



WORLD ENERGY PARAMOUNT
World Energy Renewables Project
Paramount, California

MECHANICAL EQUIPMENT DATASHEET
Document Number A8KM-18-096-540081-A
Rev. D, 24-Nov-2021

EN203076-FLUOR-LD1-00177



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



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		
REV	DATE	DESCRIPTION	PAGES	ORIG	CHK'D	APPV'D

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 		API 610 CENTRIFUGAL PUMP DATA SHEET		Contract: A8KM		
				Item No: 18-P-351A/B		
		Doc. No.: A8KM-18-096-540081-A		Revision: 2		Date: 16-Oct-23
		Note: This data sheet has been modified from that in the annex of API Standard 610, 11th Edition.		Unit: RFJU-B		P.O. No.:
		Inquiry No.: 4-601F-RQ		Sheet 2 of 11		
				REV		



1	CLIENT: World Energy Paramount		PROJECT: World Energy Renewables Project																
2	SERVICE: LP Absorber Rich Amine Pump		FACILITY: World Energy Renewables Plant SITE: Paramount, CA																
3	NO. REQ'D: Two (2) (Note 2.1)		PUMP SIZE: OHH 2-3x8-1	API TYPE: OH2 NO. STAGES: One (1)															
4	MANUFACTURER: SULZER		MODEL: OHH	SERIAL NO.: 650955/56															
5	APPLICABLE TO: <input type="radio"/> PROPOSALS <input type="radio"/> PURCHASE <input checked="" type="radio"/> AS-BUILT																		
7	GENERAL																		
8	PUMPS OPERATE IN:	N/A	NO. MOTOR DRIVEN:	Two (2)															
9	WITH:		PUMP ITEM NO.:	18-P-351A/B															
10	GEAR ITEM NO.:	N/A	MOTOR ITEM NO.:	18-P-351AM/BM															
11	GEAR PROVIDED BY:		MOTOR PROVIDED BY:	Pump Supplier															
12	GEAR MOUNTED BY:		MOTOR MOUNTED BY:	Pump Supplier															
13	GEAR DATA SHEET NO.:		MOTOR DATA SHEET NO.:	Attached															
14	LIQUID CHARACTERISTICS																		
15	UNITS	MAXIMUM	RATED	MINIMUM															
16	LIQUID TYPE OR NAME:	Rich Amine (Note 2.8)																	
17	VAPOR PRESSURE: psi (a)		34.2																
18	RELATIVE DENSITY:		1.045																
19	SPECIFIC HEAT: BTU/lbm °F																		
20	VISCOSITY: cP		5.22																
21	OPERATING CONDITIONS (6.1.2)																		
22	UNITS	MAXIMUM	RATED	NORMAL															
23	NPSHa DATUM:	C.L. IMPELLER (Note 2.2)																	
24	PUMPING TEMP.: °F	160	135.4																
25	FLOW: gpm		254.7	231.5															
26	DISCHARGE PRESS: psi(g)		129.3																
27	SUCTION PRESSURE: psig(g)	93.2	32.8																
28	DIFFERENTIAL PRESS: psi		96.5																
29	DIFFERENTIAL HEAD: ft		213.1																
30	NPSH _A : ft	(Note 2.2)	29.3	Excludes Req'd 3ft Margin															
31	HYDRAULIC POWER: hp		14.3																
32	SITE AND UTILITY DATA (6.1.2)																		
33	LOCATION:		COOLING WATER: SOURCE: COOLING TOWER																
34	<input checked="" type="radio"/> OUTDOOR	<input checked="" type="radio"/> UNHEATED	SUPPLY TEMP.: 80 °F MAX. ALLOW. RETURN TEMP.: 120 °F																
35	MOUNTED AT: <input checked="" type="radio"/> GRADE <input type="radio"/> TROPICALIZATION REQ'D		NORM. PRESS.: 50 psi(g) DESIGN PRESS.: 120 psi(g)																
36	ELECTRICAL AREA CLASSIFICATION <input type="radio"/> NON HAZARDOUS		MAX. RETURN BACKPRESSURE: 30 psi(g)																
37	CLASS: CL. I, B/C/D	DIVISION: 2	TEMP CODE: T3C	MAXIMUM ALLOWABLE ΔF: 20 psi															
38	SITE DATA:		CHLORIDE CONCENTRATION: < 840 ppm DESIGN T: 150 °F																
39	ELEVATION (MSL): 69 ft	BAROMETER: 14.7 psia	INSTRUMENT AIR MAX.: psi(g) MIN.: psi(g)																
40	RANGE OF AMBIENT TEMPS: MIN. / MAX. 35 / 105 °F		MECH. DESIGN: psi(g) °F																
41	RELATIVE HUMIDITY: MIN. / MAX. Average = 54 %		STEAM:																
42	UNUSUAL CONDITIONS:		<table border="1"> <tr> <td></td> <td>DRIVERS</td> <td>HEATING</td> </tr> <tr> <td>TEMP: °F</td> <td>MAX.:</td> <td></td> </tr> <tr> <td></td> <td>MIN.:</td> <td></td> </tr> <tr> <td>PRESS.: psig</td> <td>MAX.:</td> <td></td> </tr> <tr> <td></td> <td>MIN.:</td> <td></td> </tr> </table>			DRIVERS	HEATING	TEMP: °F	MAX.:			MIN.:		PRESS.: psig	MAX.:			MIN.:	
	DRIVERS	HEATING																	
TEMP: °F	MAX.:																		
	MIN.:																		
PRESS.: psig	MAX.:																		
	MIN.:																		
44	UTILITY CONDITIONS:																		
45	ELECTRICITY:	DRIVERS	HEATING	CONTROL															
46	VOLTAGE:	460	120	120															
47	PHASE:	3	1	1															
48	HERTZ:	60	60	60															
50	NOTES																		
51	2.1 2 x 100% pumps; 1 operating and 1 spare.																		
52	2.2 Pump centerline is 19" above top of pump foundation.																		
53	A minimum 3-ft. NPSH margin is required at 110% of Rated flow.																		
54	2.3 Pump Control Method: Level control valve. Steady-state process operation to maintain the normal liquid level.																		
55	2.4 Governing Project Specification: A8KM-PP-000-50626, Centrifugal Pumps for Petroleum and Natural Gas Industries - API 610.																		
56	2.5 At Rated conditions, the system static head is 24.2% of total system head (total is inclusive of the control valve).																		
57	2.6 Delete.																		
58																			
59	2.7 When pumped fluid is flashed to atmospheric pressure, the fluid is 0.2 wt% vapor.																		
60	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. CO ₂ concentration estimate																		
61	nominally <20,000 ppmw. H ₂ S loading is 0.004 lbmol/lbmol. H ₂ S concentration estimated nominally <600 ppmw.																		

