01722973

CBI Matrix Process & Technology

CENTRIFUGAL PUMP (API 610-8TH) DATA SHEET U.S. CUSTOMARY UNITS

JOB NO. 613144 ITEM NO. 21-MP-107A/B
PURCHASE ORDER NO.
SPECIFICATION NO. A121-21-MP-107A/B
REVISION NO. 0 DATE 3/1/2004
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APPLICABLE TO: ○ PROPOSALS ○ PURCHASE ◉ AS BUILT ☐ REFURBISH AND REUSE
FOR Chevron / Texaco UNIT Ethanol Drier
SITE Refineria Panama SERVICE Dry ETOH Loading Pumps
NO. REQ 2 PUMP SIZE 16 x 20 x 29 TYPE Centrifugal NO. STAGES ONE
MANUFACTURER SULZER MODEL H S A SERIAL NO.

NOTES: INFORMATION BELOW TO BE COMPLETED: ○ BY PURCHASER ☐ BY MANUFACTURER ◉ BY MANUFACTURER OR PURCHASER

○ GENERAL (3.1.1)

PUMPS TO OPERATE IN (PARALLEL)	NO. MOTOR DRIVEN 2	NO. TURBINE DRIVEN 0
(SERIES) WITH NONE	PUMP ITEM NO. 21-MP-107A/B	PUMP ITEM NO. 21-MP-107A/B
GEAR ITEM NO.	MOTOR ITEM NO. 21-MP-107A/BM	TURBINE ITEM NO.
GEAR PROVIDED BY	MOTOR PROVIDED BY Vendor	TURBINE PROVIDED BY
GEAR MOUNTED BY	MOTOR MOUNTED BY Vendor	TURBINE MOUNTED BY
GEAR DATA SHT. NO.	MOTOR DATA SHT. NO.	TURBINE DATA SHT. NO.

OPERATING CONDITIONS

- ◉ CAPACITY, NORMAL 7001 (GPM) RATED 8051 (GPM)
- OTHER
- ◉ SUCTION PRESSURE MAX/RATED 28 / -6.9 (PSIG)
- ◉ DISCHARGE PRESSURE 91 (PSIG)
- ◉ DIFFERENTIAL PRESSURE 98 (PSI)
- ◉ DIFF. HEAD 287 (FT) NPSHA 15.9631 (FT)
- ○ PROCESS VARIATIONS (3.1.2)
- ○ STARTING CONDITIONS (3.1.3)
- SERVICE: ○ CONT. ◉ INTERMITTENT (STARTS/DAY) 1
- ○ PARALLEL OPERATION REQ'D (2.1.11)

○ SITE AND UTILITY DATA

LOCATION: (2.1.29)

- ○ INDOOR ○ HEATED ○ UNDER ROOF
- ◉ OUTDOOR ○ UNHEATED ○ PARTIAL SIDES
- ○ GRADE ○ MEZZANINE ○
- ○ ELECTRIC AREA CLASSIFICATION (2.1.22 / 3.1.5)
  - CL GR DIV
- ○ WINTERIZATION REQ'D ○ TROPICALIZATION REQ'D.

SITE DATA (2.1.29)

- ○ ALTITUDE 5 (FT) BAROMETER (PSIA)
- ○ RANGE OF AMBIENT TEMPS: MIN/MAX. 104 / 15 (°F)
- ○ RELATIVE HUMIDITY: MIN / MAX / 100 (%)

UNUSUAL CONDITIONS: (2.1.23) ○ DUST ○ FUMES

- ○ OTHER Petroleum Refinery Atmosphere
- ○ UTILITY CONDITIONS:

STEAM:	DRIVERS		HEATING	
MIN	550 (PSIG)	(°F)	(PSIG)	(°F)
MAX	650 (PSIG)	(°F)	(PSIG)	(°F)

ELECTRICITY	DRIVERS	HEATING	CONTROL	SHUTDOWN
VOLTAGE		120		
HERTZ				
PHASE				

COOLING WATER: (2.1.17)

- TEMP. INLET (°F) MAX. RETURN (°F)
- PRESS. NORM (PSIG) DESIGN (PSIG)
- MIN RETURN (PSIG) MAX ALLOW DP (PSI)

SITE AND UTILITY DATA (CONT'D)

- WATER SOURCE
- CHLORIDE CONCENTRATION (PPM) (3.5.2.6)
- INSTRUMENT AIR: MAX/MIN PRESS / (PSIG)

LIQUID

- ◉ TYPE OR NAME OF LIQUID Ethanol
- ◉ PUMPING TEMPERATURE
  - NORMAL 80 (°F) MAX. 125 (°F) MIN. (°F)
- ◉ VAPOR PRESSURE 1.3 (PSIA) @ 80 (°F)
- ◉ RELATIVE DENSITY (SPECIFIC GRAVITY):
  - NORMAL 0.79 MAX 1.0 MIN 0.79
- ◉ SPECIFIC HEAT, Cp 0.7896 (BTU/LB °F)
- ◉ VISCOSITY 0.93 (cP) @ 80 (°F)
- ◉ MAX. VISCOSITY 1 (cP)
- ○ CORROSIVE/EROSIVE AGENT (2.11.1.8)
- ○ CHLORIDE CONCENTRATION (PPM) (3.5.2.6)
- ○ H_2S CONCENTRATION (PPM) (2.11.1.11)

