Edl, Michele

From: Erica Stephenson [estephenson@tranter.com]
Sent: Monday, December 12, 2011 11:47 AM
To: Edl, Michele
Cc: Service_CA
Subject: RE: 1985 geothermal use of Superchanger
Attachments: D-84185-1.jpg; D-84185-2.jpg; D-84185-3.jpg; West Coast Service Center - ES.pdf

Michele,
I have attached the technical drawings for each of the four heat exchangers included in the project.

- How many exchangers were provided for this project? - Tranter provided 4 heat exchangers: serial numbers P-33199-H and P-33200-H, detailed on attached drawing D-84185-1, serial number P-33201-H, detailed on attached drawing D-84185-2 and serial number P-33202-H, detailed on attached drawing D-84185-3.

- Were they to be set in series or parallel? - we cannot confirm because the original manufacturing file has been destroyed due to age. Given the different nozzle sizes, we can assume that they were NOT in parallel performance. Our recommendation would be to double-check the actual piping against what the fabrication drawing shows.

- What is the range and maximum hot side (geothermal water) flow rate for each unit? - The actual original flow rates are shown on the drawings. The maximum flow through the 4-in nozzles (D-84185-3) is approximately 980gpm and the maximum flow through the 2-in nozzles (D-84185-1 and D-84185-2) is approximately 240gpm.

The source well will support a sustained withdrawal rate of 195 gpm (~0.43 cfs) but the operators appear to have exceeded that pumping rate regularly.

- Can the exchangers deliver more heat if the rate of hot-side water delivered to them is greater? - Yes, but this could produce an increase in pressure drop unless you also expand the units (add more plates). If you can provide the new rate of the hot-side water, our Engineering Dept can work up some performance models to show the anticipated conditions. Or, if you can provide your new heat transfer goal, we can work up some performance models to show what, if any, structural/flow modifications would be required to meet these goals.

We have a Factory Service Center in central California where we offer a comprehensive cleaning and regasketing service to restore the units to their original operating efficiency. We also have Technicians available for on-site cleaning and additional services. I've attached some details for your reference. I hope you find this information helpful; if you have any additional questions do not hesitate to call.

Erica Stephenson
Inside Sales and Service
Tranter Inc, West Coast Svc Center
Phone: 559-686-1840
Fax: 559-686-3964
www.tranter.com

From: Edl, Michele [mailto:Michele.Edl@idwr.idaho.gov]
Sent: Thursday, December 08, 201[illegible]:40 AM
To: Service_CA
Subject: 1985 geothermal use of Superchanger

Dear customer service,

As you can see by the return address of this email, I work for the Idaho Department of Water Resources. I have been assigned to review a 1980's vintage water right file and determine the use of water for its heat value in the period 1984-1995. Only a small portion of the system that would have been in place at that time still exists, so I need to calculate the heat use from file documents.

In the file documents, I find spec sheets for at least 3 Tranter Superchanger heat exchangers. The sheets are copies of copies and some of the numbers are not legible. The customer was Heath (Heath Engineering Company). The project was a use of low temperature geothermal well water (~92 deg F), to heat the Twin Fall High School (located in Twin Falls Idaho).

The date on the spec sheets is Feb 4, 1985. The proposal might be **#SC-27848-33R1**.

Although there may have been 4 exchangers, I have only these 3 part numbers:

#26UJ0171 NN04022202220

#26UJ0131 NN04022202220

#26UP0771 NN14024202220

The engineer who did the water balance for this system gives different numbers for the flow rates through the exchangers than I see on the spec sheets.

My questions:

- How many exchangers were provided for this project?
- Were they to be set in series or parallel?
- What is the range and maximum hot side (geothermal water) flow rate for each unit?

The source well will support a sustained withdrawal rate of 195 gpm (~0.43 cfs) but the operators appear to have exceeded that pumping rate regularly.

