1	Applicable To:	Manufacturer:	DAEKYUNG MACHINERY & ENGINEERING CO., LTD.	Requisition No.:	MR205-E-3-1	1B
2	○ Proposal	TEMA Type:	AJ21S	Shells/Unit:	1	1B
3	◉ Purchase	Size (in X in):	58 X 288	Connected in:	1 Parallel 1 Series	1B
4	○ As Built	Surface/Unit (Eff): 6,740 ft²	Surface/Shell (Eff): 6,740 ft²	Orientation:	Horizontal	1B

5 PERFORMANCE OF ONE UNIT: PHASE II (Design Case)

No.	Item	Unit	Shell Side IN LIQ	Shell Side IN VAP	Shell Side OUT LIQ	Shell Side OUT VAP	Tube Side IN LIQ	Tube Side IN VAP	Tube Side OUT LIQ	Tube Side OUT VAP	Rev
6			SHELL SIDE				TUBE SIDE				
7	Fluid Name		HC Vapor/Liquid (Note 4)				Cooling Water (Note 4)				
8	Fluid Quantity, Total	lb/hr	457,383				1,188,312				
9			IN		OUT		IN		OUT		
10	Vapor	lb/hr	447,093		407,273		-		-		
11	Liquid	lb/hr	10,291		50,111		1,188,312		1,188,312		
12	Steam	lb/hr	-		-		-		-		
13	Condensate	lb/hr	-		-		-		-		
14	Noncondensable	lb/hr	-		-		-		-		
15	Molecular Weight, Vapor		-		-		-		-		
16	Molecular Weight, Noncondensable		-		-		-		-		
17	Temperature	°F	212		125		75		110		
18			LIQ	VAP	LIQ	VAP	LIQ	VAP	LIQ	VAP	
19	Density	lb/ft³	59.78	-	49.73	-	61.78	-	61.15	-	
20	Viscosity	cP	0.279	0.013	0.463	0.012	0.99	-	0.62	-	
21	Specific Heat	Btu/lb-°F	1.008	0.498	0.8	0.47	1	-	0.997	-	
22	Thermal Conductivity	Btu/hr-ft-°F	0.392	0.021	0.103	0.018	0.36	-	0.37	-	
23	Latent Heat	Btu/lb @ °F	-				-				
24	Inlet Pressure	psig	182				90				
25	Velocity	ft/s	21.79				7.08				1B
26	Pressure Drop (Allowable / Calculated)	psi	3.0 / 2.686				15 / 16.923 Note 1				1B
27	Fouling Resistance	hr-ft²-°F/Btu	0.001				0.002				
28	Heat Exchanged	MM Btu/hr	41.58 (Note 4)		MTD (Corrected) ~~(Weighted)~~		66.7 °F				1B
29	Transfer Rate (Required / Fouled / Clean)		92.49 / 93.3 / 145.52 Btu/hr-ft²-°F								1B
30	ρV² - lb/ft-s²: Inlet Nozzle 1207.5	Outlet Nozzle	(*)				Bundle Entrance 378.41		Bundle Exit 548.74		1B

31 CONSTRUCTION OF ONE SHELL

No.	Item	Unit	Shell Side NO.	Shell Side SIZE	Shell Side RATING	Shell Side FACING	Tube Side NO.	Tube Side SIZE	Tube Side RATING	Tube Side FACING
32			SHELL SIDE				TUBE SIDE			
33	Design Pressure / Test Pressure	psig	375.0 / Per Code				290.0 / Per Code			
34	External Design Pressure	psia @ °F	15 @ 400°F				15 @ 400°F			
35	Design Temperature (Max / Min)	°F	650.0 / -20				650.0 / -20			
36	No. of Passes per Shell		Combined Flow				4			
37	Corrosion Allowance	in.	0.25				0.125			
38	Insulation Thickness	in	2" (PP)				1.5" (FP)			
39	Connections, Size, Rating & Facing		NO.	SIZE	RATING	FACING	NO.	SIZE	RATING	FACING
40		Inlet (Note 9)	2	20 NPS	300#	RFWN	1	14 NPS	300#	RFWN
41		Outlet	1	24 NPS	300#	RFWN	1	14 NPS	300#	RFWN
42		Thermowells w/blind	3	2	300#	RFLWN	2	2	300#	RFLWN
43		Pressure Gages w/blind	3	2	300#	RFLWN	2	2	300#	RFLWN
44		Miscellaneous	-	-	-	-	-	-	-	-