LIQUID (2.1.3) ○ HAZARDOUS ◉ FLAMMABLE
○ OTHER

PERFORMANCE

- PROPOSAL CURVE NO. 65079 ■ RPM 1170
- ■ IMPELLER DIA. RATED 25.88 MAX. 27.25 MIN. 21.5 (IN.)
- ■ RATED POWER 542 (BHP) EFFICIENCY 85 (%)
- ■ MINIMUM CONTINUOUS FLOW:
  - THERMAL (GPM) STABLE 3300 (GPM)
- ■ PREFERRED OPERATING REGION 5600 TO 8800 (GPM)
- ■ ALLOWABLE OPERATING REGION 3300 TO 9650 (GPM)
- ■ MAX HEAD @ RATED IMPELLER 325 (FT)
- ■ MAX POWER @ RATED IMPELLER 585 (BHP)
- ■ NPSHR AT RATED CAPACITY 14 (FT) (2.1.8)
- ■ SUCTION SPECIFIC SPEED 10225 (2.1.9)
- ○ MAX. SOUND PRESS. LEVEL REQ'D (dBA) (2.1.14)
- ■ EST MAX SOUND PRESS. LEVEL 83.5 (dBA) (2.1.14)

REMARKS: Sulzer standard wear ring clearances.

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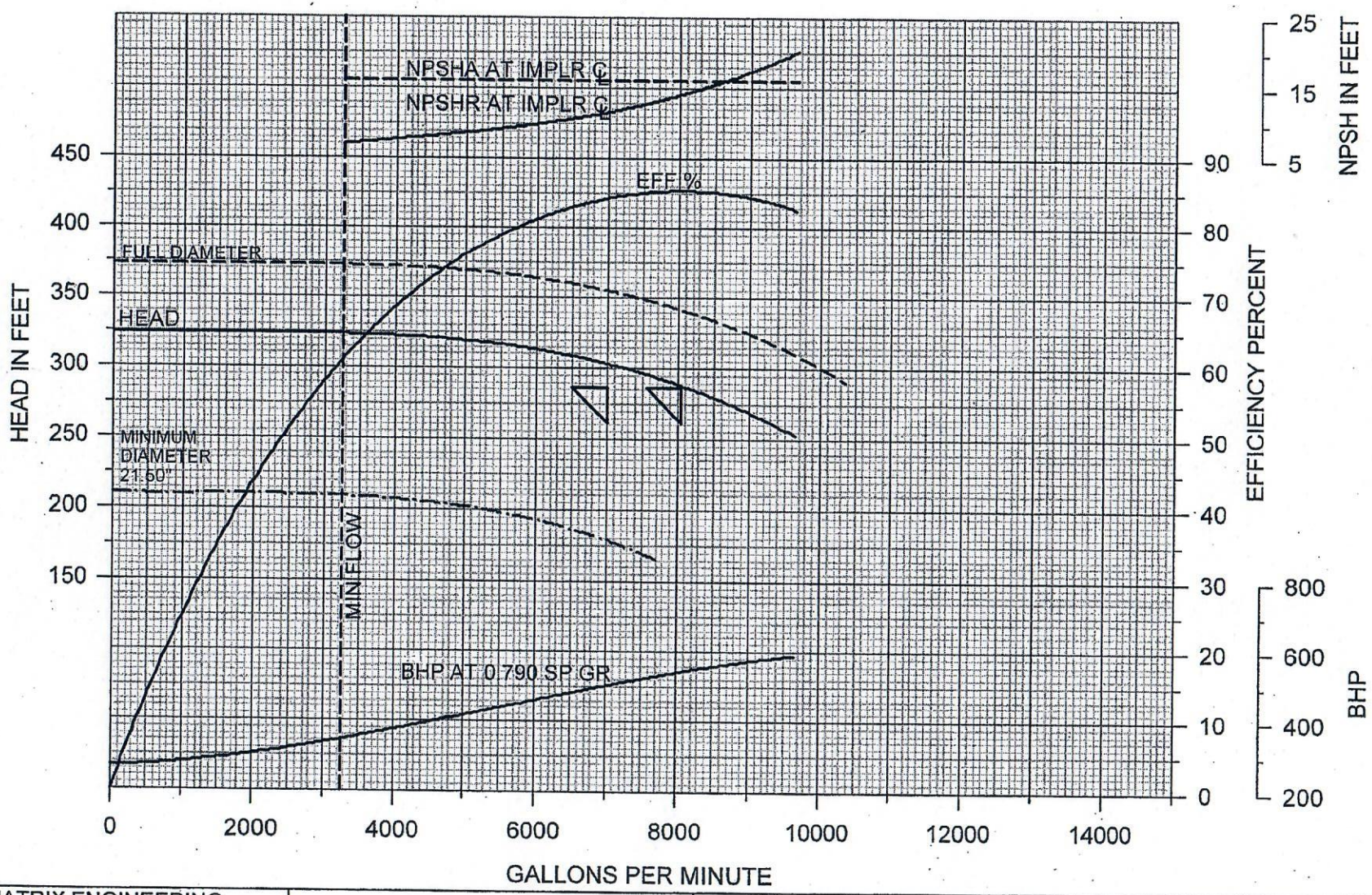
77.5 FLA

SULZER STANDARD CLEARANCES

65079



CBI MATRIX ENGINEERING CHEVRON TEXACO COMPANY REFINERIA COLON, PANAMA DRY ETOH LOADING PUMP ITEM NO: 21-MP-107A/B	**SULZER** **PAN.0003 HOU.03.0949-F1** EP 009-0949-JM DLE/LMJ 30-JAN-04	IMPELLER MAX DIA 27.25"	16 X 20 X 29 HSA 1 STAGE			
		EYE AREA SQ IN 184	DIA IMPELLER 25.88"	IMPELLER PATT 1613 HSB-7	1170 RPM	
			REFERENCE PF-HB-78-1mod		CURVE NO. 65079	REV -

