

ITEM NO.	DESCRIPTION	MATERIAL
1	HEAD	SA516 GR70
2	FOLLOWER	SA516 GR70
3	END SUPPORT	A36
4	TOP BAR	304SS
5	BOTTOM BAR	304SS
6	M26 DIA. TIE BAR	SA193 GRB7
7	TIE BAR HEX NUTS	SA194 GR2H ZINC PLATED
8	HEAT TRANSFER PLATES	SE688 N08367
9	STUDS	SA193 GRB7 ZINC PLATED
10	LINERS (H1 & H4)	316L STAINLESS STEEL
11	LINERS (H2 & H3)	AL6XN
12	GRD LUSS	A36
13	NAMEPLATE BRACKET	A36

**MATERIALS OF CONSTRUCTION**

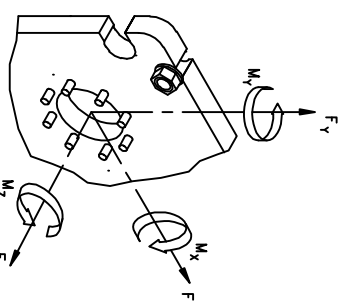
VALERO ENERGY CORP.  
 DELAWARE CITY REFINERY  
 Item No.: G2007000996  
 ASSET #: 45-E-301 C  
 Title: Closed Loop Cooling Water  
 Plant: UNIT 82 GASIFIER  
 P.O. No.: 4501319183  
 W.O. No.:  
 VALERO Dwg No.:

CUSTOM PLATE DETAIL

**INVENSY'S**  
**PARAFLOW**  
 COMPANY OF  
 APV PRODUCTS, INC. 1200 W. ASH STREET, GOLDSBORO, NC 27530  
 TEL: 919-735-4570 FAX: 919-735-1134

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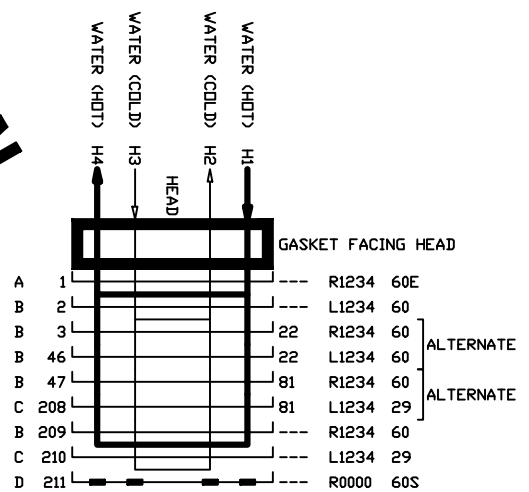
APV PRODUCTS, INC. 1200 W. ASH STREET, GOLDSBORO, NC 27530  
 TEL: 919-735-4570 FAX: 919-735-1134



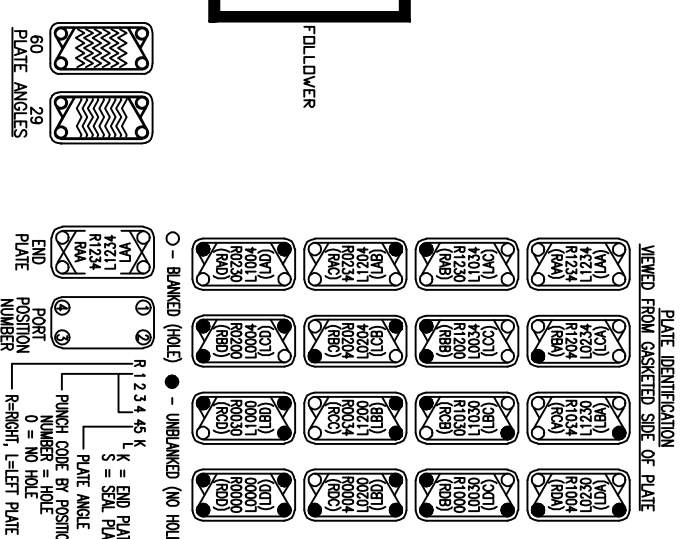
F <sub>x</sub> (lb)	2720.3
F <sub>y</sub> (lb)	2221.2
F <sub>z</sub> (lb)	9136.5
M <sub>x</sub> (ft lb)	9136.5
M <sub>y</sub> (ft lb)	9136.5
M <sub>z</sub> (ft lb)	12919.4

NOTE:  
 MOMENTS AND FORCES MAY ACT IN ANY COMBINATION IN ANY SENSE (ie. +/-).

**CERTIFIED FINAL**



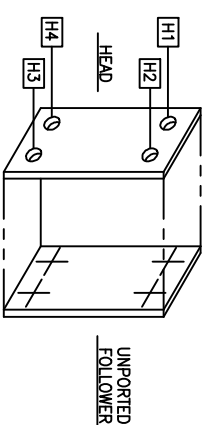
WATER	1 DF 105	WATER	1 DF 105
1	60	1	60
2	60	2	60
3	60	3	60
4	60	4	60
5	60	5	60
6	60	6	60
7	60	7	60
8	60	8	60
9	60	9	60
10	60	10	60
11	60	11	60
12	60	12	60
13	60	13	60
14	60	14	60
15	60	15	60
16	60	16	60
17	60	17	60
18	60	18	60
19	60	19	60
20	60	20	60
21	60	21	60
22	60	22	60
23	60	23	60
24	60	24	60
25	60	25	60
26	60	26	60
27	60	27	60
28	60	28	60
29	60	29	60
30	60	30	60



