

Rotation (Facing Governor end of Turbine).....Counter Clockwise
Inlet Pressure PSIG.....545
Inlet Temperature °F.....610
Exhaust Pressure "Hg.....4.5
Oil Pressure to Turbine Governor PSIG.....140
Oil Pressure to Turbine Bearings PSIG.....15-20
Casing Sentinel Valve Setting PSIG.....5

FIRST BODY COMPRESSOR

Manufacturer.....DELAVAL-STORK
Model Designation.....4C57
Normal BHP (total).....12,975
Normal Speed, RPM.....6,700
Rotation (Facing Governor end of Turbine).....Counter Clockwise
Gas Handled.....Ammonia
Specific Gravity.....0.587
 C_p/C_v1.31
Z.....0.964
Suction Pressure, PSIA.....14.2
Suction Temp., °F.....minus 26
Discharge Press., PSIA.....45.8
Discharge Temp., °F.....155
Normal Inlet Capacity, CFM.....21,434

SECOND BODY COMPRESSOR

Manufacturer.....DELAVAL-STORK
Model Description.....7CK45
Normal BHP (total).....12,975
Normal Speed, RPM.....8900
Rotation (Facing Governor end of Turbine).....Clockwise
Gas Handled.....Ammonia
Specific Gravity.....0.587
 C_p/C_v1.31
Z.....0.967
Suction Press., PSIA.....45.8
Suction Temp., °F.....91
Discharge Press., PSIA.....272.8
Discharge Temp., °F.....283
Normal Inlet Capacity, CFM.....15,994

ITEM
76241ITEM
76240



CENTRIFUGAL COMPRESSOR DATA SHEET

REV. 5-12-1-75 P.9

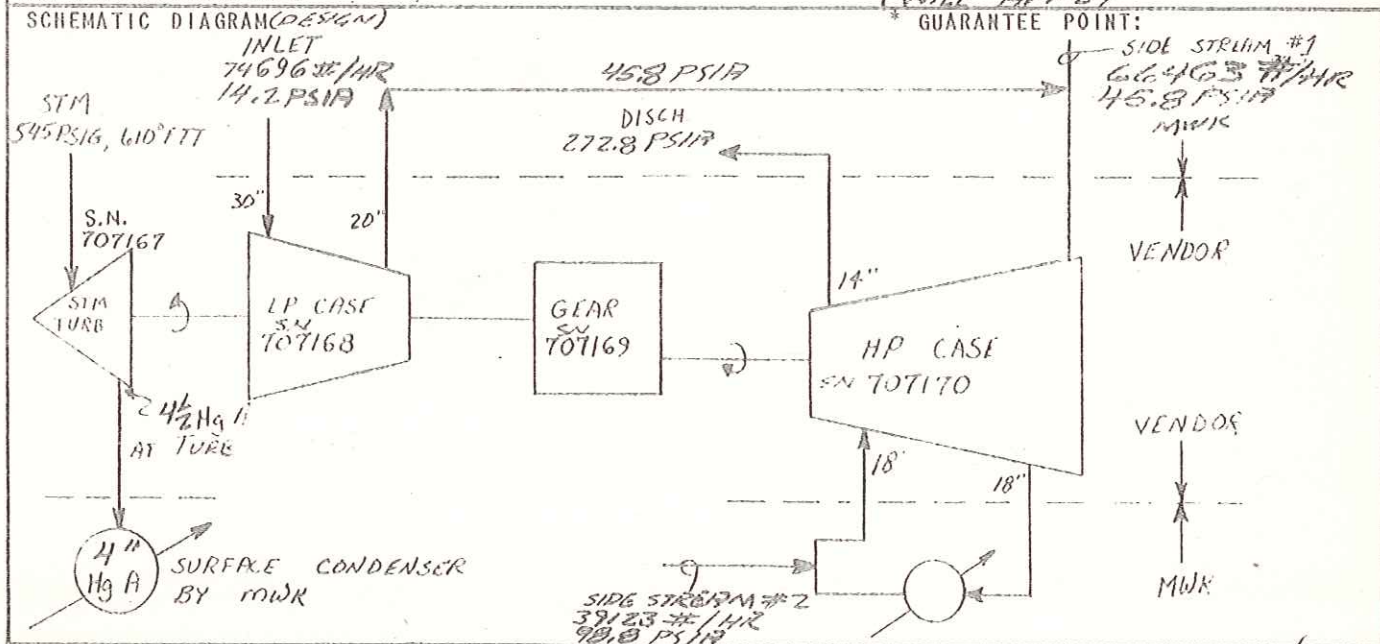
JOB NO.: 5058 ITEM NO.: 105-J
 REQ. NO.: 5058-P-J21-102
 PAGE NO. 105J-1 BY: W. ZITTERICH
 DATE: 4-8-74
 REV. 1: 7-31-74 ALL PAGES
 REV 2 18 DEC 74 P. 145

