WORLD ENERGY RENEWABLES PROJECT

MECHANICAL EQUIPMENT DATA SHEET FOR 18-P-351A/B

LP ABSORBER RICH AMINE PUMPS

Document Number A8KM-18-096-540081-A

Fluor Project No: A8KM

REV	DATE	DESCRIPTION	PAGES	ORIG	CHK'D	APPV'D
2	10/16/2023	As Built	11	JPE	SJI	CGO
1	8/30/2023	As Built	11	JPE	SJI	CGO
D	11/24/2021	Issued for Purchase	11	CP	JF AD ME	BT
C	9/13/2021	Issued for Quotation	10	JA	JF AD ME	BT
B	8/30/2021	Issued for Client Review - Revised Operating Conditions	10	JA	JF AD ME	BT
A1	8/24/2021	Issued for Internal Review - Revised Operating Conditions	10	JA	JF	
A	1/19/2021	Issued for Internal Review	10	JDM		

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API 610
CENTRIFUGAL PUMP DATA SHEET

Doc. No.: A8KM-18-096-540081-A

Note: This data sheet has been modified from that in the annex of API Standard 610, 11th Edition.

Contract:	A8KM		
Item No:	18-P-351A/B		
Revision:	2	Date:	16-Oct-23
Unit:	RFJU-B		
P.O. No.:			
Inquiry No.:	4-601F-RQ		
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REV

CLIENT: World Energy Paramount | PROJECT: World Energy Renewables Project

SERVICE : LP Absorber Rich Amine Pump | FACILITY: World Energy Renewables Plant | SITE : Paramount, CA

NO. REQ'D : Two (2) (Note 2.1) | PUMP SIZE : OHH 2-3x8-1 | API TYPE : OH2 | NO. STAGES : One (1)

MANUFACTURER : SULZER | MODEL : OHH | SERIAL NO. : 650955/56

APPLICABLE TO : ○ PROPOSALS ○ PURCHASE ● AS-BUILT

GENERAL

PUMPS OPERATE IN :	N/A	NO. MOTOR DRIVEN :	Two (2)	NO. TURBINE DRIVEN :	N/A
WITH :		PUMP ITEM NO. :	18-P-351A/B	PUMP ITEM NO. :	
GEAR ITEM NO. :	N/A	MOTOR ITEM NO. :	18-P-351AM/BM	TURBINE ITEM NO. :	
GEAR PROVIDED BY :		MOTOR PROVIDED BY :	Pump Supplier	TURBINE PROVIDED BY :	
GEAR MOUNTED BY :		MOTOR MOUNTED BY :	Pump Supplier	TURBINE MOUNTED BY :	
GEAR DATA SHEET NO. :		MOTOR DATA SHEET NO. :	Attached	TURBINE DATA SHEET NO. :	

LIQUID CHARACTERISTICS

	UNITS	MAXIMUM	RATED	MINIMUM
LIQUID TYPE OR NAME:		Rich Amine (Note 2.8)		
VAPOR PRESSURE :	psi (a)		34.2	
RELATIVE DENSITY :			1.045	
SPECIFIC HEAT :	BTU/lbm ºF			
VISCOSITY :	cP		5.22	

SERVICE : CONTINUOUS

*IF INTERMITTENT, NO. OF STARTS / DAY :

CORROSION DUE TO: (6.12.1.9) : Rich Amine

EROSION DUE TO: (6.12.1.9) :

H_2S CONCENTRATION (ppmw) (6.12.1. <600 (Note 2.8)

WET (YES / NO) : YES

CHLORIDE CONCENTRATION (ppmw) NIL

PARTICULATE SIZE (DIA. IN MICRONS

PARTICULATE CONCENTRATION (ppm

MECHANICAL DESIGN TEMPERATURE (300

OPERATING CONDITIONS (6.1.2)

	UNITS	MAXIMUM	RATED	NORMAL	MINIMUM
NPSHa DATUM :		C.L. IMPELLER (Note 2.2)			
PUMPING TEMP.:	°F	160	135.4		
FLOW :	gpm		254.7	231.5	99.3
DISCHARGE PRESS:	psi(g)		129.3		
SUCTION PRESSURE :	psig(g)	93.2	32.8		
DIFFERENTIAL PRESS.:	psi		96.5		
DIFFERENTIAL HEAD :	ft		213.1		
$NPSH_A$:	ft	(Note 2.2)	29.3	Excludes Req'd 3ft Margin	
HYDRAULIC POWER :	hp		14.3		

SITE AND UTILITY DATA (6.1.2)

LOCATION: OUTDOOR | UNHEATED

MOUNTED AT: GRADE ○ TROPICALIZATION REQ'D

ELECTRICAL AREA CLASSIFICATION ○ NON HAZARDOUS

CLASS : CL. I, B/C/D | DIVISION : 2 | TEMP CODE T3C

SITE DATA:

ELEVATION (MSL) 69 ft | BAROMETER : 14.7 psia

RANGE OF AMBIENT TEMPS: MIN. / MAX. 35 / 105 °F

RELATIVE HUMIDITY: MIN. / MAX. : Average = / 54 %

UNUSUAL CONDITIONS :

UTILITY CONDITIONS:

ELECTRICITY :	DRIVERS	HEATING	CONTROL	INSTRUMENTS
VOLTAGE :	460	120	120	24 VDC
PHASE :	3	1	1	
HERTZ :	60	60	60	

COOLING WATER : SOURCE : COOLING TOWER

SUPPLY TEMP. 80 °F | MAX. ALLOW. RETURN TEMP.: 120 °F

NORM. PRESS. 50 psi(g) | DESIGN PRESS. : 120 psi(g)

MAX. RETURN BACKPRESSUR 30 psi(g)

MAXIMUM ALLOWABLE ΔP 20 psi

CHLORIDE CONCENTRATION < 840 ppm | DESIGN T: 150 °F

INSTRUMENT AIRMAX. : psi(g) | MIN. : psi(g)

MECH. DESIGN psi(g) °F

STEAM :

		DRIVERS	HEATING
TEMP :	°F MAX. :		
	MIN. :		
PRESS. :	psig MAX. :		
	MIN. :		

NOTES

2.1 2 x 100% pumps; 1 operating and 1 spare.

2.2 Pump centerline is 19" above top of pump foundation.

A minimum 3-ft. NPSH margin is required at 110% of Rated flow.

2.3 Pump Control Method: Level control valve. Steady-state process operation to maintain the normal liquid level.

2.4 Governing Project Specification: A8KM-PP-000-50626, Centrifugal Pumps for Petroleum and Natural Gas Industries - API 610.

2.5 At Rated conditions, the system static head is 24.2% of total system head (total is inclusive of the control valve).

2.6 Delete.

2.7 When pumped fluid is flashed to atmospheric pressure, the fluid is 0.2 wt% vapor.

2.8 Pump is in amine and wet sour service. Amine concentration in rich amine is 66.2 wt%. CO_2 loading: 0.109 lbmol/lbmol. CO2 concentration estimat nominally <20,000 ppmw. H2S loading is 0.004 lbmol/lbmol. H2S concentration estimated nominally <600 ppmw.

