



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				
12 ● GAS HANDLED (ALSO SEE P. 2) _____)	-	-				
13 ● Nm ³ /HR	-	-				
14 ● WEIGHT FLOW, kg/h (WET)(DRY)	645	820				
15 INLET CONDITIONS:						
16 ● PRESSURE (BarA) @ Package Inlet	0.86	3.02				
17 ● TEMPERATURE (°C) @ Package inlet	-36.65	59.17				
18 ○ RELATIVE HUMIDITY (%)						
19 ● MOLECULAR WEIGHT (M)	17.031	17.031				
20 ● Cp/Cv (K ₁) OR (K _{AVG})						
21 ● COMPRESSIBILITY (Z ₁) OR (Z _{AVG})						
22 ● INLET VOLUME, (Am ³ /HR-WET)						
23 DISCHARGE CONDITIONS:						
24 ● PRESSURE (BarA) @ Package outlet	3.02	21				
25 ● TEMPERATURE (°C) @ Package outlet	59.3	83.3				
26 ● Cp/Cv (K ₂) OR (K _{AVG})	1.3415	1.3171				
27 ● COMPRESSIBILITY (Z ₂) OR (Z _{AVG})						
28 ● OUTLET VOLUME, (Am ³ /HR-WET)						
29 ● kW REQUIRED (ALL LOSSES INCL)	54.7	98.1				
30 ● SPEED (RPM)	2,950	2,950				
31 ● PRESSURE RATIO (R)						
32 ● VOLUMETRIC EFFICIENCY (%)						
33 ● ADIABATIC EFFICIENCY (%)						
34 ● _____						
35 ● PERFORMANCE CURVE NO.						

These data has discrepancy with PFD & process simulation, please check it again.

Conclusion meeting (2024/02/17): compressor data sheet and PFD to be aligned.

37 **PROCESS CONTROL:**

38 METHOD: ● BYPASS FROM DISCHARGE VIA SLIDE VALVE TO _____

39 ● BYPASS: ○ MANUAL ● AUTO **VIA UCP**

40 ○ SPEED VARIATION FROM _____ TO _____

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

42 SIGNAL: ● SOURCE **COMPRESSOR SUCTION PRESSURE**

43 ● TYPE **4-20 mA**

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

45 ○ OTHER _____

46 SERVICE: ○ SPECIAL PURPOSE ● GENERAL PURPOSE

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

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

49 **NOTE 2 2x50% compressor in opeartion**

50



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1	GAS ANALYSIS		NOR- MAL	RAT- ED	OTHER CONDITIONS				REMARKS
	2	MOL %			A	B	C	D	
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							

Our fluid is ammonia

30 LOCATION:

31 INDOOR HEATED UNDER ROOF

32 OUTDOOR UNHEATED PARTIAL SIDES

33 GRADE MEZZANINE _____

34 ELECTRICAL AREA CLASS 2 / T3 GR IIB DIV. 1

35 WINTERIZATION REQ'D. TROPICALIZATION REQ'D.

36 SITE DATA:

37 ELEVATION xxx m BAROMETER 1.0 kg/cm2

38 RANGE OF AMBIENT TEMPS.:

39 DRY BULB WET BULB

40 SITE RATED °C x _____

41 NORMAL °C x _____

42 MAXIMUM °C x _____

43 MINIMUM °C x _____

44 UNUSUAL CONDITIONS:

45 OTHER DUST _____

46 FUME _____

47 SEA SALT _____

48 Chemical plat _____

49 Oil & Gas Plant, _____

50 REMARKS:

51 _____

NOISE SPECIFICATIONS:

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

SEE SPECIFICATION _____

APPLICABLE TO NEIGHBORHOOD

SEE SPECIFICATION _____

ACOUSTIC 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				AXIAL POSITION DETECTOR:	
2		SIZE	ANSI RATING	FACING	POSITION	<input type="radio"/> IN ACCORDANCE WITH: API 670
3						OTHER (SPECIFY) _____
4	INLET	in	TBA	TBA#	RF	Top
5	DISCHARGE	in	TBA	TBA#	RF	END
6						<input type="radio"/> TYPE _____ MODEL _____
7						<input type="radio"/> MFR. _____ NO. REI _____
8						<input type="radio"/> OSCILLATOR-DETECTORS SUPPLIED BY _____
9						<input type="radio"/> MFI _____ MODEL _____
10	ALLOWABLE PIPING FORCES AND MOMENTS:				<input type="radio"/> MONITOR SUPPLIED BY None	
11		INLET		DISCHARGE		<input type="radio"/> LOCATION _____ ENCLOSURE _____
12		FORCE	MOMT	FORCE	MOMT	<input type="radio"/> MFI _____ MODEL _____
13		N	N-m	kg	N-m	<input type="radio"/> RANGE * _____ ALARM: <input type="checkbox"/> SET @ _____ mils
14	AXIAL					TIME DELAY _____ SEC TRIP: <input type="checkbox"/> SET @ _____ mils
15	VERTICAL					* RANGE _____ to _____ in/s _____ to _____ mm/s
16	HORIZ. 90°					COUPLINGS:
17		FORCE	MOMT	FORCE	MOMT	IN ACCORDANCE WITH: _____
18		N	N-m	kg	N-m	OTHER (SPECIFY) _____
19	AXIAL					<input type="radio"/> MAKE FLEXIBLE DISCS
20	VERTICAL					<input type="radio"/> MODEL _____
21	HORIZ. 90°					<input type="radio"/> LUBRICATION _____
22	OTHER CONNECTIONS:				<input type="radio"/> MOUNT CPLG. HALVES _____	
23	SERVICE:	NO	SIZE (")	TYPE		<input type="radio"/> SPACE REQUIRED (mm) _____
24	Bearing Lube Oil	1		FLG		<input type="radio"/> LIMITED END FLOAT REQ'D _____
25	Injection Lube Oil	1		FLG		<input type="radio"/> IDLING ADAPTOR REQ'D _____
26	Casing Drain	1		PT		<input type="radio"/> CPLG. RATING (kW/100 RPM) _____
27	Economizer Port					<input type="radio"/> KEYED (1) OR (2) OR HYDR. FIT _____
28	Load Oil	1		PT		
29	Unload Oil	1		NPT		
30	TPTB (if equipped)					BASEPLATE & SOLEPLATES:
31	Seal Oil (if TPTB)	0		xx		SOLE PLATES FOR: <input type="radio"/> COMPRESSOR <input type="radio"/> GEAR <input type="radio"/> DRIVER
32	TEMPERATURE					BASEPLATE: <input type="radio"/> EPOXY GROUT/EPOXY PRIMER <input type="radio"/> LEVELING PADS
33	PURGE FOR:					<input type="radio"/> COMMON (UNDER COMP. GEAR & DRIVER) Open Structure
34	BRG. HOUSING					<input type="radio"/> UNDER COMP. ONLY <input type="radio"/> OTHER MOTOR
35	BETWEEN BRG. & SEAL					<input type="radio"/> DECKED WITH NON-SKID DECK PLATES <input type="radio"/> OPEN CONSTR.
36	BETWEEN SEAL & GAS					<input type="radio"/> DRIP RIM <input type="radio"/> WITH OPEN DRAIN
37	VIBRATION SENSOR					<input type="radio"/> HORIZONTAL ADJUSTING SCREWS FOR EQUIPMENT (DRIVER ONLY)
38	AXIAL SENSOR					<input type="radio"/> SUITABLE FOR POINT SUPPORT
39						<input type="radio"/> SUITABLE FOR PERIMETER 3-POINT SUPPO Open Structure
40	VIBRATION DETECTORS:				<input type="radio"/> SUITABLE FOR FULL SUPPORT UNDER ALL MEMBERS	
41	<input type="radio"/> IN ACCORDANCE WITH: API670 _____ N/A _____ xx				LUBE OIL SYSTEM	
42	<input checked="" type="radio"/> OTHER (SPECIFY) xxxxx				614 LUBE OIL SYSTEM	
43	<input checked="" type="radio"/> TYPE _____ MODEL _____				MAYEKAWA STD	
44	<input checked="" type="radio"/> MFR. _____				<input type="radio"/> COMMON <input checked="" type="radio"/> DEDICATED SYSTEM	
45	<input type="radio"/> NO. AT EACH SHAFT BEARING _____				<input type="radio"/> ALTERNATIVE LUBE SYSTEM (4.10.5)	
46	<input type="radio"/> OSCILLATOR-DETECTORS SUPPLIED BY: _____				<input type="radio"/> OIL COOLER _____	
47	<input type="radio"/> MFR. _____ MODEL _____				<input type="radio"/> OIL FILTER _____	
48	<input type="radio"/> MONITOR SUPPLIED BY None				<input type="radio"/> HEATER _____	
49	<input type="radio"/> LOCATION _____ ENCLOSURE _____				<input checked="" type="radio"/> OIL SEPARATOR (4.10.5.8)	
50	<input type="radio"/> MFR. _____ MODEL _____				<input checked="" type="radio"/> 1st SEPARATOR _____ CARRYOVER	
51	<input type="radio"/> RANGE * _____ ALARM: <input type="checkbox"/> SET @ _____				<input type="radio"/> 2nd SEPARATOR _____ CARRYOVER	
52	TIME DELAY _____ SEC TRIP: <input type="checkbox"/> SET @ See Drawing				<input checked="" type="radio"/> INSTRUMENTS PER MAYEKAWA P&ID	
53	* RANGE _____ to _____ in/s _____ to _____ mm/s				NOTE: _____	
54						