No.	Item	Unit	Value	Item	Unit	Value	Item	Value	Rev
45	TUBES		SA 179 (note 7)	SHELL		SA516-70N (Note 7)	CHANNEL	SA516-70N	
46	No.:		1122	ID:	in.	58	Channel Cover:	SA516-70N	1B
47	OD	in.	1	OD:	in.	(*)	Body Flanges:	C. Stl. (Note 2)	
48	Thk. (ave/min)	in.	0.134 Min	Cover:		SA516-70N (Note 7)	Studs/Nuts (External):	SA193 B7M/SA194 2HM	
49	Length	ft.	24	Body Flanges:		C. Stl. (Note 2,7)	Gaskets:	316L Kammprofile (Note 3)	
50	Pitch	in.	1.25	Studs/Nuts (External):		SA193 B7M/SA194 2HM			
51	Layout		45°	Gaskets:		316L Kammprofile (Note 3)	Nozzle Necks:	SA106 Gr. B	1B
52	Type		Bare / Seamless	Expansion Joint:		N/A	Nozzle Flanges:	SA105N	
53	CROSS BAFFLES		SA516-70N (Note 6)	Nozzle Necks:		C Stl (Note 7,2)	Nozzle Reinforcement:	SA516-70N	
54	Type/Orientation		Seg/Vertical	Nozzle Flanges:		SA105N (Note 7)	Pass Partition Plates:	SA516-70N (Note 8)	
55	%Cut diameter		28.5	Nozzle Reinforcement:		SA516-70N	TUBESHEET -Stationary:	SA516-70N (Note 7)	1B
56	No. Crosspasses:		10	Supports:		SA516-70N	-Floating:	SA516-70N (Note 7)	1B
57	Spacing, c/c:		25.2	FLOATING HEAD		SA516-70N (Note 7)	TUBE-TO-TUBESHEET JOINT	Rolled, Grooved & Seal Welded	1B
58	Inlet:		37	Flange:		C. Stl. (Note 2,7)	IMPINGEMENT	C. Stl. (Note 2,7)	1B
59	LONG. BAFFLE		N/A	Backing Ring:		C. Stl. (Note 2,7)	Type:	Rods	
60	Seal Type:		-	Studs/Nuts (Internal):		SA193 B7M/SA194 2HM	BUNDLE SKID BARS	C Stl (Note 2,7)	
61	SUPPORT		Required	Gasket:		316L Kammprofile (Note 3)	# F-STREAM SEAL RODS	C Stl (Note 2,7)/ per API 660	
62	Tubes:		SA516-70N (Note 5,6)	WEIGHT/SHELL-Empty	lb	91,491	# SEALING STRIPS	C Stl (Note 2,7)/ per API 660	1B
63	Floating Head:		SA516-70N (Note 5,6)	Filled with Water:	lb	124,846	TIE RODS, SPACERS	C Stl (note 2,7)	1B
64	U-bends:		-	Bundle:	lb	54,277	TUBE LAYOUT	Mixed / Symmetrical (Note 5)	1B
65	CODE STAMP		Yes	CODE REQUIREMENTS		ASME Sect VIII Div 1	TEMA CLASS	R	

66 NOTES: (*) Information to be confirmed / provided by the Seller

67 Phase II: Design case for duty

68

REV

NO.	DATE	REVISION	BY	CHK.	APPR.	APPR.
1B	2007/04/07	Issued for Purchase	[signature]	[signature]	[signature]	[signature]
1A	27-Mar-07	Issued for Quotation	PF	JN	PS	FO

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

BANTREL

PROJECT:	VOYAGEUR UPGRADER (VU)	JOB NO.: 987	PROJ#: 03-00005-PU-05-00
CLIENT NAME:	SUNCOR ENERGY INC.	REQUISITION NO.:	MR205-E-3-1
PLANT LOCATION:	SUNCOR FEE LOT #2	DOCUMENT NO.:	REV
SERVICE:	Compressor Discharge Cooler	DS205-A-E400-1	1B
EQUIP NO.:	205E-400		

FORM E3009-E (2004/05)

