

CISCO SAMPLE PROBE

MODEL EP-750, EP-750/HT &
EP-760/HT

USERS' GROUP MEETING 2017
LEN RICHTER



CISCO SAMPLE PROBE

**THE PURPOSE OF A SAMPLE PROBE
IS TO OBTAIN
A
REPRESENTATIVE
SAMPLE**

CISCO SAMPLE PROBE

- CISCO PROPRIETARY DESIGN
 - EP-750 DESIGNED IN 1985 ON START UP OF CISCO
 - AVAILABLE SAMPLE PROBES WERE ALL FROM EUROPE
 - DID NOT LIKE:
 - COMPLEXITY
 - CYLINDRICAL FILTER
 - SINGLE UMBILICAL

CISCO SAMPLE PROBE

➤ KISS

- KEEP IT SMALL & SIMPLE
 - NO MOVING PARTS
 - 750 WEIGHS APPROX. 25 LBS.
 - SUPPORTS SEPARATE HSL/PSB
-
- OVER 1,500 SHIPPED TOO
DATE - 1/2 DOZEN REPLACED

CISCO SAMPLE PROBE

➤ THREE VERSIONS

- EP-750 STANDARD – GAS TEMPERATURES UP TO 400 °F
- EP-750/HT & EP-760/HT HIGH TEMPERATURES UP TO 1,000 °F
 - 750 – 4" ANSI FLANGE
 - 760 – 3" ANSI FLANGE – SMALL STACKS – ICE
- HIGHER GAS TEMPS – EXTEND FLANGE

CISCO SAMPLE PROBE

➤ TWO MAJOR PARTS

1. PROBE HEAD
2. INSERTION TUBE

E
P
-
7
5
0



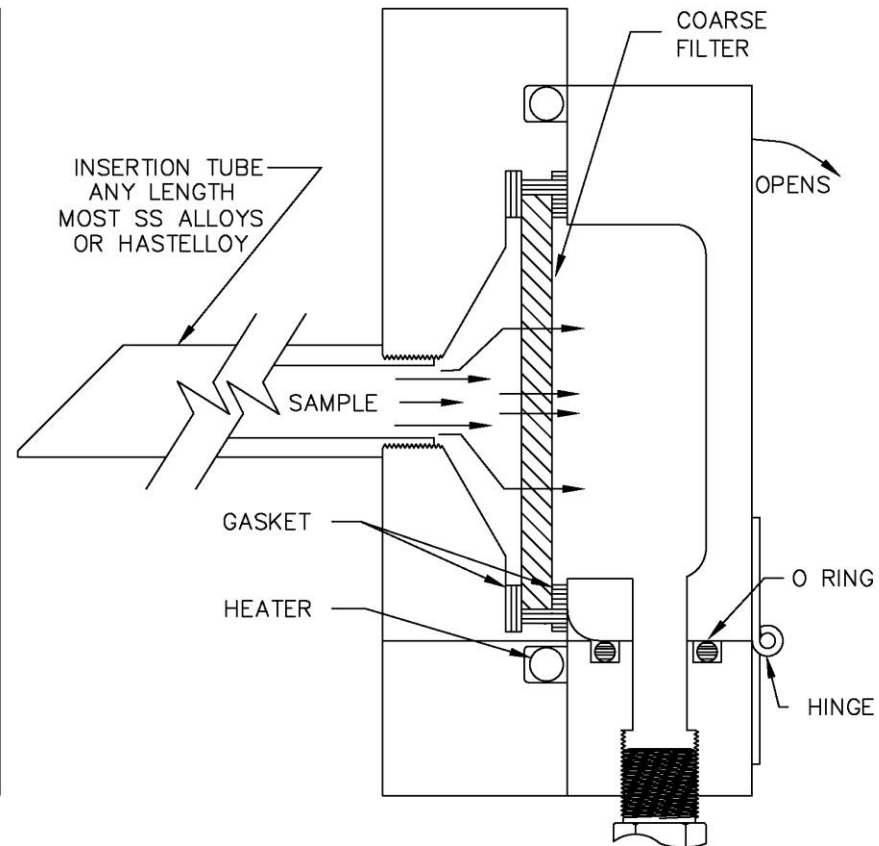
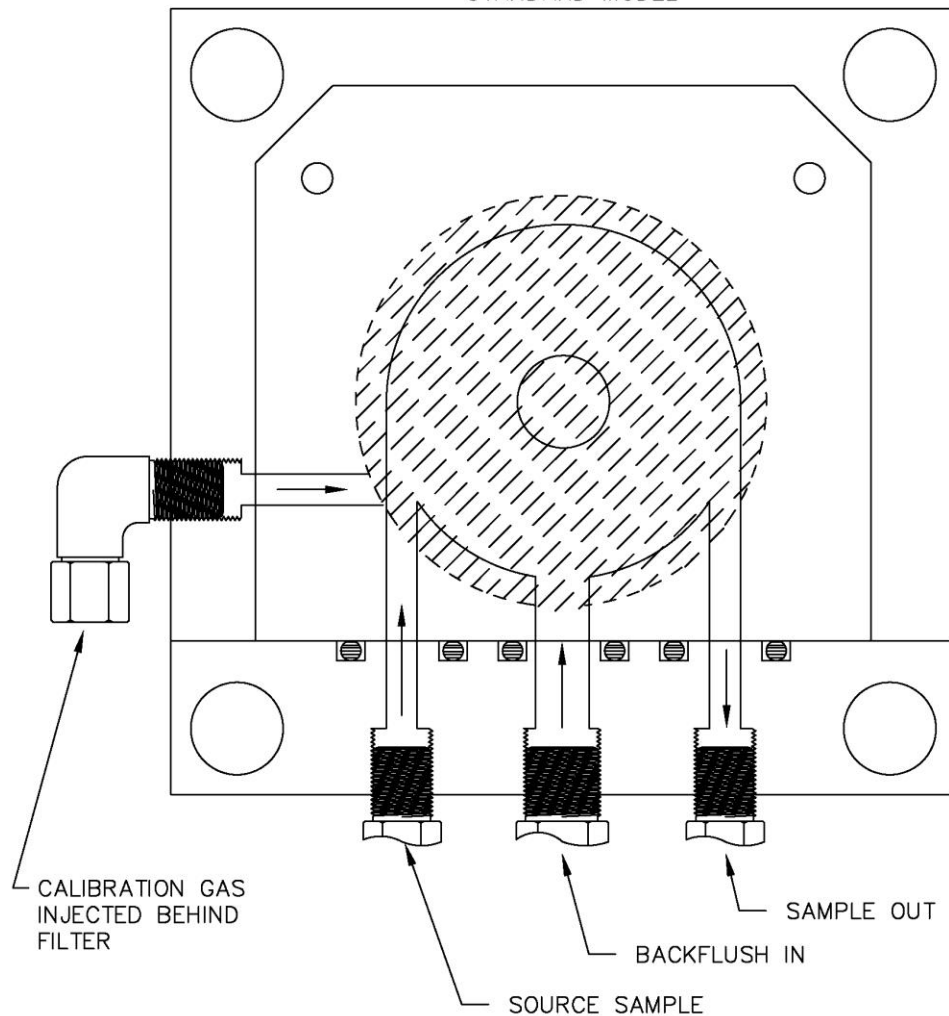
E
P
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7
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E
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4"/150 lb ANSI FLANGE
STANDARD MODEL



