



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
	<b>SUCTION</b>	<b>SUCTION</b>				
	<b>AMMONIA</b>	<b>AMMONIA</b>				
	-	-				
	<b>645</b>	<b>820</b>				
<b>INLET CONDITIONS:</b>						
● PRESSURE (BarA) @ Package Inlet <b>NOTE 1</b>	<b>0.86</b>	<b>3.02</b>				
● TEMPERATURE (°C) @ Package inlet <b>NOTE 1</b>	<b>-36.65</b>	<b>59.17</b>				
○ RELATIVE HUMIDITY (%)						
● MOLECULAR WEIGHT (M)	<b>17.031</b>	<b>17.031</b>				
● Cp/Cv (K <sub>1</sub> ) OR (K <sub>AVG</sub> )						
● COMPRESSIBILITY (Z <sub>1</sub> ) OR (Z <sub>AVG</sub> )						
● INLET VOLUME, (Am <sup>3</sup> /HR-WET)						
<b>DISCHARGE CONDITIONS:</b>						
● PRESSURE (BarA) @ Package outlet <b>NOTE 1</b>	<b>3.02</b>	<b>21</b>				
● TEMPERATURE (°C) @ Package outlet <b>NOTE 1</b>	<b>59.3</b>	<b>83.3</b>				
● Cp/Cv (K <sub>2</sub> ) OR (K <sub>AVG</sub> )	<b>1.3415</b>	<b>1.3171</b>				
● COMPRESSIBILITY (Z <sub>2</sub> ) OR (Z <sub>AVG</sub> )						
● OUTLET VOLUME, (Am <sup>3</sup> /HR-WET)						
● kW REQUIRED (ALL LOSSES INCL)	<b>54.7</b>	<b>98.1</b>				
● SPEED (RPM)	<b>2,950</b>	<b>2,950</b>				
● 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	GAS ANALYSIS		NOR- MAL	RAT- ED	OTHER CONDITIONS				REMARKS
	MOL %	M.W.			A	B	C	D	
2	<input checked="" type="radio"/> MOL %								
3		M.W.							
4	AIR	28.966							FOR GAS COMPOSITION REFER TO MAYEKAWA
5	OXYGEN	32.000							HYSYS SIMULATION
6	NITROGEN	28.016							
7	WATER VAPOR	18.016							
8	CARBON MONOXIDE	28.010							
9	CARBON DIOXIDE	44.010							
10	HYDROGEN SULFIDE	34.076							
11	HYDROGEN	2.016							
12	METHANE	16.042							
13	ETHYLENE	28.052							
14	ETHANE	30.068							
15	PROPYLENE	42.078							
16	PROPANE	44.094							
17	I-BUTANE	58.120							
18	n-BUTANE	58.120							
19	I-PENTANE	72.146							
20	n-PENTANE	72.146							
21	n-HEXANE	86.178							
22	n-HEPTANE	100.205							
23	n-OCTANE	114.232							
24	AMMONIA (max)								
25	CARBONYL SULPHIDE								
26	SULPHUR								
27	Non-Saturated Hydrocar								
28	TOTAL		0.00%						
29	AVG. MOL. WT.		0.00						

30 **LOCATION:**

31  INDOOR     HEATED     UNDER ROOF

32  OUTDOOR     UNHEATED     PARTIAL SIDES

33  GRADE     MEZZANINE     TROPICALIZATION REQ'D

34  ELECTRICAL AREA CLASS 2 / T3     GR IIB     DIV.

35  WINTERIZATION REQ'D.     TROPICALIZATION REQ'D

36 **SITE DATA:**

37  ELEVATION    1.0 kg/cm2

38  RANGE OF AMB    WET BULB

39 SITE RATED °C      

40 NORMAL °C    x

41 MAXIMUM °C    x

42 MINIMUM °C    x

43 **UNUSUAL CONDITIONS:**

44  OTHER    DUST

45 FUME

46 SEA SALT

47 Chemical plant

48 Oil & Gas Plant,

49 **REMARKS:**

50

51

**NOISE SPECIFICATIONS:**

APPLICABLE TO MACHINE    85    dB    dBA + 0 @ 1.0 m from skid layout

SPECIFICATION

APPLICABLE TO NEIGHBORHOOD

SPECIFICATION

ENCLOSURE HOUSING:    YES    NO

SOUND LEVEL    <85 dB @    1 m    0

dB RE: 0.0002 MICROBAR

**APPLICABLE SPECIFICATIONS:**

MAYEKAWA STANDARD COMPRESSOR

Enclosure:

**PAINTING:**

MANUFACTURER'S STD.

OTHERS

Primer    Epoxy Base (MYK STD)

Intermediate    N/A

Final    Urethane (MYK STD)

**SHIPMENT:**

DOMESTIC     EXPORT     EXPORT BOXING REQ'D

LONG TERM STORAGE FOR    MONTHS

PROVIDE N2 PURGE EQUIPMENT DURING SHIPMENT



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Table with columns: NO., BY, APP, DATE, DESCRIPTION. Row 1: 0, PAULO, SES, 05/12/2023, FOR APPROVAL

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: (SPECIFY) 13 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 [X] 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 [X] NO 36 [X] 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 [X] 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 51 Note 3: Based on System Design Pressure



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**1 MAIN CONNECTIONS:** All Flanges are per ANSI B31.3