1	Applicable To:	Manufacturer: DAEKYUNG MACHINERY & ENGINEERING CO., LTD.	Requisition No.: MR205-E-3-1	1B
2	○ Proposal	TEMA Type: AJ21S	Shells/Unit: 1	
3	◉ Purchase	Size (in X in): 58 X 288	Connected in: 1 Parallel 1 Series	1B
4	○ As Built	Surface/Unit (Eff): 6,740 ft² Surface/Shell (Eff): 6,740 ft²	Orientation: Horizontal	1B

5	**PERFORMANCE OF ONE UNIT:**										
6			**SHELL SIDE**				**TUBE SIDE**				
7	Fluid Name		HC Vapor/Liquid (Note 4)				Cooling Water (Note 4)				
8	Fluid Quantity, Total	lb/hr	309,063				814,298				
9			IN		OUT		IN		OUT		
10	Vapor	lb/hr	302,457		275,337		-		-		
11	Liquid	lb/hr	6,604		33,726		814,298		814,298		
12	Steam	lb/hr	-		-		-		-		
13	Condensate	lb/hr	-		-		-		-		
14	Noncondensable	lb/hr	-		-		-		-		
15	Molecular Weight, Vapor		-		-		-		-		
16	Molecular Weight, Noncondensable		-		-		-		-		
17	Temperature	°F	213		125		75		110		
18			LIQ	VAP	LIQ	VAP	LIQ	VAP	LIQ	VAP	
19	Density	lb/ft³	59.78	-	49.73	-	61.78	-	61.15	-	
20	Viscosity	cP	0.278	0.013	0.463	0.012	0.99	-	0.62	-	
21	Specific Heat	Btu/lb-°F	1.008	0.498	0.8	0.47	1	-	0.997	-	
22	Thermal Conductivity	Btu/hr-ft-°F	0.392	0.021	0.103	0.018	0.36	-	0.37	-	
23	Latent Heat	Btu/lb @ °F	-				-				
24	Inlet Pressure	psig	182				90				
25	Velocity	ft/s	14.69				4.85				1B
26	Pressure Drop (Allowable / Calculated)	psi	3.0 / 1.292				15 / 8.429 Note 1				1B
27	Fouling Resistance	hr-ft²-°F/Btu	0.001				0.002				
28	Heat Exchanged	MM Btu/hr	28.49 (Note 4)		MTD (Corrected) ~~(Weighted)~~		67.3 °F				1B
29	Transfer Rate (Required / Fouled / Clean)		62.8 / 79.6 / 114.54 Btu/hr-ft²-°F								1B
30	ρV² - lb/ft-s²: Inlet Nozzle 552.91	Outlet Nozzle	(*)				Bundle Entrance 173.27		Bundle Exit 250.44		1B
31	**CONSTRUCTION OF ONE SHELL**										

66 **NOTES:** (*) Information to be confirmed / provided by the Seller

67 Phase I

REV

74 --- Continued ---

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

BANTREL

PROJECT:	VOYAGEUR UPGRADER (VU)	JOB NO.: 987	PROJ#: 03-00005-PU-05-00
CLIENT NAME:	SUNCOR ENERGY INC.	REQUISITION NO.:	MR205-E-3-1
PLANT LOCATION:	SUNCOR FEE LOT #2	DOCUMENT NO.:	REV
SERVICE:	Compressor Discharge Cooler	DS205-A-E400-1	1B
EQUIP NO.:	205E-400		

FORM E3009-E (2004/05)

NOTES

1) Seller to add 1 gage thickness for HTRI pressure drop calculations on Min Wall tubes.

2) Material to be SA516-70N or equivalent.

3) Graphite Filled; Use Y=10000 and m=3 for design calculations.

4) Flowrates and duties include 10% overdesign margin.

5) Approximately 8.6" height under inlet nozzle. Vibration support baffles required for 1st 5 rows at inlet nozzles.

6) Baffles are 0.75" thick. Floating Head Support baffle to have central cut-out.

7) Wet H2S service **Shell Side.**

7.1 Materials shall comply with NACE MR 0103 (2005). Production hardness testing required for C Stl welds; maximum hardness shall be 200 HBW. Welding procedures shall be qualified with cross sectional microhardness testing (HV10). Maximum hardness for C Stl shall be 248 HV. PWHT required for C Stl pressure retaining components. Meets NACE 8X194, category 2 definition of wet H2S service.