CISCO CUSTOM INSTRUMENTATION
SERVICES CORPORATION

SAMPLE PROBE

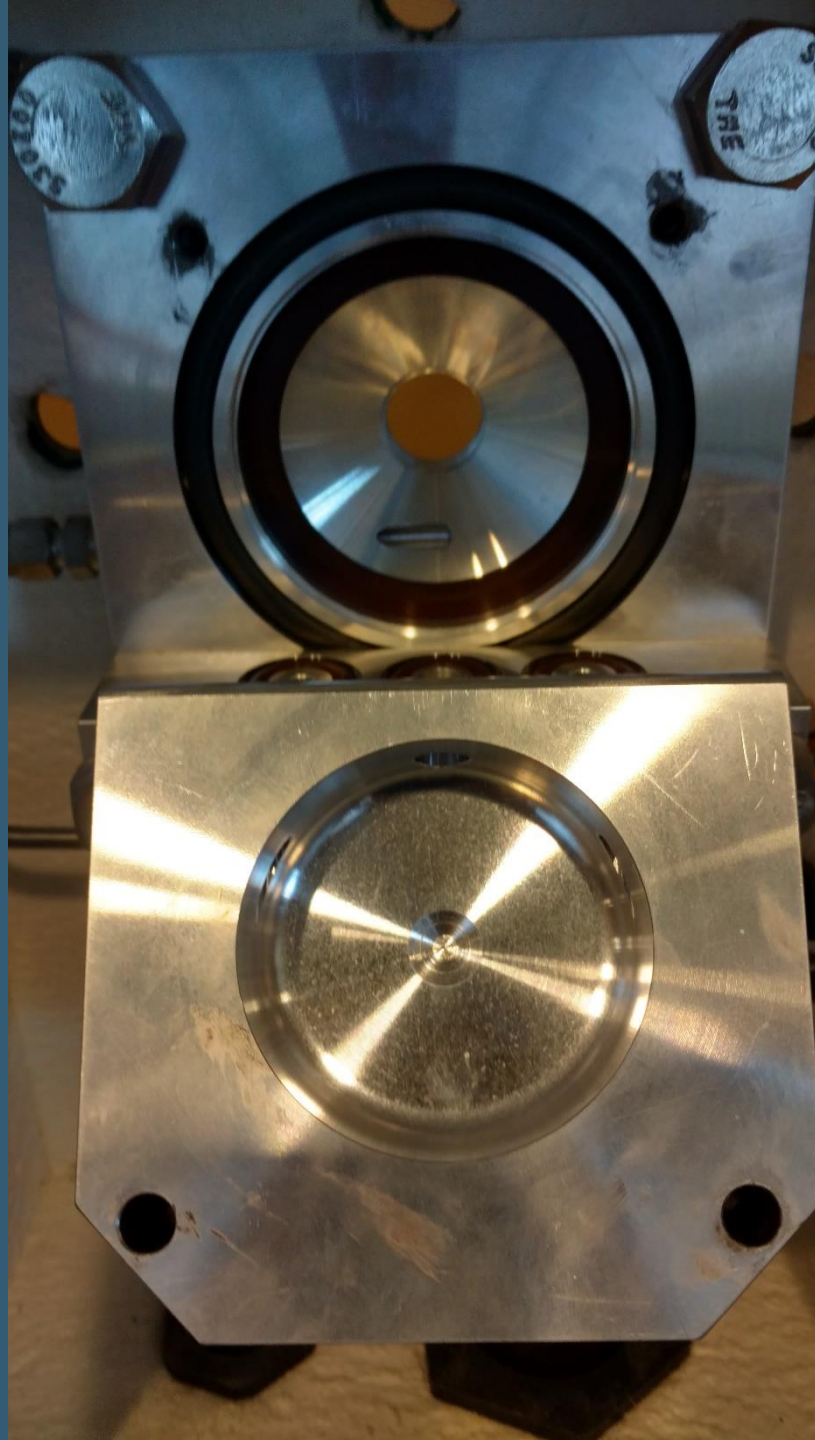
DESCRIPTION

DRAWING NO.
61000005

SCALE NONE	REVISION D	DRAWN BY TAS	DATE 9-10-03
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CISCO SAMPLE PROBE

- ONCE INSTALLED – NEVER NEEDS REMOVAL FOR SERVICE
- STRAIGHT THROUGH DESIGN ALLOWS CLEARING OF ANY PLUGGAGE
- COMPLETELY SUPPORTED BY SYSTEM – NO PLANT UTILITIES REQUIRED



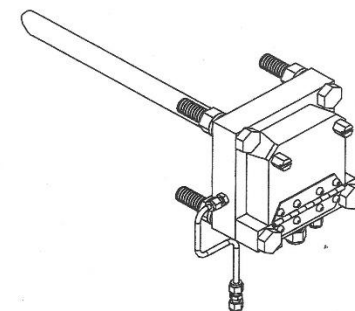
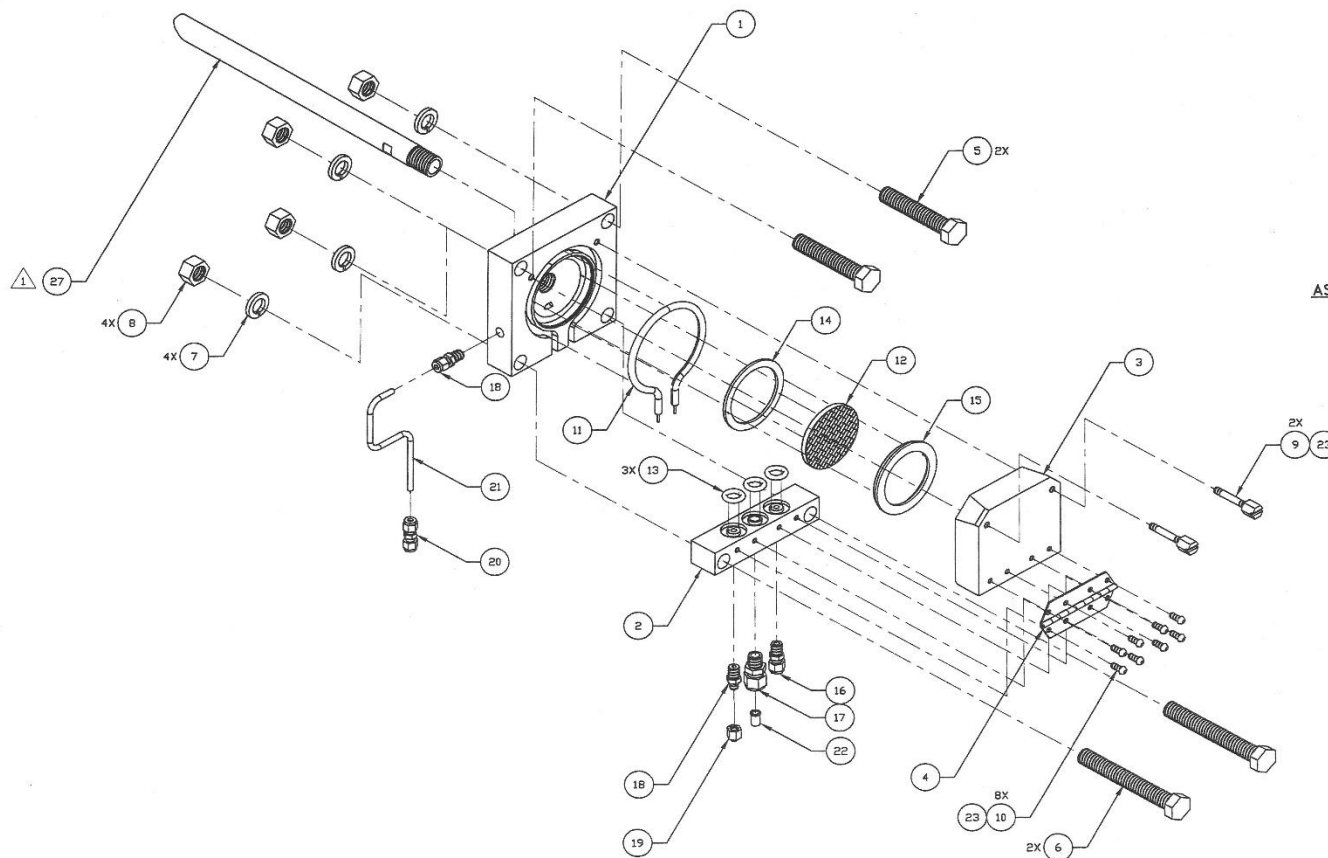
CISCO SAMPLE PROBE

- PROBE HEAD MATERIAL
 - STANDARD – 316L SS
 - OTHER MATERIAL AVAILABLE
 - HASTELOY C-276
 - INCONEL 600
 - TEFLON COATED ALUMINUM

CISCO SAMPLE PROBE

➤ THREE MACHINED PARTS

1. BODY
2. COVER
3. MANIFOLD



ASSEMBLED STANDARD SAMPLE PROBE

NOTES:

1 SHOWN FOR REFERENCE ONLY

EXPLODED STANDARD SAMPLE PROBE

SAMPLE PROBE ASSEMBLY
REFERENCE # 75000001-F

CISCO CUSTOM INSTRUMENTATION SERVICES CORPORATION				
STANDARD SAMPLE PROBE BOX ASSY				ISSUED BY
PROBE ASSEMBLY				75000901-2
REV	REVISION	REV DATE	DESIGNED BY	DATE
NONE	A	—	ZRW	7-12-01

CISCO SAMPLE PROBE

- STANDARD PROBE HAS HEATED FILTER CHAMBER
 - 150 WATT 120 VAC ROD HEATER
 - STEAM TRACED WITH 1/4" OD TUBE FOR CLASS 1,2 INSTALL
- HIGH TEMP PROBE HEAD IS NOT HEATED



