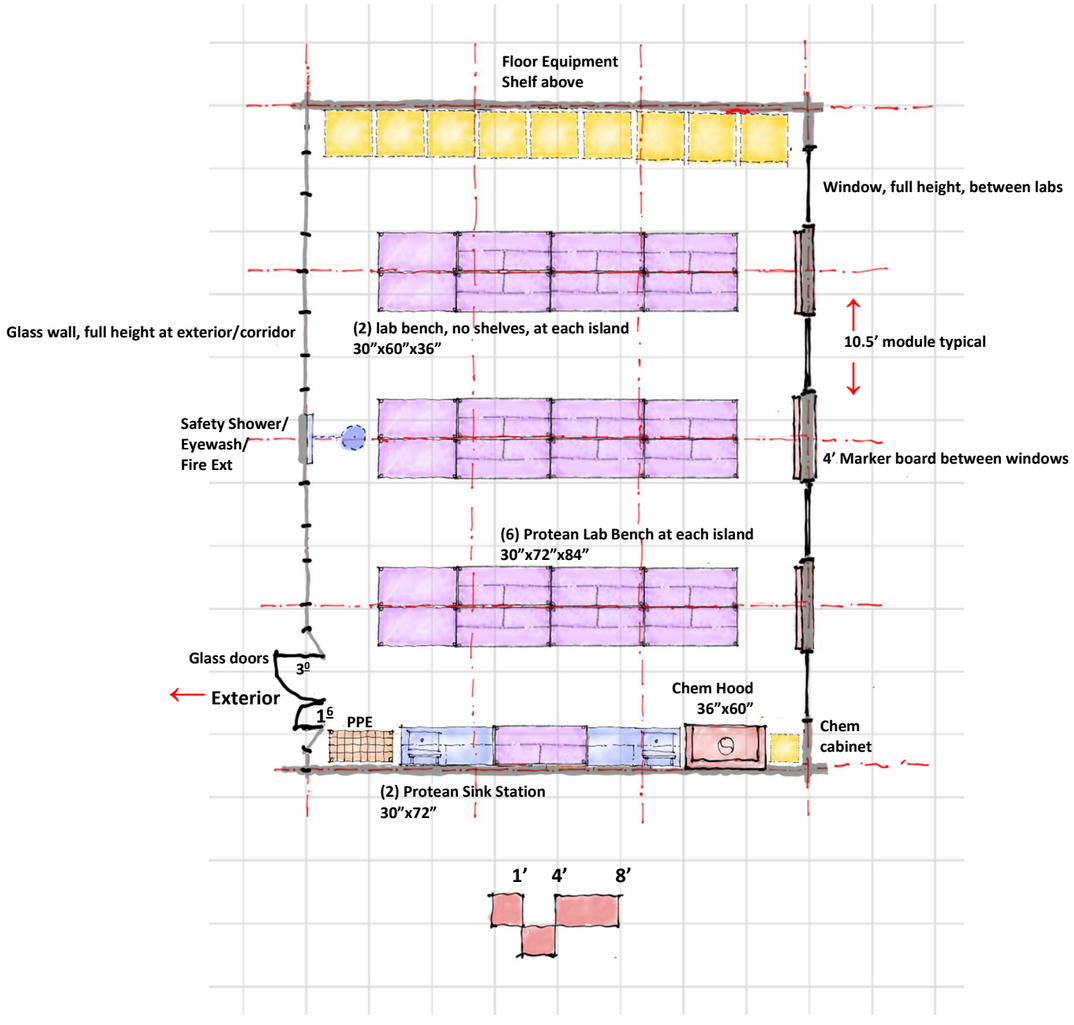
Lab benches are completely mobile and relocatable. Lab benches have integral power outlets and power cords, and plug into service columns or wall service modules. Air and vacuum valves are located at service columns and wall service modules.

Equipment space for OFOI lab equipment has unistrut frames at the wall which provides seismic anchoring of lab equipment, and the shelf above provides 6 square feet of storage area above each equipment location.

Transparency and views between adjacent labs and lab support rooms is made possible with glass doors and glass walls at select locations. There is a significant amount of transparency as illustrated in the design concept.

The lab system is called "PROTEAN" which means adaptable, flexible, versatile. PROTEAN is not a brand, but a concept. The PROTEAN system can be bid by multiple qualified manufacturers/lab subcontractor teams, thereby achieving competitive multiple bids. The manufacturer/lab subcontractor teams are in alphabetical order: 1. Karan/H2I; 2. Kewaunee/ISEC; 3. Mott/Mott Lab.

Glen Berry, FAIA
Gensler Lab Architect
glen_berry@gensler.com



Plant Science Research Lab

Similar for 7 labs: 1. Plant Protection; 2. Plant Protection; 3. Plant Production; 4. Entomology; 5. Molecular Plant Breeding; 6. Forestry & Fire Research; 7. Forestry and Fire Projects

GENERAL
Occupancy: B
Biosafety Level: 1
Area: 42'x31.5' centerline of wall; ~1200 net square feet face of wall
Capacity: ~12-24 research personnel
Hours of Operation: 24/7/365

ARCHITECTURAL (Div 9)
Security: Card reader access
Floor: Polished concrete or rubber tile; rubber base
Walls: Metal stud; Gypsum board; Enamel or acrylic paint
Ceiling: 12' Ceiling; Consider cloud above lab benches, open to structure at perimeter
Doors: 3-0/1-6x8-0 pair at lab entry
Light Attenuation: Roller shades at exterior windows;
Sound Attenuation: NC 45 or less

STRUCTURAL (Div 5)
Vibration Attenuation: 6.000 microinches per second or less; Live Load: 100 lbs/square foot

MECHANICAL (Div 23)
Temperature: 70-75 deg F +/- 2 deg F
Exhaust: 100%- no recirculation of air; 1 cfm per square foot
Pressure: Negative
Humidity: Ambient
Heat Gain: 25 btuh/sf

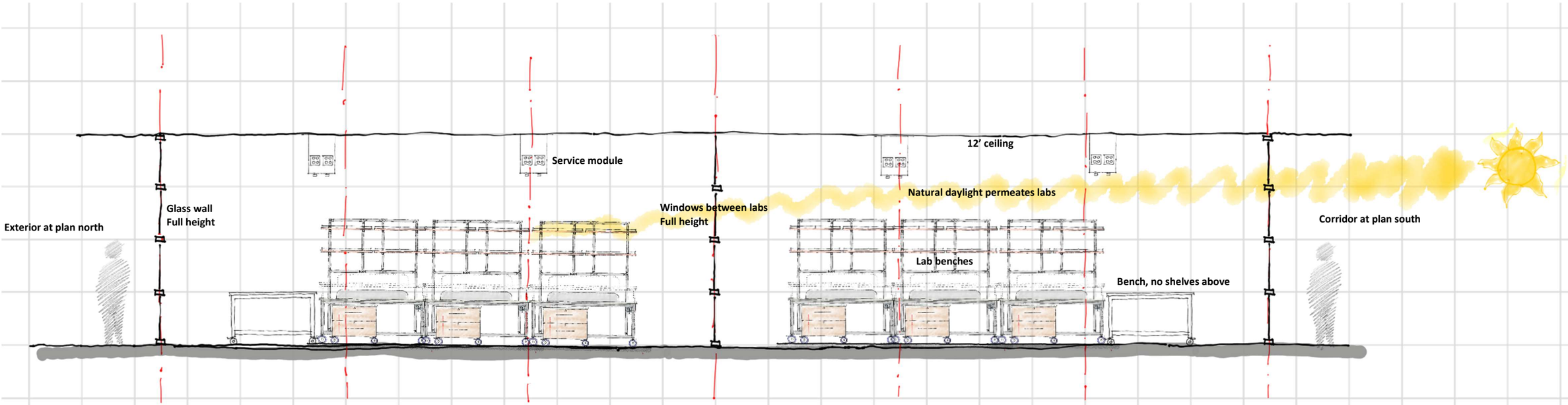
PLUMBING (Div 22)
Water: Tepid water at Safety Shower
Hot/Cold Water at lab sinks with vacuum breaker
RO water at lab sinks for point-of-use water polishers
Pure water at lab sinks via point-of-use water polishers
Floor Drain: At select equipment locations (growth chambers)
Centrally Piped: Compressed/Dry/Oil Free air at 100 psi, step down to 30 psi at lab;
Vacuum at 15" water column; Natural gas
Locally Piped in Lab via cylinders: Inert gases- CO2, Helium, Nitrogen, Argon, as needed

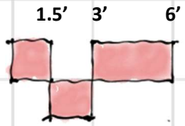
ELECTRICAL (Div 26)
Normal Power: 115v20a duplex at 2' on center at benchtop, max 8 plugs per circuit;
115v20a duplex/fourplex at 6' on center at equipment space, max 4 plugs per circuit;
Standby Power: 115v20a duplex at 6' on center at equipment space;
208v20a dedicated circuit at 12' on center at equipment space
Data: Hardwire and wireless
Lighting: 500 LUX LED; Task lighting at lab benches to provide ~700 LUX at lab bench
Audio/Visual: None

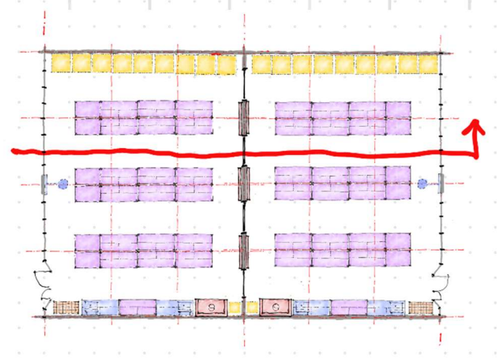
CONTRACTOR FURNISHED EQUIPMENT (Div 11)
Floor Equipment: PROTEAN Lab Benches; PROTEAN Sink Stations, sediment traps;
Chemical Fume Hoods
Benchtop Equipment: None
Wall Equipment: PROTEAN Equipment Space with shelf above;
Safety Shower/Eyewash/Fire Ext
Ceiling Equipment: Elec/Plumb service modules above lab benches

UNIVERSITY FURNISHED EQUIPMENT
Floor Equipment: Refrigerators; Freezers; Incubators; Growth Chambers
Biological Safety Cabinets Class II Type A2; Centrifuges
Benchtop Equipment: Scientific instruments
Wall Equipment: None
Ceiling Equipment: None

