



DOC.:

**ROTARY-TYPE POSITIVE DISPLACEMENT
COMPRESSOR (API 619) DATA SHEET SI
UNITS**

NO.	BY	APP	DATE	DESCRIPTION
0	PAULO	SES	05/12/2023	FOR APPROVAL

1 APPLICABLE TO: PROPOSAL PURCHASE AS BUILT -

2 CLIENT: Zanjan Urea Project UNIT Oil Flooded Screw Compressor

3 PROJECT: Fertilizer ITEM NO. - SERIAL NO. -

4 SERVICE: AMMONIA REFRIGERATION PACKAGE NO. REQUIRED 2

5 LOCATION: Zanjan MODEL N2016MSC-LBM DRIVER MOTOR

6 NOTE: INDICATES INFORMATION TO BE COMPLETED BY PURCHASER BY MANUFACTURER

OPERATING CONDITIONS

(ALL DATA ON PER UNIT BASIS) ALL DATA ARE FOR EACH COMPRESSOR	1 stage (3.1.24 & 4.1.3)	2 stage (4.1.4)	OTHER CONDITIONS			
			A	B	C	D
	SUCTION	SUCTION				
	AMMONIA	AMMONIA				
	-	-				
	645	820				
INLET CONDITIONS:						
● PRESSURE (BarA) @ Package Inlet NOTE 1	0.86	3.02				
● TEMPERATURE (°C) @ Package inlet NOTE 1	-36.65	59.17				
○ RELATIVE HUMIDITY (%)						
● MOLECULAR WEIGHT (M)	17.031	17.031				
● Cp/Cv (K ₁) OR (K _{AVG})						
● COMPRESSIBILITY (Z ₁) OR (Z _{AVG})						
● INLET VOLUME, (Am ³ /HR-WET)						
DISCHARGE CONDITIONS:						
● PRESSURE (BarA) @ Package outlet NOTE 1	3.02	21				
● TEMPERATURE (°C) @ Package outlet NOTE 1	59.3	83.3				
● Cp/Cv (K ₂) OR (K _{AVG})	1.3415	1.3171				
● COMPRESSIBILITY (Z ₂) OR (Z _{AVG})						
● OUTLET VOLUME, (Am ³ /HR-WET)						
● kW REQUIRED (ALL LOSSES INCL)	54.7	98.1				
● SPEED (RPM)	2,950	2,950				
● PRESSURE RATIO (R)						
● VOLUMETRIC EFFICIENCY (%)						
● ADIABATIC EFFICIENCY (%)						
● PERFORMANCE CURVE NO.						

PROCESS CONTROL:

METHOD: ● BYPASS FROM DISCHARGE VIA SLIDE VALVE TO _____

● BYPASS: ○ MANUAL ● AUTO **VIA UCP**

○ SPEED VARIATION FROM _____ TO _____

● OTHER **SLIDE VALVE 30-100% (NORMAL),**

SIGNAL: ● SOURCE **COMPRESSOR SUCTION PRESSURE**

● TYPE **4-20 mA**

○ RANGE: FOR PNEUMATIC CONTROL _____ RPM @ _____ PSIG & _____ RPM @ _____ PSIG (kPa)