FOR: MONSANTO	UNIT: 1150 STPD NH ₃ PLANT
SITE: LULING, LA	SERIAL NO.: SEE DIAGRAM
SERVICE: NH ₃ REFRIGERATION	NUMBER REQUIRED: ONE
MANUFACTURER: DE LAVAL-STORK	
TYPE: 4C57 7CK45 HORIZ SPLIT, MULTI-STG	
DRIVER TYPE: STM TURBINE	RATED H.P. 15000 RPM 6700

RATED OPERATING CONDITIONS (EACH MACHINE)

SERVICE / ITEM NO. STAGE	NH ₃ / 105-J					GAS ANALYSIS DATA		
	4C57	SS #1	7CK45	SS #2	REENTRY	MATERIAL	(MOL %)	LBS. / HR.
GAS COMPRESSED	NH ₃					NH ₃	100	
CORROSIVE DUE TO	-							
RELATIVE HUMIDITY	-							
MOL. WGT. AT INTAKE	17	17	17	17	17			
Cp/ Cv VALUE AT SUCT	1.3055		1.3055		1.3055			
Cp/ Cv VALUE AT DISCH								
INLET TEMP. °F	-26	19	91	56	98			
INLET PRESS, PSIA	14.2	45.8	45.8	98.8	98.8			
DISCH. TEMP. °F	154	-	237	-	279			
DISCH. PRESS, PSIA	45.8		106.8		272.8			
Z @ SUCTION	0.964		0.967		0.928			
Z @ DISCHARGE	0.970		0.972		0.940			
POLYTROPIC HEAD, FT.	54365	-	44750	-	54410			

NORMAL CAPACITY						APPLICABLE SPECIFICATIONS		
LBS./HR.	69163	61540	130703	36225	166928	☒ MWK SPEC J-47-IE 70	AND	
INLET CFM	22987		17198		9919	☒ J31-1568		
COMPR. SPEED RPM						☐ API CENT. COMP. SPEC. 617		
BHP @ DRIVER COUPLING						☒ API TURBINE SPEC 612		
DESIGN CAPACITY*						☒ MWK MOTOR SPEC. J46-1E2		
LBS. / HR.	74624	66463	141157	39123	180282			
INLET CFM	23149		17273		9939			
COMPR. SPEED RPM								
BHP @ DRIVER COUPLING								



MANUFACTURER TO FILL IN ALL MISSING DATA.