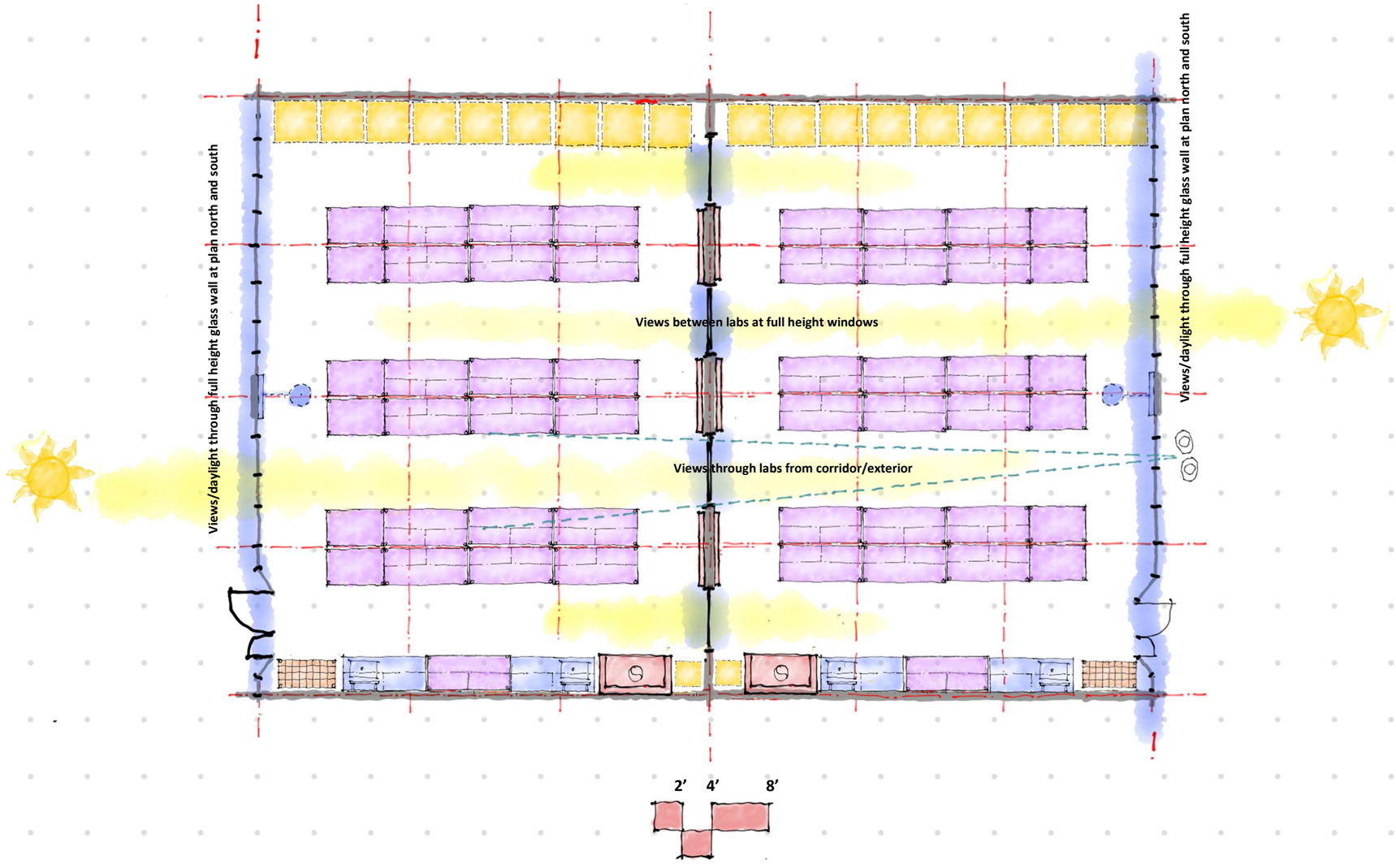
Lab Concept Section

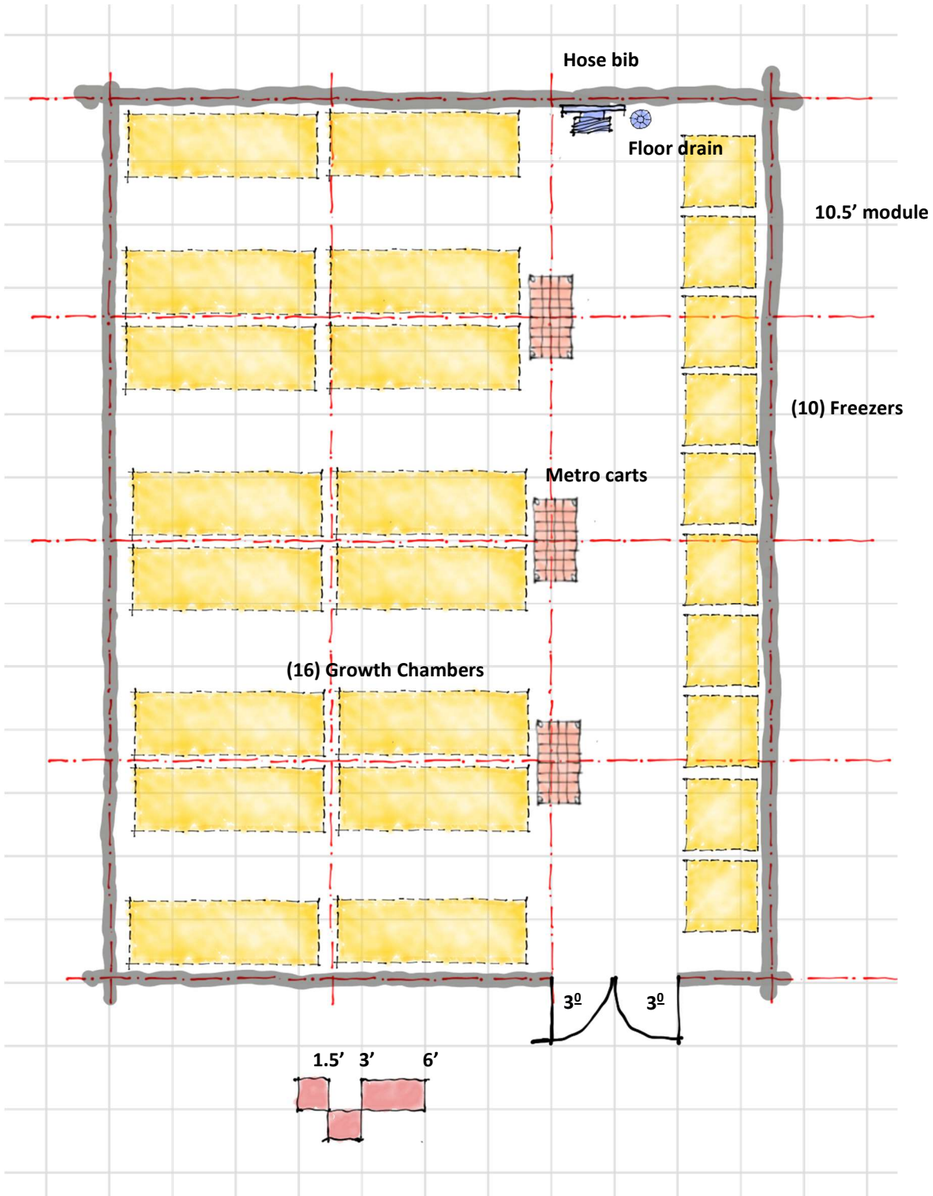






Lab Views/Transparency





Growth Chamber/Freezer Room

GENERAL
Quantity: 1 Lab
Occupancy: B
Area: 31.5’x42’ centerline ~1200 NSF face of wall
Capacity: ~2-4 research personnel
Hours of Operation: 24/7/365
Biosafety Level: None

ARCHITECTURAL
Security: Card reader access
Floor: Sealed concrete, rubber base
Walls: Metal stud; Gypsum board; Enamel or acrylic paint
Ceiling: open to structure
Doors: 3-0/3-0 pair x8-0
Light Attenuation: Blinds at exterior windows, if any
Sound Attenuation: NC 45 or less

STRUCTURAL
Vibration Attenuation: 6.000 microinches per second or less
Live Load: 150 lbs/square foot

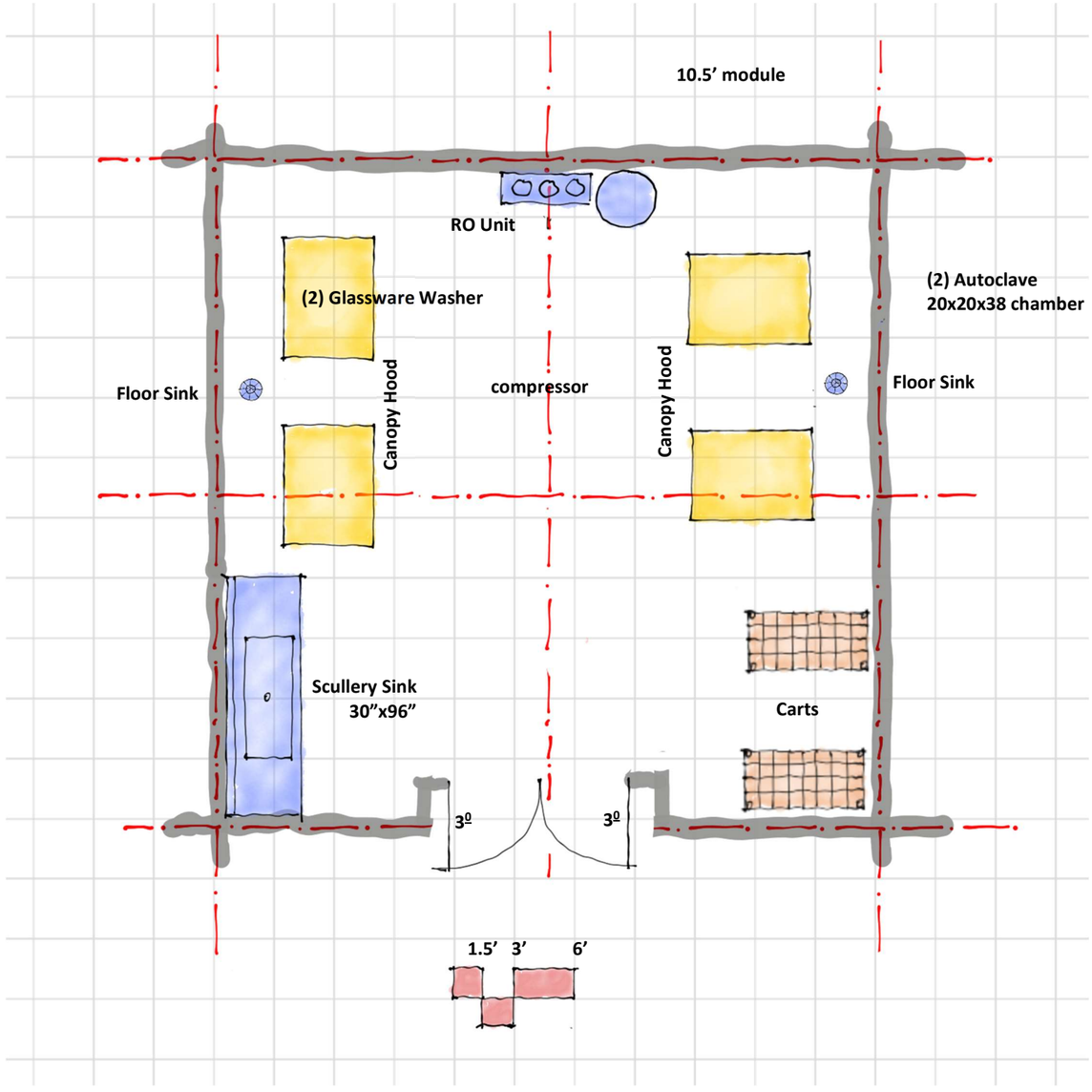
MECHANICAL
Temperature: 68-74 deg F +/- 2 deg F
Exhaust: 100%- no recirculation of air
Pressure: Negative to corridor
Humidity: Ambient
Heat Gain: 75 btuh/sf

PLUMBING
Water: hose bib at perimeter wall
Floor Drain: At perimeter
Centrally Piped: None
Locally Piped in Lab: None

ELECTRICAL
Normal Power: 115v20a duplex convenience at perimeter
Standby Power: 115v20a duplex at 3’ on center at equipment space;
208v20a dedicated circuits at perimeter
Data: Hardwire and wireless
Lighting: 500 LUX LED
Audio/Visual: None identified

CONTRACTOR FURNISHED EQUIPMENT
Floor Equipment: Unistrut frame for seismic bracing of equipment over 400 lbs.
Benchtop Equipment: None
Wall Equipment: PROTEAN Equipment Space with shelf above;
Ceiling Equipment: None identified

UNIVERSITY FURNISHED EQUIPMENT
Floor Equipment: Growth chambers; -80C freezers
Benchtop Equipment: None
Wall Equipment: None
Ceiling Equipment: None



Glasswash/Autoclave

GENERAL
Quantity: 1 Lab
Occupancy: B
Area: 22’x22’; ~480 NSF (centerline of wall)
Capacity: ~2 research personnel
Hours of Operation: 24/7/365
Biosafety Level: None

ARCHITECTURAL
Security: Card reader access
Floor: Polished concrete, rubber base; or epoxy resin with integral base
Walls: Metal stud; water proof gypsum board; Epoxy paint
Ceiling: Open to structure
Doors: 3-0/3-0 pair x8-0
Light Attenuation: Blinds at exterior windows, if any
Sound Attenuation: NC 45 or less

STRUCTURAL
Vibration Attenuation: 6.000 microinches per second or less
Live Load: 100 lbs/square foot

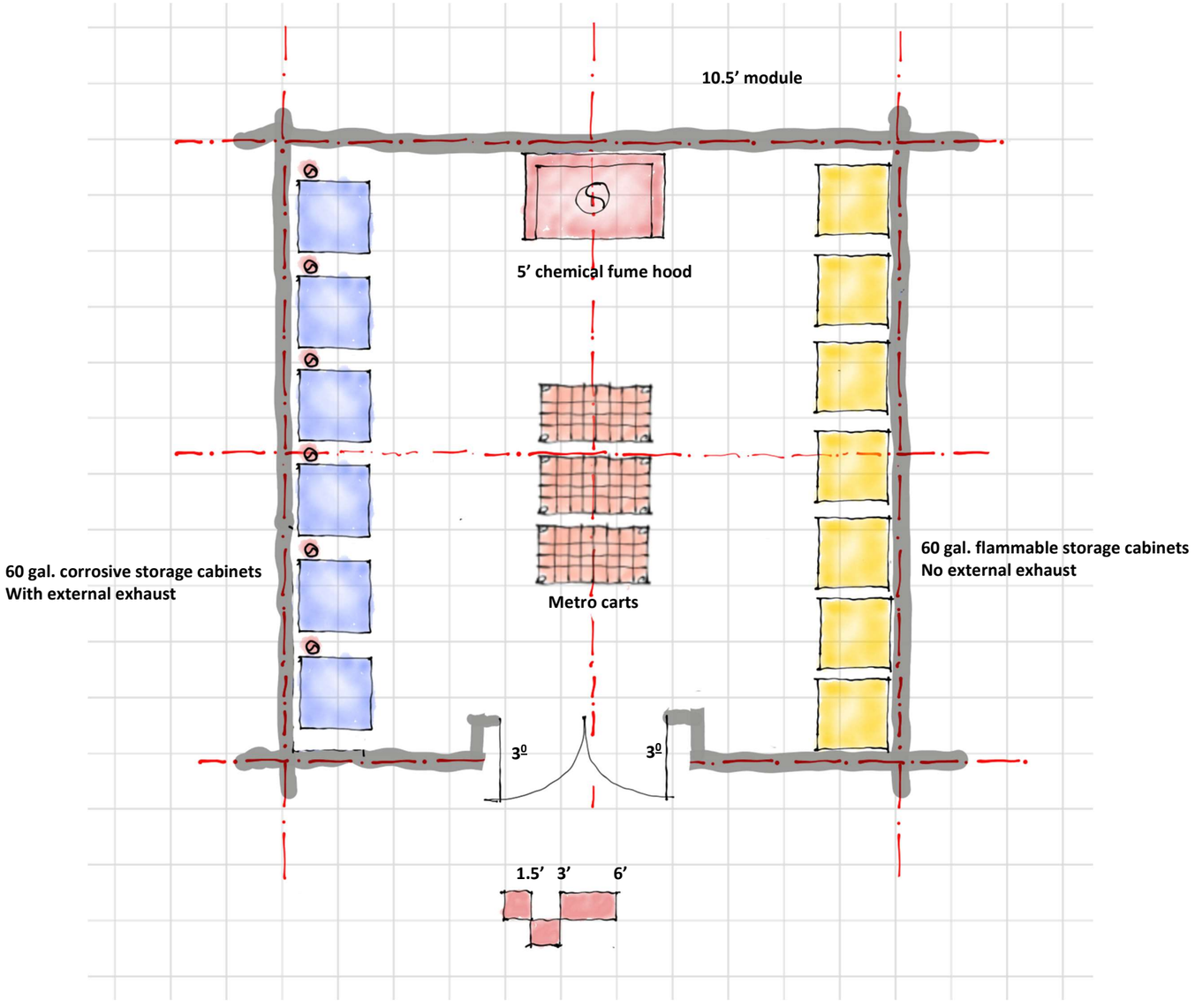
MECHANICAL
Temperature: 68-74 deg F +/- 2 deg F
Exhaust: 100%- no recirculation of air
Pressure: Negative to corridor
Humidity: Ambient
Heat Gain: 75 btuh/sf

