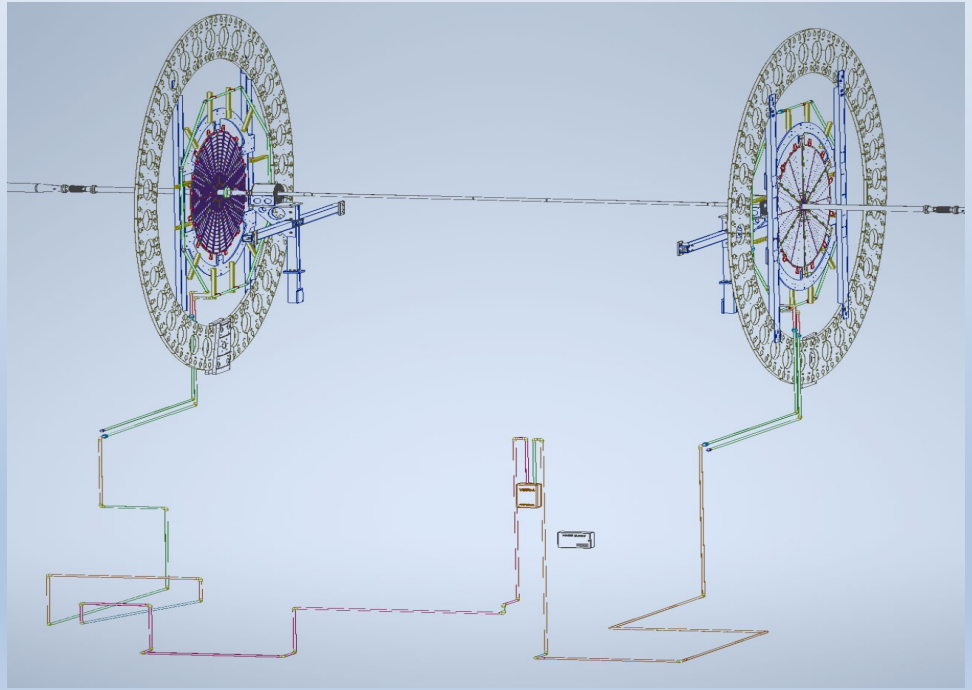
VESDA Piping Design Overview



VESDA Piping System

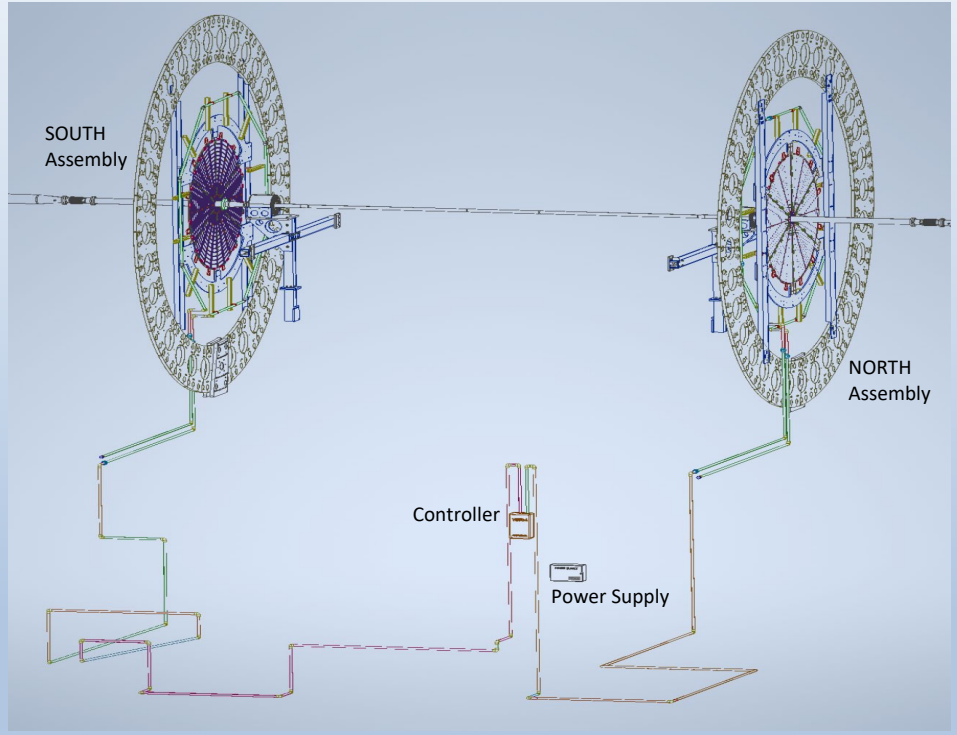
Agenda

- VESDA piping overall components and building views
- North/South sEPD mounting assemblies
- North/South octagon drawings
- VESDA Controller & Power Supply (Battery backup)
- Timing analysis from vendor
- Drawing status

VESDA Piping Overview

Components:

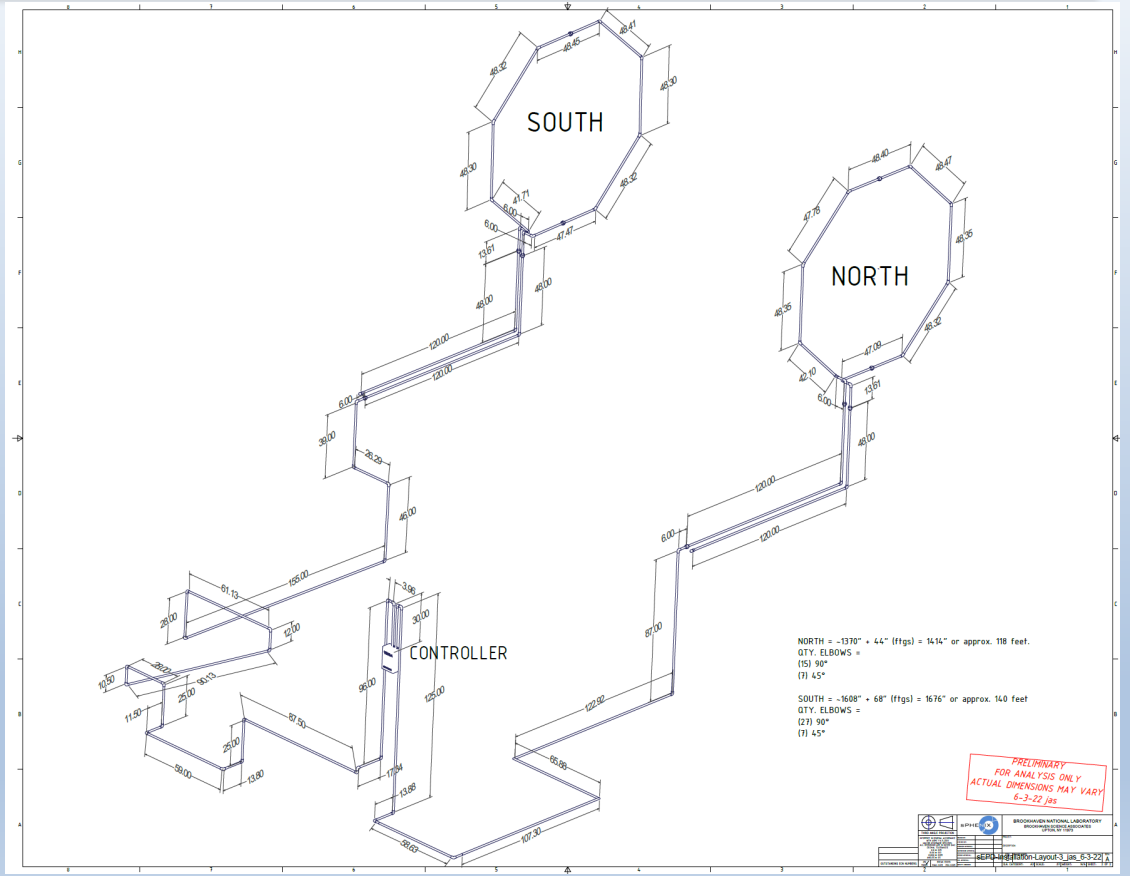
- North assembly
  - (8) sample ports and (1) test port
  - Approx. **118 feet**.
  - QTY. ELBOWS = (15) 90˚ (7) 45˚ (22 fittings total +/-)
- South assembly
  - (8) sample ports and (1) test port
  - Approx. **140 feet**
  - QTY. ELBOWS = (27) 90˚ (7) 45˚ (34 fittings total +/-)
- Controller:
  - VESDA-E VEP-A10-P.
  - (4) top inlet ports,
  - (1) bottom exhaust.
  - (can be inverted)
- Power Supply: (Battery backup)
  - VPS-100US-120



All pipe sizes are standard 3/4” CPVC. (1.050” O.D. x 0.824” I.D.) (0.113” +/- wall)