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REV

PERFORMANCE

PROPOSAL CURVE NO.:	OHH 69-1-1-03 Rev	RPM	3520			
TEST CURVE NO.:	M-13403					
IMPELLER DIA.: RATED:	7.45	MAX:	8.23	MIN:	6.6	in
RATED POWER	24.89	hp	EFFICIENCY:		57.6	%
RATED CURVE BEP FLOW: (at rated impeller dia.)					285.5	gpm
MIN. FLOW: THERMAL :		gpm	STABLE :		80.6	gpm
PREFERRED OPERATING REGION: (6.1.12)	199.5	to	342			gpm
ALLOWABLE OPERATING REGION:	80.6	to	342			gpm
MAX. HEAD @ RATED IMPELLER:					241.8	ft
MAX. POWER @ RATED IMPELLER: (6.8.9)					28	hp
NPSHR at CL IMPELLER for RATED FLOW :					8.3	ft
CL PUMP TO LOWER SIDE OF BASEPLATE:					1.58	ft
NPSH MARGIN at RATED FLOW :					21	ft
SPECIFIC SPEED:				gpm,rpm,ft	1029	
SUCTION SPECIFIC SPEED LIMITATIC				gpm,rpm,ft	(Note 3.1)	
SUCTION SPECIFIC SPEED: (6.1.9):				gpm,rpm,ft	9399	
MAX. ALLOW. SOUND PRESS. LEVEL / EST.: (6.1.14) @ 3 ft					85 / 78	dBA
MAX. ALLOW. SOUND POWER LEVEL / EST.: (6.1.14) @ 3 ft					/	dBA
MAX. DISCHARGE PRESSURE: (6.3.2)					202.5	psig
BASIS: (6.3.2.a, b or c)						

DRIVER (7.1.5)

DRIVER TYPE:	INDUCTION MOTOR		
GEAR:	NO		1
VARIABLE SPEED REQUIRED:	NO		1
SOURCE OF VARIABLE SPEED:	N/A		
OTHER:	TEFC / IP55		
MANUFACTURER:	TECO		
NAMEPLATE POWER:	40	hp	1
NOMINAL RPM:	3600		
RATED LOAD RPM:	3550		1
FRAME OR MODEL:	324TS		1
ORIENTATION:	HORIZONTAL		
LUBE:	GREASE		1
BEARING TYPE:	ANTI-FRICTION		
RADIAL: (Qty / Brg. Number)	BALL	6312ZC3	1
THRUST: (Qty / Brg. Number)	BALL	6212ZC3	1
STARTING METHOD:	CLOSED VALVE (UNLOADED) START		
DRIVER DATA SHEET:	ATTACHED		
ACCESSORIES:			

CONSTRUCTION

API PUMP TYPE: **OH2** [Based on API 610 Definitions]

CASING MOUNTING: CENTERLINE

CASING TYPE:

NOZZLE CONNECTIONS: (6.4.2)

	SIZE	FACING	RATING	POSITION
SUCTION	3"	RF	300	END
DISCHARGE	2"	RF	300	TOP

PRESSURE CASING AUX. CONNECTIONS: (6.4.1.2)(6.4.3.1)(6.4.3.2)(6.4.3.12

	NO.	SIZE	TYPE	FACING	RATING	POSITION
BALANCE/LEAK OFF						
DRAIN (Note 3.2)		0.75"	BW	RF	300	BOTTOM
VENT (IF NOT SELF VENT)						
PRESSURE GAUGE	--					
TEMP GAUGE	--					
WARM-UP LINE*						

*VENDOR TO ADVISE WARM-UP FLOW IF REQUIRED: gpm

DRAIN VALVE SUPPLIED BY:	N/A		
DRAINS MANIFOLDED	N/A		
VENT VALVE SUPPLIED BY:			
VENTS MANIFOLDED:	N/A		
THREADED CONNS FOR PIPELINE SERVICE & < 50°C:(6.	N/A		
SPECIAL FITTINGS FOR TRANSITIONING: (6.4.3.3)	NO		
CYLINDRICAL THREADS REQUIRED: (6.4.3.8)	NO		
GUSSET SUPPORT REQUIRED: (6.4.3.10)	YES		
MACHINED AND STUDDED CONNECTIONS: (6.4.3.12)	NO		
TYPE VS6 DRAIN CONN.: (9.3.13.5)	N/A		
DRAIN TO SKID EDGE:	YES		
BOLTING CONFORMANCE:: (6.1.29.1)	YES		
(ISO 261, ISO 262, ISO 724, ISO 965 OR ANSI/ASME B1	ASME B1.1		
SEAL FLUSH CASING CONNS. w/ SECONDARY SEALING REQD: (6.4.3.			
	NO		
AUX. PIPING TERMINATIONS:	RFWN		

CASE PRESSURE RATING:	(Note 3.3)		
MAWP: (6.3.5)	559 psig	@	300 °F
HYDROTEST: (8.3.2.6)	838.5 psig	@	100 °F
Hydrotest at 1.5 x MAWP of the Pump Assembly.			
HYDROTEST OH PUMP AS ASSEMBLY:	YES		
SUCTION PRESS. REGIONS DESIGNED FOR MAWP:	YES		
ROTATION: (VIEWED FROM COUPLING END)			
- IMPELLERS INDIVIDUALLY SECURED:	N/A		
- BOLT OH 3/4/5 PUMP TO PAD / FOUNDATION:	N/A		
- PROVIDE SOLEPLATE FOR OH 3/4/5 PUMPS:	N/A		
ROTOR:			
SHAFT FLEXIBILITY INDEX (SFI): (9.1.1.3)			
FIRST CRITICAL SPEED, WET: (MULTI-STAGE)	N/A RPM		1
COMPONENT BALANCE TO ISO 1940 G1.0: (6.9.4.4)	YES		
SHRINK FIT LIMITED MOVEMENT IMPELLERS: (9.2.2.3)	N/A		
OH3 BACKPULLOUT LIFING DEVICE REQ'D: (9.1.2.6)	NO		

COUPLING & GUARD: (7.2.2)	(Note 3.4 & 3.5)		
MANUFACTURER:	Rexnord		
MODEL:	0644 XTSR 71-XXL		1
RATING: (POWER/100 RPM)			
SPACER LENGTH:	5 in		1
ACTUAL SF AT MOTOR NAMEPLATE:	1.83		1
RIGID:	N/A		
COUPLING WITH HYDRAULIC FIT: (7.2.10)	NO		
COUPLING BALANCED TO ISO 1940-1 G6.3: (7.2.3)	G2.5		
COUPLING WITH PROPRIETARY CLAMPING DEVICE: (7.	N/A		
COUPLING IN COMPLIANCE WITH: (7.2.4)	API 610 COMPLIANT		
COUPLING GUARD STANDARD PER: (7.2.13.a)	ANSI B15.1		
WINDOW ON COUPLING GUARD:	YES		

NOTES

3.1	Suction specific speeds greater than 11,000 for hydrocarbons and 9,000 for water (USC units) require specific approval by the Buyer.
3.2	Terminate drain piping with gate valve at edge-of-skid.
	Customer connections shall be flanged.
3.3	Nameplate for MAWP at mechanical design temperature.
3.4	Coupling guards shall be non-sparking.
3.5	Pumps are in hazardous service due to H2S content (over 600 ppm), so no socket welded case connections are allowed.
	Butt welded or integrally flanged case connections are required.