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		Sheet		3		of		11		REV	



PERFORMANCE										DRIVER (7.1.5)																																																										
PROPOSAL CURVE NO.: OHH 69-1-1-03 Rev RPM 3520										DRIVER TYPE: INDUCTION MOTOR																																																										
TEST CURVE NO.: M-13403										GEAR: NO																																																										
IMPELLER DIA.: RATED: 7.45 MAX: 8.23 MIN: 6.6 in										VARIABLE SPEED REQUIRED: NO																																																										
RATED POWER 24.89 hp EFFICIENCY: 57.6 %										SOURCE OF VARIABLE SPEED: N/A																																																										
RATED CURVE BEP FLOW: (at rated impeller dia.) 285.5 gpm										OTHER: TEFC / IP55																																																										
MIN. FLOW: THERMAL: gpm STABLE: 80.6 gpm										MANUFACTURER: TECO																																																										
PREFERRED OPERATING REGION: (6.1.12) 199.5 to 342 gpm										NAMEPLATE POWER: 40 hp																																																										
ALLOWABLE OPERATING REGION: 80.6 to 342 gpm										NOMINAL RPM: 3600																																																										
MAX. HEAD @ RATED IMPELLER: 241.8 ft										RATED LOAD RPM: 3550																																																										
MAX. POWER @ RATED IMPELLER: (6.8.9) 28 hp										FRAME OR MODEL: 324TS																																																										
NPSHR at CL IMPELLER for RATED FLOW: 8.3 ft										ORIENTATION: HORIZONTAL																																																										
CL PUMP TO LOWER SIDE OF BASEPLATE: 1.58 ft										LUBE: GREASE																																																										
NPSH MARGIN at RATED FLOW: 21 ft										BEARING TYPE: ANTI-FRICTION																																																										
SPECIFIC SPEED: gpm,rpm,ft 1029										RADIAL: (Qty / Brg. Number) BALL / 6312ZC3																																																										
SUCTION SPECIFIC SPEED LIMITATIC (Note 3.1) gpm,rpm,ft										THRUST: (Qty / Brg. Number) BALL / 6212ZC3																																																										
SUCTION SPECIFIC SPEED: (6.1.9): gpm,rpm,ft 9399										STARTING METHOD: CLOSED VALVE (UNLOADED) START																																																										
MAX. ALLOW. SOUND PRESS. LEVEL / EST.: (6.1.14) @ 3 ft 85 / 78 dBA										DRIVER DATA SHEET: ATTACHED																																																										
MAX. ALLOW. SOUND POWER LEVEL / EST.: (6.1.14) @ 3 ft / dBA										ACCESSORIES:																																																										
MAX. DISCHARGE PRESSURE: (6.3.2) 202.5 psig																																																																				
BASIS: (6.3.2.a, b or c)																																																																				
CONSTRUCTION																																																																				
API PUMP TYPE: OH2 [Based on API 610 Definitions]										CASING MOUNTING: CENTERLINE																																																										
NOZZLE CONNECTIONS: (6.4.2)										CASING TYPE:																																																										
<table border="1"> <thead> <tr> <th></th> <th>SIZE</th> <th>FACING</th> <th>RATING</th> <th>POSITION</th> </tr> </thead> <tbody> <tr> <td>SUCTION</td> <td>3"</td> <td>RF</td> <td>300</td> <td>END</td> </tr> <tr> <td>DISCHARGE</td> <td>2"</td> <td>RF</td> <td>300</td> <td>TOP</td> </tr> </tbody> </table>											SIZE	FACING	RATING	POSITION	SUCTION	3"	RF	300	END	DISCHARGE	2"	RF	300	TOP	OH3 BACKPULLOUT LIFING DEVICE REQ'D: (9.1.2.6) NO																																											
	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)										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.																																																										
<table border="1"> <thead> <tr> <th></th> <th>NO.</th> <th>SIZE</th> <th>TYPE</th> <th>FACING</th> <th>RATING</th> <th>POSITION</th> </tr> </thead> <tbody> <tr> <td>BALANCE/LEAK OFF</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DRAIN (Note 3.2)</td> <td></td> <td>0.75"</td> <td>BW</td> <td>RF</td> <td>300</td> <td>BOTTOM</td> </tr> <tr> <td>VENT (IF NOT SELF VENT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PRESSURE GAUGE</td> <td>--</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TEMP GAUGE</td> <td>--</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>WARM-UP LINE*</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>											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*							HYDROTEST OH PUMP AS ASSEMBLY: YES									
	NO.	SIZE	TYPE	FACING	RATING	POSITION																																																														
BALANCE/LEAK OFF																																																																				
DRAIN (Note 3.2)		0.75"	BW	RF	300	BOTTOM																																																														
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TEMP GAUGE	--																																																																			
WARM-UP LINE*																																																																				
*VENDOR TO ADVISE WARM-UP FLOW IF REQUIRED: gpm										SUCTION PRESS. REGIONS DESIGNED FOR MAWP: YES																																																										
DRAIN VALVE SUPPLIED BY: N/A										ROTATION: (VIEWED FROM COUPLING END)																																																										
DRAINS MANIFOLDED N/A										- IMPELLERS INDIVIDUALLY SECURED: N/A																																																										
VENT VALVE SUPPLIED BY:										- BOLT OH 3/4/5 PUMP TO PAD / FOUNDATION: N/A																																																										
VENTS MANIFOLDED: N/A										- PROVIDE SOLEPLATE FOR OH 3/4/5 PUMPS: N/A																																																										
THREADED CONNS FOR PIPELINE SERVICE & < 50°C: (6.4.3.3) N/A										ROTOR:																																																										