CENTRIFUGAL COMPRESSOR DATA SHEET

JOB NO. 5058 ITEM NO.: 105-J
REQ. NO.: 5058-P-721-102
PAGE NO. 105-J-2 BY: W. ZITPERICH
DATE: 4-8-74

[illegible]

MANUFACTURER SHALL FILL IN ALL MISSING DATA:



CENTRIFUGAL COMPRESSOR DATA SHEET

JOB NO. 5058 ITEM NO.: 105-J
 REQ. NO.: 5058-P-721-102
 PAGE NO. 105J-3 BY: W. ZITTERICH
 DATE: 4-8-74

LUBE AND SEAL OIL SYSTEM

- MFR. SHALL FURNISH OIL SYSTEM PER 331-1868
 TO SUPPLY OIL TO ☒ COMP. ☒ DRIVERS ☒ GEAR
☐ COMPLETE SYSTEM MOUNTED INTERNAL WITH
 COMPRESSOR DRIVER BASE PLATE
☒ COMPLETE SYSTEM MOUNTED IN SEPARATE CONSOLE
☒ COMBINED LUBE AND SEAL OIL SYSTEM
☐ SEPARATE LUBE AND SEAL OIL SYSTEMS
☒ LUBE OIL SYSTEM FOR 101-J TO COMPRESSOR
DRIVER & GEAR
☒ TAKE OFF TO STEAM TURBINE POWER CYLINDER
☒ STEAM OIL RESEVOIR HEATING COIL
☐ ELECTRIC OIL RESEVOIR HEATING COIL
☐ OIL RESEVOIR INERT GAS PURGE
☒ PRESSURE REDUCING STATION TO BEARING OIL LEVEL
☒ LUBE & SEAL OIL COOLERS TO HAVE
304 SS TUBES
☒ DEGASSING POT TO REMOVE NH₃ FROM
SEAL OIL RETURNING TO RESERVOIR
FROM SEAL OIL DRAINERS
☒ ACCUMULATOR IN L.O. PUMP DISCHARGE

INSTRUMENT LIST

- THERMOMETERS IN ☒ °F ☐ °C
 PRESSURE GAGES IN ☒ POUNDS / SQ. IN.
☐ KILOGRAMS / SQ. CENTIMETERS
☐ ALL INSTRUMENTS LOCALLY MOUNTED
☒ COMPRESSOR MFR. SHALL FURNISH INSTRUMENT
 PANEL LOCATED ON BASE PLATE OF
COMPRESSOR.

CONTAINING THE FOLLOWING INSTRUMENTS:

- (2) SEAL OIL DIFF PRESS. INDICATING SWITCHES
(BARTON)
 (2) LOW S.O. PRESS ALARM & AUX. OIL PUMP
START UP SWITCHES
 (1) LOW L.O. ALARM & AUX PUMP START-UP SWITCH
 (1) LOW L.O. ALARM & TRIP
 (2) LOW S.O. DIFF PRESS. SHUT DOWN SWITCHES
 (1) GOV. OPER & SEAL OIL PRESS GAGE
 (2) S.O. PRESS GAGES (DOWNSTREAM OF EACH ORIFICE
IN S.O. SUPPLY LINES)
 (2) SEAL GAS PRESS GAGES (1) L.O. PRESS GAGE

LIST OF INSTRUMENTS PROVIDED BY COMPRESSOR MFR.
 FOR MOUNTING ON MWK PANEL: (MFR. SHALL INCLUDE
 MAKE AND CATALOG NUMBER FOR EACH INSTRUMENT.)