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REV

CONSTRUCTION (CONT'D)

MATERIAL (6.12.1.1)

APPENDIX H CLASS:	A-8: 316L SS / 316L SS	NACE	
MINIMUM DESIGN METAL TEMP: (6.12.4.1)	32 °F		
REDUCED HARDNESS MATERIALS REQ'D: (6.12.1.12.1)	NO		
APPLICABLE HARDNESS STANDARD: (6.12.1.12.3)	N/A		
BARREL:			
CASE:	A351 GR. CF3M		
DIFFUSERS:	N/A		
IMPELLER:	A743/A351 GR.CF3M		
IMPELLER / CASE WEAR RIN	A890 Gr 1B/AISI Gr 316L STELLITE 6		
SHAFT:	A276 Type 316 COND. A		
BOWL (IF VS TYPE):			
INSPECTION CLASS: (API/ISO TABLE 14)	LEVEL 2		

BEARINGS AND LUBRICATION (6.10.1)

BEARING (TYPE / NUMBER):			
RADIAL:	BALL / 6310		
THRUST:	BALL / 7311		
REVIEW AND APPROVE THRUST BEARING SIZE: (9.2.5.2.	NO		
LUBRICATION TYPE: (6.11.3)(6.11.4)(9.2.6.1)	RING OIL		
PRESSURE LUBE SYSTEM TO ISO 10438	(9.2.6.4)	N/A	
ISO 10438 DATA SHEETS ATTACHED			
PRESSURIZED LUBE OIL SYSTEM MTD. ON PUMP BASEPL	N/A		
LOCATION OF PRESSURIZED LUBE OIL SYSTEM MOUNTED ON BASEPLAT			
INTERCONNECTING PIPING PROVIDED B	N/A		
OIL VISC. ISO GRADE:	ISO VG 46		
CONSTANT LEVEL OILER: (6.10.2.2)	REQUIRED		

INSTRUMENTATION

SEE ATTACHED API-670 DATA SHEET:	NO	
ACCELEROMETER OR VELOMETER: (7.4.2.		
QUANTITY:		
MOUNTING LOCATIONS:		
DETECTORS REQUIRED:		
THRD'D PROVISIONS ONLY PER ANSI/API 670: (6.10.2.1		
QUANTITY:		
MOUNTING LOCATIONS:		
FLAT SURFACE REQ'D FOR MAGNETIC P/U's: (6.10.2.1	YES	
QUANTITY:		
MOUNTING LOCATIONS:		
VIBRATION PROXIMITY PROBES FOR HYDRODYNAMIC BEARINGS:		
PROVISION-ONLY FOR VIB. PROBES: (7.4.2.2)	NO	
QUANTITY PER RADIAL BEARING:		
QUANTITY PER THRUST BEARING:		
VIBR. MONITORS & CABLES SUPPLIED BY: (7.4.2.4		
TEMP. DETECTORS FOR HYDRODYNAMIC BEARINGS: (7.4.2.3)		
PROVISION-ONLY FOR TEMPERATURE PROBES:	N/A	
RADIAL BEARING TEMPERATURE PROBES:	N/A	
QUANTITY PER RADIAL BEARING:		
THRUST BEARING TEMPERATURE PROBES:	N/A	
QUANTITY PER THRUST BEARING ACTIVE SIDE:		
QUANTITY PER THRUST BEARING INACTIVE SIDE:		
THRD'D T/W's FOR GEARBOX TEMP GAGES: (9.1.3.6)	N/A	
PRESSURE GAGE TYPE:		
TEMP. MONITORS & CABLES SUPPLIED BY: (7.4.2.		

BASEPLATE OR SOLE PLATE

API BASEPLATE NUMBER:	5.5	1
BASEPLATE CONSTRUCTION: (7.3.1	FULL TOP DECKING	
BASEPLATE DRAINAGE: (7.3.1)	Sloped Deck Drain Pan	
MOUNTING:	GROUTED	
NON-GROUT CONSTRUCTION: (7.3.13	NOT REQUIRED	
VERTICAL LEVELING SCREWS:	REQUIRED	1
HORIZONTAL DRIVER POSITIONING SCREW	REQUIRED	
SUPPLIED WITH - GROUT VENT HOLES	YES	1
- DRAIN CONNECTION	YES	1
MOUNTING PADS SIZED FOR BASEPLATES LEVELING: (7.3	YES	1
MOUNTING PADS OR SOLE PLATE TO BE MACHINED: (7.3.	YES	
PROVIDE SPACER PLATE UNDER ALL EQUIP. FEET: (7.3.6)		
OTHER: Furnish two (2) diagonally opposed grounding provisions per Note 6		

NOTES

COATINGS REQ'D: (6.12.1.10)	--
4.1) SYNTHETIC OIL REQ'D: (6.10.2.12)	NO
4.2) PROVISIONS FOR PURE OR PURGE MIST: (6.11.3)	IF STD
4.3) PRESS. / CIRC. LUBE SYSTEM: 9.2.6	
4.4) CONST. LEVEL OILER PREFERENCE: (6.10.2	(Note 4.6)
4.5) Bearing housing isolators shall be Inpro or Equal.	
4.6) Bearing housing oilers shall be Trico 8-oz. constant-level sight fee	
Provide a minimum 1" NPS bullseye level gauge.	
4.7) Oil drains shall be furnished with an ESCO single-piece sight glass	

SEAL SUPPORT SYSTEM MOUNTING

BARRIER/BUFFER RESERV. MTD ON PUMP BASEPL.:(7.5	YES	
IDENTIFY LOCATION ON BASEPLAT		
INTERCONNECTING PIPING BY:	SUPPLIER	
RESERVOIR(S) SHIPPED SEPARATELY:	YES	

MECHANICAL SEAL (6.8)

SEE ATTACHED API 682 DATA SHEET:	SEE PAGE 7	
ADDITIONAL CENTRAL FLUSH PORT: (6.8.9)		
HEATING OR COOLING JACKET REQ'D:		
MAX. CHAMBER PRESS.: (6.8.1 STATIC:	DYN.:	psig
SEAL CATEGORY: (6.8.1)	Category 2 (API-610)	

HEATING AND COOLING

COOLING REQUIRED: (6.1.17	See Page 8 Seals	
COOLING WATER PIPING PLAN:	Plan M	
CLG WATER PIPING CONSTR.:	See Page 8 Seals	
FITTINGS TYPE:	THREADED	1
COOLING WATER PIPING MATERIAL	CS	1
CLG WTR REQMNTS: (BOTH ENDS IF DOUBLE ENDED)		
BEARING HOUSING(S):	gpm	
SEAL SUPPORT: (HX, BUFFER, BARRIER, ETC.)	gpm	
TOTAL COOLING WATER:	1 gpm	1
HEATING MEDIUM:	N/A	
OTHER:		
HEATING MEDIUM PIPING CONSTRUCTION:		

PIPING & APPURTENANCES

MANIFOLD PIPING SYS. FOR PURCHASHER CONN.: (7.5.1.6)		
VENTS:	N/A	
DRAINS:	N/A	
COOLING WATER:	N/A	
TAG ALL ORIFICES: (7.5.2.4)	YES	
SOCKET WELD CONN. ON SEAL GLAND: (7.5.2.8)	NO	

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REV

SURFACE PREPARATION AND PAINT

MANUFACTURER'S STANDARD:	NO
OTHER (SEE BELOW)	YES
SPECIFICATION NUMBEI	A8KM-PP-00-500520-A
PUMP:	
PUMP SURFACE PREPARATIO	
PRIMER:	
FINISH COAT:	
BASEPLATE OR SOLE PLATE:	
SURFACE PREPARATION:	
PRIMER:	
FINISH COAT:	
DETAILS OF LIFTING DEVICES:	Calcs & NDE Req'd for Lifts > 20,000 LBS
SHIPMENT: (8.4.1)	(Note 6.8)
EXPORT BOXING REQUIRED	
OUTDOOR STORAGE UP TO 6 MONTHS:	YES
SPARE ROTOR ASSEMBLY PACKAGED FOR:	
ROTOR STORAGE ORIENTATION: (9.2.8.2)	N/A
SHIP'G & STORAGE CONTAINER FOR VERT. STORAGE: (9.2	N/A
N2 PURGE: (9.2.8.4)	N/A
SPARE PARTS: (Note 6.1)	
START-UP:	YES
NORMAL MAINTENANCE:	YES