SPECIAL FITTINGS FOR TRANSITIONING: (6.4.3.3) NO										SHAFT FLEXIBILITY INDEX (SFI): (9.1.1.3)																																																										
CYLINDRICAL THREADS REQUIRED: (6.4.3.8) NO										FIRST CRITICAL SPEED, WET: (MULTI-STAGE) N/A RPM																																																										
GUSSET SUPPORT REQUIRED: (6.4.3.10) YES										COMPONENT BALANCE TO ISO 1940 G1.0: (6.9.4.4) YES																																																										
MACHINED AND STUDDED CONNECTIONS: (6.4.3.12) NO										SHRINK FIT LIMITED MOVEMENT IMPELLERS: (9.2.2.3) N/A																																																										
TYPE VS6 DRAIN CONN.: (9.3.13.5) N/A										COUPLING & GUARD: (7.2.2) (Note 3.4 & 3.5)																																																										
DRAIN TO SKID EDGE: YES										MANUFACTURER: Rexnord																																																										
BOLTING CONFORMANCE: (6.1.29.1) YES										MODEL: 0644 XTSR 71-XXL																																																										
(ISO 261, ISO 262, ISO 724, ISO 965 OR ANSI/ASME B1 ASME B1.1										RATING: (POWER/100 RPM)																																																										
SEAL FLUSH CASING CONNS. w/ SECONDARY SEALING REQD: (6.4.3.2) NO										SPACER LENGTH: 5 in																																																										
										ACTUAL SF AT MOTOR NAMEPLATE: 1.83																																																										
AUX. PIPING TERMINATIONS: RFWN										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: (7.2.4) 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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1	CONSTRUCTION (CONT'D)				
2	MATERIAL (6.12.1.1)		BASEPLATE OR SOLE PLATE		
3	APPENDIX H CLASS: A-8: 316L SS / 316L SS	NACE	API BASEPLATE NUMBER: 5.5		1
4	MINIMUM DESIGN METAL TEMP: (6.12.4.1) 32 °F		BASEPLATE CONSTRUCTION: (7.3.1) FULL TOP DECKING		
5	REDUCED HARDNESS MATERIALS REQ'D: (6.12.1.12.1) NO		BASEPLATE DRAINAGE: (7.3.1) Sloped Deck Drain Pan		
6	APPLICABLE HARDNESS STANDARD: (6.12.1.12.3) N/A		MOUNTING: GROUTED		
7	BARREL:		NON-GROUT CONSTRUCTION: (7.3.13) NOT REQUIRED		
8	CASE: A351 GR. CF3M		VERTICAL LEVELING SCREWS: REQUIRED		1
9	DIFFUSERS: N/A		HORIZONTAL DRIVER POSITIONING SCREW: REQUIRED		
10	IMPELLER: A743/A351 GR.CF3M		SUPPLIED WITH - GROUT VENT HOLES YES		1
11	IMPELLER / CASE WEAR RIN A890 Gr 1B/AISI Gr 316L STELLITE 6		- DRAIN CONNECTION YES		1
12	SHAFT: A276 Type 316 COND. A		MOUNTING PADS SIZED FOR BASEPLATES LEVELING: (7.3.4) YES		1
13	BOWL (IF VS TYPE):		MOUNTING PADS OR SOLE PLATE TO BE MACHINED: (7.3.5) YES		
14	INSPECTION CLASS: (API/ISO TABLE 14) LEVEL 2		PROVIDE SPACER PLATE UNDER ALL EQUIP. FEET: (7.3.6)		
15	BEARINGS AND LUBRICATION (6.10.1)		OTHER: Furnish two (2) diagonally opposed grounding provisions per Note 6		
16	BEARING (TYPE / NUMBER):		NOTES		
17	RADIAL: BALL / 6310		COATINGS REQ'D: (6.12.1.10) --		
18	THRUST: BALL / 7311		4.1) SYNTHETIC OIL REQ'D: (6.10.2.12) NO		
19	REVIEW AND APPROVE THRUST BEARING SIZE: (9.2.5.2) NO		4.2) PROVISIONS FOR PURE OR PURGE MIST: (6.11.3) IF STD		
20	LUBRICATION TYPE: (6.11.3)(6.11.4)(9.2.6.1) RING OIL		4.3) PRESS. / CIRC. LUBE SYSTEM: 9.2.6		
21	PRESSURE LUBE SYSTEM TO ISO 10438 (9.2.6.4) N/A		4.4) CONST. LEVEL OILER PREFERENCE: (6.10.2) (Note 4.6)		
22	ISO 10438 DATA SHEETS ATTACHED		4.5) Bearing housing isolators shall be Inpro or Equal.		
23	PRESSURIZED LUBE OIL SYSTEM MTD. ON PUMP BASEPL N/A		4.6) Bearing housing oilers shall be Trico 8-oz. constant-level sight feed		
24	LOCATION OF PRESSURIZED LUBE OIL SYSTEM MOUNTED ON BASEPLAT		Provide a minimum 1" NPS bullseye level gauge.		
25			4.7) Oil drains shall be furnished with an ESCO single-piece sight glass		1
26	INTERCONNECTING PIPING PROVIDED B N/A				
27	OIL VISC. ISO GRADE: ISO VG 46				
28	CONSTANT LEVEL OILER: (6.10.2.2) REQUIRED				
29	INSTRUMENTATION		SEAL SUPPORT SYSTEM MOUNTING		
30	SEE ATTACHED API-670 DATA SHEET: NO		BARRIER/BUFFER RESERV. MTD ON PUMP BASEPL.: (7.3.1) YES		
31	ACCELEROMETER OR VELOMETER: (7.4.2)		IDENTIFY LOCATION ON BASEPLAT		
32	QUANTITY:				
33	MOUNTING LOCATIONS:		INTERCONNECTING PIPING BY: SUPPLIER		
34	DETECTORS REQUIRED:		RESERVOIR(S) SHIPPED SEPARATELY: YES		
35	THRD'D PROVISIONS ONLY PER ANSI/API 670: (6.10.2.1)		MECHANICAL SEAL (6.8)		
36	QUANTITY:		SEE ATTACHED API 682 DATA SHEET: SEE PAGE 7		
37	MOUNTING LOCATIONS:		ADDITIONAL CENTRAL FLUSH PORT: (6.8.9)		
38			HEATING OR COOLING JACKET REQ'D:		
39	FLAT SURFACE REQ'D FOR MAGNETIC P/U's: (6.10.2.1) YES		MAX. CHAMBER PRESS.: (6.8.1) STATIC: DYN.: psig		
40	QUANTITY:		SEAL CATEGORY: (6.8.1) Category 2 (API-610)		
41	MOUNTING LOCATIONS:		HEATING AND COOLING		
42			COOLING REQUIRED: (6.1.17) See Page 8 Seals		
43	VIBRATION PROXIMITY PROBES FOR HYDRODYNAMIC BEARINGS:		COOLING WATER PIPING PLAN: Plan M		
44	PROVISION-ONLY FOR VIB. PROBES: (7.4.2.2) NO		CLG WATER PIPING CONSTR.: See Page 8 Seals		
45	QUANTITY PER RADIAL BEARING:		FITTINGS TYPE: THREADED		1
46	QUANTITY PER THRUST BEARING:		COOLING WATER PIPING MATERIAL CS		1
47	VIBR. MONITORS & CABLES SUPPLIED BY: (7.4.2.4)		CLG WTR REQMENTS: (BOTH ENDS IF DOUBLE ENDED)		
48			BEARING HOUSING(S): gpm		
49	TEMP. DETECTORS FOR HYDRODYNAMIC BEARINGS: (7.4.2.3)		SEAL SUPPORT: (HX, BUFFER, BARRIER, ETC.) gpm		
50	PROVISION-ONLY FOR TEMPERATURE PROBES: N/A		TOTAL COOLING WATER: 1 gpm		1
51	RADIAL BEARING TEMPERATURE PROBES: N/A		HEATING MEDIUM: N/A		
52	QUANTITY PER RADIAL BEARING:		OTHER:		
53	THRUST BEARING TEMPERATURE PROBES: N/A		HEATING MEDIUM PIPING CONSTRUCTION:		
54	QUANTITY PER THRUST BEARING ACTIVE SIDE:		PIPING & APPURTENANCES		
55	QUANTITY PER THRUST BEARING INACTIVE SIDE:		MANIFOLD PIPING SYS. FOR PURCHASHER CONN.: (7.5.1.6)		
56	THRD'D T/W's FOR GEARBOX TEMP GAGES: (9.1.3.6) N/A		VENTS: N/A		
57	PRESSURE GAGE TYPE:		DRAINS: N/A		
58	TEMP. MONITORS & CABLES SUPPLIED BY: (7.4.2)		COOLING WATER: N/A		
59			TAG ALL ORIFICES: (7.5.2.4) YES		
60			SOCKET WELD CONN. ON SEAL GLAND: (7.5.2.8) NO		