ALARMS AND SHUTDOWNS

- COMPRESSOR MFR. SHALL FURNISH CONTACTS FOR:
☒ LOW L.O. PRESSURE ALARMS
☒ LOW L.O. PRESSURE AUX. PUMP START-UP
☒ LOW L.O. PRESSURE SHUTDOWN OF DRIVER
 BY ☒ ELECTRIC ☐ PNEUMATIC ☒ HYDRAULIC
☒ LOW LUBE OIL PRESS SHUT DOWN ALARM
☐ LOW SEAL OIL LEVEL ALARM
☒ LOW GOV OIL PRESS AUX. PUMP START-UP
☐ LOW SEAL OIL LEVEL SHUTDOWN
 BY ☐ ELECTRIC ☐ PNEUMATIC ☐ HYDRAULIC
☒ ALEC. SWITCHES SHALL BE 2 POLE, 2 THROW
☐ HIGH SEAL OIL LEVEL ALARM
☐ HIGH SEAL OIL LEVEL SHUTDOWN OF SEAL PUMP
☒ LOW DIFFERENTIAL SEAL OIL ALARM
☒ LOW DIFF. SEAL OIL AUX. PUMP START-UP
☒ LOW SEAL OIL SHUTDOWN OF MAIN DRIVER BY:
☒ ELECT ☐ PNEUMATIC ☐ HYDRAULIC
☒ REMOTE SHUTDOWN ☒ ELECT ☐ PNEUMATIC
☐ HYDRAULIC
 ALARM CONTACTS SHALL ☒ OPEN ☐ CLOSE TO ALARM
 SHUTDOWN CONTACTS SHALL ☐ OPEN ☒ CLOSE TO SHUT-
 DOWN
☒ PURCH WILL FURNISH HIGH DISCHARGE TEMPERATURE
 ELEMENT TO ALARM AND SHUTDOWN BY
☒ ELECT ☐ PNEUMATIC ☐ HYDRAULIC
 RECOMMENDED SETTINGS: ALARM 300 °F
 SHUTDOWN °F

ACCESSORIES

- COMPRESSOR MFR. SHALL FURNISH:
☐ AIR INTAKE FILTER
 MFR. _____ MODEL _____
 TYPE _____
☐ INTERSTAGE PIPING
☐ INTER COOLERS
☐ SEPARATE MOISTURE SEPARATORS W/TRAPS AND
 LIQUID LEVEL ALARMS
☐ AFTERCOOLERS
☒ INSTRUMENT PANEL
VIBRATION PROBES BENTLY-NEVADA
RTD'S: THOMAS EDISON
SEE PAGES -6 & 7 FOR DETAILS