WEIGHTS lb

ITEM No.	PUMP	DRIVER	ACCESSORY	BASE	TOTAL
18-P-351A	309	616	718	984	2627
18-P-351B	309	616	718	984	2627

OTHER PURCHASER REQUIREMENTS

COORDINATION MEETING REQUIRED: (10.1.3)	YES
MAXIMUM DISCHARGE PRESSURE TO INCLUDE:	
MAX RELATIVE DENSITY:	YES
OPERATION TO TURBINE TRIP SPEED OR ASD OVERSPEED:	N/A
MAX DIA. IMPELLERS AND / OR NO. OF STAGES:	NO
CONNECTION DESIGN APPROVAL: (9.2.1.4) (BB Pumps)	N/A
TORSIONAL ANALYSIS / REPORT: (6.9.2.10) (REQ'D IF GEAR OR VFD)	N/A
PROGRESS REPORTS:	YES
OUTLINE OF PROCEDURE FOR OPTIONAL TESTS: (10.2.5)	YES
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION: (8.2.1.1)	NO
LATERAL ANALYSIS REQUIRED: (9.1.3.4)(9.2.4.1.3)	N/A
MODAL ANALYSIS REQUIRED FOR VS PUMPS: (9.3.9.2)	N/A
DYNAMIC BALANCE ROTOR ASSEMBLY TO ISO G1.0: (9.2.4.2.3)	NO
INSTALLATION LIST IN PROPOSAL: (10.2.3.l)	NO
VFD STEADY STATE DAMPED RESPONSE ANALYSIS: (6.9.2.3)	N/A
TRANSIENT TORSIONAL RESPONSE: (6.9.2.4)	N/A
BEARING SELECTION & LIFE CALCS PER (6.10.1.1) & (6.10.1.6):	YES
IGNITION HAZARD ASSESSMENT TO EN 13463-1 FOR EXPLOSIVE ATM: (7.2.	N/A
CASING RETIREMENT THICKNESS DWG: (10.3.2.3)	NO
FLANGES REQ'D IN PLACE OF SOCKET WELD UNIONS: (7.5.2.8	YES
INCLUDE PLOTTED VIBRATION SPECTRA FOR PERF. TEST: (6.	YES
CONNECTION BOLTING: (7.5.1.7)	PAINTED
CADMIUM PLATED BOLTS PROHIBITED:	YES
VENDOR TO KEEP REPAIR AND HT RECORDS: (8.2.1.1.c)	YES
VENDOR TO SUBMIT TEST PROCEDURES: (8.3.1.1)	YES
VENDOR SUBMIT INSPECTION CHECK LIST:(8.1.5)	YES
TEST REQUIREMENTS PER 8.3.3.5a THROUGH 8.3.3.5d:	YES
DISASSEMBLE AND INSPECT AFTER TEST: (8.3.3.8)	NO

INSPECTION & TEST

SHOP INSPECTION: (8.1.1)	YES	
PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPME	YES	
TEST WITH SUBSTITUTE SEAL: (8.3.3.2.b)	NO	
MATERIAL CERT. REQUIRED: (6.12.1.8 CASING:	YES	
IMPELLER:	YES	
SHAFT:	YES	
OTHER: See Note 6.3	YES	
CASTING REPAIR PROCED. APPROVAL REQ'D: (6.12.2.5)(6.12.3	Note 6.7	
INSPECTION REQ'D FOR CONN. WELDS: (6.12.3.4.d,e)		
MAG PARTICLE:	NO	
(BW AUX CONN.) RADIOGRAPHY:	YES	
LIQUID PENETRANT:	NO	
ULTRASONIC:	NO	
INSPECTION REQUIRED FOR CASTINGS: (TABLE 14)		
MAG PARTICLE:	NO	
RADIOGRAPHY:	NO	
LIQUID PENETRANT:	YES	
ULTRASONIC:	NO	
HARDNESS TEST REQUIRED: (8.2.2.7) (NACE SERVICES)	NO	
ADDITIONAL SUBSURFACE EXAMINATION: (6.12.1.5)(8.2.1.3)	NO	
FOR:		
METHOD:		
PMI TESTING REQUIRED: (8.2.2.8)	YES	
COMPONENTS TO BE TESTE See Note 6.4		
RESIDUAL UNBALANCE TEST: (J.4.1.2)	N/A	
NOTIFICATION OF SUCCESSFUL SHOP PRELIM. TEST:(8.1.1.c)(8.	NO	1
BASEPLATE TEST: (7.3.21)	NO	1
HYDROSTATIC TEST OF CASING/HEA	NON-WIT	
HYDROSTATIC TEST OF BOWLS & COLUMN: (9.3.13.2)	N/A	
PERFORMANCE TEST:	NON-WIT	
TEST IN COMPLANCE WITH: (8.3.3.2)	8.3.3.2	
TEST DATA POINTS TO: (8.3.3.3)	8.3.3.3	
TEST TOLERANCES TO: (8.3.3.4)	TABLE 16	
NPSH TEST PTS./RETEST: (8.3.4.3.1)(8.3.4.3	N/A	
NPSH TEST-1ST STAGE ONLY: (8.3.4.3.2)	N/A	
NPSH TESTING TO HI 1.6 : (8.3.4.3.3)		
PERFORMANCE TEST LIMITED TO 110% SITE NPSHA: (8.3.3.(	NO	
RETEST ON SEAL LEAKAGE: (8.3.3.2.d)	NO	
RETEST REQUIRED AFTER FINAL HEAD ADJ.: (8.3.3.7.b)(Mult	N/A	
COMPLETE UNIT TEST: (8.3.4.4.1)	N/A	
SOUND LEVEL TEST: (8.3.4.5) FOR INFORMATION ONLY	NON-WIT	
CLEANLINESS PRIOR TO FINAL ASSEMBLY: (8.2.2.6)	NON-WIT	
LOCATION OF CLEANLINESS INSPECTION: @ SUPPLIERS		
NOZZLE LOAD TEST:	NO	
CHECK FOR CO-PLANAR MOUNTING PAD SURFACES:	NON-WIT	
MECH. RUN TEST AT RATED CAPACITY UNTIL OIL TEMP STABLE: (8.3.4.2	NO	
4 HR. MECH RUN TEST AT RATED CAPACITY AFTER OIL TEMP STABLE:	NO	
1 HR. MECH RUN TEST AT RATED CAPACITY: (8.3.4.2.2)	NON-WIT	
BEARING HSG. RESONANCE TEST: (8.3.4.7)	N/A	
STRUCTURAL RESONANCE TEST: (9.3.9.2)	N/A	
REMOVE / INSPECT HYDRODYN. BRGS. AFTER TEST: (9.2.7.	N/A	
AUXILIARY EQUIPMENT TEST: (8.3.4.6)	N/A	
EQUIP. TO BE INCLUDED IN AUX. TESTS		
LOCATION OF AUX. EQUIPMENT TEST		
IMPACT TEST: (6.12.4.3) PER EN 13445	N/A	
PER ASME SECTION VIII	N/A	
REMOVE CASING AFTER TEST:	N/A	

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API 610
CENTRIFUGAL PUMP DATA SHEET

Doc. No.: A8KM-18-096-540081-A

Note: This data sheet has been modified from that in the annex of API Standard 610, 11th Edition.

Contract:	A8KM		
Item No:	18-P-351A/B		
Revision:	2	Date:	16-Oct-23
Unit:	RFJU-B		
P.O. No.:			
Inquiry No.:	4-601F-RQ		
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REV

PRESSURE VESSEL DESIGN CODE REFERENCES

THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER:

CASTING FACTORS USED IN DESIGN: (TABLE 3)

SOURCE OF MATERIAL PROPERTIES:

WELDING AND REPAIRS

THESE REFERENCES MUST BE LISTED BY THE PURCHASER (DEFAULT TO TABLE 11 IF NO PURCHASER PREFERENCE IS STATED)

ALTERNATIVE WELDING CODES AND STANDARDS:

WELDING REQUIREMENT: (APPLICABLE CODE OR STANDARD) **DEFAULT PER TABLE 11**

WELDER/OPERATOR QUALIFICATION:

WELDING PROCEDURE QUALIFICATION:

NON-PRESSURE RETAINING STRUCTURAL WELDING SUCH AS BASEPLATES OR SUPPORTS:

MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION OF PLATE EDGES:

POSTWELD HEAT TREATMENT:

POSTWELD HEAT TREATMENT OF CASING FABRICATION WELDS:

MATERIAL INSPECTION

THESE REFERENCES MUST BE LISTED BY THE PURCHASER DEFAULT TO TABLE 14: **YES**

ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA:

TYPE OF INSPECTION	METHOD	FOR FABRICATIONS	FOR CASTINGS
RADIOGRAPHY			
ULTRASONIC INSPECTION			
MAGNETIC PARTICLE INSPECTION			
LIQUID PENETRANT INSPECTION			
VISUAL INSPECTION (ALL SURFACES)			

NOTES

6.1 Deleted.

6.2 Deleted.

Deleted.