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VERTICAL PUMP (API 610-8TH) SUPPLEMENTAL DATA SHEET U.S. CUSTOMARY UNITS

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VERTICAL TYPE (FIG 1.1) ○ VS1 ○ VS2 ○ VS3 ○ VS4 ○ VS5 ○ VS6 ○ VS7 ○ OTHER

REMARKS

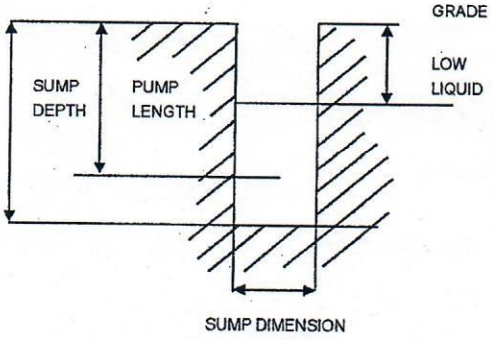
VERTICAL PUMPS

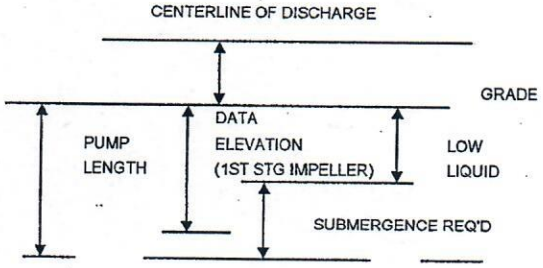
☐ PUMP THRUST: (+) UP (-) DOWN
AT MIN FLOW (LBS) (LBS)
AT RATED FLOW (LBS) (LBS)
AT MAX FLOW (LBS) (LBS)
MAX THRUST (LBS) (LBS)
☒ SOLEPLATE (IN) X (IN)
☐ SOLEPLATE THICKNESS (IN)
COLUMN PIPE: ☐ FLANGED ☐ THREADED
DIAMETER (IN) LENGTH (FT)
GUIDE BUSHINGS:
☐ NUMBER
☐ LINE SHAFT BEARING SPACING (IN)
GUIDE BUSHING LUBE:
☐ WATER ☐ OIL
☐ GREASE ☐ PUMPAGE

VERTICAL PUMPS (CONT'D)

LINE SHAFT: ☒ OPEN ☒ ENCLOSED
☐ LINE SHAFT DIAMETER (IN) ☐ TUBE DIAMETER (IN)
LINE SHAFT COUPLING:
☐ SLEEVE & KEY ☐ THREADED
☐ SUCTION CAN THICKNESS (IN)
☐ LENGTH (FT)
☐ DIAMETER (FT)
○ SUCTION STRAINER TYPE
○ FLOAT & ROD ○ FLOAT SWITCH
○ IMPELLER COLLETS ACCEPTABLE (2.5.2)
○ HARDENED SLEEVES UNDER BEARINGS (5.3.9.7)
○ RESONANCE TEST (5.3.8.2)
○ STRUCTURAL ANALYSIS (5.3.4.1)
○ DRAIN PIPED TO SURFACE (5.3.12.6)

SUMP ARRANGEMENT





○ SUMP DEPTH (FT)
○ SUMP DIMENSION (FT)
○ LOW LIQUID (FT)

☐ PUMP LENGTH (FT)
☐ SUBMERGENCE REQ'D (FT)
☐ CENTERLINE DISCHARGE HEIGHT (FT)
☐ DATUM ELEVATION (FT)

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INSTRUMENTATION

VIBRATION:
- ● NONCONTACTING (API 670) ○ TRANSDUCER
- ● PROVISION FOR MOUNTING ONLY (2.9.2.11)
- ○ FLAT SURFACE REQ'D (2.9.2.12)
- ○ SEE ATTACHED API 670 DATA SHEET
- ○ MONITORS AND CABLES (3.4.3.3)

REMARKS

TEMPERATURE AND PRESSURE:
- ● RADIAL BRG METAL TEMP ○ THRUST BRG METAL TEMP
- ● PROVISION FOR INSTRUMENTS ONLY
- ○ SEE ATTACHED API-670 DATA SHEET
- ○ TEMP GAUGES (WITH THERMOWELLS) (3.4.1.3)

OTHER

- ○ PRESSURE GAUGE TYPE (3.4.2.2)

LOCATION

REMARKS

SPARE PARTS (TABLE 6.1)

- ○ START-UP ○ NORMAL MAINTENANCE
- ○ SPECIFY

MOTOR DRIVE (3.1.5)

- ● MANUFACTURER Reliance Electric
- ■ 600 (HP) ■ 1200 (RPM)
- ● HORIZONTAL ◎ VERTICAL
- ■ FRAME
- ● SERVICE FACTOR
- ● VOLTS/PHASE/HERTZ 4160 / 3 / 60
- ● TYPE
- ● ENCLOSURE
- ○ MINIMUM STARTING VOLTAGE (3.1.6)
- ○ TEMPERATURE RISE
- ◎ FULL LOAD AMPS
- ◎ LOCKED ROTOR AMPS
- ● INSULATION
- ◎ STARTING METHOD
- ● LUBE
- ☐ VERTICAL THRUST CAPACITY

UP (LBS) DOWN (LBS)

BEARINGS (TYPE / NUMBER):
- ☐ RADIAL /
- ☐ THRUST /

MOTOR DRIVE (CONT) (3.1.5)

REMARKS DRIVER SHALL COVER THE END OF CURVE
REQUIREMENTS FOR TH E IMPELLER SELECTED
PUMPING 1.0 SP GR FLUID

SURFACE PREPARATION AND PAINT

- ● MANUFACTURER'S STANDARD
- ○ OTHER (SEE BELOW)