PLUMBING
Water: Hot/Cold Water at lab sinks with vacuum breaker;
Floor Drain: At washer, autoclave
Centrally Piped: None
Locally Piped in Lab: None

ELECTRICAL
Normal Power: 115v20a circuits; 208v/480v circuits for washer, autoclave
Standby Power: None
Data: Hardwire and wireless
Lighting: 500 LUX LED
Audio/Visual: None

CONTRACTOR FURNISHED EQUIPMENT
Floor Equipment: Washers, autoclaves
Benchtop Equipment: None
Wall Equipment: Scullery Sink, sediment trap; RO Unit for feed water to washer & autoclave
Ceiling Equipment: Canopy exhaust above washers and autoclaves

UNIVERSITY FURNISHED EQUIPMENT
Floor Equipment: carts
Benchtop Equipment: None
Wall Equipment: None
Ceiling Equipment: None



Chem Store

GENERAL
Quantity: 1 Lab
Occupancy: B
Area: 21’x21’ centerline; ~400 square feet face of wall
Capacity: ~2 research personnel
Hours of Operation: 24/7/365
Biosafety Level: None

ARCHITECTURAL
Security: Card reader access
Floor: Polished concrete, rubber base
Walls: Metal stud; water proof gypsum board; Epoxy paint
Ceiling: Open to structure
Doors: 3-0/3-0 x8-0 pair
Light Attenuation: Roller shades at exterior windows, if any
Sound Attenuation: NC 45 or less

STRUCTURAL
Vibration Attenuation: 6.000 microinches per second or less
Live Load: 100 lbs/square foot

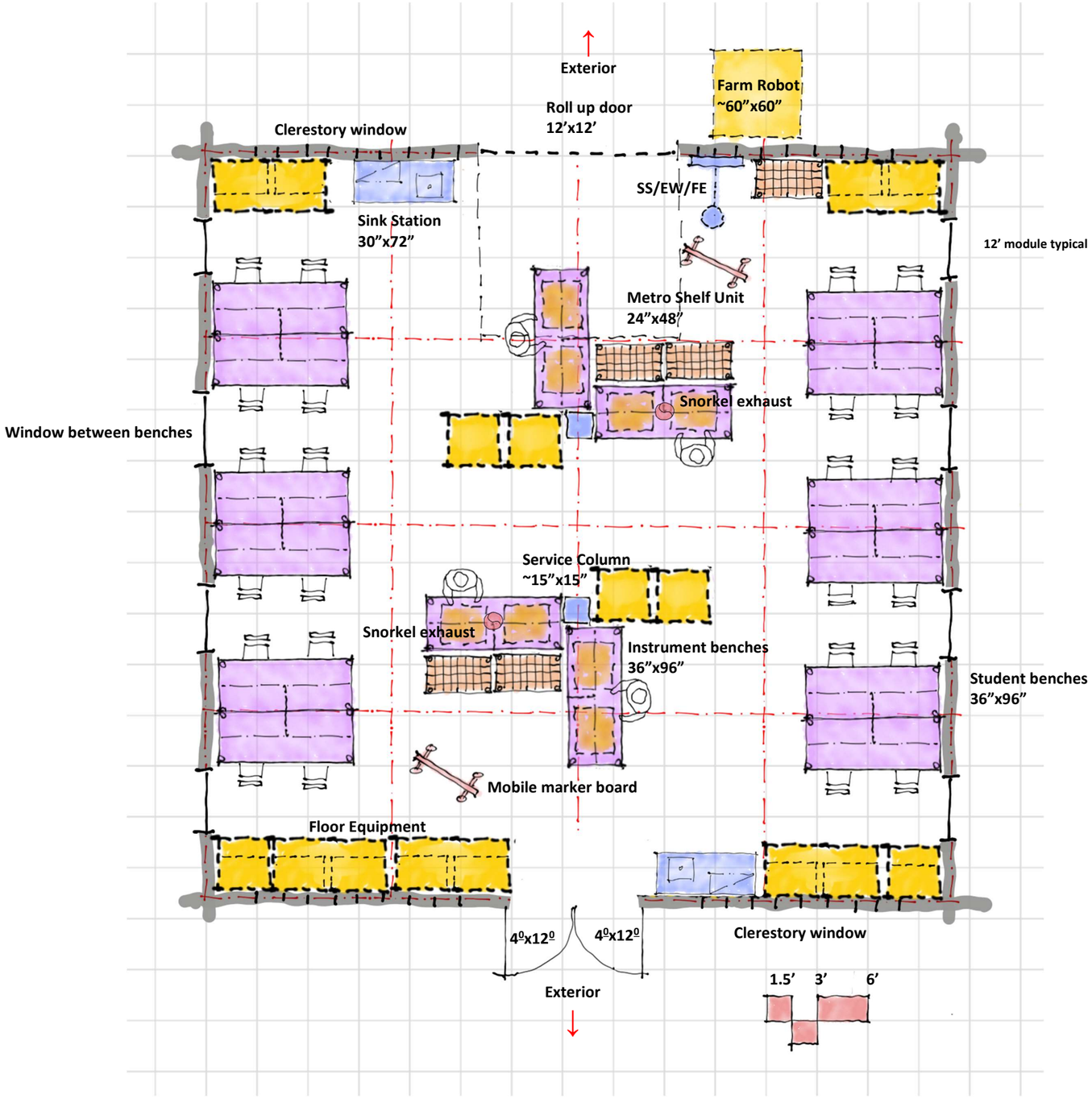
MECHANICAL
Temperature: 68-74 deg F +/- 2 deg F
Exhaust: 100%- no recirculation of air;
700 cfm at fume hood VAV
Pressure: Negative to corridor
Humidity: Ambient
Heat Gain: 25 btuh/sf

PLUMBING
Water: None
Floor Drain: None
Centrally Piped: Air and vac at fume hood
Locally Piped in Lab: None

ELECTRICAL
Normal Power: 115v20a circuits
Standby Power: Fume Hood exhaust; Corrosive cabinet exhaust
Data: Hardwire and wireless
Lighting: 500 LUX LED
Audio/Visual: None

CONTRACTOR FURNISHED EQUIPMENT
Floor Equipment: 5’ Chemical fume hood;
Chemical storage cabinets
Benchtop Equipment: None
Wall Equipment: None
Ceiling Equipment: None

UNIVERSITY FURNISHED EQUIPMENT
Floor Equipment: Metro carts
Benchtop Equipment: None
Wall Equipment: None
Ceiling Equipment: None



Automation Projects Lab

GENERAL
Quantity: 1 Lab
Occupancy: B
Area: 48'x48'; ~2300 NSF (centerline of wall)
Capacity: ~24 students, 1-2 instructors
Hours of Operation: 6 am to 6 pm, Mon- Sat
Biosafety Level: None

ARCHITECTURAL
Security: Card reader access
Floor: Sealed concrete; rubber base
Walls: CMU or metal stud with concrete backer board; enamel paint
Ceiling: High bay open to structure
Doors: 4-0/4-0x12-0 pair; 12'x12' roll up door
Light Attenuation: Roller shades at exterior windows
Sound Attenuation: NC 45 or less

STRUCTURAL
Vibration Attenuation: 6.000 microinches per second or less
Live Load: 200 lbs/square foot

MECHANICAL
Temperature: 68-74 deg F +/- 2 deg F; Local heating; Ventilation for cooling
Exhaust: Local snorkel exhaust
Pressure: Neutral
Humidity: Ambient
Heat Gain: 50 buth/sf

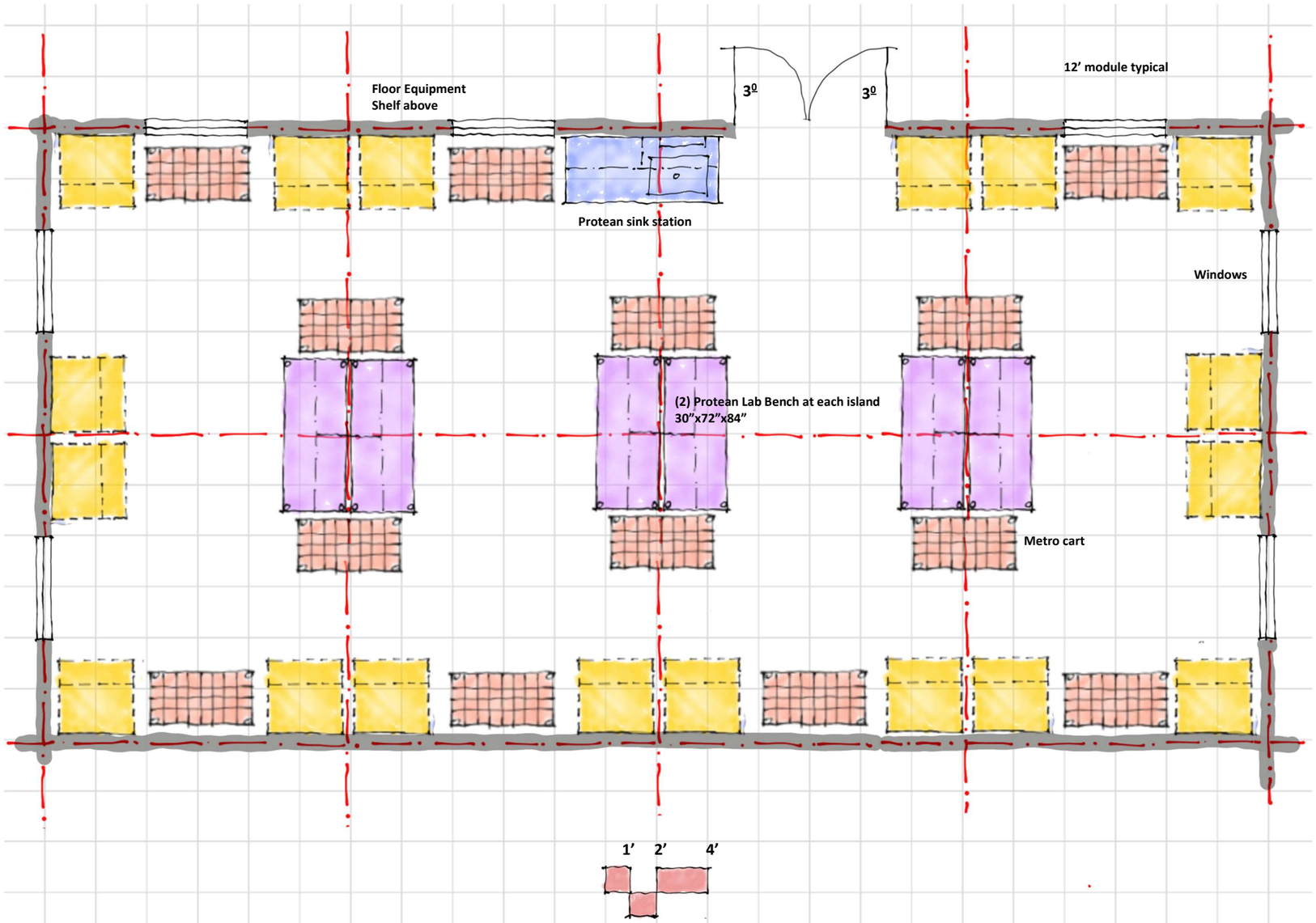
PLUMBING
Water: Tepid water at Safety Shower; Hot/Cold Water at sinks with vacuum breaker;
Floor Drain: None
Centrally Piped: Compressed Air
Locally Piped in Lab: Inert gases- Helium, Nitrogen, Argon, as needed

ELECTRICAL
Normal Power: 115v20a circuits
Standby Power: None
Data: Hardwire and wireless
Lighting: 500 LUX LED
Audio/Visual: None identified

CONTRACTOR FURNISHED EQUIPMENT
Floor Equipment: Lab Benches; Sink Stations, sediment traps; Service Columns; Equipment shelves
Benchtop Equipment: None identified
Wall Equipment: None identified
Ceiling Equipment: Snorkel exhaust if required; Fans

UNIVERSITY FURNISHED EQUIPMENT
Floor Equipment: 47 linear feet floor equipment required- 53 linear feet provided in design; Mobile marker boards; Chairs
Benchtop Equipment: 18 linear feet benchtop instrument required- 32 linear feet provided in design
Wall Equipment: None identified
Ceiling Equipment: None identified

