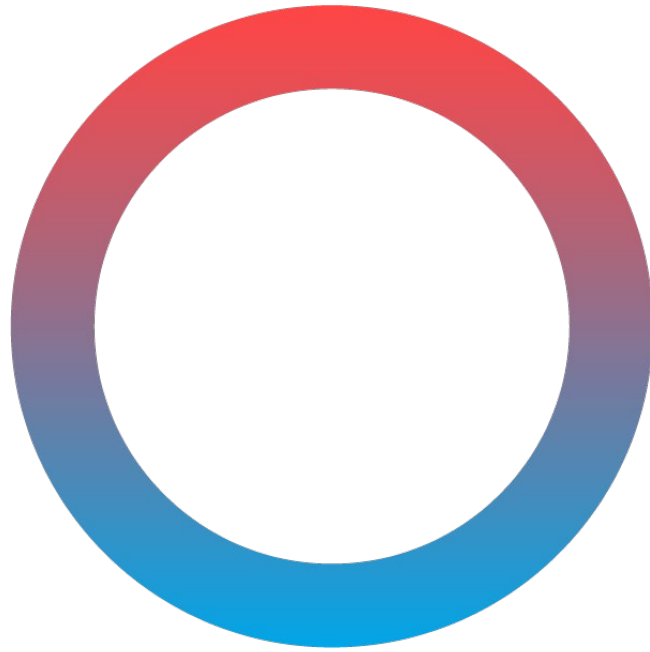


°LAUDA



°FAHRENHEIT. °CELSIUS. °LAUDA.



Semistat and PSC Installation Guide

°FAHRENHEIT. °CELSIUS. °LAUDA.

LN DOC # Q4-8004-EN-01_SystemInstallationGuide_2022-06-30_et

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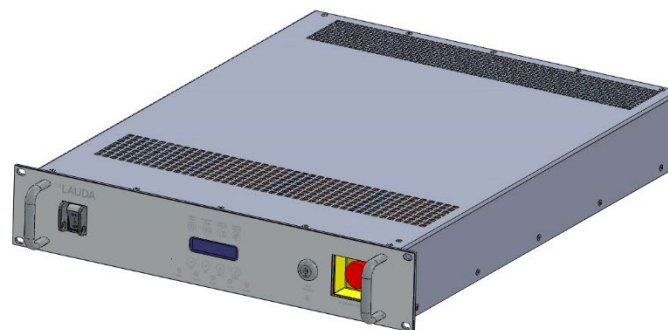
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Semistat System Components

Semistat Module



PSC (Power Supply/Controller)