○ OTHER _____

SERVICE: ○ SPECIAL PURPOSE ● GENERAL PURPOSE

● CONTINUOUS ○ INTERMITTENT ○ STANDBY ○ DRY ● FLOODED SCREW ● SEPARATOR

REMARKS: **NOTE 1 CONDITION @ COMPRESSOR INLET AND OUTLET NOZZLES**

NOTE 2 2x50% compressor in operation



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1 **SPEEDS:**

2 MAX. CONT. 3,600 RPM TRIP N/A RPM

3 MIN. TIP SPEEDS: xxx m/s @ RATED SPEED

4 MAX. TIP SPEEDS: xxx m/s @ MAX. CONT. SPEED

5 **LATERAL CRITICAL SPEEDS:**

6 FIRST CRITICAL TBA RPM

7 DAMPED _____ UNDAMPED _____

8 MODE SHAPE _____

9 LATERAL CRITICAL SPEED - BASIS:

10 DAMPED UNBALANCE RESPONSE ANALYSIS

11 SHOP TEST

12 OTHER TYPE ANALYSIS: _____

13 (SPECIFY) _____

14 **TORSIONAL CRITICAL SPEEDS:**

15 FIRST CRITICAL xxx RPM

16 SECOND CRITICAL --- RPM

17 THIRD CRITICAL --- RPM

18 **VIBRATION: AS PER MAYEKAWA EXCEPTION TO API-619**

19 ALLOWABLE LEVEL 0.3 in/s 8.0 mm/s **RMS** TEST

20 (PEAK TO PEAK) 0.5 in/s 12.0 mm/s **RMS** SITE

21

22 **ROTATION, VIEWED FROM DRIVEN END:**

23 **CASING:**

24 MODEL _____

25 CASING SPLIT Radial (vertical)

26 MATERIAL FC300 JIS A48-93A [Note1](#)

27 OPERATION: DRY FLOODED, w/ Oil LIQUID

28 THICKNESS (") Varies CORR. ALLOW (") None

29 MAX. WORK PRESS. xx kg/cm2 G (xx) Bar G

30 RELIEF VALVE SETTING 23.1 kg/cm2 22.7 BarG

31 MARGIN FOR ACCUMULATION N/A kg/cm2

32 TEST PRESS. (BarG/kg/cm2G) AIR 27.8 HYDRO 38.0 [Note3](#)

33 MAX. ALLOW. TEMI 120 °C MIN. OPER. TEMP. -28.89 °C

34 MAX. CASING CAPACITY (Inlet m3/h) 4,710

35 RADIOGRAPH QUALITY YES NO

36 **ROTORS:**

37 DIAMETER (mm): 321.30

38 NO. LOBES: MALE 4 FEMALE 6

39 TYPE: Unsymmetric

40 TYPE FABRICATION xxxx

41 MATERIAL FCD 600 JIS [Note2](#)

42 MAX. YIELD STRENGTH (N/mm2) > 705

43 BRINELL HARDNESS. MAX. _____ MIN. 269

44 ROTOR LENGTH TO DIAMETER RATIO (L/D) xxx

45 ROTOR CLEARANCE (mm) Not Applicable to Oil Flooded Screw

46 MAX. DEFLECTION (mm) 4.60E-02

47 MAX. MACHINE MACH NO. @ LOBES _____

48 INTERNALLY COOLED N/A UNCOOLED N/A

SHAFT: The Shaft is Integral with the Rotor (One Piece)

MATERIAL Same as Rotor

DIA @ ROTORS (mm) N/A DIA @ COUPLING (mm) xxx

SHAFT END. TAPERED CYLINDRICAL With Key

SHAFT SLEEVES: This Section is Not Applicable

AT SHAFT SEALS MATL. _____

TIMING GEARS: This Section is Not Applicable

SIZE (mm) _____ TYPE _____

MATERIAL _____

SHAFT SEALS:

TYPE Double Oil Flooded MAYEKAWA STD

SEAL SYSTEM TYPE Flushing: Internal Compressor Oil

INNER OIL LEAKAGE GUAR. (GAL/DAY/SEAL) _____

TYPE BUFFER GAS _____

BUFFER GAS FLOW (PER SEAL)

NORMAL: _____ m³/min @ _____ kg/cm2

MAX.: _____ m³/min @ _____ kg/cm2

BEARING HOUSING CONSTRUCTION:

TYPE (SEPARATE), (INTEGRAL) Integral SPLIT Axial

MATERIAL Same as Casing

RADIAL BEARINGS: (Main Bearing / Side Bearing)

TYPE TBA SPAN (mm) xx / xx

AREA (cm²) xx /CENTER LOAD (kgf/cm2): ACT. _____ ALLOW. _____

PIVOT N/A OFFSET PIVOT N/A

% OFFSET FROM LEADING EDGE N/A

NO. PADS N/A ROTOR ON _____ OR BETWEEN _____ PADS

PAD MATERIAL _____ THICKNESS 1.0 (mm)