Forestry & Fire Operations



GENERAL
Occupancy: B; Biosafety Level: 1
Area: 24'x48' centerline of wall; ~1100 nsf face of wall
Capacity: ~4-8 research personnel
Hours of Operation: 6 am to 6 pm; Mon-Sat

ARCHITECTURAL (Div 9)
Security: Card reader access
Floor: Polished concrete; rubber base
Walls: Metal stud; Gypsum board; Enamel or acrylic paint
Ceiling: Open to structure
Doors: 3-0/3-0x8-0 pair at entry
Light Attenuation: Roller shades at exterior windows
Sound Attenuation: NC 45 or less

STRUCTURAL (Div 5)
Vibration Attenuation: 6.000 microinches per second or less; Live Load: 100 lbs/square foot

MECHANICAL (Div 23)
Temperature: 70-75 deg F +/- 2 deg F
Exhaust: None; Recirc Air
Pressure: Neutral
Humidity: Ambient
Heat Gain: 25 btuh/sf

PLUMBING (Div 22)
Water: Hot/Cold Water at lab sinks with vacuum breaker;
Floor Drain: None
Centrally Piped: None
Locally Piped in Lab via cylinders: None

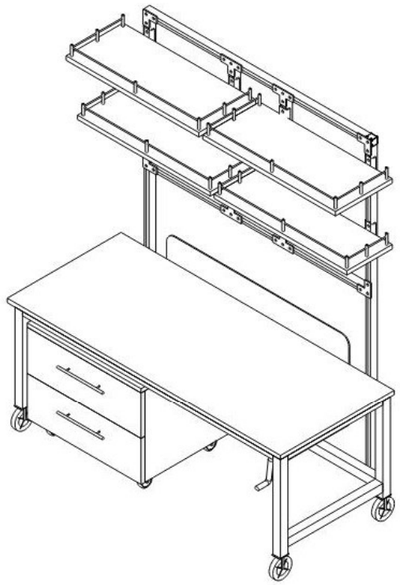
ELECTRICAL (Div 26)
Normal Power: 115v20a circuits
Standby Power: None
Data: Hardwire and wireless
Lighting: 500 LUX LED; Task lighting at lab benches to provide ~700 LUX at lab bench
Audio/Visual: None

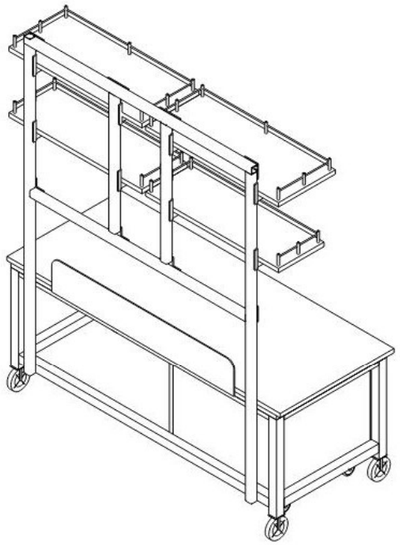
CONTRACTOR FURNISHED EQUIPMENT (Div 11)
Floor Equipment: PROTEAN Lab Benches; PROTEAN Sink Stations, sediment traps;
PROTEAN Equipment spaces with shelves
Benchtop Equipment: None
Wall Equipment: PROTEAN Equipment Space with shelf above;
Ceiling Equipment: Elec/Plumb service modules above lab benches

UNIVERSITY FURNISHED EQUIPMENT
Floor Equipment: Fire equipment
Benchtop Equipment: Scientific instruments
Wall Equipment: None
Ceiling Equipment: None

Protean Lab Bench

Cut Sheet (CFCI)





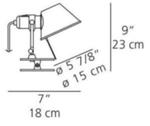
Lab bench has integral power raceway and power cord.
Cord plugs into service column.

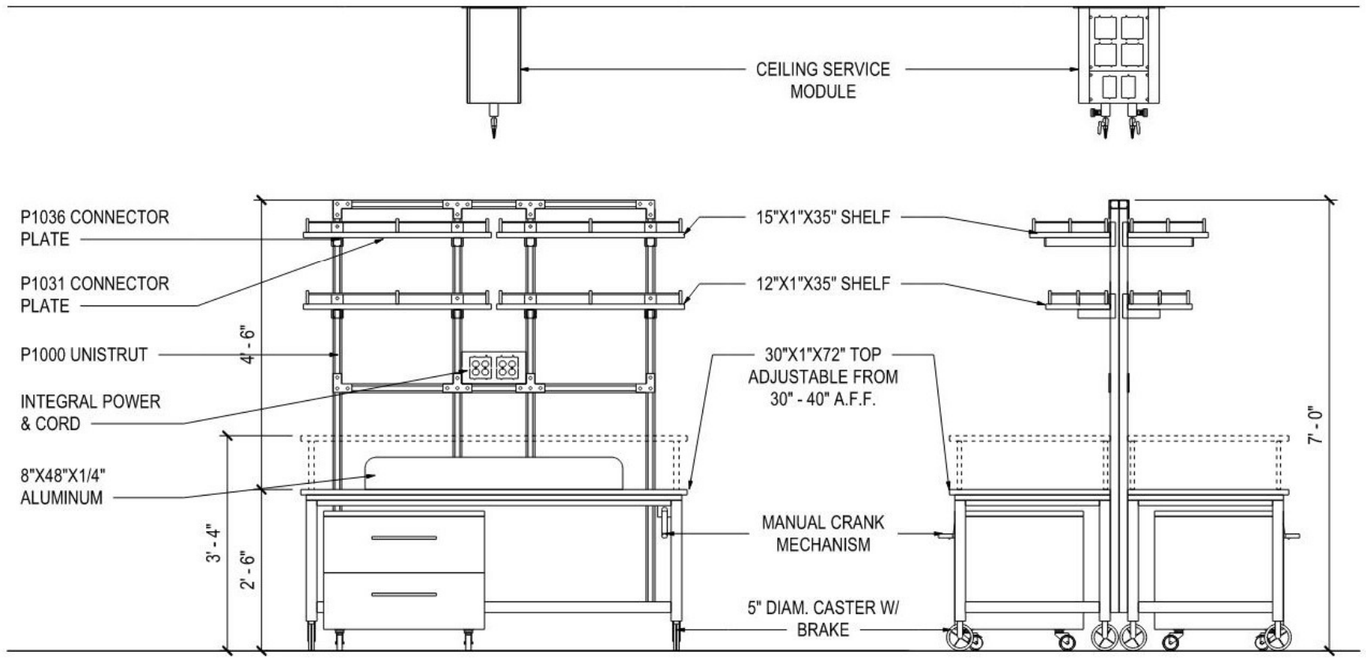
8 plugs (4 duplex) 120v per bench, one 20 amp circuit.

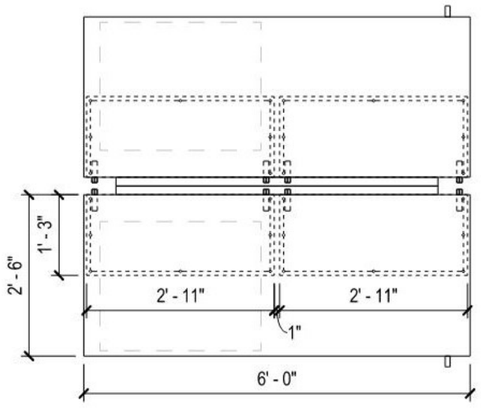
Bench comes prewired from factory.

Air and vacuum valves are located at service column.

Tolomeo mobile task light at each bench-







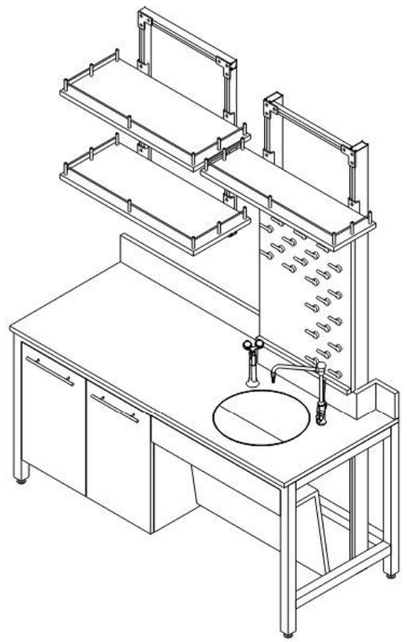
PLAN VIEW

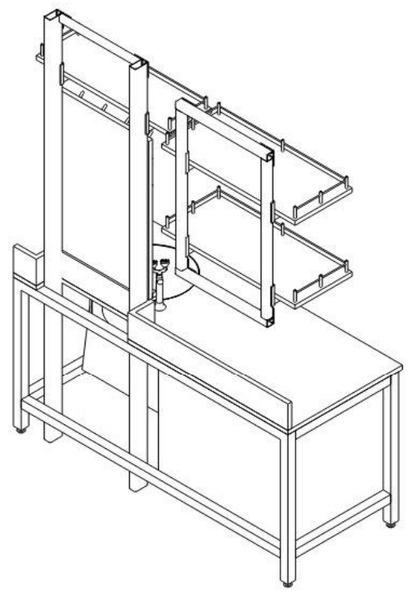
FRONT ELEVATION

SIDE ELEVATION

Protean Sink Station

Cut Sheet (CFCI)

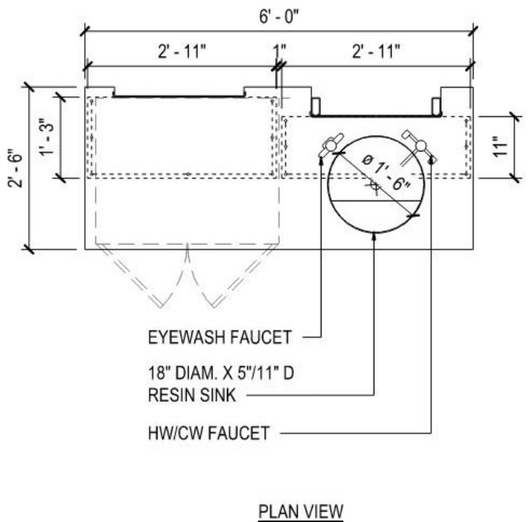




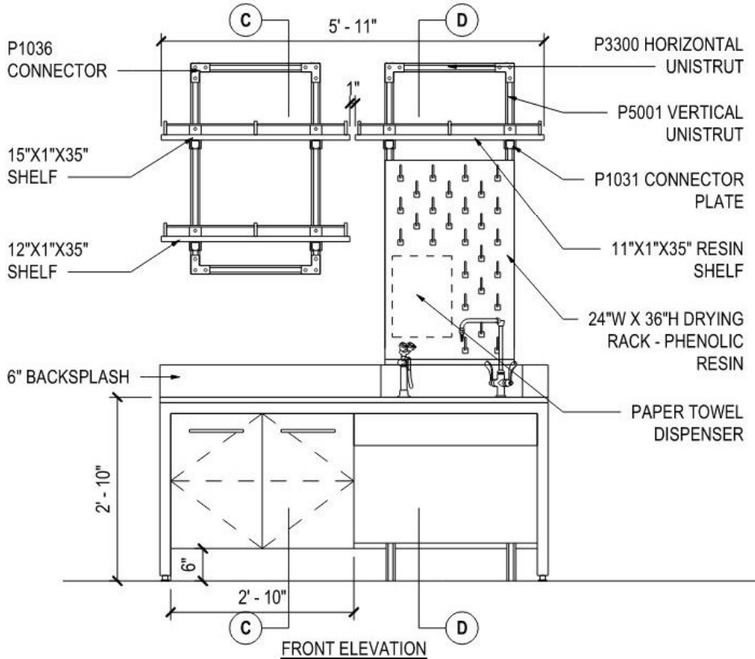
Sink station includes integral pipe enclosure. All plumbing runs vertical from interstitial space at face of wall, inside pipe enclosure. No plumbing inside wall cavity. Simplifies construction and trade coordination.

HW/CW and eyewash at each sink.
RO stub out/vavle for point-of-use water polisher, with duplex below work surface.

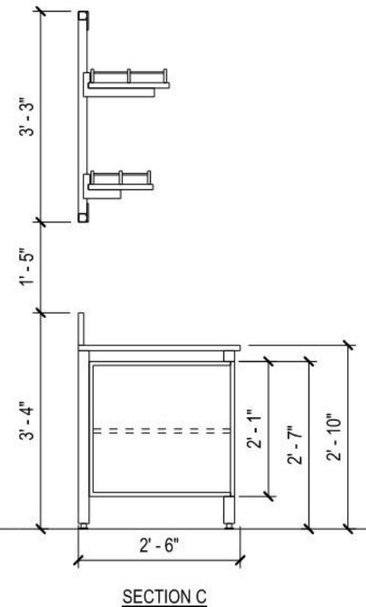
Casters (not shown) can make movement easier when relocating sinks stations.