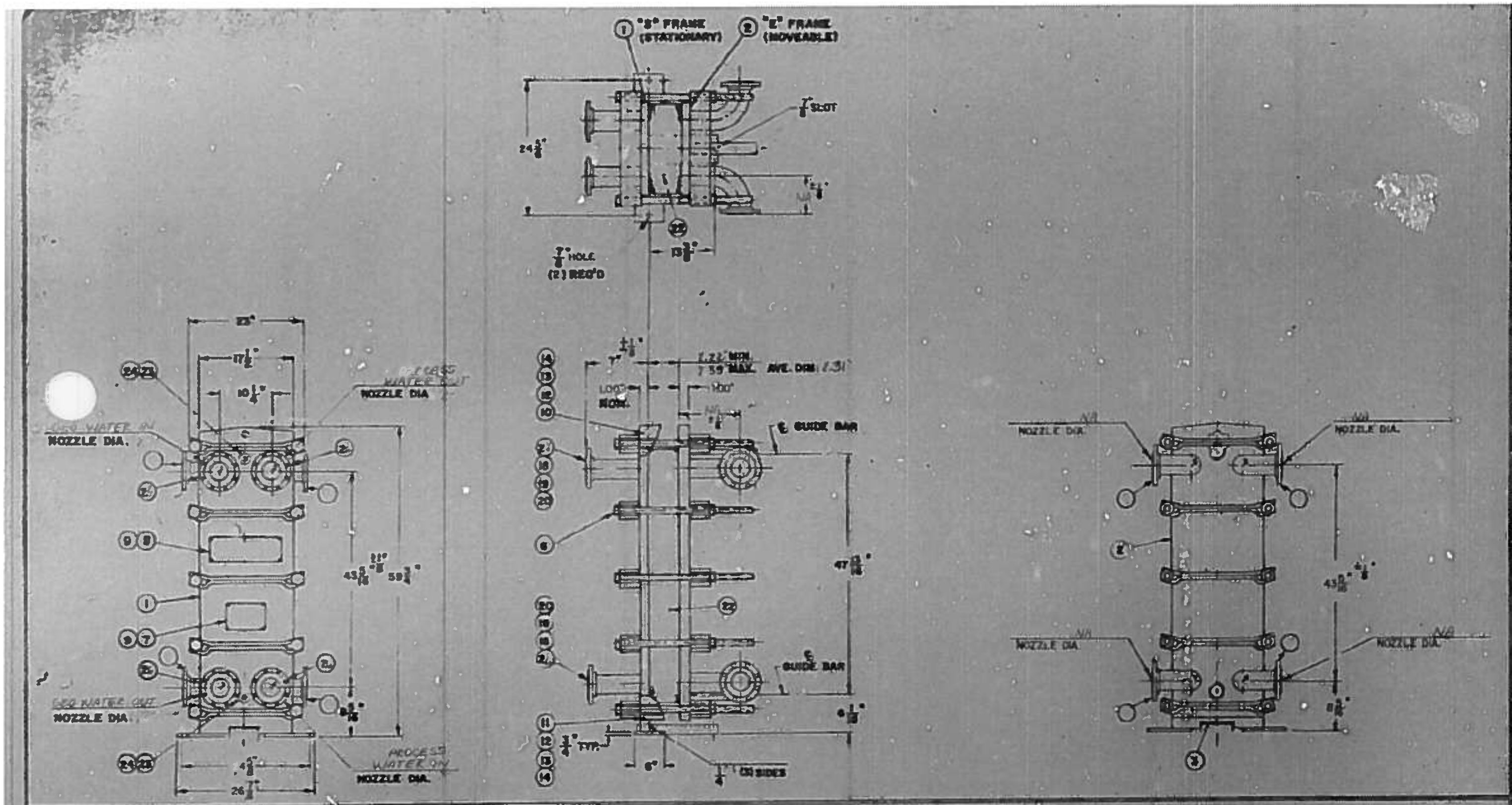
- Can the exchangers deliver more heat if the rate of hot-side water delivered to them is greater?

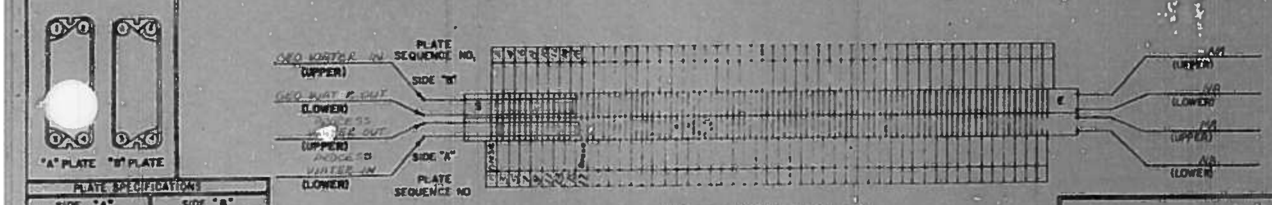
I am trained as civil engineer so my understanding of heat exchangers is in its infancy. (That may be restating the obvious.) Any assistance you can provide would be welcome.

