EQUIPMENT DATA SHEET
(INCL PREDICTED PERFORMANCE CURVE)

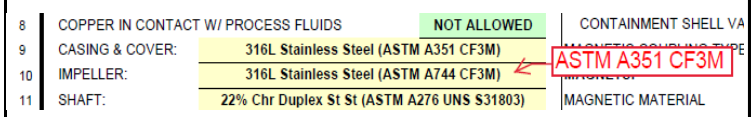
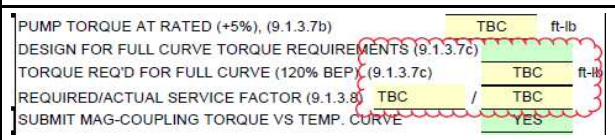
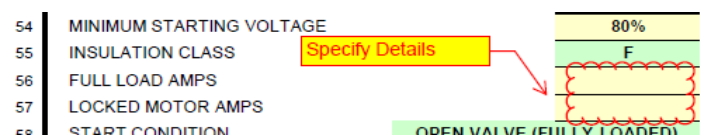
CLIENT	:	Air Products Manufacturing LLC
PROJECT NAME/NO.	:	WEP Renewables
CLIENT PO NO	:	4505605360
HMD DOCUMENT NO	:	HMD-4505605360-C04-04
CLIENT DOCUMENT NO	:	
HMD PUMP NO	:	839919 A/B
EQUIPMENT TAG NO	:	18-P-254 A/B

2	05/09/2022	ISSUE FOR REVIEW	ND	ARM	AFS
1	30/05/2022	ISSUE FOR REVIEW	JLW	AFS	NW
0	04/03/2022	ISSUE FOR REVIEW	AFS	AFS	NW
REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY

NOTE:

HMD KONTRO Sealless Pumps

RESOLUTION SHEET

Comment Number	Document Name: EQUIPMENT DATA SHEET (INCL PREDICTED PERFORMANCE CURVE)		Revision from which comment first appeared	Comment Status: Open\Closed - (Date Closed:)
	CLIENT COMMENT	HMD RESPONSE	Current Rev:	
1	As per KOM notes point no. 7.8, head rise to shut off is 6.8% without the use of orifice	Noted and updated. Noted, Closed	1	Closed (05/09/2022)
2	Indicate limit 9000, as shown on all other data sheets	Noted and updated. Noted, Closed	1	Closed (05/09/2022)
3	Vendor to confirm that the Magnetic Material is in compliance to Table I.1 of API 685	Confirm. Noted, Closed	1	Closed (05/09/2022)
4		Noted and updated. This comment was not marked on previous revision.	1	Closed (05/09/2022)
5		Noted and updated. Noted, Closed	1	Closed (05/09/2022)
6		Noted and updated. Noted, Closed	1	Closed (05/09/2022)

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WORLD ENERGY PARAMOUNT
World Energy Renewables Project
Paramount, California

MECHANICAL EQUIPMENT DATASHEET
Document Number: A8KM-18-088-540097-A
Rev. 2, 5-Sep-2022

EN203076-FLUOR-LD1-00133

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WORLD ENERGY RENEWABLES PROJECT

MECHANICAL EQUIPMENT DATA SHEET FOR 18-P-254A/B

CAUSTIC CIRCULATION PUMPS

Document No. HMD-4505605360-C04-04

Fluor Project No: A8KM

2	5-Sep-2022	Issue for Review	7	ND	ARM	AFS	
1	30-May-2022	Issue for Review	7	JLW	AFS	NW	
0	4-Mar-2022	Issue for Review	8	AFS	AFS	NW	
REV	**DATE**	**DESCRIPTION**	**PAGES**	**ORIG**	**CHK'D**	**APPV'D**	**CLIENT**

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SEALESS CENTRIFUGAL PUMP
API 685, 2nd EDITION
DATA SHEET

Note: This Data Sheet has been modified from that in Annex R of API 685, Second Edition.

Contract:	A8KM
Item No:	18-P-254A/B
Revision:	2 Date: 5-Sep-22
Unit:	SWSPlus Unit
Doc. No.:	HMD-4505605360-C04-04
Inquiry No.:	4505605360
Sheet	2 of 8

REV

CLIENT: **World Energy Paramount**

SERVICE: **Caustic Circulation Pumps** PLANT: **World Energy Renewables Plant** SITE: **Paramount, CA**

NO. REQ'D : **2 x 100% (Note 2.1)** PUMP SIZE : **3 x 2 x 7** TYPE: **MAGNETIC DRIVEN** NO. STAGES : **1**

MANUFACTURER: **Sundyne HMD Kontro** MODEL: **GSPFL Frame 2** SERIAL NO.: **838919 A/B**