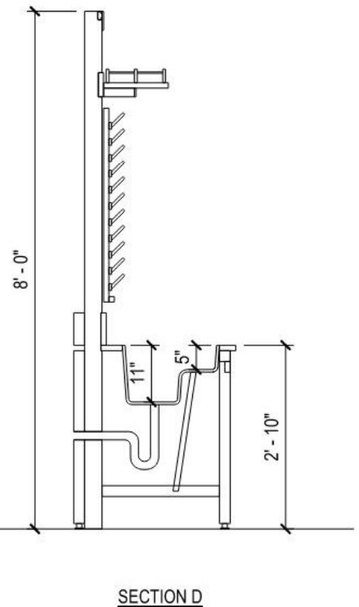
PLAN VIEW



FRONT ELEVATION



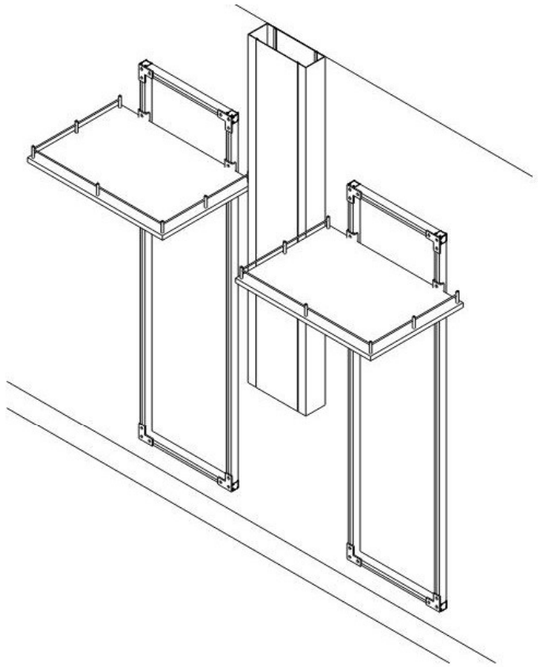
SECTION C

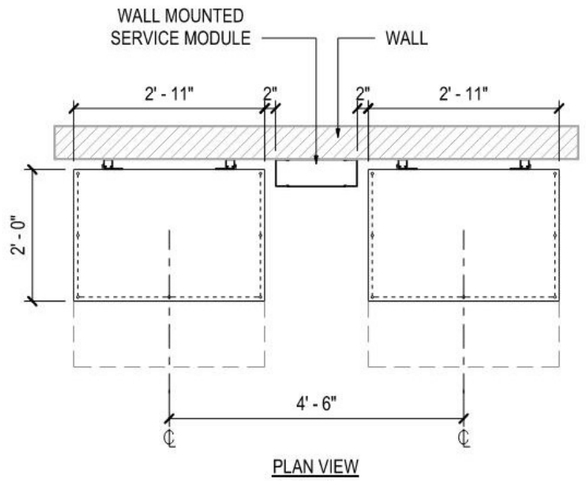


SECTION D

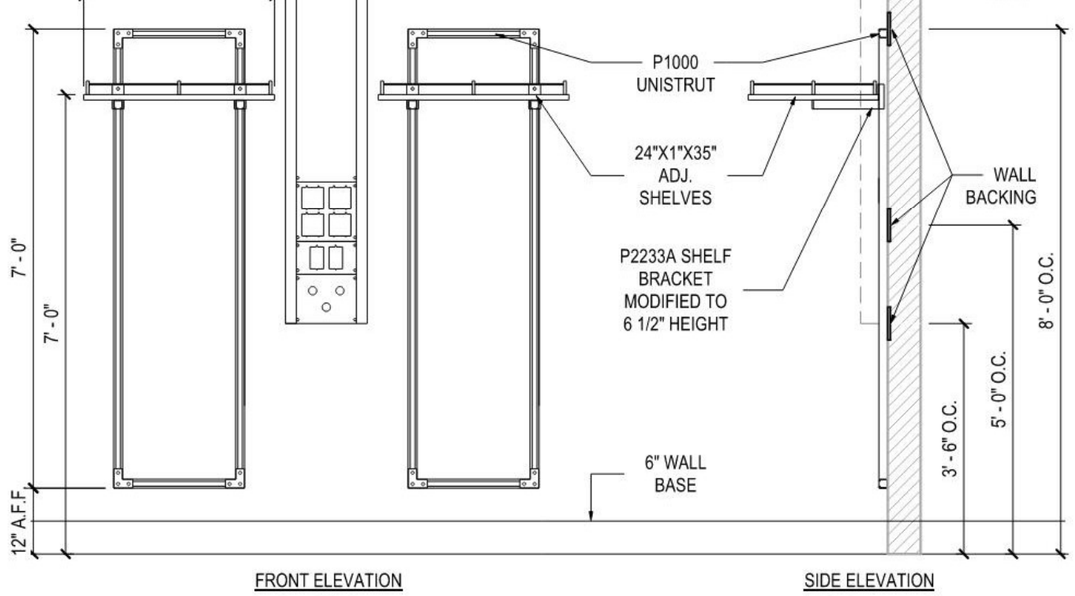
Protean Equipment Station

Cut Sheet (CFCI)





PLAN VIEW



FRONT ELEVATION

SIDE ELEVATION

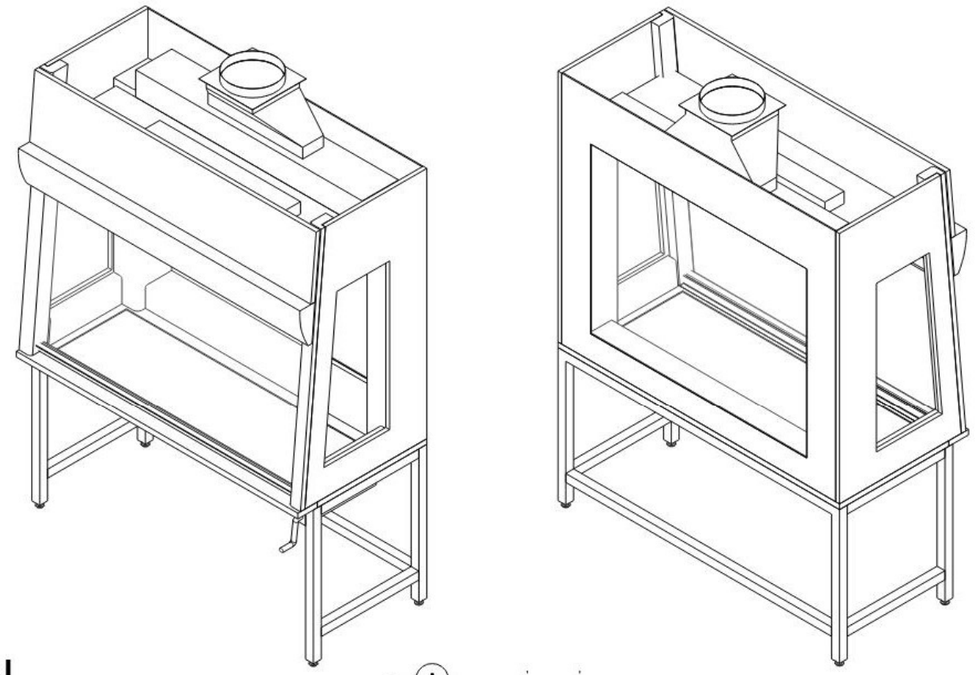
Equipment space at wall includes shelf above.
Wall service column is separate from shelf unit, and may or may not be located at each equipment space.

Equipment space without service column to have wall mounted vertical conduit from interstitial space down to 120v duplex or fourplex at equipment space.

Service column comes pre-wired and pre-plumbed from factory.

Protean Chemical Fume Hood

Cut Sheet (CFCI)



Chemical fume hoods have glass sides and back, which enhances lab safety, visibility, and transparency between lab units.

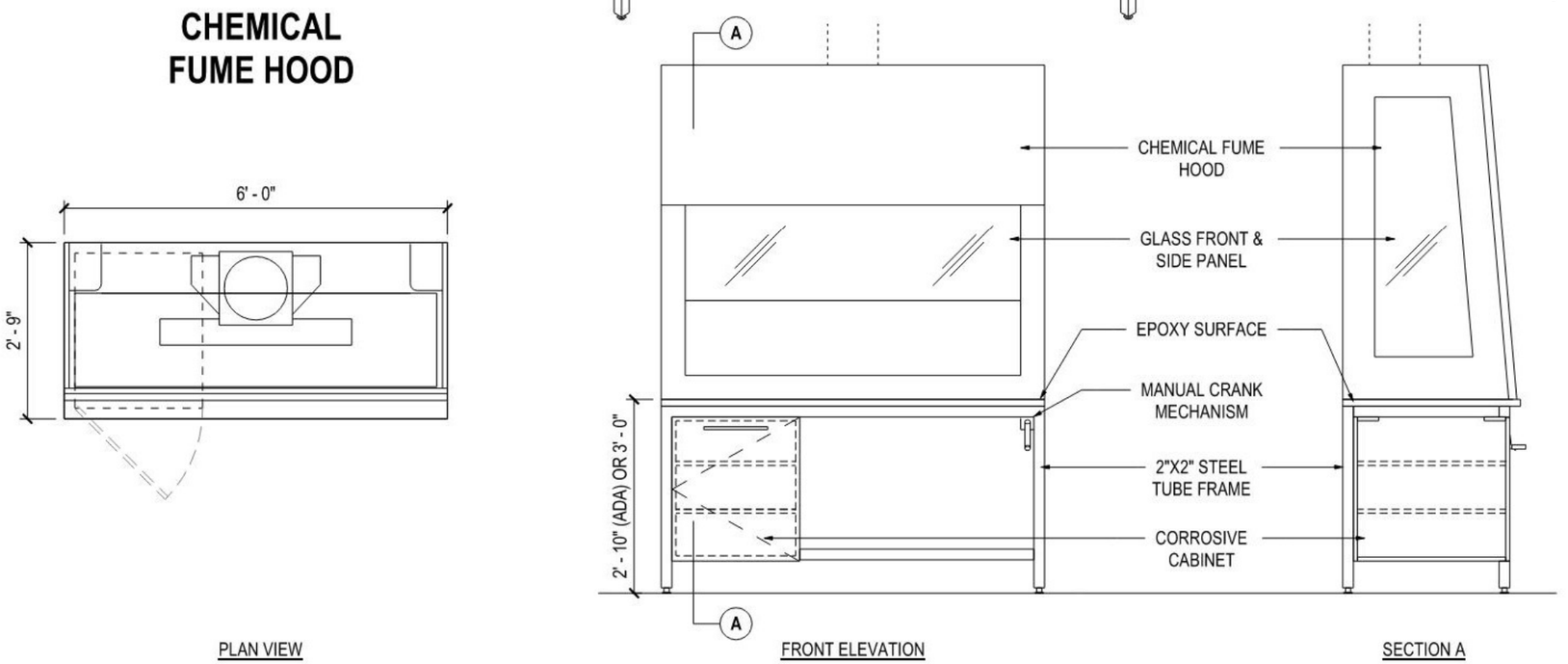
Six foot fume hood shown at left; actual fume hood size in research lab units is five foot fume hood.

750 cfm exhaust, variable air volume, at each fume hood, manifolded to central lab exhaust system.

Fume hood comes pre-wired and pre-plumbed from factory. 120v duplex at each side of fume hood; Air and vacuum at one sie.

Manual crank system with adjustable exhaust plenum provides accessibility at any fume hood.

Adjustable thimble exhaust at top of fume hood for height adjustment.



Safety Shower/Eyewash/Fire Ext

Cut Sheet (CFCI)

One safety shower required for each lab.

Maximum of 55’ feel travel distance maximum from any location in lab to safety shower.

Combination eyewash and fire extinguisher unit satisfies code requirement for both.

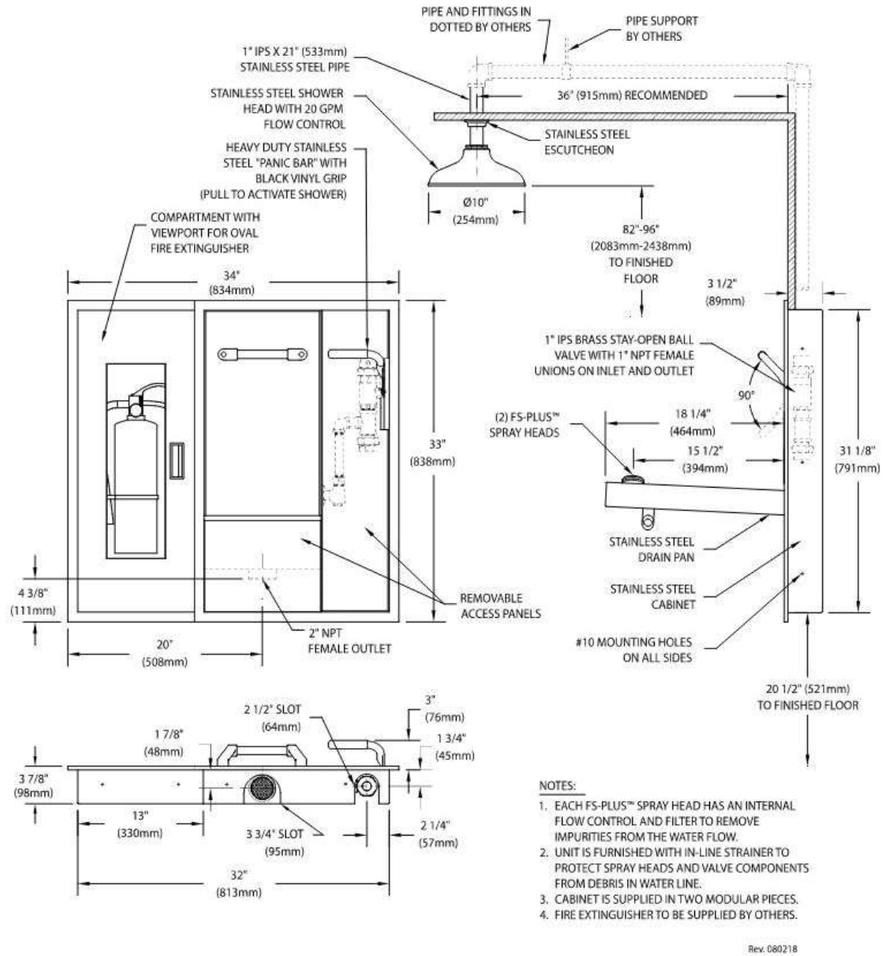
No floor drain below safety shower. No curb below shower.