7.1.1 Plate Material:

a) Plate material shall be SA 516, normalized, fully killed, vacuum degassed, maximum hardness shall be 200 HB.

b) Additional chemistry requirements for plate:

Cb: 0.015 % maximum

V: 0.004% preferred maximum; refer to Suncor 0601 Para. 12.1 if V > 0.004%.

S: 0.002% maximum

P: 0.010% maximum

CE < 0.44% (carbon equivalent): Plate CE per ASME SA-20, S20.2.

c) 100% UT in accordance with ASME SA 578 S1.1 with level C acceptance standards.

d) All cold formed heads shall be stress relieved.

e) Carbon steel pressure retaining components shall be supplied with a Certified Materials Test Report (CMTR). Chemical analysis results, as reported on CMTR, shall include Cb, V, Ti, S, P, Ni, Mo, Cr, Cu. CE < 0.44% (carbon equivalent):

7.1.2 Forgings shall be normalized.

7.1.3 Bolts shall be SA 193 Gr.B7M.

7.1.4 Nuts shall be SA 194 Gr.2HM.

7.2 Fabrication:

a) Microhardness testing required.

Welding procedure qualification maximum hardness for HAZ shall be 248 HV (10 kg maximum load) per NACE RP 0472. The maximum weld deposit hardness shall be 248 HV and the average weld deposit hardness shall not exceed 210 HV. Hardness survey shall include readings transverse to the centerline of the weld from base metal through the weld and into the adjoining base metal as shown in fig.3 of NACE RP0472, latest edition.

b) General Welding Requirements:

In addition to Client's specifications the following requirements apply:

i) The inside weld surface of pressure equipment shall have the weld reinforcement as smooth and as nearly flush as possible to reduce stress risers, remove built-in notches and linear indications, and to facilitate Wet Fluorescent Magnetic Particle Testing (WFMT). Discontinuity generating profiles, such as welds overlay reinforced with high crowns or with the tops of crowns ground flat and having sharp edges or welds with rough bead profiles, shall be corrected. Acceptance standards for the weld profile shall be agreed with the Level II NDE Examiner prior to the start of testing.

ii) The remains of any internal temporary attachments, line-up clamps, backing bars or arc strikes shall be ground flush with the base metal and inspected with WFMT prior to preparation for shipment. Documented test results shall be submitted for review.

iii) Longitudinal and circumferential seams shall be full-penetration butt welds. All nozzles welds shall be full penetration welds.

iv) All internal attachment welds shall be full penetration butt welds with a minimum of two passes if applicable.

v) Production welds; minimum preheat used shall be the highest of either the one used on PQR or as specified on Suncor Standard No 0903.

vi) Fillet weld tests: Hardness survey results from a butt weld PQR are not representative of production fillet and corner welds.

vii) For fillet/corner welds, additional hardness testing on test coupon that is more representative of production joint configuration is required. Microhardness testing survey shall be as per Fig.3 of NACE RP0472.

REV

--- Continued ---

FORM E3009-E (2004/05)

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

BANTREL

PROJECT:	VOYAGEUR UPGRADER (VU)
CLIENT NAME:	SUNCOR ENERGY INC.
PLANT LOCATION:	SUNCOR FEE LOT #2
SERVICE:	Compressor Discharge Cooler
EQUIP NO.:	205E-400

JOB NO.: 987 PROJ#: 03-00005-PU-05-00

REQUISITION NO.: MR205-E-3-1

DOCUMENT NO.: DS205-A-E400-1 REV 1B

NOTES

7.3 PWHT

a) Duration: 1h per inch of thickness, 60 min. minimum.

b) PWHT shall be performed after all forming and welding operations have been completed, including weld repairs. No weld repairs are permitted after PWHT.

c) PWHT shall be performed in a furnace or local PWHT may be used for final closing welds.

d) All cold formed heads shall be PWHT.

e) For Carbon Steel, PWHT temperature to be **1150 °F±25 °F**; refer to Suncor 0601 Para. 12.1 for cases where V > 0.004%.