PUMP:
- ○ PUMP SURFACE PREPARATION
- ○ PRIMER
- ○ FINISH COAT

BASEPLATE: (3.3.18)
- ○ BASEPLATE SURFACE PREPARATION
- ○ PRIMER
- ○ FINISH COAT

SHIPMENT: (4.4.1)
- ○ DOMESTIC ● EXPORT ○ EXPORT BOXING REQUIRED
- ○ OUTDOOR STORAGE MORE THAN 6 MONTHS

SPARE ROTOR ASSEMBLY PACKAGED FOR:
- ○ HORIZONTAL STORAGE ○ VERTICAL STORAGE
- ○ TYPE OF SHIPPING PREPARATION

REMARKS

■ WEIGHTS

MOTOR DRIVEN:
- WEIGHT OF PUMP (LBS) 8147
- WEIGHT OF BASEPLATE (LBS) 5023
- WEIGHT OF MOTOR (LBS)
- WEIGHT OF GEAR (LBS) 0
- TOTAL WEIGHT (LBS)

TURBINE DRIVEN:
- WEIGHT OF BASEPLATE (LBS) N/A
- WEIGHT OF TURBINE (LBS)
- WEIGHT OF GEAR (LBS)
- TOTAL WEIGHT (LBS)

REMARKS

OTHER PURCHASE REQUIREMENTS

- ○ COORDINATION MEETING REQUIRED (6.1.3)
- ○ REVIEW FOUNDATION DRAWINGS (2.1.27)
- ○ REVIEW PIPING DRAWINGS
- ○ OBSERVE PIPING CHECKS
- ○ OBSERVE INITIAL ALIGNMENT CHECK
- ○ CHECK ALIGNMENT AT OPERATING TEMPERATURE
- ○ CONNECTION DESIGN APPROVAL (2.11.3.5.4)

REMARKS:

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OTHER PURCHASER REQUIREMENTS (CONT)

- ○ RIGGING DEVICE REQ'D FOR TYPE OH3 PUMP (5.1.2.7)
- ○ HYDRODYNAMIC THRUST BRG SIZE REVIEW REQ'D (5.2.5.2.4)
- ☐ LATERAL ANALYSIS REQUIRED (5.1.3.3/5.2.4.1)
- ☐ ROTOR DYNAMIC BALANCE (5.2.4.2)
- ☐ MOUNT SEAL RESERVOIR OFF BASEPLATE (3.5.1.4)
- ☐ INSTALLATION LIST IN PROPOSAL (6.2.3L)
- ○ SPARE ROTOR VERTICAL STORAGE (5.2.9.2)
- ○ TORSIONAL ANALYSIS/REPORT (2.6.2.6)
- ● PROGRESS REPORTS REQUIRED (6.3.4)

REMARKS:

QA INSPECTION AND TEST

- ○ REVIEW VENDORS QA PROGRAM (4.1.7)
- ○ PERFORMANCE CURVE APPROVAL
- ○ SHOP INSPECTION (4.1.4)
- ☐ TEST WITH SUBSTITUTE SEAL (4.3.3.1.2)

TEST	NON-WIT	WIT	OBSERVE
HYDROSTATIC (4.3.2)	●	○	○
PERFORMANCE (4.3.3)	○	●	○
NPSH (4.3.4.1)	○	●	○
COMPLETE UNIT TEST (4.3.4.2)	○	○	○
SOUND LEVEL TEST (4.3.4.3)	○	○	○
○ CLEANLINESS PRIOR TO FINAL ASSEMBLY (4.2.3.1)	○	○	○
○ NOZZLE LOAD TEST (3.3.6)	○	○	○
○ BRG HSG RESONANCE TEST (4.3.4.5)	○	○	○
○ REMOVE/INSPECT HYDRODYNAMIC BEARINGS AFTER TEST (5.2.8.5)	○	○	○
○ AUXILIARY EQUIPMENT TEST (4.3.4.4)	○	○	○
● **Final Inspection**	○	●	○
○	○	○	○

- ● MATERIAL CERTIFICATION REQUIRED (2.11.1.7)
  - ● CASING ● IMPELLER ● SHAFT
  - ○ OTHER
- ○ CASTING REPAIR PROCEDURE APPROVAL REQ'D (2.11.2.5)
- ○ INSPECTION REQUIRED FOR CONNECTION WELDS (2.11.3.5.6)
  - ○ MAG PARTICLE ○ LIQUID PENETRANT
  - ○ RADIOGRAPHIC ○ ULTRASONIC
- ○ INSPECTION REQUIRED FOR CASTINGS (4.2.1.3)
  - ○ MAG PARTICLE ○ LIQUID PENETRANT
  - ○ RADIOGRAPHIC ○ ULTRASONIC

QA INSPECTION AND TEST (CONT'D)

- ○ ADDITIONAL INSPECTION REQUIRED FOR: (4.2.1.3)
  - ○ MAG PARTICLE ○ LIQUID PENETRANT
  - ○ RADIOGRAPHIC ○ ULTRASONIC
- ○ ALTERNATE ACCEPTANCE CRITERIA (SEE REMARKS) (4.2.2.1)
- ○ HARDNESS TEST REQUIRED FOR: (4.2.3.2)
- ● WETTING AGENT HYDROTEST (4.3.2.5)
- ○ VENDOR SUBMIT TEST PROCEDURES (4,3.1.2/6.2.5)
- ● RECORD FINAL ASSEMBLY RUNNING CLEARANCES
- ○ INSPECTION CHECK-LIST (APPENDIX N) (4.1.6)

REMARKS

GENERAL REMARKS

REMARK 1:

REMARK 2:

REMARK 3:

REMARK 4:

REMARK 5:

REMARK 6:

ADDITIONAL REMARKS:

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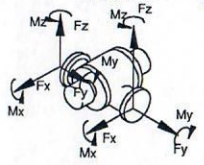
CONNECTION LEGEND

CONNECTION USE		CONNECTION TYPE	
PLUGGED	▲	UNION	⏤
PIPED BY SULZER	●	NPT (FEMALE)	⊕
COVERED BY PROTECTIVE CAP	■	FLANGE	□
OCCUPIED BY INSTRUMENT	○	OPEN CORE	Ø

ITEM	DESCRIPTION	SIZE	USE	TYPE	
PV	PUMP VENT (300# ANSI RF)	0.75"	■	□	2 3
PD	PUMP DRAIN (300# ANSI RF)	0.75"	■	□	2 3
AD1	BEARING BRACKET DRAIN	1.50"	■	⊕	
AD2	BASE DRAIN	2.00"		–	
GD	OIL DRAIN	0.75"	▲	⊕	
GS	CONSTANT LEVEL OILER	0.25"	○	⊕	
GV	SIGHT INSPECTION HOLE COVER	-		–	
FI	SEAL FLUSH - INLET	0.50"	●	⊕	
FO	SEAL FLUSH - SOURCE	0.50"	●	⊕	
NM1	GAGE CONNECTION - SUCTION	0.50"	▲	⊕	2
NM2	GAGE CONNECTION - DISCHARGE	0.50"	▲	⊕	2
TM1	BEARING RTD'S (PROVISION ONLY)	0.50"	▲	⊕	2 5
ZM1	VIBRATION PROBE X (PROVISION ONLY)	0.75"	▲	⊕	2 4
ZM2	VIBRATION PROBE Y (PROVISION ONLY)	0.75"	▲	⊕	2 4

MAXIMUM NOZZLE LOADINGS

8th EDITION

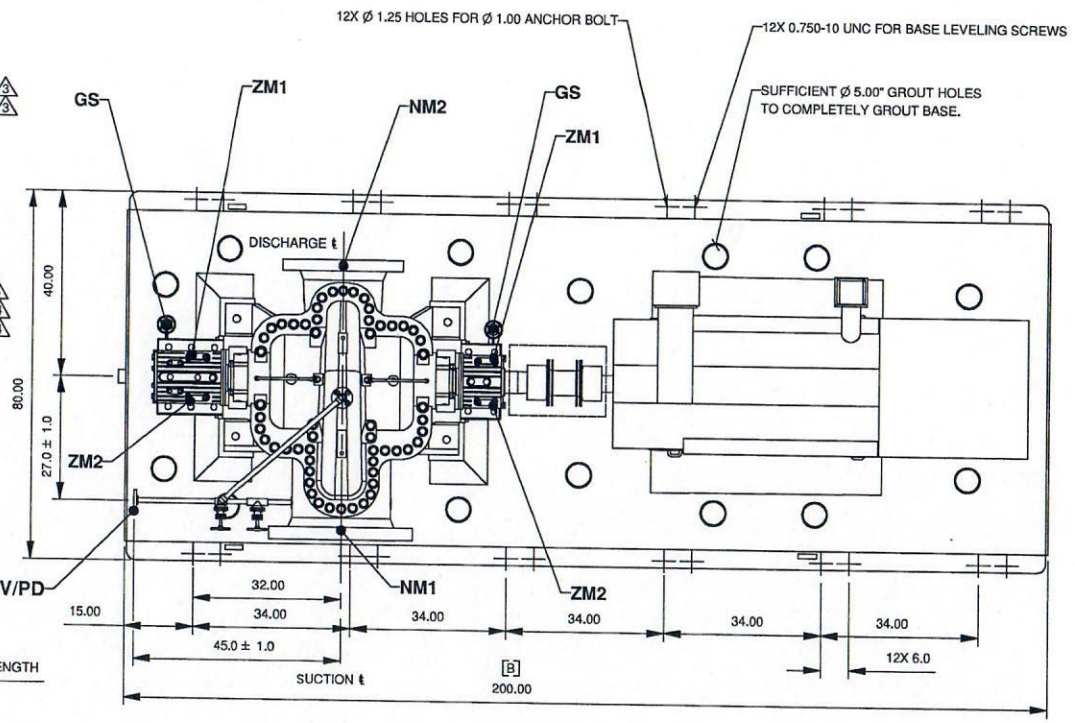


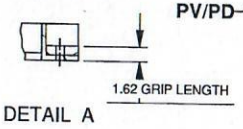
FORCE IN (Lb)
MOMENTS IN (Ft-Lb)

		SUCT	DISCH
FORCE	Fx	2350	1900
	Fy	2850	2300
	Fz	1850	1500
	Fr	4130	3300
MOMENTS	Mx	6850	5400
	My	3450	2700
	Mz	5050	4000
	Mr	9200	7200

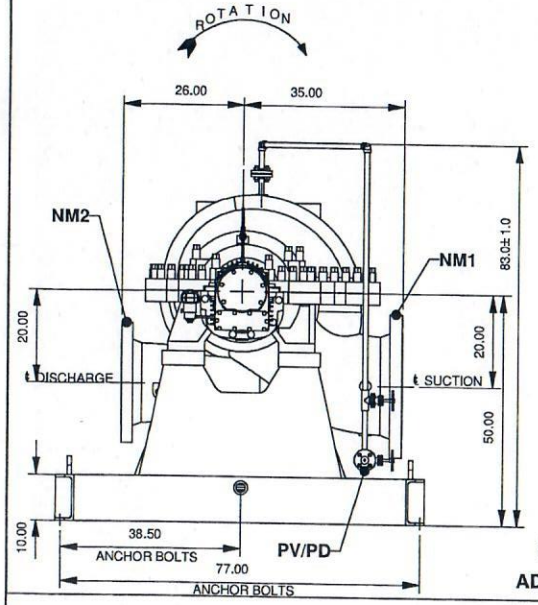
REV:	BY:	APVD:	DATE:	ECR:	DESCR:
B	JH	RWP	06-OCT-04	135250	ADDED OVER-ALL DIM, REVISED MOTOR DIM

