TRANTER Plate & Frame Performance Specification

FOR INFORMATION

06018
CIE: ETHANOL
Canton, Illinois
RECEIVED OCT 0 3 2006
17.1
File: EP-2101
018001000 2
FIELD FILE

Customer:	Lurgi PSI Dennis Paganoni	Date:	08/25/2006
Address:	1790 Kirby Pkwy Suite 300 MEMPHIS, TN 38138	Order No.:	115687
Cust. Reference:	5021-006 Central Illinois Energy	Item No.:	
Model:	**GXD-042-L-5-UP-73**	Technician:	MDC
		Run No.:	252498
		Units Required:	1

Intended End Use: Heat exchanger to heat Water 32.00°F using 135.00°F Water with pressure drop at or below 15.00 psi on hot side and at or below 20.00 psi on cold side.

PERFORMANCE

		Hot Side	Cold Side	
Flow Rate (Total)	lb/h	90333.00	122101.00	lb/h
Flow Rate (Unit)	lb/h	90333.00	122101.00	lb/h
Inlet Temperature	°F	135.00	88.00	°F
Outlet Temperature	°F	91.76	120.00	°F
Pressure Drop	psi	14.05	19.27	psi
Operating Pressure	psi·g	150.00	150.00	psi·g
Total Heat Exchanged	Btu/h		3901649	
U-Value	Btu/(h·ft²·°F)		1428	
Total Heat Transfer Area (Per Unit)	ft²		336.26	
LMTD	°F		8.12	

FLUID DATA

		Hot Side	Cold Side	
Fluid Name		Water	Water	
Specific Gravity	-	0.99	1.00	-
Specific Heat	Btu/(lb·°F)	1.00	1.00	Btu/(lb·°F)
Thermal Conductivity	Btu/(h·ft·°F)	0.37	0.36	Btu/(h·ft·°F)
Viscosity (avg.)	cP	0.59	0.65	cP

CONSTRUCTION

Plate Material/Thickness	SA-240 316 Stainless Steel	0.5 mm. Electropolished
Gasket Material (Hot/Cold)	EPDM	EPDM
Connection Material	SA-312TP 316LSS	SA-312TP 316LSS
Connection Size (Hot/Cold inlet)	4" 150# STUD	4" 150# STUD
Connection Size (Hot/Cold outlet)	4" 150# STUD	4" 150# STUD
Frame/Finish	SA-516-70 Carbon Steel	Painted, 1-3 mils DFT
Guide Bar (plate Guides)/Finish	SA-240 304 Stainless Steel	Mill Finish
Tightening Bolts/Finish	SA-193-B7 Carbon Steel	Zinc Plated
Tightening Nuts/Finish	SA-194-2H Carbon Steel	Zinc Plated

DESIGN

Design/Test Pressure	psi·g	150.00 / 195.00	
Design Temperature	°F	300.00	
ASME Stamp / CE Stamp		Yes	-
Total Weight Empty/Flooded (Per Unit)	lb	1911	2122
No. Plates		73 (25% Expansion Capacity)	
Pass Arrangement (Hot/Cold)		2	2
Plate Mix (Hot/Cold)		9LS+9LD	2LS+16LD
Flow Direction		Countercurrent	

REMARKS:

EP-2101 Cook Water Pre-Heater Standard Gap.

Channel Velocities H/S 1.84 fps, C/S 2.48 fps

The performance guarantee is based on the accuracy of the data presented above, and the customers ability to supply product and operating conditions in conformance with the above.

Tranter, Inc. ▲ P.O. Box 2289 ▲ Wichita Falls, TX 76307
Phn: (940) 723-7125 ▲ Fax: (940) 723-5131
http://www.tranter.com

TRANTER®

Maintenance Package with Hydraulic Tool For Ethanol Facilities

EZ-Changer- Model EZ-4D-B *- Four Dual-Acting Cylinders* *- 6-inch Stroke* *- 70 tons torque* *- Electric or Pneumatic are available*	$	24,000
Spanner wrench - 80mm *- use for GF-187 units with 2-inch dia. Tie-bolts*	$	414
Reducing inserts for spanner wrench *- for condenser units with 1.75-inch dia. Tie-bolts*	$	90
Package Price:	$	24,504

CERTIFIED PRINT CHECK

CHK. BY:

DATE: 9/21/07

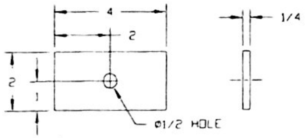
LURGI, INC.