Typical Semistat System Installation

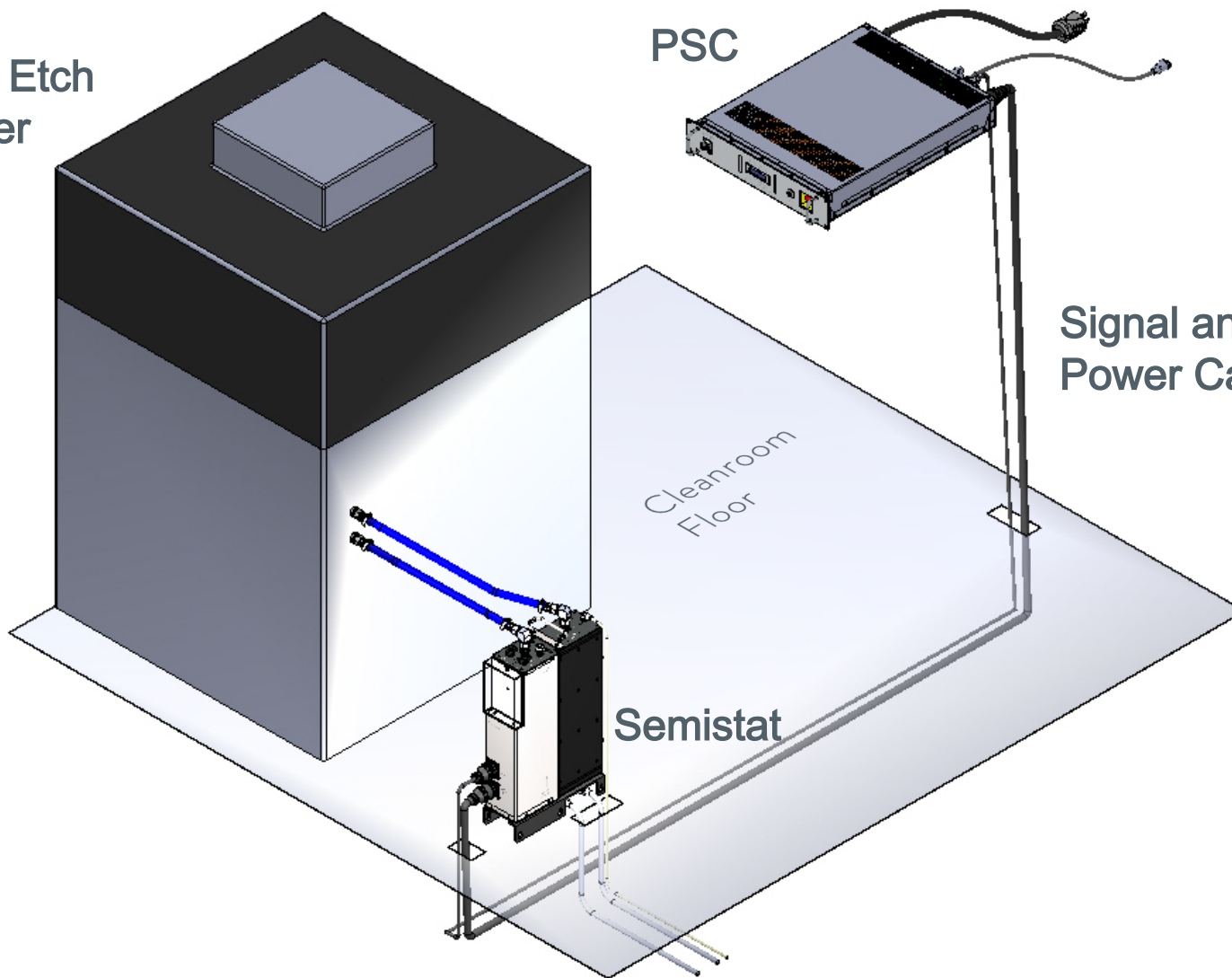
Plasma Etch Chamber

PSC

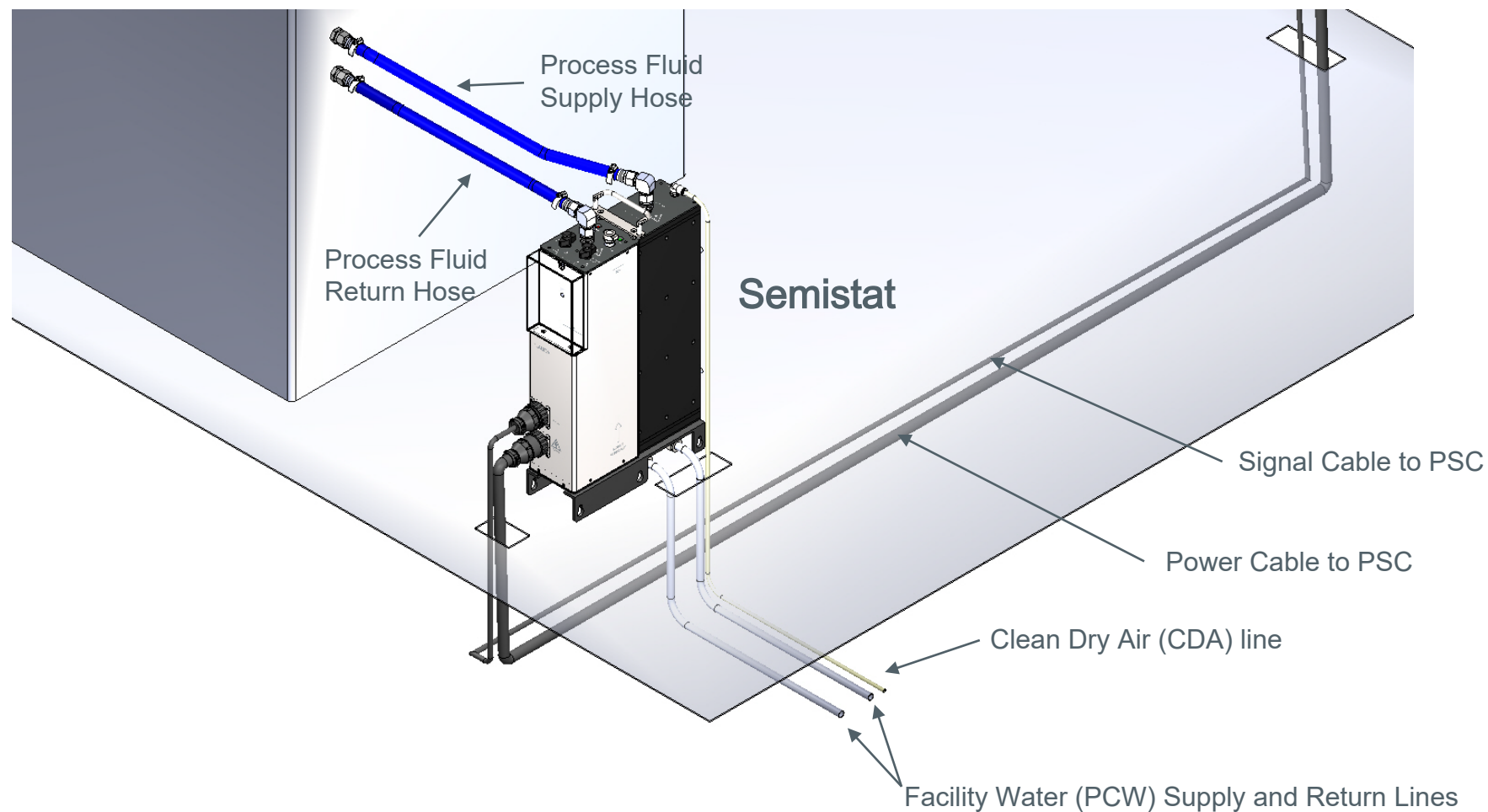
Signal and DC
Power Cables

Semistat

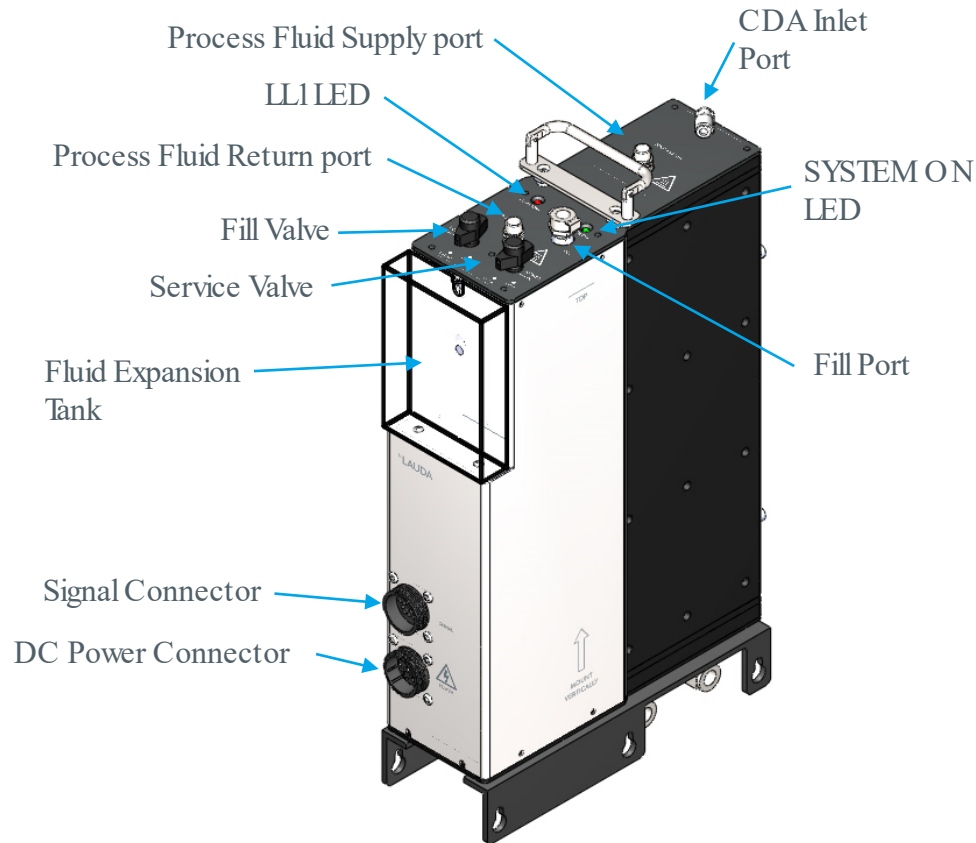
Cleanroom
Floor



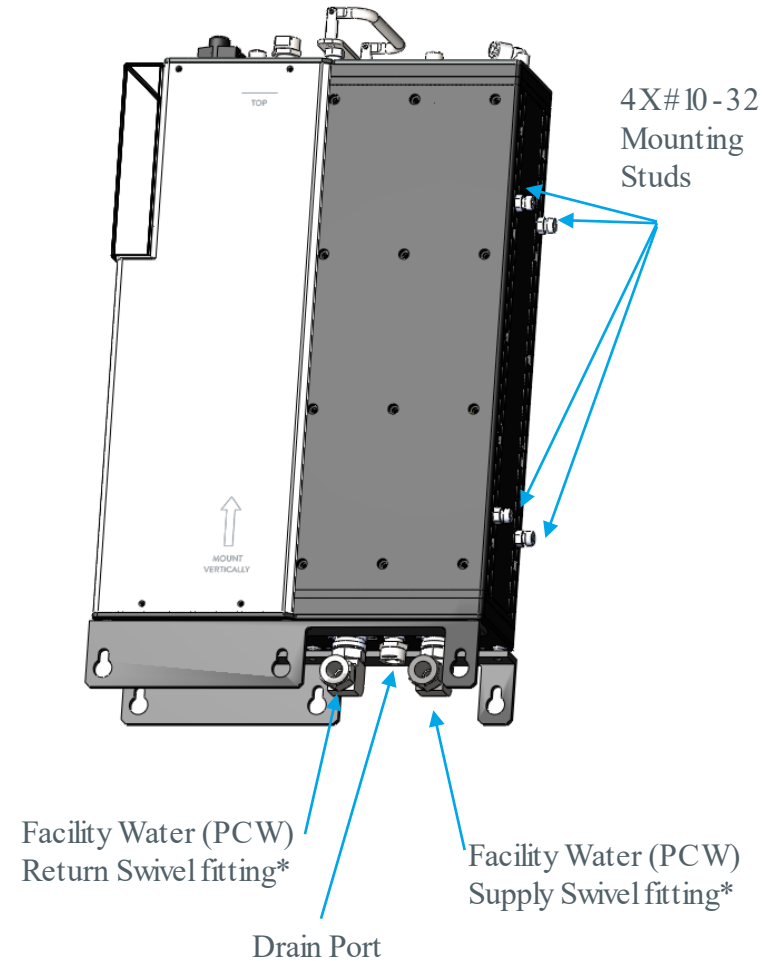
Semistat Installation



Semistat Features - Top

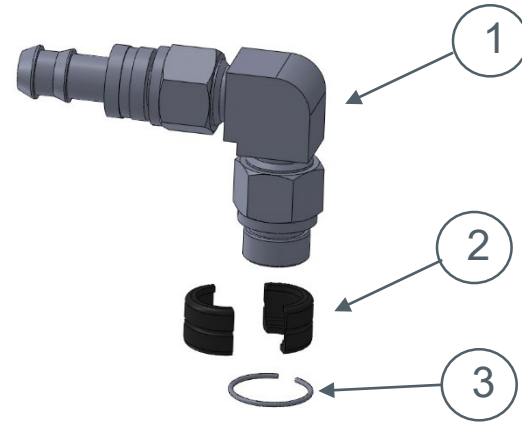


Semistat Features - Bottom



*Note: Fittings are 1/2" Swagelok® tube fittings

Prepare Thermostat For Installation by Installing Process Fitting Kits

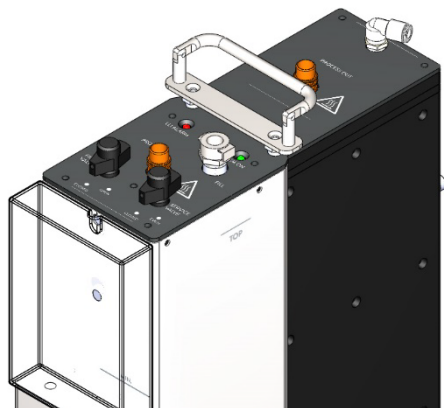


KIT COMPONENTS

- 901-3620B-KIT (for ½" ID hose)
- 901-3623-KIT (for ¾" ID hose)

1. Swivel Elbow Fitting Assembly with hose barb
2. Locking Sleeve Set