APPLICABLE TO : ● PURCHASE

INFORMATION BELOW TO BE COMPLETED: ○ BY PURCHASER ■ BY SUPPLIER ◯ BY EITHER

●LIQUID CHARACTERISTICS

LIQUID TYPE OR NAME: **Circulating Wash Caustic**

	UNITS	MAXIMUM	NORMAL	RATED
VAPOR PRESSURE:	psi (a)			**31.7**
SPECIFIC GRAVITY:				**1.01**
SPECIFIC HEAT:	BTU/lbm ºF			**0.516**
VISCOSITY:	cP			**1.40**

NOTE: Max, Min, & Rated values refer only to the property listed

●OPERATING CONDITIONS (6.1.2)

	UNITS	MAXIMUM	RATED	NORMAL	MINIMUM
NPSHa Datum		C.L. IMPELLER - 3' Above Grade			
PUMPING TEMP.:	°F	**170.0**	**118.0**	**118.0**	
FLOW:	gpm		**20.5**	**10.6**	**4.2**
DISCHARGE PRESS: (6.3.2)	psig		**133.3**		
SUCTION PRESSURE:	psig	**95.5**	**22.8**		
DIFFERENTIAL PRESSURE:	psi		**110.5**		
DIFFERENTIAL HEAD:	ft		**253.4**		
$NPSH_A$:	ft		**13.4**	**Excludes required 3' margin**	
HYDRAULIC POWER:	HP		**0.75**		

OPERATING CONDITIONS - CONTINUED

SERVICE :	**CONTINUOUS**
*IF INTERMITTENT NO. OF STARTS / DAY	
PUMPS OPERATE IN:	
TEMPERATURE - VAPOR PRESS. CURVE	
CORROSION DUE TO: (6.10.1.8)	**Note 2.2**
EROSION DUE TO: (6.10.1.8)	
H_2S CONCENTRATION (ppmw): (6.10.1.11)	**20,540**
CHLORIDE CONCENTRATION (ppmw):	
PARTICULATE SIZE (DIA. IN MICRONS):	
PARTICULATE SIZE DISTRIBUTION:	
PARTICULATE CONCENTRATION (ppm):	1
PARTICULAR HARDNESS:	
THERMAL CONDUCTIVITY: Btu/(h-ft-°F)	
THERMAL EXPANSION: in/in/°F	
POLYMERIZATION CHARACTERISTICS: (6.1.3.3)	

SITE AND UTILITY DATA

LOCATION:

OUTDOOR **UNHEATED**

MOUNTED AT: **GRADE** ○ TROPICALIZATION REQ'D

ELECTRICAL AREA CLASSIFICATION: ○ NON CLASSIFIED

CLASS: **I** GROUP: **B,C,D** DIVISION: **2**

ZONE: GROUP: TEMP. CLASS **T3C**

SITE DATA:

ELEVATION (MSL): **69** ft BAROMETER: **14.7** psia

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

RELATIVE HUMIDITY: MIN / MAX **AVG** / **54** %

UNUSUAL CONDITIONS:

UTILITY CONDITIONS:

ELECTRICITY:	DRIVERS	HEATING	CONTROL	Instruments
VOLTAGE	**460**	**120**	**120**	**24V**
PHASE	**3**	**1**	**1**	
HERTZ	**60**	**60**	**60**	

COOLING WATER: IF APPLICABLE

		INLET	RETURN		MECH. DESIGN
TEMP	°F	**80**	**120**	MAX	**150**
PRESSURE	psig	**45**	**35**	MIN	**120**

SOURCE **Cooling Tower**

COOLING WATER CHLORIDE CONCENTRATION: **<840** ppmw

INSTRUMENT AIR: MAX: **N/A** psig MIN: **N/A** psig

NITROGEN: MAX: psig MIN: psig

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

NOTES

2.1 2 x 100% pumps. One (1) operating & one (1) spare.

2.2 Corrosive compositions dissolved in water (ppmw):

Wet H2S = 2.5 wt%

NH3 = 24.2 wt%

CO2 = 19 ppmw

NaOH = 14.5 wt%

NH4SH = 4.1 wt%

2.3 Pump centerline is assumed to be 3'-0" above grade and 27" above top of foundation. Pump Supplier shall adjust the NPSHa based on the actual pump centerline elevation above the pump foundation. A minimum NPSH margin of 3 ft or 10%, whichever is higher, is required at 110% of Rated flow.

2.4 Pump Control Method: Flow control valve.

2.5 Motor shall be rated for Class 1, Div 2, Gr B,C,D and Temperature Code T3C.

2.6 Pump supports shall meet design load requirements per Project Spec. A8KM-PP-000-40002-A, Structural Data for Mechanical Equipment, and A8KM-PP-000-20001-A, Plant Site Data Sheet.

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SEALESS CENTRIFUGAL PUMP
API 685, 2nd EDITION
DATA SHEET

Note: This Data Sheet has been modified from that in Annex R of API 685, Second Edition.