Certified By Tranter, Inc
Date 04-04-2007
By:

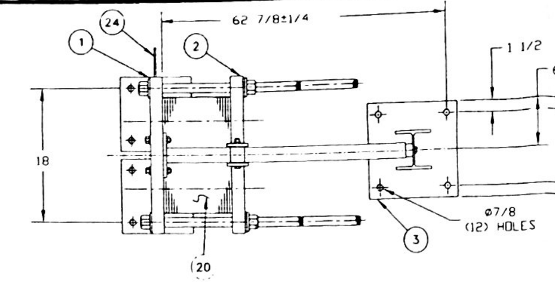
06018
CIE: ETHANOL
Canton, Illinois
08.24.07
File 17.1 EP2101
0180010024

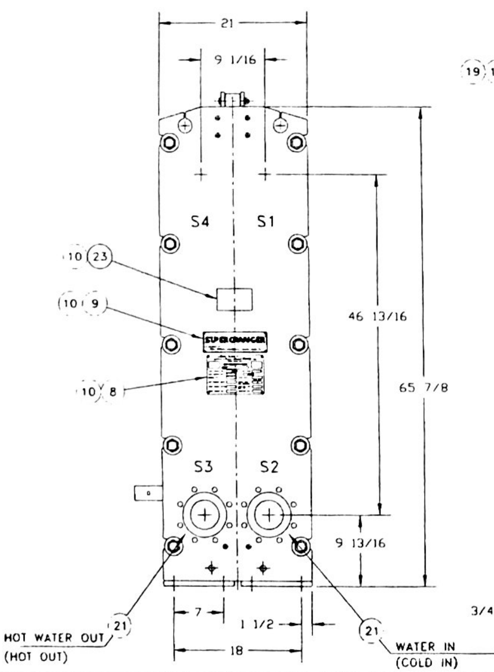
NOTES CONT'D

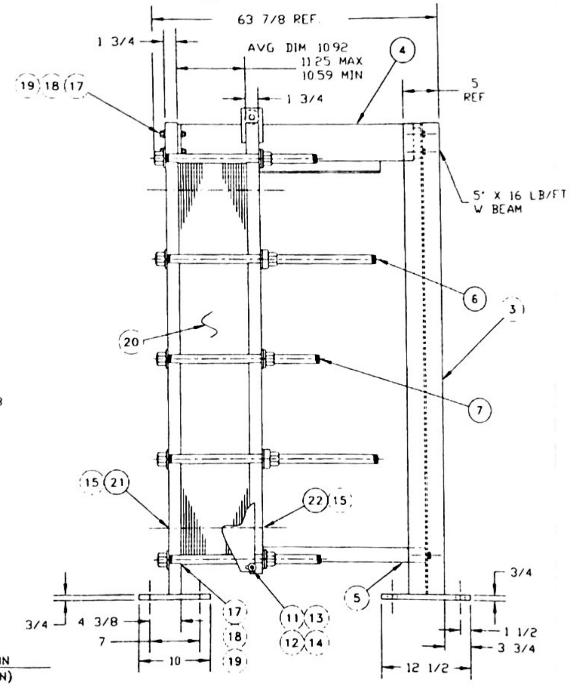
10. DOCUMENT CONTROL REQUIRED. DOCUMENT PACKAGE TO SHIP SEPARATELY CONSISTING OF ASME PRESSURE CALCULATIONS, SEISMIC LOAD CALCULATIONS & CERTIFIED DRAWINGS.
11. PLATES ARE TO BE ELECTROPOLISHED.

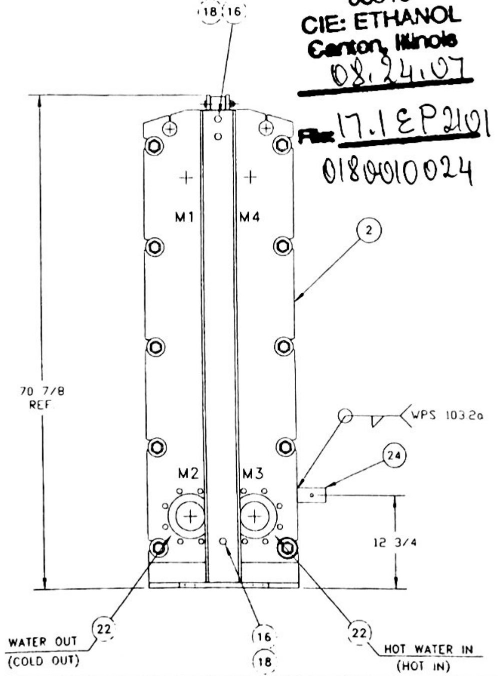


GROUND LUG DETAIL -24
1/4 X 2 X 4 SA240-304SS
(DO NOT PAINT)