CISCO SAMPLE PROBE

- PROBE TEMPERATURE NOT MONITORED
- HEATER CURRENT IS MONITORED AND ALARMED ON LOSS

CISCO SAMPLE PROBE

➤ FILTER

➤ STANDARD & HIGH TEMP

➤ ALUM OXIDE

➤ 5-7 MICRON

➤ COARSE FILTER

➤ PROTECT SAMPLE LINE

➤ OPTION

➤ SS

➤ SMALLER MICRON RATING

CISCO SAMPLE PROBE

➤ GASKETS

➤ STANDARD PROBE

- VITON GASKETS & O-RINGS

- 400 °F LIMIT

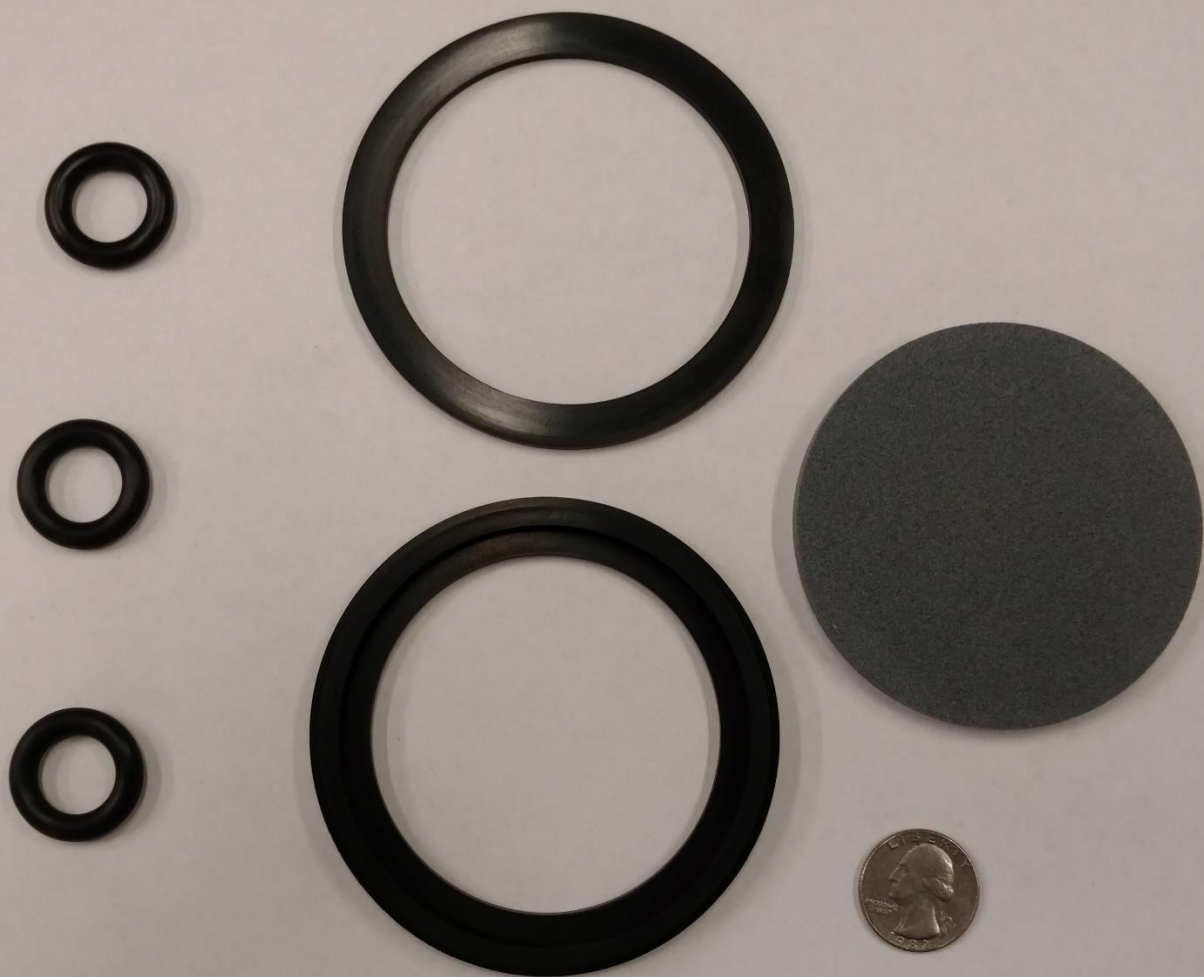
➤ HIGH TEMP PROBE

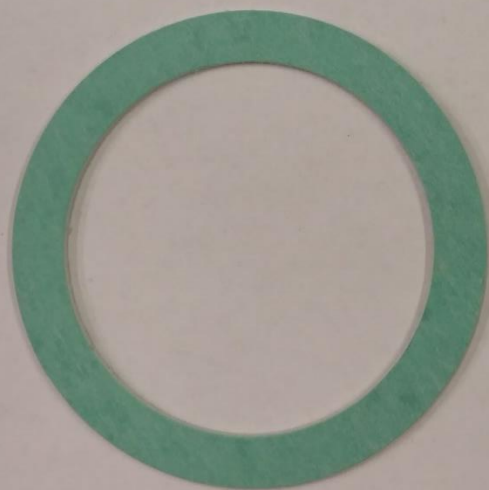
- ARAMID FIBER/NITRILE RUBBER

- OUTER GASKET & O-RINGS

- CERAMIC FIBER

- INNER GASKET





CISCO SAMPLE PROBE

- CAL GAS INJECTION AS CLOSE TO SAMPLE PICKUP POINT AS MANUFACTURER RECOMMENDS
 - 32 YEARS – 1 DESIGN CHANGE
 - CAL GAS INJECTION PORT MOVED FROM DOWNSTREAM OF FILTER TO UPSTREAM OF FILTER
 - OLD CAL PORT LEFT – TEST TEAM CAN USE

CISCO SAMPLE PROBE

➤ BACKFLUSH

- NOT NECESSARY ON GAS FIRED SOURCE – BUT SPECIFIED
- NEEDED ON HIGH PARTICULATE SOURCES (BIOMASS)
- DIFFICULT TO CLEAN CYLINDRICAL FILTER
- CISCO SAMPLE PROBE – FILTER DISK – EASY TO CLEAN

CISCO SAMPLE PROBE

- BACKFLUSH BALLAST TANK
TYPICALLY IN SHELTER – NOT
AT PROBE
 - NO SOLENOID VALVE/CONTROL
WIRING REQUIRED AT PROBE
 - SEPARATE 1/2" OD BACKFLUSH
TUBE IN PROBE SUPPORT
BUNDLE



CISCO SAMPLE PROBE

- EP-750 & 750/HT MOUNTS ON 4 INCH 150 LB. ANSI FLANGE
 - WE HAVE FLANGE ADAPTERS FOR OTHER FLANGE SIZES
- FLANGE HOLE ALIGNMENT - ONE HOLE TOP DEAD CENTER (TDC)
 - NOT STANDARD PIPING
 - WE HAVE FLANGE ADAPTERS TO CORRECT HOLE ALIGNMENT

CISCO SAMPLE PROBE

- REQUIRES FOUR $\frac{3}{4}$ " BOLT HOLES IN FLANGE FOR PROBE ALIGNMENT
 - US FLANGE – NO PROBLEM
 - EUROPEAN/CHINA FLANGES MAY HAVE TO BE DRILLED TO $\frac{3}{4}$ "
 - mm HOLE SLIGHTLY TOO SMALL

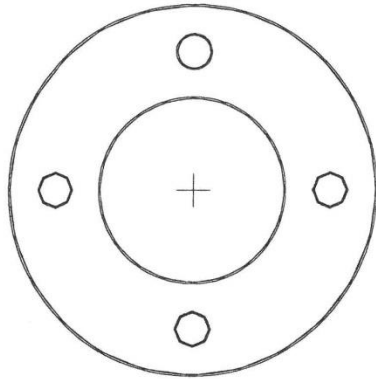
CISCO SAMPLE PROBE

- EP-760 MOUNTS ON 3 INCH 150 LB. ANSI 4-HOLE FLANGE
- FLANGE HOLE ALIGNMENT IS TWO HOLES LEVEL – STANDARD

CISCO SAMPLE PROBE

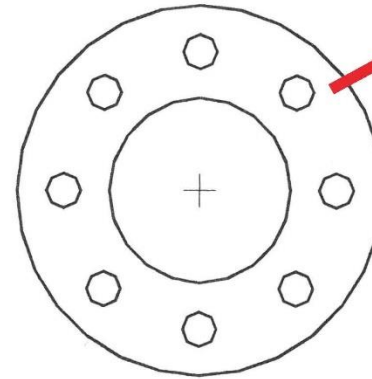
- FACILITY FLANGE PROVIDED CAN BE RAISED OR FLAT FACED
- FLANGE COVER/GASKET/BOLTS SUPPLIED WITH SAMPLE PROBE

FOUR HOLES



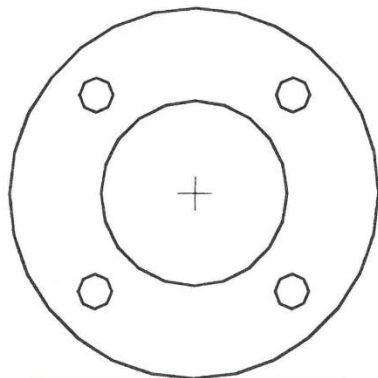
EIGHT HOLES

TDC

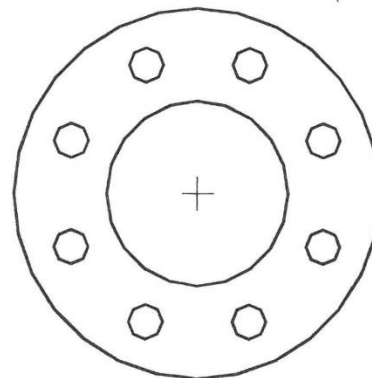


3/4" DIA
TYP 4

EP-750 & 750/HT



EP-760/HT



CISCO SAMPLE PROBE

➤ INSERTION TUBE

➤ STANDARD

➤ SINGLE POINT

➤ OPTION

➤ MULTI POINT (CROSS STACK)

➤ NOT SCAQMD APPROVED

CISCO SAMPLE PROBE

- INSERTION TUBE
 - EP-750 & 750/HT STANDARD $\frac{3}{4}$ " SCHD 80 PIPE
 - EP-760/HT STANDARD $\frac{1}{2}$ " SCHED 80 PIPE
 - THREADED INTO BODY
- END CUT AT 45° – PARTICULATE PROTECTION

CISCO SAMPLE PROBE

➤ INSERTION TUBE MATERIAL

➤ ANY MATERIAL

➤ EP-750 316L SS STANDARD

➤ EP750/HT & EP-760/HT HIGH
TEMP 310 SS STANDARD

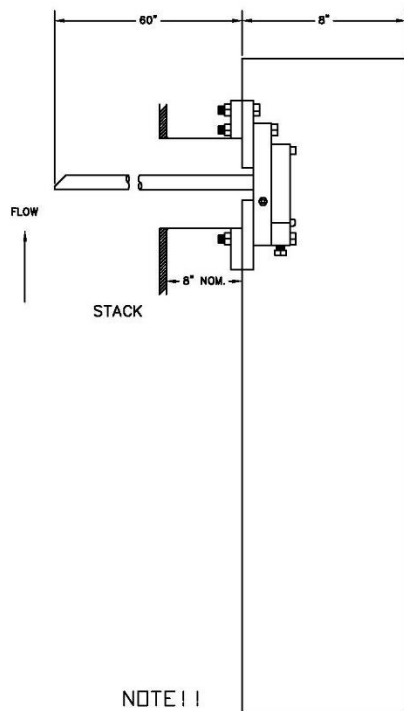
➤ INCONEL 600 HIGH TEMP NH_3

➤ C-276 HIGH CORROSION

➤ CERAMIC

CISCO SAMPLE PROBE

- INSERTION TUBE LENGTH
 - MINIMUM 1 METER OFF INSIDE WALL OR CENTRODE OF STACK IF LESS THAN 2 METER DIAMETER PER REGULATIONS
 - LENGTH OF INSERTION TUBE PER SITE SPECIFICS
 - WE NEED TO KNOW FLANGE PIPE NIPPLE DIMENSION AS WELL AS STACK DIA



NOTE !!
TDC
9 IN. DIA.