Tepid water required by code.

WaterSaver

Safety Centers

☐ **GSC2650B** Recessed Safety Center with Drain Pan, Exposed Shower Head



NOTES:

1. EACH FS-PLUS™ SPRAY HEAD HAS AN INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES FROM THE WATER FLOW.
2. UNIT IS FURNISHED WITH IN-LINE STRAINER TO PROTECT SPRAY HEADS AND VALVE COMPONENTS FROM DEBRIS IN WATER LINE.
3. CABINET IS SUPPLIED IN TWO MODULAR PIECES.
4. FIRE EXTINGUISHER TO BE SUPPLIED BY OTHERS.

Rev. 080218

THIS SPACE FOR ARCHITECT/ENGINEER APPROVAL

Due to continuing product improvement, the information contained in this document is subject to change without notice. All dimensions are ± 1/4" (6mm). rev. 072022

Designed to accommodate: OVAL BRAND FIRE PRODUCTS

Sign Included

WaterSaver
701 W Erie St
Chicago, IL 60654

312 666 5500 TELEPHONE
312 666 5501 FACSIMILE
wsflab.com

Listed 8116. Units have been tested to and comply with ANSI Z358.1-2014 and the Uniform Plumbing Code.

Washer

Cut Sheet (CFCI)

Two washers shown in Glasswash/Autoclave Room.

Requires hot/cold water; RO Water for rinse cycle; Air; 208v or 480v power; floor sink, exhaust. Unit will be specified with integral electric steam generator in lieu of house steam.

SPIRE INTEGRATED SOLUTIONS

SCIENTEK

Glassware Washers

SW3000 Series

Ensuring efficient washing for all your laboratory equipment

SCIENTEK SW3000 Series Washers are heavy duty, reliable hydro-spray washers designed for ease of use with minimal maintenance. The balanced hydro spray system holds glassware in place without the need for hold-down screens minimizing glassware breakage. These washer provide the highest cleanability of labware items used in research and other types of laboratories including laboratory glassware, instruments, and plasticware. Rotary spray arms located in the top and bottom of the chamber provide complete and consistent coverage. A variety of interchangeable headers fitted with spray arms or spindles connect directly by a quick-lock connection to the washer. Baskets and wheeled headers can be pre-loaded on the drop down door, which acts as a convenient loading platform. SCIENTEK standardizes on non-proprietary parts on all equipment providing maximum uptime.

Key Features

- PLC control system with HMI Touch Screen with user configurable cycles
- Temperature guarantee
- Insulated construction
- Electrically or steam heated
- Standard and customizable loading racks

Construction

SCIENTEK SW3000 Series Glassware Washers are provided with an all stainless steel drop-down door with glass window. Recirculated water is heated by a stainless steel steam coil to achieve guaranteed treatment temperatures. A touch screen control panel provides a user-friendly interface for selecting, programming, and monitoring cycles. Unit is provided with a stainless steel treatment pump with a direct read pump pressure gauge. Additionally there are two chemical pumps for time based chemical dispensing.

SCIENTEK offers SD8000 and SD9000 model dryers as companion units to the SW3000 Glassware Washers for faster glassware processing.

Optional Features

- Right or left hand services
- House hot water heat exchanger
- Drain discharge cooling - injected
- Devapourmatic System (no exterior exhaust)
- Seismic Tie Down
- Chemical Level Monitoring System
- Direct DI or pure water final rinse

Accessories

SCIENTEK washers accommodate 4 accessories per load in any combination. Standard and customizable racks are available.

Spindle Headers

4 position (12" *diameter*)
25 position (5" *diameter*)
49 position (3 3/8" *diameter*)
81 position (2 ¾" *diameter*)

For 3000 only:

110 position (2 3/16" *diameter*)
210 position (2 ½" *diameter*)

Accessories *cont*

Wire Holding Screens

25 spindle header & 6" spindles
25 spindle header & 13" spindles
49 spindle header & 6" spindles
49 spindle header & 13" spindles

Baskets & Covers

Test tube basket (6" x 6" x 6")
Test tube basket cover (6" x 6")
Test tube basket (9" x 9" x 6")
Test tube basket cover (9" x 9")
Open basket (12 ½" x 25" x 6")
Open basket (25" x 25" x 6")
Multi purpose basket (12 ½" x 25" x 6")
Multi purpose basket (25" x 25" x 6")

A Chalmers Group Company

Your Healthcare and Life Science Partner

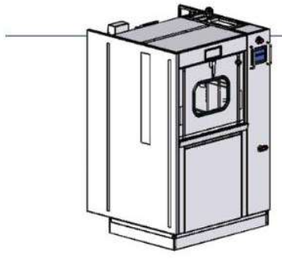
Utilities

Electrical (E)	3-60-208/480V, 9HP
Hot Water (HW)	½" NPT, 30 PSI, 12 GPM @ 120° F ± 5° F *(12 gallon sump capacity)*
Cold Water (CW)*	½" NPT, 30 PSI, 12 GPM @ 60° F ± 5° F
Steam (S)	1" NPT, 30-60 PSI, Dynamic ± 5 PSI, 200 #/Hr Flow Rate
Condensate (C)	Sump heater: ½" NPT *(return to boiler rec.)*, 1 GPM | Heat exchanger: ¾" NPT *(return to boiler rec.)*, 1 GPM
Air (A)	¼" NPT, 80-120 PSI, 1 Cubic Foot Per Cycle
Drain (D)	12" x 12" Floor Sink with 4" Floor Drain *(minimum)*, 180 GPM Flow Rate
Vent (V)	12" x 4" ID Duct, 300-500 CFM, Saturated Vapor @ 190° F

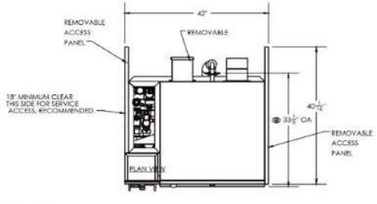
**CW - Required if drain discharge cool-down package ordered*

Model	Standard Chamber Size *W x H x D*	Standard Unit Size *W x H x D*	Configuration	Pump
SW3000	27" x 21.5" x 27"	42" x 64" x 37"	Single Door	7.5 HP
SW3000PT	27" x 21.5" x 27"	42" x 64" x 37"	Pass-through	7.5 HP
SW3002	27" x 21.5" x 27"	42" x 64" x 37"	Single Door	2 HP
SW3002PT	27" x 21.5" x 27"	42" x 64" x 37"	Pass-through	2 HP

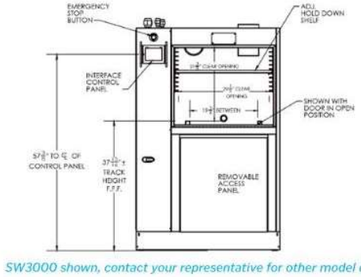
Representative Drawings



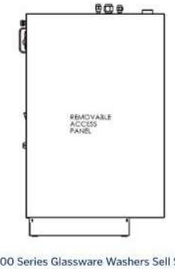
Top View



Front View



Side View



SW3000 shown, contact your representative for other model drawings.

SW3000 Series Glassware Washers Sell Sheet_M1082_1.00 2021-1118

PRIMUS

Specification and Technical Data Sheet

Small Steam Sterilizers

FOR GENERAL PURPOSE APPLICATIONS

PRIMUS® small steam sterilizers come in **multiple chamber configurations** for your application. Designed for simplicity in operation and serviceability. These models are ideal for use in research laboratories, bio-containment environments, and animal care facilities.

Model AA
16"x 16"x 26"

Model B
26"x 26"x 39"

Model A
20"x 20"x 38"

Features

Intelligent design focuses on ease of use, simplified diagnostics, and clear service access for maximum uptime.

- **Vessel Design** features a stainless steel, fully-jacketed 316L chamber. The vessel is insulated and mounted on a steel frame, which offers adjustable feet on self-centering floor pads.
- **Vertical Sliding Doors** are energy-efficient, safe, and can be operated with a finger-tip. Hands-free options are available.
- **Rectangular Chamber** eliminates wasted space and reduces high utility costs common to cylindrical or elliptical designs.
- **All Chambers** are polished to a mirror finish of **<10 Ra.** Surface finish can be just as critical in determining the corrosion resistance of austenitic stainless steel as the grade. Poor quality finishes can lead to disappointing performance of stainless steel. A highly polished surface will give the best performance in any specified environment.
- **Non-Proprietary Parts** are a hallmark of PRIMUS Steam Sterilizers allowing for immediate diagnostic and replacement of worn components.
- **Gravity, Vacuum, and Liquid Cycles** come standard on **all** models. Multiple test cycles are included for process challenge. Low temperature cycles and effluent decontamination are available for specific applications.
- **Configurable Controls** are adaptable to meet a variety of applications.
- **Water Conservation** is available with our PRI-Saver® system that offers up to **95% water savings.**
- **Predictive Maintenance** functionality included in our PLC based controls allows for increased uptime through the proactive monitoring of critical components.
- **Ease of Service** is built into the design and delivered by PRIMUS Authorized Service Agents.

Electrical Connection and Utilities Consumption[1]

Provide utility services within 6'-0" of final connection to sterilizer. Optimum sterilizer performance requires the specified utilities.

	STEAM (S)		WATER (W)		AIR (A)	DRAIN (D)	ELECTRICAL (E)
	Building Steam Supply • **Pipe Size:** 3/4" NPT • **Quality:** Condensate free 97% to 100% saturated vapor (suitably trapped to ensure dry steam and filtered to remove particulates) • **Pressure:** 50 to 80 PSIG Dynamic **Note:** 1. Steam-to-Steam Generator requires minimum pressure 65 PSIG house steam		WATER (W) **Cold Water Supply** • **Pipe Size:** 3/4" NPT • **Temperature:** < 70° F • **Pressure:** 50-70 PSIG Dynamic		Instrument Air[2] • **Connection:** See Below • **Quality:** Dry and oil free • **Pressure:** 60-80 PSI Dynamic	Building Drain System Minimum 2" • **Location:** Locate floor sink directly under sterilizer **Note:** 1. Exhaust discharge is cooled to < 140°F 2. 12" x 12" x 8" floor sink is recommended by PRIMUS	ELECTRICAL (E) Building Power Supply - Dedicated Circuit • Volts: 110 • Phase: Single • Amps: 10 **Note:** Additional circuits required for ancillary and optional equipment i.e., vacuum pump, boost pump, boiler, etc.
MODEL	NPT	LBS/HR (KG/HR)	NPT	GPM (LPM)	NPT	NPT (Discharge Pipe Size)	
AA	3/4"	50 (22.68)	3/4"	8 (30)	1/4"	3/4"	
A	3/4"	65 (29.48)	3/4"	8 (30)	1/4"	3/4"	
B	3/4"	100 (45.36)	3/4"	8 (30)	1/4"	3/4"	
C	3/4"	134 (60.78)	3/4"	14 (53)	1/4"	1"	
D	3/4"	204 (92.53)	3/4"	14 (53)	1/4"	1"	

1. Based on sterilizer using a water ejector.
2. Not required for models with a vertically sliding door.

HVAC DATA Heat loss, at ambient of 70° F

	Model	KBTU'S/HR
SINGLE DOOR: Through one wall, at fascia	AA	1.5
	A	2.2
	B	4.1
	C	4.4
	D	4.1
SINGLE DOOR: Through one wall, service area	AA	1.9
	A	3.4
	B	5.7
	C	7.1
	D	9.7
SINGLE DOOR: Free standing, cabinet total	AA	3.4
	A	5.6
	B	9.8
	C	11.2
	D	13.8

	Model	KBTU'S/HR
DOUBLE DOOR: Through one wall, at fascia	AA	1.5
	A	2.2
	B	4.1
	C	4.4
	D	4.1
DOUBLE DOOR: Through one wall, service area	AA	3.3
	A	5.1
	B	7.8
	C	9.7
	D	11.5
DOUBLE DOOR: Through two walls, at each fascia	AA	1.5
	A	2.2
	B	4.1
	C	4.1
	D	4.1
DOUBLE DOOR: Through two walls, service area	AA	1.8
	A	2.9
	B	3.7
	C	5.6
	D	7.4

Autoclave

Cut Sheet (CFCI)

Two autoclaves shown in Glasswash/Autoclave Room.

Requires electric steam (integral with unit); Cold Water; RO Water; Floor sink; and 208v or 480v power.

PRIMUS

Steam Source

Electric Boilers

☐ **EB** Carbon steel. Uses house supplied water. Includes feedwater boost pump.

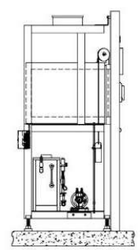
☐ **EBC** Stainless steel construction for clean steam generation. Includes stainless steel feedwater boost pump.
NOTE: Stainless Steel Boilers shall be operated using only deionized water, having a maximum conductance of 1 microsiemen per cm (1µS/cm) [minimum specific resistivity of 1 megohm per cm (1MW/cm)].

