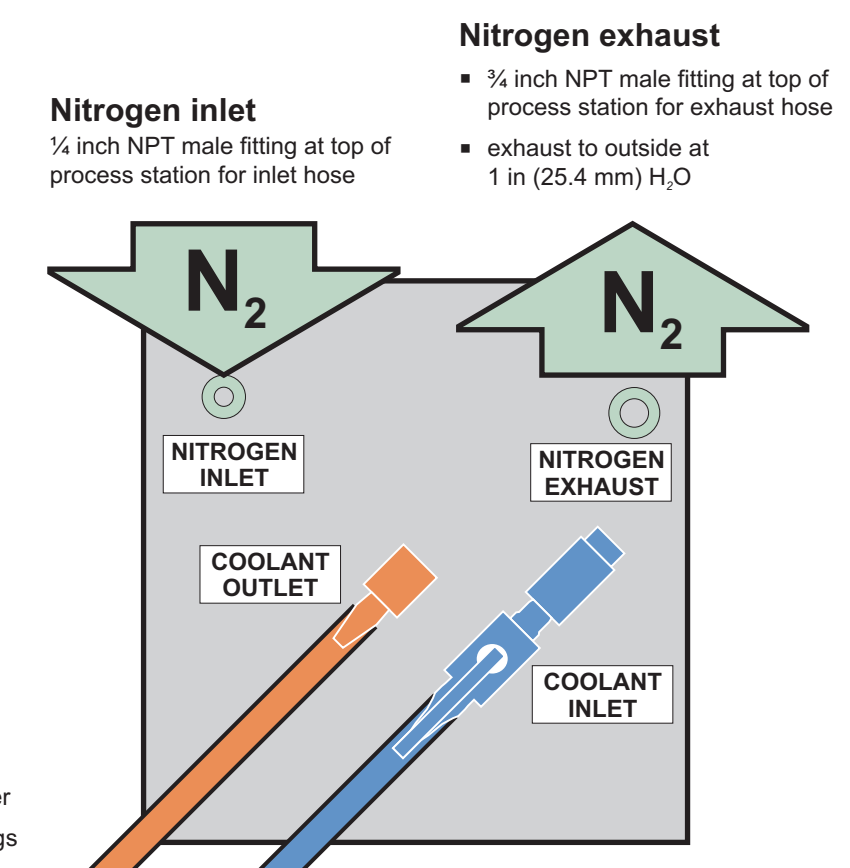


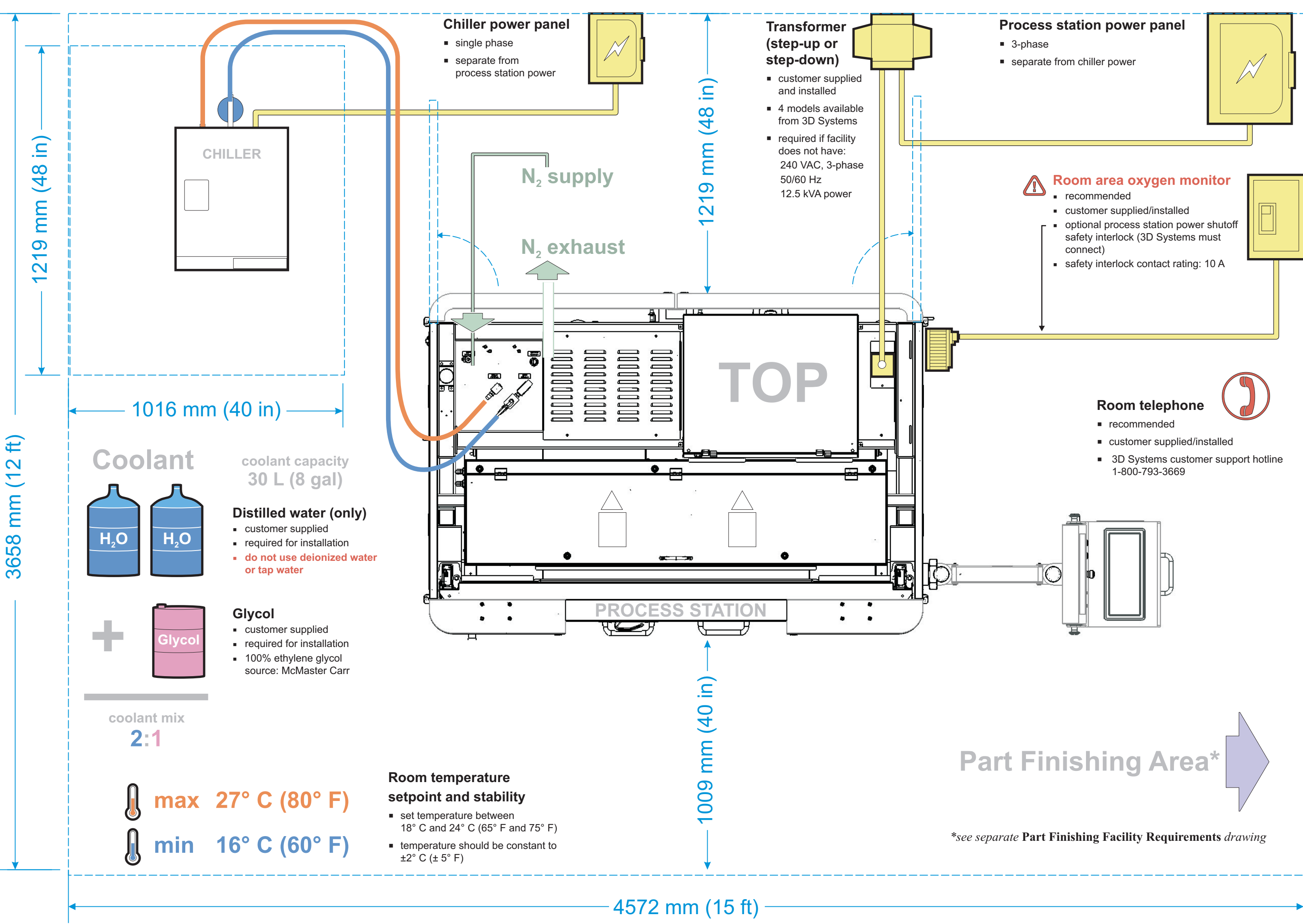
- 1 Bulk nitrogen tank**
- 99.999% pure nitrogen
 - option for high nitrogen demand sites
 - suitable for LaserForm Oven N₂ supply
- 2 Nitrogen dewars**
- 99.999% pure nitrogen
 - connect dewars with auto-switching manifold(s) to ensure constant N₂ supply during build
 - suitable for LaserForm Oven N₂ supply
- 3 Nitrogen generator**
- not suitable for LaserForm Oven N₂ supply
 - 99.9% pure nitrogen

Nitrogen System Options 1, 2 or 3.



- Coolant hoses**
- included with 3D Systems-supplied chiller
 - 1/2 inch NPT male barbed Pushloc® fittings

Coolant out
Coolant in



Coolant coolant capacity 30 L (8 gal)

Distilled water (only)

- customer supplied
- required for installation
- do not use deionized water or tap water

Glycol

- customer supplied
- required for installation
- 100% ethylene glycol source: McMaster Carr

coolant mix **2:1**

max 27° C (80° F)
min 16° C (60° F)

- Room temperature setpoint and stability**
- set temperature between 18° C and 24° C (65° F and 75° F)
 - temperature should be constant to ±2° C (± 5° F)

Part Finishing Area*

*see separate Part Finishing Facility Requirements drawing

Room

Minimum Clearance	Width	Depth	Height
Room	457 cm	366 cm	305 cm
	15 ft	12 ft	10 ft
Access door	213 cm	244 cm	244 cm
	7 ft	8 ft	8 ft

Floor

First floor installation	Required
Vibration-free	Preferred
Uncarpeted	Preferred
Level and flatness	within 25.4 mm (1 in) below process station
Distributed load-bearing capacity	0.024 bar (50 psf) on seven 100 mm (4 in) dia. pads