CENTRIFUGAL COMPRESSOR DATA SHEET

JOB NO. 5058 ITEM NO.: 105J
 REQ. NO.: 5058-PJ21-102
 PAGE NO. 105J-4 BY: W. ZITTERICH
 DATE: 4-8-74

SITE DATA	UTILITY CONSUMPTION																																																																
ALTITUDE <u>10</u> FT. BAROMETER <u>14.7</u> PSIA DESIGN TEMP. °F <u>95</u> SUMMER <u>10</u> WINTER MIN. DESIGN WET BULB TEMP. °F <u>83</u> COOLING WATER PRESS. PSIG _____ SUPPLY _____ RETURN _____ TEMP. °F <u>90</u> SUPPLY _____ RETURN MAX. _____ ELECTRIC POWER: <u>400</u> H.P. & OVER <u>2300</u> VOLTS <u>3</u> PH <u>60</u> CYCLES _____ H.P. TO <u>350</u> HP <u>460</u> VOLTS <u>3</u> PH <u>60</u> CYCLES _____ H.P. & LESS <u>110</u> VOLTS <u>1</u> PH <u>60</u> CYCLES CONTROL EQUIPMENT: VOLTS <u>110</u> PH <u>1</u> CYCLES <u>60</u> ☒ EXPLOSION PROOF (NEMA 7) ☐ GENERAL PURPOSE (NEMA 1A) ☐ WEATHER PROOF (NEMA 4) AUXILIARY MOTORS: ☒ TEFC ☐ EXP. PROOF ☐ DRIP PROOF ☐ OPEN _____ INSULATION TYPE _____ CLASS <u>B (1.15 SF)</u> EQUIPMENT SHALL BE SUITABLE FOR: ☐ INDOORS ☐ HEATED ☐ UNHEATED ☒ OUTDOORS ☒ UNDER ROOF ☐ WITHOUT ROOF STEAM SUPPLY: NORMAL PRESS. <u>545</u> PSIG @ <u>610</u> °FTT MIN. PRESS <u>535</u> PSIG @ <u>610</u> °FTT STEAM EXHAUST: NORMAL PRESS. <u>4" HgA</u> PSIG @ _____ °FTT MAX. PRESS _____ PSIG @ _____ °FTT INSTRUMENT AIR SUPPLY _____ PSIG	ELECTRIC: MAIN DRIVER/SPACE HEATER-SEE MOTOR PAGE NO. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>HP</th> <th>LRC</th> <th>FLC</th> </tr> </thead> <tbody> <tr> <td>(AUX) LUBE OIL PUMP</td> <td><u>50</u></td> <td><u>367</u></td> <td><u>60.5</u></td> </tr> <tr> <td>MAIN SEAL OIL PUMP</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>AUX. SEAL OIL PUMP</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>LUBE OIL RES. HTR.</td> <td>—</td> <td>WATTS —</td> <td>VOLTS — PH</td> </tr> <tr> <td>MOTOR SPACE HEATER</td> <td><u>100</u> WATTS</td> <td><u>110</u> VOLTS</td> <td><u>1</u> PH</td> </tr> </tbody> </table> STEAM: MAIN DRIVER-SEE TURBINE PAGE NO. <u>5</u> MAIN L.O. PUMP <u>**5500</u> # HR. <u>535</u> PSIG <u>610</u> °FTT TO <u>55</u> PSIG AUX. L.O. PUMP — # HR. — PSIG — °FTT TO — PSIG MAIN S.O. PUMP — # HR. — PSIG — °FTT TO — PSIG AUX. S.O. PUMP — # HR. — PSIG — °FTT TO — PSIG L.O. RES. HTR. <u>1500</u> # HR. <u>45</u> PSIG <u>350</u> °FTT TO <u>0</u> PSIG S.O. RES. HTR. — # HR. — PSIG — °FTT TO — PSIG COMP. EJECTOR: _____ °FTT TO _____ PSIG SEAL <u>NONE</u> — # HR. — PSIG — °FTT TO — PSIG COOLING WATER - FOR PROCESS GAS COOLERS, SEE PAGE NO. _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>L.O. COOLER</th> <th>S.O. COOLER</th> <th>DIAPH. SYSTEM</th> <th>DIAPH. COOLERS</th> </tr> </thead> <tbody> <tr> <td>TYPE WATER</td> <td colspan="4"><u>COOLING TOWER</u></td> </tr> <tr> <td>QUANTITY GPM</td> <td><u>280</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INLET TEMP °F</td> <td><u>90</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>OUTLET TEMP. °F</td> <td><u>100</u></td> <td><u>(110 MAX)</u></td> <td></td> <td></td> </tr> <tr> <td>PRESS DROP PSIG</td> <td><u>4</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MAX. PRESS. PSIG</td> <td><u>75</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TOTAL C.W. GPM</td> <td><u>280</u></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		HP	LRC	FLC	(AUX) LUBE OIL PUMP	<u>50</u>	<u>367</u>	<u>60.5</u>	MAIN SEAL OIL PUMP	—	—	—	AUX. SEAL OIL PUMP	—	—	—	LUBE OIL RES. HTR.	—	WATTS —	VOLTS — PH	MOTOR SPACE HEATER	<u>100</u> WATTS	<u>110</u> VOLTS	<u>1</u> PH		L.O. COOLER	S.O. COOLER	DIAPH. SYSTEM	DIAPH. COOLERS	TYPE WATER	<u>COOLING TOWER</u>				QUANTITY GPM	<u>280</u>				INLET TEMP °F	<u>90</u>				OUTLET TEMP. °F	<u>100</u>	<u>(110 MAX)</u>			PRESS DROP PSIG	<u>4</u>				MAX. PRESS. PSIG	<u>75</u>				TOTAL C.W. GPM	<u>280</u>			
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FLOOR SPACE AND WEIGHTS COMPR. & DRIVER L. <u>36'-8"</u> W. <u>9'-7"</u> H. <u>9'</u> LUBE OIL CONSOLE L. <u>17'</u> W. <u>12'</u> H. <u>9'</u> SEAL OIL CONSOLE L. _____ W. _____ H. _____ TOTAL WT. <u>125,290</u> LBS. ERECT. WT. <u>125,290</u> LBS. MAINTENANCE WT. <u>15,000</u> LBS. PART <u>CASE COVER</u> LUBE OIL CONSOLE WT. <u>14000</u> LBS. <u>EMPTY</u> SEAL OIL CONSOLE WT. <u>26000</u> LBS. <u>FILLED</u>	MISCELLANEOUS DATA SURGE CFM _____ @ _____ PSIA _____ °F _____ MW FIELD BREAK IN ON ATMOSPHERIC AIR AT _____ R/FM AND MAX. DISCH. TEMP. OF _____ °F _____ _____ _____ ** TURBINE SHALL BE SUITABLE FOR MAXIMUM STEAM CONDITIONS OF <u>600 PSIG AND 750 °FTT</u> _____ _____ _____																																																																
INSPECTION AND TESTS ☒ MFR. STD. MECH. RUN TEST FOR ☒ COMPR. ☒ GEARS ☒ DRIVER TO TRIP SPEED ☐ PERFORMANCE TEST ☐ MODIFIED ASME POWER TEST ☐ MANUFACTURER STANDARD ☐ CLOSE LOOP WITH _____ (GAS) @ _____ PSIA SUCTION PRESSURE ☐ AIR ☒ STATIC SEAL OIL LEAKAGE TEST ☒ AT <u>85</u> PSIG																																																																	