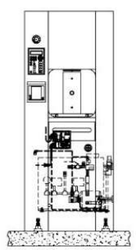
PRI-Pure Reverse Osmosis System

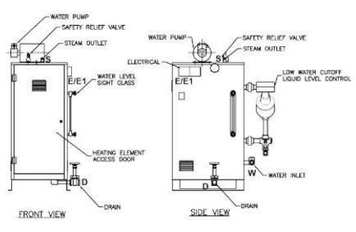
☐ **P30** Designed and recommended for all PRIMUS small sterilizers with integral carbon steel boilers. The PRI-Pure, when used together with softened water, will significantly increase boiler and sterilizer life by removing up to 99% of damaging contaminants.

Boiler Utilities

MODEL		AA	A	B	C	D
Chamber Size (W x H x L) Inches/Millimeters		16 x 16 x 26 406.4 x 406.4 x 660.4	20 x 20 x 38 508 x 508 x 965.2	26 x 26 x 39 660.4 x 660.4 x 990.6	26 x 26 x 49 660.4 x 660.4 x 1244.6	26 x 26 x 67 660.4 x 660.4 x 1701.8
Boiler Size	kW/Hr	24	24	36	48	72
Boiler Steam Output	lbs/Hr	73	73	108	145	217
Integral	Model	EB1-AA	EB1-A	EB1-B	EB1-C	EB1-D
Stand Alone	Model	EB-AA	EB-A	EB-B	EB-C	EB-D
208 Vac, 3ph	Amperes	67	67	100	134	200
240 Vac, 3ph	Amperes	58	58	87	116	174
380 Vac, 3ph	Amperes	37	37	54	73	110
480 Vac, 3ph	Amperes	29	29	44	58	87
Vac 110, 60Hz[1]	Amperes	10	10	10	10	10


SIDE VIEW


FRONT VIEW



1. Electric boilers are available in Carbon Steel or Stainless Steel. Carbon Steel Boilers are integral on AA, A, and B sizes single door only. Additional options, if selected, may require stand-alone on these sizes. Specify whenever stand-alone is required on any model.
2. Contact PRIMUS for overall dimensions and utility connections.
3. All models are stand-alone.
4. GMP Validatable Option Only. Sanitary piping is required.
5. Low Water Cutoff is standard and the "automatic reset" feature is disabled with this option. The boiler will need to be manually reset.
6. Water Quality - For best results, feed water supply should be evaluated prior to initial startup to ensure it is of the quality necessary for the application, various external treatment processes (water softener, water conditioning, etc.) may be used. Contact PRIMUS for further recommendations.

Refrigerator 4C

Cut Sheet (OFOI)

Ref plugs into standby 115v20a duplex outlet.
Two refs may be on one circuit.

Fisherbrand™ Isotemp™ FBG Series Glass Door Laboratory Refrigerators

Catalog No.FBG3005GA

- $7,850.00 / Each of 1

Description

- Purpose-built from the ground up for clinical and research laboratory customers
- Quiet operation, less than 53 dB
- ENERGY STAR certified
- Heat-free defrost
- Double-pane glass doors
- Four 2 in. casters, front casters are lockable
- Self-closing door with 90° stop
- Bright LED interior lighting
- Hi/Lo Temperature, door ajar, and power failure alarms
- 12 hour controller battery backup
- Rear access port
- Keyed door locks, compatible with popular E-lock adapters
- Remote alarm contacts
- Available accessories such as chart recorders, independent temperature monitors, surge suppressors, and more

Specifications

Capacity (English)	29.2 cu. ft.
Temperature Range	3°C to 7°C
Door Style	Glass
Shelves	4 Adjustable
Exterior Finish	Painted
Certifications/Compliance	cULus
Ports	1 Rear Access Port
Monitoring Options	SMART VUE Compatible, Remote Alarm Contacts
Dimensions (DxWxH) Exterior	37.3 x 34.0 x 78.5 in. (947 x 864 x 1994 mm)
Plug Type	NEMA 5-15
Frequency	60 Hz
Shipping Weight (Metric)	208 kg
Capacity (Metric)	827 L
Refrigerant	R290
No. of Doors	1
Cabinet Material	Painted Steel
Interior	White (Painted)
Control Type	Capacitive Touch
Warranty	3 Years Parts and Labor + 2 Year Compressor
Access Security	Key Lock
Dimensions (D x W x H) Interior	28.5 x 30.0 x 58.0 in. (723 x 762 x 1473 mm)
Electrical Requirements	115 V, 60 Hz
Shipping Weight (English)	458 lb.

Freezer -20 C

Cut Sheet (OFOI)

Standby plug 115v20a plug, NEMA 5-15.

Actual ref may vary from item shown at left.

TSX Series High-Performance Manual Defrost –20°C Freezers

LEARN MORE AT energystar.gov

Biologics · Diagnostics kits and reagents · Enzymes · Industrial testing · Molecular biology

Our manual defrost, high-performance freezers are designed for applications in which even slight intermittent coil warming during auto defrost cannot be tolerated.

- Cold wall convection cooling with temperature uniformity
- Enzyme freezers feature enzyme bins
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Four 2" casters for easy mobility; the front two are lockable
- Self-closing door with 90° stop to assist with inventory loads
- See pages 14–21 for options and accessories

Thermo Scientific™ TSX 23 cu ft freezer

TSX Series high-performance manual defrost –20°C freezers

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Shelves (bins)	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2320FA	-25°C to -15°C (-20°C)	23.3 (659)	115V, 60Hz (NEMA 5-15)	1 solid	4 (0)	Manual	UL, cUL	28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	38.9 x 28.0 x 78.5 (99.0 x 71.1 x 199.4)	459 (208)
TSX2320FD			208-230V, 60Hz (NEMA 6-15)				UL, cUL			438 (199)
TSX3020FA	-25°C to -15°C (-20°C)	29.2 (827)	115V, 60Hz (NEMA 5-15)	1 solid	4 (0)	Manual	UL, cUL	28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	38.9 x 34.0 x 78.5 (99.0 x 86.4 x 199.4)	483 (219)
TSX3020FD			208-230V, 60Hz (NEMA 6-15)				UL, cUL			483 (219)
TSX Series high-performance manual defrost –20°C enzyme freezers										
TSX2320EA	-25°C to -15°C (-20°C)	23.3 (659)	115V, 60Hz (NEMA 5-15)	1 solid	9 (45)	Manual	UL, cUL	28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	38.9 x 28.0 x 78.5 (99.0 x 71.1 x 199.4)	514 (233)
TSX2320ED			208-230V, 60Hz (NEMA 6-15)				UL, cUL			493 (224)
TSX3020EA	-25°C to -15°C (-20°C)	29.2 (827)	115V, 60Hz (NEMA 5-15)	1 solid	9 (54)	Manual	UL, cUL	28.5 x 30.0 x 58 (72.3 x 76.2 x 147.3)	38.9 x 34.0 x 78.5 (99.0 x 86.4 x 199.4)	552 (251)
TSX3020ED			208-230V, 60Hz (NEMA 6-15)				UL, cUL			552 (251)

Freezer -80C

Cut Sheet (OFOI)

Freezer Packages with Factory-Installed Options

Thermo Scientific TDE Ultra-Low Freezer with Two Shelves of Sliding Drawer Racks Plus Boxes

Model	Capacity		Electrical, 60Hz	# of Racks Included	Cryoboxes* Included
	cu. ft. (L)	Cryoboxes*			
TDE30086FARK	14.9 (422)	300	115V	6	150
TDE30086FDRK	14.9 (422)	300	208-230V	6	150
TDE40086FARK	19.4 (549)	400	115V	8	200
TDE40086FDRK	19.4 (549)	400	208-230V	8	200
TDE50086FARK	24.1 (682)	500	115V	10	250
TDE50086FDRK	24.1 (682)	500	208-230V	10	250
TDE60086FARK	28.8 (816)	600	115V	12	300
TDE60086FDRK	28.8 (816)	600	208-230V	12	300

*For cryoboxes that measure 5 x 5 x 2 in (12.7 x 12.7 x 5 cm) (W x D x H)

Thermo Scientific TDE Ultra-Low Freezer with LN_2 Backup System, Two Shelves of Sliding Drawer Racks Plus Boxes

Model	Capacity		Electrical, 60Hz	# of Racks Included	Cryoboxes* Included
	cu. ft. (L)	Cryoboxes*			
TDE40086FARLN	19.4 (549)	400	115V	8	200
TDE40086FDRLN	19.4 (549)	400	208-230V	8	200
TDE50086FARLN	24.1 (682)	500	115V	10	250
TDE50086FDRLN	24.1 (682)	500	208-230V	10	250
TDE60086FARLN	28.8 (816)	600	115V	12	300
TDE60086FDRLN	28.8 (816)	600	208-230V	12	300

*For cryoboxes that measure 5 x 5 x 2 in (12.7 x 12.7 x 5 cm) (W x D x H)

Thermo Scientific TDE Ultra-Low Freezer with CO_2 Backup System, Two Shelves of Sliding Drawer Racks Plus Boxes

Model	Capacity		Electrical, 60Hz	# of Racks Included	Cryoboxes* Included
	cu. ft. (L)	Cryoboxes*			
TDE40086FARCO	19.4 (549)	400	115V	8	200
TDE40086FDRCO	19.4 (549)	400	208-230V	8	200
TDE50086FARCO	24.1 (682)	500	115V	10	250
TDE50086FDRCO	24.1 (682)	500	208-230V	10	250
TDE60086FARCO	28.8 (816)	600	115V	12	300
TDE60086FDRCO	28.8 (816)	600	208-230V	12	300

*For cryoboxes that measure 5 x 5 x 2 in (12.7 x 12.7 x 5 cm) (W x D x H)

Unit is available in either 115v or 208v power.

Requires standby power outlet.

Biological Safety Cabinet

Cut Sheet (OFOI)

Requires metal base stand.

Logic+ Type A2 Biosafety Cabinets

Specifications

Plug Configurations

115V, 15A
for North America
100V, 15A for Japan
(3' and 4' widths)

115V, 20A
for North America
100V, 20A* for Japan
(5' and 6' widths)

All models feature:

- Electronically Commutated Motor (ECM)
- ❇ Constant Airflow Profile (CAP) airflow monitoring system
- Intrinsically-safe negative pressure design
- ❇ Air-Wave™ Entry System*
- ❇ Contain-Air™ Negative Pressure Channel*
- Supply and exhaust 99.99% efficient HEPA filters. 99.999% efficient ULPA filters available
- ❇ Interior-mounted, line-of-sight color LCD with MyLogic OS. Displays filter life, status messages for alarm conditions and alerts. 8 languages
- Bright, 90-150 footcandle, glare-free LED lighting located outside the contaminated work area
- Fully-closing, clear 1/4" tempered safety glass sash
- ❇ Curved stainless steel inlet grille with Reserve-Air Secondary Airflow Slots*
- ❇ Two electrical duplex receptacles. Flush-mounted-stainless steel with dampened hinges. Single outlets on 230V models. One outlet on each side, with ground fault interruption (115V)
- Smart-Start™ System user-programmable start up & shut down
- Night-Smart™ System reduces blower speed when sash is closed
- Leak-tight stainless steel interior & powder-coated steel exterior
- Removable towel catch located under work surface
- Code-activated electronic security lock
- ❇ 22.6" (57 cm) max. sash opening & 27.0" (69 cm) viewing height
- 10° Angled sash with counterbalanced, easy lift mechanism
- ADA-Compliant touchpad control on right side post
- Noise level <63 dBA

❇ Labconco exclusive feature

- Heat load 717 BTU/hour (4' models)
- Removable, seamless type 304 stainless steel, dished work surface with lift out knobs
- Nominal inflow velocity of 105 fpm (0.5 m/sec)
- Nominal downflow velocity of 55 fpm (0.3 m/sec)
- Approximately 70% air recirculation
- Overall depth x height: 32.0" x 61.6" (81.3 x 156.5 cm)**
- 10' (3 m) power cord with plug
- Built-in timer and digital clock
- Five year warranty

Models conform to the following standards:

- NSF/ANSI Standard 49
- ETL listed
- ADA-compliant (height of controls and receptacles)
- NSF and modified ASHRAE 110 compliant (Cell Logic+ models)
- CE Conformity marking (230V models)
- ISO 5 conditions per ISO 14644-1 and 2

Options include:

- Telescoping base stand with fixed feet (NSF approved and non-welded)
- Accessory Package: See page 11
- Ventus Canopy Connection: See page 23
- ❇ Cell Logic+ Packages: See page 10

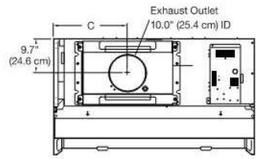
All models require (not included):

- Supporting base if non-welded stand option is not selected

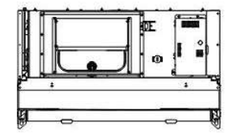
*U.S. Patent No. 6,368,206.
**5' and 6' models with 12" sash opening are 32.7" depth.