.75 IN DIA. HOLE
8 PLCS. EQ. SP.
ON 7.5 IN. DIA. B.C.

4 INCH 150 LB FLANGE
CUSTOMER SUPPLIED

NEMA 4
ENCLOSURE

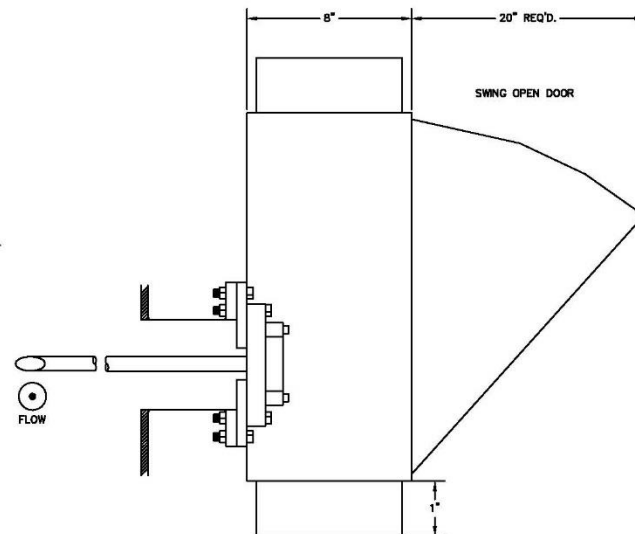
APPROXIMATE WEIGHT: 90 lbs.

EXHAUST

FAN

VENT

HEATED SAMPLE LINE



TOP VIEW

SAMPLE PROBE INSTALLATION
316L STAINLESS STEEL INSERTION TUBE

0	01-18-14	AS BUILT	-	BS
CISCO CUSTOM INSTRUMENTATION SERVICES CORPORATION				
KVPB POWER PARTNERS				
29025	13644-SP018-POA-0001	10010190		
GARRISON ENERGY CENTER CONTINUOUS EMISSION MONITORING SYSTEM INSTALLATION, SAMPLE PROBE				
GO	DATE: 02-09-2014	10010174-1		
SCALE: NONE		SHEET: 1 OF 3 REV. 0		



CISCO SAMPLE PROBE

- ADDED SUPPORTS FOR LONGER INSERTION TUBES AND HIGH VELOCITY FLOWS
- INSERTION TUBE HEATER
 - ACROSS ANNULUS
- SAFETY ISOLATION SHUT OFF VALVES
 - POSITIVE PRESSURE SOURCES



NOT A MINOR

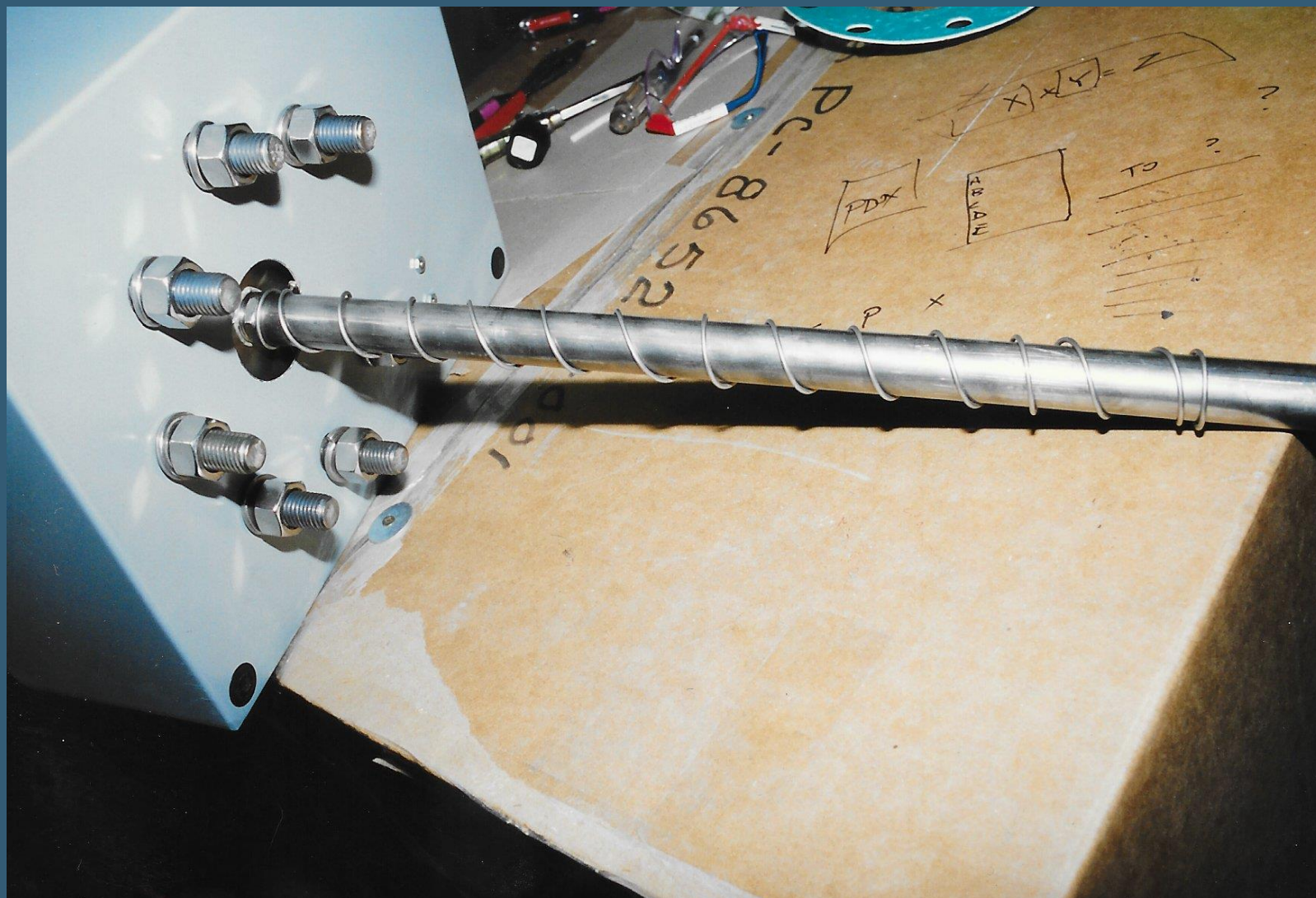
HANDLE WITH CARE

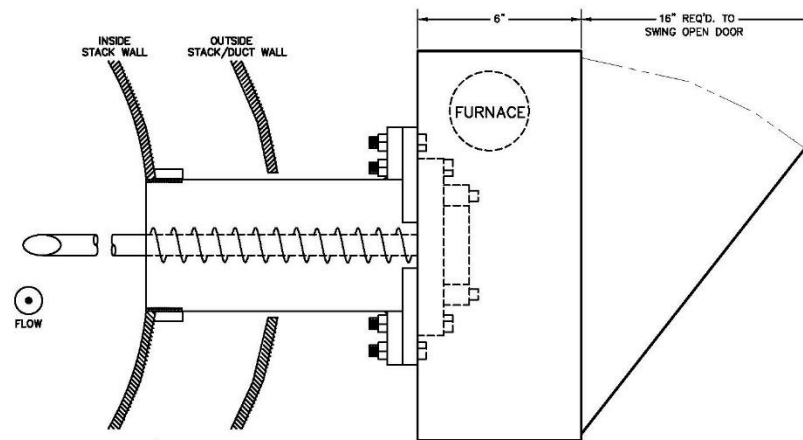
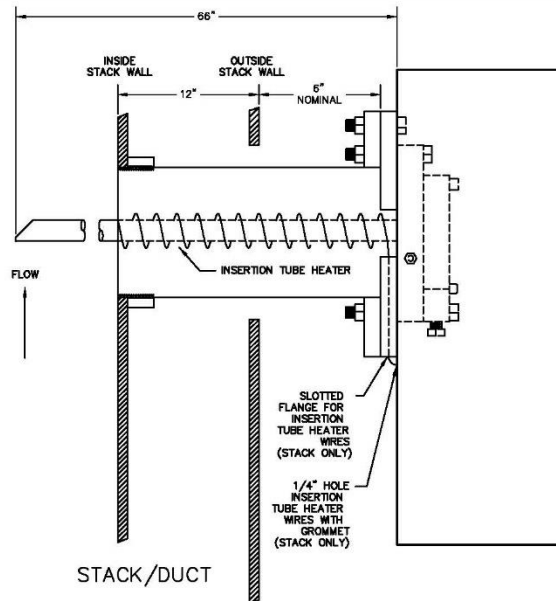
FRAGILE

FRAGILE

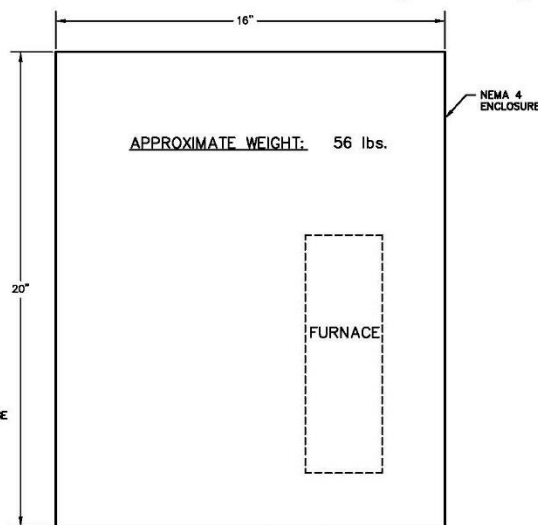
FRAGILE

WIRE ARE LOCATED WITHIN
OF BALLAST. USE WIRES RATED
AT 400 V.