TYPE BABBITT will be finalized after order

THRUST BEARING: Male Side / Female Side

LOCATION At the driven end TYPE TBA

MFR. TBA AREA (mm²) M/F xxx / xxx

LOAD (kg/cm2): M/F ALL. _____ / _____ ALLOW. _____ / CPLG. _____

GAS LOADING (N) _____ SLIP LOAD (N) _____

CPLG. COEFF. FRICT. _____ CPLG. GEAR PITCH DIA. (mm) _____

BAL. PISTON COMPENSATING LOAD _____ kgf

CENTER PIVOT xx OFFSET PIVOT _____

% OFFSET FROM LEADING EDGE _____

NUMBER OF PADS M/F: xxxx

PAD MATERIAL xxx

TYPE BABBITT xxxx THICKNESS xx (mm)

A xxxx

B xxxx

49 **REMARKS:** Note 1: Equal To: ASTM A 48-93A

50 Note 2: Equal To: ASTM A536 Gr84

50 Note 3: Based on System Design Pressure

51

1	MAIN CONNECTIONS: All Flanges are per ANSI B31.3	AXIAL POSITION DETECTOR:
2		<input type="radio"/> IN ACCORDANCE WITH: API 670
3		OTHER (SPECIFY) _____
4	INLET <i>in</i>	<input type="radio"/> TYPE _____ MODEL _____
5	DISCHARGE <i>in</i>	<input type="radio"/> MFR. _____ NO. REI _____
6		<input type="radio"/> OSCILLATOR-DETECTORS SUPPLIED BY
7		<input type="radio"/> MFI _____ MODEL _____
8		<input type="radio"/> MONITOR SUPPLIED BY None
9		<input type="radio"/> LOCATION _____ ENCLOSURE _____
10	ALLOWABLE PIPING FORCES AND MOMENTS:	<input type="radio"/> MFI _____ MODEL _____
11	INLET DISCHARGE	<input checked="" type="radio"/> RANGE * _____ ALARM: <input type="checkbox"/> SET @ _____ mils
12	FORCE MOMT FORCE MOMT FORCE MOMT	TIME DELAY _____ SEC TRIP: <input type="checkbox"/> SET @ _____ mils
13	N N-m kg N-m kg N-m	* RANGE _____ to _____ in/s to _____ mm/s
14	AXIAL	
15	VERTICAL	COUPLINGS:
16	HORIZ. 90°	IN ACCORDANCE WITH: _____
17		OTHER (SPECIFY) _____
18	FORCE MOMT FORCE MOMT FORCE MOMT	
19	N N-m kg N-m kg N-m	
20	AXIAL	DRIVER-COMP OR DRIVER GEAR-COMP
21	VERTICAL	TBA N/A
22	HORIZ. 90°	N/A N/A
23	OTHER CONNECTIONS:	N/A N/A
24	SERVICE:	YES N/A
25	Bearing Lube Oil	N/A N/A
26	Injection Lube Oil	N/A N/A
27	Casing Drain	N/A N/A
28	Economizer Port	TBA N/A
29	Load Oil	KEYED N/A
30	Unload Oil	
31	TPTB (if equipped)	
32	Seal Oil (if TPTB)	
33	TEMPERATURE	
34	PURGE FOR:	BASEPLATE & SOLEPLATES:
35	BRG. HOUSING	SOLE PLATES FOR: <input type="radio"/> COMPRESSOR <input type="radio"/> GEAR <input type="radio"/> DRIVER
36	BETWEEN BRG. & SEAL	BASEPLATE: <input type="radio"/> EPOXY GROUT/EPOXY PRIMER <input type="radio"/> LEVELING PADS
37	BETWEEN SEAL & GAS	<input checked="" type="radio"/> COMMON (UNDER COMP. GEAR & DRIVER) Open Structure
38	VIBRATION SENSOR	<input type="radio"/> UNDER COMP. ONLY <input type="radio"/> OTHER MOTOR
39	AXIAL SENSOR	<input type="radio"/> DECKED WITH NON-SKID DECK PLATES <input type="radio"/> OPEN CONSTR.
40		<input type="radio"/> DRIP RIM <input type="radio"/> WITH OPEN DRAIN
41	VIBRATION DETECTORS:	<input checked="" type="radio"/> HORIZONTAL ADJUSTING SCREWS FOR EQUIPMENT (DRIVER ONLY)
42	<input type="radio"/> IN ACCORDANCE WITH: API670 _____ N/A _____ xx	<input type="radio"/> SUITABLE FOR POINT SUPPORT
43	<input checked="" type="radio"/> OTHER (SPECIFY) xxxxx	<input type="radio"/> SUITABLE FOR PERIMETER 3-POINT SUPPO Open Structure
44	<input checked="" type="radio"/> TYPE _____ MODEL _____	<input checked="" type="radio"/> SUITABLE FOR FULL SUPPORT UNDER ALL MEMBERS
45	<input checked="" type="radio"/> MFR. _____	
46	<input type="radio"/> NO. AT EACH SHAFT BEARING _____	LUBE OIL SYSTEM
47	<input type="radio"/> OSCILLATOR-DETECTORS SUPPLIED BY:	614 LUBE OIL SYSTEM
48	<input type="radio"/> MFR. _____ MODEL _____	MAYEKAWA STD
49	<input type="radio"/> MONITOR SUPPLIED BY None	<input type="radio"/> COMMON <input checked="" type="radio"/> DEDICATED SYSTEM
50	<input type="radio"/> LOCATION _____ ENCLOSURE _____	<input type="radio"/> ALTERNATIVE LUBE SYSTEM (4.10.5)
51	<input type="radio"/> MFR. _____ MODEL _____	<input type="radio"/> OIL COOLER _____
52	<input checked="" type="radio"/> RANGE * _____ ALARM: <input type="checkbox"/> SET @ _____	<input type="radio"/> OIL FILTER _____
53	TIME DELAY _____ SEC TRIP: <input type="checkbox"/> SET @ See Drawing	<input type="radio"/> HEATER _____
54	* RANGE _____ to _____ in/s to _____ mm/s	<input checked="" type="radio"/> OIL SEPARATOR (4.10.5.8)
		<input checked="" type="radio"/> 1st SEPARATOR CARRYOVER
		<input type="radio"/> 2nd SEPARATOR CARRYOVER
		<input checked="" type="radio"/> INSTRUMENTS PER MAYEKAWA P&ID
		NOTE: _____