**NOTES**

1. THE INSTALLATION, OPERATION AND MAINTENANCE OF THIS HEAT EXCHANGER SHALL BE IN ACCORDANCE WITH THE APV PARAFLOW PLATE HEAT EXCHANGER INSTRUCTION MANUAL.
2. THIS MODEL HEAT EXCHANGER IS TIGHTENED USING A WRENCH ON THE TIE BAR HEX NUTS AT THE HEAD (FIXED COVER) END ONLY. CLEAN AND LUBRICATE THE THREADS BEFORE OPENING OR CLOSING USING A LUBRICANT COMPATIBLE WITH CARBON STEEL. APV RECOMMENDS NEVER-SIEZ REGULAR GRADE. DO NOT USE COUPLER GREASE.
3. THE PLATE PACK IS TO BE TIGHTENED IN ACCORDANCE WITH THE INSTRUCTION MANUAL SUPPLIED. DO NOT TIGHTEN BELOW THE MINIMUM DIMENSION SHOWN.
4. THE CUSTOMER IS RESPONSIBLE FOR PROVIDING:
  - ANCHOR BOLTS PER ASTM A58 MINIMUM WITH A RECOMMENDED DIAMETER OF 1 3/16".
  - PROTECTION AGAINST START UP OR OPERATING PRESSURES EXCEEDING THE MAXIMUM ALLOWABLE WORKING PRESSURE.
  - SPRING TO THE FOLLOWER OR CONNECTOR BOLTS THAT ALLOWS FOR FLEXIBILITY WHEN THE UNIT IS OPENED FOR SERVICE AND PROVIDES LINED STUDDED PORTS ARE PROVIDED WITH A SEPARATED RAISED FACE FINISH.
5. BOLT HOLES STRADDLE CENTERLINES SHOWN.
6. DIMENSIONS ARE SHOWN IN INCHES. DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS.
7. STANDARD TOLERANCES:
  - FRAME AND FOUNDATION BOLT LOCATIONS: ±1/4 INCH [6mm]
  - NOZZLE CENTERLINE AND FACE DIMENSIONS: ±1/8 INCH [3mm]

**APV**  
 FACTORY SERVICE  
 FOR PARTS AND SERVICE  
 CALL OUR CUSTOMER  
 SERVICE DEPARTMENT  
 1-888-278-4321



QTY	DES / REV	DATE	BY	DATE	DESCRIPTION AND LOCATION
01	DES / REV 008		CSL	BT / DATE	THE DATA STAYS UNDER THE CUSTOMER REQUEST

**DESIGN SPECIFICATIONS**

DESIGN CODE	ASME SECTION VIII DIV 1 2004 EDITION 2006 ADDENDA
MAX ALLOWABLE WORKING PRESSURE	150 PSIG.
MINIMUM DESIGN METAL TEMPERATURE	-20 °F @ 150 PSIG.
HYDROTEST PRESSURE	195 PSIG.
MINIMUM OPERATING TEMPERATURE	5°F.
MAXIMUM OPERATING TEMPERATURE	239°F.
SERIAL NUMBER	G2007000996
HEAT TRANSFER AREA	3014.5 SQ.FT.
FRAME SIZE	No. 25
MAXIMUM FRAME CAPACITY	364 PLATES MAX.
DRY WEIGHT	9802 LBS.
FLOODED (OPERATING) WEIGHT	11851 LBS.
TOTAL LIQUID VOLUME	247.4 GALS.
FINISH	SPECIAL PAINT-670.285.96210
ACCESSORIES SUPPLIED	ASME U STAMP, GRD LUSS, INSULATED SHROUD

**OPERATING CONDITIONS**

LIQUID	FLOW RATE (lb/h)	TEMP (°F)	ΔP (psi)
HOT WATER	263000.0	115.3	28.3
COLD WATER	2017500.0	88.0	17.3

**BILL OF MATERIALS**

Plates (Total: 211)	ID	Description
1	G8046K4LYSANNXA	A B134S (60) END AL6XN 0.5 PCL NIT (1 YEL)
17	G8046K4LYSANNXA	B B134S (60) FLOW AL6XN 0.5 PCL NIT (1 YEL)
82	G8046K4LYSANNXA	C B134S (29) FLOW AL6XN 0.5 PCL NIT (1 YEL)
1	G8046S0KLYSANNXA	D B134S (60) SPL (SPL 1 2 3 4) AL6XN 0.5 PCL NIT (1 YEL)
1	G39001345G1FGG1	Head B134 M-12 ser2/2
1	G39001346K4YXXKX	Follower
1	G8134XXC12VXX25B	B134 M-12 ser2/2

Fitting	Qty	Part Number	Pos	Description
2	G12HDDPR70A	H1,H4	NPS 12 Flange (Studded) SS 316L Class 150	
2	G8507992	H2,H3	NPS 12 Flange (Studded) AL6XN Class 150 (Mates With) ANSI B16.5 Phone Face	

Accessories	Qty	Part Number	Description
2	G8501252	Earthing Lug	
1	G8505871	Custom Nonspindle	
1	G8500317H	Nameplate Bracket	
1	G8507995	Shroud for Insulation	
1	G8507998	Insulation Kit for Shroud	
1	GASME U STAMP	ASME Inspection and U Stamp	
1	GASPECIAL PAINT-3	Special Paint 3	
14	G8500835	M36 Polyethylene sleeves	

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**APV**  
 APV Products  
 1200 W. Ash Street  
 Goldsboro, NC 27530  
 Tel: (919) 735-4570/Fax: (919) 581-1134

Approved:	Date:	Drawn:	Date:	Drawing No.:	Rev.:
HSB	15NOV07	0700996		01	