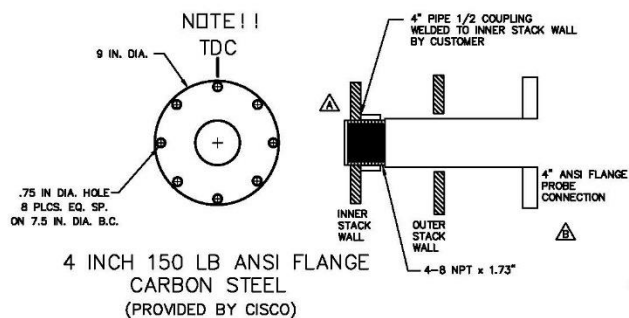




TOP VIEW

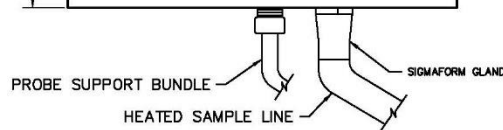



STACK SAMPLE PROBE INSTALLATION INCONEL INSERTION TUBE

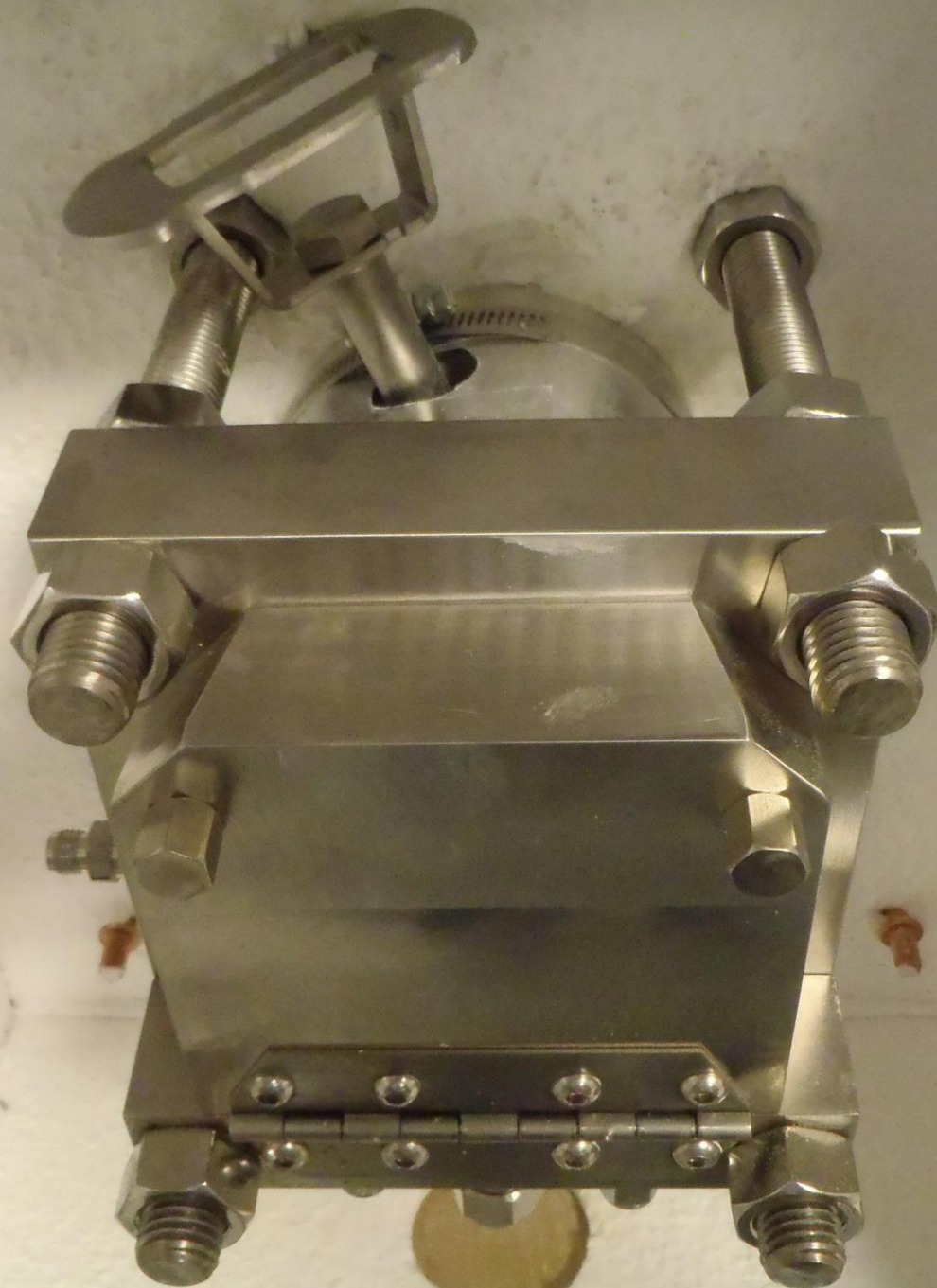


NOTES:

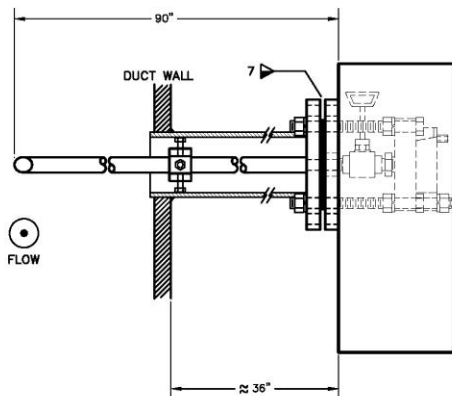
- △ 4" PIPE COUPLING PROVIDED AND INSTALLED BY CUSTOMER
- △ PORT ASSEMBLIES



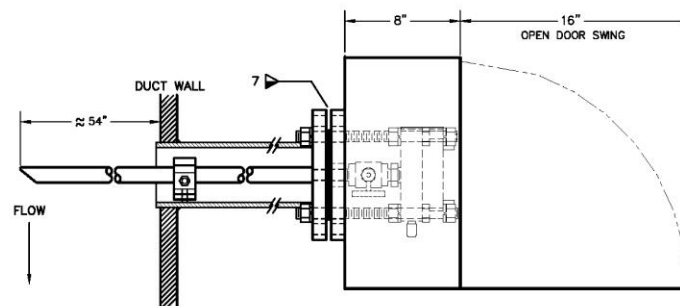
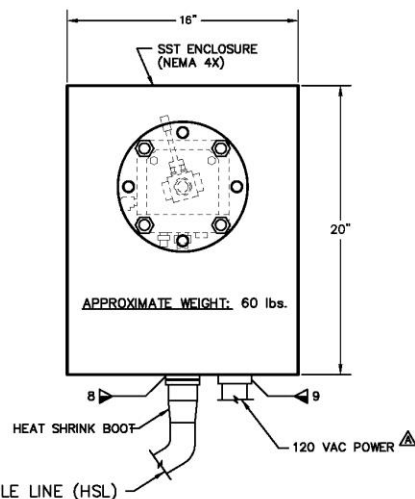
1	01/07/05	HSL LENGTH ADJUSTMENT AND INSERTION TUBE HEATER	-	BJ
0	08/04/05	AS BUILT	-	BS
REV	DATE	DESCRIPTION	BY	APP'D
 CISCO CUSTOM INSTRUMENTATION SERVICES CORPORATION				
SNC-LAVALIN				
PROJ NO.	21007	PURCHASE NO.	015755-IH26	ORDER NUMBER
				10007530
FIBROMINN BIOMASS - POWER PLANT CONTINUOUS EMISSION MONITORING SYSTEM INSTALLATION DETAILS				
MADE BY	BTB	APPROVED	DATE	
		<i>S.N.C.</i>	01007541-1	
DATE:		01-08-2005	09/01/05	
SCALE: NONE		SHEET: 1 OF 5		REV. 1



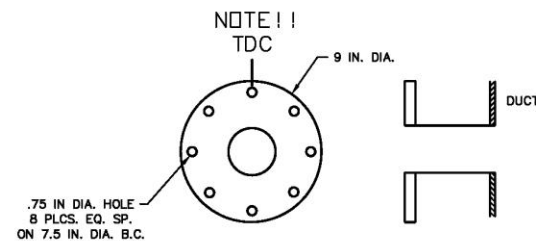
08/16/2016



DUCT



TOP VIEW



4 INCH 150 LB ANSI FLANGE
CUSTOMER SUPPLIED

TAG NO.