Contract:	A8KM
Item No:	18-P-254A/B
Revision:	2 Date: 5-Sep-22
Unit:	SWSPlus Unit
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PERFORMANCE

PROPOSAL CURVE NO.:	N/A			RPM	3510				
As Tested Curve No.:									
IMPELLER DIA.:	RATED:	7.08	MAX:	7.625	MIN:	6.97	in		
HYDRAULIC EFFICIENCY AT RATED POINT:						15.5	%		
HYSTRERESIS & MECHANICAL LOSSES:							HP		
RATED POWER:	8.6	HP	EFFICIENCY:			15.5	%		
RATED CURVE BEP FLOW (at rated impeller dia.)						249.5	gpm		
MIN. FLOW	THERMAL :		gpm	STABLE :		8.8	gpm		
PREFERRED OPERATING REGION: (6.1.11)				174.65	to	299.4	gpm		
ALLOWABLE OPERATING REGION:				8.8	to	23.25	gpm		
MAX. HEAD @ RATED IMPELLER:						265.86	ft		
MAX. POWER @ RATED IMPELLER:						8.8	HP		
PERCENT RISE TO SHUTOFF:						6.8	%		
ORIFICE USED TO STEEPEN CURVE OR GIVE CONT. RISE						NO			
NPSH3 at RATED FLOW :						6.89	ft		
CL PUMP TO U/S BASEPLATE:						1.64	ft		
NPSH MARGIN at RATED FLOW :						6.51	ft		
SPECIFIC SPEED: (6.1.16)			gpm,rpm,ft			250.2			
SUCTION SPECIFIC SPEED LIMIT:						9000			
SUCTION SPECIFIC SPEED:			gpm,rpm,ft			5912			

ROTOR CHAMBER TEMP RISE OPERATING: (1)

AT RATED CONDITIONS		°F
AT MAXIMUM PUMP FLOW		°F (1)
ROTOR CHAMBER TEMP RISE ON SHUTDOWN:		°F

SOUND LEVELS (AT 3 FT)

MAX ALLOWABLE SOUND PRESSURE LEVEL	85	dBA
ESTIMATED MAX SOUND PRESSURE LEVEL	76	dBA

SYSTEM DESCRIPTION

SUCTION VESSEL:	CLOSED
PUMP LOCATION:	BELOW LIQUID LEVEL
SUCTION VESSEL ON LEVEL CONTROL?	YES
PRESSURE SENSOR ON SUCTION VESSEL?	NO (2)
SUCTION VESSEL PRESSURE MAINTAINED BY LIQUID LEVEL PLUS:	
FLUID VAPOR PRESSURE	
IF FLUID LEVEL OR TANK PRESSURE DROPS TOO LOW, WILL SYSTEM AUTOMATICALLY STOP THE PUMP?	YES
WILL THE PUMP RUN DRY IN NORMAL OPERATION?	NO (1)
REMARKS:	(2)
	(1)

CONSTRUCTION

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

NOZZLE CONNECTIONS: (6.4.5)

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

FLANGE THICKNESS REQ'S NON-STD BOLT LENGTH

PRESSURE CASING AUXILIARY CONNECTIONS: (6.3.3)

	NO.	SIZE	TYPE	FACING	RATING	POSITION
PURGE/FLUSH OUT	-	-	-	-	-	-
DRAIN	1	3/4	BW	RF	300LB	SIDE
VENT	-	-	-	-	-	-
PRESSURE SENSOR	1	1	BW	RF	300LB	SIDE
TEMP SENSOR	-	-	-	-	-	-
WARM-UP LINE	-	-	-	-	-	-
EXTERNAL	-	-	-	-	-	-
2ND DRAIN	1	3/4	BW	RF	300LB	SIDE

GUSSET SUPPORT REQUIRED (6.3.3.5):	YES
DRAIN CONNECTION FOR SECONDARY CASING	NO
ROTOR CAVITY DRAINABLE THROUGH 2ND DRAIN:	N/A
DRAIN VALVE SUPPLIED BY:	PURCHASER
VENT VALVE SUPPLIED BY:	N/A
NO THREAD CONS TO SECONDARY CASING:	NO
SPECIAL FITTINGS FOR TRANSITIONING (6.3.3.2):	NO
CYLINDRICAL THREADS REQUIRED (6.3.3.11.3):	NO
MACHINED AND STUDDED CONNECTIONS (6.3.3.7):	NO