VESDA Piping Overview

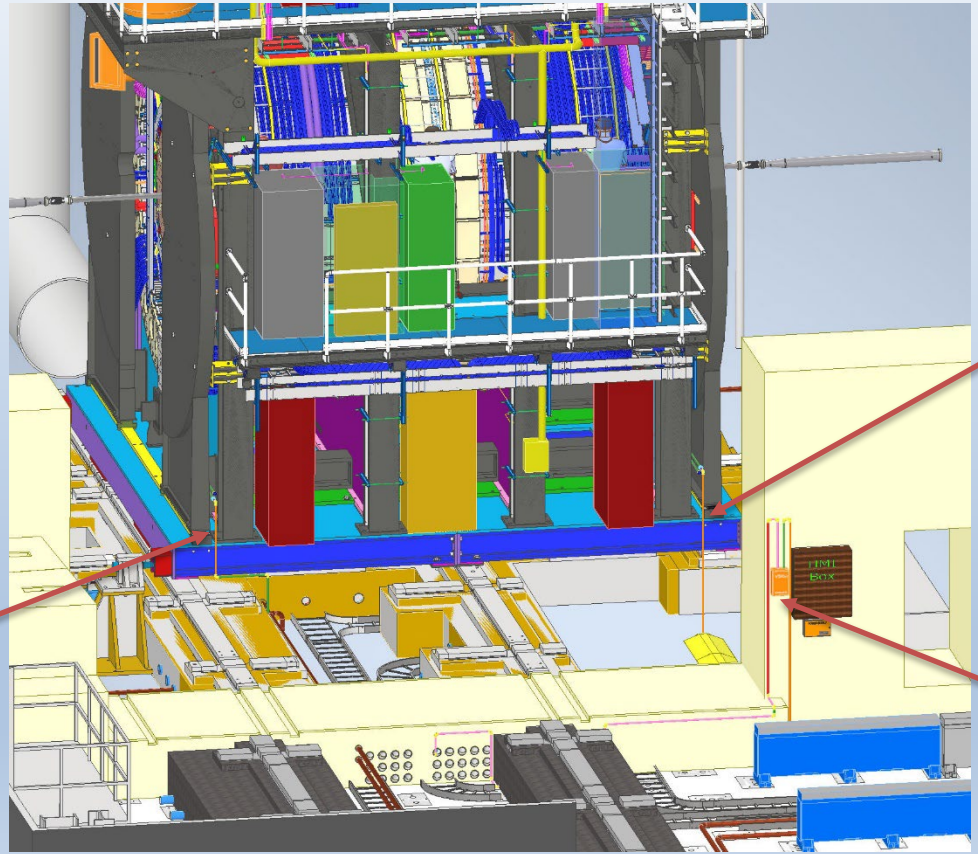
- ✓ ALL PIPE SIZES ARE STANDARD 3/4” CPVC. (1.050” O.D. X 0.824” I.D.) (0.113” +/- WALL)
- ✓ ALL GLUED PER THE VENDOR SPECIFICATION.
- ✓ (8) SAMPLE PORT HOLES (1/8” DIAMETER) WILL BE ADDED AT EACH OCTAGON ASSEMBLY.
- ✓ THIS IS A FIELD INSTALLATION AND ROUTED AND SECURED AS NEEDED TO AVOID EXISTING SERVICES AND EQUIPMENT.