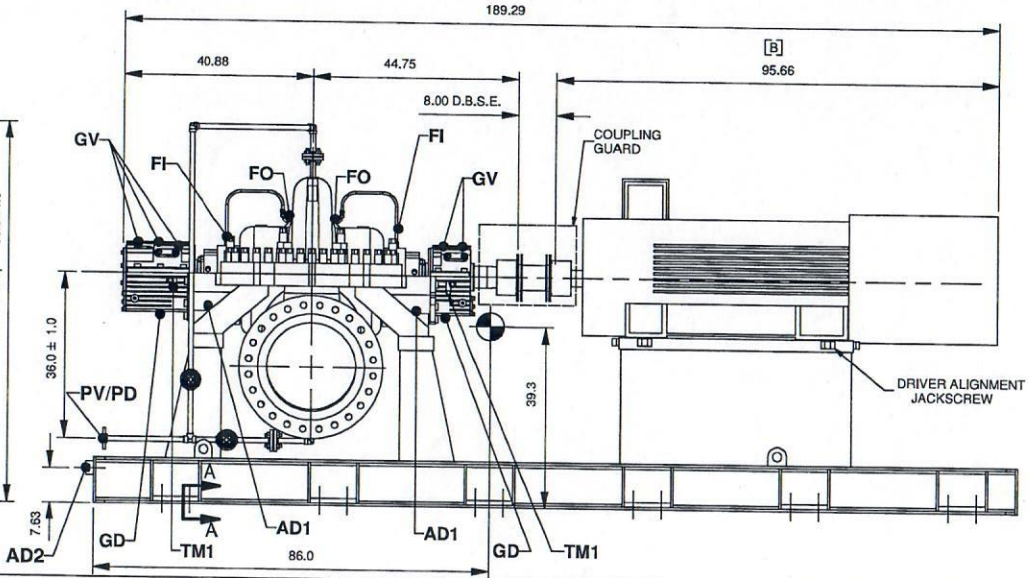
C-01722973-05





DETAIL A





REFERENCE DRAWINGS

B-01722973-08	PUMP X-SECTION & PARTS LIST
B-01722973-09	BEARING X-SECTION & P/L
B-01722973-10	PRIMARY SEAL FLUSH PIPING
B-01722973-11	VENT & DRAIN MANIFOLD PIPING
D-01722973-25	CLEARANCE RECORD

NOTES:

1. **CAUTION!** CAREFULLY CHECK ALIGNMENT BEFORE STARTING UNIT. ALL HOLES IN FLANGES STRADDLE CENTERLINES. UNIT SHOULD BE RELIEVED OF EXCESS PIPING STRAINS.
2. CUSTOMER CONNECTION POINTS.
3. PUMP VENT AND DRAIN ARE MANIFOLDED TO A COMMON CONNECTION, TERMINATION AT EDGE OF BASEPLATE.
4. PUMP SHAFT MATERIAL PER ASTM A434 4140/45.
5. BEARING RTD CONNECTION PROVIDED WITH 0.50" NPT X Ø 0.31" BORE X 9.25" STEM DEPTH

PUMP SPECIFICATIONS

SIZE & TYPE:	16 X 20 X 29 HSA		
SPEED:	1780		
ROTATION:	CCW	(AS VIEWED FROM DRIVER)	
DISCH FLG:	16"	CLASS 300 ANSI	RF
SUCT FLG:	20"	CLASS 300 ANSI	RF
MECH SEAL:	JOHN CRANE		
MFR TYPE:	1648 RS		
API CODE:	BSAHN		

DRIVER SPECIFICATIONS

MOTOR:	RELIANCE		
FRAME:	G5012Z		
HP:	600	SPEED:	1800
PHASE:	3	VOLTAGE:	4160
DIMEN. PRINT:		CYCLE:	60
FURNISHED BY:	SULZER		

APPROXIMATE WEIGHTS

PUMP:	12,500 LBS
BASE:	6,700 LBS
DRIVER:	7,300 LBS
AUXILIARY:	- LBS
TOTAL:	26,500 LBS

CONTRACT DATA

USER:	CHEVRON TEXACO
PURCHASER:	CBI MATRIX
JOB/PROJECT:	ETHANOL DRYER
P.O. NO:	13359
SERVICE:	DRY ETHANOL LOADING PUMPS
INSTALLED AT:	PANAMA

IDENTIFICATION NUMBERS

SULZER SERIAL NO.	CUSTOMER NO'S	
	PUMP	DRIVER
0172297301	21-MP-107A	21-M-107A
0172297302	21-MP-107B	21-M-107B

■ CERTIFIED FINAL
□ CERTIFIED FOR NOZZLE & FOUNDATION ONLY
□ PRELIMINARY ONLY

BY: RWP DATE: 08-JUL-04

SULZER

THIRD ANGLE PROJECTION

UNLESS SPECIFIED DIMENSIONS: INCH [MM]
LINEAR: .X = ± .25 [6] .XX = ± .12 [3]

BY:	JH
APVD:	RWP
DATE:	12-MAY-04
ECR:	134XXX

PUMP & MOTOR
GENERAL ARRANGEMENT
SCALE: - REF: F.O.P.