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 		API 610 CENTRIFUGAL PUMP DATA SHEET				Contract: A8KM				
						Item No: 18-P-351A/B				
		Doc. No.: A8KM-18-096-540081-A				Revision: 2		Date: 16-Oct-23		
						Unit: RFJU-B				
		Note: This data sheet has been modified from that in the annex of API Standard 610, 11th Edition.				P.O. No.:				
				Inquiry No.: 4-601F-RQ						
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SURFACE PREPARATION AND PAINT										INSPECTION & TEST														
1	MANUFACTURER'S STANDARD:									NO									SHOP INSPECTION: (8.1.1)		YES			
2	OTHER (SEE BELOW)									YES									PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPMENT		YES			
3	SPECIFICATION NUMBER: A8KM-PP-00-500520-A																		TEST WITH SUBSTITUTE SEAL: (8.3.3.2.b)		NO			
4	PUMP:																		MATERIAL CERT. REQUIRED: (6.12.1.8) CASING:		YES			
5	PUMP SURFACE PREPARATION:																		IMPELLER:		YES			
6	PRIMER:																		SHAFT:		YES			
7	FINISH COAT:																		OTHER:		See Note 6.3		YES	
8	BASEPLATE OR SOLE PLATE:																		CASTING REPAIR PROCED. APPROVAL REQ'D: (6.12.2.5)(6.12.3.4.d,e)		Note 6.7			
9	SURFACE PREPARATION:																		INSPECTION REQ'D FOR CONN. WELDS: (6.12.3.4.d,e)					
10	PRIMER:																		MAG PARTICLE:		NO			
11	FINISH COAT:																		(BW AUX CONN.) RADIOGRAPHY:		YES			
12	DETAILS OF LIFTING DEVICES: Calcs & NDE Req'd for Lifts > 20,000 LBS																		LIQUID PENETRANT:		NO			
13	SHIPMENT: (8.4.1)									(Note 6.8)									ULTRASONIC:		NO			
14	EXPORT BOXING REQUIRED																		INSPECTION REQUIRED FOR CASTINGS: (TABLE 14)					
15	OUTDOOR STORAGE UP TO 6 MONTHS:									YES									MAG PARTICLE:		NO			
16	SPARE ROTOR ASSEMBLY PACKAGED FOR:																		RADIOGRAPHY:		NO			
17	ROTOR STORAGE ORIENTATION: (9.2.8.2)									N/A									LIQUID PENETRANT:		YES			
18	SHIP'G & STORAGE CONTAINER FOR VERT. STORAGE: (9.2.8.4)									N/A									ULTRASONIC:		NO			
19	N2 PURGE: (9.2.8.4)									N/A									HARDNESS TEST REQUIRED: (8.2.2.7) (NACE SERVICES)		NO			
20	SPARE PARTS: (Note 6.1)																		ADDITIONAL SUBSURFACE EXAMINATION: (6.12.1.5)(8.2.1.3)		NO			
21	START-UP:									YES									FOR:					
22	NORMAL MAINTENANCE:									YES									METHOD:					
23																			PMI TESTING REQUIRED: (8.2.2.8)		YES			
24																			COMPONENTS TO BE TESTED: See Note 6.4					
25	WEIGHTS lb																		RESIDUAL UNBALANCE TEST: (J.4.1.2)		N/A			
26	ITEM No.	PUMP	DRIVER	ACCESSORY	BASE	TOTAL					NOTIFICATION OF SUCCESSFUL SHOP PRELIM. TEST: (8.1.1.c)(8.1.1.d)									NO		1		
27	18-P-351A	309	616	718	984	2627					BASEPLATE TEST: (7.3.21)									NO		1		
28	18-P-351B	309	616	718	984	2627					HYDROSTATIC TEST OF CASING/HEAD									NON-WIT				
29											HYDROSTATIC TEST OF BOWLS & COLUMN: (9.3.13.2)									N/A				
30																			PERFORMANCE TEST:		NON-WIT			
31	OTHER PURCHASER REQUIREMENTS																		TEST IN COMPLIANCE WITH: (8.3.3.2)		8.3.3.2			
32	COORDINATION MEETING REQUIRED: (10.1.3)									YES									TEST DATA POINTS TO: (8.3.3.3)		8.3.3.3			
33	MAXIMUM DISCHARGE PRESSURE TO INCLUDE:																		TEST TOLERANCES TO: (8.3.3.4)		TABLE 16			
34	MAX RELATIVE DENSITY:									YES									NPSH TEST PTS./RETEST: (8.3.4.3.1)(8.3.4.3.2)		N/A			
35	OPERATION TO TURBINE TRIP SPEED OR ASD OVERSPEED:									N/A									NPSH TEST-1ST STAGE ONLY: (8.3.4.3.2)		N/A			
36	MAX DIA. IMPELLERS AND / OR NO. OF STAGES:									NO									NPSH TESTING TO HI 1.6: (8.3.4.3.3)		N/A			
37	CONNECTION DESIGN APPROVAL: (9.2.1.4) (BB Pumps)									N/A									PERFORMANCE TEST LIMITED TO 110% SITE NPSHA: (8.3.3.4)		NO			
38	TORSIONAL ANALYSIS / REPORT: (6.9.2.10) (REQ'D IF GEAR OR VFD)									N/A									RETEST ON SEAL LEAKAGE: (8.3.3.2.d)		NO			
39	PROGRESS REPORTS:									YES									RETEST REQUIRED AFTER FINAL HEAD ADJ.: (8.3.3.7.b)(Multiple)		N/A			
40	OUTLINE OF PROCEDURE FOR OPTIONAL TESTS: (10.2.5)									YES									COMPLETE UNIT TEST: (8.3.4.4.1)		N/A			
41	ADDITIONAL DATA REQUIRING 20 YEARS RETENTION: (8.2.1.1)									NO									SOUND LEVEL TEST: (8.3.4.5) FOR INFORMATION ONLY		NON-WIT			
42	LATERAL ANALYSIS REQUIRED: (9.1.3.4)(9.2.4.1.3)									N/A									CLEANLINESS PRIOR TO FINAL ASSEMBLY: (8.2.2.6)		NON-WIT			
43	MODAL ANALYSIS REQUIRED FOR VS PUMPS: (9.3.9.2)									N/A									LOCATION OF CLEANLINESS INSPECTION:		@ SUPPLIERS			
44	DYNAMIC BALANCE ROTOR ASSEMBLY TO ISO G1.0: (9.2.4.2.3)									NO									NOZZLE LOAD TEST:		NO			
45	INSTALLATION LIST IN PROPOSAL: (10.2.3.1)									NO									CHECK FOR CO-PLANAR MOUNTING PAD SURFACES:		NON-WIT			
46	VFD STEADY STATE DAMPED RESPONSE ANALYSIS: (6.9.2.3)									N/A									MECH. RUN TEST AT RATED CAPACITY UNTIL OIL TEMP STABLE: (8.3.4.2)		NO			
47	TRANSIENT TORSIONAL RESPONSE: (6.9.2.4)									N/A									4 HR. MECH RUN TEST AT RATED CAPACITY AFTER OIL TEMP STABLE:		NO			
48	BEARING SELECTION & LIFE CALCS PER (6.10.1.1) & (6.10.1.6):									YES									1 HR. MECH RUN TEST AT RATED CAPACITY: (8.3.4.2.2)		NON-WIT			
49	IGNITION HAZARD ASSESSMENT TO EN 13463-1 FOR EXPLOSIVE ATM: (7.2.1.1)									N/A									BEARING HSG. RESONANCE TEST: (8.3.4.7)		N/A			
50	CASING RETIREMENT THICKNESS DWG: (10.3.2.3)									NO									STRUCTURAL RESONANCE TEST: (9.3.9.2)		N/A			
51	FLANGES REQ'D IN PLACE OF SOCKET WELD UNIONS: (7.5.2.8)									YES									REMOVE / INSPECT HYDRODYN. BRGS. AFTER TEST: (9.2.7.1)		N/A			