Sincerely,

Michele Edl

Associate Engineer





ELEMENT COMPOSITION DIAGRAM

PLS #1 THRU 7 ARE UX-216
ODD # PLS # 9 THRU 17 ARE UX-216
EVEN # PLS #8 THRU 16 ARE UX-216

NOTES:
1. GASKETS FACE "S" FRAME
2. NO NUMBER INDICATES A (4) HOLE PLATE (1234)

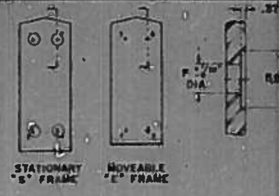
PLATE SPECIFICATIONS

SIDE "A"		SIDE "B"	
HOLE PUNCH NO.	NO. REQ'D	HOLE PUNCH NO	NO REQ'D
1234	[illegible]	1234	[illegible]
1230		1230	
1204		1204	
1034		1034	
0234		0234	
1200		1200	
0034		0034	
0204		0204	
1004		1004	
1030		1030	
[illegible]	[illegible]		
[illegible]	[illegible]		
TOTAL	9	TOTAL	8

PERFORMANCE

SECTION	FLUID NAME	FLOW RATE (GPM)	INLET TEMP °F	OUTLET TEMP °F	PRESSURE DROP (PSI)	PLATE ARRANGEMENT	MATERIAL		
							PLATE	GASKET	NOZZLE
1	GEO WATER	60	91	85	4.89	8X	304	NBR	316L
	PROCESS W.	40	78	85.48	2.30	8X	304	NBL	316L

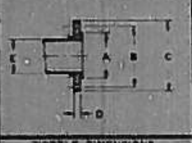
NOZZLE LOCATION	"F" DIA HOLE
1	2 7/16"
2	2 7/16"
3	2 7/16"
4	2 7/16"
5	
6	
7	
8	



FRAME HOLE DATA

PARTS LIST

ITEM NO.	DESCRIPTION	DRAWING NO.	NO. REQ'D PER ASSY
1	STATIONARY FRAME ASS'Y. SA-516-70	D-202549	1
2	MOVEABLE FRAME ASS'Y. SA-516-70	D-202552	1
3	REAR SUPPORT	A-202192	1
4	UPPER GUIDE BAR (WKG LGTH. 14")	C-202549	1
5	LOWER GUIDE BAR (WKG. LGTH. 10")	C-202547	1
6	BOLT ASS'Y. (WKG. LGTH 26½")	B-202067	10
7	DATA NAMEPLATE	B-202112	1
8	NAMEPLATE	B-200796	1
9	DRIVE PIN	A-200921	6
10	SHROUD, TOP	C-202190	1
11	SHROUD, SIDE (WIDTH [illegible])	C-202191	2
12	SHROUD, STUD	A-200930	20
13	SHROUD, NUT	A-200931	20
14	SHROUD, WASHER	A-200932	20
15	SKID	B-200874	1
16	LAG SCREW	A-200694	3
17	WASHER	A-38709-2	3
18	FLANGE PROTECTOR	A-200891	4
19	FLANGE PROTECTOR PIN	A-200892	16
20	FLANGE PROTECTOR WASHER	A-200893	16
21	SHIPPING BAG	A-200895	1
22	PLATE (SEE PLATE SPEC. TABLE)	D-202355	17
23	GUIDE BAR BOLT	A-202091-1	2
24	GUIDE BAR WASHER	A-202093-1	2
26	NOZZLE 2" STR ("E" FRAME)	D-202168	4



NOZZLE DIMENSIONS

SIZE / DIM.	2"	4"
A	3⅝"	6 3/16"
B	4¾"	7½"
C	6"	9"
D	¾"	15/16"
E	2⅜"	4½"

NOTES
1. FLEXIBILITY IN PIPING SYSTEM IS RECOMMENDED TO PROVIDE FOR THERMAL EXPANSION AND VIBRATION.
2. ~~FABRICATE PER ASME SPECS~~
3. ONLY NOZZLES AT LOCATIONS SHOWN IN "FRAME HOLE DATA" ARE APPLICABLE FOR THIS ORDER.

