

TRANTRER Plate & Frame Performance Specification

Customer: Lurgi PSI	Date: 02/09/2007
Richard Ballast	Proposal No.: 06-115687-02
Address: 1790 Kirby Pkwy Suite 300	Item No.: 4
MEMPHIS, TN 38138	Technician: MDC
Cust. Reference: CIE	Run No.: 289513
Model: GFP-187-M-8-HP-175	Units Required: 1

Intended End Use: Heat exchanger to cool Cooked Mash 38.70°F using 83.00°F Water with pressure drop at or below 29.96 psi on hot side and at or below 34.03 psi on cold side.

PERFORMANCE

		Hot Side		Cold Side	
Flow Rate (Total)	lb/h	325816.00	600000.00	lb/h	
Flow Rate (Unit)	lb/h	325816.00	600000.00	lb/h	
Inlet Temperature	°F	128.00	83.00	°F	
Outlet Temperature	°F	89.30	102.58	°F	
Pressure Drop	psi	29.96	34.03	psi	
Operating Pressure	psi-g	150.00	150.00	psi-g	
Total Heat Exchanged	Btu/h		11725005		
U-Value	Btu/(h·ft ² ·°F)		308		
Total Heat Transfer Area (Per Unit)	ft ²		2772.77		
LMTD	°F		13.71		

FLUID DATA

		Hot Side	Cold Side
Fluid Name		Cooked Mash	Water
Density	lb/ft ³	66.51	62.08 lb/ft ³
Specific Heat	Btu/(lb·°F)	0.93	1.00 Btu/(lb·°F)
Thermal Conductivity	Btu/(h·ft·°F)	0.37	0.36 Btu/(h·ft·°F)
Viscosity (avg.)	cf	50.00	0.74 cf

CONSTRUCTION

Plate Material/Thickness	SA-240 316 Stainless Steel	0.8 mm. Electropolished
Gasket Material (Hot/Cold)	EPDM	EPDM
Connection Material	SA-312TP 316LSS	SA-312TP 316LSS
Connection Size (Hot/Cold inlet)	8" 150# STUD	8" 150# STUD
Connection Size (Hot/Cold outlet)	8" 150# STUD	8" 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	15556
No. Plates		175 (25% Expansion)
Pass Arrangement (Hot/Cold)		5
Plate Mix (Hot/Cold)		17M+0M
Flow Direction		Countercurrent

REMARKS:

EP-2302 Mash Cooler Revised Design

Channel Velocities H/S 1.43 fps, C/S 2.81 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

