



CONNECTION SCHEDULE										
Item	Size	Neck Order Length	Material		Heat No.	Thickness		Fig Type	Description	Repad Item
			Neck	Fig/Cplg		Neck	Fig/Cplg			
C1-3	3/4" IPS	2'	SA-312 304L	-		SCH STD	-	STUB	INSTRUMENTATION	-
P1-2	1-1/2" IPS	9'	SA-312 304L	-		SCH STD	-	STUB	OUTER CR HOLDER	-
S1-4	4" IPS	2-1/2'	SA-312 304L	-		SCH 40	-	STUB	CROSSOVER STUBS	-
T1-4	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T11-15	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T21-25	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T31-35	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T41-45	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T16-18	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T26-28	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-
T36-38	1/2" NPT	-	SA-182 304	-		-	3000#	FULL	INSTRUMENTATION	-

Item	Designation	Qty.	Heat No.	Material	Item Description
1	TOP TUBESHEET 'A'	1		SA-240 304	1/2" THK X 10-3/4" OD X 1-3/16" ID
2	BOTTOM TUBESHEET 'B'	1		SA-240 304	1/2" THK X 10-3/4" OD
3	TUBE	36		SA-249 304	18mm OD X 16mm ID X 70" LG
4	SHELL	1		SA-240 304	12" SCH 10 (.180" WALL) X 80-1/2" LG
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6	TOP COVER PLATE	1		SA-240 304	3/4" THK X 16" OD X 1-15/16" ID
7	BOTTOM COVER PLATE	1		SA-240 304	3/4" THK X 16" OD X 4" ID
8	BODY FLANGE	2		SA-240 304	3/4" THK X 16" OD X 12-7/8" ID
9	GASKET	2		CERAMIC FIBER	1/8" THK PACKING FIBER WRAPPED 3 TIMES OR MORE TO FORM 12-3/4" ID X 13-1/2" OD, MCMASTER CARR ITEM #H57KS OR EQUAL
10	WING BOLT	2		C.S.	1/2" - 13 UNC X 2-1/2" LG, MCMASTER CARR ITEM #9756A722
11	WING BOLT SLEEVES	8		SA-312 304	1/2" SCH 80 (.147" WALL) X 1-1/2" LG
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13	UPPER PLENUM COVER	1		SA-240 304	1/4" THK X 12-1/4" OD
14	UPPER PLENUM SUPPORT	1		SA-240 304	1/4" THK X 12" OD X 10-1/4" ID
15	UPPER PLENUM SHELL	1		SA-240 304	1/4" THK X 10-1/4" ID (33" SO) X 3" LG
16					
17	HEATERS	6		NICKEL	1000W CARTRIDGE HEATER, 0.4375" OD OMEGA STRIH-7242-120
18	HEATER SLEEVES	6		CERAMIC	1" OD X 3/4" ID X 4" LG, (CUT FROM (2) PIECES OF MCMASTER CARR ITEM #B746K552)
19	HEATER TERMINALS	3		CERAMIC	Terminal Block, 840 Degrees F, 2 Circuits, 600V AC/DC, 20 Amps McMaster 1322T11 OR EQUAL
20	INTERNAL SUPPORT TABS	3		SA-240 304	3/8" THK X 5-3/4" X 5/8"
21	THERMOCOUPLE TERMINALS	4		CERAMIC	6 POLE TERMINAL BLOCK PYROMATION 210336 OR EQUAL
22	LOWER PLENUM FLOOR	1		SA-240 304	1/2" THK X 12-1/4" OD X 2-1/16" ID
23	CORE SUPPORT TUBES	7		SA-249 304	2" OD X .0065" AVG. WALL X 4-1/4" LG
24	CORE SUPPORT PLATES	7		SA-240 304	1/4" THK X 2" OD
25	CENTER SUPPORT BOLT	1		SA-194 8	3/4"-10 UNC X 7/8" LG, BOTTOM THREADED
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27	CROSSOVER ELBOW	1		SA-403 304	4" SCH 40S (.219" WALL) 90° L.R. B.W. ELBOW
28	CROSSOVER PIPE	3		SA-312 304	4" SCH 40S (.219" WALL) X (1) @ 38" LG; (1) @ 1-3/4" LG; (1) @ 1-1/2" LG
29	CROSSOVER CLOSURE PLATE	2		SA-240 304	1/2" THK X 4-1/2" OD
30	CROSSOVER COUPLING	4		304	V-BAND CLAMP, 4-1/2" ID, SPD EXHAUST ITEM #VBK4505
31	CROSSOVER VAVLE	1		304	4" BALL VALVE, FULL PORT B.W. W/ ACTUATOR, TRIAC ITEM #F88B3-400/SS5D-A (0/45" OVERALL)
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33	TIE RODS	6		SA-479 304	1/2" DIA. ROD X 72" LG
34	NUTS	12		SA-194 2H	1/2" - 13 UNC HEAVY HEX, ZINC PLATED