In resources folder

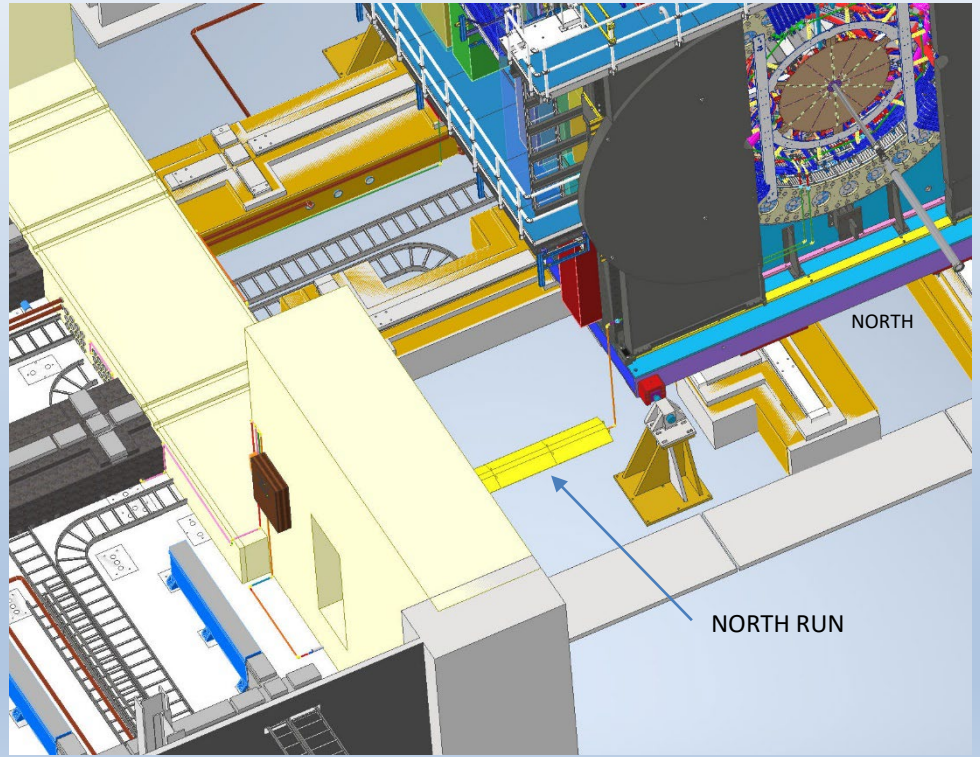
VESDA Piping Building Views

East Side



VESDA Piping Building Views

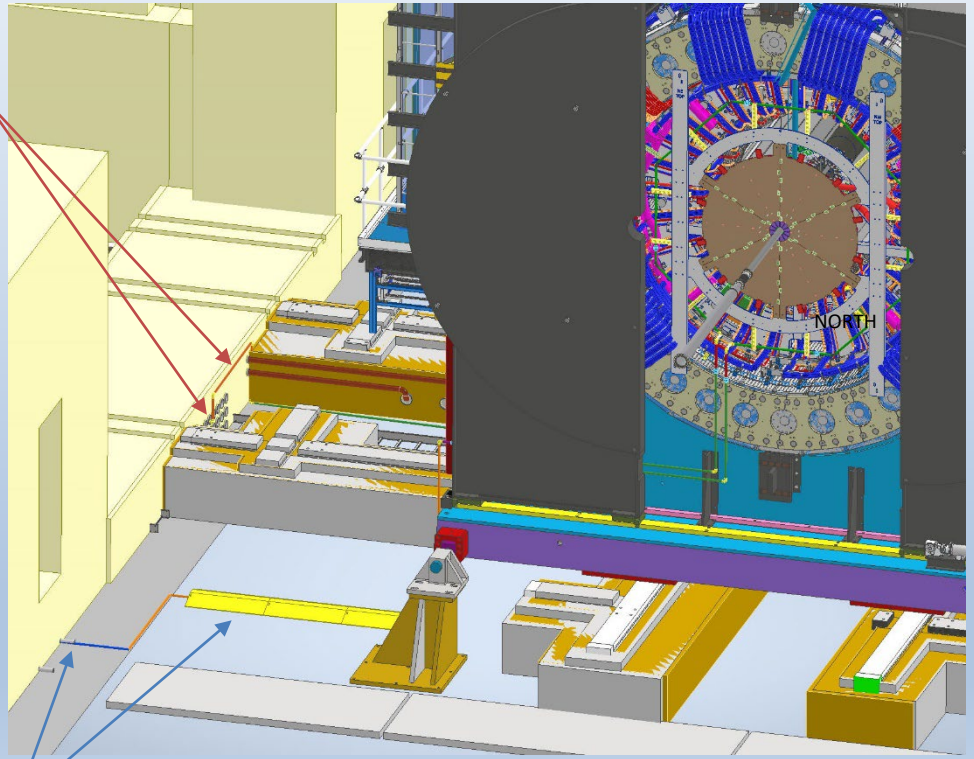
North East corner



VESDA Piping Building Views

North side and Sill

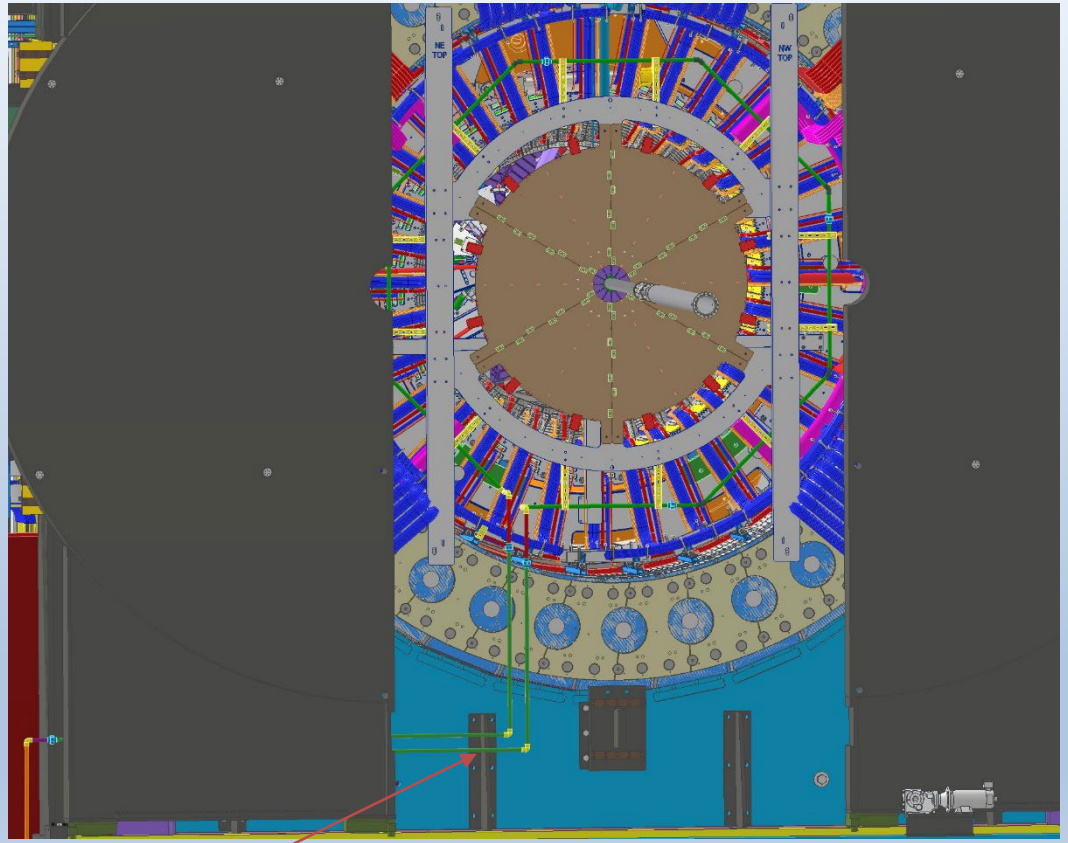
SOUTH RUN
THRU SILL PORT #10



NORTH RUN
THRU PLUG DOOR WEST PORT

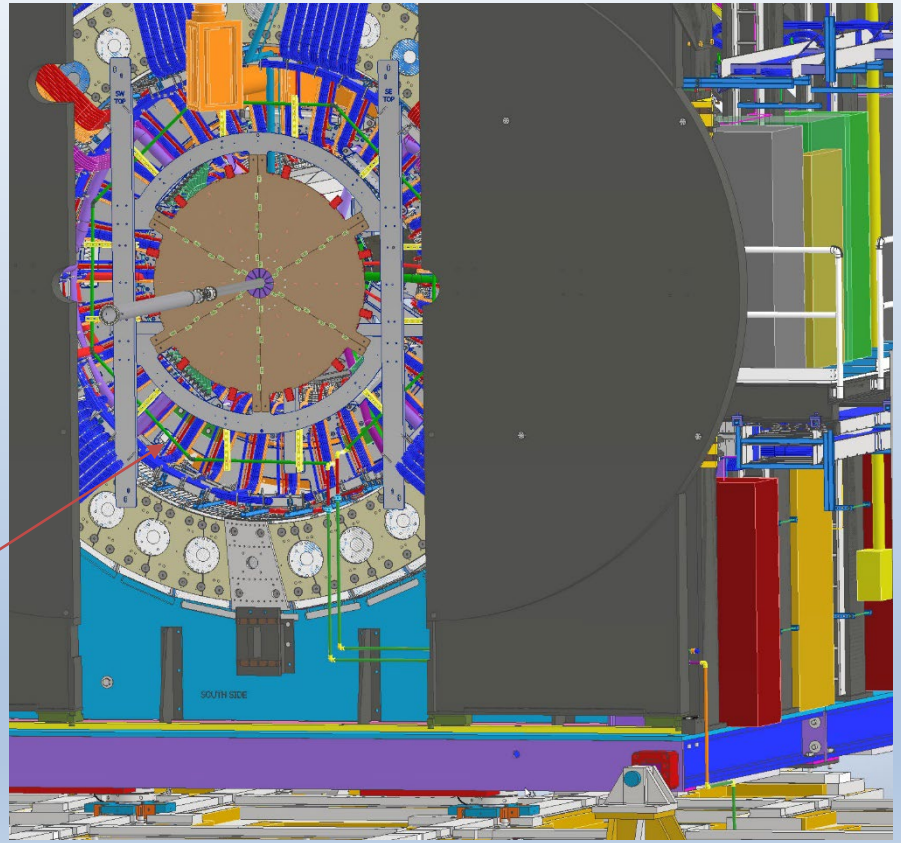
VESDA Piping Building Views