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17M+0M

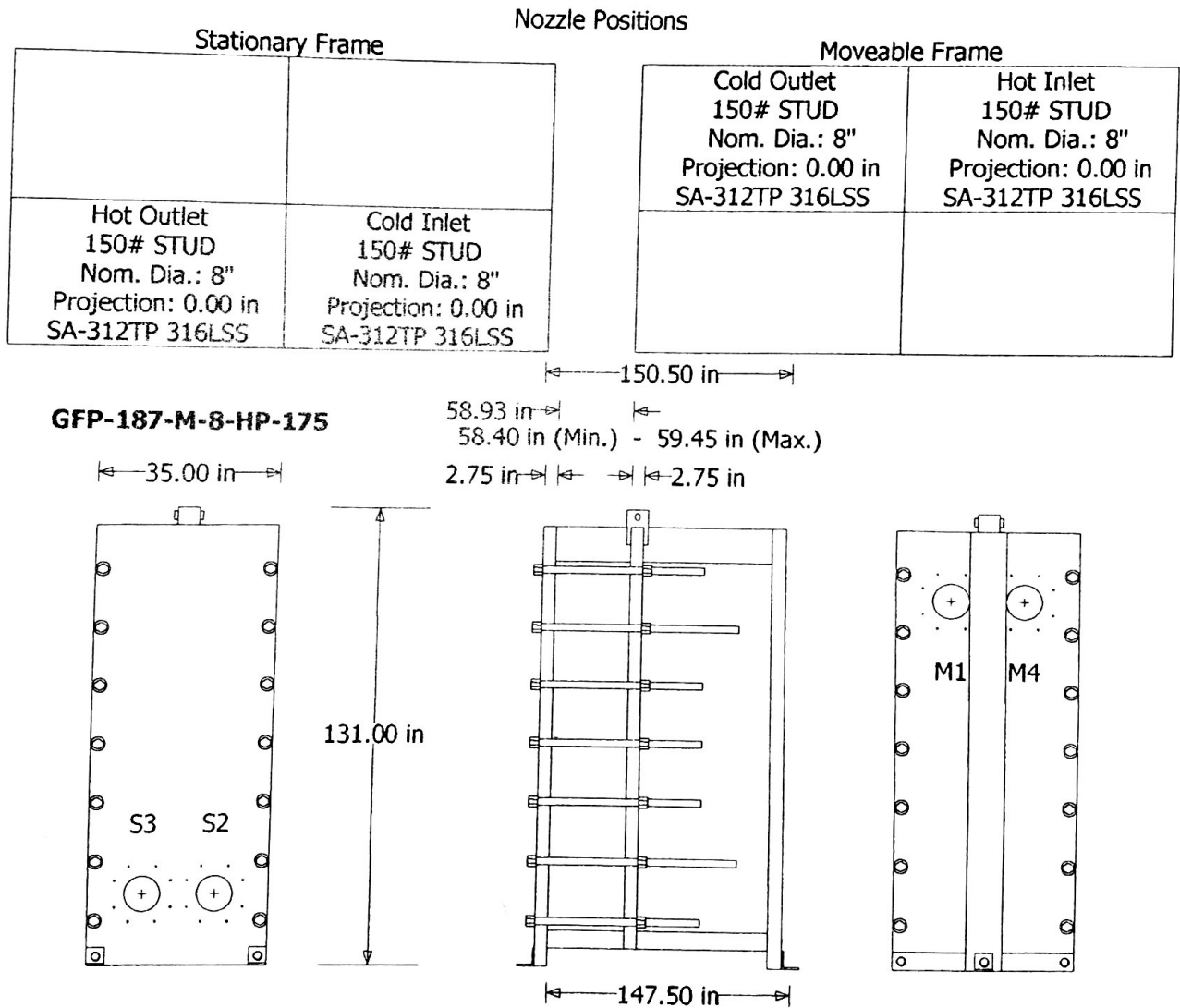
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FIELD FILE

TRANTER Plate & Frame Construction Specification

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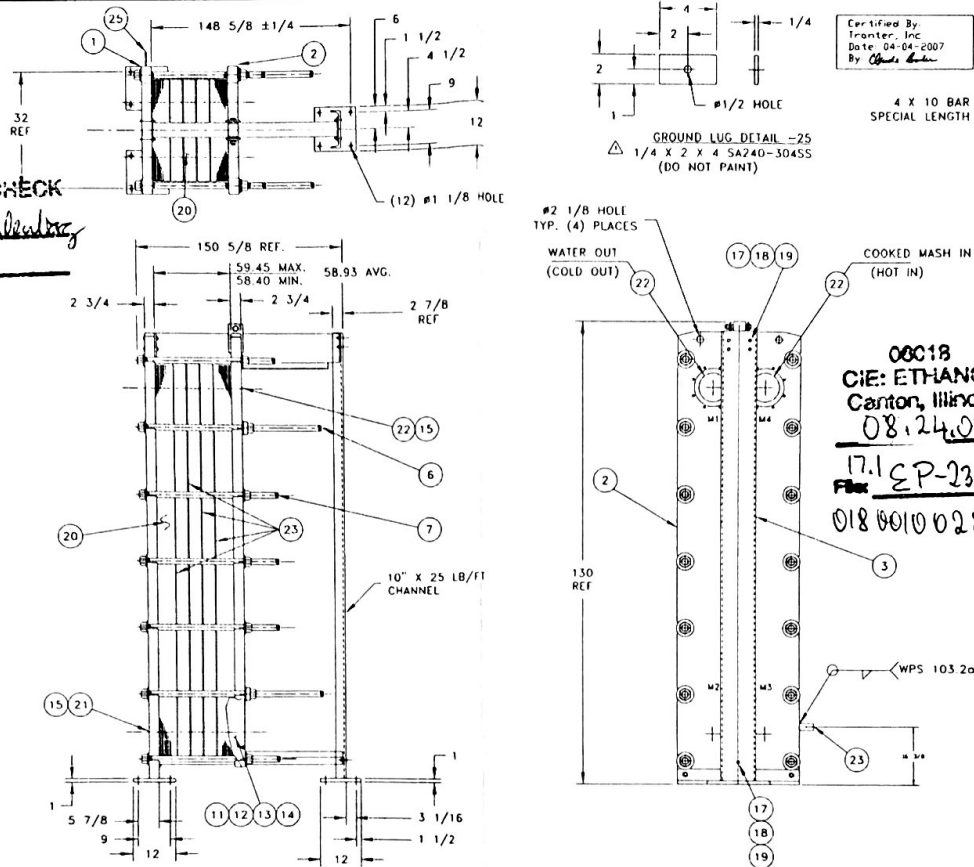


