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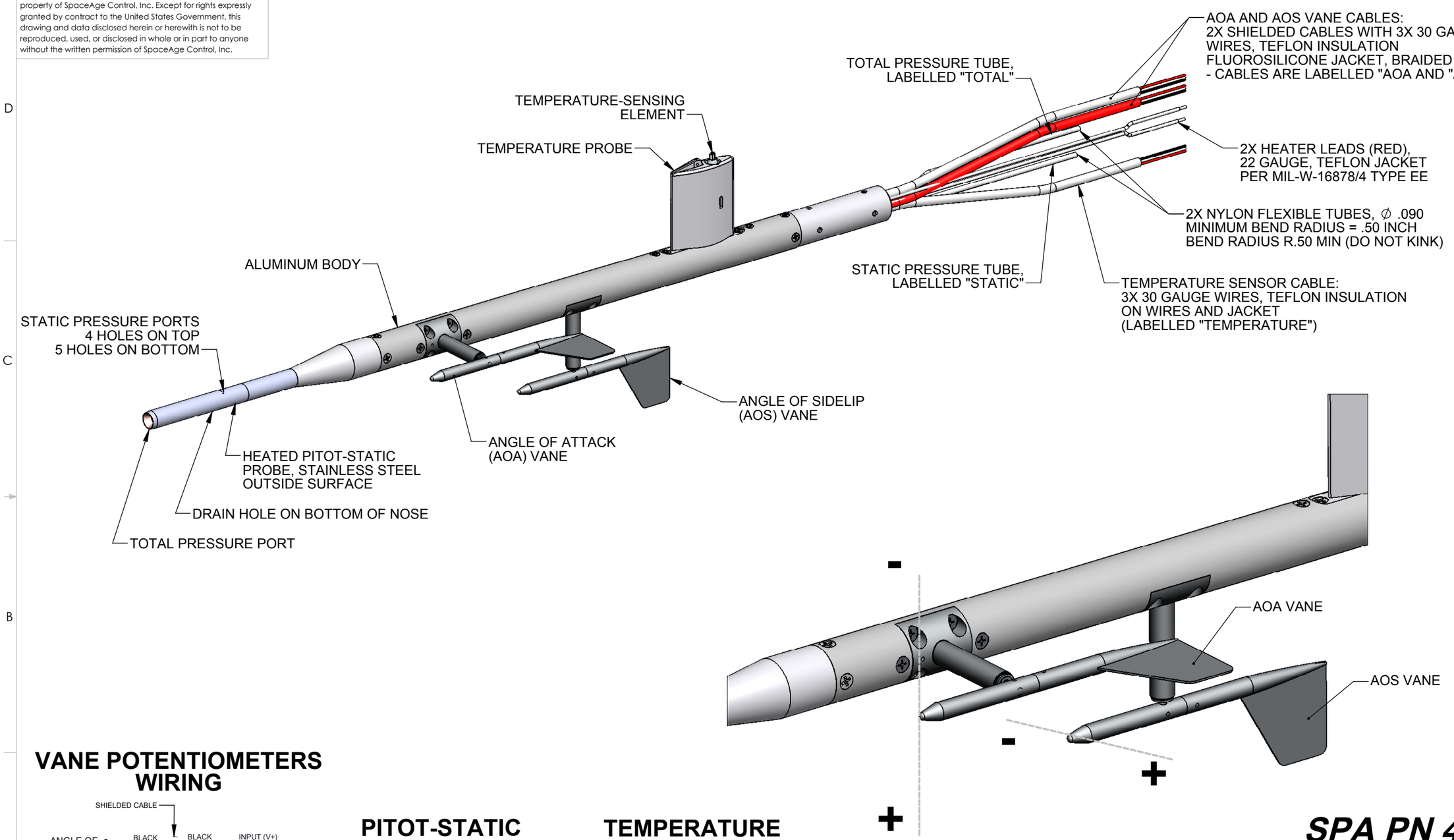
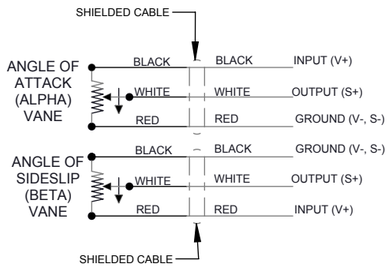
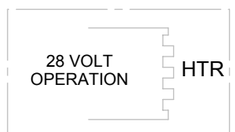