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1	UTILITY CONDITIONS:				
2	STEAM	DRIVERS		HEATING	
3	INLET	MIN.	kg/cm ²	°C	kg/cm ² °C
4		NORM	kg/cm ²	°C	kg/cm ² °C
5		MAX.	kg/cm ²	°C	kg/cm ² °C
6	EXHAUST	MIN.	kg/cm ²	°C	kg/cm ² °C
7		NORM	kg/cm ²	°C	kg/cm ² °C
8		MAX.	kg/cm ²	°C	kg/cm ² °C
9	ELECTRICITY:				
10		DRIVERS	HEATING	CONTROL	SHUT-DOWN
11	VOLTAGE	6,000	220	24	24
12	HERTZ	50	50	VDC	VDC
13	PHASE	3	1	1	
14	COOLING WATER				
15	TEMP. INLET	TBA	°C	MAX. RETURN	°C °C
16	PRESS. NORM	TBA	kg/cm ² G	DESIGN	kg/cm ² G
17	MIN. RETURN		kg/cm ² G	Max Allow. Δ P	kg/cm ² G
18	WATER SOURCE	-			
19	INSTRUMENT AIR:				
20	MAX PRESS	7.0	(kg/cm ² G)	MIN.	6.0 (kg/cm ² G)
21	TOTAL UTILITY CONSUMPTION:				
22	COOLING WATER				LPM
23	STEAM, NORMAL	N/A			kg/h
24	STEAM, MAX	N/A			kg/h
25	INSTRUMENT AIR				Sm ³ /h
26	DRIVER	1	150	BY MAIN MOTOR	kW
27	AUXILIARIES:	2	TBA	BY OIL PUMP	kW
28		1	TBA	Oil Heater	kW
29		1	3.0	CONTROL PANEL	kW
30	SHOP INSPECTION AND TESTS:				
31	SHOP INSPECTION		REQ'D		WITNESS
32	HYDROSTATIC				
33	HELIUM LEAK				
34	MECHANICAL RUN				
35	MECHANICAL RUN SPARE ROTORS				
36	FIT IN SPARE ROTORS				
37	PERFORMANCE TEST (GAS)(AIR)				
38	COMP. WITH DRIVER				
39	COMP. LESS DRIVER				
40	USE SHOP LUBE & SEAL SYSTEM				
41	USE JOB LUBE & SEAL SYSTEM				
42	USE SHOP VIBRATION PROBES, ETC.				
43	USE JOB VIB. & AXIAL DISP. PROBES,				
44	OSCILLATOR-DETECTORS & MONITOR				
45	PRESSURE COMP. TO FULL OPER. PRESS.				
46	DISASSEMBLE-REASSEMBLE COMP.				
47	AFTER TEST				
48	CHECK BRGS. & SEALS AFTER TEST				
49	NOISE LEVEL TEST				
50	DIMENSIONAL				
51	CASING LEAK TEST				
52	AUX. EQUIPMENT				

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:		
<input type="radio"/> RECOMMEND STRAIGHT RUN OF PIPE DIA. BEFORE SUCTION <input type="radio"/> VENDOR REPRESENTATIVE OBSERVATION AT SITE <input type="radio"/> VENDOR'S REVIEW & COMMENTS ON PURCHASER'S PIPING & FOUNDATION <input checked="" type="radio"/> OPTICAL ALIGNMENT FLATS REQUIRED ON COMPRESSOR, GEAR & DRIVER <input type="radio"/> PROVISION FOR WATER WASHING BEFORE OPENING CASING BY _____ LATERAL ANALYSIS REPORT REQUIRED TORSIONAL ANALYSIS REPORT REQUIRED <input type="radio"/> PROVISIONS FOR TORSIONAL PICKUP ON CASE <input type="radio"/> CONDENSATE REMOVAL EQUIPMENT REQUIRED <input type="radio"/> YES _____ <input type="radio"/> NO _____ <input type="radio"/> SILENCERS FURNISHED BY NOT REQUIRED		
VENDOR REPRESENTATIVE SHALL:		
<input type="radio"/> OBSERVE FLANGE PARTING <input checked="" type="radio"/> CHECK ALIGNMENT AT TEMPERATURE DURING COMMISSIONING <input checked="" type="radio"/> 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		