World Energy Renewables Project

RENEWABLE JET FUEL UNIT B

MECHANICAL EQUIPMENT DATA SHEET FOR 18-P-355A/B

STRIPPER REFLUX PUMP

Document Number A8KM-18-096-540064-A

Fluor Project No: A8KM

REV	DATE	DESCRIPTION	PAGES	ORIG	CHK'D	APPV'D
G	11-Jan-2023	As-Built	8	AGU	CGO	
F	12-Jan-2023	Issued for Approval	8	AGU	CGO	
E	28-Nov-2022	Issued for Approval	6	AGU	CGO	
D	14-Oct-2021	Issued for Purchase	11	CP	JF AD ME	BT
C	26-May-2021	Issued for Quotation	10	JF	JPK AD ME	BT
B	12-May-2021	Issued for Client Review	10	JF	JPK AD ME	BT
A1	11-May-2021	Re-Issued for Internal Review	10	JF	JPK	
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API 610
CENTRIFUGAL PUMP DATA SHEET

Doc. No.: A8KM-18-096-540064-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-355A/B		
Revision:	G	Date:	16-Mar-23
Unit:	Renewable Jet Fuel Unit B		
P.O. No.:			
Inquiry No.:	4-601D-RQ		
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REV

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

SERVICE : Stripper Reflux Pump | FACILITY: World Energy Renewables Plant | SITE : Paramount, CA

NO. REQ'D : 2 x 100% (Note 2.1) | PUMP SIZE : 2x3x7.5A-1 | API TYPE : OH2 | NO. STAGES : One (1)

MANUFACTURER : Sulzer | MODEL : OHH | SERIAL NO. : 649501 / 649502

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-355A/B	PUMP ITEM NO. :	
GEAR ITEM NO. :	N/A	MOTOR ITEM NO. :	18-P-355AM/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:		Stripper Reflux		
VAPOR PRESSURE :	psi (a)		35.2	
RELATIVE DENSITY :			0.665	0.643
SPECIFIC HEAT :	BTU/lbm °F			
VISCOSITY :	cP		0.44	0.34

SERVICE : CONTINUOUS

*IF INTERMITTENT, NO. OF STARTS / DAY :

CORROSION DUE TO: (6.12.1.9) :

EROSION DUE TO: (6.12.1.9) :

H_2S CONCENTRATION (ppmw) (6.12.1.12) : 166

WET (YES / NO) : YES

CHLORIDE CONCENTRATION (ppmw) :

PARTICULATE SIZE (DIA. IN MICRONS) :

PARTICULATE CONCENTRATION (ppmw)

MECHANICAL DESIGN TEMPERATURE (°F) : 300

OPERATING CONDITIONS (6.1.2)

	UNITS	MAXIMUM	RATED	NORMAL	MINIMUM
NPSHa DATUM :		C.L. IMPELLER (Note 2.2)			
PUMPING TEMP.:	°F	160	110		
FLOW :	gpm		131.3	114.2	39.6
DISCHARGE PRESS:	psi(g)		82.6		
SUCTION PRESSURE :	psig(g)	106.2	24.6		
DIFFERENTIAL PRESS.:	psi		58.0		
DIFFERENTIAL HEAD :	ft		201.1		
$NPSH_A$:	ft	(Note 2.2)	14.4	Excludes Req'd Margin	
HYDRAULIC POWER :	hp		4.4		

Flash vapor at atmospheric pressure is 3 - 4 wt%

Pump is in wet sour service

Water and HCl are present

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. : 45 psi(g) | DESIGN PRESS. : 120 psi(g)

MAXIMUM RETURN PRESSURE : 35 psi(g)

MAXIMUM ALLOWABLE ΔP : 10 psi

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

INSTRUMENT AIR : MAX. : 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	NPSHa calculation based on 3' above grade. Please see Sheet 3 for actual as-built pump centerline from bottom baseplate. G
	Minimum NPSH margin shall be the greater of 2 feet or 15% of NPSHA (UOP Specification) G
	Deleted.
2.3	Pump Control Method: Level control cascading to flow control.
2.4	This is a UOP Pump Service. Governing Project Specifications are: #1; Honeywell/UOP Standard Specification 5-11-13, Centrifugal Pumps.
	#2; Project Specification A8KM-PP-000-50626-A, Centrifugal Pumps for Petroleum and Natural Gas Industries - API 610.
	Deleted. G
2.6	The head-capacity curve shall continuously rise to minimum continuous stable flow (UOP Specification).