SPECIFICATIONS

DESIGN PRESSURE:	115 PSIG
TEST PRESSURE:	150 PSIG
DESIGN TEMP:	125 °F
NO OF PLATES:	17
SURFACE AREA:	40.5 SQ. FT.
WEIGHT:	1287 LBS
NOZZLES	150 LB ASA LAP JOINT FLANGE
PAINT	BIG SKY BLUE

NON-ASME

NO.	REVISION	BY	DATE
1	REL. FOR PROD.	JM	[illegible]
2	ISSUED FOR APPROVAL	JM	[illegible]

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE SPECIFIED: ± 1/4"

TRA 1270

TEXAS DIVISION - TRANTER INC
WICHITA FALLS, TEXAS

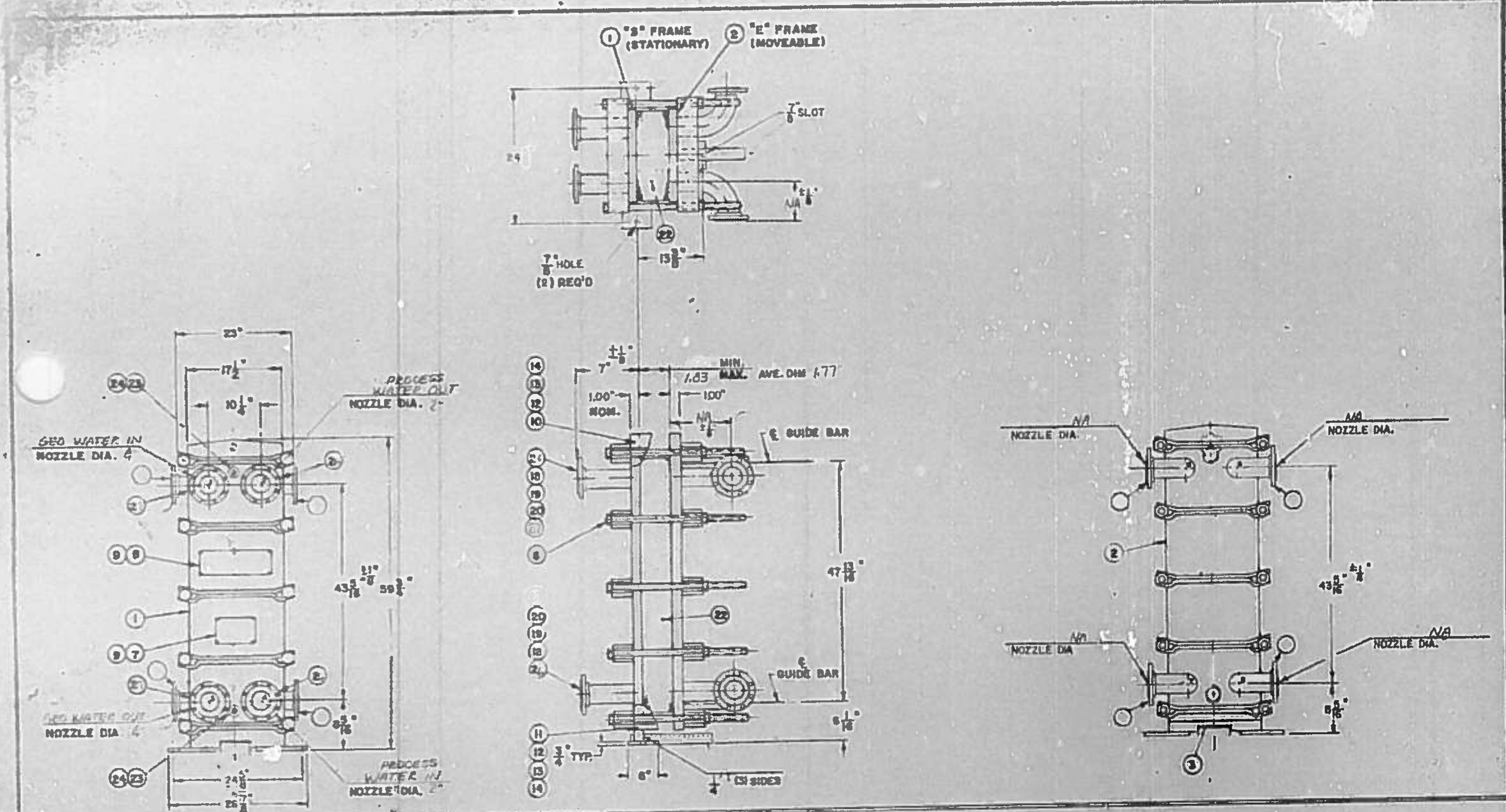
PROPERTY OF TEXAS DIVISION TRANTER INC AND NOT TO BE REPRODUCED WITHOUT THEIR CONSENT