52	INCLUDE PLOTTED VIBRATION SPECTRA FOR PERF. TEST: (6.10.1.1)									YES									AUXILIARY EQUIPMENT TEST: (8.3.4.6)		N/A			
53	CONNECTION BOLTING: (7.5.1.7)									PAINTED									EQUIP. TO BE INCLUDED IN AUX. TESTS					
54	CADMIUM PLATED BOLTS PROHIBITED:									YES														
55	VENDOR TO KEEP REPAIR AND HT RECORDS: (8.2.1.1.c)									YES									LOCATION OF AUX. EQUIPMENT TEST					
56	VENDOR TO SUBMIT TEST PROCEDURES: (8.3.1.1)									YES														
57	VENDOR SUBMIT INSPECTION CHECK LIST: (8.1.5)									YES														
58	TEST REQUIREMENTS PER 8.3.3.5a THROUGH 8.3.3.5d:									YES									IMPACT TEST: (6.12.4.3) PER EN 13445		N/A			
59	DISASSEMBLE AND INSPECT AFTER TEST: (8.3.3.8)									NO									PER ASME SECTION VIII		N/A			
60																			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.:			
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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 in² [65 cm²] 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		
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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
 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	<input type="radio"/> Seal Category 1	<input checked="" type="radio"/> Seal Category 2	<input type="radio"/> Seal Category 3	<input checked="" type="radio"/> Seal Code (Annex D) 23A-FIN-048-11/53B	2
TYPE (CODE CW)	<input checked="" type="checkbox"/> Type A (3.1.90) <input checked="" type="checkbox"/> Type C (3.1.92)	<input checked="" type="checkbox"/> Type B (3.1.91) <input checked="" type="checkbox"/> Alternate Rotating (Type C)	<input checked="" type="checkbox"/> Alternate Stationary (Type A&B) <input checked="" type="checkbox"/> Single Spring (Type A)		
ARRANGEMENT	Default Configuration	Alternate Design	Flush Plans (See Annex G)		
1 (3.1.2)	Single <input checked="" type="checkbox"/> 1CW-FX	<input checked="" type="checkbox"/> 1CW-FL <input checked="" type="checkbox"/> Dist. Flush <input checked="" type="checkbox"/> Alternative Bush	<input checked="" type="checkbox"/> 01 <input checked="" type="checkbox"/> 13 <input checked="" type="checkbox"/> 23 <input checked="" type="checkbox"/> 50 <input checked="" type="checkbox"/> 62 <input checked="" type="checkbox"/> 02 <input checked="" type="checkbox"/> 14 <input checked="" type="checkbox"/> 31 <input checked="" type="checkbox"/> 51 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 21 <input checked="" type="checkbox"/> 32 <input checked="" type="checkbox"/> 61		
2 (3.1.3)	Buffer Liquid <input checked="" type="checkbox"/> 2CW-CW Gas <input checked="" type="checkbox"/> 2CW-CS	<input checked="" type="checkbox"/> FX <input checked="" type="checkbox"/> Dist. Flush <input checked="" type="checkbox"/> Tangential LBO Connection <input checked="" type="checkbox"/> 2NC-CS <input checked="" type="checkbox"/> FX <input checked="" type="checkbox"/> Dist. Flush	<input checked="" type="checkbox"/> 01 <input checked="" type="checkbox"/> 13 <input checked="" type="checkbox"/> 23 <input checked="" type="checkbox"/> 41 <input checked="" type="checkbox"/> 62 <input checked="" type="checkbox"/> 75 <input checked="" type="checkbox"/> 02 <input checked="" type="checkbox"/> 14 <input checked="" type="checkbox"/> 31 <input checked="" type="checkbox"/> 52 <input checked="" type="checkbox"/> 71 <input checked="" type="checkbox"/> 76 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 21 <input checked="" type="checkbox"/> 32 <input checked="" type="checkbox"/> 61 <input checked="" type="checkbox"/> 72		
3 (3.1.4)	Barrier Liquid <input checked="" type="checkbox"/> 3CW-FB Gas <input checked="" type="checkbox"/> 3NC-BB	<input checked="" type="checkbox"/> 3CW-BB <input checked="" type="checkbox"/> FX <input checked="" type="checkbox"/> 3CW-FF <input checked="" type="checkbox"/> Tang. LBO Conn. <input checked="" type="checkbox"/> 3NC-FF <input checked="" type="checkbox"/> 3NC-FB	<input checked="" type="checkbox"/> 01 <input checked="" type="checkbox"/> 13 <input checked="" type="checkbox"/> 53A <input checked="" type="checkbox"/> 54 <input checked="" type="checkbox"/> 74 <input checked="" type="checkbox"/> 02 <input checked="" type="checkbox"/> 14 <input checked="" type="checkbox"/> 53B <input checked="" type="checkbox"/> 61 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 32 <input checked="" type="checkbox"/> 53C <input checked="" type="checkbox"/> 62		
SLEEVE-SHAFT DRIVE	<input checked="" type="checkbox"/> Set-Screw Onto Shaft	<input type="checkbox"/> 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	2
<input checked="" type="checkbox"/> FKM <input checked="" type="checkbox"/> FFKM	<input checked="" type="checkbox"/> CARBON vs SIC	<input checked="" type="checkbox"/> UNS N10276 (TypeB)	<input checked="" type="checkbox"/> UNS N10276	<input checked="" type="checkbox"/> UNS S31600 / S31635	
<input checked="" type="checkbox"/> Spiral Wound Gasket	<input checked="" type="checkbox"/> SIC vs SIC	<input checked="" type="checkbox"/> UNS N07718 (TypeC)	or UNS N06455	<input checked="" type="checkbox"/> UNS N10276	
<input checked="" type="checkbox"/> EPM / EPDM <input checked="" type="checkbox"/> NBR	<input checked="" type="checkbox"/> SS-SIC <input checked="" type="checkbox"/> RB-SIC	<input checked="" type="checkbox"/> UNS N08020	<input checked="" type="checkbox"/> UNS S31600	<input checked="" type="checkbox"/> UNS N08020	
<input checked="" type="checkbox"/> Other :	<input checked="" type="checkbox"/> vs	<input checked="" type="checkbox"/> Other :	or UNS S31635	<input checked="" type="checkbox"/> Other :	