North side



VESDA Piping Building Views

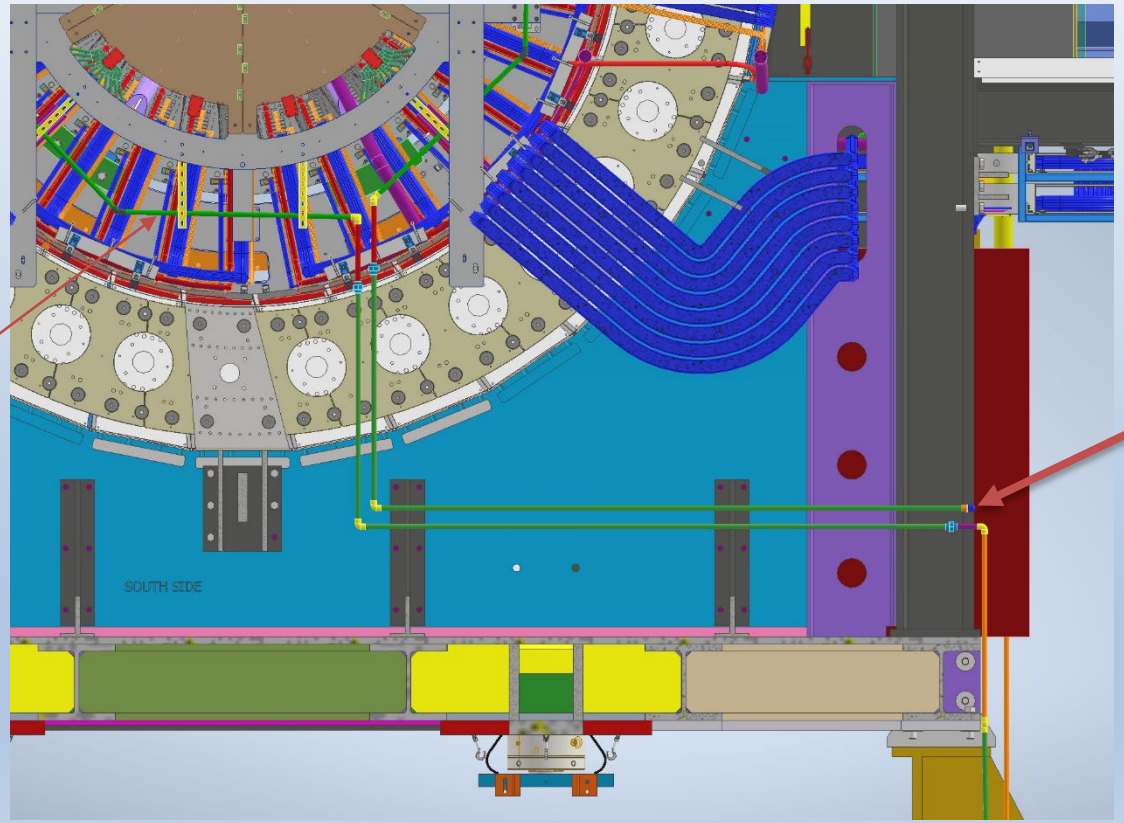
South East Corner



VESDA Piping Building Views

South Test Port

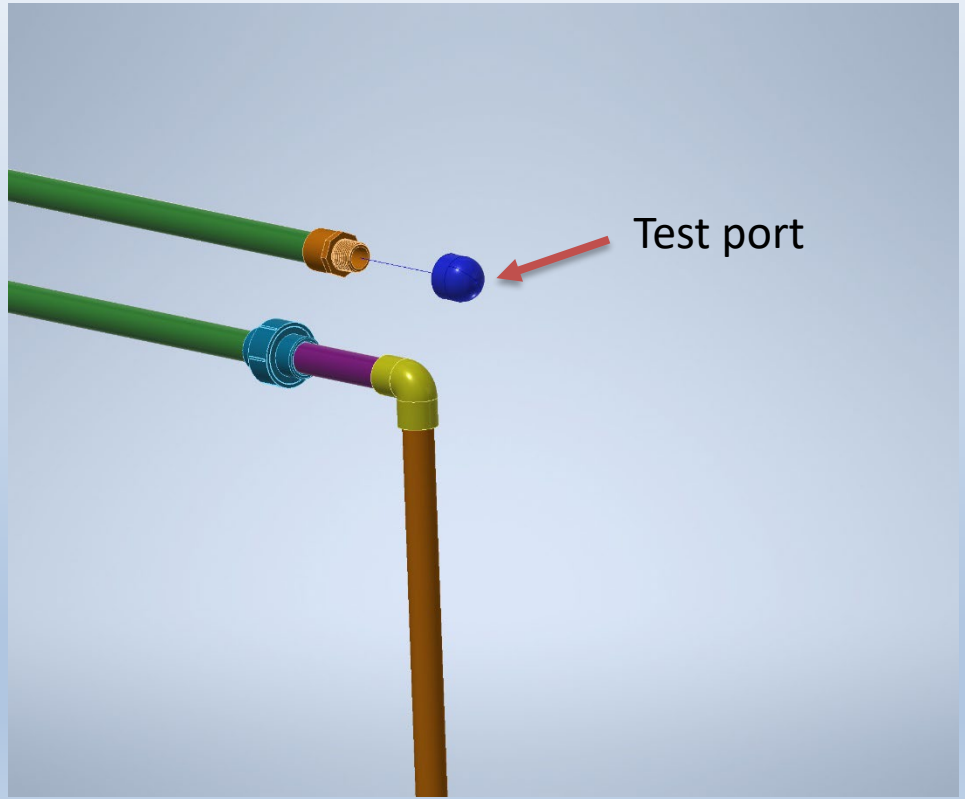
POLETIP DOORS
NOT SHOWN



VESDA Piping Building Views

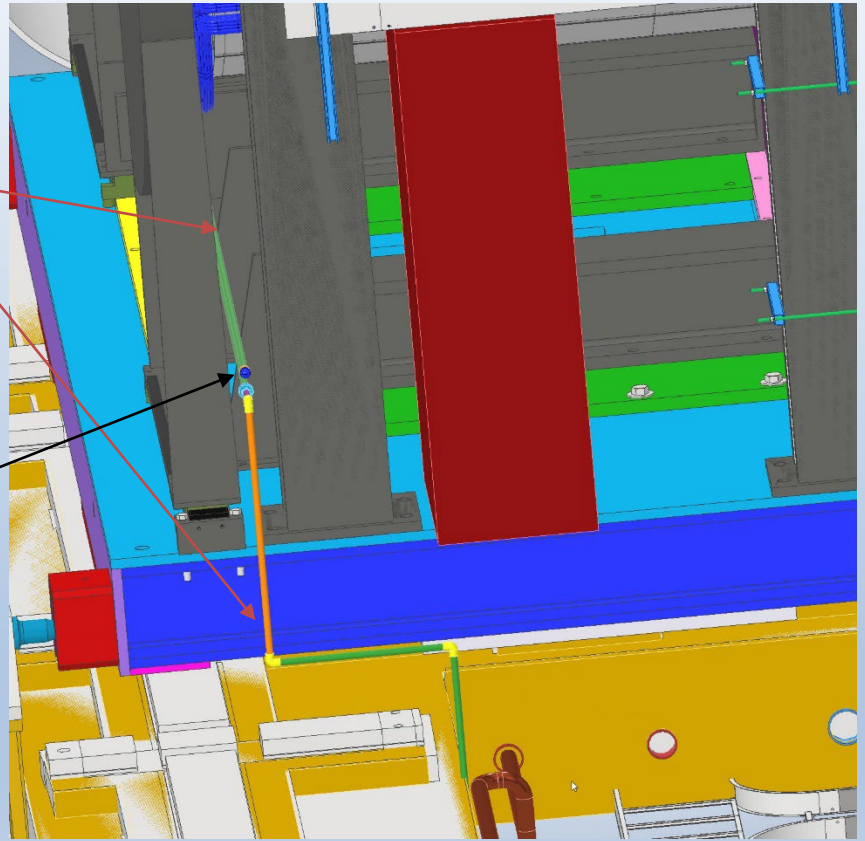
Test Port

THREADED END CAP TO BE REPLACED BY ONE WITH AN 1/8” DIAMETER TEST HOLE IN IT DURING TESTING.