CUSTOMER: WHITE PLUMBING & HEATING

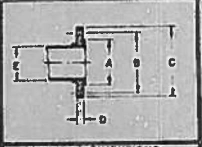
CUSTOMER REFERENCE DATA
ITEM: 220
P.O. NO.: [illegible]
SERIAL NO.: [illegible] AND
JOB NO.:

TITLE: SUPERCHANGER
(MOD. II) MODEL UX-2[illegible]U-7
DRAWN BY: JM
CHECKED BY: GB
APPROVED BY:
DATE: 4/4/85
DATE: 4/4/85
SCALE: 6/10
84185
DWG NO.: D-84185-1
REV: ⚠

D-84185-1.jpg



PARTS LIST			
ITEM NO.	DESCRIPTION	DRAWING No	NO. REQ'D PER ASSY
1	STATIONARY FRAME ASS'Y SA-516-70	D-202149-A	1
2	MOVEABLE FRAME ASS'Y SA-516-70	D-202152-A	1
3	REAR SUPPORT	A-202192	1
4	UPPER GUIDE BAR (WKG LGTH 14")	C-202646	1
5	LOWER GUIDE BAR (WKG. LGTH.10")	C-202647	1
6	BOLT ASS'Y (WKG. LGTH 28" [illegible])	B-202067	10
7	DATA NAMEPLATE	B-202112	1
8	NAMEPLATE	B-200734	1
9	DRIVE PIN	A-200829	8
10	SHROUD, TOP	C-202190	1
11	SHROUD, SIDE (WIDTH 3 1/2")	C-202191	2
12	SHROUD, STUD	A-200830	20
13	SHROUD, NUT	A-200831	20
14	SHROUD, WASHER	A-200832	20
15	SKID	B-200874	1
16	LAG SCREW	A-200896	3
17	WASHER	A-14708-2	3
18	FLANGE PROTECTOR	A-200891	4
19	FLANGE PROTECTOR PIN	A-200892	16
20	FLANGE PROTECTOR WASHER	A-200893	16
21	SHIPPING BAG	A-200895	1
22	PLATE (SEE PLATE SPEC TABLE)	D-202350	13
23	GUIDE BAR BOLT	A-202091-1	2
24	GUIDE BAR WASHER	A-202095-1	2
26	NOZZLE 2" STR ("S" FRAME)	D-202168	2
27	NOZZLE 4" STR ("S" FRAME)	D-202165-5	2



NOTES

1. FLEXIBILITY IN PIPING SYSTEM IS RECOMMENDED TO PROVIDE FOR THERMAL EXPANSION AND VIBRATION.
2. ~~FABRICATE PER ASME SPECS.~~
3. ONLY NOZZLES AT LOCATIONS SHOWN IN "FRAME HOLE DATA" ARE APPLICABLE FOR THIS ORDER.

NOZZLE DIMENSIONS				
DIM. \ SIZE	2"	4"		
A	3 5/8"	6 3/16"		
B	4 3/4"	7 1/2"		
C	6"	9"		
D	3/4"	15/16"		
E	2 3/8"	4 1/2"		

SPECIFICATIONS

DESIGN PRESSURE:	125 PSIG
TEST PRESSURE:	150 PSIG
DESIGN TEMP:	125 °F
NO. OF PLATES:	13
SURFACE AREA:	44.4 SQ.FT
WEIGHT:	1277 LBS
NOZZLES	150 LB ASA LAP JOINT FLANGE
PAINT	BIG SKY BLUE

NON CODE

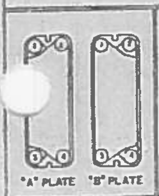
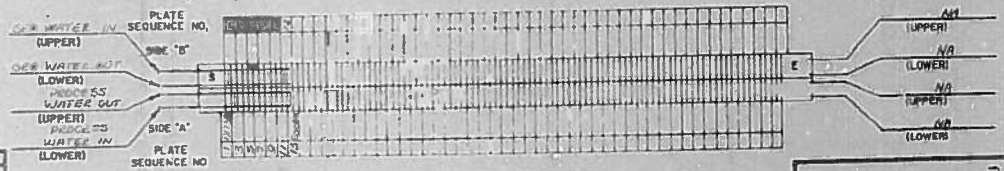