Atmosphere

Room temperature controls	Heating and air conditioning installed; A/C not blowing on top of process station
Temperature	Operating range: (16 to 27)° C; (60 to 80)° F Setpoint range: (18 to 24)° C; (65 to 75)° F Stability: ± 2° C (± 5° F)
Non-condensing relative humidity	No higher than 70%
Room air changes	4 per hour minimum
Heat dissipation	Maximum: 3516 W (12000 Btu/h) Average: 2110 W (7200 Btu/h)
Atmospheric corrosives	None

Electrical

Process station input voltage	(240 ± 5%) VAC, 3-phase, 50/60 Hz, 12.5 kVA
Normal operating current	(20 to 25) A
Peak operating current	30 A
On/Off breaker rating	40 A
Power cable (for 3-phase power)	4-conductor; wire size according to local electrical code
Power cable circuit breaker wiring	phase 1 to FD1-L1; phase 2 to FD1-L2; phase 3 to FD1-L3

- The 3-phase power cable and cable gland (cord grip) are customer supplied and installed. The cable feeds through the gland on the top of the process station.
- Connect the power cable ground wire to the ground bus bar in the process station's power distribution enclosure.
- Connect the process station to a dedicated power circuit.
- The electrical systems in the Vanguard SLS System process station and computer cabinet meet U.S. and European standards for electrical noise suppression. If your facility power noise levels exceed the applicable standard, install an isolation filter in series between the power panel and the process station.

Process Station Facility Power Transformer

A customer-supplied step-up or step-down transformer is required if the facility does not have 240 VAC, 3-phase, 50/60 Hz, 12.5 kVA power. 3D Systems stocks four transformers:

Transformer Type	3D Systems Part No.	Output
Step-up	5600-03538	208 to 240 VAC, 3-phase; 60 Hz
Step-down	5600-03539	400 to 240 VAC, 3-phase; 50 Hz
Step-down (CE approved)	5600-03539-EUR	400 to 240 VAC, 3-phase; 50 Hz
Step-down	5600-03768	480 to 240 VAC, 3-phase; 60 Hz

- If you purchase a transformer from a supplier other than 3D Systems, specify a "delta-to-wye" or "wye-to-wye" primary-to-secondary configuration.
- Connect the transformer secondary neutral to the transformer secondary ground.
- CAUTION:** Do not connect the transformer secondary neutral to the process station ground.

Chiller

These requirements only apply to the 3D Systems-supplied chiller.

Chiller Electrical

Facility power	230 VAC, 60 Hz, single phase, 10 A
	200 VAC, 50 Hz, single phase, 10 A
	240 VAC, 50 Hz, single phase, 10 A
Step-up or step-down transformer	May be required to modulate power
Wiring	Ground wire cannot be used for neutral (return)

NOTE: The single phase chiller power source must be separate from the 3-phase process station power source.

Chiller Coolant

Distilled water	2 parts	Use only distilled water; do not use deionized water or tap water
Glycol	1 part	100% pure ethylene glycol (preferred) or DowFrost® propylene glycol
Coolant capacity	30 L (8 gal)	

- Coolant is customer-supplied and must be available at installation.
- 100% pure ethylene glycol is available through McMaster-Carr in 1 and 5 gallon containers. Request part no. 3190K246 (5 gal size—recommended). To order, call 404-346-7000 (U.S. only) or see www.mcmaster.com
- If local toxic chemical regulations do not permit use of ethylene glycol in the Vanguard facility, use DowFrost® propylene glycol manufactured by The Dow Chemical Company.

Nitrogen

Purity	99.998%
Nitrogen line fittings	Inlet: 1/4 in NPT male; Exhaust: 3/4 in NPT male
Continuous flow	9 lpm (19 scfh) for length of build
Purge flow	Continuous flow of 9 lpm (19 scfh) plus 165 lpm (350 scfh) maintaining 1.03 bar (15 psi) for 25 min
Exhaust	Must exhaust to outside at pressure 0.0025 bar (1.0 in H ₂ O)
Weekly consumption	120 m ³ (4240 ft ³) of N ₂ gas based on 24 h/day operation with 7 purge cycles

- Nitrogen supply and exhaust systems are customer supplied and installed.
- If you plan to use the process station's nitrogen supply for a LaserForm Oven, use liquid or bottled nitrogen with a purity of at least 99.998%. The 99.9% nitrogen produced by nitrogen generators is not sufficiently pure for metals processes.