CASING MOUNTING:	CENTERLINE			
CASING TYPE: (6.3.10)	SINGLE VOLUTE			
ROTATION: (VIEWED FROM COUPLING END)				
CASE PRESSURE RATING:				
MAWP: (6.2.2)	580.151 psig	@	170 °F	(1)
HYDROTEST:	870.226 psig	@	100.4 °F	
TYPE BOLTING USED ON PUMP (6.1.31.1):				
AUXILIARY CIRCULATION PIPING PLAN				
PIPING FORM:				
PIPING MATERIAL:				(1)
PIPING ASSEMBLY:				(1)
IF FLANGED:				(1)
				(1)
COOLING WATER REQUIREMENTS:	NOT APPLICABLE			(1)
COOLING WATER PIPING PLAN				(1)
PIPING FORM:				(1)
PIPING MATERIAL:				(1)
PIPING ASSEMBLY:				(1)
IF FLANGED:				
FOR: JACKET		gpm		
HEAT EXCHANGER		gpm		
TOTAL COOLING WATER		gpm		(1)
HEATING REQUIREMENTS:	NOT APPLICABLE			
HEATING MEDIUM		gpm		
HEATING PIPING		MATERIAL:		

ROTOR:

IMPELLER TYPE	SEMI-OPEN
RENEWABLE IMPELLER WEAR RINGS REQUIRED	YES
RENEWABLE CASE WEAR RINGS REQUIRED	YES
COMPONENT BALANCE TO ISO 1940 G1.0	YES

NOTES

3.1 Flanges for spiral wound gaskets shall have flange surface finish of 125 µin Ra to 250 µin Ra maximum. Finishes shall be judged by visual comparison with surface roughness standards conforming to ASME B46.1

3.2 Reduced hardness materials are required in accordance with API 685, 2nd Edition, Section 6.10.1.11

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SEALESS CENTRIFUGAL PUMP
API 685, 2nd EDITION
DATA SHEET

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Contract:	A8KM
Item No:	18-P-254A/B
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CONSTRUCTION (CONT'D)

MATERIAL (6.10.1.1)

APPENDIX H CLASS:	A-8: 316L SS / 316L SS
MINIMUM DESIGN METAL TEMP (6.10.4.1)	psig @ 32 °F
IMPACT TEST SPECIFICATION	
REDUCED HARDNESS MATERIALS REQ'D (6.10.1.11)	YES
APPLICABLE HARDNESS STANDARD (6.10.1.11)	MR0103
COPPER IN CONTACT W/ PROCESS FLUIDS	NOT ALLOWED
CASING & COVER:	316L Stainless Steel (ASTM A351 CF3M)
IMPELLER:	316L Stainless Steel (ASTM A351 CF3M)
SHAFT:	22% Chr Duplex St St (ASTM A276 UNS S31803)
WEAR RINGS:	N/A
CONTAINMENT SHELL/STATOR LINER:	PEEK Composite
INNER MAG SHEATH/ROTOR LINER:	316L Stainless Steel - Resin Potted
BEARING SLEEVE:	Silicon Carbide
BEARING BRUSHING:	Silicon Carbide
STATOR HOUSING/FRAME:	
INSPECTION CLASS	LEVEL 2

PRESSURE VESSEL DESIGN CODE REFERENCES

THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER:

SOURCE OF MATERIAL PROPERTIES	ASTM
CASTING FACTORS USED IN DESIGN (TABLE 3)	

WELDING AND REPAIRS

ALTERNATE WELDING CODES AND STANDARDS	
WELDER QUALIFICATION	
WELD PROCEDURE QUALIFICATION	
MP OR LP EXAM OF PLATE EDGE	
POST WELD HEAT TREAT	
POST WELD HEAT TREAT OF CASING	

ALTERNATE STD/ACCEPT CRITERIA APPLIES

INSPECTION	METHOD	CASTINGS	FABRICATIONS
RADIOGRAPH			
ULTRASONIC			
MAG PARTICLE			
LIQ PENETRATE			
VISUAL			

MOTOR REQUIREMENTS APPLICABLE TO ALL (7.1.2), See Sheet 8

MANUFACTURER:		BALDOR
FRAME OR MODEL:		254T
ORIENTATION:		HORIZONTAL
NAMEPLATE POWER	HP	15
SERVICE FACTOR		1.15
NOMINAL RPM		3510
RATED LOAD RPM		
VARIABLE SPEED REQUIRED		NO
SOURCE OF VARIABLE SPEED		
VOLTAGE		460
PHASE		3
HERTZ		60
MINIMUM STARTING VOLTAGE		80%
INSULATION CLASS		F
FULL LOAD AMPS		17
LOCKED MOTOR AMPS		114
START CONDITION		OPEN VALVE (FULLY-LOADED)

MAGNETIC DRIVEN PUMP SPECIFIC (9.1)

DRIVER TYPE	MOTOR	GEAR	NO
CLOSE COUPLED DESIGN APPROVED (9.1.1.2):			
DESIGN FOR REMOVAL OF DRIVE END WITHOUT DISTURBING THE PRESSURE CASING OR DRIVER (9.1.1.4):	YES		
DESIGN CONTAINMENT SHELL FOR VACUUM (6.2.4):			
CONTAINMENT SHELL VACUUM DESIGN:	psig		
MAGNETIC COUPLING TYPE:	SYNCHRONOUS		