VESDA Piping Building Views

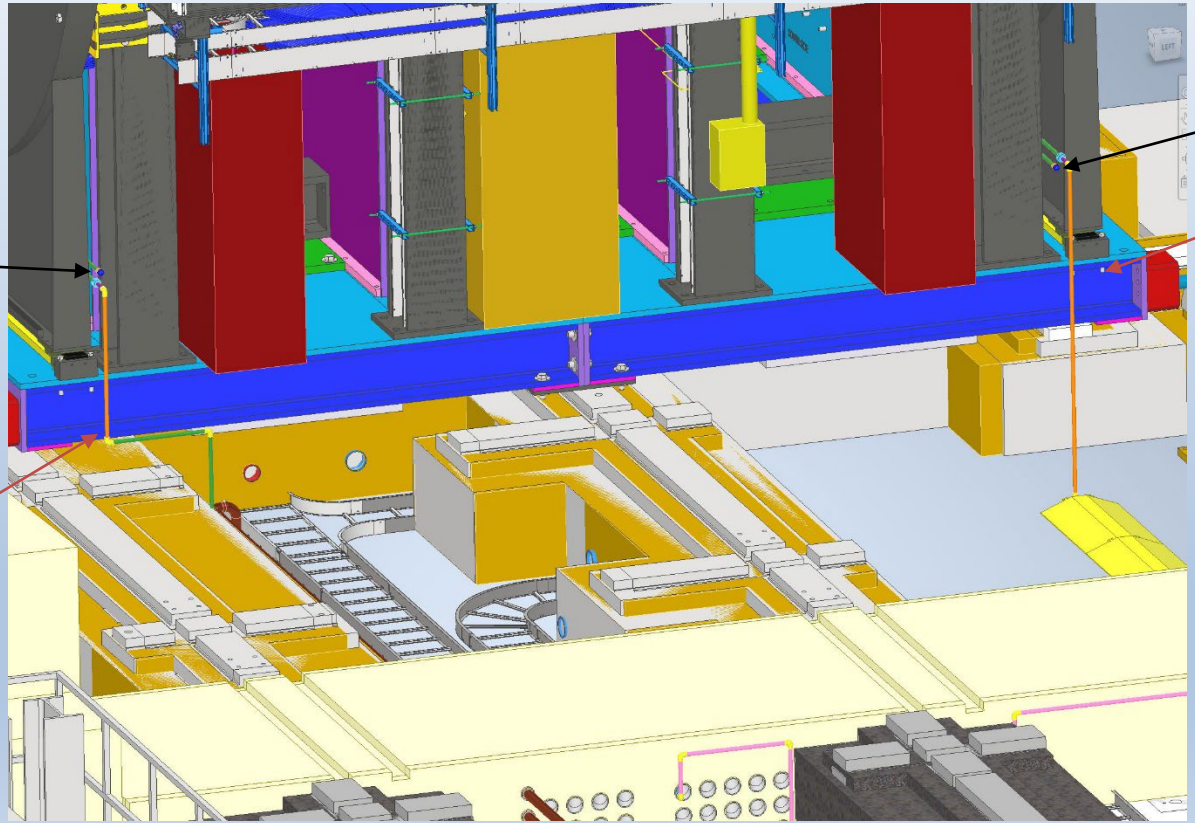
South East Corner



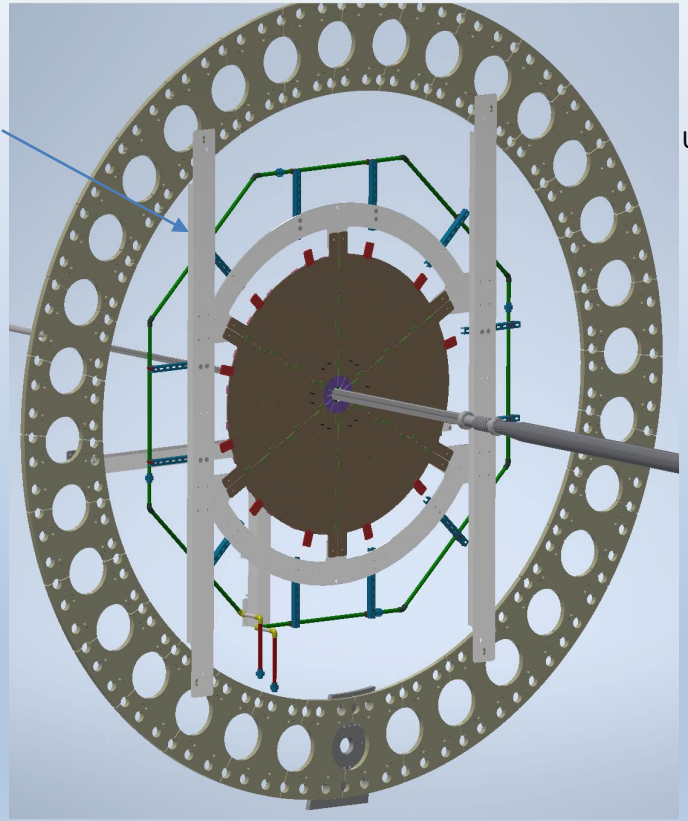
SOUTH ASSEMBLY

VESDA Piping Building Views

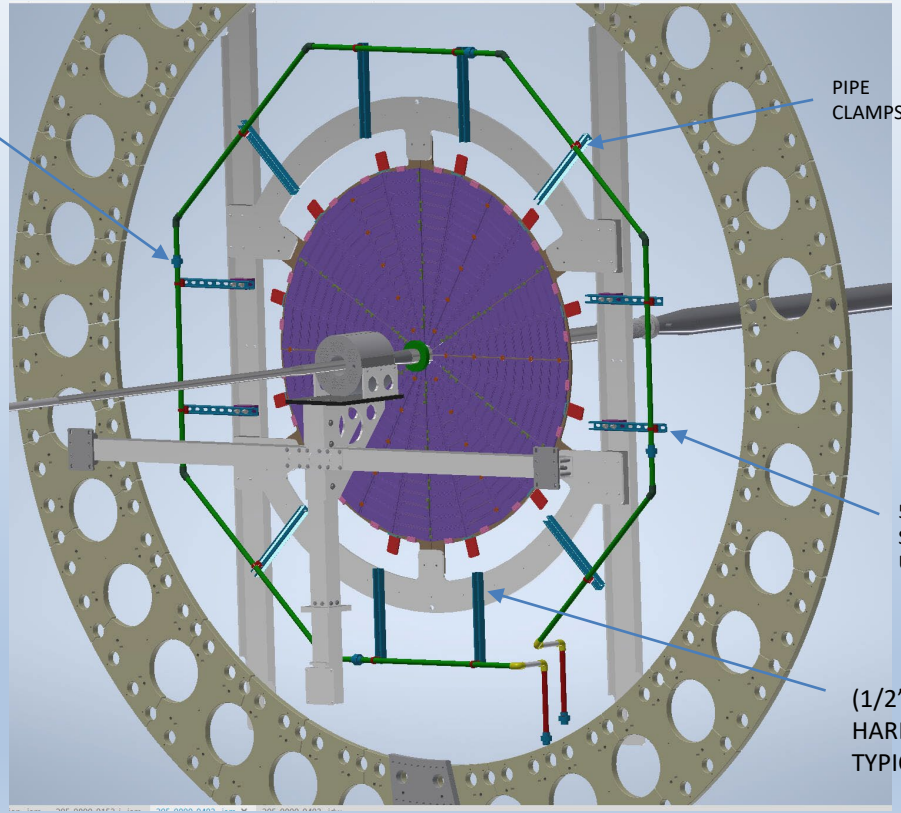
East Side



VESDA NORTH sEPD MOUNTING

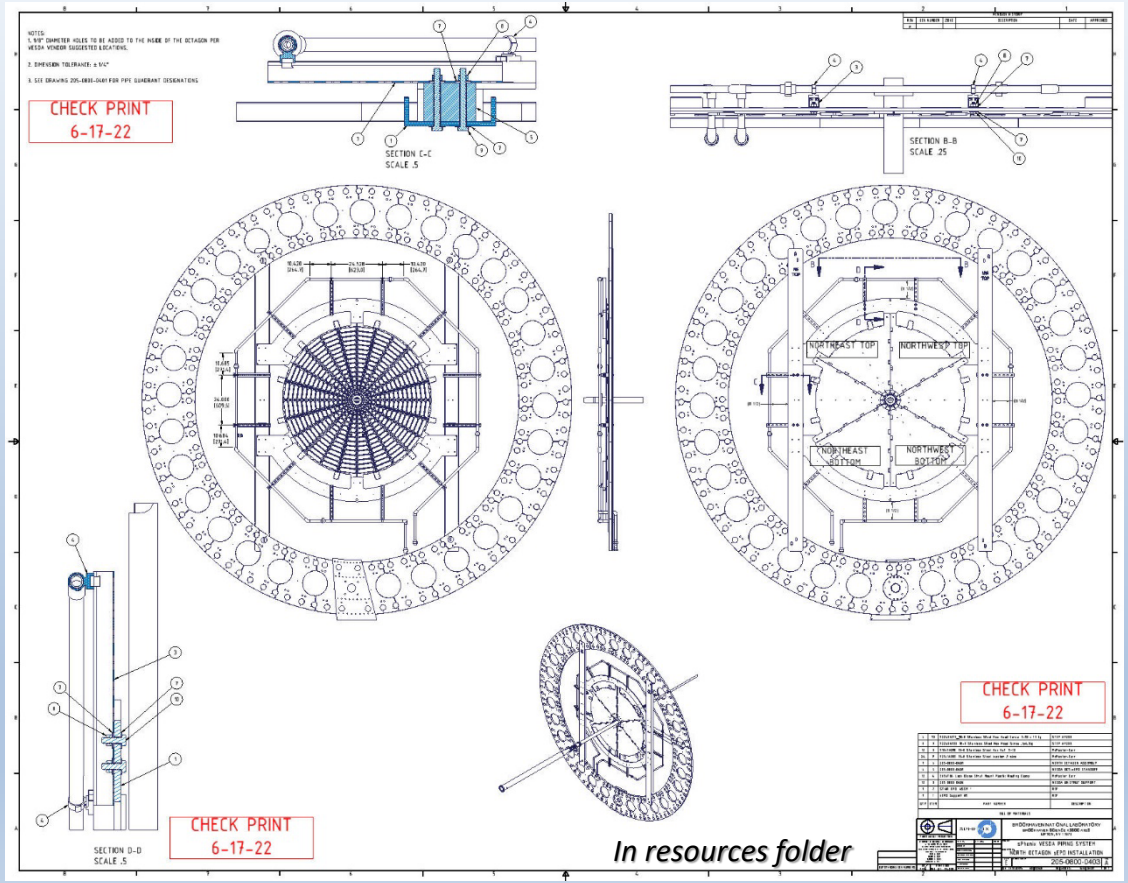


NORTH FACE

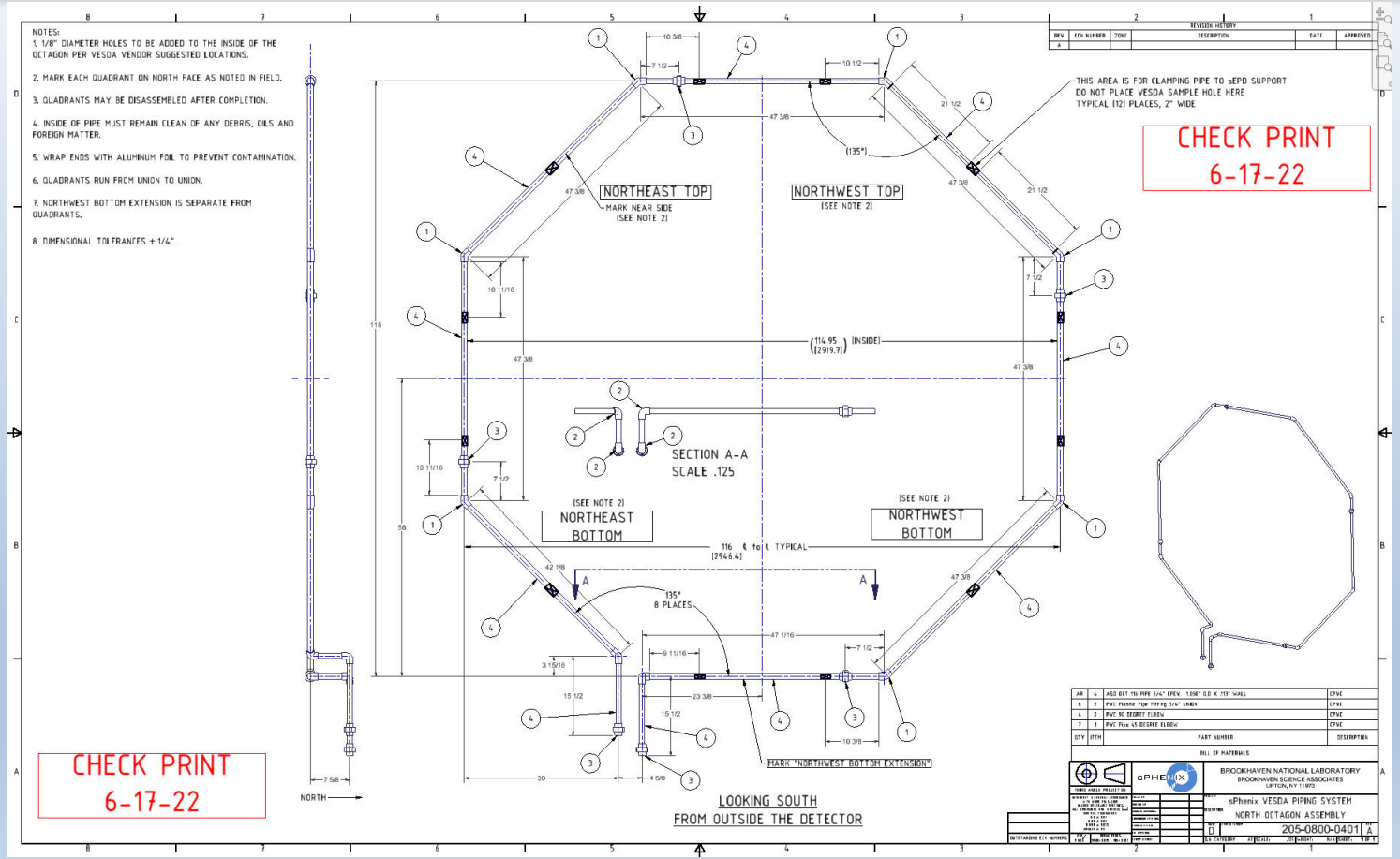


REAR SIDE OF NORTH ASSEMBLY

