FLUOR

world energy

ROTARY PUMP MAG-DRIVE GEAR DATA SHEET

Contract:	A8KM
Item Tag(s):	18-J-276/276S/276SM
Revision:	D
Unit:	RJFU-A
P.O. No.:	SM00000885
Inquiry No.:	A8KM-4-622
Sheet	2 of 5

REV

Applicable To : ● □□□□□

Client :	WORLD ENERGY PARAMOUNT	Unit:	RJFU-A
Site :	PARAMOUNT, CA	No. of Pumps Required:	1 + Warehouse Spare - NOTE 2.1
Service :	RJFU-A H2S COMPRESSOR SOUR WATER	Size & Type:	MAG-DRIVE GEAR / NOTE 2.6
Manufacturer :	LIQUIFLO	Serial Number:	109107-14-1 / 109107-15-1

GENERAL

No. Motor Driven :	One (1)-NOTE 2.1	Other Driver Type :			
Pump Item No's.:	18-J-276/276S	Pump Item No's.:			
Motor Item No's.:	18-J-276M/276SM	Driver Item Nos.:		Gear Item No's.:	
Motor Provided By :	PUMP SUPPLIER	Driver Provided By :		Gear Provided By :	
Motor Mounted By :	PUMP SUPPLIER	Driver Mounted By :		Gear Mounted By :	
Motor Data Sheet No. :	ATTACHED	Driver Data Sh. No. :		Gear Data Sh. No. :	

Notes : Information Below To Be Completed : ○ By Purchaser ☐ By Supplier ☒ By Supplier Or Purchaser

OPERATING CONDITIONS

		Min	Normal	Rated	Max
● Capacity	gpm			0.5	
○ Other Operating Conditions	gpm				
● Discharge Pressure	psig			17.4	
● Suction Pressure	psig			2.4	231.4
● Differential Pressure	psi			15	

● NPSH Available 3.25 ft

● NPIP Available 1.39 psia **(Excludes margin)**

● NPSHa / NPIP Datum ● CL Suction Nozzle

● Duty Cycle (Note 2.1) Intermittent

(1) Maximum - mechanical design

PERFORMANCE

☐ Proposal Curve No. :	H3F	
■ Rated Capacity :	0.69	gpm
■ NPSH/NPIP Required :	2 ft	psia
■ Rated Speed :	1150	RPM
☐ Displacement :	0.0006	gpm
☐ Volumetric Efficiency :	100	%
■ Pump Efficiency :	15.1	%
■ Req. Power @ Maximum Viscosity :	0.06	HP
■ Req. Power @ Pres. Limiting Val :	0.46	HP
■ Req. Power @ Rated Condition :	0.04	HP
☐ Maximum Allowable Speed :	1750	RPM
☐ Minimum Allowable Speed :	230	RPM

CONSTRUCTION

Connections :	Size	ANSI Rating	Facing	Position
Suction :	1/2"	150#	RF	SIDE
Discharge :	1/2"	150#	RF	SIDE
Grand Flush :				
Drains* :	1/2"		NPT	FRONT
Vents* :	NA			
Jacket :				

* ~~Vent and~~ Drain valves and piping by Purchaser

PUMP TYPE

● Sealless Mag-Drive, Gear, Close-Coupled

PUMPED FLUID

● Type or Name of Pumped Fluid SOUR WATER

		Min	Rated	Max
● Temperature	°F		124	175
● Vapor Pressure	psia		15.7	
● Relative Density	S.G.		0.987	
● Viscosity	cP		0.53	

● Specific Heat BTU/lb°F

● Corrosive / Erosive Agents Description

○ Erosive ● Corrosive H2S

○ Chloride Concentration (ppmw) :

● H2S Concentration (ppm) : 1310

Fluid ● Hazardous ○ Flammable ● Other Toxic

○ Gas ○ Entrained ○ Slug Flow % by volume of GVF

○ Solids Particle Size Distribution & Min/Max in

○ Shape ○ Concentration Hardness

SITE AND UTILITY DATA

Location : ● Outdoor ● Unheated ○

Electrical Area Classification :

● Class: I Group: BCD Division: 2

○ Non-Classified

○ Winterization Required ○ Tropicalization Required

Site Data : Elevation (MSL) : 69 ft

Barometer : 14.7 psia

○ Range of Ambient Temps : MIN / MAX: 35 / 104 °F

Unusual Conditions :

○ Dust ○ Fumes ○ Salt Atmosphere

○ Other :

○ Utility Conditions

Electricity	Drivers	Heating	Control	Shutdown
Voltage :	460	120	120	
Hertz :	60	60	60	
Phase :	3	1	1	

Cooling Water Source :

Supply Temp °F Max Return Temp °F

Norm. Press psig Design Press. psig

Min. Return Press psig Max. Allow. ΔP psi

Instrument Air Max Min

Pressure : psig 80 psig

Notes :

2.1) Pump is 1x100% intermittent service. Vendor included an uninstalled warehouse pump spare and warehouse pump motor spare.