PLATE SPECIFICATIONS			
SIDE "A"		SIDE "B"	
HOLE PUNCH NO	NO. REQ'D	HOLE PUNCH NO	NO REQ'D
1234	[illegible] 5	1234	[illegible]
1230		1230	
1204		1204	
1034		1034	
0234		0234	
1200		1200	
0034		0034	
0204		0204	
1004		1004	
1030		1030	
0234	[illegible] 1		
[illegible] 1	[illegible]		
TOTAL		TOTAL	



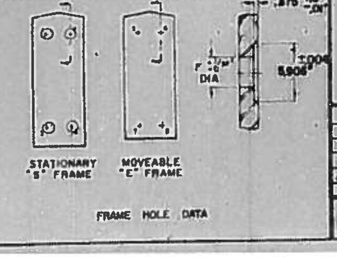
ELEMENT COMPOSITION DIAGRAM

NOTES:
1. GASKETS FACE "S" FRAME
2. NO NUMBER INDICATES A (4) HOLE PLATE (1234)

PLS #1 THRU [illegible] ARE UX-216
EVEN # PLS # [illegible] THRU 12 ARE UX-276
ODD # PLS # 7 THRU 13 ARE UX-216

PERFORMANCE									
SECTION	FLUID NAME	FLOW RATE (GPM)	INLET TEMP. °F	OUTLET TEMP °F	PRESSURE DROP (PSI)	PLATE ARRANGEMENT	MATERIAL		
							PLATE	GASKET	NOZZLE
1	GEO WATER	46	92	85	4.93	6 x 1	304	NBR	316L
	PROCESS WTR	31	78	88.36	2.37	6 x 1	304	NBR	316L

NOZZLE LOCATION	"F" DIA	"H" HOLE
1	4 9/16"	
2	17/16	
3	4 9/16	
4	2 3/16	
5		
6		
7		
8		



FRAME HOLE DATA

TAG 1230

NO	REVISION	BY	DATE
1	REVISED FOR PROD	CB	4-26
0	ISSUED FOR APPROVAL	JM	4-25

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE SPECIFIED: ± 1/4"

TEXAS DIVISION – TRANTER INC
WICHITA FALLS, TEXAS

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CUSTOMER
WHITE PLUMBING & HEATING