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1 UTILITY CONDITIONS:

STEAM	DRIVERS		HEATING		
INLET	MIN.	kg/cm ²	°C	kg/cm ²	°C
	NORM	kg/cm ²	°C	kg/cm ²	°C
	MAX.	kg/cm ²	°C	kg/cm ²	°C
EXHAUST	MIN.	kg/cm ²	°C	kg/cm ²	°C
	NORM	kg/cm ²	°C	kg/cm ²	°C
	MAX.	kg/cm ²	°C	kg/cm ²	°C

9 ELECTRICITY:

	DRIVERS	HEATING	CONTROL	SHUT-DOWN
VOLTAGE	6,000	220	24	24
HERTZ	50	50	VDC	VDC
PHASE	3	1	1	

14 COOLING WATER

TEMP. INLET	TBA	°C	MAX. RETURN	°C
PRESS. NORM	TBA	kg/cm ² G	DESIGN	kg/cm ² G
MIN. RETURN		kg/cm ² G	Max Allow. Δ P	kg/cm ² G
WATER SOURCE	-			

19 INSTRUMENT AIR:

MAX PRESS	7.0	(kg/cm ² G)	MIN.	6.0	(kg/cm ² G)
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21 TOTAL UTILITY CONSUMPTION:

COOLING WATER		LPM	
STEAM, NORMAL	N/A	kg/h	
STEAM, MAX	N/A	kg/h	
INSTRUMENT AIR		Sm ³ /h	
DRIVER	1 150	BY MAIN MOTOR	kW
AUXILIARIES:	2 TBA	BY OIL PUMP	kW
	1 TBA	Oil Heater	kW
	1 3.0	CONTROL PANEL	kW