3. C-Clip

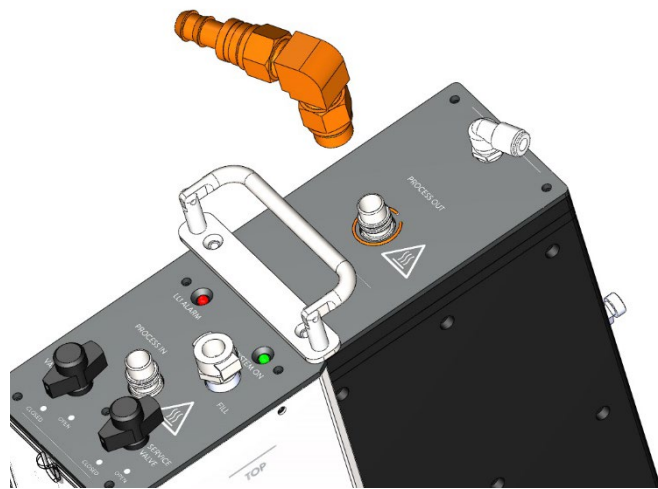
Process Fitting Kit Installation Procedure



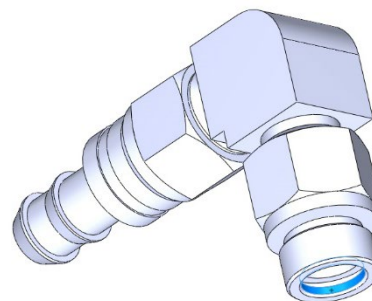
STEP 1: Locate Process Supply and Return Ports on Semistat



STEP 2: Lay C-Clip over port

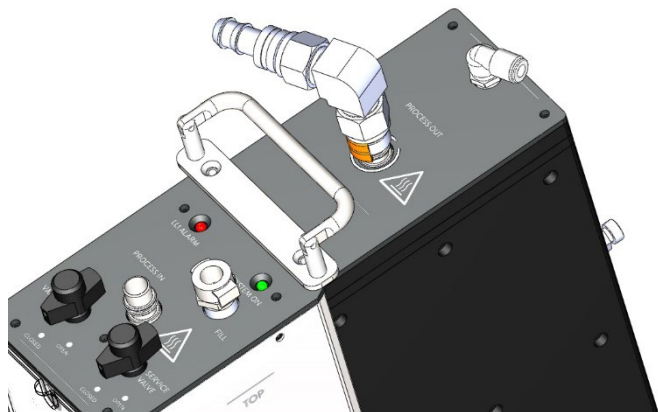


STEP 3: Align Fitting Assembly over port and push down to fully seat

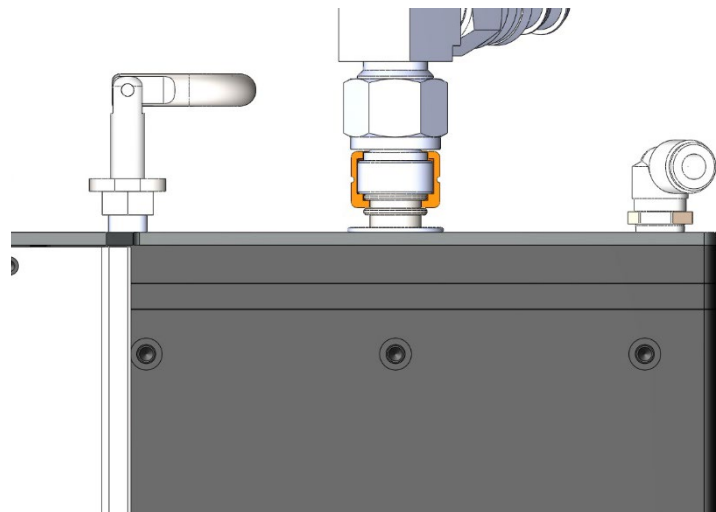


NOTE: Ensure supplied o-ring is fully seated in fitting before performing STEP 3.

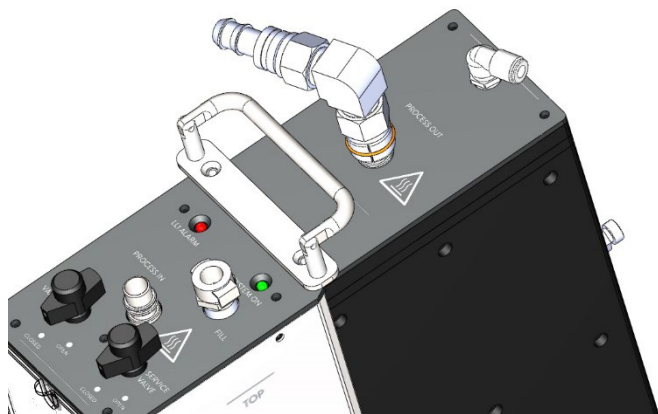
Process Fitting Kit Installation Procedure



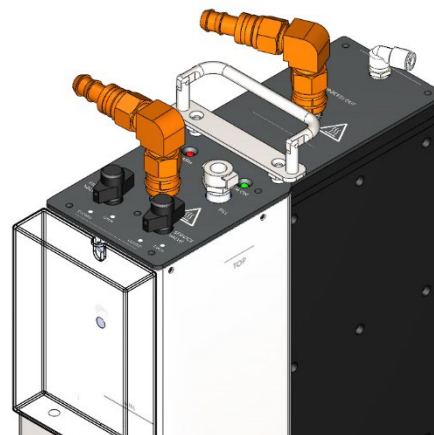
STEP 4: Install one of the locking sleeve pieces.



NOTE: Ensure locking sleeve engages both fitting assembly and port.