MANUFACTURER TO FILL IN ALL MISSING DATA.



TURBINE DATA SHEET

ENG EQUIP 34 12/65

REV 2

REV 3: NOV 5, 1975

JOB NO. 5058 ITEM NO. 105-JT
REQUISITION NO. 5058-P-J21-102
PAGE NO. 105J-5 BY: W. ZITTERK
DATE: 4-8-74

FOR: MONSANTO UNIT: 1150 STPD NH₃ PLANT
SITE: LULING, LA. SERIAL NO. 707167
SERVICE: DRIVER FOR NH₃ REFRIG. COMP. NO. REQ'D. ONE
MANUFACTURER: DE LAVAL-STORK MODEL: KJDF-MV
TYPE: ☐ SINGLE VALVE ☒ MULTI-VALVE ☐ SINGLE STAGE ☒ MULTI-STAGE 8 STAGES
☐ NON-CONDENSING ☒ CONDENSING

OPERATING CONDITIONS (EACH MACHINE)

	RATING	DESIGN	NORMAL
BRAKEHORSEPOWER	15,000	13992	12975
TURBINE SPEED RPM	6800	6800	6700
DESIRED WATER RATE, LBS/BHP HR			
ACTUAL WATER RATE, LBS/BHP HR	8.05	8.2	8.3
THROTTLE FLOW, LBS/HR.	120,750	114,750	107,700
EXTRACTION FLOW, LBS/HR.			
NO. OF HAND VALVES CLOSED			
THROTTLE PRESSURE PSIG	545	545	545
THROTTLE TEMP. ° F TT	610	610	610
EXHAUST PRESSURE (PSIG) (HGA)	4	4 1/2	4 1/2
EXHAUST TEMPERATURE ° F			
EXTRACTION PRESSURE, PSIG			
EXTRACTION ENTHALPY BTU/LB			
MAX STEAM NOZZLE FLOW LB/HR		GUARANTEE POINT	