C-01722973-05

REV B
ICAD

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BEARINGS AND LUBRICATION (CONT)

- ◎ OIL HEATER REQ'D ○ ELECTRIC ○ STEAM (2.9.2.9/5.2.6.3)
- ○ OIL PRESS TO BE GREATER THAN COOLANT PRESS (5.2.6.2.b)

REMARKS

MECHANICAL SEAL OR PACKING

SEAL DATA: (2.7.2)

- ● SEE ATTACHED API-682 DATA SHEET (2.7.2)
- ○ NON-API 682 SEAL (2.7.2)
- ● APPENDIX H SEAL CODE **BSAHN** (2.11.1.1)
- ■ SEAL MANUFACTURER **John Crane**
- ■ SIZE AND TYPE **4.75** / **1648RS-2**
- ■ MANUFACTURER CODE **BP(147)1BD(81)H 316/HC**

SEAL CHAMBER DATA: (2.1.6/2.1.7)

- ◎ TEMPERATURE ____ (°F)
- ◎ PRESSURE ____ (PSIG)
- ◎ FLOW ____ (GPM)
- ☐ SEAL CHAMBER SIZE (TABLE 2.3)
- ☐ TOTAL LENGTH ____ (IN) ☐ CLEAR LENGTH ____ (IN)

SEAL CONSTRUCTION:

- ■ SLEEVE MATERIAL **316 SS**
- ■ GLAND MATERIAL **316 SS**
- ○ AUX SEAL DEVICE (2.7.3.20)
- ◎ JACKET REQUIRED (2.7.3.17)

GLAND TAPS: (2.7.3.14)

◎ FLUSH (F)	◎ DRAIN (D)	◎ BARRIER/BUFF. (B)
◎ QUENCH (Q)	◎ COOLING (C)	◎ LUBRICATION (G)
◎ HEATING (H)	◎ LEAKAGE	◎ PUMPED FLUID (P)
◎ BAL'NCE FLUID (E)	◎ EXTERNAL FLUID INJECTION (X)	

SEAL FLUIDS REQUIREM'T AND AVAILABLE FLUSH LIQUID:

NOTE: IF FLUSH LIQUID IS PUMPAGE LIQUID (AS IN FLUSH PIPING PLANS 11 TO 41), FOLLWING FLUSH LIQUID DATA IS NOT REQ'D.

- ○ SUPPLY TEMPERATURE MAX/MIN ____ / ____ (°F)
- ○ RELATIVE DENSITY (SPECIFIC GRAVITY) ____ @ ____ (°F)
- ○ NAME OF FLUID
- ○ SPECIFIC HEAT, Cp ____ (BTU/LB °F)
- ○ VAPOR PRESSURE ____ (PSIA) @ ____ (°F)
- ○ HAZARDOUS ○ FLAMMABLE ○ OTHER
- ☐ FLOW RATE MAX/MIN ____ / ____ (GPM)
- ☐ PRESSURE REQUIRED MAX/MIN ____ / ____ (PSIG)
- ☐ TEMPERATURE REQUIRED MAX/MIN ____ / ____ (°F)

BARRIER/BUFFER FLUID (2.7.3.21):

- ○ SUPPLY TEMPERATURE MAX/MIN ____ / ____ (°F)
- ○ RELATIVE DENSITY (SPECIFIC GRAVITY) ____ @ ____ (°F)
- ○ NAME OF FLUID

MECHANICAL SEAL OR PACKING (CONT)

- ○ VAPOR PRESSURE ____ (PSIA) @ ____ (°F)
- ○ HAZARDOUS ○ FLAMMABLE ○ OTHER ____
- ☐ FLOW RATE MAX/MIN ____ / ____ (GPM)
- ☐ PRESSURE REQUIRED MAX/MIN ____ / ____ (PSIG)
- ◎ TEMPERATURE REQUIRED MAX/MIN ____ / ____ (°F)

QUENCH FLUID:

- ○ NAME OF FLUID
- ☐ FLOW RATE ____ (GPM)

SEAL FLUSH PIPING: (2.7.3.19 AND APPENDIX D)

- ● SEAL FLUSH PIPING PLAN **11**
- ■ TUBING ◎ CARBON STEEL
- ◎ PIPE ■ STAINLESS STEEL
- ○ AUXILIARY FLUSH PLAN **None**
- ◎ TUBING ◎ CARBON STEEL
- ◎ PIPE ◎ STAINLESS STEEL
- ○ PIPING ASSEMBLY: (3.5.2.10.1)
- ◎ THREADED ◎ UNIONS ◎ SOCKET WELDED
- ◎ FLANGED ◎ TUBE TYPE FITTINGS
- ◎ PRESSURE SWITCH (PLAN 52/53) TYPE ____
- ○ PRESSURE GUAGE (PLAN 52/53)
- ◎ LEVEL SWITCH (PLAN 52/53) TYPE ____
- ○ LEVEL GUAGE (PLAN 52/53)
- ○ TEMP INDICATOR (PLANS 21, 22, 23, 32, 41)
- ○ HEAT EXCHANGER (PLAN 52/53)

REMARKS

PACKING DATA: (APPENDIX C)

MANUFACTURER
TYPE
SIZE ____ NO. OF RINGS ____

- ☐ PACKING INJECTION REQUIRED
- ☐ FLOW ____ (GPM) @ ____ (°F)
- ☐ LANTERN RING

STEAM AND COOLING WATER PIPING

- ◎ COOLING WATER PIPING PLAN ____ (3.5.4.1)
- ☐ COOLING WATER REQUIREMENTS
  - SEAL JACKET/BRG HSG ____ (GPM) @ ____ (PSIG)
  - SEAL HEAT EXCHANGER ____ (GPM) @ ____ (PSIG)
  - QUENCH ____ (GPM) @ ____ (PSIG)
  - TOTAL COOLING WATER ____ (GPM)
- ○ STEAM PIPING: ○ TUBING ○ PIPE