All dimensions are approximate, and should NOT be used for construction purposes

Sales and Support Contact:

Tranter, Inc.
 1900 Old Burk Highway
 Wichita Falls, TX 76306-5904
 Phn: 940-723-7125 / Fax: 940-723-1131

- NOTES CONTINUED
- PLATES ARE TO BE ELECTROPOLISHED.
 - PERMANENTLY ATTACH TO FRAME METAL TAG SHOWING COLD IN, COLD OUT, HOT IN, HOT OUT
 - DOCUMENT CONTROL REQUIRED. DOCUMENT PACKAGE TO SHIP SEPARATELY CONSISTING OF ASME PRESSURE CALCULATIONS, SEISMIC LOAD CALCULATIONS & CERTIFIED DRAWINGS.
 - UNIT DESIGNED FOR SEISMIC LOADING PER BOCA 96
 - $A_s=0.05$, $A_v=0.05$ 80 MPH WIND LOADING.
 - NO DRAIN HOLES IN TURNING PLATE.



Certified By:
Tranter, Inc.
Date: 04-04-2007
By: *[Signature]*

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CIE: ETHANOL
Canton, Illinois
08.24.07
17.1 EP-2302
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PARTS LIST				
ITEM NO.	DESCRIPTION	DRAWING NO.	QTY	NO. REQ'D
1	STATIONARY FRAME ASSY. SA-516-70N	D-206083	1	1
2	MOVEABLE FRAME ASSY. SA-516-70N	D-203861-1	1	1
3	GUIDE BAR SUPPORT	D-206084	1	1
4	UPPER GUIDE BAR (WORKING LGTH. 145)	D-203490-5	1	1
5	LOWER GUIDE BAR (WORKING LGTH. 145)	D-203498-4	1	1
6	BOLT ASSY. (WORKING LGTH. 130)	D-202779-B	4	4
7	BOLT ASSY. (WORKING LGTH. 86)	D-202779-B	10	10
8	2 DIA. CARBON STEEL SA-193-B7			
9	DATA NAMEPLATE	B-202112	1	1
10	NAMEPLATE	B-200734	1	1
11	METAL TACK FASTENER	A-203187	12	12
12	SHROUD SET ("L" DIM: 62 3/16)	D-203866	1	1
13	SHROUD, STUD	A-200830	32	32
14	SHROUD, NUT	A-200831	32	32
15	SHROUD, WASHER	A-200832	32	32
16	NOZZLE PROTECTOR (NOT SHOWN)	D-204774-5	4	4
17	GUIDE BAR BOLT	B-203480-8	6	6
18	GUIDE BAR NUT	B-203480-4	5	5
19	GUIDE BAR WASHER	B-203481	11	11
20	PLATE		175	175
21	NOZZLE B STR ("S" FRAME) SA312-TP316L-WLD	B-6-115687-10	2	2
22	NOZZLE B STR ("M" FRAME) SA312-TP316L-WLD	B-6-115687-10	2	2
23	"L" FRAME ASSEMBLY SA240-316	D-205775	4	4
24	3 X 5 X 16 GA 304SS TAG		1	1
25	GROUNDING LUG	DETAIL	1	1

STUDDED PORT ANSI B16.5 BOLT HOLE DIMENSIONS		
SIZE	8"	
150 LB	8"	
DIM.	A	3/4-10 UNC 2B
	B	8
	C	13/16

SPECIFICATIONS			"U" CODE STAMP DATA		
DESIGN PRESSURE:	150 PSI	M.A.W.P.:	150 PSI AT 300 °F		
TEST PRESSURE:	195 PSI	M.D.M.T.:	-20 °F, AT 150 PSI		
DESIGN TEMP.:	300 °F	MEDIUM:	COOKED MASH/WATER		
NO. OF PLATES:	175	FORM:	U-1	NO. REQ'D:	1
SURFACE AREA:	2772.77 SQ.FT.	LOCATION OF INSTALLATION			
WEIGHT:	16054 LBS.	CENTRAL ILLINOIS ETHANOL			
PAINT: ROYAL BLUE		CANTON, IL			