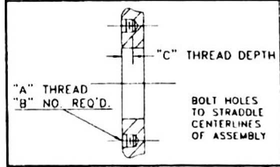








ITEM NO	DESCRIPTION	DRAWING NO.	NO. REQ'D
1	STATIONARY FRAME ASS'Y. SA-516-70N	D-206249	1
2	MOVEABLE FRAME ASS'Y. SA-516-70N	D-204216-1	1
3	GUIDE BAR SUPPORT	D-206099	1
4	UPPER GUIDE BAR (WORKING LGTH. 58)	D-203525-2	1
5	LOWER GUIDE BAR (WORKING LGTH. 58)	D-203532-2	1
6	BOLT ASS'Y. (WORKING LGTH. 36)		
	1 1/4 DIA. CARBON STEEL SA-193-B7	D-202087-B	4
7	BOLT ASS'Y. (WORKING LGTH. 24)		
	1 1/4 DIA. CARBON STEEL SA-193-B7	D-202087	6
8	DATA NAMEPLATE	B-202112	1
9	NAMEPLATE	B-200734	1
10	METAL TACK FASTENER	A-203187	12
11	SHROUD SET (WIDTH: 14 3/16)	D-204222	1
12	SHROUD STUD	A-200830	20
13	SHROUD NUT	A-200831	20
14	SHROUD WASHER	A-200832	20
15	NOZZLE PROTECTOR (NOT SHOWN)	D-204774-3	4
16	GUIDE BAR BOLT	A-203480-6	3
17	GUIDE BAR BOLT	A-203480-3	6
18	GUIDE BAR WASHER	B-203482	6
19	GUIDE BAR NUT	A-203481	6
20	PLATE	--	73
21	NOZZLE 4" STR ("S" FRAME) SA249-316L	D-203536-4	2
22	NOZZLE 4" STR ("M" FRAME) SA249-316L	D-203536-4	2
23	3 X 5 X 16 GA 304SS TAG		1
24	GROUNDING LUG	DETAIL	1



STUDDED PORT ANSI B16.5 BOLT HOLE DIMENSIONS

DIM. \ SIZE	4" 150 LB
A	5/8-11 UNC 2B
B	8
C	11/16

SPECIFICATIONS

DESIGN PRESSURE:	150	PSI
TEST PRESSURE:	195	PSI
DESIGN TEMP.:	300	°F
NO. OF PLATES:	73	
SURFACE AREA:	336.26	SQ.FT.
WEIGHT:	1980	LBS

PAINT: ROYAL BLUE

"U" CODE STAMP DATA

M.A.W.P. 150 PSI AT 300 °F
M.D.M.T. -20 °F, AT 150 PSI
MEDIUM : WATER
FORM : U-1 NO. REQ'D. 1
LOCATION OF INSTALLATION
CENTRAL ILLINOIS ETHANOL
CANTON, IL

NOTES

1. FLEXIBILTY IN PIPING IS NECESSARY TO PROVIDE FOR THERMAL EXPANSION. WHERE APPLICABLE, PIPE VIBRATIONS AND FLUID PULSATIONS SHOULD BE ELIMINATED FOR FATIGUE AND CYCLIC TYPE OF APPLICATIONS.
2. FABRICATE PER ASME CODE SECTION VIII, DIV. 1 SPECS., LATEST EDITION AND ADDENDA. "U" STAMP YES ■ NAT'L BD. YES ■
3. MAXIMUM FRAME CAPACITY = 61 PLATES (25% EXPANSION).
4. MAPICS PART# GX-042-115687-1
5. METAL STAMP ON ITEM #23: P.O. NO.: 601870722
PROJECT NO: 06018
CENTRAL ILLINOIS ETHANOL
CANTON, IL
EP-2101
COOK WATER PRE-HEATER
6. CHANNEL VELOCITIES: H/S 1.84 fps C/S 2.48 fps
7. PERMANENTLY ATTACH TO FRAME METAL TAG SHOWING COLD IN, COLD OUT, HOT IN, HOT OUT.
8. UNIT DESIGNED FOR SEISMIC LOADING PER BOCA 96 Av=0.05, Aa=0.05 80 MPH WIND LOADING.
9. PLATE GAP: H/S 3.3mm C/S 3.3mm