MAGNETS:	OUTER	INNER
MAGNETIC MATERIAL	Neodymium (fully encapsulated)	
MOUNTING METHOD	Bonded	Bonded/Potted
TEMP. LIMIT °F	248	248
HERMETIC. SEALED	No	Yes
NO. OF MAGNETS	Proprietary	Proprietary

PROTECTION OF OUTER MAG RING (9.1.3.5):			
STARTING REQUIREMENT:	ACROSS-THE-LINE		
TORQUE RATING (DECOUPLING)	103	ft-lb	
MAX TORQUE REQ'D ON STARTING (9.1.3.7a)	TBC	ft-lb	1
PUMP TORQUE AT RATED (+5%), (9.1.3.7b)	12.87	ft-lb	1
DESIGN FOR FULL CURVE TORQUE REQUIREMENTS (9.1.3.7c)	YES		
TORQUE REQ'D FOR FULL CURVE (120% BEP), (9.1.3.7c)	13.17	ft-lb	2
REQUIRED/ACTUAL SERVICE FACTOR (9.1.3.8)	1.25 / 8		2
SUBMIT MAG-COUPLING TORQUE VS TEMP. CURVE	YES		
SUBMIT SPEED VS TORQUE CURVE (9.1.3.10)	YES		

BEARINGS AND LUBRICATION (9.1.4)

DRIVE MAGNET BEARING (TYPE / NUMBER):	See Note 6.7 for additional requirements	
RADIAL	Ball	6215
THRUST	Ball	6214
LUBRICATION METHOD:	OIL BATH	
OIL VISC. ISO GRADE	VG	68
CONSTANT LEVEL OILER (9.1.4.2.1) PREFERENCE	Note 5.2	
HOUSING VENT	Required	
SUMP COLLECTOR REQUIRED (9.1.4.2.2)		
BEARING HOUSING END SEALS	Inpro or Equal	

SHAFT COUPLING & GUARD: (9.1.5.2)

COUPLING MANUFACTURER:	John Crane			
MODEL	Metastream TSKS 13	SPACER LENGTH	7.09	in
RATING (POWER / 100 RPM)		SERVICE FACTOR	min. 1.5	
COUPLING BALANCED TO ISO 1940-1G6.3 (9.1.5.2.3)			G2.5	
COUPLING TO ISO 14691 (9.1.5.2.9)				
COUPLING GUARD STANDARD (9.1.5.2.11)	ANSI B15.1			
IGNITION HAZARD ASSESSMENT REQUIRED (9.1.5.2.11.5)	N/A			
SPARK RESISTANT MATERIAL (9.1.5.2.11.6)	YES			

BASEPLATE (9.1.5.3)

API BASEPLATE NUMBER (9.1.5.3.3):	
BASEPLATE CONSTRUCTION (9.1.5.3.1.1):	FULL TOP DECKING
BASEPLATE DRAINAGE (7.3.1)	DRAIN RIM
MOUNTING:	EPOXY GROUTED
NON-GROUT CONSTRUCTION (9.1.5.3.13)	NOT REQUIRED
OPEN DECK DESIGN (9.1.5.3.14):	
PROVIDE STAINLESS SPACER PLATE UNDER ALL EQUIP. FEET (9.1.5.3.6):	
OTHER	Furnish two (2) diagonally opposed grounding provisions, Note 6.3

SEPARATE MOTOR DRIVER, See Sheet 8

APPLICABLE SPEC:		ENCLOSURE:	
INCLUDE: SPACE HEATER		VIB. SENSOR	
LUBRICATION:			
DRIVER MOTOR BEARING (TYPE / NUMBER):			
RADIAL	/		
THRUST	/		

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SEALESS CENTRIFUGAL PUMP
API 685, 2nd EDITION
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Revision:	2 Date: 5-Sep-22
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Doc. No.:	HMD-4505605360-C04-04
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CANNED MOTOR PUMP SPECIFIC (9.2)

MOTOR WINDING INSULATION CLASS (9.2.2.8)	
SOLID OR LIQUID HEAT TRANS. MEDIA ALLOWED IN STATOR?	
DESIGN MOTOR FOR FREQUENT STARTS (9.2.2.9)	
STARTS PER	
IMPACT ON LIFE:	
DESIGN MOTOR FOR (9.2.2.9):	
UL, FM, ATEX OR EQUIVALENT REQUIRED (9.2.2.10)	
CERTIFICATION OF IEEE 252 TEST REQUIRED (5.2.7.1)	
DESIGN STATOR LINE FOR VACUUM (6.2.4)	
STATOR LINER VACUUM DESIGN:	psig
DECONTAMINATION CONNECTION ON STATOR (9.2.2.11)	

SECONDARY CONTROL / CONTAINMENT

NFPA RATING:

HEALTH: FLAMMABILITY: INSTABILITY:

USE ANNEX B HAZARD BASED PROCEDURE

HAZARD STATEMENT

RISK PHRASE

HAZARD GROUP

REQUIRED MEASURE:

SECONDARY CONTROL (3.67)

MAX LEAKAGE ON PRIMARY FAILURE:	gpm
FLOW RESTRICTION:	DRY-RUN MECHANICAL SEAL
DEVICE MANUFACTURER:	Proprietary information
MATERIAL:	Proprietary information
ELASTOMERS:	Proprietary information
MANUFACTURER CODE:	Proprietary information

SECONDARY CONTAINMENT (3.65)

SECONDARY SEAL:	
DESIGN PRESSURE:	psig

INSTRUMENTATION (7.4.2)

DETECT OPER. OUTSIDE ACCEPT. RANGE OR DECOUPLE (7.4.2.1)	
METHOD:	
LOCATION:	
IF LOCAL PROVIDED BY:	
USE FOR:	
MONITOR LEAKAGE INTO SECOND CASING:	**YES**
METHOD:	**PRESSURE**
SENSOR BY:	**SUPPLIER**
TYPE:	**TRANSMITTER**
USE FOR:	**ALARM**
MONITOR VIBRATION:	**NOT REQUIRED**
METHOD:	
PROVISION REQUIRED:	
SENSOR BY:	
IF FULL TIME, USE FOR:	
MONITOR TEMPERATURE OF:	**NOT REQUIRED**
METHOD:	
SENSOR BY:	
TYPE:	
USE FOR:	

PREPARATION FOR SHIPMENT (8.4.1)

TYPE OF SHIPMENT (8.4.1):	**EXPORT**
EXPORT BOXING	**Timber Box (Certified Wood)**
N2 PURGE DURING SHIPPING (9.2.8.4)	
OUTDOOR STORAGE MORE THAN 6 MONTHS	**YES**
PURGE DURING STORAGE (9.2.8.4)	**NO**
DETAILS OF LIFTING DEVICES	

SPARE PARTS (include cost & details w/ proposal)

START - UP	**YES**
NORMAL MAINTANANCE	**YES**
SPARE ASSEMBLY:	
OTHER:	

WEIGHTS lb

ITEM NO.	PUMP	DRIVER	GEAR	BASE	TOTAL	
18-P-254A	1208	340	44	1026	2618	1
18-P-254B	1208	340	44	1026	2618	1

OTHER PURCHASER REQUIREMENTS

COORDINATION MEETING REQUIRED (10.1.3)	**YES**	
CASTING REPAIR WELD PROCEDURE APPR REQ'D (6.10.2.5)	**Note 5.1**	
MAXIMUM DISCHARGE PRESSURE TO INCLUDE (6.2.3):		
MAX RELATIVE DENSITY	**YES**	
OPERATION TO TRIP SPEED		1
MAX DIAM. IMPELLERS	**YES**	1
CONNECTION DESIGN APPROVAL (6.10.3.4.4)		1
DEMONSTRATE CO-PLANAR MOUNTING PAD SURFACES		1
IN PUMP VENDOR SHOP (9.1.5.3.5)	**NONE**	
DYNAMIC BALANCE TO ISO 1940-1 gr. G1.0 (6.8.4.2)	**YES**	
INSTALLATION LIST IN PROPOSAL (10.2.3.1)	**YES**	
INCLUDE PLOTTED VIBRATION SPECTRAS (6.8.3.2.1)	**YES**	
CONNECTION BOLTING COATING	**PAINTED**	
SUBMIT EST. SPL BY OCTAVE BAND	**REQUIRED**	
MATERIAL CERTIFICATION REQUIRED (6.10.1.7)		
CASING	**YES**	
IMPELLER	**YES**	
SHAFT	**YES**	
OTHER:	**All wetted pressure containing components and wear rings**	
VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)	**YES**	1
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1G)		

SURFACE PREPARATION AND PAINT

MANUFACTURER'S STANDARD	**YES**
	MFR STD per A8KM-PP-000-500520-A
PUMP:	
PUMP SURFACE PREPARATION	**Per A8KM-PP-000-500520-A**
PRIMER	**MFR std in compliance or exceed ISO 12944-C4**
FINISH COAT	**Same as above**
BASEPLATE:	
BASEPLATE SURFACE PREPARATION	**Per A8KM-PP-000-500520-A**
PRIMER	**MFR std in compliance or exceed ISO 12944-C4**
FINISH COAT	**No finish coat on underside. Epoxy grout compatible**

NOTES

5.1 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 in total area) may be repaired without Buyer's approval

5.2 Bearing housing oilers shall be Trico 8-oz. constant-level sight feed. Vendor to provide standard 3/4" NPS bullseye level gauge.

5.3 Deleted

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SEALESS CENTRIFUGAL PUMP
API 685, 2nd EDITION
DATA SHEET

Note: This Data Sheet has been modified from that in Annex R of API 685, Second Edition.