MECHANICAL SEAL DATA

<input type="radio"/> Seal Vendor : John Crane	<input checked="" type="checkbox"/> Dynamic Sealing Pressure Rating (3.1.27) : 375 psig	1
<input type="radio"/> Data Requirements Form (Annex J)	<input checked="" type="checkbox"/> Static Sealing Pressure Rating (3.1.84) : 500 psig	1
<input checked="" type="checkbox"/> Size / Type : 2.875"/2.375" / 3648	<input checked="" type="checkbox"/> Maximum Allowable Temperature (3.1.51) : °F	1
<input checked="" type="checkbox"/> Seal Drawing No.: GA-271185-1	<input checked="" type="checkbox"/> Min. Design Metal Temperature (6.1.6.11.1) : 32 °F	2
<input checked="" type="checkbox"/> Vendor's Seal Code : 23A-FIN-048-11/53B	<input type="checkbox"/> Generated Heat at Normal Conditions : BTU/hr	1
<input type="checkbox"/> Modified Faces For Pump Performance Test	<input type="checkbox"/> Heat Soak at Normal Conditions : BTU/hr	
<input type="checkbox"/> Alternative Seal For Pump Performance Test	<input type="checkbox"/> Total Seal Axial Thrust on Shaft : lb	

SEAL CHAMBER DATA (REFERENCE 6.1.2.4)

<input checked="" type="checkbox"/> API 610	<input checked="" type="checkbox"/> ASME B73.1&2	<input checked="" type="checkbox"/> Cylindrical	<input checked="" type="checkbox"/> Tapered	<input checked="" type="checkbox"/> ISO 3069-C	<input checked="" type="checkbox"/> Other :
<input type="checkbox"/> Bolt-On Chamber (6.1.2.5)	<input checked="" type="checkbox"/> Seal Chamber Flush Port Req'd	<input checked="" type="checkbox"/> Seal Chamber Vent Req'd			
<input checked="" type="checkbox"/> Floating Throat Bushing	<input checked="" type="checkbox"/> Fixed Throat Bushing	<input checked="" type="checkbox"/> Chamber Heating	<input checked="" type="checkbox"/> Chamber Cooling		

PUMP DATA

<input checked="" type="checkbox"/> Manufacturer : Sulzer	<input checked="" type="checkbox"/> Model : OHH	<input checked="" type="checkbox"/> Size : 2X3X8-1	<input checked="" type="checkbox"/> Case Material : A-8 NACE	1
Pump Operating Pressure : <input checked="" type="radio"/> Discharge Press. (Rated) : 96.5 psig	<input checked="" type="radio"/> Suction Press. (Rated) : 32.8 psig			
Seal Chamber Press <input checked="" type="checkbox"/> Norm.: 31.9 psig	<input type="checkbox"/> Min/Max (MDSP 3.1.53) 31.9 / 92.31 psig	<input type="checkbox"/> MSSP (3.1.55) : psig		2
Shaft: <input checked="" type="checkbox"/> Horizontal	<input checked="" type="checkbox"/> Vertical	<input checked="" type="checkbox"/> Diameter : 1.89	<input checked="" type="checkbox"/> Shaft Speed : 3550 RPM	1
<input checked="" type="checkbox"/> Shaft Rotation (Viewed From Driver) : <input checked="" type="checkbox"/> CCW <input type="checkbox"/> 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.
- 7.7 Deleted.
- 7.7 Refer to 8ES-2DG1 - "WEP Instrumentation & Electrical Standard Vendor List," for Instrumentation.