6.3 CMTR's are required for pressure casings & covers, impellers, wear rings & shaft. Include all QA documents in Quality Data Books.

6.4 PMI is required for alloy pressure containing parts, including seal glands, pipe, and valves, per Project Specification A8KM-PP-000-500512-A, Positive Material Identification.

6.5 Mechanical run testing is required for each pump. Mechanical run test shall be one (1) hour at Rated point for single-stage pumps with vibration recordings at 10-minute intervals, and four (4) hours for multi-stage pumps with plotted vibration spectra at 30 minute intervals.

Deleted.

6.6 Deleted.

6.7 Minor defects of a surface nature in the pressure casting (amounting to less than 20% of the wall thickness and less than 10 in^2 [65 cm^2] in total area) may be repaired without Buyer's approval. See Project Pump Specification A8KM-PP-000-50626-A.

6.8 Export Boxing is required for Ocean Transit only. Supplier shall include as applicable to their scope and place of manufacture in relation to destination of equipment. All boxing shall be protective of the weather elements.

6.9 Baseplate grounding tabs shall be 1/4" thick steel with at least one (1) 9/16" dia. hole provided. If two (2) are provided, they shall be 9/16" dia. spaced 1-3/4" on center. Where Stainless Steel grounding pads are provided, they shall be threaded with one (1) 1/2"-13 hole, or either two (2), or four (4), 1/2"-13 holes, all spaced 1-3/4" on center.

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API 682 MECHANICAL SEAL DATA SHEET

Doc. No.: A8KM-18-096-540081-A

Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)

Contract:	A8KM		
Item No:	18-P-351A/B		
Revision:	2	Date:	16-Oct-23
Unit:	RFJU-B		
P.O. No.:			
Inquiry No.:	4-601F-RQ		
Sheet	7	of	11

REV

Client: World Energy Paramount — Project: World Energy Renewables Project

Service: LP Absorber Rich Amine Pump — Facility: World Energy Renewables Plant

No. Seals Required per Pump: — Site: Paramount, CA

NOTES: Information Below to be Completed ○ By Purchaser ■ By Manufacturer ☒ By Manufacturer or Purchaser

Seal Specification - (Ref. 4.1, Figures 1 to 6)

CATEGORY: ○ Seal Category 1 ● Seal Category 2 ○ Seal Category 3 ■ Seal Code (Annex D) 23A-FIN-048-11/53B (2)

TYPE (CODE CW): ■ Type A (3.1.90) ☒ Type B (3.1.91) ☒ Alternate Stationary (Type A&B) ☒ Type C (3.1.92) ☒ Alternate Rotating (Type C) ☒ Single Spring (Type A)

ARRANGEMENT		Default Configuration	Alternate Design	Flush Plans (See Annex G)
1 (3.1.2)	Single	☒ 1CW-FX	☒ 1CW-FL ☒ Dist. Flush ☒ Alternative Bush	☒ 01 ☒ 13 ☒ 23 ☒ 50 ☒ 62 02 ☒ 14 ☒ 31 ☒ 51 ☒ 11 ☒ 21 ☒ 32 ☒ 61
2 (3.1.3)	Buffer	Liquid ☒ 2CW-CW	☒ FX ☒ Dist. Flush ☒ Tangential LBO Connection	☒ 01 ☒ 13 ☒ 23 ☒ 41 ☒ 62 ☒ 75 ☒ 02 ☒ 14 ☒ 31 ☒ 52 ☒ 71 ☒ 76
		Gas ☒ 2CW-CS	☒ 2NC-CS ☒ FX ☒ Dist. Flush	☒ 11 ☒ 21 ☒ 32 ☒ 61 ☒ 72
3 (3.1.4)	Barrier	Liquid ● 3CW-FB	☒ 3CW-BB ☒ FX ☒ 3CW-FF ☒ Tang. LBO Conn.	☒ 01 ☒ 13 ☒ 53A ☒ 54 ☒ 74 ☒ 02 ☒ 14 ■ 53B ☒ 61
		Gas ☒ 3NC-BB	☒ 3NC-FF ☒ 3NC-FB	■ 11 ☒ 32 ☒ 53C ☒ 62

SLEEVE-SHAFT DRIVE: ■ Set-Screw Onto Shaft ☒ Alternative (6.1.3.15) Specify :

MATERIALS (REFERENCE 6.1.6 & ANNEX B) (Note 7.3)

SECONDARY SEALS	SEAL FACES	METAL BELLOWS	SPRINGS	METAL PARTS
☒ FKM ■ FFKM	■ CARBON vs SIC	☒ UNS N10276 (TypeB	■ UNS N10276	■ UNS S31600 / S31635 (2)
☒ Spiral Wound Gasket	☒ SIC vs SIC	☒ UNS N07718 (TypeC	or UNS N06455	☒ UNS N10276
☒ EPM / EPDM ☒ NBR	☒ SS-SIC ☒ RB-SIC	☒ UNS N08020	☒ UNS S31600	☒ UNS N08020
☒ Other :	☒ vs	☒ Other :	or UNS S31635	☒ Other :

MECHANICAL SEAL DATA

○ Seal Vendor : John Crane

○ Data Requirements Form (Annex J)

■ Size / Type : 2.875"/2.375" / 3648

■ Seal Drawing No.: GA-271185-1

■ Vendor's Seal Code : 23A-FIN-048-11/53B

☐ Modified Faces For Pump Performance Test

☐ Alternative Seal For Pump Performance Test

■ Dynamic Sealing Pressure Rating (3.1.27) 375 psig (1)

■ Static Sealing Pressure Rating (3.1.84) : 500 psig (1)

■ Maximum Allowable Temperature (3.1.51) °F (1)

● Min. Design Metal Temperature (6.1.6.11.1 32 °F (2)

☐ Generated Heat at Normal Conditions : BTU/hr (1)

☐ Heat Soak at Normal Conditions : BTU/hr

☐ Total Seal Axial Thrust on Shaft : lb

SEAL CHAMBER DATA (REFERENCE 6.1.2.4)

■ API 610 ☒ ASME B73.1&2 ☒ Cylindrical ☒ Tapered ☒ ISO 3069-C ☒ Other :

○ Bolt-On Chamber (6.1.2.5) ☒ Seal Chamber Flush Port Req'd ☒ Seal Chamber Vent Req'd

☒ Floating Throat Bushing ☒ Fixed Throat Bushing ☒ Chamber Heating ☒ Chamber Cooling

PUMP DATA

■ Manufacturer : Sulzer ■ Model : OHH ■ Size : 2X3X8-1 ■ Case Material : A-8 NACE (1)

Pump Operating Pressure : ● Discharge Press. (Rated) : 96.5 psig ● Suction Press. (Rated) : 32.8 psig

Seal Chamber Press ■ Norm.: 31.9 psig ☐ Min/Max (MDSP 3.1.53 31.9 / 92.31 psig ☐ MSSP (3.1.55) : psig (2)

Shaft: ■ Horizontal ☒ Vertical ■ Diameter : 1.89 ■ Shaft Speed : 3550 RPM (1)

■ Shaft Rotation (Viewed From Driver) : ■ CCW ☐ CW (1)

NOTES

7.1	Pump Supplier shall consult seal Manufacturer for finalization of seal flushing Plans.
7.2	Seal Manufacturer shall consider the Liquid Characteristics and Operating Conditions on sheet 2.
7.3	Seal Manufacturer shall recommend seal face material, elastomers and spring material based on pumped fluid properties.
7.4	Seal and instrumentation Suppliers shall be per the Project Approved Suppliers List, A8KM-PP-000-800081-A.
7.5	Baseplates shall be sized for mounting of seal flush systems on-base. Seal flush systems shall not interfere with pump maintenance.
	Plan 53B systems shall be pre-piped and removed for shipping.
7.6	Deleted.
	Deleted.
7.7	Refer to 8ES-2DG1 - "WEP Instrumentation & Electrical Standard Vendor List," for Instrumentation.