CUSTOMER REFERENCE DATA

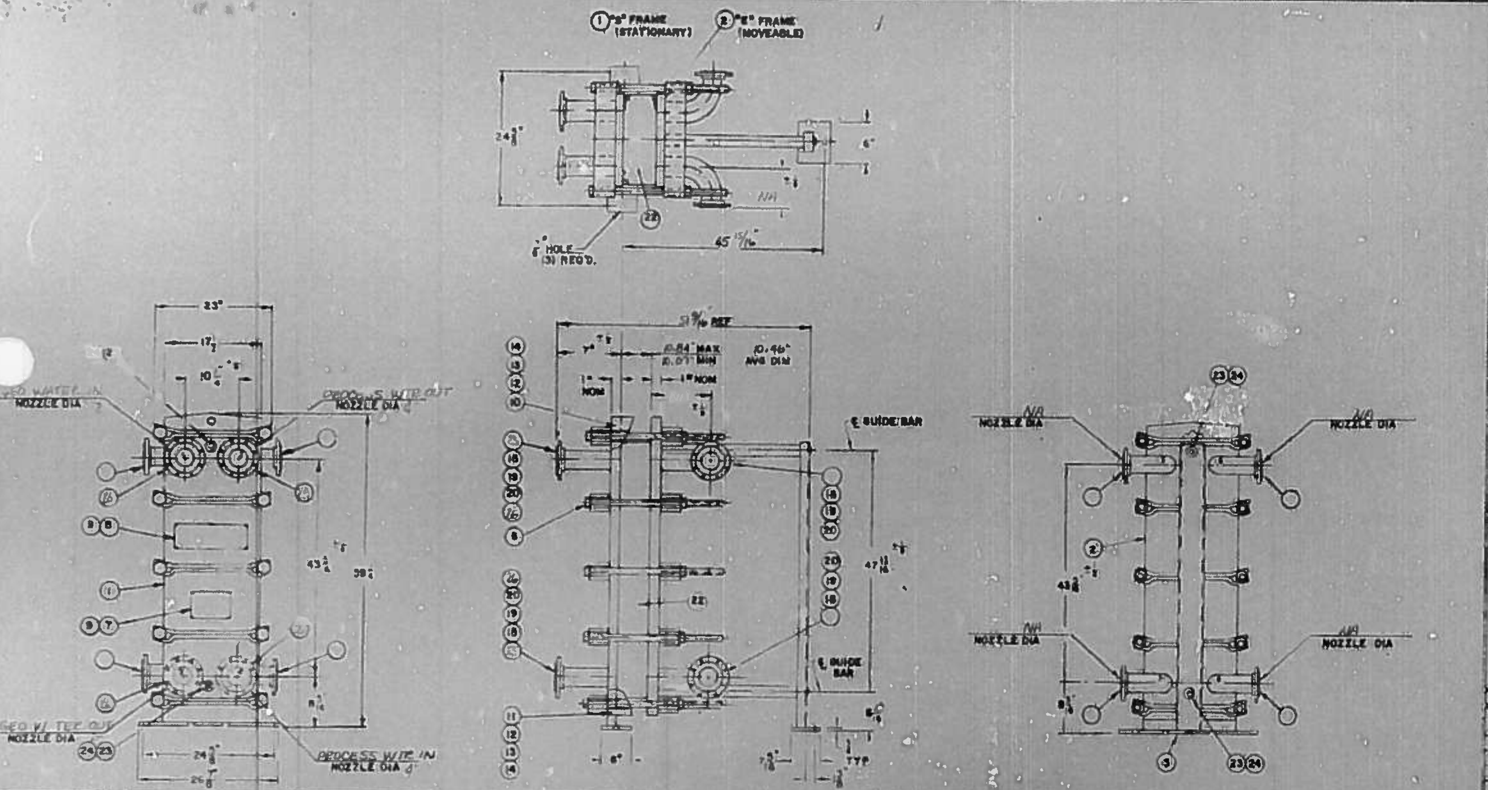
P.O. NO	1220	MFG NO	10740
SERIAL NO	[illegible]201-H	DWG NO	

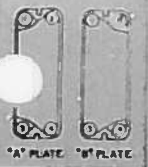
TITLE
SUPERCHANGER
(MOD III) MODEL UX-296-UW/13

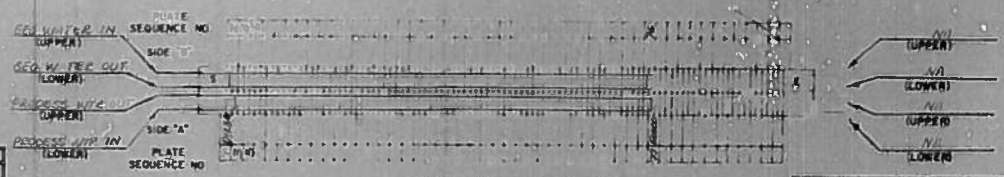
DRAWN BY	JM	CHECKED BY	CB	APPROVED BY	
DATE	4-24-85	DATE	4-26-85	DATE	

S/O	DWG NO	REV
84185	D-84185-2	4

D-84185-2.jpg







ELEMENT COMPOSITION DIAGRAM

NOTES:
1. GASKETS FACE "S" FRAME.
2. NO NUMBER INDICATES A (4) HOLE PLATE (1234)

PLS # THRU 47 ARE UX-216
ODD # PLS # 49 THRU 77 ARE UX 216
EVEN # PLS # 48 THRU 76 ARE UX 226

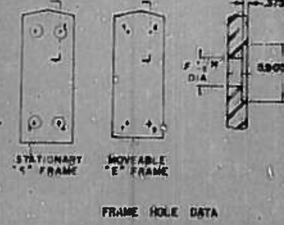
PLATE SPECIFICATIONS

SIDE "A"		SIDE "B"	
HOLE PUNCH NO	NO REQ'D	HOLE PUNCH NO	NO REQ'D
1234	[illegible] 27	1234	[illegible]
1230		1230	
1204		1204	
1034		1034	
0234		0234	
1200		1200	
0034		0034	
0204		0204	
1004		1004	
1030		[illegible]	
[illegible]	[illegible]		
[illegible]	[illegible]		
TOTAL	39	TOTAL	38