UNIT A 192AE-9223A
UNIT B 192AE-9223B
UNIT C 292AE-9223C

NOTES:

- FIELD TIE POINT REF DWG: 10009113
- (*) A FOR UNIT A, B FOR UNIT B, C FOR UNIT C
- CONDUIT AND WIRES SUPPLIED AND INSTALLED BY OTHERS.
- SUPPLIED BY CISCO, INSTALLED BY OTHERS.

SCR INLET
SAMPLE PROBE INSTALLATION
310 SST INSERTION TUBE
STANDARD TEMPERATURE PROBE

TYPICAL OF THREE

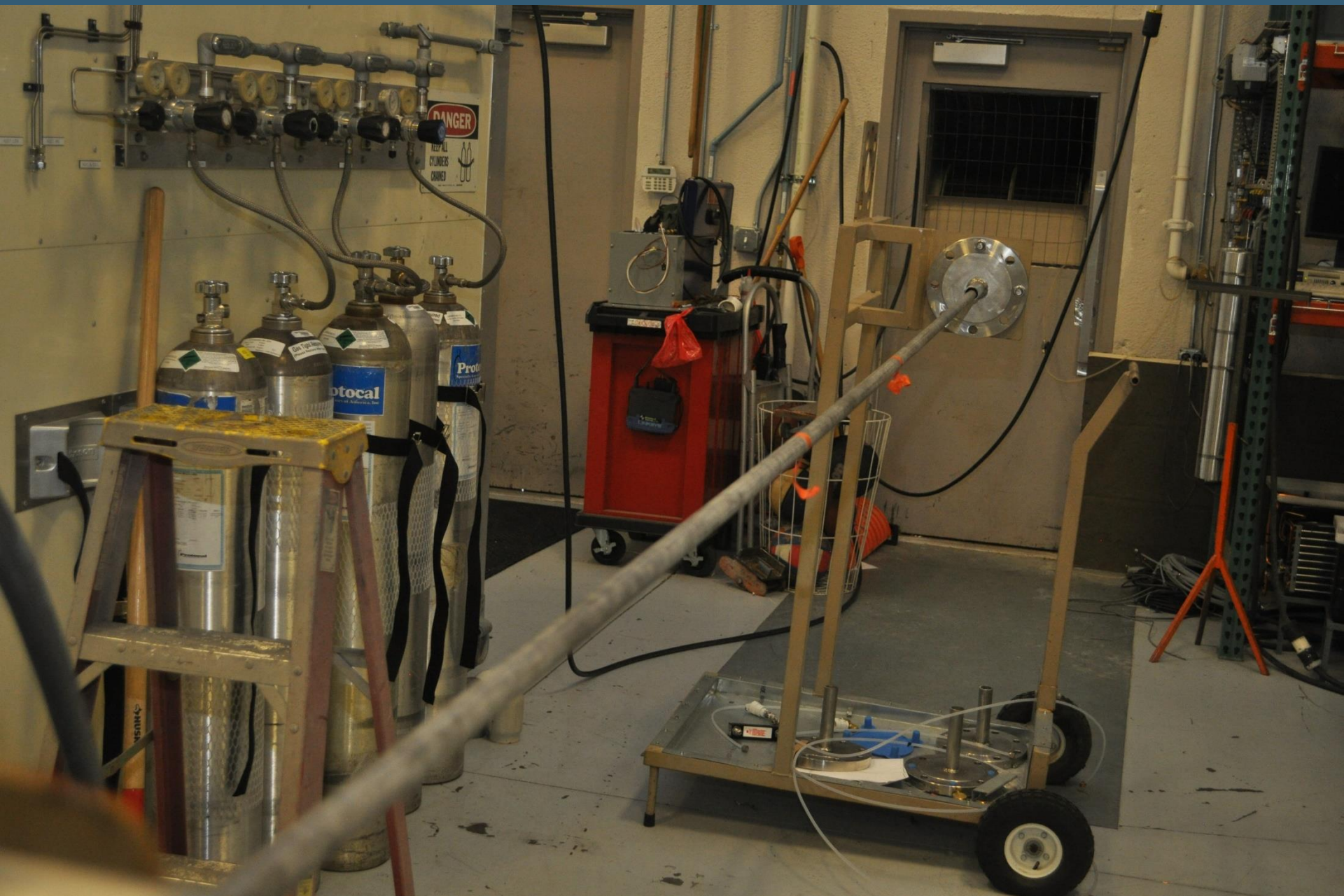
1	06/17/10	REPLACEMENT PROBE DESIGN	-	LR
0	04/28/11	AS BUILT	-	BJS
REV	DATE	DESCRIPTION	BY	APP
CISCO CUSTOM INSTRUMENTATION SERVICES CORPORATION EXXONMOBIL 26622 09MY454P-DD053036 10009130-1, -2, -3 LA BARGE NOX REDUCTION PROJECT CONTINUOUS EMISSION MONITORING SYSTEM INSTALLATION DETAILS DRAWN BY JRD APPROVED DATE 09-10-10 SCALE: NONE SHEET: 3 OF 5 REV. 1				

CISCO SAMPLE PROBE

- OPTION MULTI POINT
 - ACROSS STACK AVERAGING
 - CORRECT FOR STRATIFICATION
 - 1/2" PIPE 316L SS SCHED 160
 - EP-750 & EP-760
- SUPPORT MAY BE REQUIRED FOR BOTH ENDS

CISCO SAMPLE PROBE

- OPTION MULTI POINT
 - THREE HOLES
 - 16.7%, 50%, 83.3% STACK DIA.
 - 40CFR60 PS 2
 - ABT. 7/64" DIA. (DESIGN SPECIFIC)
 - INCREASES SYSTEM FLOW TO MAINTAIN SONIC FLOW THROUGH EACH HOLE
 - INCREASES CAL GAS USAGE

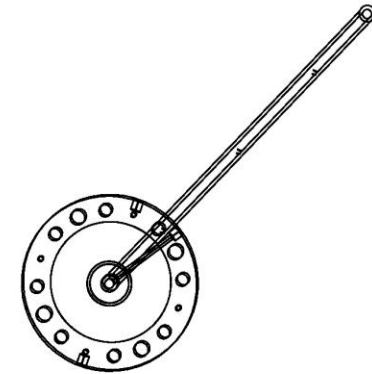
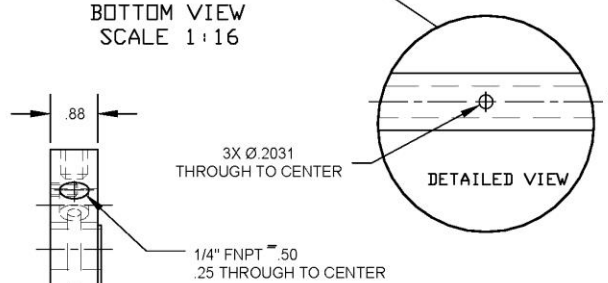
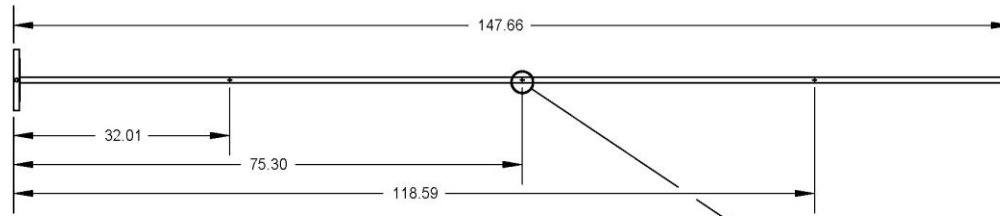
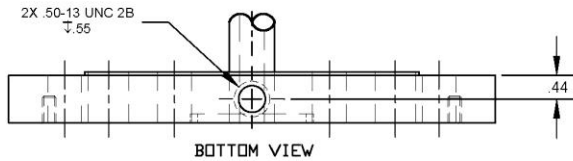
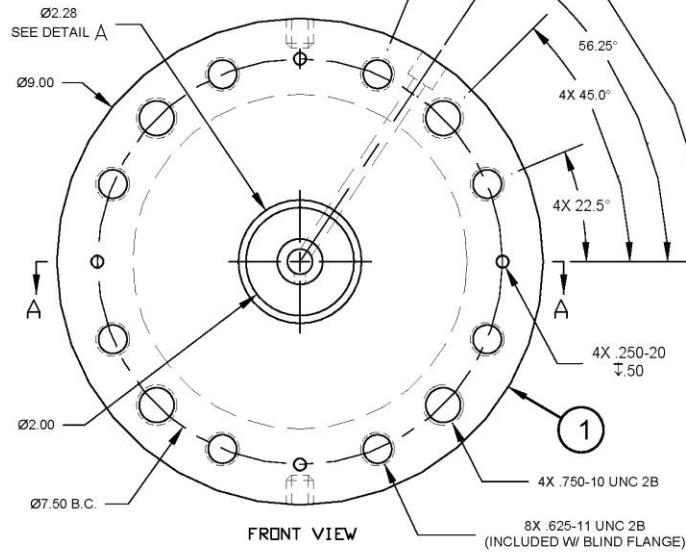


NOTES:

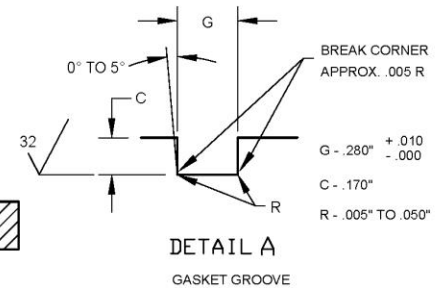
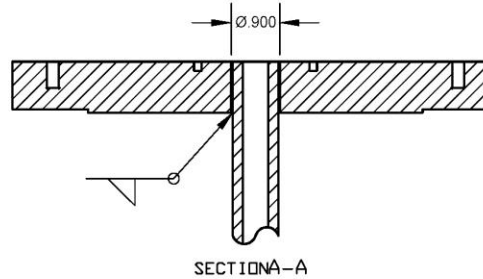
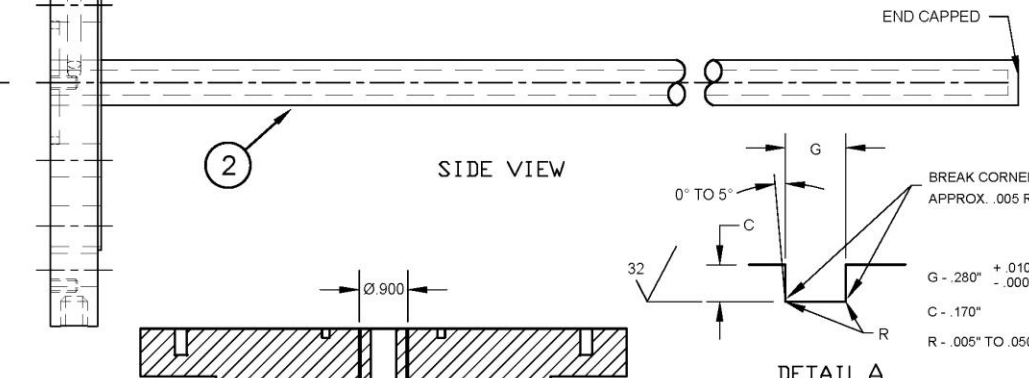
1. REMOVE ALL BURRS AND SHARP EDGES.
2. ALL DIMENSIONS ARE IN INCHES.
3. TOLERANCE: (UNLESS OTHERWISE NOTED)
XX = $\pm .01$
XXX = $\pm .005$
4. MATERIAL:
SEE TABLE

PART NO.
71000031-X
MATERIAL

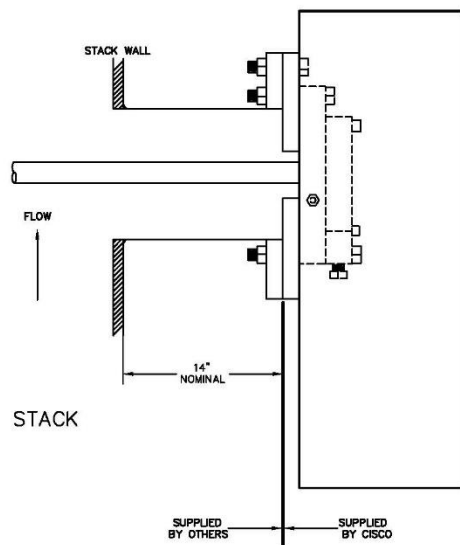
DASH No.	MATERIAL
0	316L STAINLESS STEEL
-1	HASTELLOY C-276
-2	ALUMINUM 6061-T6
-3	INCONEL 600



FIND No.	QTY.	CISCO P/N	DESCRIPTION
1	1	889900561501	4" 150 lb. FLANGE, 304 SS
2	1	80000016-XXXX	1/2" SCH 160 PIPE



CISCO CUSTOM INSTRUMENTATION SERVICES CORPORATION			
LOS ESTEROS AVERAGING PROBE			
SAMPLE END			
DATE	REV	BY	CHK
1:2	A	-	JFH
71000031-0148			07-08-12

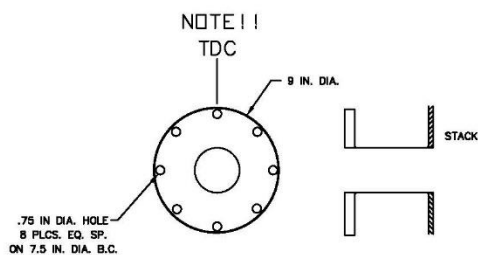


STACK SAMPLE PROBE INSTALLATION

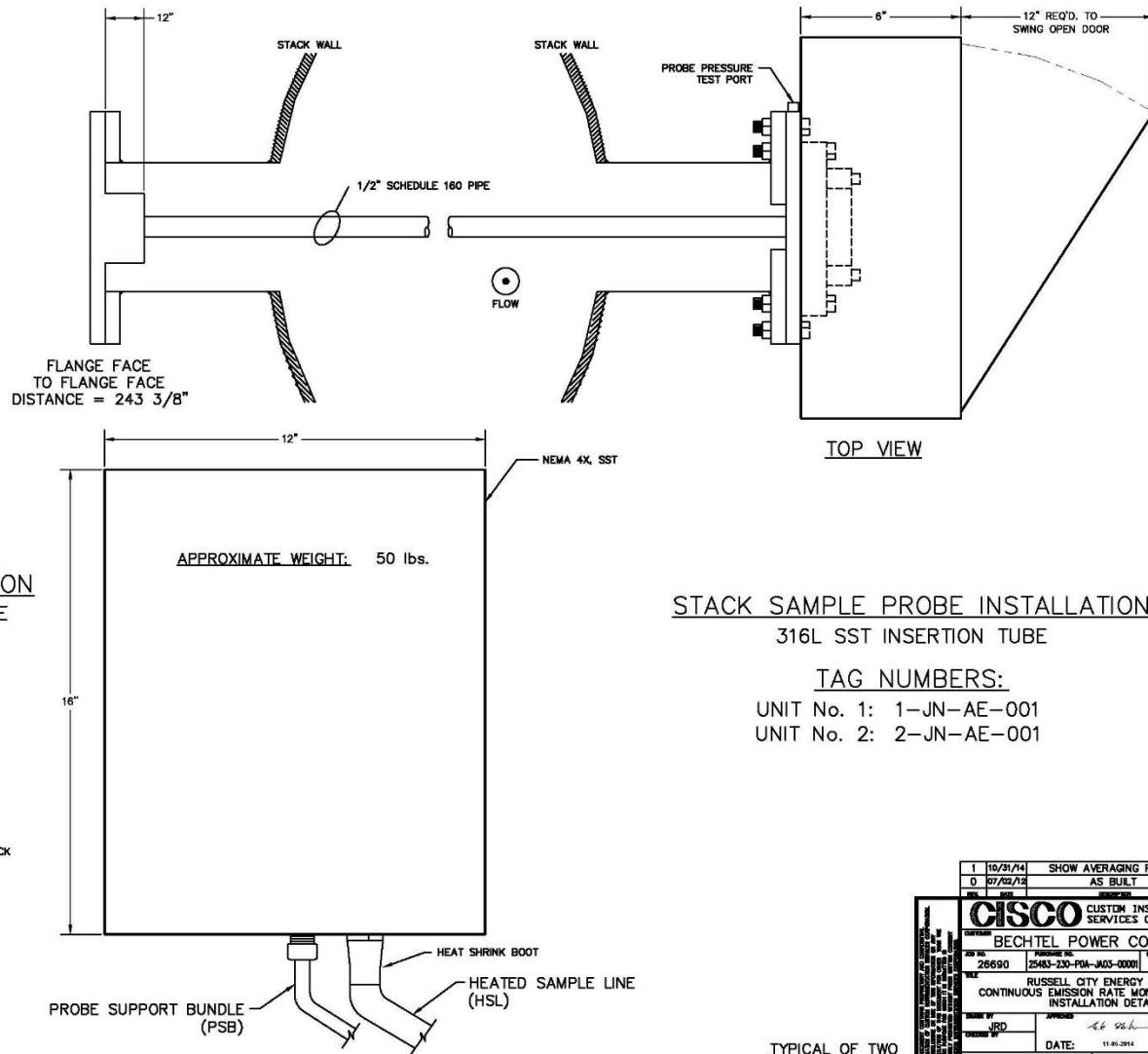
316 SST CROSS STACK AVERAGING TUBE

(PROBE BY CISCO, MODEL EP-750)

TUBE PART NUMBER: 71000034-0240



4 INCH 150 LB ANSI FLANGE
CUSTOMER SUPPLIED



TOP VIEW

STACK SAMPLE PROBE INSTALLATION

316L SST INSERTION TUBE

TAG NUMBERS:

UNIT No. 1: 1-JN-AE-001

UNIT No. 2: 2-JN-AE-001

1	10/31/14	SHOW AVERAGING PROBE	MS
0	07/02/13	AS BUILT	MS
CISCO CUSTOM INSTRUMENTATION SERVICES CORPORATION			
BECHTEL POWER CORPORATION			
26090	26090-0000	26090-0000	10009390
RUSSELL CITY ENERGY CENTER			
CONTINUOUS EMISSION RATE MONITORING SYSTEM			
INSTALLATION DETAILS			
DATE:	11-05-2014	DATE:	05-03-11
SCALE:	NONE	SHEET:	1 OF 4
REV:	1	REV:	1