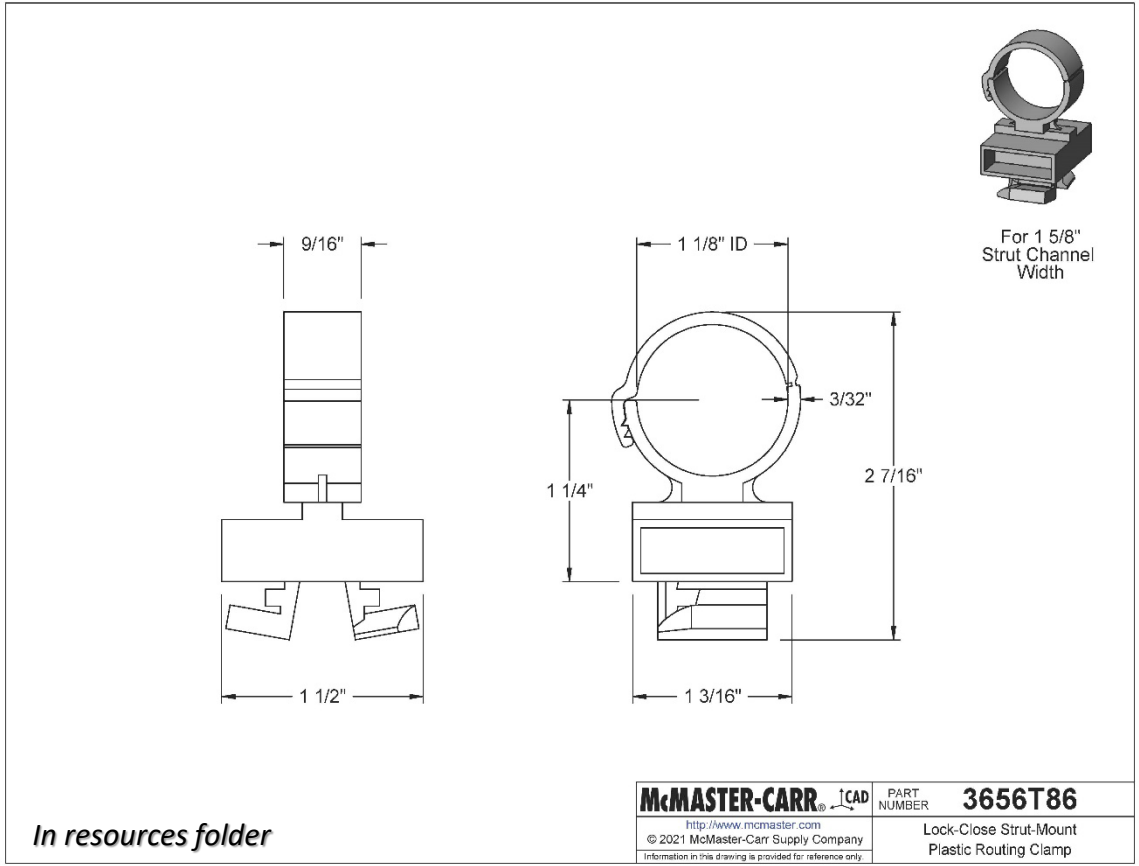
VESDA NORTH sEPD MOUNTING



VESDA NORTH OCTAGON



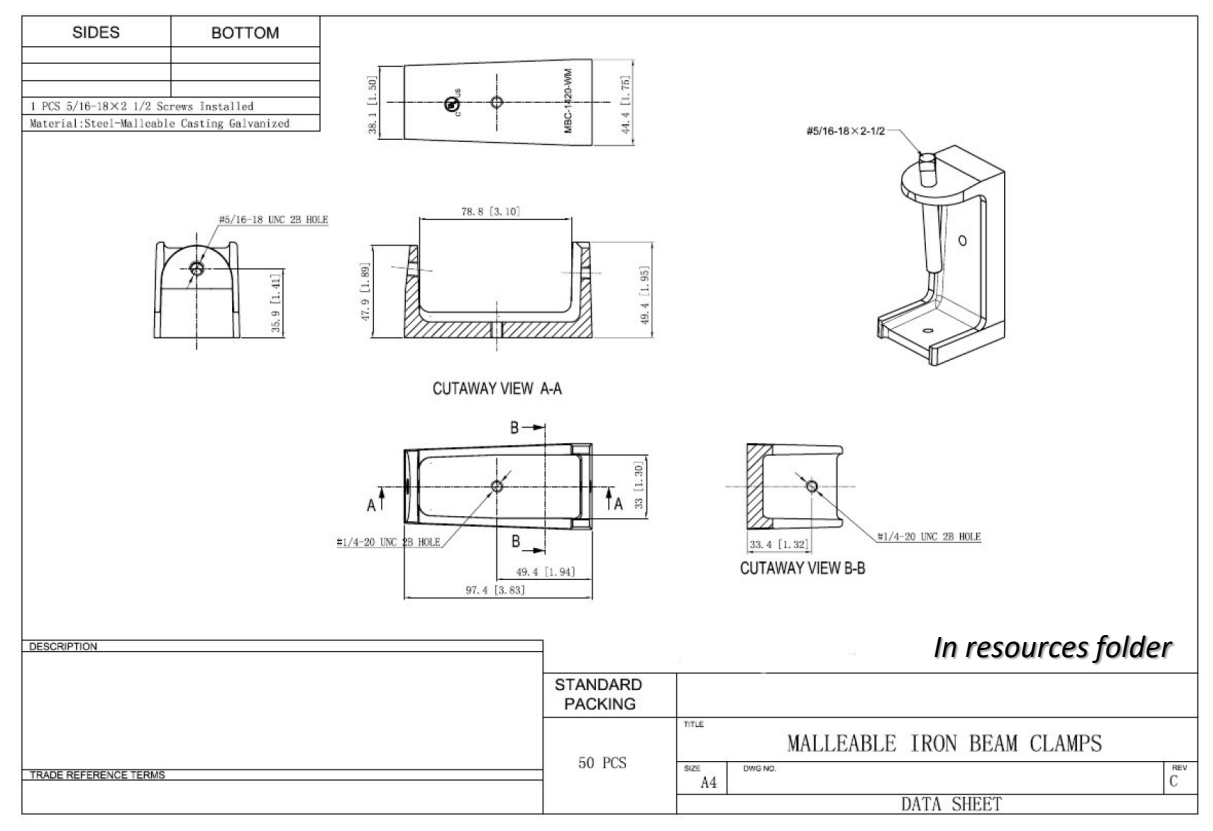
VESDA OCTAGON UNISTRUT CLAMP



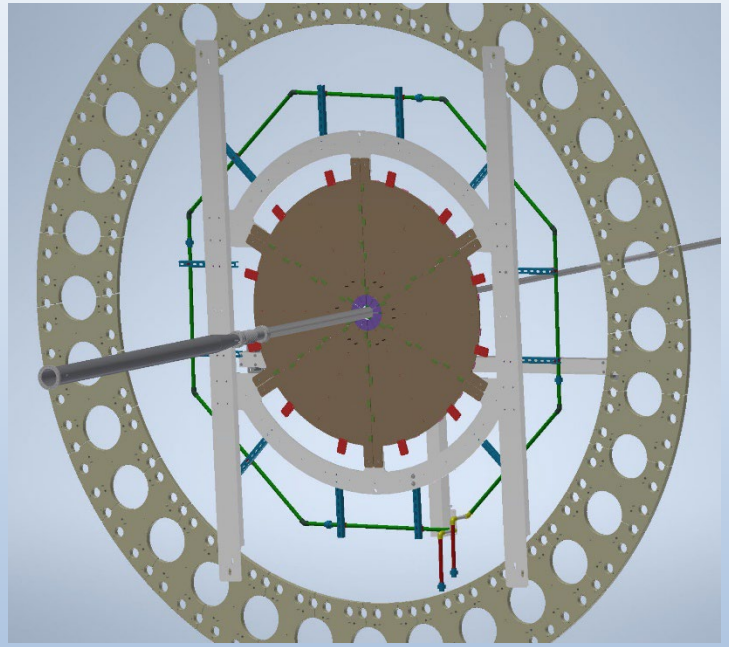
In resources folder

VESDA WIDE FLANGE CLAMP

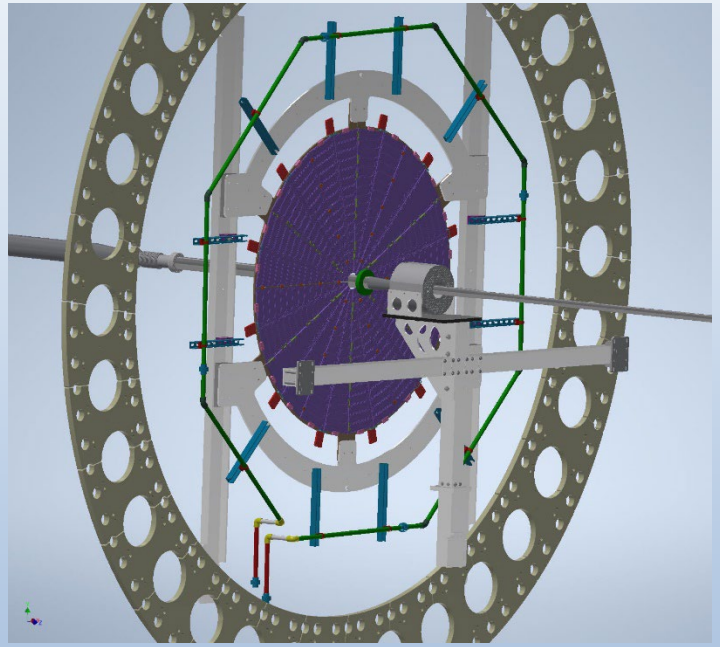
TO BE USED ALONG WITH A PIECE OF UNISTRUT (TBD) DURING FIELD INSTALLATION AS NEEDED.