Contract:	A8KM
Item No:	18-P-254A/B
Revision:	2 Date: 5-Sep-22
Unit:	SWSPlus Unit
Doc. No.:	HMD-4505605360-C04-04
Inquiry No.:	4505605360
Sheet	6 of 8

REV

INSPECTION AND TESTING

GENERAL (8.1)

DAYS IN ADVANCE NOTIFICATION OF WITNESSED OR OBSERVED TESTS AND INSPECTIONS	N/A
NOTIFICATION OF SUCCESSFUL PRELIMINARY SHOP PERFORMANCE TEST (8.1.1.3)	
SUBMIT INSPECTION CHECKLIST (8.1.6)	

SHOP INSPECTION (8.2)

ADDITIONAL SUBSURFACE EXAMINATION (6.10.1.5) (8.2.1.3)	
PART / EXAM	
PART / EXAM	
PART / EXAM	
PART / EXAM	
PMI TESTING REQUIRED (8.2.1.4)	REQUIRED
PARTS TO BE TESTED:	Please refer to Inspection Test Plan
INSPECTION REQUIRED FOR CASTINGS (8.2.2.1)	
MAG PARTICLE	NO
LIQUID PENTRANT	YES
RADIOGRAPHY	NO
ULTRASONIC	NO
INSPECTION REQUIRED FOR CONNECTION WELDS (6.10.3.4.5)	
MAG PARTICLE	NO
LIQUID PENTRANT	YES
RADIOGRAPHY	NO
ULTRASONIC	NO
CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.3.1)	NON-WIT

TESTING (8.3)

HARDNESS TEST REQUIRED (8.2.3.2)	NON-WITNESS
FOR	
METHOD	
COMPONENTS TO BE TESTED	
IMPACT TEST - TO	NOT REQUIRED
HYDROSTATIC TEST (8.3.2)	NON-WITNESS
WETTING AGENT INCLUDED (8.3.2.7)	
PERFORMANCE TEST (8.3.3)	NON-WITNESS
TEST DATA POINTS	PER 8.3.3.3
PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPMENT (8.3.3.3.5)	REQUIRED
TEST W/ NPSHA LIMITED TO 110% SITE NPSHA	NO
RUN UNTIL TEMP STABILIZATION ACHIEVED	YES
1 HR. MECH RUN TEST (8.3.4.2.2)	NON-WITNESS
THRUST BEARING LOAD TEST (8.3.4.3)	
NPSH3 TEST (8.3.4.4.1)	NO
COMPLETE UNIT TEST (8.3.4.5)	
SOUND LEVEL TEST (8.3.4.6) FOR INFORMATION ONLY	NON-WITNESS
AUXILIARY EQUIPMENT TEST (8.3.4.7)	
SECONDARY CONTROL SYSTEM HYDRO	NON-WITNESS
SECONDARY CONTAINMENT / CONTROL SYSTEM INSTRUMENT TEST (8.3.4.9)	
STATIC TORQUE TEST (9.1.6.1)	
RUN UNTIL OIL TEMPERATURE STABILIZED (9.1.6.3)	
RESIDUAL UNBALANCE TEST (J.4.1.2)	
OTHER:	

NOTES

6.1 PMI of alloy pressure containment parts, including pipes & valves, is required per Project Specification A8KM-PP-000-500512-A Positive Material Identification (PMI).

6.2 Pressure containing parts (including auxiliaries shall be tested hydrostatically with liquid at a minimum 1.5 times the maximum allowable working pressure.

6.3 Baseplate grounding tabs shall be 1/4" thick steel with at least (1) 9/16" diameter hole provided. If two (2) are provided, they shall be 9/16" dia. spaced 1-3/4" on center. Where stainless steel grounding tabs are required, 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.

6.4 Baseplate shall be constructed with top plate decking and a drain rim. The baseplate shall be epoxy grouted. Baseplate shall be rigid constructed to accommodate 2 X Allowable Nozzle Loads & Moments in API 685, 2nd Edition.

6.5 Motor requires oversized terminal box.

6.6 Deleted

6.7 An ESCO single piece sight glass is required for the oil drain. A magnetic drain plug in housing is also required.

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SEALESS CENTRIFUGAL PUMP
API 685, 2nd EDITION
DATA SHEET

Note: This Data Sheet has been modified from that in Annex R of API 685, Second Edition.