TYPICAL OF TWO

CISCO SAMPLE PROBE

➤ ENCLOSURE

- HI TEMP VERSIONS TYPICALLY WITHOUT ENCLOSURE

- OPTIONAL

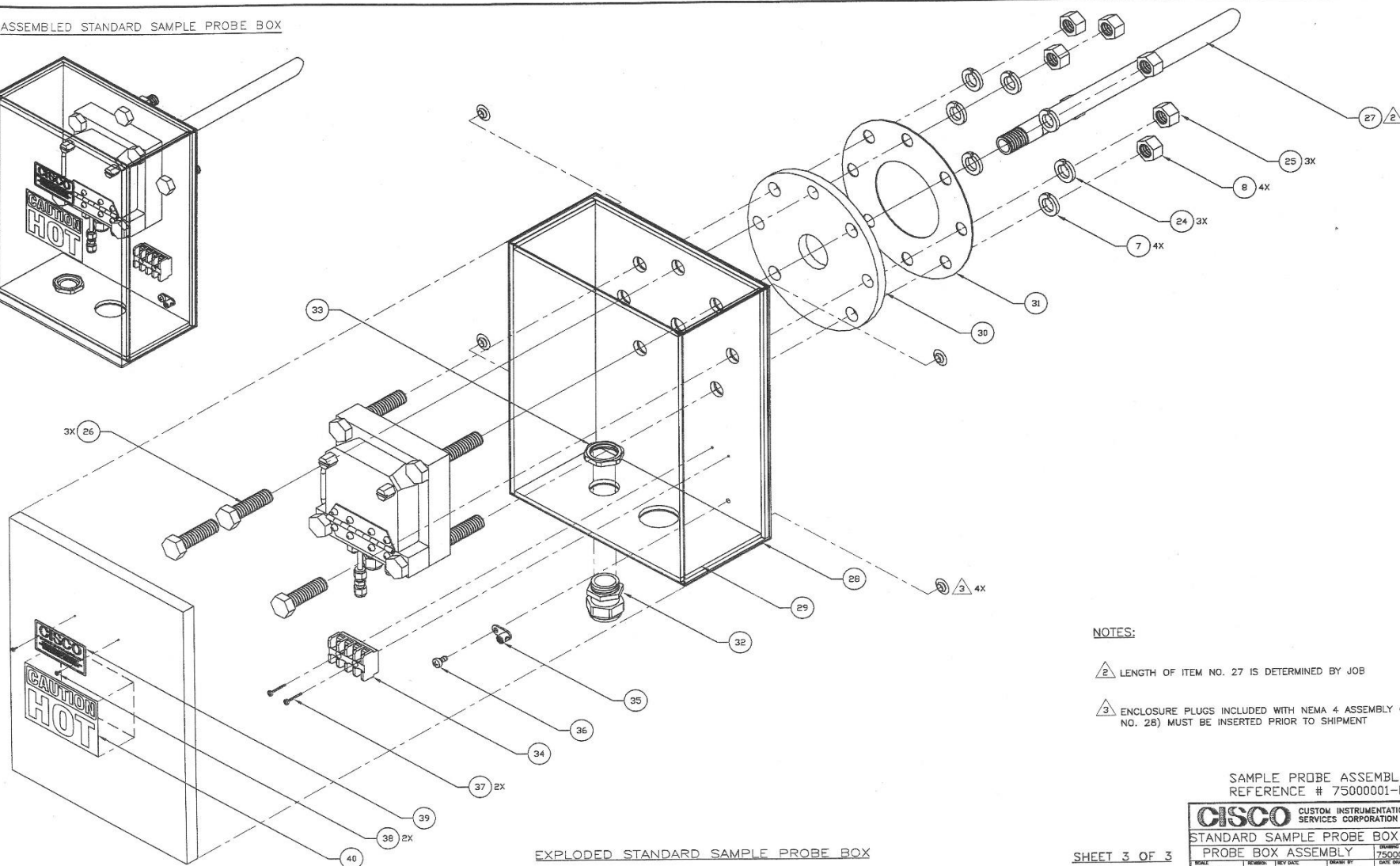
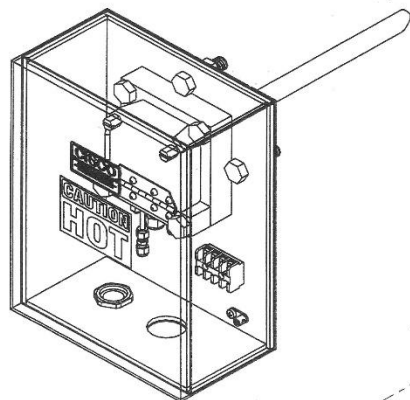
- STANDARD PROBE IN AN ENCLOSURE

- MATERIAL

- STANDARD –STEEL

- OPTION STAINLESS STEEL

ASSEMBLED STANDARD SAMPLE PROBE BOX



EXPLODED STANDARD SAMPLE PROBE BOX

NOTES:

2 LENGTH OF ITEM NO. 27 IS DETERMINED BY JOB

3 ENCLOSURE PLUGS INCLUDED WITH NEMA 4 ASSEMBLY (ITEM NO. 28) MUST BE INSERTED PRIOR TO SHIPMENT

SAMPLE PROBE ASSEMBLY
REFERENCE # 75000001-F

CISCO		CUSTOM INSTRUMENTATION SERVICES CORPORATION	
STANDARD SAMPLE PROBE BOX ASSY		75000001-3	
PROBE BOX ASSEMBLY		8-9-01	
DATE	REVISION	BY	DATE
NONE	A	—	ZRW

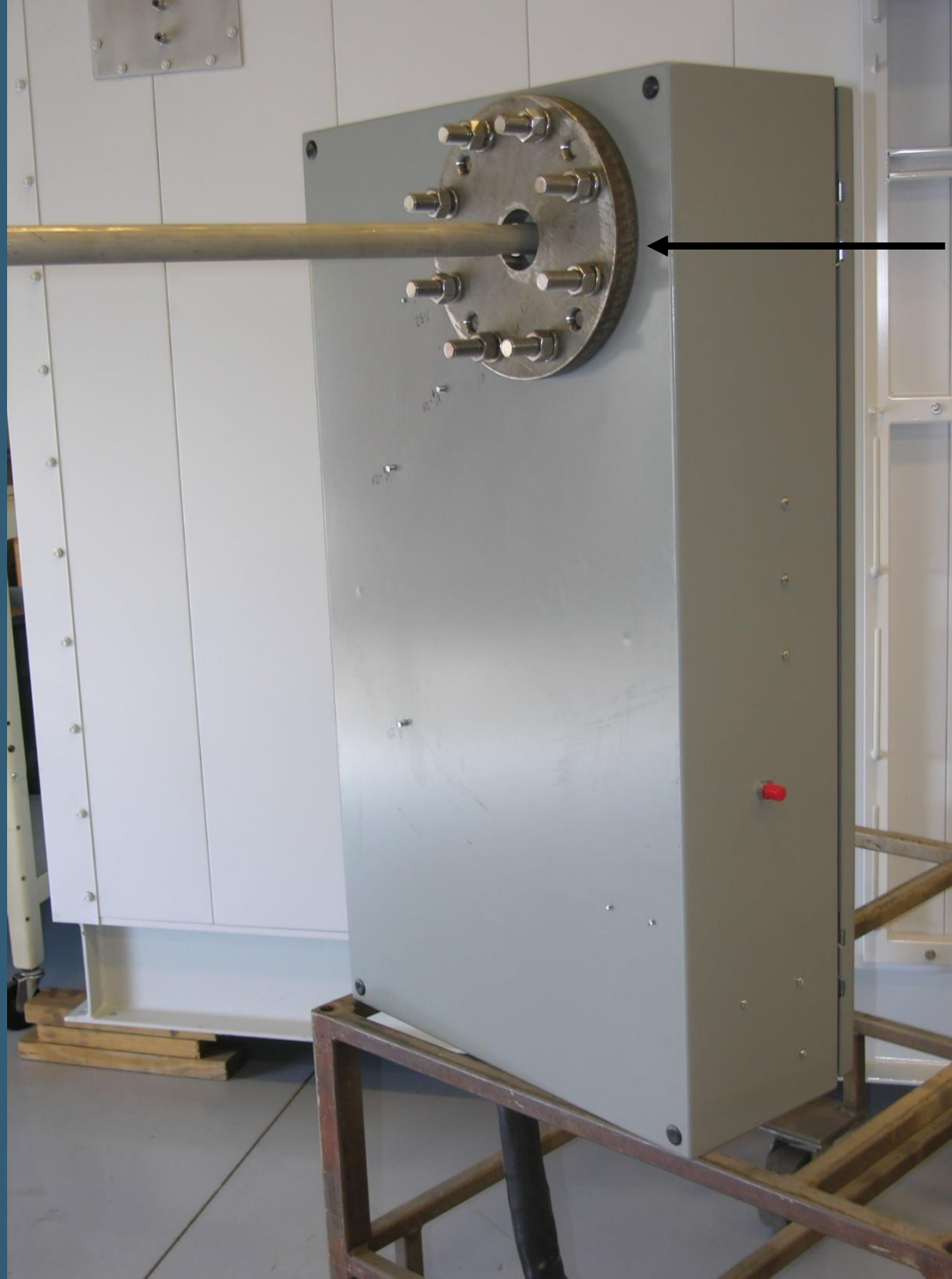
SHEET 3 OF 3

A
M
M
O
N
I
A

P
R
O
B
E







4" BOLT HOLE
ALIGNMENT
ADAPTER
FLANGE

NFPA 496
Z PURGE
CL 1 DIV 2