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REV

PERFORMANCE

PROPOSAL CURVE NO.:	OHH 52-1-1-11	RPM	3520	
TEST CURVE NO.:	M-13409 /M-13410			
IMPELLER DIA.: RATED:	7.36	MAX: 7.5	MIN: 4.5	in
RATED POWER:	8.69	hp	EFFICIENCY: 51.65	%
RATED CURVE BEP FLOW: (at rated impeller dia.)			160.3	gpm
MIN. FLOW: THERMAL :		gpm	STABLE : 32.56	gpm
PREFERRED OPERATING REGION: (6.1.12)	112.2	to	192.3	gpm
ALLOWABLE OPERATING REGION:	32.56	to	200	gpm
MAX. HEAD @ RATED IMPELLER:			222.6	ft
MAX. POWER @ RATED IMPELLER: (6.8.9)			11.3	hp
NPSHR at CL IMPELLER for RATED FLOW :			5.9	ft
CL PUMP TO LOWER SIDE OF BASEPLATE:			1.67	ft
NPSH MARGIN at RATED FLOW :			8.5	ft
SPECIFIC SPEED:		gpm,rpm,ft	847	
SUCTION SPECIFIC SPEED LIMITATION		gpm,rpm,ft	(Note 3.1)	
SUCTION SPECIFIC SPEED: (6.1.9):		gpm,rpm,ft	10410	
MAX. ALLOW. SOUND PRESS. LEVEL / EST.: (6.1.14) @ 3 ft	85	/	70	dBA
MAX. ALLOW. SOUND POWER LEVEL / EST.: (6.1.14) @ 3 ft		/		dBA
MAX. DISCHARGE PRESSURE: (6.3.2)	170.3			psig
BASIS: (6.3.2.a, b or c)				

DRIVER (7.1.5)

DRIVER TYPE:	INDUCTION MOTOR		
GEAR:			NO
VARIABLE SPEED REQUIRED:			NO
SOURCE OF VARIABLE SPEED:		N/A	
OTHER:		TEFC / IP56	
MANUFACTURER:		ABB	
NAMEPLATE POWER:		15	hp
NOMINAL RPM:		3600	
RATED LOAD RPM:		3520	
FRAME OR MODEL:		256T	
ORIENTATION:		HORIZONTAL	
LUBE:		GREASE	G
BEARING TYPE:		ANTI-FRICTION	
RADIAL: (Qty / Brg. Number)		/	45BC03X30X
THRUST: (Qty / Brg. Number)		/	45BC03X30X
STARTING METHOD:		CLOSED VALVE (UNLOADED) START	
DRIVER DATA SHEET:		ATTACHED	
ACCESSORIES:			

CONSTRUCTION

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

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)	1	0.75"	BWF	RF	300	BOTTOM
VENT (IF NOT SELF VENTING)						
PRESSURE GAUGE	--					
TEMP GAUGE	--					
WARM-UP LINE*						

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

DRAIN VALVE SUPPLIED BY:	PURCHASER
DRAINS MANIFOLDED:	N/A
VENT VALVE SUPPLIED BY:	
VENTS MANIFOLDED:	N/A
THREADED CONNS FOR PIPELINE SERVICE & < 50°C:(6.4.3.2	N/A
SPECIAL FITTINGS FOR TRANSITIONING: (6.4.3.3)	NO
CYLINDRICAL THREADS REQUIRED: (6.4.3.8)	NO
	NO
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 B1.1)	ASME B1.1
SEAL FLUSH CASING CONNS. w/ SECONDARY SEALING REQD: (6.4.3.3)	
	NO
AUX. PIPING TERMINATIONS:	

CASING MOUNTING:	CENTERLINE
CASING TYPE:	
OH3 BACKPULLOUT LIFING DEVICE REQ'D: (9.1.2.6)	NO
CASE PRESSURE RATING: (Note 3.3)	
MAWP: (6.3.5)	640 psig @ 300 °F
HYDROTEST: (8.3.2.6)	960 psig @ --- °F G
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)	85 (Note 6.11)
FIRST CRITICAL SPEED, WET: (MULTI-STAGE)	N/A RPM
COMPONENT BALANCE TO ISO 1940 G1.0: (6.9.4.4)	YES
SHRINK FIT LIMITED MOVEMENT IMPELLERS: (9.2.2.3)	N/A
COUPLING & GUARD: (7.2.2) (Notes 3.4)	
MANUFACTURER:	Rexnord
MODEL:	Series 71
RATING: (POWER/100 RPM)	
SPACER LENGTH:	5 in
ACTUAL SF AT MOTOR NAMEPLATE:	1.5 minimum
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: (7.2.1	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 valve by others.
	Deleted.
3.3	Nameplate for MAWP at mechanical design temperature.
3.4	Coupling guards shall be non-sparking.
3.5	Deleted.
	Deleted.