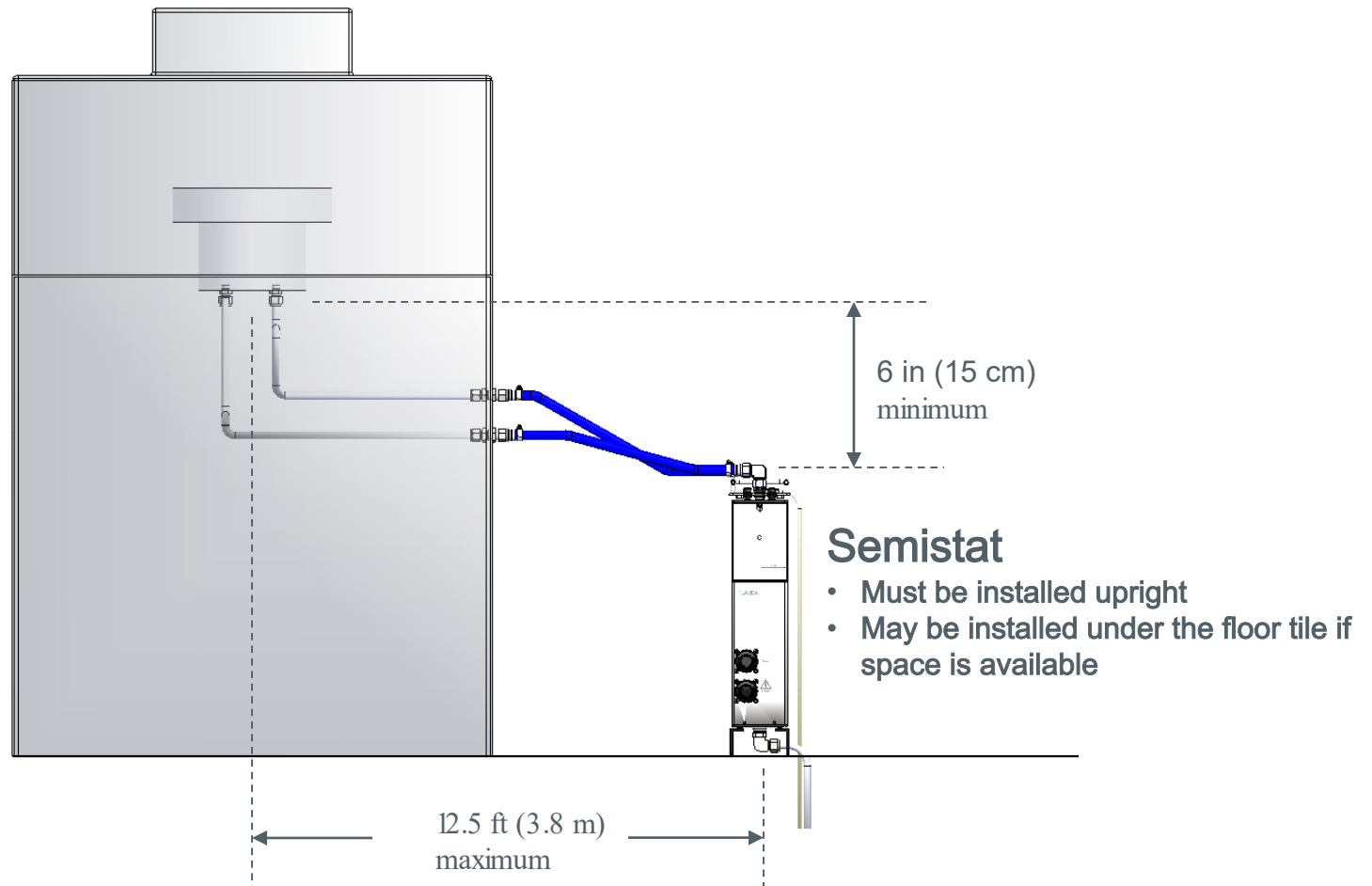


STEP 5: Install the other half of the sleeve and slide c-ring up to lock both into place.

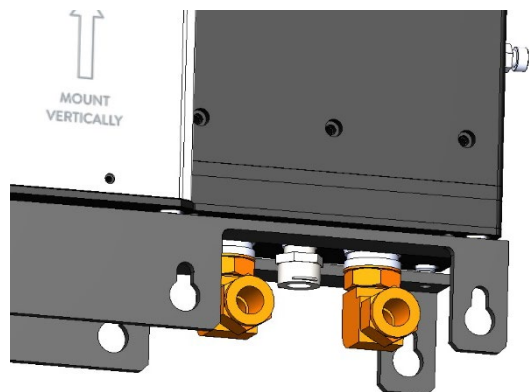


STEP 6: Install fitting assembly over the other port. Pull up and rotate both assemblies to ensure both are locked into place and can fully swivel.

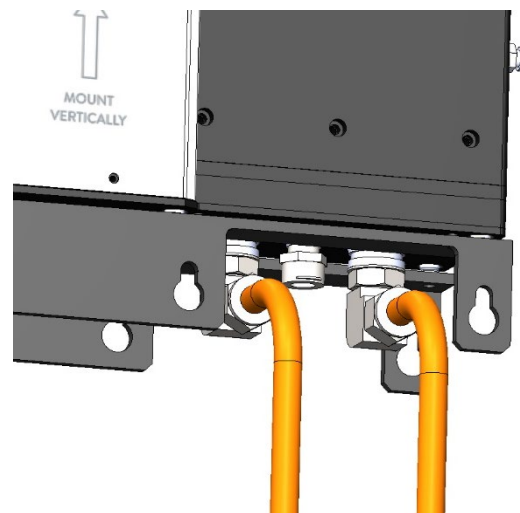
Semistat Installation - Limits



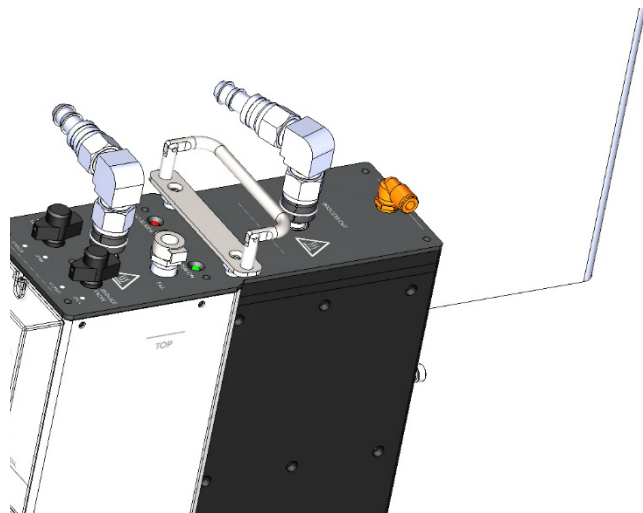
Semistat Facility Water and CDA Connections



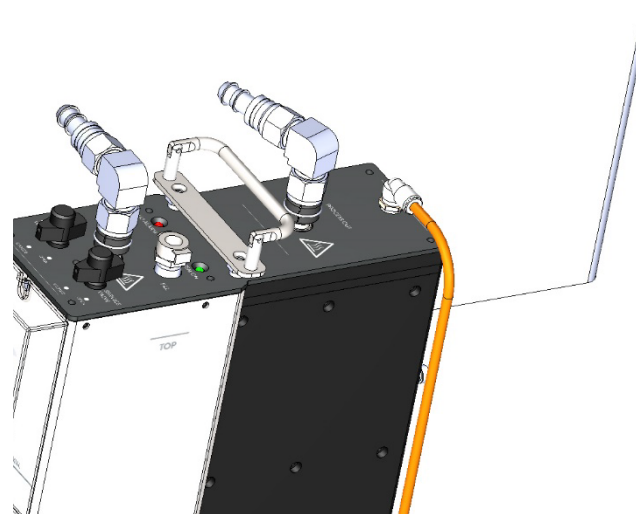
STEP 1: Locate PCW Return and Supply fittings on bottom of unit. These are 1/2" Swagelok® tube fittings.