	SIZE	ANSI RATING	FACING	POSITION
2 INLET in	TBA	TBA#	RF	Top
4 DISCHARGE in	TBA	TBA#	RF	END
5				
6				
7				
8				
9				

**AXIAL POSITION DETECTOR:**

IN ACCORDANCE WITH: API 670

OTHER (SPECIFY) \_\_\_\_\_

TYPE \_\_\_\_\_ MODEL \_\_\_\_\_

MFR. \_\_\_\_\_ NO. REI \_\_\_\_\_

OSCILLATOR-DETECTORS SUPPLIED BY \_\_\_\_\_

MFI \_\_\_\_\_ MODEL \_\_\_\_\_

MONITOR SUPPLIED BY **None**

LOCATION \_\_\_\_\_ ENCLOSURE \_\_\_\_\_

MFI \_\_\_\_\_ MODEL \_\_\_\_\_

RANGE \* \_\_\_\_\_ ALARM:  SET @ \_\_\_\_\_ mils

TIME DELAY \_\_\_\_\_ SEC TRIP:  SET @ \_\_\_\_\_ mils

\* RANGE \_\_\_\_\_ to \_\_\_\_\_ in/s \_\_\_\_\_ to \_\_\_\_\_ mm/s

**10 ALLOWABLE PIPING FORCES AND MOMENTS:**

	INLET		DISCHARGE		FORCE		MOMT	
	FORCE	MOMT	FORCE	MOMT	FORCE	MOMT	FORCE	MOMT
	N	N-m	kg	N-m	kg	N-m	kg	N-m
14 AXIAL								
15 VERTICAL								
16 HORIZ. 90°								
17								
18								
19 AXIAL								
20 VERTICAL								
21 HORIZ. 90°								

**COUPLINGS:**

IN ACCORDANCE WITH: \_\_\_\_\_

OTHER (SPECIFY) \_\_\_\_\_

	DRIVER-COMP OR DRIVER	GEAR-COMP
<input checked="" type="radio"/> MAKE <b>FLEXIBLE DISCS</b>	TBA	N/A
<input type="radio"/> MODEL		N/A
<input type="radio"/> LUBRICATION	N/A	N/A
<input checked="" type="radio"/> MOUNT CPLG. HALVES	YES	N/A
<input checked="" type="radio"/> SPACE REQUIRED (mm)		N/A
<input type="radio"/> LIMITED END FLOAT REQ'D	N/A	N/A
<input type="radio"/> IDLING ADAPTOR REQ'D	N/A	N/A
<input type="radio"/> CPLG. RATING (kW/100 RPM)	TBA	N/A
<input type="radio"/> KEYED (1) OR (2) OR HYDR. FIT	KEYED	N/A

**22 OTHER CONNECTIONS:**

SERVICE:	NO.	SIZE (" )	TYPE
23 Bearing Lube Oil	1		FLG
24 Injection Lube Oil	1		FLG
25 Casing Drain	1		PT
26 Economizer Port			
27 Load Oil	1		PT
28 Unload Oil	1		NPT
29 TPTB (if equipped)			
30 Seal Oil (if TPTB)	0		xx
31 TEMPERATURE			
32 PURGE FOR:			
33 BRG. HOUSING			
34 BETWEEN BRG. & SEAL			
35 BETWEEN SEAL & GAS			
36 VIBRATION SENSOR			
37 AXIAL SENSOR			

**BASEPLATE & SOLEPLATES:**

SOLE PLATES FOR:  COMPRESSOR  GEAR  DRIVER

BASEPLATE:  EPOXY GROUT/EPOXY PRIMER  LEVELING PADS

COMMON (UNDER COMP. GEAR & DRIVER) **Open Structure**

UNDER COMP. ONLY  OTHER **MOTOR**

DECKED WITH NON-SKID DECK PLATES  OPEN CONSTR.

DRIP RIM  WITH OPEN DRAIN

HORIZONTAL ADJUSTING SCREWS FOR EQUIPMENT (**DRIVER ONLY**)

SUITABLE FOR POINT SUPPORT

SUITABLE FOR PERIMETER 3-POINT SUPPO **Open Structure**

SUITABLE FOR FULL SUPPORT UNDER ALL MEMBERS

**40 VIBRATION DETECTORS:**

IN ACCORDANCE WITH: API670 \_\_\_\_\_ N/A \_\_\_\_\_ xx

OTHER (SPECIFY) **xxxxx**

TYPE \_\_\_\_\_ MODEL \_\_\_\_\_

MFR. \_\_\_\_\_

NO. AT EACH SHAFT BEARING \_\_\_\_\_

OSCILLATOR-DETECTORS SUPPLIED BY: \_\_\_\_\_

MFR. \_\_\_\_\_ MODEL \_\_\_\_\_

MONITOR SUPPLIED BY **None**

LOCATION \_\_\_\_\_ ENCLOSURE \_\_\_\_\_

MFR. \_\_\_\_\_ MODEL \_\_\_\_\_

RANGE \* \_\_\_\_\_ ALARM:  SET @ \_\_\_\_\_

TIME DELAY \_\_\_\_\_ SEC TRIP:  SET @ **See Drawing**

\* RANGE \_\_\_\_\_ to \_\_\_\_\_ in/s \_\_\_\_\_ to \_\_\_\_\_ mm/s

**LUBE OIL SYSTEM**

614 LUBE OIL SYSTEM

**MAYEKAWA STD**

COMMON  DEDICATED SYSTEM

ALTERNATIVE LUBE SYSTEM (4.10.5)

OIL COOLER \_\_\_\_\_

OIL FILTER \_\_\_\_\_

HEATER \_\_\_\_\_

OIL SEPARATOR (4.10.5.8)

1st SEPARATOR \_\_\_\_\_ CARRYOVER \_\_\_\_\_

2nd SEPARATOR \_\_\_\_\_ CARRYOVER \_\_\_\_\_

INSTRUMENTS **PER MAYEKAWA P&ID**

NOTE: \_\_\_\_\_