30 SHOP INSPECTION AND TESTS:

	REQ'D	WITNESS
31 SHOP INSPECTION	<input type="checkbox"/>	<input type="checkbox"/>
32 HYDROSTATIC	<input type="checkbox"/>	<input type="checkbox"/>
33 HELIUM LEAK	<input type="checkbox"/>	<input type="checkbox"/>
34 MECHANICAL RUN	<input type="checkbox"/>	<input type="checkbox"/>
35 MECHANICAL RUN SPARE ROTORS	<input type="checkbox"/>	<input type="checkbox"/>
36 FIT IN SPARE ROTORS	<input type="checkbox"/>	<input type="checkbox"/>
37 PERFORMANCE TEST (GAS)(AIR)	<input type="checkbox"/>	<input type="checkbox"/>
38 COMP. WITH DRIVER	<input type="checkbox"/>	<input type="checkbox"/>
39 COMP. LESS DRIVER	<input type="checkbox"/>	<input type="checkbox"/>
40 USE SHOP LUBE & SEAL SYSTEM	<input type="checkbox"/>	<input type="checkbox"/>
41 USE JOB LUBE & SEAL SYSTEM	<input type="checkbox"/>	<input type="checkbox"/>
42 USE SHOP VIBRATION PROBES, ETC.	<input type="checkbox"/>	<input type="checkbox"/>
43 USE JOB VIB. & AXIAL DISP. PROBES,	<input type="checkbox"/>	<input type="checkbox"/>
44 OSCILLATOR-DETECTORS & MONITOR	<input type="checkbox"/>	<input type="checkbox"/>
45 PRESSURE COMP. TO FULL OPER. PRESS.	<input type="checkbox"/>	<input type="checkbox"/>
46 DISASSEMBLE-REASSEMBLE COMP.	<input type="checkbox"/>	<input type="checkbox"/>
47 AFTER TEST	<input type="checkbox"/>	<input type="checkbox"/>
48 CHECK BRGS. & SEALS AFTER TEST	<input type="checkbox"/>	<input type="checkbox"/>
49 NOISE LEVEL TEST	<input type="checkbox"/>	<input type="checkbox"/>
50 DIMENSIONAL	<input type="checkbox"/>	<input type="checkbox"/>
51 CASING LEAK TEST	<input type="checkbox"/>	<input type="checkbox"/>
52 AUX. EQUIPMENT	<input type="checkbox"/>	<input type="checkbox"/>

WEIGHTS (KILOGRAMS): REFER TO GA

COMPR.	GEAR	N/A	DRIVER	BASE
ROTORS: COMPR.			DRIVER	GEAR
COMPR. SKID				
VESSEL SKID	AIR COOLER			
MAX. FOR MAINTENANCE (IDENTIFY)				
TOTAL SHIPPING WEIGHT	REFER TO GA:			

SPACE REQUIREMENTS (METERS):

COMPRESSOR PACKAGE	L	W	H
VESSEL SKID	L	W	H
AIR COOLER	L	W	H

REFER TO GA:

MISCELLANEOUS:

- RECOMMEND STRAIGHT RUN OF PIPE DIA. BEFORE SUCTION
- VENDOR REPRESENTATIVE OBSERVATION AT SITE
- VENDOR'S REVIEW & COMMENTS ON PURCHASER'S PIPING & FOUNDATION
- OPTICAL ALIGNMENT FLATS REQUIRED ON COMPRESSOR, GEAR & DRIVER
- PROVISION FOR WATER WASHING BEFORE OPENING CASING BY _____
- LATERAL ANALYSIS REPORT REQUIRED
- TORSIONAL ANALYSIS REPORT REQUIRED
- PROVISIONS FOR TORSIONAL PICKUP ON CASE
- CONDENSATE REMOVAL EQUIPMENT REQUIRED
- YES _____ NO _____
- SILENCERS FURNISHED BY NOT REQUIRED

VENDOR REPRESENTATIVE SHALL:

- OBSERVE FLANGE PARTING
- CHECK ALIGNMENT AT TEMPERATURE DURING COMMISSIONING
- BE PRESENT AT INITIAL ALIGNMENT DURING COMMISSIONING

REMARKS:

NOTE 1: REFER TO MAYEKAWA QA PLAN FOR MORE INFORMATION REGARDING THE APPLICABLE TESTING PROCEDURES DOCUMENT NO. AS PER AGREED ITP in the bid stage