2.2) Pressure relief valve by Others shall be set at 100 psig. ~~Pump shall include required BHP @ relief set point.~~

2.3) Suction static head is measured from LLL.

2.4) Pump shall be rated for NACE MR0103 service with flanged connections.

2.5) Pump baseplate is mounted at grade and pump centerline is estimated to be 7" from bottom of baseplate.

2.6) Pump Model H3F Mag-Drive (H3FL6PEE102000US) / 1/2" Flange

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ROTARY PUMP
MAG-DRIVE GEAR
DATA SHEET

Contract:	A8KM
Item Tag(s):	18-J-276/276S/276SM
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Sheet	3 of 5

REV

PIPING AND APPURTENANCES

Manifold Piping For Purchaser Connection
- ☒ Vent ☒ Drain ☒ Steam / Cooling Water
- ○ Heating Jacket Required ☒ Cooling Required
- ☒ ☒ Fittings
- ☒
- ☒ Valves: ☒
- ☒ Flanges Required in Place of Socket Weld Unions
- ☒ Mount Seal Pot Off Baseplate

Connection Bolting ○ Cadmium Plated Bolts Prohibited
- ○ ○

HEATING AND COOLING

Heating Medium ○

☒ Steam Jacket / Cooling Water Press. psig @ °F

Cooling Water Requirements

☐ Bearing Housing	gpm	@	psig		
☐ Lube Oil Cooler	gpm	@	psig		
☐ Seal Oil Cooler	gpm	@	psig		
☐ Other	gpm	@	psig		
Total Cooling Water	gpm	@	psig		

INSTRUMENTATION

- ○ Accelerometer :
- ○ Provision for MTG Only
- ○ Flat Surface Required
- ○ Radial Bearing Temp. ○ Thrust Bearing Temp.
- ○ Temp. Gauges (With Thermowells)
- ○ Pressure Gauge Type
- ○ Other : Magnetrol model 961 liquid level switch
- ○ Other :
- ○ Other :

PREPARATION FOR SHIPMENT

● Domestic ○ Export Boxing Req'd **(Required if overseas)**
- ● Outdoor Storage for 12 Months minimum
- ● Specification 4WGN-10001, Shipment and Packing Specification

SURFACE PREPARATION AND PAINT

● **Supplier's Standard in compliance with below spec'**
- ● Specification Number : **A8KM-PP-000-500520-A, Painting**

Pump (8.4.3.1)
- ● Primer: Manufacturer's standard
- ● Finish Coat: Manufacturer's standard

Baseplate (8.4.3.1)
- ● Primer: Primer to be compatible w/ epoxy grout & ISO 12944-5 C4
- ● Finish Coat: No finish coat on underside.

WEIGHTS

■ Pump	31	lb	■ Base	33	lb	D
■ Driver	61	lb	■ Gear		lb	D
Total	125	lb				D

BASEPLATE

● By Pump Manufacturer ● Suitable For Epoxy Grout
- ○ Extended For :
- ○ Non-Grout Construction (7.4.2)
- ○ Drain - Rim ○ Drain - Pan D

OTHER PURCHASER REQUIREMENTS

Nameplate Units : ● USGS
- ○ Relief Valves By Pump Mfgr :

Piping For Seal Flush Furnished By :
- ○

Piping For Cooling Water / Heating Furnished By :
- ○
- ● Provide Technical Data Manual
- ☒ Installation List in Proposal (9.2.3.1) D

NOTES

3.1) Pump shall be prepared for long term storage for minimum of 12 months outdoor.

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P.O. No.:	SM00000885
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Sheet	4 of 5

REV

APPLICABLE SPECIFICATIONS:

API 676 Positive Displacement Pumps - Rotary

- ○ Governing Specification (If Different)
- ● NACE MR0103 (6.13.2.13)
- ○ NACE MR0175
- ○ Other

CONSTRUCTION

Casing :

- ■ Max. Allowable Press.(6.3.1): 233 psig @ 175 °F
- ■ Max. Allow. Suction Press. : psig @ °F
- ■ Hydrostatic Test Pressure - Suct / Disch 1.5 MAWP / 350 psig
- ☐ Steam Jacket Press. : psig @ °F

Rotating Elements :