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36	STACK SHELL	1		SA-240 304	6" SCH STD (.280" WALL) X APPROX 96" LG
37	STACK SHELL TOP PLATE	1		SA-240 304	1/2" THK X 6-5/8" OD
38	STACK SHELL BTM. PLATE	1		SA-240 304	1/2" THK X 10" SQUARE
39	STACK SHELL BASE	1		SA-516 Gr70	1" THK X 12" SQUARE
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41	SUPPORT BASE	1		SA-516 Gr70	1" THK X 24" SQUARE
42	SUPPORT ANGLE	2		SA-36	L2" X 2" X 3/16" THK X 46" LG
43	SUPPORT CHANNEL	2		SA-36	C6 X 8.2 C-CHANNEL X 46" LG
44	SUPPORT BRACE PLATES	2		SA-516 Gr70	1/2" THK X 2" X 15"
45	SUPPORT PIPE	2		SA-53B	2" SCH STD (.154" WALL) X 5-3/4" LG
46	SUPPORT PIPE STRAPS	2		SA-36	VIBRATION DAMPING CLAMP WITH TPR CUSHION, ZINC PLATED, 1-7/8" ID, MCMASTER CARR ITEM #11355T35
47	SUPPORT STRAP BOLTS	4		C.S.	3/8" - 16 UNC X 1-1/2" LG
48	SUPPORT STRAP NUTS	4		SA-194 2H	3/8" - 16 UNC HEAVY HEX
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50	NAME PLATE BRACKET	1		304	10GA X 8" X 16"
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DESIGN DATA		NOTES		SPECIAL NOTES		REVISIONS		Do Not Scale Drawing	
Code	In General accordance with ASME SECTION VIII, DIVISION 1	1.	ALL FLANGE BOLT HOLES TO STRADDLE MAJOR VESSEL CENTERLINES.	1.	FOR 304L TO 304L USE PROCEDURE GM08-F60 OR GT08-F6M OR SA08-F6 WITH ER308L FILLER. FOR 316L TO 316L USE PROCEDURE GM08-F60 OR GT08-F6M OR SA08-F6 WITH ER316L FILLER. FOR 316L TO 304L USE PROCEDURE GM08-F60 OR GT08-F6M WITH ER316L FILLER.	Rev.	Date	Drawn By	Checked By
Design Conditions	Shellside	2.	EACH SECTION OF NOZZLE REPADS AND ALL REPADS CROSSING A WELD SEAM REQUIRE AN 1/8" NPT WEEP HOLE W/PLUG.	2.	FOR S.S. TO C.S. USE PROCEDURE GM0801-F60 OR GT0801-F6 WITH ER308L FILLER. FOR C.S. TO C.S. USE PROCEDURE GM01-F6 OR GT01-F6 OR SA01-F6 WITH ER70XX FILLER. EXCHANGER EMPTY..... LBS. FULL OF WATER..... LBS. BUNDLE..... LBS.				
Design Pressure	15 PSIG	3.	CONDUCT 15psi AIR TEST FOR ALL NOZZLE REPADS AND ALL REPADS CROSSING A WELD SEAM.	3.	ALL FABRICATED GASKET SURFACES TO BE PHONO-SERRATED 44-55 CUTS PER INCH ON FACE WITH APPROXIMATELY 125-250 MICRO-INCH RMS ROUGHNESS.				
Design Temperature	-20°F	4.	ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SPECIFIED.	4.	REMOVE ALL RUST, MILL SCALE, ETC., & APPLY ONE COAT OF RED OXIDE PRIMER TO ALL EXPOSED C.S. SURFACES.				
MDMT	-20°F	5.	CLEAN HEAT TINT AREA WITH FLAPPER WHEEL.						
Hydrotest	5 PSIG Leak test	6.	ALL WELDS TO BE CLEANED INSIDE AND OUTSIDE WITH SS POWER WIRE BRUSH.						
Corrosion Allowance	NONE	7.	APPLY "NEVER-SEEZ" OR EQUAL TO ALL EXTERNAL FLANGE FASTENERS.						
Other NDE	NONE	8.	IMMEDIATELY PRIOR TO SHIPMENT CLEAN ALL INNER SURFACES OF DIRT, PAINT, SCALE, WELD SLAG, OXIDE AND GREASE.						
Radiography	none	9.	COVER AND PROTECT ALL NOZZLES AND OPENINGS W/HARDBOARD OR EQUAL FOR SHIPMENT.						
Insulation:	NONE	10.	OVERPRESSURE PROTECTION SHALL BE PROVIDED BY THE CUSTOMER PRIOR TO PLACING VESSEL IN SERVICE.						
Gasket Material:	1/8" OD GARLOCK Ceramic Packing	11.	TAG VESSEL WITH OPERATING TEMPERATURE WARNING.						
Fasteners:	Stainless Steel								

Drawn	PEM	Title:	12" IDSETSET VESSEL
Checked	JPM	Customer:	OREGON STATE UNIVERSITY
Approved	JN	Destination:	CORVALLIS, OREGON
Quote No.	-	Date	2/26/16
Job No.	26776	Size	D
P.O. No.	-	Scale:	NONE
		Sheet	1 Of 5