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API 682 MECHANICAL SEAL DATA SHEET

Doc. No.: A8KM-18-096-540081-A

Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)

Contract:	A8KM		
Item No:	18-P-351A/B		
Revision:	2	Date:	16-Oct-23
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FLUID DATA

PUMPED STREAM (PLANS 01, 02, 11, 12, 13, 14, 21, 23, 31, 41)

- ● Type or Name : **Rich Amine** Conc'n : **66.2** %
- ● Dissolved Contaminant ● H_2S : **Note 2.8** ppmw ● Wet
  - ○ Cl_2 : ppm ● Other : **CO_2** @ **Note 2.8** wt%
- ○ Solid Contaminant :
  - ○ Conc'n (Mass Fract. or PPM)
- ● Fluid Temp.: Min °F Norm **135.4** °F Max **160** °F
- ● Spec. Gravity :@ Norm. Temp.: **1.045** @ Min. Temp.:
- ● Vapor Pressure : @ Norm Temp.: **34.2** psi(a)
  - @ Max Temp.: psi(a)
- ○ Atmospheric Boiling Point : °F
- ● Viscosity : Normal **5.22** cP Max.: cP

- ● Hazardous ○ Flammable ○
- ○ Fluid Solid at Ambient ○ Solidifies @ °F
  - ○ Pour Point : °F
- ○ Pumped Stream Solidifies Under Shear
- ○ Pumped Stream Contains Agents That Polymerize
  - Specify Agents : @ Temp : °F
- ○ Pumped Stream Can Plate Out or Decompose :
  - Specify Conditions :
- ● Pumped Stream is Regulated For Fugitive or Other Emissions
  - Regulation Level : wt% 2
- ○ Special Pump Cleaning Procedures D
- ○ Alt. Process Fluids (incl. Commissioning) Specify :

FLUSH FLUID (PLAN 3

- ○ Type or Name : Conc'n : %
- ○ Seal Vendor Review Required
- ○ Fluid Temp :Min °F Norm °F Max °F
- ○ Spec. Gravity :@ Norm. Temp.: @ Max. Temp

- ○ Vapor Press @ Norm. Temp psi(a) @ Max. Temp: psi(a)
- ○ Viscosity @ Normal Temperature cP
- ○ Atmospheric Boiling Poin °F
- ☐ Flow Rate Req'd Max. / Min.: / gpm
- ☐ Pressure Req'd Max. / Min.: / psig

QUENCH MEDIUM (PLAN 62)

- ☒ Type or Name :

- ☒ Supply Temperature Max. / Min. : / °F
- ☐ Flow Rate Req'd (@STP for gas) Max. / Min / gpm

BUFFER / BARRIER MEDIUM (PLAN 52, 53, 54, 72, 74)

- ■ Type or Name : **50% Glycol/50% Water**
- ● Purchaser Selection ☐ Seal Vendor Selection
- ● Seal Vendor Review ☐ Purchaser Review
- ☐ Flow Rate Req'd (@STP for Gas) Max. / Mir / gpm
- ☒ Supply Pressure Max. / Min.: / psig
- ☒ Fluid Temperature :
  - Min.: °F Normal : °F Max.: °F

- ☒ Specific Gravity:
  - @ Normal Temperature : @ Max. Temp. : 2
- ☒ Vapor Pressure at :
  - Normal Temp. psia Max. Temp.: psia
- ☒ Atmospheric Boiling Point : °F
- ☒ Viscosity at Normal Pump Temperature : cP
- ☒ Specific Heat Capacity at Const. Press.: BTU/lb°F
- ■ Cooling / Heating Required :

SITE AND UTILITIES

- ● Control Voltage : V : **120** Ph : **1** Hz : **60**
- ● Area Class: Cl.: **I** Gr.: **B/C/D** Div.: **2**
- ● Design Ambient (Min. / Max.) : **35** / **105** °F
- ○ ATEX (Ex Directive 94/9/EC) : Gr.: Cat.: T-CLASS: **T3C**

- ● Cooling Water Supply Temp. Norr **80** °F ● Cl_2 : **< 840** ppmw
- ● Cooling Water Supply Press. Norm./Design: **50** / **120** psi(g)
- ● Cooling Water Allowable Pressure Drop **20** psi
- ● Cooling Water AllowableTemp. Rise : **40** °F

ACCESSORIES (Clauses 8 and 9)

GENERAL

- ○ Joint User / Vendor Layout of Equipment (8.1.3)
- ○ Pipe Taper Threads (8.2.13) ○ ISO 7 ○ ASME B1.20.1
- ○ Special Requirements For Hazardous Service
  - Define :
- ○ Special Cleaning and Decontamination Requirements
- ○ Utility Manifold Connections Required (8.2.24)
- ○ Type and Spec. of Heat Tracing (8.3.9.1.1) :
- ○ Thermal Relief Valves Required (9.8.3)

PLAN 11, 12, 13, 14, 21, 23, 31, 32 and 41 SYSTEMS

- ● Connecting Line Supplier : **PUMP SUPPLIER**
  - ○ Tubing ● Piping (8.3.5.2) **(Note 8.2)**
- ● Restriction Orifice Nipple in Flush Line (8.3.5.4)
- ○ Cyclone Seperator Supplier :
- ○ Plan 32 Equipment Supplier :
- ○ Plan 32 Flow Indicator ○ Plan 32 Temp. Indicator
  - ○ Plan 23 Temp. Indicator

COOLING SYSTEMS (PLAN 21,22,23,41,52,53B,53C) (Note 8.4)

- ● Heat Exchanger Supplier
  - ■ Water Cooled ☒ Air Cooled ○ ISO 15649
- ☒ Equipment Reference / Code :
- ● Cooling Water Line Supplier: **PUMP SUPPLIER**
  - ○ Tubing ○ Galvanized Piping (8.2.21) ● Gal CS Piping 2
- ● Sight Flow Indicators (8.2.22) ○ Open ● Closed
- ■ Cooling Water Flow Requirement & Equipment Pressure Drop: **(If Req'd)**
  - ☐ Primary Equipment : gpm ΔP : psi
  - ■ Secondary Equipment : **1** gpm ΔP : psi 2

PLAN 72 and 74 SYSTEMS

- ○ Equipment Supplier :
- ○ High Flow Alarm Switch (8.3.10.5)

PLAN 75 and 76 SYSTEMS

- ○ Equipment Supplier :
- ○ High Level Alarm Switch For Plan 75 (8.3.9.3.3)
- ○ Test Connection (8.3.9.3.4)

NOTES

8.1	**Pump Supplier has unit responsibility for the furnishing of all instruments & equipment associated with seal flush Plans.**
8.2	**Primary seal flush piping shall be 300# ANSI RF flanged, schedule 160 minimum.**
8.3	**Orifice size shall be stamped on each orifice, with direction of flow indicated. Orifice assembly shall be tagged with Buyer's orifice tag number.**
8.4	**Cooling water piping to follow Material Pipe Class TAAG2.**