- Rotor Mount : ☐
- Timing Gears : ☐
- Bearing Type : ☐ Radial ☐ Thrust
- Bearing Number : ☐ Radial ☐ Thrust
- Lubrication Type : ○ Constant Level Oilers
  - ☐ Pumped Fluid ☒ Ring Oil ☒ Oil Mist
  - ○ External ○ Oil Flood ○ Grease
  - ☐ Lubricant Info (Visc,etc)
- ○ **Mechanical Seals : (Not Applicable. Sealless)**
  - ☐ Supplier and Model :
  - ☐ Supplier Code :
- ○ API 682 and Data Sheets :
- ☐ API 682 Seal Code :
- ○ API 682 Seal Flush Plan:

DRIVER TYPE

- ● Induction Motor
- ○ Other :

DRIVE MECHANISM

- ● Direct Coupled
- ☒ Coupling Manufacturer :
- ■ Coupling Type : **Close Coupled**
- ☐ Rating (Max Torque) ☒ Model :
- ☐ Spacer Length in ☒ S.F.
- ○ Coupling Balanced :
- ○ Coupling Per ARI 671 (7.2.4)
- ○ Coupling Hub Attachment
  - ○

Coupling Guard Type

- ○
- ■ Non-Spark Coupling Guard (7.2.15)

MOTOR DRIVER

- ● IEEE 841
- ○ ASD Supplier By:
- ■ Manufacturer **BALDOR** ☐ Type
- ■ Frame **145TC** ■ Enclosure TEFC
- ■ Horizontal
- ■ HP 1 RPM 1160 Volts 460
- ● Phase 3 Hertz 60 S.F. 1.15
- ○ Variable Speed Range RPM
- ● Minimum Starting Voltage (7.1.2.2) **80% at Motor Terminals**
- ☒ Insulation F ☒ Temp Rise B
- ☒ Full Load Amps 1.7
- ☒ Locked Rotor Amps 4.5
- ☒ Starting Method DOL
- ☒ Lube Grease

Bearings (Type / Number)

- ☐ Radial 25BC02X30X
- ☐ Thrust 25BC02X30X

MATERIALS

■ MDMT (6.13.6.1) :	32	
■ Casing :	316 SS	D
■ Stator / Liner :	316 SS (CONTAINMENT SHELL)	D
■ Wear Plates:	Carbon 60	D
■ Gear :	316 SS (IDLER - PEEK)	D
☐ Vanes :		
■ Shaft :	Tungsten Carbide Coated 316 SS	D
☐ Sleeve(s) :		D
☐ Gland(s) :		
■ Bearing Housing :	Carbon 60 (Bearings) Teflon (Bearing Pins)	D
☐ Timing Gears :		
■ Elastomers / Gaskets :	TEFLON	D

QA INSPECTION AND TEST

- ○ Special Material Tests
- ○ Low Ambient Temp. Materials Tests (6.13.6.5)
- ○ Compliance with Inspector's Check List
- ● Certification of Materials (Casing, Rotor/Shaft)
- ● Surface and Sub-Surface Examinations
  - ○ Radiography
  - ○ Ultrasonic
  - ● Magnetic Particle N/A
  - ● Liquid Penetrant Case Attachment Welds
  - ● Component PMI Per A8KM-PP-000-500512-A
- ● Hardness of Parts, Welds & Heat Affected Zones
- ● Vendor to Submit Test Procedures (8.3.1.2)
- ○ Supplier to Keep Repair and HT Records (8.2.1.1)

	Non-Witn	Witn	Obsd	
● Shop Inspection (8.1)				D
● Hydrostatic	●	○	○	
● Performance (8.3.4)	○	●	○	D
○ Retest On Seal Leakage	○	○	○	
○ Npsh / Npip (8.3.7.1)	○	○	○	D
○ True Peak Velocity Data	○	○	○	
○ Complete Unit Test (8.3.7.2)	○	○	○	
○ Sound Level Test (8.3.7.3)	○	○	○	D
○ Cleanliness Prior To Final Assembly (8.2.3.3)	○	○	○	
○ High Discharge Pressure @ Plv	○	○	○	D
○ Check For Co-Planar At Mounting Pad Surfaces (7.4.7)	○	○	○	
○ 1 Hr Mechanical Run Test After Oil Temp Stable (8.3.5.1)	○	○	○	D
○ 4 Hr. Mech Run After Oil Temp Stable (8.3.5.2)	○	○	○	D
○ Auxiliary Equipment Test (8.3.4.3)	○	○	○	D
○ Other	○	○	○	D

- ○ Test With Substitute Seal (8.3.5.3)
- ○ Supplier Submit Test Data Within 24 Hours
- ○ Include Plotted Vibration Spectra
- ○ Record Final Assembly Running Clearances (8.2.1.1,f)
- ● Performance Curve & Data Approval Prior to Shipment (8.3.9)