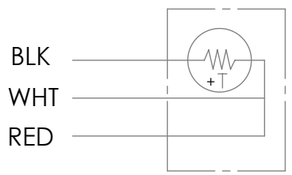
VANE POTENTIOMETERS WIRING



PITOT-STATIC PROBE WIRING



TEMPERATURE SENSOR WIRING



SPA PN 4512-01

	DRAWN B.P. DATE 07-22-09	SpaceAge Control, Inc.	
	APPROVALS		
MATERIAL SEE NOTES	CHECKED DIGITAL - ON FILE	MINI AIR DATA BOOM	
FINISH SEE NOTES	ENG DIGITAL - ON FILE	SIZE B / CAGE CODE 34851 / DWG. NO. 4512 / REV. A	
CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE		SCALE / CAD FILE:	SHEET 1 OF 3

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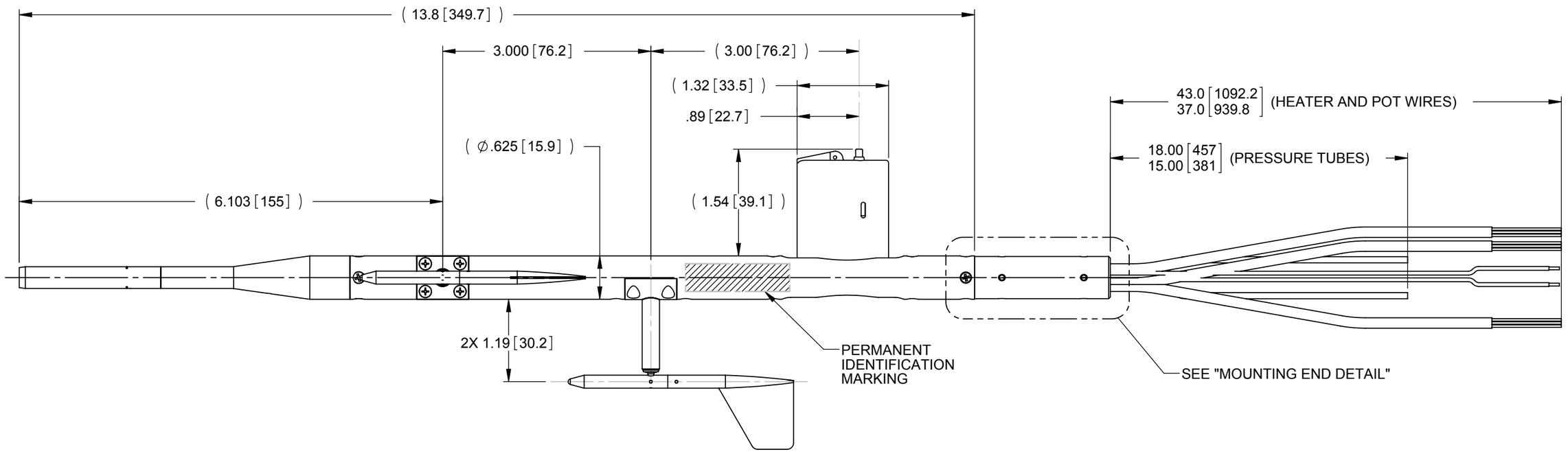
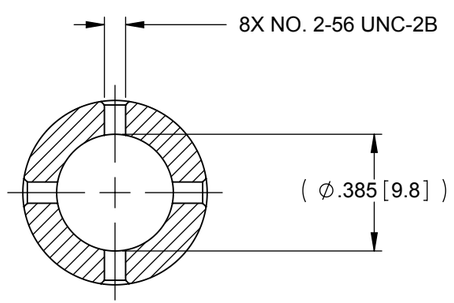
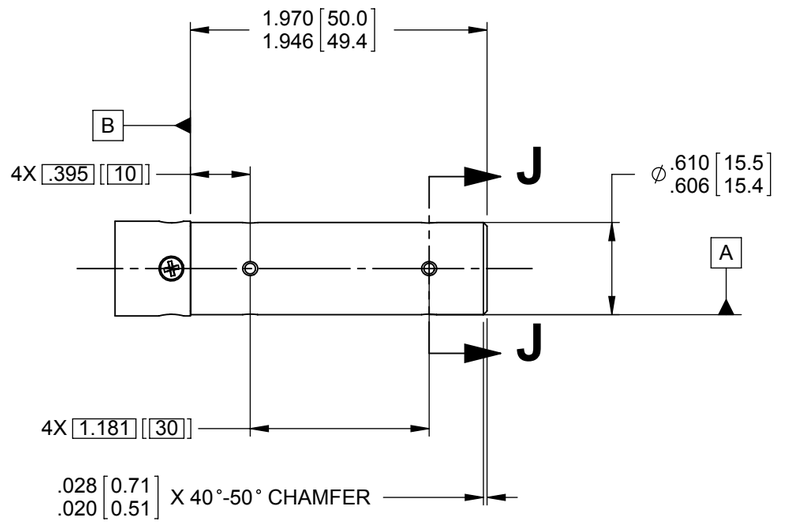
DIMENSIONS IN BRACKETS [ ] ARE mm