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P.O. No.:			
Inquiry No.:	4-601D-RQ		
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REV

CONSTRUCTION (CONT'D)

MATERIAL (6.12.1.1)

APPENDIX H CLASS:	S-8: CS / 316L SS
MINIMUM DESIGN METAL TEMP: (6.12.4.1)	32 °F
REDUCED HARDNESS MATERIALS REQ'D: (6.12.1.12.1)	YES
APPLICABLE HARDNESS STANDARD: (6.12.1.12.3)	MR0103
BARREL:	
CASE:	A216 GR. WCB (PWHT)
DIFFUSERS:	
IMPELLER:	A743/A351 GR.CF3M
IMPELLER / CASE WEAR RING:	316L / C6HF // A890 GR.1B NACE
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: (9.2.5.2.4)	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 BASEPLATE:	N/A
LOCATION OF PRESSURIZED LUBE OIL SYSTEM MOUNTED ON BASEPLATE:	
INTERCONNECTING PIPING PROVIDED BY:	N/A
OIL VISC. ISO GRADE:	68
CONSTANT LEVEL OILER: (6.10.2.2)	REQUIRED

INSTRUMENTATION

SEE ATTACHED API-670 DATA SHEET:	NO
ACCELEROMETER OR VELOMETER: (7.4.2.1):	
QUANTITY:	
MOUNTING LOCATIONS:	
DETECTORS REQUIRED:	
THRD'D PROVISIONS ONLY PER ANSI/API 670: (6.10.2.10)	
QUANTITY:	
MOUNTING LOCATIONS:	
FLAT SURFACE REQ'D FOR MAGNETIC P/U's: (6.10.2.11)	YES (Note 4.8)
QUANTITY:	TWO
MOUNTING LOCATIONS:	
VIBRATION PROXIMITY PROBES FOR HYDRODYNAMIC BEARINGS:	
PROVISION-ONLY FOR VIB. PROBES: (7.4.2.2)	NO
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: (7.4.2.4)	

BASEPLATE OR SOLE PLATE

API BASEPLATE NUMBER:	
BASEPLATE CONSTRUCTION: (7.3.14)	FULL TOP DECKING
BASEPLATE DRAINAGE: (7.3.1)	Sloping Deck Drain Pan
MOUNTING:	GROUTED
NON-GROUT CONSTRUCTION: (7.3.13)	NOT REQUIRED
VERTICAL LEVELING SCREWS:	REQUIRED
HORIZONTAL DRIVER POSITIONING SCREWS:	REQUIRED
SUPPLIED WITH: - GROUT VENT HOLES	YES
- DRAIN CONNECTION	YES
MOUNTING PADS SIZED FOR BASEPLATES LEVELING: (7.3.5)	YES
MOUNTING PADS OR SOLE PLATE TO BE MACHINED: (7.3.6)	YES
PROVIDE SPACER PLATE UNDER ALL EQUIP. FEET: (7.3.6)	
OTHER:	Furnish two (2) diagonally opposed grounding provisions per Note 6.9.

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: 9.2.6.1)	
4.4) CONST. LEVEL OILER PREFERENCE: (6.10.2.2)	(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 feed. Provide a minimum 1" NPS bullseye level gauge.

4.7) Oil drains shall be furnished with an ESCO single-piece sight glass.

4.8) Pumps with A/F bearings shall have a minimum 1" diameter flat surface for a magnetic-based vibration transducer (UOP specification). G

SEAL SUPPORT SYSTEM MOUNTING

BARRIER/BUFFER RESERV. MTD ON PUMP BASEPL.:(7.5.1.4	YES
IDENTIFY LOCATION ON BASEPLATE:	
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.: (6.8.13) STATIC:	DYN.: psig
SEAL CATEGORY: (6.8.1)	Category 2