NOTES

4.1. ~~Rotor shall be balance to ISO 1940 G2.5~~

~~4.2 Vendor to advise mag coupling make during detailing~~ D

4.3 Offered Pump Design Temp is 260 Deg F. D

4.4 Bearings are Product Lubricated D

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LOW VOLTAGE MOTOR (IEEE 841) DATA SHEET
U.S. CUSTOMARY UNITS

APPLICABLE MOTOR SPECIFICATION
A8KM-PP-000-50670-A

Contract:	A8KM
Item No:	18-J-276M/276SM
Revision:	E — Date: 6-Dec-23
Unit:	RFJU-A H2S Recovery Unit
RFQ / P.O. No.:	A8KM-4-622
Sheet	5 of 5

Rev

APPLICABLE TO ○ PROPOSAL ○ PURCHASE ● AS BUILT

CLIENT: WORLD ENERGY PARAMOUNT — SERVICE: H2S COMPRESSOR SOUR WATER PUMP

PLANT: WORLD ENERGY RENEWABLES PLANT — MOTOR TAG NO. / NO. REQ'D: 18-J-276M/276SM / 1 + Spare

SITE: PARAMOUNT, CA — DRIVEN EQUIPMENT TYPE / TAG NO.: MAG-DRIVE GEAR / 18-J-276/276S

DESIGN DATA AND ACCESSORY EQUIPMENT

NAMEPLATE 1 HP 1.15 S.F. 1160 RPM — POWER (VOLTAGE/PHASE/HERTZ) 460 / 3 / 60

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

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

AREA CLASSIFICATION: ● CLASS I, GROUP B/C/D DIV. 2 ● T-RATING T4 / ____ °F ○ UNCLASSIFIED ○ ____

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

AMBIENT TEMPERATURE: MAX 104 °F / MIN. 35 °F — ALTITUDE 69 ft

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

MOUNTING METHOD: ● FOOT ○ FLANGE, TYPE: ____

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

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

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

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

SOUND PRESSURE LEVEL REQUIREMENTS: 85 dBA @ 3 FEET

STARTING: ● FULL VOLTAGE ● REDUCED VOLTAGE, 80 % OF VOLTAGE Starting Voltage Dip Allowance ○ UNLOADED ● LOADED ○ CAPACITORS FOR POWER FACTOR CORRECTION

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

● OVERSIZE TERMINAL BOX ● DRAIN PLUGS

● SS NAMEPLATE ○ AUXILIARY NAMEPLATE

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

REMARKS: **5.1) This data sheet applies to motors 1/2 hp through 500 hp with anti-friction bearings.**

~~**5.2) Space heaters are required for 100 hp and above. Space heaters shall be rated at 120V/1 ph./60Hz for operation at 120V.**~~

5.3) IP55 degree of protection is required. 5.4) Average relative humidity is 54%.

INFORMATION BELOW TO BE COMPLETED BY VENDOR

MOTOR MFR. Baldor — MODEL CECP83582T-4 — SERIAL NO. ____

NAMEPLATE HP 1 — FULL LOAD RPM 1160 — FRAME 145TC — WEIGHT 69 LB

MOTOR OUTLINE DRAWING NO. 05LYEE943

ROTOR CAGE MATERIAL OF CONSTRUCTION Iron — MOTOR WINDING MATERIAL Copper

BEARING MANUFACTURER SKF — SIZE 6205

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

Note 5.8

LOAD	FULL	3/4	1/2	OTHER
AMPERES	~~1.35~~	1.28	~~1.21~~	
EFFICIENCY, %	79.2	75.7	69.1	
POWER FACTOR	44	36	28	
SPEED, RPM	~~1180~~	1185	~~1191~~	

LOCKED ROTOR AMPS*	4.5 AMPS
FULL LOAD TORQUE*	4.53 FT-LB
LOCKED ROTOR TORQUE*	12 %
PULL UP TORQUE*	11.1 %
BREAKDOWN TORQUE*	14.6 %
ACCEL. TIME W/ LOAD (0 TO FULL SPEED)*	____ SEC.
STALL TIMES AT ZERO RPM* - HOT / COLD	____ / ____ SEC.
NUMBER OF CONSECUTIVE STARTS*	____

SOUND LEVEL: GUARANTEED 85 dBA / EXPECTED ____ dBA

FAN MATERIAL ____ (NON-SPARKING)

* INDICATED AT RATED VOLTAGE

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

● SAFE TIME - CURRENT CURVE

● SPEED - TORQUE CURVE

● SAFE LOCKED ROTOR TIME HOT ____ COLD ____

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

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

NOTES:

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

5.6 **Delete**

5.7 **Motor shall be rated for Cl. I, Div. 2, Gr. B,C,D and a T3C temperature code.**

5.8 Refer to Baldor Motor Data Pack - EN207122-DXP-00068

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