REMARKS

ADDITIONAL REMARKS:

01722973

CBI Matrix Services & Technology

CENTRIFUGAL PUMP (API 610-8TH)
DATA SHEET
U.S. CUSTOMARY UNITS

JOB NO. ### ITEM NO. 21-MP-107A/B
REVISION NO. 0 DATE 3/1/2004
PAGE 2 OF 5 BY gpm

CONSTRUCTION

APPLICABLE STANDARD:
- ● API 610 8TH EDITION
- ○ OTHER _____ (SEE REMARKS)

PUMP TYPE: (1.1.2)

○ OH2	● BB1	○ VS1	○ VS6	
○ OH3	○ BB2	○ VS2	○ VS7	
○ OH6	○ BB3	○ VS3	○ OTHER	
	○ BB4	○ VS4		
	○ BB5	○ VS5		

■ NOZZLE CONDITIONS: (2.3.2)

	SIZE (IN)	FLANGE RATING (LBS)	FAC'G	POSITION
SUCTION	20	300	RF	SIDE
DISCHARGE	16	300	RF	SIDE
BALANCE DRUM				

PRESSURE CASING CONNECTIONS: (2.3.3)

	NO.	SIZE (NPS)	TYPE
■ DRAIN	1	0.75	Skiweld & Flg
■ VENT	1	0.75	In API Plan 11
☐ PRESSURE GAUGE			
☐ TEMP GAUGE			
☐ WARM-UP			
☐ BALANCE / LEAK-OFF			

○ CYLINDRICAL THREADS REQUIRED (2.3.3)

CASING MOUNTING: (SEE SEPARATE SHEET FOR VERTICLES)
- ☐ CENTERLINE ■ NEAR CENTERLINE
- ☐ FOOT ☐ SEPARATE MOUNTING PLATE
- ☐ IN-LINE

CASING SPLIT:
- ☐ AXIAL ■ RADIAL

CASING TYPE:

☐ SINGLE VOLUTE	■ MULTIPLE VOLUTE	☐ DIFFUSER
○ OVERHUNG	● BETWEEN BEARINGS	○ BARREL

CASE PRESSURE RATING:
- ■ MAX ALLOWABLE WORKING PRESSURE 465 (PSIG)
- @ 100 (°F)
- ■ HYDROTEST PRESSURE 700 (PSIG)
- ○ SUCTN PRESS. REGIONS MUST BE DESIGNED FOR MAWP (2.2.4)

ROTATION: (VIEWED FROM COUPLING END)
- ☐ CW ■ CCW
- ● IMPELLERS INDIVIDUALLY SECURED (5.2.2.2)

REMARKS:

○ BOLT OH3 PUMP TO PAD/FOUNDATION (5.1.2.4)

SHAFT:
- ■ SHAFT DIAMETER AT COUPLING 4.75 (IN)

REMARKS: Premcor [Clark] spec 40.01 applies

CONSTRUCTION (CONT)

- ■ SHAFT DIAMETER BETWEEN BEARINGS 5 (IN)
- ■ SPAN BETWEEN BEARING CENTERS 59.5 (IN)
- ■ SPAN BETWEEN BEARING & IMPELLER 29.75 (IN)

REMARKS

COUPLINGS: (3.2.2) DRIVER - PUMP
- ● MAKE Metastream
- ◐ MODEL TSCS-0500
- ☐ RATING (HP/100 RPM) 67
- ● LUBRICATION None
- ◐ LIMITED END FLOAT REQUIRED Integral
- ◐ SPACER LENGTH 8 (IN)
- ◐ SERVICE FACTOR 1

DRIVER HALF COUPLING MOUNTED BY: (3.2.11)
- ● PUMP MFR. ○ DRIVER MFR. ○ PURCHASER
- ○ COUPLING PER API 671 (5.2.7)

BASEPLATES:
- ☐ API BASEPLATE NUMBER N/A (APPENDIX M)
- ○ NON-GROUT CONSTRUCTION: (3.3.13/5.3.7.3.5)

REMARKS: Fabricated steel

MATERIAL

- ● APPENDIX H CLASS S-4 (2.11.1.1)
- ● MIN DESIGN METAL TEMP (2.11.4.5) -20 (°F)
- ■ BARREL/CASE A216 Gr. WCB IMPELLER A216 Gr. WCB
- ■ CASE/IMPELLER WEAR RINGS Cast Iron
- ■ SHAFT A434 Cl BC (AISI 4140)
- ☐ DIFFUSERS
- ■ COUPLING SPACER/HUBS Steel
- ■ COUPLING DIAPHAGMS (DISKS) Stainless Steel

REMARKS:

BEARINGS AND LUBRICATION

BEARING (TYPE/NUMBER):
- ■ RADIAL Split Sleeve /
- ■ THRUST Ball / 7317
- ○ REVIEW AND APPROVE THRUST BEARING SIZE (5.2.5.2.4)

LUBRICATION: (2.10)

◐ GREASE	◐ FLOOD	● RING OIL
◐ FLINGER	○ PURGE OIL MIST	○ PURE OIL MIST

- ○ CONSTANT LEVEL OILER PREFERENCE (SEE REMARKS) (2.9.2.2)
- ○ PRESSURE LUBE SYS (5.2.6) ○ API-610 ○ API-614
- ◐ OIL VISC. ISO GRADE (5.2.6.5)

06/95 SHT 2 OF 5 API610.XLS REV 0