HEATING AND COOLING

COOLING REQUIRED: (6.1.17)	YES
COOLING WATER PIPING PLAN:	Plan M
CLG WATER PIPING CONSTR.:	TAAG2
FITTINGS TYPE:	
COOLING WATER PIPING MATERIALS:	Killed CS
CLG WTR REQMNTS: (BOTH ENDS IF DOUBLE ENDED)	
BEARING HOUSING(S):	gpm
SEAL SUPPORT: (HX, BUFFER, BARRIER, ETC.)	gpm
TOTAL COOLING WATER:	gpm
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:	YES
TAG ALL ORIFICES: (7.5.2.4)	N/A
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 NUMBER:	A8KM-PP-00-500520-A
PUMP: **Meets ISO 12944-5, C4 Environment**	
PUMP SURFACE PREPARATION:	SSPC-SP 10)
PRIMER:	Hempadur AvantGuard 750
FINISH COAT:	Hempathane 55610
BASEPLATE OR SOLE PLATE: **Meets ISO 12944-5, C4 Environment**	
SURFACE PREPARATION:	SSPC-SP 10)
PRIMER:	Hempadur AvantGuard 750
FINISH COAT:	Hempathane 55610
DETAILS OF LIFTING DEVICES:	
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: (9.2.8.3)	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-355A	333	239	690	1218	2480
18-P-355B	333	239	690	1218	2480

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)	N/A
INSTALLATION LIST IN PROPOSAL: (10.2.3.I)	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: (7.2.15)	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: (6.9.3.3	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 SHIPMENT:	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)(6.12.3.1)	Note 6.7
INSPECTION REQ'D FOR CONN. WELDS: (6.12.3.4.d,e)	
MAG PARTICLE:	YES
(BW Piping) RADIOGRAPHY:	YES
LIQUID PENETRANT:	NO
ULTRASONIC:	NO
INSPECTION REQUIRED FOR CASTINGS: (TABLE 14)	
MAG PARTICLE:	YES
RADIOGRAPHY:	YES
LIQUID PENETRANT:	YES
ULTRASONIC:	YES
HARDNESS TEST REQUIRED: (8.2.2.7) (NACE SERVICES)	YES
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 TESTED: See Note 6.4	
RESIDUAL UNBALANCE TEST: (J.4.1.2)	NO
NOTIFICATION OF SUCCESSFUL SHOP PRELIM. TEST:(8.1.1.c)(8.3.3.5)	NO
BASEPLATE TEST: (7.3.21)	NO
HYDROSTATIC TEST OF CASING/HEAD:	NON-WIT
HYDROSTATIC TEST OF BOWLS & COLUMN: (9.3.13.2)	N/A
PERFORMANCE TEST: (Note 6.5)	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)(8.3.4.3.4)	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: (8.3.3.6)	NO
RETEST ON SEAL LEAKAGE: (8.3.3.2.d)	NO
RETEST REQUIRED AFTER FINAL HEAD ADJ.: (8.3.3.7.b)(Multistg)	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: (8.3.4.2.1)	NON-WIT
1 HR. MECH RUN TEST AT RATED CAPACITY AFTER OIL TEMP STABLE:	YES
4 HR. MECH RUN TEST AT RATED CAPACITY: (8.3.4.2.2)	N/A
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: (9.2.7.5)	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-18-096-540064-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-355A/B		
Revision:	G	Date:	16-Mar-23
Unit:	Renewable Jet Fuel Unit B		
P.O. No.:			
Inquiry No.:	4-601D-RQ		
Sheet	6	of	8

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 Provide a Start-up Spare Parts List and 2-yrs. Operating Spares List, inclusive of coupling and motor parts.

6.2 Pump Supplier shall provide pump performance curves, General Arrangement drawing sized for the driver, completed data sheets & Bill of Material, and un-priced Sub-Supplier buyouts.

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.

Deleted.

6.6 Deleted.

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 or lugs 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.

6.10 Pumps must comply with Honeywell UOP Pump Specification 5-11-13 CENTRIFUGAL PUMPS dated 06Jul16 and Motor specification 7-12-6 ELECTRIC MOTORS dated 03Jun15. (UOP Pump service)

6.11 The value of the overhung pump shaft flexibility, ISF, for the given pump size factor, Kt, shall not exceed 1.2 times the equation (K.5) (US units). (UOP Specification)

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PUMP DATASHEET
ANNEX

Contract:	**A8KM**		
Item No:	**18-P-355A/B**		
Revision:	**G**	**Date:**	**16-Mar-23**
Unit:	**Renewable Jet Fuel Unit B**		
P.O. No.:			
Inquiry No.:	**4-601D-RQ**		
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REV