STEP 2: Connect 1/2" OD tubing to PCW Return and Supply Fittings using supplied Swagelok® ferrules and nuts.

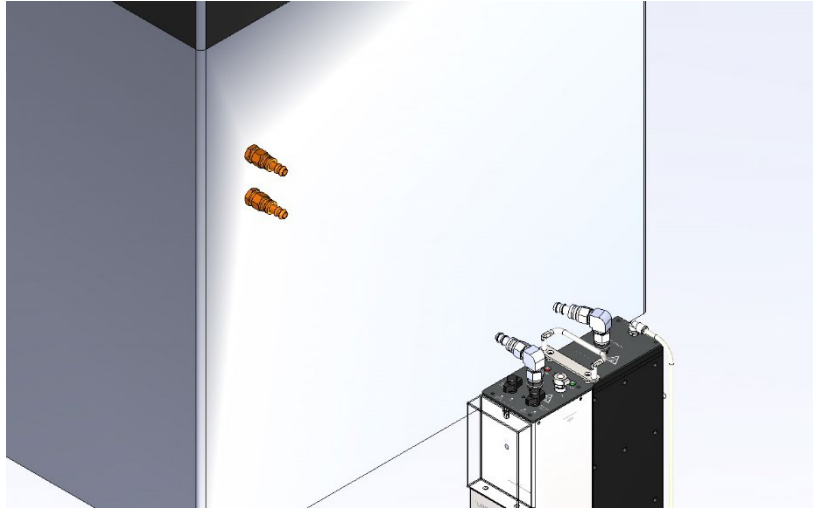


STEP 3: Locate CDA swivel fitting on top of unit.



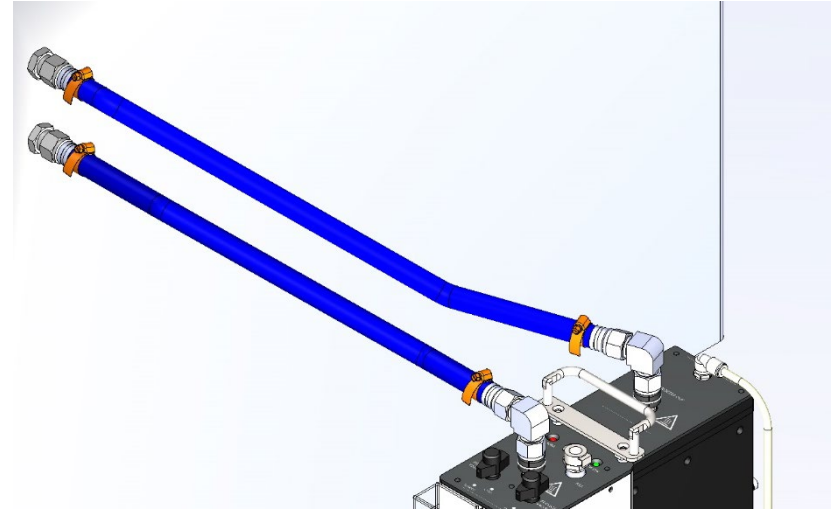
Step 4: Attach 1/4" tubing for CDA by pushing it into fitting until it seats and is locked into place.

Semistat Process Fluid Connections



STEP 1: Process Chamber Connections

1. Connect appropriate hose fitting kit to chamber. LAUDA-Noah has fitting kits tailored for specific tool chambers.

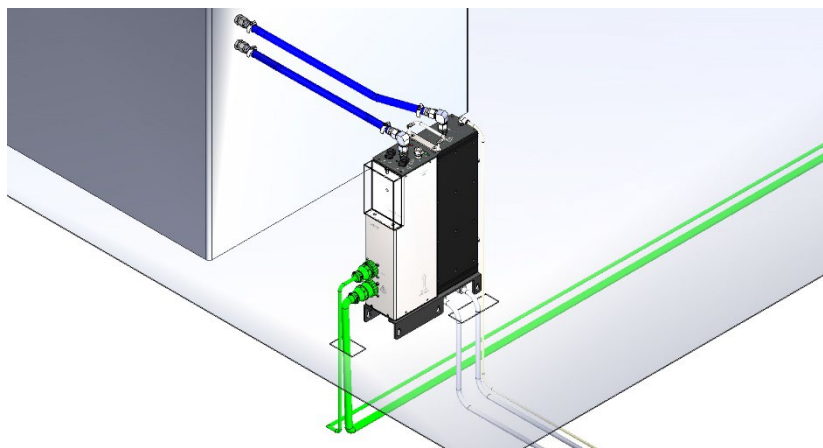
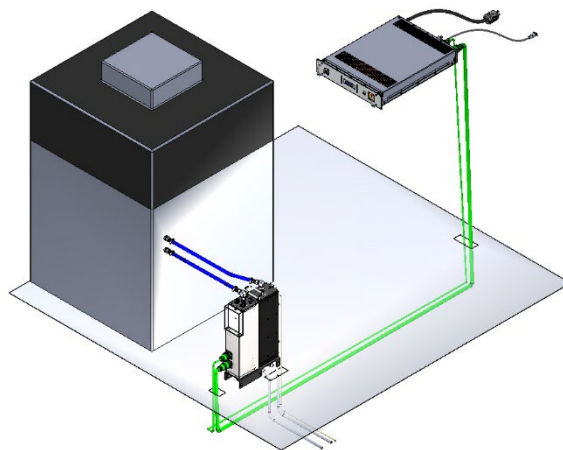


STEP 2: Process fluid hose connections

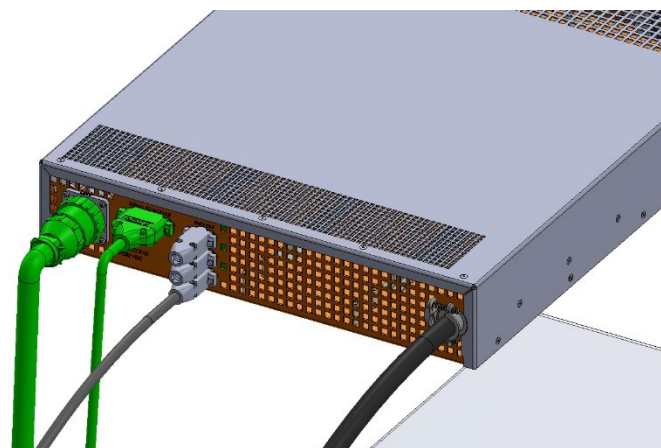
1. Connect Process fluid supply and return hose between Semistat and process chamber. Secure hose with supplied hose clamps.
2. For operation at low temperatures, it is recommended to install insulation over hose.

Semistat Electrical Connections

Connect Signal and DC Power Cables between Semistat and PSC. Cable connectors are keyed and specific to Semistat and PSC.