SECTION J-J

MOUNTING END DETAIL



SIZE	CAGE CODE	DWG. NO.	REV.
B	34851	4512	A
SCALE	CAD FILE:	SHEET 2 OF 3	

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NOTES:

1. DESCRIPTION: AIR DATA BOOM WITH HEATED PITOT-STATIC PROBE, ANGLE OF ATTACK VANE, ANGLE OF SIDESLIP VANE, AND TEMPERATURE SENSOR.

2. WEIGHT: .55 LB MAX

3. VANE SPECIFICATIONS

3.1 VANE POTENTIOMETERS (AOA AND AOS):
- TYPE: CONDUCTIVE PLASTIC
- RESISTANCE: 1.5K OHMS ±10%
- INDEPENDENT LINEARITY: ±5% MAX OF FULL SCALE PER VRCI-P-100A
- POWER RATING AT 70º C: 0.5 WATT MIN
- MECHANICAL TRAVEL: 360° CONTINUOUS
- MECHANICAL LIFE: 100 MILLION SHAFT REVOLUTIONS MIN
- OPERATING TEMPERATURE RANGE: -65° TO +125° C

3.2 AOA VANE ELECTRICAL OUTPUT CHARACTERISTICS:
- OUTPUT VOLTAGE INCREASES FROM "-" TO "+" AS SHOWN ON DRAWING
- AOA ELECTRICAL TRAVEL: -30° TO +60°
- OUTPUT AT -30°: .01% - .60% OF FULL SCALE INPUT VOLTAGE
- OUTPUT AT +30°: 93.00% - 99.99% OF FULL SCALE INPUT VOLTAGE
- A CALIBRATION DATASHEET IS SUPPLIED FOR EXACT CHARACTERISTICS

. 3.3 AOS VANE ELECTRICAL OUTPUT CHARACTERISTICS:
- OUTPUT VOLTAGE INCREASES FROM "-" TO "+" AS SHOWN ON DRAWING
- AOS ELECTRICAL TRAVEL: -30° TO +30°
- OUTPUT AT -30°: .01% - .60% OF FULL SCALE INPUT VOLTAGE
- OUTPUT AT +60°: 93.00% - 99.99% OF FULL SCALE INPUT VOLTAGE
- A CALIBRATION DATASHEET IS SUPPLIED FOR EXACT CHARACTERISTICS

4.0 TEMPERATURE SENSOR SPECIFICATIONS

4.1 THE TEMPERATURE SENSOR HAS A SINGLE PLATINUM TEMPERATURE SENSING ELEMENT. THE TEMPERATURE-RESISTANCE CHARACTERISTICS ARE IN ACCORDANCE WITH DIN-EN60751, CLASS B, WITH ELEMENT RESISTANCE OF 500 OHMS AT 0 °C. SEE THE TEMPERATURE-RESISTANCE TABLE FOR NOMINAL OUTPUT CHARACTERISTICS. THE RESISTANCE-TEMPERATURE RELATIONSHIP IS AS FOLLOWS:

FOR THE RANGE -200 °C to 0 °C: R = Ro [1 + AT + BT^2 + C (T - 100) X T^3]
FOR THE RANGE 0 °C to 850 °C: R = Ro (1 + AT + BT^2)
WHERE::
RO = RESISTANCT AT 0 °C (= 500.0 ohm)
T = TEMPERATURE IN °C
A = 3.9083 X 10^-3
B = -5.775 X 10^-7
C = -4.183 X 10^-12

STATIC CALIBRATION ACCURACY: ± (.30 + .005 X|T|) WHERE “T” IS TEMPERATURE IN °C.