VESDA SOUTH PIPING



South Face



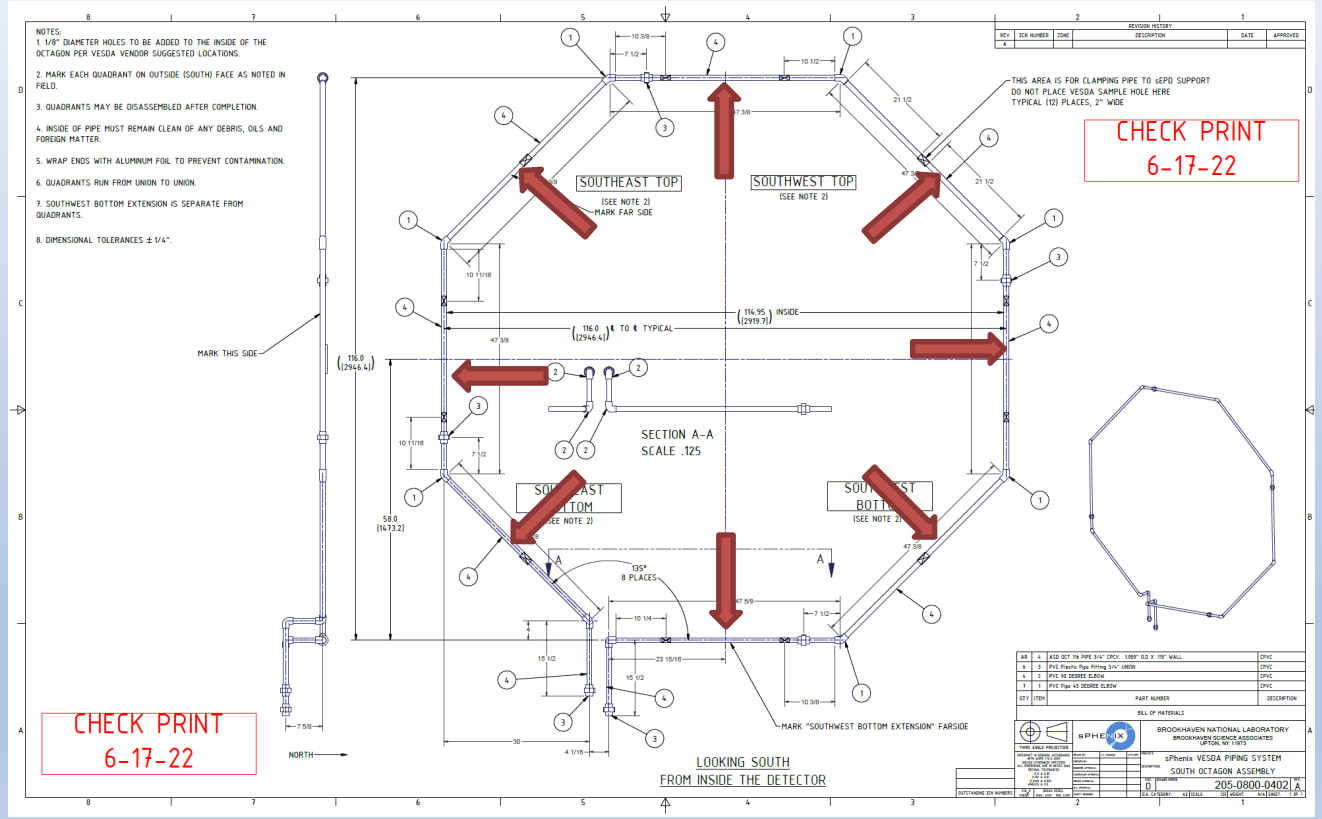
Looking South from inside magnet

South piping is same construction as the north and mirrored

VESDA SOUTH OCTAGON

(8) SAMPLE PORTS ON EACH OCTAGON (1/8” DIAMETER)

Should they be drilled from the I.R. side?



In resources folder

VESDA CONTROLLER

VESDA-E VEP-A10-P Product Guide

VEP-A10-P (4 Pipes)

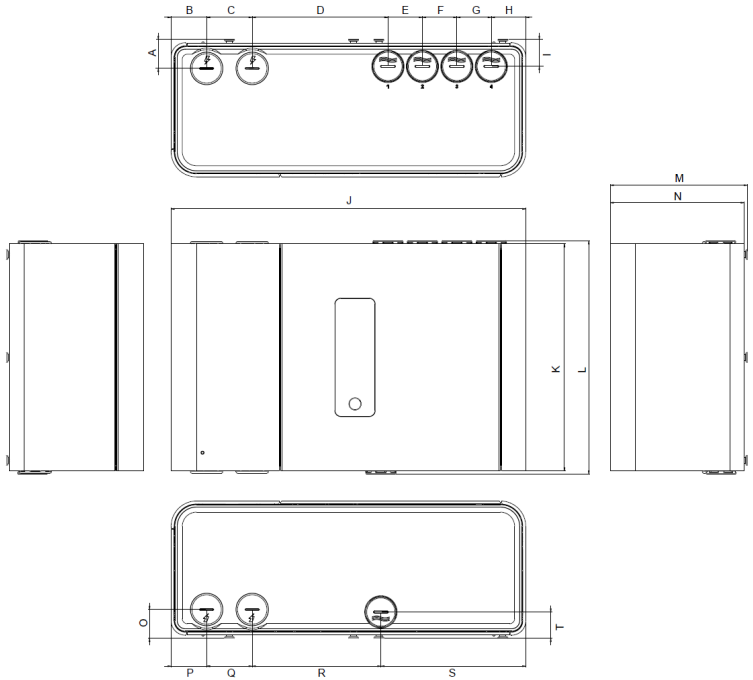
The VESDA-E VEP-A10-P is an aspirating smoke detector (ASD) that provides very early warning of fire conditions by drawing air samples through an air sampling pipe network.

Figure 1-1: VESDA-E VEP-A10-P Aspirating Smoke Detector

In resources folder

VESDA CONTROLLER

2.8 Dimensions



	mm	inch
A	28.5	1.12
B	35.0	1.38
C	45.0	1.77
D	134.0	5.28
E	34.0	1.34
F	34.0	1.34
G	34.0	1.34
H	34.0	1.34
I	26.5	1.04
J	350.0	13.78
K	224.0	8.82
L	230.2	9.06
M	135.5	5.3
N	132.3	5.21
O	28.5	1.12
P	35.0	1.38
Q	45.0	1.77
R	127.0	5.0
S	143.0	5.63
T	26.0	1.02

Figure 2-9: Front, top, bottom and side dimensions

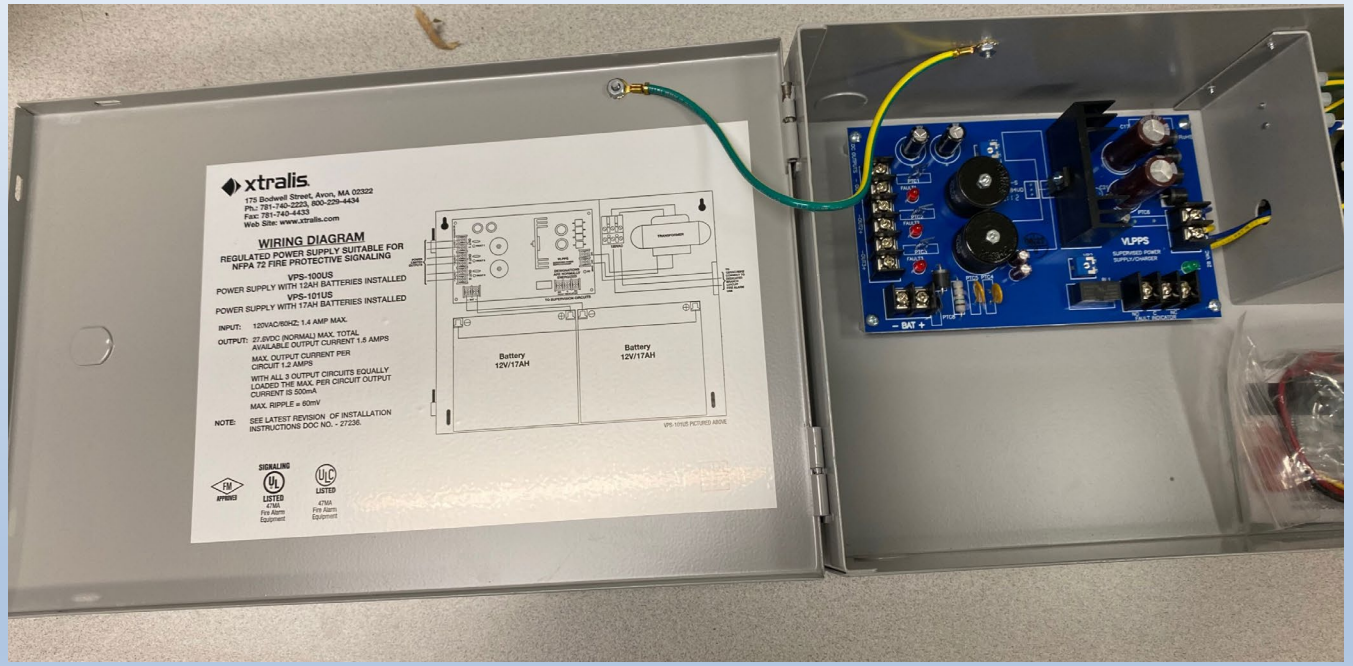
VESDA CONTROLLER

Table 4-3: Calculating the size of backup battery

Equipment	Normal loads @ 24 V DC (Backlight off)			Full alarm load @ 24 V DC (Backlight on)		
	Load (A)	Qty	Total	Load (A)	Qty	Total
Detector set to Fan Speed 1	0.34			0.43		
Detector set to Fan Speed 5	0.42			0.48		
Other 24V Loads		Total (A)			Total (A)	
			X			X
	Normal Hours			Alarm Hours		
			=			
	Normal Capacity			Alarm Capacity		
				Total Capacity = Normal + Alarm		
				Multiply by battery factor X1.25		

VESDA CONTROLLER POWER SUPPLY

VPS-100US-120 PS SGL ZONE, HSG, 120VAC
2081-9288 BATTERY 12.7AH



The intent is to provide batteries that meet / exceed code, which is 24h standby followed by 15m of alarm

VESDA CONTROLLER POWER SUPPLY

VPS-100US-120 PS SGL ZONE, HSG, 120VAC 2081-9288 BATTERY 12.7AH

VESDA Accessories

Power Supply
VPS-100US & VPS-300US

VESDA VLF-250 *

VPS-100US-XXX provides power for 2 VESDA VLF-250 detectors, or up to 5 remote (single box) units, or 1 sub rack assembly.
Battery requirements: (2) 12 volt/ 12 Amp-hour batteries.

VPS-300US-XXX provides power for 6 VESDA VLF-250 detectors, or up to 15 remote (single box) units, or 3 sub rack assemblies. Battery requirements:

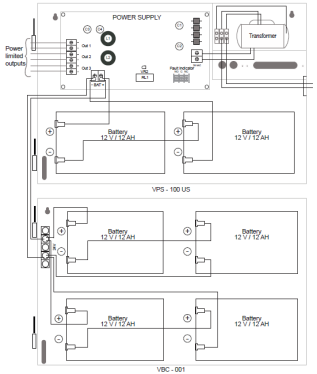
- 4 detectors or 2 sub racks or 10 remotes require (4) 12 Volt / 12 Amp-hour batteries
- 6 detectors or 3 sub racks or 15 remotes require (6) 12 Volt / 12 Amp-hour batteries

VESDA VLF-500 *

VPS-100US-XXX provides power for 1 VESDA VLF-500 detector, or up to 5 remote (single box) units, or 1 sub rack assembly.
Battery requirements: (2) 12 volt/ 12 Amp-hour batteries.