Logic+ Type A2 Biosafety Cabinets

Dimensional Data

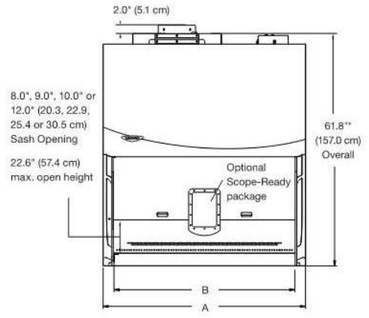


TOP

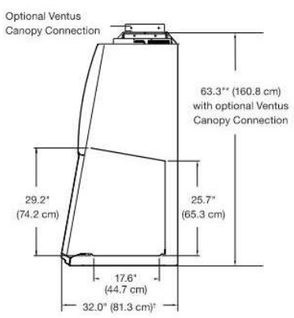


TOP (EN MODEL)

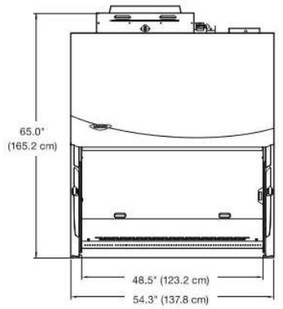
Nominal Width	A	B	C
3'	42.3" (107.4 cm)	36.5" (92.7 cm)	13.6" (34.5 cm)
4'	54.3" (137.9 cm)	48.5" (123.2 cm)	19.9" (50.5 cm)
5'	66.3" (168.4 cm)	60.5" (153.7 cm)	26.9" (68.3 cm)
6'	78.3" (198.9 cm)	72.5" (184.2 cm)	32.9" (83.6 cm)



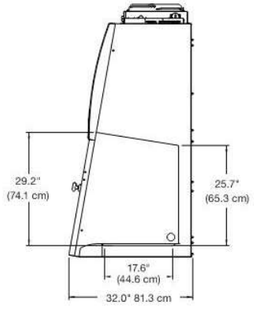
FRONT



SIDE



FRONT (EN MODEL)



SIDE (EN MODEL)

*Exhaust collar adds 2.0" (5.0 cm) to overall height.
**Sash opening working height varies. All Cell Logic+ Class II, Type A2's have a 9.0" working height. Remaining models have either an 8.0", 10.0" or 12.0" working height.
†5' and 6' models with 12" sash opening are 32.7" depth.

Incubator

Cut Sheet (OFOI)

Standby 120v20 amp circuit plug; 6 amp max current for unit.
Up to two units per circuit.

Thermo Scientific Heratherm General Protocol Incubators

Designed for routine applications in pharmaceutical, medical, food and research laboratories.

Heratherm microbiological incubators have a smooth inner chamber with easy to clean rounded corners

Heratherm General Protocol microbiological incubators, 60 L, 100 L, 180 L models

The flexible shelf system can be removed with just a finger click to easily clean the chamber

intelligent design for improved results

- Gravity convection provides gentle air flow and minimal drying out
- Temperature range from ambient +5 °C up to 75 °C
- Temperature uniformity of ± 0.6 °C
- Temperature stability of ± 0.2 °C
- Corrosion resistant stainless steel chamber (AISI 430)

easy to use interface

- Intuitive user interface for easy temperature setting
- Large vacuum fluorescent display for easy reading
- Intuitive 24 hour timer function to program automated switch on or off

Specifications table/order numbers General Protocol Incubators

Order number		51028063	51028064	51028065
Model		IGS60	IGS100	IGS180
Convection technology		Gravity convection	Gravity convection	Gravity convection
Temperature range	°C	ambient +5 °C to 75 °C	ambient +5 °C to 75 °C	ambient +5 °C to 75 °C
Spatial temperature deviation	at 37 °C	± 0.6 °C	± 0.6 °C	± 0.6 °C
Temperature deviation over time	at 37 °C	± 0.2 °C	± 0.2 °C	± 0.2 °C
Footprint	m² / sqft	0.3 / 3.2	0.36 / 3.9	0.47 / 5.1
Chamber volume	L / cuft	75 / 2.6	117 / 4.0	194 / 6.85
Dimensions	chamber, mm / in (W x H x D)	354 x 508 x 414 / 13.9 x 20.0 x 16.3	464 x 608 x 414 / 18.3 x 23.9 x 16.3	464 x 708 x 589 / 18.3 x 27.9 x 23.2
	exterior[1], mm / in (W x H x D)	530 x 755 x 565 / 20.9 x 29.7 x 22.2	640 x 855 x 565 / 25.2 x 33.7 x 22.2	640 x 955 x 738 / 25.2 x 37.6 x 29.1
Number of shelves	supplied / positions	2 / 13	2 / 16	2 / 19
Max. shelf load	kg / lb	25 / 55	25 / 55	25 / 55
Rated voltage / frequency	V / Hz	120 / 60	120 / 60	120 / 60
Rated power / max. current	W / A	300 / 2.5	540 / 4.5	720 / 6
Weight	kg / lb	40 / 88	51 / 112	65 / 143
Energy consumption at 37 °C	W	21	26	31

[1] Depth does not include handle/display (65mm / 2.6 in.) and distance spacer at rear (80mm / 3.1 in.); height includes the feet (35mm / 1.4 in.)
NOTE: All figures in tables are typical average values for series devices, based on factory standard following norm Din12880. Please contact us for certification information or IQ/OQ documents.

Growth Chamber

Cut Sheet (OFOI)

Standby 115v20a circuit. 12 amp current for unit.

May require floor drain.

22 Cubic Foot Arabidopsis/Algae, 1-Door, 300 µmole, 3 Tier (14.5 inch Growth Height) Plant Growth Chamber With LED Illumination,115V

SKU: CARO-7304-22-1
Weight: 625.00 LBS

$28,275.00

Product Description

Capacity:
623 Liters
Number of Tiers:
3
Temperature Range - Lights Off:
5C-50C
Temperature Range - Lights On:
10C-50C
Interior Dimensions:
22.5W x 28.5D x 57.8H (inches)
Exterior Dimensions:
30W x 35.1D x 81.5H (inches)
Light Intensity:
300 micro moles
Growth Height:
14.5"
Comes With This Many Shelves:
3
Shelf Dimensions:
21.6W x 26.5D
Voltage/Frequency/Current:
115V/60Hz/12A

Refrigerator Undercounter

Cut Sheet (OFOI)

May be located below lab benches.
Standby circuit at each lab island, 115v20a circuit, with two duplex per circuit.
5 amp current for unit.

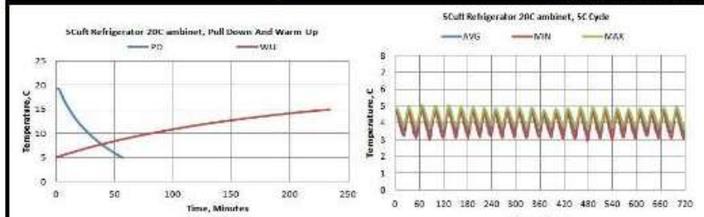
thermo scientific

Technical Data Sheet
Thermo Scientific High Performance Refrigerator

Revision-1

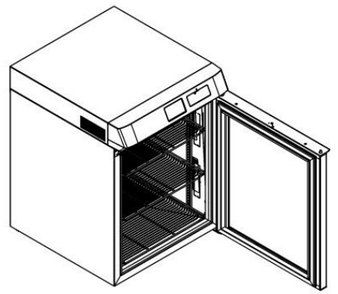
Thermo Fisher Scientific, Asheville, North Carolina

Specifications	
	Catalog Number
	TSX505GA
	Production Model Number
	TSX505GA
	Application, Rating And Electrical Data
Application	5.5cf High Performance Laboratory Refrigerator
Storage Volume	5.5cf(156L)
Temperature Rating	+2°C to 8°C
Electrical Power	115V/60Hz
Instrument Rated Current	5 Amps
Building Supply Rating	Breaker 15 Amps/115v± 10%Volt While Operating
Power Plug/Power Cord Length	NEMA 5-15P, 1.828 Meters (6 Feet)
Agency Listings	UL
Indoor/Outdoor Usage	Indoor Use Only
Application Environment	Non-Corrosive, Non-Flammable, Non-Explosive, Good Air Ventilation
Ambient Operating Temperature	15° C - 32° C (60° F - 90° F)
	Refrigeration Configuration
Refrigeration System	Thermoelectric Based Refrigeration System
Cooling System	125W Thermoelectric Heat Pump Devices
Cold Side	Hybrid cold wall / forced air with CO2 as refrigerant
Hot Side	Forced Air Heat-pipe Fin Tube With Water As Refrigerant
Defrost Method	Automatic
	Controller/Electrical System Configuration And Features
Controller Level	Waist Level
Power Switch	No
Controller Type	Programmable and Integraed Full Colour LCD Touchscreen Controller, 4.3", 480 X272
Control Sensor	(2) Air Thermisters
Remote Alarm Terminals	Yes, Audible & Visual
Power Failure Alarm	Yes
Data Logger / Chart Recorder	Yes, In-Built Data Logger. Data Accessible Through USB Device
	Dimensions And Construction
Interior Dimensions (H x W x D)	23" X 19.5" X 20.5" (58.4 X 49.5 X 52.07 cm)
Exterior Dimensions (H x W x D)	31.80" X 23.60" X 27.02" (80.8 X 59.9 X 68.6 cm)
Insulation	VIP, Polyurethane Foam
Door Perimeter heater	No
Shelves	3 Adjustable Wire Shelves
Levelling Legs	4 Leveling legs with 1" Height adjustment
Ship Weight	155 lbs
Access Port	Yes, Rear wall, Accommodates 25mm Probe
	Typical Performance Characteristics

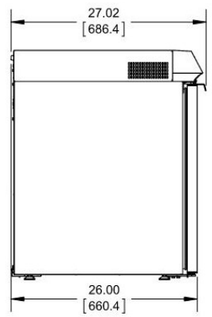


Test Unit Series Number or MSO Number:	19627-BA-T4
Cabinet Load:	Unloaded
Average Cabinet Temp at 4C Cycle (C):	4.1
Peak Variation from Setpoint (C):	+0.05 / -2.06
Uniformity (C):	0.45
Stability (C):	1.63
1-min Door Opening Recovery to 4C (min):	5
Duty Cycle at 4C (%):	50
Energy Consumption (kw-hr/day):	3.1
Heat Rejection Rate (btu/hr):	260.2
Pull Down Time (to 4C) (min):	55
Warm Up Time (4C to 15C) (min):	234

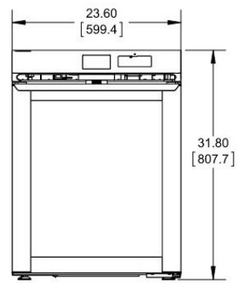
1) Performance is nominal and individual units may vary.
2) Freezer performance will differ due to product amount, product size and operating conditions.
3) Continuous product enhancements may, without notice, result in amendments or ommisions to this specification. Thermo Scientific cannot accept responsibility for damage, injury, loss or expenses resulting from misapplication of the information herein.



ISOMETRIC VIEW WITH DOOR OPEN



SIDE VIEW



FRONT VIEW

Freezer Undercounter

Cut Sheet (OFOI)

May be located below lab benches.
Standby circuit at each lab island, 115v20a circuit, with two duplex per circuit.
1.2 amp current for unit.

Thermo SCIENTIFIC

Technical Data Sheet
Thermo Scientific General Purpose Freezer
Unit Revision # A - 4/15/2015
Thermo Fisher Scientific, Asheville North Carolina

Model	**02LFEETSA**
Brand	Thermo Scientific
Type	General Purpose Freezer
Product	ThermoSci 1.4cf FRZR 115V/60Hz

Specifications	Application and Features
Application	General Storage Of Non-Critical Samples And Reagents
Storage Volume	1.42 Cubic Feet / 40.2 Liters
Temperature Rating	-12° to -20°C
Agency Listings	cCSAus
Lifetime of Product	10 Years
Warranty	13 Months Parts and Labor
Additional Features	None
	Dimensions and Construction
Number of Doors	1(1 compartment)
Type of Door	Hinged, Opens Left to Right, Reversible
Door Lock	Yes
Interior Light	Yes
Interior Material	ABS Plastic
Exterior Material	Enameled Steel
Color	White
Casters / Leveling Feet	No Leveling Feet
Interior Dimensions (H x W x D)	14.63" x 12.38" x 14.5" (37.16 x 31.45 x 36.83 cm)
Exterior Dimensions (H x W x D)	20.13" x 17.38" x 19.0" (51.13 x 44.15 x 48.26 cm)
Packaged Dimensions (H x W x D)	
Interior Storage Configuration	1 Fixed Shelf, Storage On Bottom Of Unit
Shelf Area (D x W)	
Unpacked Weight	40lbs / 18.14kg
Shipping Weight	55lbs / 24.9kg
	Refrigeration Configuration
Compartment Type	Freezer
Refrigerant	R134A, CFC Free
Insulation	Polyurethane Foam
Cooling Method / Defrost	Manual Defrost
Controller Type / Controller Location	Mechanical / Outside rear bottom left
Compressor Mounting	Bottom Mounted
Compressor Specifications	
	Electrical System Configuration and Installation Features
Electrical Power	115 Volts / 60 Hertz
Rated Current / Wattage	1.2 Amps / 83 Watts
Power Plug/Power Cord Length	Yes / Three prong NEMA 5-15P, 1.828 Meters (6 Feet)
Minimum Air Clearance Required	4" On Sides, 4" At Back, 4" On Top

1) Performance is nominal and individual units may vary.
2) Freezer performance will differ due to product amount, product size and operating conditions.
3) Continuous product enhancements may, without notice, result in amendments or ommisions to this specification. Thermo Scientific cannot accept responsibility for damage, injury, loss or expenses resulting from misapplication of the information herein.