Signal and Power cable connections on Semistat

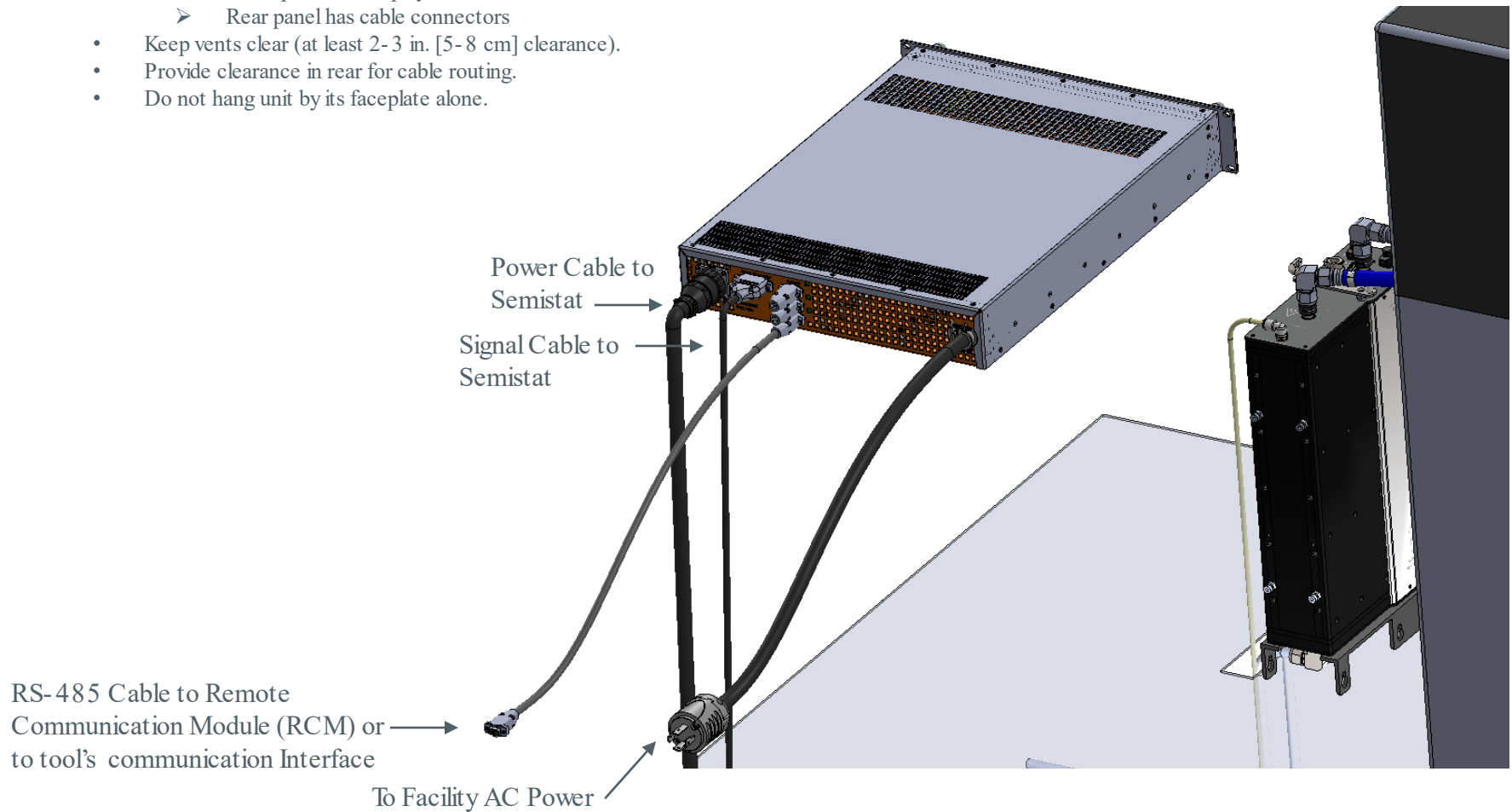


Signal and Power cable connections on PSC rear panel.

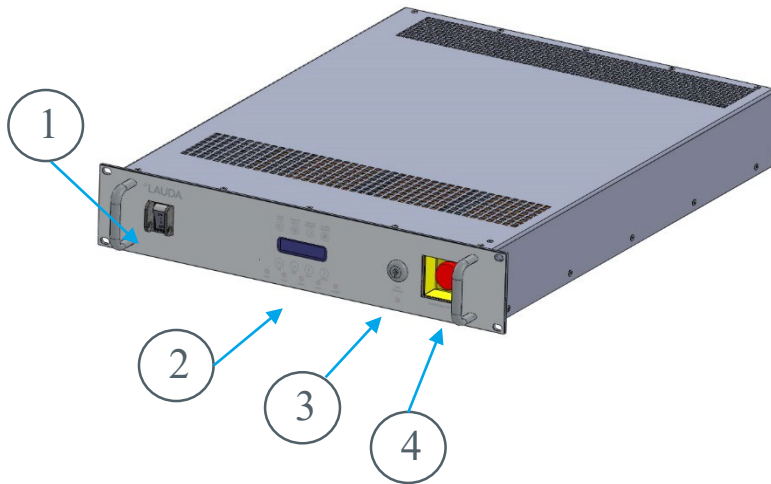
PSC Installation

Notes:

- PSC provides power and control to the POU module.
- PSC can be installed in a standard 19 in. equipment rack.
- PSC weight = 54 lbs (24 kg)
- Provide access to front and rear panels:
 - Front panel has display and user interface
 - Rear panel has cable connectors
- Keep vents clear (at least 2-3 in. [5-8 cm] clearance).
- Provide clearance in rear for cable routing.
- Do not hang unit by its faceplate alone.

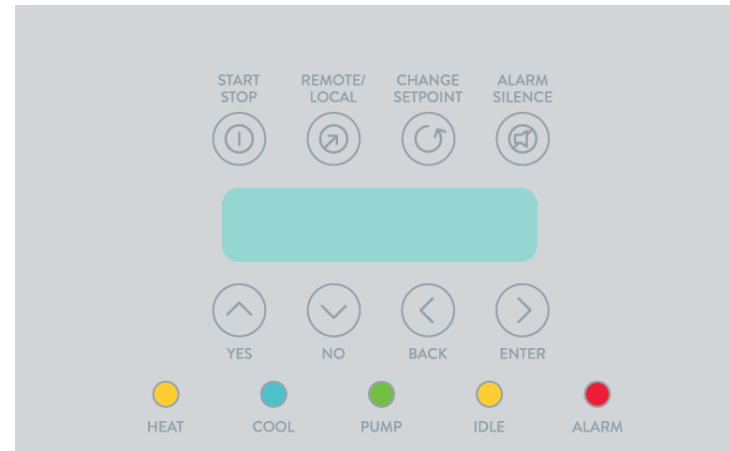


PSC Features



PSC Front Panel and Switches

1. Power Switch
2. Keypad and Display
3. EMO Disable (use provided key to disable PSC's EMO circuit if needed).
4. EMO (Emergency OFF) button



PSC Keypad and Display

1. Buttons

- **START/STOP** – Switches the module between IDLE mode and the ON state (ACTIVE mode).
- **REMOTE/LOCAL** - Switches the system's operation mode from tool controlled (REMOTE) to front panel controlled (LOCAL).
- **CHANGE SETPOINT** - Press this button to initiate a change in the process setpoint while in local mode.
- **ALARM SILENCE** - Press this button to mute any audible alarm, as well as clear an alarm once its condition has been rectified.
- **YES, NO, BACK, ENTER** - In addition to confirming or denying inquiries from the PSC, these buttons also act as navigation keys for cycling through different menu options.