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API 682 MECHANICAL SEAL DATA SHEET

Doc. No.: A8KM-18-096-540081-A

Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)

Contract:	A8KM		
Item No:	18-P-351A/B		
Revision:	2	Date:	16-Oct-23
Unit:	RFJU-B		
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ACCESSORIES (Clauses 8 and 9) CONTINUED

PLAN 52 AND 53 SYSTEMS (See Pages 7-9 Notes)

- ■ Standard (Fig. G.35) ☒ Alternative (Fig. G.36)
- ☐ Dimensional Variations To Standard Figure G.35 :
- ☐ Dimensional Variations To Standard Figure G.36 :
- ☒ Alternative Fabrication Standard :
- ● Primary Equipment Supplier : PUMP SUPPLIER
- ☐ Supplier Reference / Code :
- ● Connecting Line Supplier : PUMP SUPPLIER
  - ● Tubing ○ SCH. 80 Piping (8.2.9)
- ● Equipment Support Supplier : PUMP SUPPLIER
- ● Filling System Supplier : BUYER
- ● ASME Code Stamp Required Req'd for All Plan 53 Services

- ○ EN 13445 or Other Code Applicable
- ■ Reservoir Capacity (8.3.6.2.5a) : 10 gal 2
- ☒ NLL to Gland Plate Height (8.3.6.2.2) : ft
- ■ Reservoir MAWP (3.1.52) 3000 psig @ 200 °F 2
- ☒ Set Pressure Range, Max. / Min. / psig
- ■ System Hold-Up Period (Plans 53B & 53C) : TBD days
- ● Temperature Indicator (Plan 53B & 53C)
- ● Pressure Alarm Setting (8.3.6.2.3) to Activate on :
  - ☒ Rising Pressure (Arr 2) Set at : psig
  - ■ Falling Pressure (Arr 3) Set at : psig
- ☒ Low Level Alarm Setting Required
- ☒ High Level Alarm Setting Required (8.3.6.2.4)
- ○ Test Based H / Q Curve For Internal Circulating Device
- ○ External Circulating Pump (8.3.7)

INSTRUMENTATION

- ● User Specification Reference For Instrumentation / Controls : (Note 7.4)

Pressure Gauges (9.4)

- ● Oil Filled Pressure Gauges (9.4.3)

Pressure Transmitters (9.5.2) ○ Switches in Lieu of Transmitters

Level Transmitters (9.5.3) ○ Switches in Lieu of Transmitters

○ Hydrostatic (Std. Option, 9.5.3) ○ Capacitance ○ Ultrasonic

Level Indicators (9.6)

○ Weld Pad (Std. Option, 9.6.1) ○ External, Removable (9.6.2)

Flow Instruments (9.7) : ○ Transmitters (9.5.4)

INSPECTION AND TESTING

- ○ Purchaser Participation in Inspection & Test
  - Specify :
- ○ Inspector's Check List (10.1.7 & Annex H)
- ○ Purchaser Approval Req'd For Welded Connection Design (6.1.6.10.5)
- ○ Hardness Test (10.2.3k) Required For : N/A

- ○ 100% Inspection of All Welds (6.1.6.10.5) Using :
  - ○ Magnetic Particle ○ Liquid Penetrant
  - ○ Radiographic ○ Ultrasonic
- ○ Optional Qualification Testing Required (10.3.2)
- ☒ Mod. Faces For Pump Test (10.3.6.1), Seal Page 1, Line 32
- ☒ Alternate Seal Pump Test (10.3.6.2), Seal Page 1, Line 33

NOTES

9.1 Seal flush systems and supports shall meet load requirements per Project specification A8KM-PP-000-40002-A, Structural Data For Mechanical Equipment ar A8KM-PP-000-20001-A, Plant Site Data Sheet.

9.2 (Omitted)

9.3 Seal Data Sheets are in the API-682, 3rd Edition format. Paragraph references are to API-682, 4th Edition. Pump seals shall be in full compliance with API-682, 4th Edition.

FLUOR / world energy	**LOW VOLTAGE MOTOR (IEEE 841) DATA SHEET U.S. CUSTOMARY UNITS**	**Contract:**	**A8KM**
		Item No:	**18-P-351AM/BM**
		Revision:	**2** **Date:** **16-Oct-23**
	APPLICABLE MOTOR SPECIFICATION A8KM-PP-000-50670-A	**Unit:**	**RFJU-B**
		RFQ / P.O. No.:	
	Doc. No.: A8KM-18-096-540081-A	**Sheet**	10 **of** 11

APPLICABLE TO ○ PROPOSAL ○ PURCHASE ● AS BUILT

CLIENT: **World Energy Paramount** SERVICE **LP Absorber Rich Amine Pump**

PLANT: **World Energy Renewables Plant** MOTOR TAG NO. / NO. REQ'D **18-P-351AM/BM** / **Two (2)**

SITE: **Paramount, CA** DRIVEN EQUIPMENT TYPE / TAG NO. **Centrifugal Pump** / **18-P-351A/B**

DESIGN DATA AND ACCESSORY EQUIPMENT

NAMEPLATE **40** HP **1.15** S.F. **3550** RPM POWER (VOLTAGE/PHASE/HERTZ) **460** / **3** / **60** 1

ROTATION (WHEN FACING MOTOR OPPOSITE DRIVE END): ○ CW ○ CCW **Fans shall be bi-directional**

INSULATION CLASS: ○ B ● F ○ H ○ VPI TEMP. RISE **CLASS B** / ____ °C over **40** **°C** **AMBIENT**

AREA CLASSIFICATION: ● CLASS **I** , GROUP **B/C/D** DIV. **2** ● T-RATING **T3C** / ____ °F

○ UNCLASSIFIED ○ ____

LOCATION: ○ INDOOR ● OUTDOOR ○ SHELTERED UNUSUAL CONDITIONS: ○ DUST ○ OTHER ____

AMBIENT TEMPERATURE: MAX **105** °F / MIN. **35** °F ALTITUDE **69** ft

ENCLOSURE: ● TOTALLY-ENCLOSED FAN-COOLED ○ TOTALLY-ENCLOSED NONVENTILATED ○ EXPLOSION PROOF

MOUNTING METHOD: ● FOOT ○ FLANGE, TYPE: ____

MOUNTING ARRANGEMENT: ● HORIZONTAL ○ VERTICAL SHAFT DOWN ○ VERTICAL SHAFT UP

BEARING TYPE: ● BALL ○ ROLLER BEARING LUBRICATION: ● GREASE ○ OIL ○ PURE OIL MIST

CONNECTION TO LOAD: ● DIRECT CONNECTED ○ V-BELT ○ THROUGH GEAR ○ CLOSE COUPLED

EQUIPMENT OPERATION: ● CONTINUOUS ○ SPARED CONTINUOUS ○ INTERMITTENT-CYCLES / DAY ____

SOUND PRESSURE LEVEL REQUIREMENTS: **85** dBA @ **3** FEET

STARTING: ● FULL VOLTAGE ● REDUCED VOLTAGE, **80** % OF VOLTAGE **Starting Voltage Dip Allowance**

○ UNLOADED ● LOADED ○ CAPACITORS FOR POWER FACTOR CORRECTION

○ SPACE HEATERS ____ V ____ PHASE ____ °F MAX. TEMP 2

● OVERSIZE TERMINAL BOX ● DRAIN PLUGS

● SS NAMEPLATE ○ AUXILIARY NAMEPLATE

TEST ● ROUTINE ○ COMPLETE ● VIBRATION ● REPORT ● FOOT FLATNESS

REMARKS: **10.1) This data sheet applies to motors 1/2 hp through 500 hp with anti-friction bearings.**

~~**10.2) Space heaters are required for 100 hp and above. Space heaters shall be rated at 240V/1 ph./60Hz for operation at 120V.**~~ 2

10.3) IP55 degree of protection is required. 10.4) Average relative humidity is 54%.