TESTED PUMP CURVE No: M-13409 PUMP TAG & SERIAL NO: 18-P-355 A 6496501

SULZER

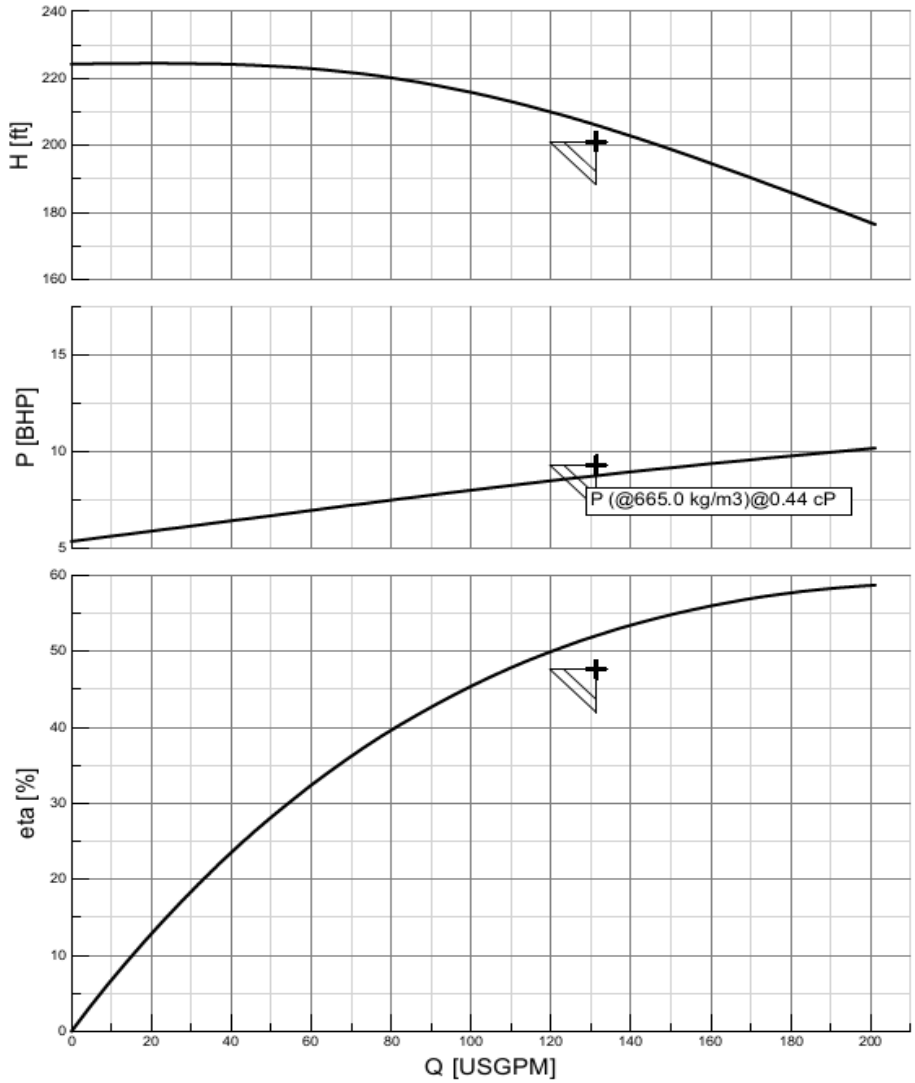
Curva de prueba / Test Curve **M-13409**

Cliente / Customer	AIR PRODUCTS AND CHEMICALS
Orden Compra	4505551384
No. Identif. / Ident No.	18-P-355 A
No. Serie. / Item No.	649501
Nombre / Name	Gerardo Endoqui
Fecha / Date	2022-07-09

	1er Paso / 1st Stage	Series / Series
Impulsor / Impeller	D10692	
Modelo / Pattern	213OHH-01	
Difusor / Diffuser	D10690	
Modelo / Pattern	214OHH-01	

D2 Diseño. / D2 design.	ø7.36 in	Venas / Vane	ø7.36 in
D2 min. / D2 min.	ø4.50 in		
D2 max. / D2 max.	ø7.50 in		

No. Or / Sulzer Comm.Nr.	100456527-0010-01
Tipo / Type	2x3x7.5A-1 OHH
Reporte No. / Test Report No.	207/22
Fecha / dated	..
n= 3520 1/min.	i= 1 Stufen / Stages
DN_s 3 in	DN_d 2 in