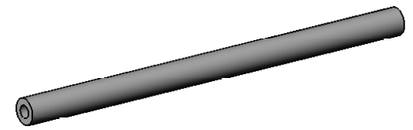
4.2 AERODYNAMIC OPERATION (RECOVERY FACTOR COMPENSATION): BELOW IS THE EQUATION FOR RELATING THE MEASURED TEMPERATURE TO THE OUTSIDE STATIC TEMPERATURE.
TS = TM / (1 + R X .2 X MACH ^2)
WHERE: TM = MEASURED TEMPERATURE FROM SENSOR IN KELVIN
TS = OUTSIDE STATIC TEMPERATURE IN KELVIN
R = RECOVERY FACTOR
R = .93 (BASED ON WIND TUNNEL TESTING TO MACH .85)

5.0 ACCESSORIES: THE AIR DATA BOOM IS SUPPLIED WITH THE FOLLOWING:
- 1 EACH OF PN 100376 PROBE COVER
- 2 EACH OF PN 100371 VANE COVER
- PRESSURE CONNECTION ACCESSORIES (4 ITEMS) AS SHOWN ON THIS SHEET

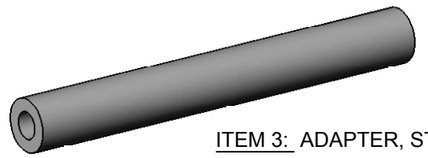
TEMPERATURE PROBE RESISTANCE VERSUS TEMPERATURE

TEMPERATURE (°C)	NOMINAL RESISTANCE (Ω)	TOLERANCE (+/- °C)	RESISTANCE TOLERANCE	
			MIN (Ω)	MAX (Ω)
-60	381.64	0.60	380.44	382.83
-40	421.35	0.50	420.36	422.34
-20	460.80	0.40	460.01	461.59
0	500.00	0.30	499.41	500.59
20	538.97	0.40	538.19	539.74
40	577.70	0.50	576.74	578.67
60	616.21	0.60	615.06	617.36
80	654.48	0.70	653.15	655.82
100	692.53	0.80	691.01	694.04
120	730.34	0.90	728.64	732.04
140	767.92	1.00	766.05	769.79
160	805.27	1.10	803.22	807.32
180	842.39	1.20	840.17	844.61
200	879.28	1.30	876.89	881.67

PRESSURE CONNECTION ACCESSORIES:

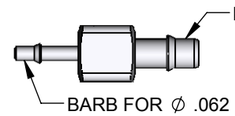


ITEM 1: POLYURETHANE TUBING
.062 I.D. X .125 O.D.
120 INCH [3048 mm] MIN EACH

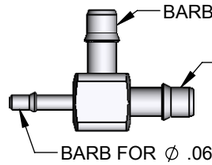


ITEM 2: POLYURETHANE TUBING
.125 I.D. X .250 O.D.
120 INCH [3048 mm] MIN

ITEM 3: ADAPTER, STRAIGHT

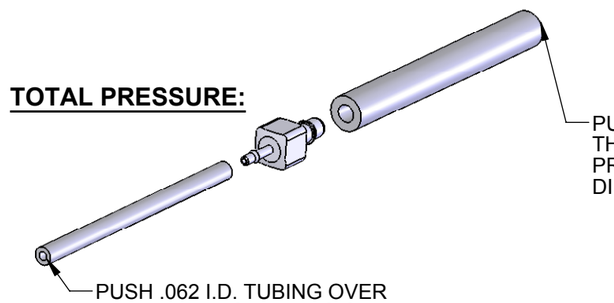


ITEM 4: ADAPTER, TEE

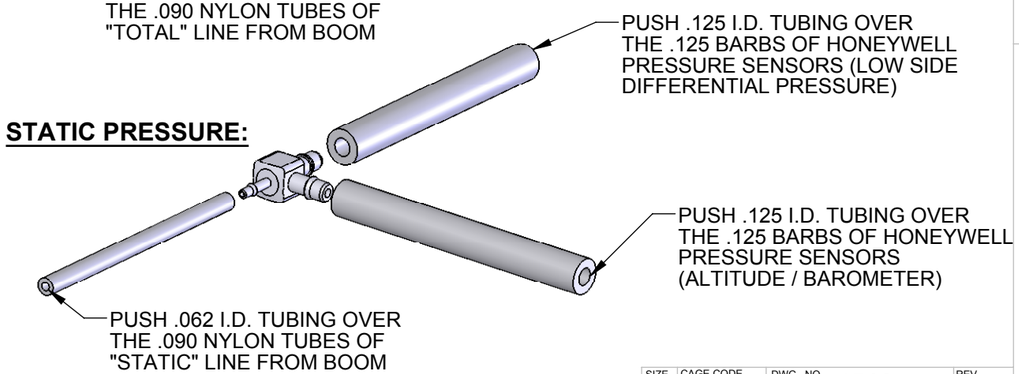


PRESSURE LINES CONNECTION METHOD

TOTAL PRESSURE:



STATIC PRESSURE:



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B	34851	4512	A
SCALE	CAD FILE:	SHEET 3 OF 3	