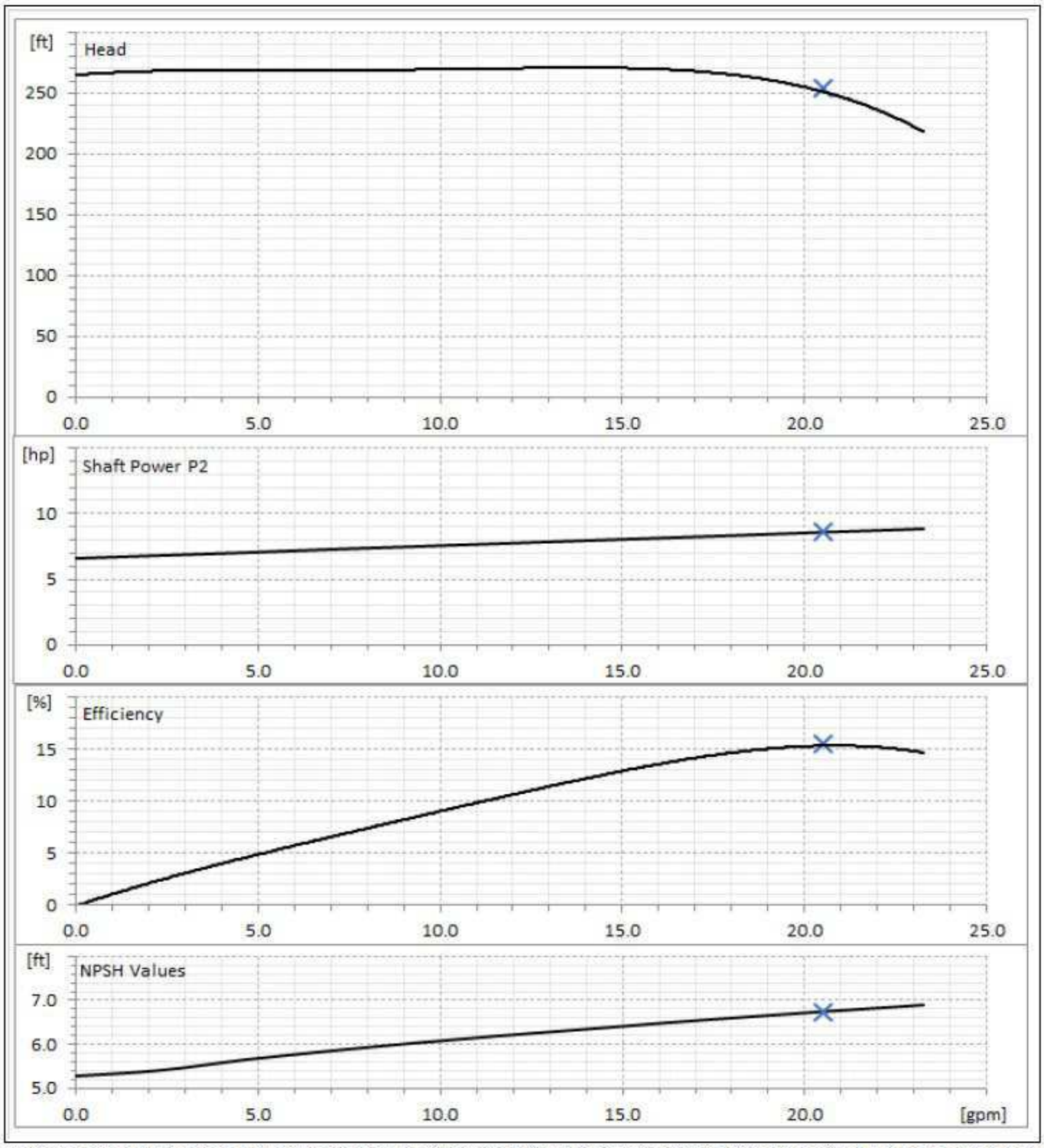
Contract:	A8KM		
Item No:	18-P-254A/B		
Revision:	2	Date:	5-Sep-22
Unit:	SWSPlus Unit		
Doc. No.:	HMD-4505605360-C04-04		
Inquiry No.:	4505605360		
Sheet	7 of 8		

REV

Predicted Pump Curve:
K2H/50-2, Sundyne HMD Kontro:

Performance curve			
Impeller type	Barske Wheel		
Direction of rotation	Anti-Clockwise from Drive End		
Impeller construction	Semi-Open		
Impeller Eye Area		NSS (US unit)	
Frequency	60 Hz Hz	Speed	3510 rpm

Impeller type			Barske Wheel
Impeller construction			Semi-Open
Impeller Ø	Max.	inch	7.625
	Designed	inch	7.08
	Min.	inch	6.967
Flow	Nominal	US g.p.m.	20.5
	Max.	US g.p.m.	23.25
	Min.	US g.p.m.	8.8
Head	Nominal	ft	253.4
	at Max Flow-	ft	217.25
	at Min Flow-	ft	270.7
Head H(Q=0)		ft	265.86
NPSH 3%		ft	6.74
Shaft power		hp	8.56
Max. shaft power sel. Impeller		hp	8.82
Efficiency		%	15.47



Performance curve data is for reference only. For specific performance data refer to tabulated actual values and datasheet.