7.4 Inspection

a) Hardness testing

i) Production hardness testing required. Maximum hardness shall be 200 HB in accordance with NACE RP0472

ii) Testing per Suncor STD 0903 paragraph 11.4 thru 11.6.

iii) Hardness test results and locations shall be recorded for review. Bantrel's representative shall be permitted to witness hardness testing and shall have access to test results.

b) Wet Fluorescent Magnetic Particle Test (WFMT)

i) 100% WFMT required including butt, nozzle, internal attachment welds (permanent or temporary) and arc strikes. Testing limited to internal (process contacted) weld surface on the pressure boundary. WFMT shall be performed after final PWHT.

ii) Testing shall be in accordance with the applicable code and the following requirements.

iii) All welds shall be designed and fabricated to permit examination by WFMT.

iv) Some conditioning (brushing, blast cleaning or grinding) shall be performed to provide a suitable surface for WFMT. Removal of slag, spatter, arc strikes, and heat treatment oxides is required.

v) The AC yoke method shall be used.

vi) UT shall be used in lieu of WFMT if there is no access to the internal weld surfaces.

c) Radiography and UT

i) All pressure retaining welds shall be 100% radiographed after final PWHT.

ii) All category D welds shall be 100% UT after final PWHT.

7.5 Tube/Tubesheet Mock-up Test

NOTE! MOCK-UP TEST IS ONLY REQUIRED WHERE WELDED TUBE/TUBESHEET IS NOT PWHT.

a) The mock-up shall supplement the welding qualification requirements of ASME Section IX and the project specifications.

i) It shall contain 2 rows of 5 tube-to-tubesheet welds, and be sectioned through all 10 welds.

ii) Each weld should be uniquely identified on the face of the tubesheet.

iii) The sections shall be polished and suitable etched to reveal weld bead placement.

b) Close simulation of the production welds is required for the mock-up and includes:

i) Use the maximum production thicknesses of both tubes and tubesheets in the mock-up.

ii) Use the same production materials (standard and grade) in the mock-up.

iii) Make the carbon equivalents of the materials used in the mock-up, the maximums allowed in production.

iv) Maximum content for each deliberately added microalloying element such as Nb, V, Ti, and B should not exceed the corresponding value on the test sample. Deliberate additions are considered to be greater than 0.01wt% for each of Nb, V, Ti, and greater than 0.0005 wt% of B.

v) Use the same production weld preparation in the mock-up.

vi) Use the same access restrictions to the weld joint as will be seen during production.

vii) Make the preheat used in the mock-up, the minimum allowed in production.

viii) Make the welding heat input for each of the two passes used in the mock-up, the minimum allowed in production.

Ix) Use the same production joint configuration in the mock-up.

x) Use the maximum degree of cold expansion intended for production in the mock-up.

REV

--- Continued ---

FORM E3009-E (2004/05)

BANTREL

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

PROJECT:	VOYAGEUR UPGRADER (VU)
CLIENT NAME:	SUNCOR ENERGY INC.
PLANT LOCATION:	SUNCOR FEE LOT #2
SERVICE:	Compressor Discharge Cooler
EQUIP NO.:	205E-400

JOB NO.: 987 PROJ#: 03-00005-PU-05-00

REQUISITION NO.: MR205-E-3-1

DOCUMENT NO.:	REV
DS205-A-E400-1	1B

NOTES

c) Testing of the mock-up

i) Testing of the mock-up shall include: Vickers microhardness traverses for all ten welds, across both base metals, both heat affected zones (HAZ's), and the weld metal.

ii) Targeting of microhardness test indentations towards hard microstructures in the HAZ's; use a suitable etchant and microscopy.

iii) Brinell hardness tests of both HAZ's in three of the ten welds. This is for information only and holds no contractual obligation.

d) Mock-up welding should be made by the prime production welder. Production welders, other than the prime welder, shall be trained to ensure that procedural control (i.e. specifications for preheat, current, arc length, travel speed, and bead placement) is maintained.

e) Testing should be performed by an Independent third party, experienced in the qualification of welding procedures and weld testing. A report shall be provided and is required to be suitable for submission to ABSA, either as a stand-alone procedure qualification record (PQR) or as a supplement to an existing PQR.

f) LPT and pulling test shall be provided for the Mockup.

8) Pass partition plates require two (2) reinforcement bars 1.5" x 1.5" for widths > 47". Corrosion allowance of 0.125" required both sides of pass partition plates.

9) Tube Side inlet nozzle to be 14" Long radius elbow (by seller).