VPS-300US-XXX provides power for 3 VESDA VLF-500 detectors, or up to 15 remote (single box) units, or 3 sub rack assemblies. Battery requirements:

- 2 detectors or 2 sub racks or 10 remotes require (4) 12 Volt / 12 Amp-hour batteries
- 3 detectors or 3 sub racks or 15 remotes require (6) 12 Volt / 12 Amp-hour batteries



Specifications

Components
The VPS-100US consists of three main components: the mounting enclosure, the transformer and the main circuit board. It uses two backup batteries (supplied separately).

The VPS300US consists of one VPS-100US Power Supply and one VBC-001 Battery Cabinet. Together the two units can hold up to 6 batteries (supplied separately).

Note: The VESDA Power Supply uses sealed acid, 12VDC, 12 Amp/hour batteries. To order, use part number VBT-012 (minimum 2).

Input
120 VAC (+10% / -15%); 60Hz; 1.4 amp max.

Output
27.6 VDC (Nominal) 1.5 Amps (Max.)

Max. output Current when a single 24 VDC output is used:
1.2 amps

Max. output when the three 24 VDC outputs are used:
0.500 Amps per output

Dimensions (WHD)
13.9 in. x 9 in. x 4.5 in.

Weight
VPS-100 US 10lbs. without batteries
VBC-001 6lbs. without batteries

Operating Temperature
Power supply ambient: 32 ° to 120 °F

Humidity: 10 - 95%RH, non-condensing

Humidity
10 - 95%RH, non-condensing

Trouble Relay
Common trouble relay rated 2A @ 30VDC
(Form C: NO/NC)
During normal operation, the power supply Fault Reporting Relay is energized.

Cable Access
3/4" knockouts in various positions

Cable Termination
Screw terminal blocks
30-12 AWG

Ordering Information

P/N	Description	Requirements
VPS-100US-XXX	Power Supply	Use XXX field to specify input voltage: 120 or 220 VAC
VPS-300US-XXX	Power Supply Model VPS-100US-XXX and Battery Cabinet model VBC-001	Use XXX field to specify input voltage: 120 or 220 VAC
VBT-012	Battery, sealed lead acid, 12 VDC, 12 Amp/hr	Minimum of 2 required

VESDA Accessories

Power Supply
VPS-100US & VPS-300US

The VESDA Power Supply is capable of providing operating power including battery backup for the entire VESDA Laser Smoke Detector product line. The VESDA Power Supply has been designed to power a single unit to multiple units depending on application needs. It provides 24 volt operating power to the VESDA system as well as a battery charger function which supervises and maintains the standby batteries. Consult "Power Supply Capabilities" for details.

Installation

The VESDA Power Supply models VPS-100US and VPS300US are power-limited power supplies. They convert 120VAC/60Hz input into 24 VDC power-limited outputs. The VPS units are intended for use in applications requiring UL, ULC and CSFM listing for fire protection signalling.

The VPS-100US or VPS-300US shall be installed in accordance with the National Electric Code (NFPA 70) and in accordance with any local regulations. See wiring diagrams for proper assembly.

Fault Reporting

A Power Supply Fault indicator is provided via a dry relay contact (Form C), which changes state due to the following conditions:

- AC input loss
- Low AC input voltage (Brown-out)
- Loss of battery voltage
- A short circuit of the battery leads
- A short circuit of any of the DC power outputs

Power Supply Capabilities

VESDA VLP or LaserSCANNER *

VPS-100US-XXX provides power for: 1 VESDA VLP or LaserSCANNER, or up to 5 remote (single box) units, or 1 subrack assembly.
Battery requirements: (2) 12 volt/12 Amp-hour batteries.

VPS-300US-XXX provides power for: up to 3 VESDA VLP or LaserSCANNER detectors, or up to 15 remote (single box) units, or up to 3 subrack assemblies.
Battery requirements:

- 2 detectors or 2 subracks or 10 remotes require (4) 12volt/12 Amp-hour batteries
- 3 detectors or 3 subracks or 15 remotes require (6) 12volt/12 Amp-hour batteries

VESDA VLC *

VPS-100US-XXX provides power for: up to 2 VESDA VLC detectors, or up to 5 remote (single box) units, or 1 subrack assembly.
Battery requirements: (2) 12volt/12 Amphour batteries.

VPS-300US-XXX provides power for: up to 6 VESDA VLC detectors, or up to 15 Remote (single box) units, or up to 3 subrack assemblies. Battery requirements:

- 4 detectors or 2 subracks or 10 remotes require (4) 12volt/12 Amp-hour batteries
- 6 detectors or 3 subracks or 15 remotes require (6) 12volt/12 Amp-hour batteries

Features

- Input 120VAC/60Hz
- 1.5 amp continuous supply current at 27.6VDC
- Filtered and electronically regulated output
- AC fail supervision
- Low AC (brown-out) supervision
- Battery supervision
- Built-in charger for sealed lead acid or gel-type batteries
- Automatic switch over to standby battery when AC fails
- AC input LED indicator

Listings/ Approvals

- UL 1481 listed
- ULC
- FM (for VPS-100US)
- CSFM

* Must be confirmed with a battery calculation compliant with local fire protection codes and standards.
To facilitate the calculation of the back up battery size, refer to the Battery Calculator (Document 21062), available from Xtralis Partner Extranet (www.xtralis.com)

The intent is to provide batteries that meet / exceed code, which is 24h standby followed by 15m of alarm

In resources folder

VESDA VENDOR ANALYSIS

RESPONSE TIME:

<u>NORTH RUN</u>

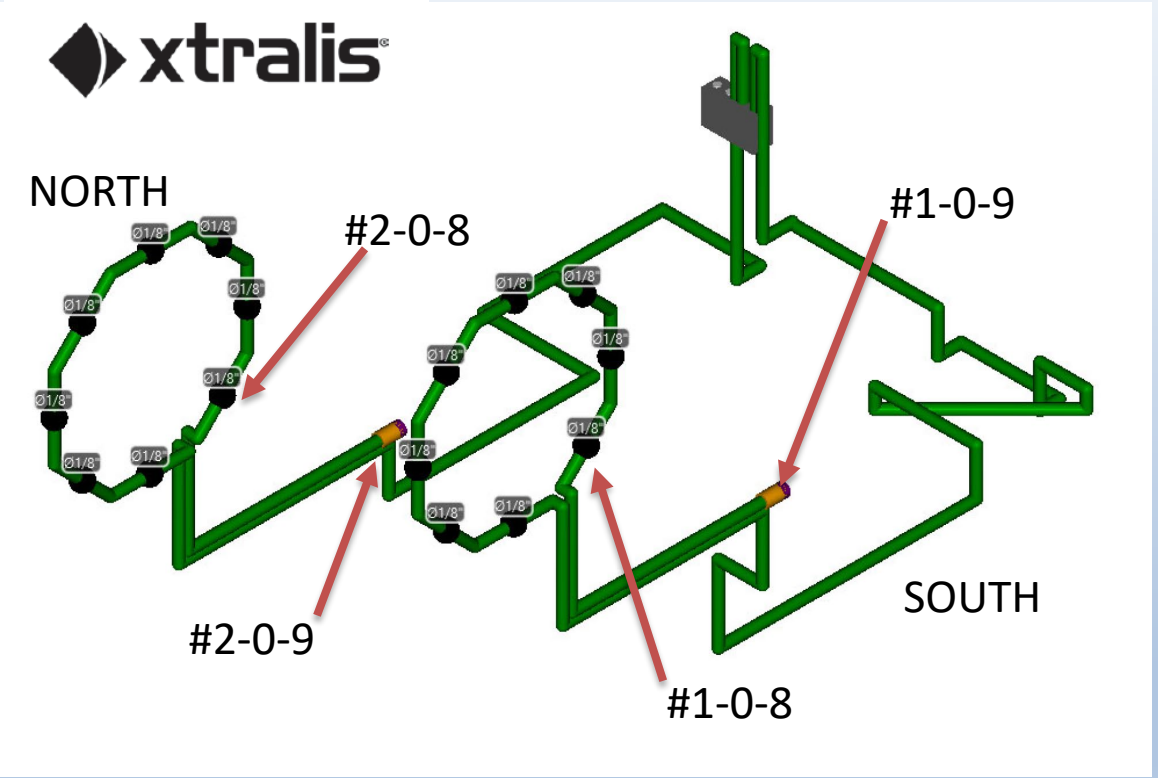
37 SECONDS PORT #2-0-8 (92 FEET)

57 SECONDS TEST PORT #2-0-9 (110 FEET)

<u>SOUTH RUN</u>

48 SECONDS PORT #1-0-8 (118 FEET)

70 SECONDS TEST PORT #1-0-9 (135 FEET)



In resources folder

VESDA DRAWING STATUS

Drawings ready for checking: *In resources folder*

205-0800-0401	NORTH OCTAGON ASSEMBLY
205-0800-0402	SOUTH OCTAGON ASSEMBLY
205-0800-0403	NORTH sEPD INSTALLATION ASSEMBLY
205-0800-0405	sEPD STANDOFF
205-0800-0406	UNISTRUT SUPPORT

Drawings to be completed:

205-0800-0400	OVERALL BUILDING PIPING INSTALLATION ASSEMBLY
205-0800-0404	SOUTH sEPD INSTALLATION ASSEMBLY

VESDA Piping System

Questions?

VESDA Piping System

Thank you

John Scheblein
schebs@bnl.gov