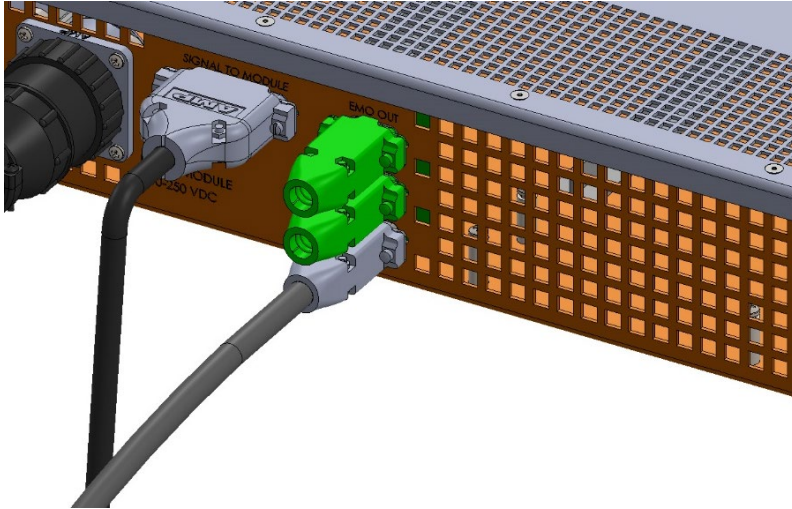
2. LED Indicators

- **HEAT** – System is in Heating Mode
- **COOL** – System is in Cooling Mode
- **PUMP** – System is in Active Mode
- **IDLE** – System is in Idle Mode
- **Alarm** – An alarm is Active

3. To access the menus, press these three keys in sequence:

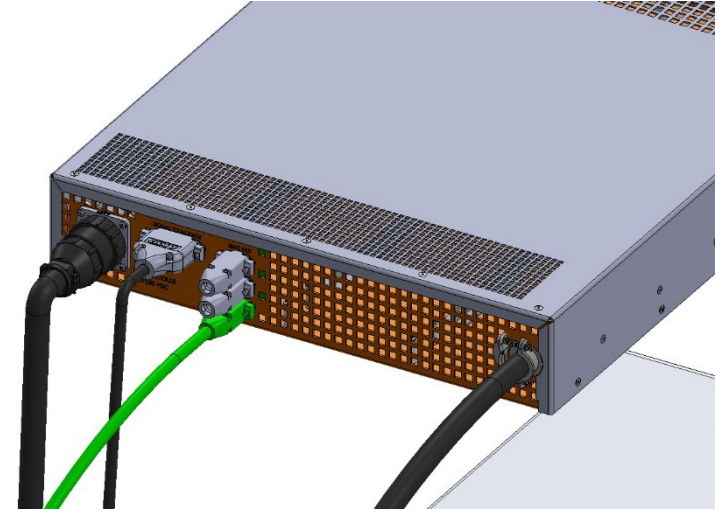
ENTER → ALARM SILENCE → CHANGE SETPOINT

PSC Rear Panel – EMO and RS-485



EMO OUT and EMO IN Jumpers

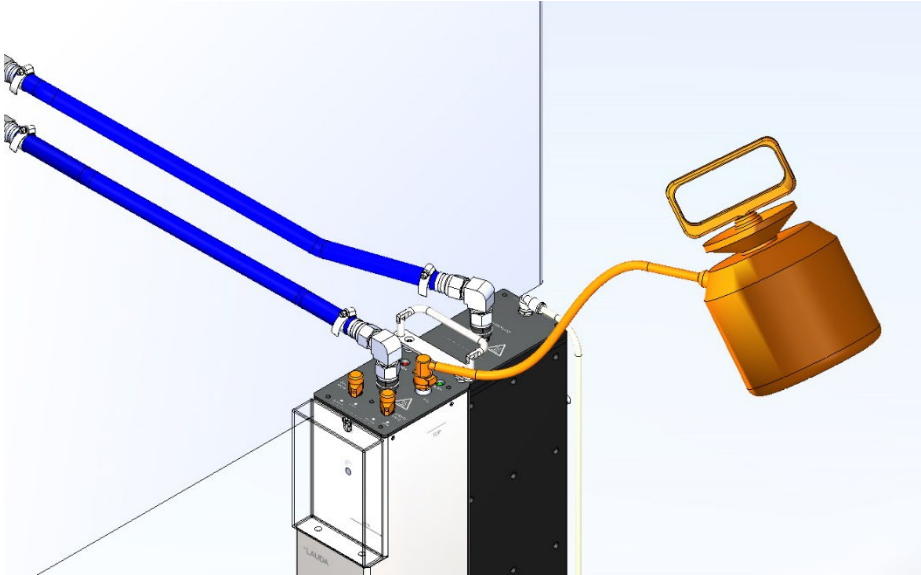
1. If a PSC is not connected to a tool's EMO circuit, connect the supplied EMO OUT and EMO IN jumpers to the corresponding connectors on the PSC. Note that the jumpers are labeled and are not interchangeable.
2. Refer to the manual for connections to the EMO ports if they will be connected to a tool or daisy-chained to other PSCs.



RS-485 Cable Connection

1. The PSC has an RS-485 serial port for remote communications with a process tool.
2. A tool that communicates directly over RS-485 can connect directly to this port if its communication protocol is supported by the PSC.
3. For other types of communication interfaces such as analog or LonWorks, LAUDA-Noah can provide a Remote Communication Module (RCM) specific to the interface. An RCM is connected between a PSC'S RS-485 port and a tool's interface.

Semitstat Fill Procedure – Initial Fill

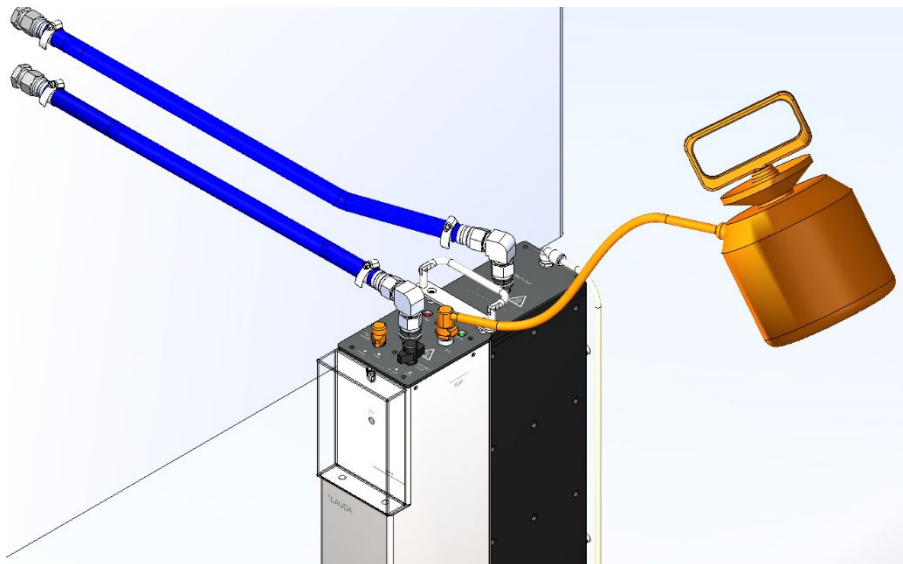


Initial FILL (Semistat in Idle Mode, SYSTEM ON light is off)

1. Power on PSC. Ensure it's in Idle mode.
2. Fill a fill canister with process fluid and connect the quick disconnect fitting on the canister's tube to the mating quick disconnect fill port on the top of the module.
3. Pressurize the fill canister with its hand pump.
4. Open the unit's Fill and Service Valves (push down and turn CCW to the Open position).
5. Press the canister's trigger to start filling the unit. Continue to pressurize the canister, pumping slowly. The LL1 Alarm light on the unit will eventually turn off. At this point the unit's internal reservoir is $\frac{1}{2}$ full.
6. Keep filling the unit until fluid enters the expansion tank.
7. If the fluid entering the expansion tank is frothy or bubbling, it means air is being purged out. Continue to fill until it stops bubbling and a solid line of fluid is visible just above the **MIN** indicator line on the expansion tank. Stop filling at this point.
8. Close both Fill and Service valves, disconnect the canister, and switch the system to Active Mode (System ON light is on).
9. When the pump starts circulating the fluid, the fluid level will usually drop and the unit will need to be topped off.

Semitstat Fill Procedure – Topping Off

Note: This top off procedure can be performed with the system either in Idle or Active modes.