 		API 682 MECHANICAL SEAL DATA SHEET		Contract: A8KM	
				Item No: 18-P-351A/B	
		Doc. No.: A8KM-18-096-540081-A		Revision: 2 Date: 16-Oct-23	
		Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)		Unit: RFJU-B	
		P.O. No.:		Inquiry No.: 4-601F-RQ	
		Sheet 8 of 11		REV	

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 ₂ S : Note 2.8 ppmw ● Wet ○ Cl ₂ : ppm ● Other : CO₂ @ 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% ○ Special Pump Cleaning Procedures ○ 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 Point °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. / Min. / gpm □ Supply Pressure Max. / Min.: / psig □ Fluid Temperature : Min.: °F Normal : °F Max.: °F	□ Specific Gravity: @ Normal Temperature : @ Max. Temp. : □ 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. Norm 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 Allowable Temp. 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. ○ 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 Separator 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 ● 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 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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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				
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	LOW VOLTAGE MOTOR (IEEE 841) DATA SHEET U.S. CUSTOMARY UNITS		Contract: A8KM																										
	APPLICABLE MOTOR SPECIFICATION A8KM-PP-000-50670-A		Item No: 18-P-351AM/BM																										
	Doc. No.: A8KM-18-096-540081-A		Revision: 2 Date: 16-Oct-23																										
	Sheet 10 of 11		Unit: RFJU-B RFQ / P.O. No.:																										
Rev																													
1	APPLICABLE TO <input type="radio"/> PROPOSAL <input type="radio"/> PURCHASE <input checked="" type="radio"/> AS BUILT																												
2	CLIENT: World Energy Paramount		SERVICE: LP Absorber Rich Amine Pump																										
3	PLANT: World Energy Renewables Plant		MOTOR TAG NO. / NO. REQ'D: 18-P-351AM/BM / Two (2)																										
4	SITE: Paramount, CA		DRIVEN EQUIPMENT TYPE / TAG NO.: Centrifugal Pump / 18-P-351A/B																										
5	DESIGN DATA AND ACCESSORY EQUIPMENT																												
6	NAMEPLATE 40 HP 1.15 S.F. 3550 RPM POWER (VOLTAGE/PHASE/HERTZ) 460 / 3 / 60																												
7	ROTATION (WHEN FACING MOTOR OPPOSITE DRIVE END): <input type="radio"/> CW <input type="radio"/> CCW Fans shall be bi-directional																												
8	INSULATION CLASS: <input type="radio"/> B <input checked="" type="radio"/> F <input type="radio"/> H <input type="radio"/> VPI TEMP. RISE CLASS B / °C over 40 °C AMBIENT																												
9	AREA CLASSIFICATION: <input checked="" type="radio"/> CLASS I , GROUP B/C/D DIV. 2 <input checked="" type="radio"/> T-RATING T3C / °F																												
10	<input type="radio"/> UNCLASSIFIED																												
11	LOCATION: <input type="radio"/> INDOOR <input checked="" type="radio"/> OUTDOOR <input type="radio"/> SHELTERED UNUSUAL CONDITIONS: <input type="radio"/> DUST <input type="radio"/> OTHER																												
12	AMBIENT TEMPERATURE: MAX 105 °F / MIN. 35 °F ALTITUDE 69 ft																												
13	ENCLOSURE: <input checked="" type="radio"/> TOTALLY-ENCLOSED FAN-COOLED <input type="radio"/> TOTALLY-ENCLOSED NONVENTILATED <input type="radio"/> EXPLOSION PROOF																												
14	MOUNTING METHOD: <input checked="" type="radio"/> FOOT <input type="radio"/> FLANGE, TYPE:																												
15	MOUNTING ARRANGEMENT: <input checked="" type="radio"/> HORIZONTAL <input type="radio"/> VERTICAL SHAFT DOWN <input type="radio"/> VERTICAL SHAFT UP																												
16	BEARING TYPE: <input checked="" type="radio"/> BALL <input type="radio"/> ROLLER BEARING LUBRICATION: <input checked="" type="radio"/> GREASE <input type="radio"/> OIL <input type="radio"/> PURE OIL MIST																												
17	CONNECTION TO LOAD: <input checked="" type="radio"/> DIRECT CONNECTED <input type="radio"/> V-BELT <input type="radio"/> THROUGH GEAR <input type="radio"/> CLOSE COUPLED																												
18	EQUIPMENT OPERATION: <input checked="" type="radio"/> CONTINUOUS <input type="radio"/> SPARED CONTINUOUS <input type="radio"/> INTERMITTENT-CYCLES / DAY																												
19	SOUND PRESSURE LEVEL REQUIREMENTS: 85 dBA @ 3 FEET																												
20	STARTING: <input checked="" type="radio"/> FULL VOLTAGE <input checked="" type="radio"/> REDUCED VOLTAGE, 80 % OF VOLTAGE Starting Voltage Dip Allowance																												
21	<input type="radio"/> UNLOADED <input checked="" type="radio"/> LOADED <input type="radio"/> CAPACITORS FOR POWER FACTOR CORRECTION																												
22	<input type="radio"/> SPACE HEATERS V PHASE °F MAX. TEMP																												
23	<input checked="" type="radio"/> OVERSIZE TERMINAL BOX <input checked="" type="radio"/> DRAIN PLUGS																												
24	<input checked="" type="radio"/> SS NAMEPLATE <input type="radio"/> AUXILIARY NAMEPLATE																												
25	TEST <input checked="" type="radio"/> ROUTINE <input type="radio"/> COMPLETE <input checked="" type="radio"/> VIBRATION <input checked="" type="radio"/> REPORT <input checked="" type="radio"/> FOOT FLATNESS																												
26	REMARKS: 10.1) This data sheet applies to motors 1/2 hp through 500 hp with anti-friction bearings.																												
27	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.																												
28	10.3) IP55 degree of protection is required. 10.4) Average relative humidity is 54%.																												
29																													
30	INFORMATION BELOW TO BE COMPLETED BY VENDOR																												
31	MOTOR MFR. TECO MODEL SERIAL NO.																												
32	NAMEPLATE HP 40 FULL LOAD RPM 3550 FRAME 324TS WEIGHT 616 LB																												
33	MOTOR OUTLINE DRAWING NO.																												
34	ROTOR CAGE MATERIAL OF CONSTRUCTION		MOTOR WINDING MATERIAL																										
35	BEARING MANUFACTURER		SIZE																										
36	VERTICAL MOTOR THRUST BEARING: TYPE CAPACITY: UP LBS DOWN LBS LOCATION																												
37																													
38	<table border="1"> <thead> <tr> <th>LOAD</th> <th>FULL</th> <th>3/4</th> <th>1/2</th> <th>OTHER</th> </tr> </thead> <tbody> <tr> <td>AMPERES</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>EFFICIENCY, %</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>POWER FACTOR</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SPEED, RPM</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				LOAD	FULL	3/4	1/2	OTHER	AMPERES					EFFICIENCY, %					POWER FACTOR					SPEED, RPM				
LOAD	FULL	3/4	1/2	OTHER																									
AMPERES																													
EFFICIENCY, %																													
POWER FACTOR																													
SPEED, RPM																													
39	LOCKED ROTOR AMPS* AMPS																												
40	FULL LOAD TORQUE* FT-LB																												
41	LOCKED ROTOR TORQUE* %																												
42	PULL UP TORQUE* %																												
43	BREAKDOWN TORQUE* %																												
44	ACCEL. TIME W/ LOAD (0 TO FULL SPEED)* SEC.																												
45	SOUND LEVEL: GUARANTEED dBA / EXPECTED dBA																												
46	FAN MATERIAL (NON-SPARKING)																												
47	STALL TIMES AT ZERO RPM* - HOT / COLD / SEC.																												
48	NUMBER OF CONSECUTIVE STARTS*																												
49	* INDICATED AT RATED VOLTAGE																												
50	INFORMATION BELOW TO BE PROVIDED BY VENDOR AFTER PURCHASE (REFER TO RFQ/PO DOCUMENTS)																												
51	<input type="radio"/> SAFE TIME - CURRENT CURVE MAX. SURFACE TEMP. DURING NORMAL STARING OR OPERATION OF:																												
52	<input type="radio"/> SPEED - TORQUE CURVE <input type="radio"/> ROTOR °F <input type="radio"/> STATOR °F <input type="radio"/> ENCLOSURE °F																												
53	<input type="radio"/> SAFE LOCKED ROTOR TIME HOT COLD																												
54	NOTES:																												
55	10.5 Motor nameplate shall indicate service factor, area classification and T-rating. T-rating relates to both external and internal components.																												
56	10.6 Provide accessory loads on submittal documents, e.g. Volts, HP, kVA, etc.																												
57	10.7 All motors, regardless of installed location, must be Class I, Division 2, Groups B,C,D, Temperature Code T3C, for project uniformity.																												
58	10.8 Motor shall have oversized terminal boxes.																												