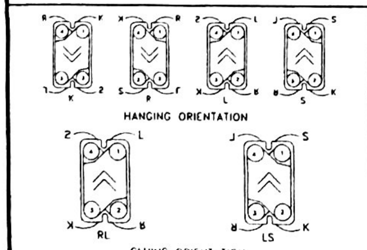


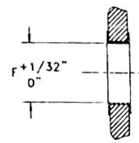
PLATE ASSEMBLY SPECIFICATIONS

Qty	Gasket Material	Theta/Piercing	Gluing
1	EPDM	L0230	RL Start
36	EPDM	L1234	LS
34	EPDM	L1234	RL
1	EPDM	L0230	RL
1	EPDM	H0230	RC End

PLATE HANGING ASSEMBLY

Plate Sequence	Gasket Material	Piercing	Gluing	Hanging
1	EPDM	L0230	RL Start	K
2, 4	EPDM	L1234	LS	R
3, 5	EPDM	L1234	RL	K
6, 8 .. 14, 16	EPDM	L1234	LS	SR
7, 9 .. 15, 17	EPDM	L1234	RL	LK
18	EPDM	L1234	LS	S
19, 21 .. 33, 35	EPDM	L1234	RL	L
20, 22 .. 34, 36	EPDM	L1234	LS	R
37	EPDM	L1004	RL	L
38, 40	EPDM	L1234	LS	S
39, 41	EPDM	L1234	RL	L
42, 44 .. 50, 52	EPDM	L1234	LS	RS
43, 45 .. 51, 53	EPDM	L1234	RL	KL
54	EPDM	L1234	LS	R
55, 57 .. 69, 71	EPDM	L1234	RL	K
56, 58 .. 70, 72	EPDM	L1234	LS	S
73	EPDM	H0230	RC End	B

EXAMPLE
EVEN PLATE CODE S,R PLATE 6 IS CODE S. PLATE 8 IS CODE R.
ODD PLATE CODE L,K PLATE 7 IS CODE L, PLATE 9 IS CODE K, &
CONTINUES IN A (4) PLATE SEQUENCE.



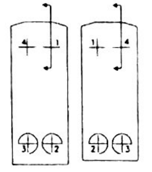
TYPICAL SECTION THRU NOZZLE

• CERTI: SA240-316

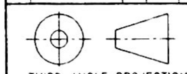
SECTION	FLUID NAME	FLOW RATE (LB/HR)	INLET TEMP. °F	OUTLET TEMP. °F	PRESSURE DROP (PSI)	PLATE ARRANGEMENT	PLATE • MATERIAL	GASKET MATERIAL	NOZZLE MATERIAL
1	HOT WATER	90333	135	91.76	14.05	9LS+9LD X 2	316	EPDM	316L
	WATER	122101	88	120	19.27	2LS+16LD X 2	316	EPDM	316L

PERFORMANCE (RUN NO: 252498)

NOZZLE LOCATION	"F" DIA. HOLE
S1	
S2	4 1/16
S3	4 1/16
S4	
M1	
M2	4 1/16
M3	4 1/16
M4	



MARK	REVISION	BY	APPR.	DATE
1	REVISED PER CUSTOMER RELEASE FOR PRODUCTION	EP	CB	10-16-06
0	ISSUED FOR APPROVAL	WS	CB	9-18-06



THIRD ANGLE PROJECTION

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED. DIMENSIONS IN BRACKETS ARE IN MILLIMETERS.

DO NOT SCALE THIS DRAWING

SCALE: ----

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE SPECIFIED: FRACTIONAL ± 1/8 DECIMAL ± 0.06 ANGULAR ± 2°

REMOVE BURRS AND SHARP EDGES. COMMERCIAL TOLERANCES APPLY FOR GAGES, TUBING AND BAR STOCK.

THE heat transfer people TRANTER®
TRANTER, Inc., Wichita Falls, Texas

CUSTOMER: LURGI PSI
SERIAL NO.: SN296
TITLE: SUPERCHANGER MODEL GXD-042-L-5-UP-73 EP-2101 COOK WATER PRE-HEATER (1)
DRAWN BY: WS | CHECKED AND APPROVED BY: CB
DATE: 9-18-06 | DATE: 9-21-06
REF.: S/O 115687 | DWG. NO.: D-6-115687-1 | REV.: 1

RH42UPS