PERFORMANCE

SECTION	FLUID NAME	FLOW RATE (GPM)	INLET TEMP °F	OUTLET TEMP °F	PRESSURE DROP (PSI)	PLATE ARRANGEMENT	MATERIAL		
							PLATE	GASKET	NOZZLE
1	SEQ WATER PROCESS WTR	168 275	85 65	69 74.75	2.33 6.11	38 X 1 38 X 1	304 304	NBR NBR	316L 316L

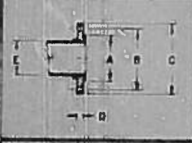
NOZZLE LOCATION	"F" DIA HOLE
1	2 7/16"
2	4 1/16
3	2 7/16"
4	4 1/16
5	
6	
7	
8	



FRAME HOLE DATA

PARTS LIST

ITEM NO.	DESCRIPTION	DRAWING NO.	NO. REQ'D. PER ASS'Y.
1	STATIONARY FRAME ASS'Y SA-216-70	D-202149-	1
2	MOVEABLE FRAME ASS'Y SA-216-70	D-202152- 2	1
3	GUIDE BAR SUPPORT	C-202187	1
4	UPPER GUIDE BAR (WKG. LGTH. 45")	C-202386-1	1
5	LOWER GUIDE BAR (WKG. LGTH. 45")	C-202386-1	1
6	BOLT ASS'Y (WKG LGTH 34 1/2)	B-202087- 2	10
7	DATA NAMEPLATE	B-202112	1
8	NAMEPLATE	B-200734	1
9	DRIVE PIN	A-200829	8
10	SHROUD, TOP	C-202190	1
11	SHROUD, SIDE (WIDTH 12 1/4")	D-202191	2
12	SHROUD, STUD	A-200830	20
13	SHROUD, NUT	A-200831	20
14	SHROUD, WASHER	A-200832	20
15	SKID	B-200874	1
16	LAG SCREW	A-200898	3
17	WASHER	A-28/08-2	3
18	FLANGE PROTECTOR	A-200891	4
19	FLANGE PROTECTOR PIN	A-200892	16
20	FLANGE PROTECTOR WASHER	A-200893	16
21	SHIPPING BAG	A-200895-1	1
22	PLATE (SEE PLATE SPEC TABLE)	D-202385	77
23	GUIDE BAR BOLT	A-202081-1	4
24	GUIDE BAR WASHER	A-202085-1	4
25	NOZZLE, 4" STR. ("S" FRAME)	D-202166-	2
26	NOZZLE, 2" STR ("S" FRAME)	D-202165-1	2



NOZZLE DIMENSIONS

DIM \ SIZE	2"	4"		
A	3 5/8	6 3/16		
B	4 3/4	7 1/2		
C	6"	9"		
D	5/8	15/16		
E	2 3/8	4 1/2		

NOTES
1. FLEXIBILITY IN PIPING SYSTEM IS RECOMMENDED TO PROVIDE FOR THERMAL EXPANSION AND VIBRATION.
2. ~~FABRICATE PER ASME SPECS.~~
3. ONLY NOZZLES AT LOCATIONS SHOWN IN "FRAME HOLE DATA" ARE APPLICABLE FOR THIS ORDER.

SPECIFICATIONS

DESIGN PRESSURE: 125 PSIG
TEST PRESSURE: 150 PSIG
DESIGN TEMP: 125 °F
NO OF PLATES: 77
SURFACE AREA: 302.7 SQ FT
WEIGHT: 1760 LBS
NOZZLES 150 LB ASA LAP JOINT FLANGE
PAINT RIG SKY BLUE

NON CODE

1216-1220

TEXAS DIVISION - TRANTER INC.
WICHITA FALLS, TEXAS

WHITE PLUMBING & HEATING

CUSTOMER REFERENCE DATA
1220
10741
SERIAL NO. P-38208-H

SUPERCHANGER
(MOD. 3E) MODEL UX-216-UP-77

DRAWN BY MIL DATE 4-24-85
CHECKED BY [illegible] DATE 4-24-85

NO.	REVISION	BY	DATE
1	REL. PER PROD.	[illegible]	[illegible]
2	ISSUED FOR APPROVAL	[illegible]	[illegible]

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE SPECIFIED: ± 1/4"

S/O 84185
D-84185-3

D-84185-3.jpg