F-BP-002

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PUMP DATASHEET
ANNEX

Contract:	A8KM			
Item No:	18-P-355A/B			
Revision:	G	Date:	16-Mar-23	
Unit:	Renewable Jet Fuel Unit B			
P.O. No.:				
Inquiry No.:	4-601D-RQ			
Sheet	8	of	8	REV

TESTED PUMP CURVE No: M-13410 PUMP TAG & SERIAL NO: 18-P-355 B 6496502

SULZER

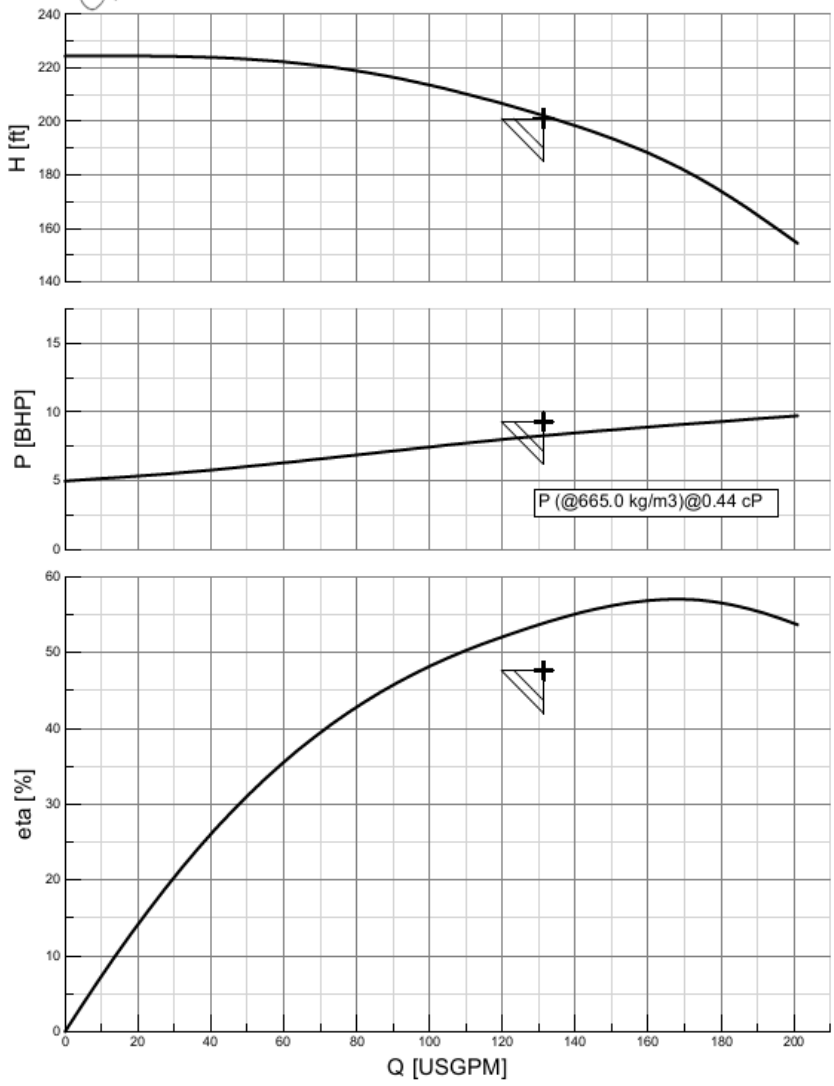
Curva de prueba / Test Curve **M-13410**

Cliente / Customer	AIR PRODUCTS AND CHEMICALS		
Orden Compra	4505551384		
No. Identif. / Ident No.	18-P-355 B		
No. Serie. / Item No.	649502		
Nombre / Name	Gerardo Endoqui		
Fecha / Date	2022-07-09		

	1er Paso / 1st Stage	Series / Series
Impulsor / Impeller	D10692	
Modelo / Pattern	213OHH-01	
Difusor / Diffuser	D10690	
Modelo / Pattern	214OHH-01	

D2 Diseño. / D2 design.	Ø7.36 in	Venas / Vane	Ø7.36 in
D2 min. / D2 min.	ø4.50 in		
D2 max. / D2 max.	ø7.50 in		

No. Or / Sulzer Comm.Nr.	100456527-0010-02		
Tipo / Type	2x3x7.5A-1 OHH		
Reporte No. / Test Report No.	208/22	Fecha / dated	..
n=	3520 1/min.	i=	1 Stufen / Stages
DN_s	3 in	DN_d	2 in



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