PHASE	Temp. °F	Duty Btu/hr	Vapor Mass Fraction	Vapor Density lb/ft3	Vapor Visc. cP	Vapor Thermal Cond. Btu/hr-ft-F	Vapor Heat Capacity Btu/lb-F	Liquid Density lb/ft3	Liquid Visc. cP	Liquid Thermal Cond. Btu/hr-ft-F	Liquid Heat Capacity Btu/lb-F
PHASE II (Design Case)	212.00	0.000E+00	0.9800	0.802	0.0130	0.021	0.498	59.83	0.2790	0.392	1.0080
	204.10	4.610E+06	0.9700	0.816	0.0130	0.021	0.495	60.02	0.2920	0.391	1.0060
	196.20	8.810E+06	0.9600	0.829	0.0130	0.021	0.492	60.21	0.3070	0.39	1.0050
	188.30	1.266E+07	0.9600	0.843	0.0120	0.02	0.490	60.40	0.3230	0.388	1.0040
	180.40	1.621E+07	0.9500	0.857	0.0120	0.02	0.487	60.58	0.3410	0.386	1.0030
	172.50	1.949E+07	0.9500	0.871	0.0120	0.02	0.484	60.75	0.3600	0.385	1.0020
	164.60	2.253E+07	0.9500	0.885	0.0120	0.019	0.481	60.91	0.3810	0.383	1.0010
	157.80	2.498E+07	0.9400	0.897	0.0120	0.019	0.479	61.05	0.4010	0.381	1.0000
	156.60	2.542E+07	0.9400	0.898	0.0120	0.019	0.479	60.59	0.4040	0.309	0.9930
	148.70	2.853E+07	0.9300	0.907	0.0120	0.019	0.476	57.35	0.4220	0.167	0.9380
	140.80	3.162E+07	0.9200	0.915	0.0120	0.018	0.474	54.41	0.4380	0.131	0.8860
	132.90	3.471E+07	0.9100	0.92	0.0120	0.018	0.472	51.89	0.4520	0.113	0.8400
	125.00	3.781E+07	0.8900	0.925	0.0110	0.018	0.470	49.76	0.4630	0.103	0.8000
PHASE I	212.90	0.000E+00	0.9800	0.8	0.0128	0.021	0.498	59.81	0.2780	0.392	1.0080
	204.90	3.180E+06	0.9700	0.814	0.0127	0.021	0.495	60.00	0.2910	0.391	1.0060
	196.90	6.070E+06	0.9600	0.828	0.0126	0.021	0.492	60.20	0.3060	0.39	1.0050
	189.00	8.720E+06	0.9600	0.842	0.0124	0.02	0.489	60.38	0.3220	0.388	1.0040
	181.00	1.116E+07	0.9500	0.856	0.0123	0.02	0.487	60.56	0.3390	0.387	1.0030
	173.00	1.341E+07	0.9500	0.87	0.0122	0.02	0.484	60.74	0.3590	0.385	1.0020
	165.00	1.549E+07	0.9500	0.885	0.0121	0.019	0.481	60.90	0.3800	0.383	1.0010
	157.80	1.726E+07	0.9400	0.898	0.0120	0.019	0.479	61.05	0.4010	0.381	1.0000
	157.00	1.746E+07	0.9400	0.898	0.0119	0.019	0.478	60.74	0.4030	0.328	0.9950
	149.00	1.958E+07	0.9300	0.907	0.0118	0.019	0.476	57.46	0.4210	0.169	0.9390
	141.00	2.169E+07	0.9200	0.915	0.0117	0.018	0.474	54.48	0.4380	0.131	0.8870
	133.00	2.379E+07	0.9100	0.921	0.0116	0.018	0.471	51.93	0.4520	0.113	0.8400
	125.00	2.591E+07	0.8900	0.926	0.0115	0.018	0.469	49.77	0.4630	0.103	0.8000

REV

--- Continued ---

FORM E3009-E (2004/05)