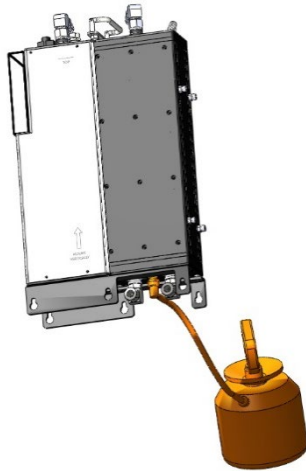


1. Open the Fill Valve only.
2. Keep the Service Valve closed.
3. Use the fill canister to start filling the unit.
4. Fill the unit until the LLI Alarm light turns off and fluid is entering the expansion tank without bubbling.
5. Stop filling when the fluid level in the expansion tank is just above the MIN indicator line.
6. At this point the fluid loop is filled completely and purged of air.
7. Close the Fill Valve and disconnect the canister.

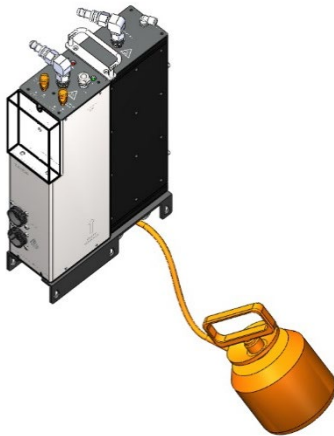
Topping Off (Semitstat in Active Mode, SYSTEM ON light is on)

Semistat Drain Procedure

Note: For clarity, all other fluid and electrical connections to Semistat are not shown.



Fill canister connected to Semistat's drain port



Fill and Service valves in Open position

1. Before draining, ensure that the system is maintaining the process fluid temperature close to room temperature.
2. Switch system to Idle mode and power off PSC.
3. Fully depressurize the fill canister by opening its vent valve or opening its fill cover.
4. Connect the quick disconnect fitting on the fill canister's tube to the mating quick disconnect drain port on the bottom of the module.
5. Open the unit's Fill and Service Valves (push down and turn CCW to the Open position).
6. Press the canister's trigger to start draining the unit.
7. Because the Semistat is connected to the process chamber, it will also be drained of fluid.
8. Pay attention to the amount of fluid draining back into the canister. It may need to be emptied periodically into a separate container so it does not overflow.
9. Keep draining the unit until fluid is no longer flowing back into the canister.
10. Disconnect the fill canister.

Semistat Facility Requirements Specifications

	Units	SEMISTAT S1200	POU 3300	SEMISTAT S2400	POU 3500	SEMISTAT S4400
HYDRAULICS						
Interfaces		½" Barb (Process) ½" Swagelok Compression (PCW)	½" Barb (Process) ½" Swagelok Compression (PCW)	½" Barb (Process) ½" Swagelok Compression (PCW)	½" Barb (Process) ½" Swagelok Compression (PCW)	½" Barb (Process) 2 x ½" Swagelok Compression (PCW)
Heat transfer liquids		Perfluorinated Fluid (3M FC-3283, Galden HT135)	Perfluorinated Fluid (3M FC-3283, Galden HT135)	Perfluorinated Fluid (3M FC-3283, Galden HT135)	Perfluorinated Fluid (3M FC-3283, Galden HT135)	Perfluorinated Fluid (3M FC-3283, Galden HT135)
PCW Temperature	°C	<20	<20	<20	<20	<20
Min PCW Flow Rate	gpm [Lpm]	3 [11.4]	3 [11.4]	5 [18.9]	3 [11.4]	8 [30.0]
CDA						
Required for setpoint	°C	-20 - 30	-20 - 30	-20 - 30	-20 - 30	-20 - 30
Interface		¼" OD Tube	¼" OD Tube	¼" OD Tube	2X ¼" OD Tube	2X ¼" OD Tube
Pressure	Psig [KPa]	7 - 9 [48 - 62]	7 - 9 [48 - 62]	7 - 9 [48 - 62]	7 - 9 [48 - 62]	7 - 9 [48 - 62]
Flow Rate	Scfh [m³/h]	80-120 [2-3]	80-120 [2-3]	80-120 [2-3]	80-120 [2-3]	80-120 [2-3]
Dewpoint	°C	-30 or lower	-30 or lower	-30 or lower	-30 or lower	-30 or lower
MECHANICAL						
Unit dimensions (w x d x h)	in [mm]	4.6 x 9.25 x 18.5 [116 x 232 x 470]	4.6 x 11.8 x 22 [116 x 300 x 560]	4.6 x 11.8 x 22 [116 x 300 x 560]	7.64 x 11.8 x 22 [194 x 300 x 560]	7.64 x 11.8 x 22 [194 x 300 x 560]
Weight	lb [kg]	33 [15]	55 [25]	55 [25]	84[38]	84[38]
Handles		Single handle, top.	Single handle, top.	Single handle, top.	Double handle, top.	Double handle, top.
ENVIRONMENTAL						
Ambient temperature	°C	5 to 40	5 to 40	5 to 40	5 to 40	5 to 40
Relative humidity		maximal 80 % at 31°C	maximal 80 % at 31°C	maximal 80 % at 31°C	maximal 80 % at 31°C	maximal 80 % at 31°C
Operational area		for internal use; altitude up to 2000 m	for internal use; altitude up to 2000 m	for internal use; altitude up to 2000 m	for internal use; altitude up to 2000 m	for internal use; altitude up to 2000 m
Overvoltage category		Category II	Category II	Category II	Category II	Category II
Pollution degree		Degree 2	Degree 2	Degree 2	Degree 2	Degree 2
Degree of protection		IP2X	IP2X	IP2X	IP2X	IP2X
QUALITY						
CE marking		yes	yes	yes	yes	yes
SEMI S2 Certification		yes	yes	yes	yes	yes
ISO 9000 (2015)		yes	yes	yes	yes	yes
SAFETY						
Safety Class		I, NFL (non-flammable liquids)	I, NFL (non-flammable liquids)	I, NFL (non-flammable liquids)	I, NFL (non-flammable liquids)	I, NFL (non-flammable liquids)

PSC Facility Requirements Specifications

	Units	PSC 1200	PSC 2400	PSC 4400
INPUT POWER				
Source Voltage	VAC	208 VAC Nom.	208 VAC Nom.	208 VAC Nom.
		3-phase, 4-wire (delta)	3-phase, 4-wire (delta)	3-phase, 4-wire (delta)
Source Frequency	Hz	50/60	50/60	50/60
Source Current	A	20	30	35
Max Power Consumption	kW	4.2	8.4	12.6
Ampere Interrupt Capacity	A	5000	5000	5000
MECHANICAL				
Unit dimensions (w x d x h)	in [mm]	19 x 26 x 3.5 [482.6 x 660.4 x 88.9]	19 x 26 x 3.5 [482.6 x 660.4 x 88.9]	19 x 26 x 3.5 [482.6 x 660.4 x 88.9]
Handles		Dual handles, front	Dual handles, front	Dual handles, front
Weight	lb [kg]	28.7 [13]	37.5 [17]	44.1 [20]
ENVIRONMENTAL				
Ambient temperature	°C	5 to 40	5 to 40	5 to 40
Relative humidity		maximal 80 % at 31°C	maximal 80 % at 31°C	maximal 80 % at 31°C
Operational area		for internal use; altitude up to 2000 m	for internal use; altitude up to 2000 m	for internal use; altitude up to 2000 m
Overvoltage category		Category II	Category II	Category II
Pollution degree		Degree 2	Degree 2	Degree 2
Degree of protection		IP2X	IP2X	IP2X
QUALITY				
CE marking		yes	yes	yes
SEMI S2 Certification		yes	yes	yes
SEMI F47 Certification		yes	yes	yes
ISO 9000 (2015)		yes	yes	yes
SAFETY				
Safety Class		Conforms to UL 61010-1	Conforms to UL 61010-1	Conforms to UL 61010-1