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PUMP DATASHEET ANNEX

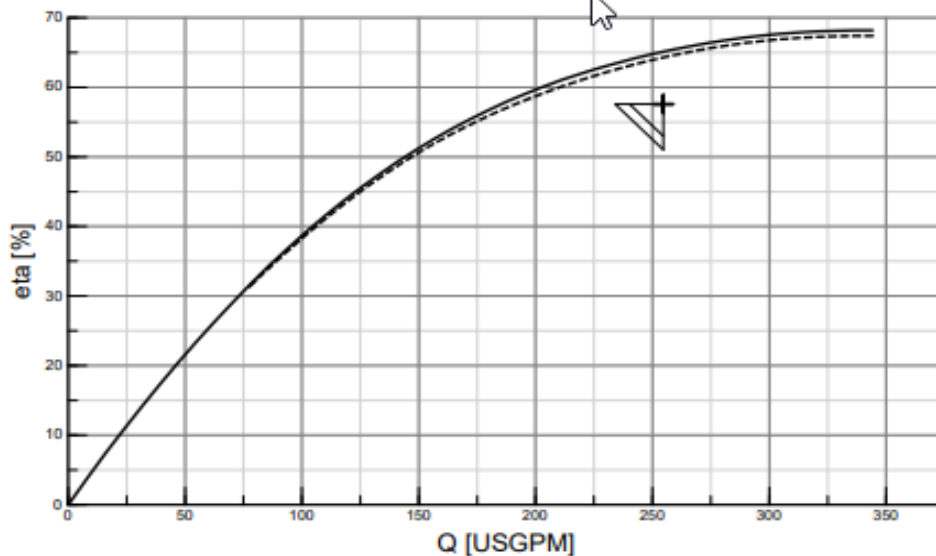
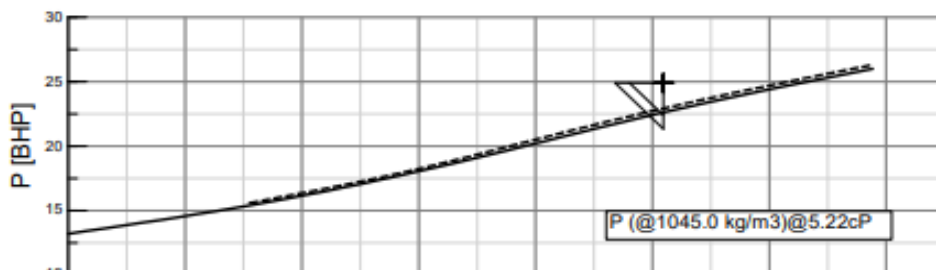
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TEST PUMP CURVE

2

SULZER		1st Paso 1st Stage		Series Series	No. Or 100462910-0020-01
Curva de prueba Test Curve M-13403		Impulsor Impeller	0-104203636		Sulzer Comm.Nr.
Cliente Customer	Air Products and Chemicals Inc.	Modelo Pattern	213OHH-03		Tipo Type
Orden Compa	4505610423	Difusor Diffuser	1-104068168		2x3x8-1 OHH
No. Identif. Ident No.	18-P-351A	Modelo Pattern	214OHH-02		
No. Serie Item No.	650955	D2 Diseño D2 design	Ø7.45 in	Venas Vane	Ø 7.45 in
Nombre Name	Gerardo Endoqui	D2 min. D2 min.	Ø6.63 in		
Fecha Date	2022-09-07	D2 max. D2 max.	Ø8.23 in		
		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

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