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

BANTREL

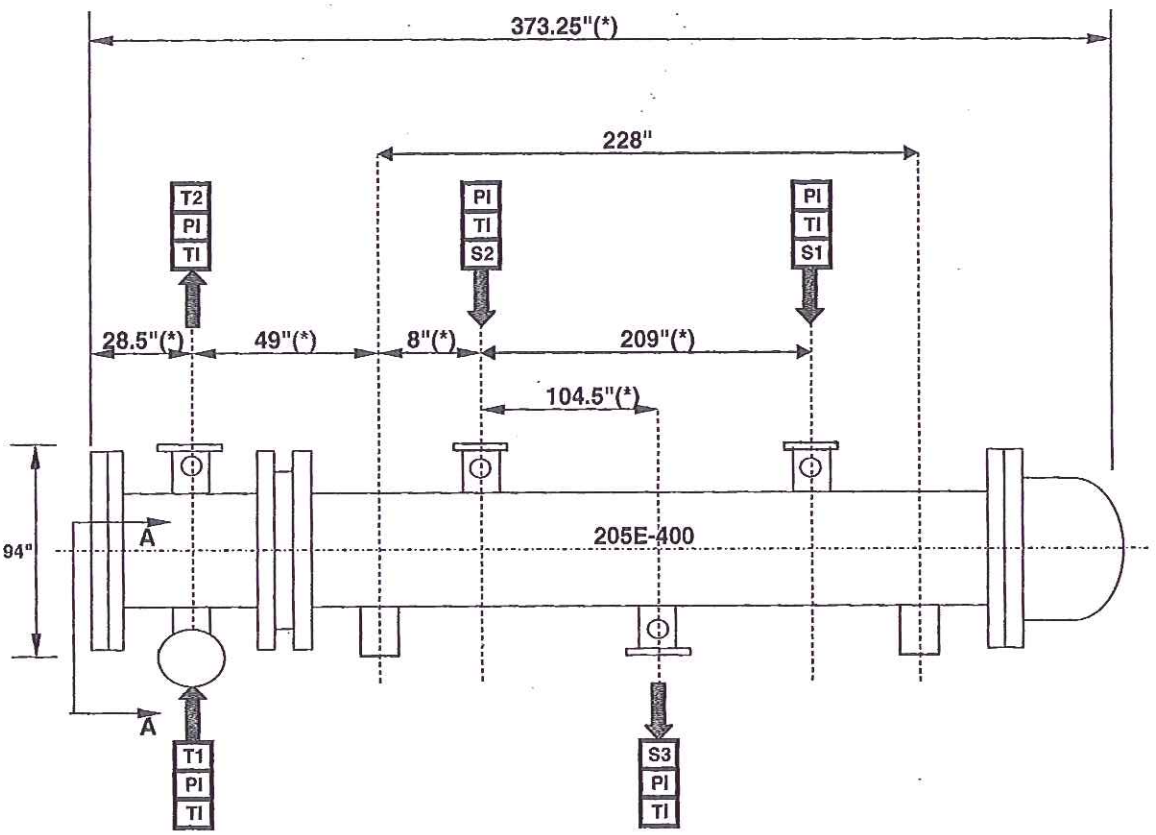
PROJECT:	VOYAGEUR UPGRADER (VU)
CLIENT NAME:	SUNCOR ENERGY INC.
PLANT LOCATION:	SUNCOR FEE LOT #2
SERVICE:	Compressor Discharge Cooler
EQUIP NO.:	205E-400

JOB NO.: 987 PROJ#: 03-00005-PU-05-00

REQUISITION NO.: MR205-E-3-1

DOCUMENT NO.: DS205-A-E400-1 REV 1B

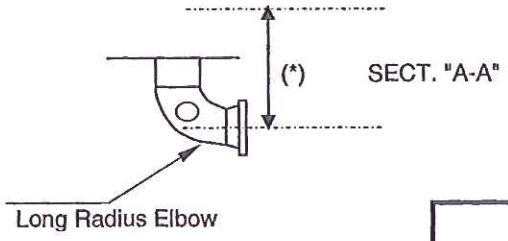
GENERAL ARRANGEMENT DRAWING



1B

T1 - Tube Side inlet
T2 - Tube Side outlet
S1 - Shell Side inlet
S2 - Shell Side inlet
S3 - Shell Side outlet
PI - Pressure Gage Connections
TI - Temperature Gage Connections

(*) Confirmed by Seller



REV

FORM E3009-E (2004/05)

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

BANTREL

PROJECT:	VOYAGEUR UPGRADER (VU)
CLIENT NAME:	SUNCOR ENERGY INC.
PLANT LOCATION:	SUNCOR FEE LOT #2
SERVICE:	Compressor Discharge Cooler
EQUIP NO.:	205E-400

JOB NO.: 987 PROJ#: 03-00005-PU-05-00
REQUISITION NO.: MR205-E-3-1
DOCUMENT NO.: DS205-A-E400-1
REV: 1B