- NOTES
- FLEXIBILITY 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.
 - FABRICATE PER ASME CODE SECTION VIII, DIV. 1. SPECS., LATEST EDITION AND ADDENDA "U" STAMP YES NAT'L BD. YES
 - METAL STAMP ON ITEM #24: P.O. NO: 601870722 PROJECT NO: 06018 CENTRAL ILLINOIS ETHANOL CANTON, IL EP-2302 MASH COOLER
 - CHANNEL VELOCITIES: H/S 1.43 fps C/S 2.81 fps
 - MAPICS PART NO.: GF-187-06-115687-02-1
 - MAXIMUM FRAME CAPACITY = 217 PLATES (25% EXPANSION).
 - PLATE GAP: H/S 8.0mm CS 8.0mm

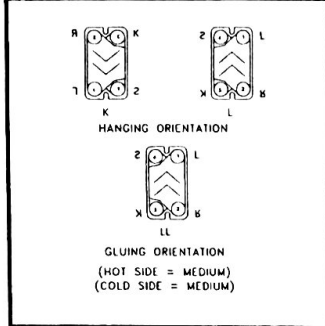
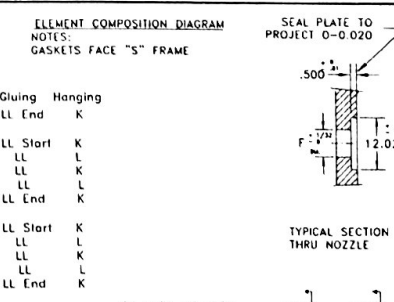


PLATE HANGING ASSEMBLY									
Plate Sequence	Gasket Material	Piercing	Gluing	Hanging	Plate Sequence	Gasket Material	Piercing	Gluing	Hanging
1	EPDM	0230	LL Start	K	107	EPDM	1004	LL End	K
2	EPDM	1234	LL	L	108	EPDM	1004	LL	L
3	EPDM	1234	LL	K	109	EPDM	1234	LL	L
4	EPDM	1234	LL	L	110	EPDM	1234	LL	K
5	EPDM	1004	LL End	K	111, 113 .. 139, 141	EPDM	1234	LL	L
6	EPDM	1004	LL Start	K	112, 114 .. 138, 140	EPDM	0230	LL End	K
7	EPDM	1234	LL	L	143	EPDM	0230	LL End	K
8	EPDM	1004	LL	L	144	EPDM	1234	LL	L
9	EPDM	1234	LL	K	145	EPDM	1234	LL	K
10	EPDM	1234	LL	L	146, 148 .. 174, 176	EPDM	1234	LL	L
11	EPDM	1234	LL	L	147, 149 .. 175, 177	EPDM	1234	LL	K
12	EPDM	0230	LL End	K	178	EPDM	1234	LL	L
13	EPDM	0230	LL Start	K	179	EPDM	1004	LL End	K
14	EPDM	1234	LL	L					
15	EPDM	1234	LL	K					
16	EPDM	1234	LL	L					
17	EPDM	1234	LL	K					
18	EPDM	1004	LL Start	K					
19	EPDM	1234	LL	L					
20	EPDM	1234	LL	K					
21	EPDM	1234	LL	L					
22	EPDM	1234	LL	K					
23	EPDM	1234	LL	L					
24	EPDM	0230	LL End	K					
25	EPDM	1234	LL	L					

PLATE ASSEMBLY SPECIFICATIONS			
Qty	Gasket Material	Theta/Piercing	Gluing
3	EPDM	0230	LL Start
165	EPDM	1234	LL
3	EPDM	1004	LL End
2	EPDM	1004	LL Start
2	EPDM	0230	LL End

PERFORMANCE (280513)									
SECTION	FLUID NAME	FLOW RATE (lb/hr)	INLET TEMP. °F	OUTLET TEMP. °F	PRESSURE DROP (PSI)	PLATE ARRANGEMENT	PLATE* GASKET MATERIAL	NOZZLE	*CERT: SA240-316
1	COOKED MASH	325816	128	89.30	29.96	17M x 5	316 EPDM 316L	S1	
	WATER	600000	83	102.58	34.03	17M x 5	316 EPDM 316L	S2, S3	



NOZZLE LOCATION			
NOZZLE LOCATION	"S" FRAME DIA. HOLE	# HOLE "L" FRM	# HOLE "M" FRM
S1		8.50	
S2	8 11/16		8.50
S3	8 11/16		8.50
S4		8.50	
M1	8 11/16		
M2			
M3			
M4	8 11/16		