INFORMATION BELOW TO BE COMPLETED BY VENDOR

MOTOR MFR. **TECO** MODEL ____ SERIAL NO. ____

NAMEPLATE HP **40** FULL LOAD RPM **3550** FRAME **324TS** WEIGHT **616** LB 1

MOTOR OUTLINE DRAWING NO. ____

ROTOR CAGE MATERIAL OF CONSTRUCTION ____ MOTOR WINDING MATERIAL ____

BEARING MANUFACTURER ____ SIZE ____

VERTICAL MOTOR THRUST BEARING: TYPE ____ CAPACITY: UP ____ LBS DOWN ____ LBS LOCATION ____

LOAD	FULL	3/4	1/2	OTHER
AMPERES				
EFFICIENCY, %				
POWER FACTOR				
SPEED, RPM				

LOCKED ROTOR AMPS* ____ AMPS

FULL LOAD TORQUE* ____ FT-LB

LOCKED ROTOR TORQUE* ____ %

PULL UP TORQUE* ____ %

BREAKDOWN TORQUE* ____ %

ACCEL. TIME W/ LOAD (0 TO FULL SPEED)* ____ SEC.

STALL TIMES AT ZERO RPM* - HOT / COLD ____ / ____ SEC.

NUMBER OF CONSECUTIVE STARTS* ____

SOUND LEVEL: GUARANTEED ____ dBA / EXPECTED ____ dBA

FAN MATERIAL ____ (NON-SPARKING)

* INDICATED AT RATED VOLTAGE

INFORMATION BELOW TO BE PROVIDED BY VENDOR AFTER PURCHASE (REFER TO RFQ/PO DOCUMENTS)

○ SAFE TIME - CURRENT CURVE

○ SPEED - TORQUE CURVE

○ SAFE LOCKED ROTOR TIME HOT ____ COLD ____

MAX. SURFACE TEMP. DURING NORMAL STARING OR OPERATION OF:

○ ROTOR ____ °F ○ STATOR ____ °F ○ ENCLOSURE ____ °F

NOTES:

10.5 **Motor nameplate shall indicate service factor, area classification and T-rating. T-rating relates to both external and internal components.**

10.6 **Provide accessory loads on submittal documents, e.g. Volts, HP, kVA, etc.**

10.7 **All motors, regardless of installed location, must be Class I, Division 2, Groups B,C,D, Temperature Code T3C, for project uniformity.**

10.8 **Motor shall have oversized terminal boxes.**

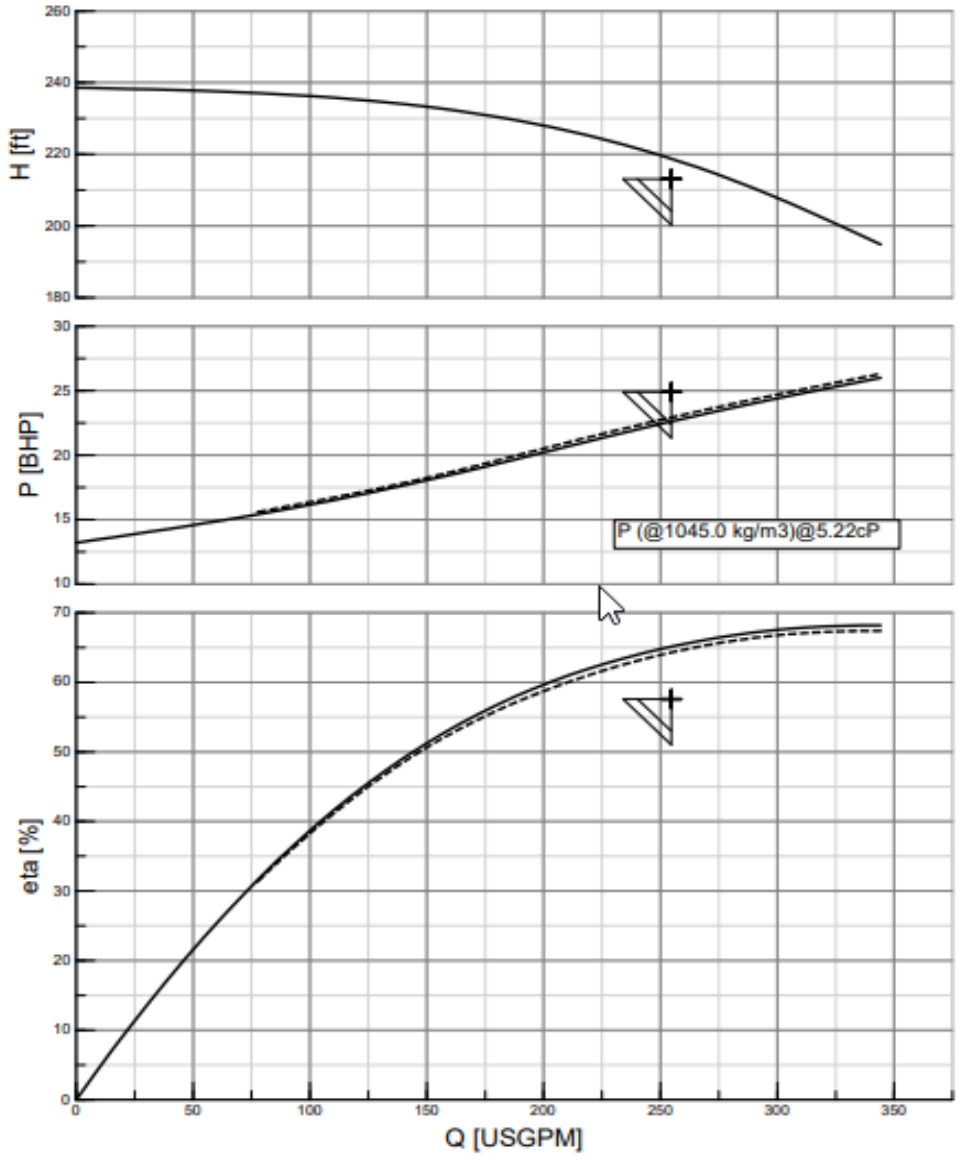
FLUOR / world energy	PUMP DATASHEET ANNEX	Contract:	A8KM	
		Item No:	18-P-351A/B	
		Revision:	2	Date: 16-Oct-23
		Unit:	RFJU-B	
		P.O. No.:		
		Inquiry No.:	4-601F-RQ	
		Sheet 11 of 11		REV 2

TEST PUMP CURVE

SULZER

Curva de prueba / Test Curve: M-13403		1er Paso / 1st Stage	Series / Series
Cliente / Customer: Air Products and Chemicals Inc.	Impulsor / Impeller	0-104203636	
Orden Compra: 4505610423	Modelo / Pattern	213OHH-03	
No. Identif. / Ident No.: 18-P-351A	Difusor / Diffuser	1-104068168	
No. Serie. / Item No.: 650965	Modelo / Pattern	214OHH-02	
Nombre / Name: Gerardo Endoqui	D2 Diseño / D2 design: ø7.45 in	Veras / Vane: Ø 7.45 in	
Fecha / Date: 2022-09-07	D2 min. / D2 min.: ø6.63 in		
	D2 max. / D2 max.: ø8.23 in		

No. Or: 100462910-0020-01	
Sulzer Comm.Nr.	
Tipo / Type: 2x3x8-1 OHH	
Reporte No. / Test Report No.: 201/22	Fecha / dated: --
n= 3550 1/min.	i= 1 Stufen / Stages
DN_s 3 in	DN_d 2 in



F-BP-002