APPLICABLE SPECIFICATIONS

☐ MWK SPEC J47-IE 70 ☐ MWK SPEC J44-IE
☒ MWK SPEC J31-1568 ☐ API TURBINE SPEC 612
OTHERS: 612

DELAVAL COMMENTS AND EXCEPTIONS WILL APPLY

TURBINE DATA

STEAM CHEST MATERIAL ST'L HYDROTEST 900 PSIG
EXHAUST END MATERIAL FAB. ST'L HYDROTEST 25 PSIG
MAX. ALLOWABLE PRESS. ON EXHAUST END 15 PSIG
ROTOR MATERIAL FORGED ALLOY ST'L
CRITICAL SPEEDS: 1ST 4020 RPM, 2ND 8160 RPM
MAX CONTINUOUS SPEED 7140 RPM
OVERSPEED TRIP SETTING 7854 RPM
ROTATION (FACING COUPLING END) CW
TYPE OF SHAFT SEAL LABYRINTH
EXHAUST RELIEF VALVE 120750 LBS/HR @ 15 PSIG
FLANGES: INLET EXTRACTION EXHAUST
LOCATION R. SIDE - TOP
FACING GOV. SIZE 6" ASA - 36"x66"
RATING/FACING 600# RF - FLAT
LUBRICATION:
☒ LUBE SYSTEM COMMON WITH COMPRESSOR
☐ SEPARATE SYSTEM PER
☐ MANUFACTURERS STANDARD

TESTS:

☒ MANUFACTURERS STANDARD MECH. RUN TO TRIP RPM
☐ PERFORMANCE TEST
☐ ASME POWER TEST CODE

* RELIEF VALVE STARTS TO OPEN AT 5 PSIG, FULLY OPEN AT 15 PSIG

ACCESSORY EQUIPMENT

MANUFACTURER SHALL FURNISH: AND
☒ STEAM STRAINER ☒ TRIP THROTTLE VALVE
☒ SENTINEL VALVE SET AT 5 PSIG
☒ INSULATION ☒ TACHOMETER
☒ NEMA CLASS C *** GOVERNOR WITH 3-15 PSIG
INSTRUMENT AIR HEAD.
☒ STEAM SEAL PIPING (WITH 1" (EDUCTOR)
(GL AND CONDENSERS) w/ 304 SS TUBES
☒ BASE PLATE COMMON WITH ☐ SOLE PLATE
☒ GAUGE BOARD WITH GAUGES
☒ SOLENOID TRIP 110 VOLTS, EXP. PROOF
☒ HAND SPEED CHANGER MIN. 85% (OF DES) MAX. 105%
*** GOV. SIGNAL AIR SPEED SETTINGS

15 PSIG - MINIMUM SPEED 5700 RPM
3 PSIG - MAXIMUM SPEED 7035 RPM
GOV TO LOCK IN LAST POSITION ON AIR FAILURE

AUXILIARY UTILITIES:

ELECTRIC 460 VOLTS 3 PH. 60 CYCLES
EJECTOR 80 LBS/HR, 45 PSIG 350 °F TT to 0 PSIG
STEAM 80 LBS/HR, 45 PSIG 350 °F TT to 0 PSIG
GLAND LEAKAGE COOLING WATER: 90 GPM @ 90 °F & 50 PSIG

WEIGHTS AND FLOOR SPACE:

TURBINE: 27,300 LBS
MAXIMUM MAINTENANCE 11,000 LBS., PART COVER
FLOOR SPACE: L. 76" W. 76" H. 52"

REMARKS: 1) TURB TO BE MECHANICALLY SUITABLE FOR MAXIMUM STM. CONDITIONS OF 600 PSIG AT 750 °F TT

MANUFACTURER TO FILL IN ALL MISSING DATA:



EQUIPMENT SPECIFICATION

CLIENT MONSANTO
 LOCATION LULING, LA.
 ITEM NO. 105 J
 SERVICE NH₃ REFRIG. COMPR
 NUMBER REQUIRED ONE
 MANUFACTURER DELAVAL - STOKER

JOB NO. 5058
 SPEC. NO. 5058-P-521-102
 REQ'N. NO. 105 J-6
 PAGE W. ZITZER, INC.
 BY 4-8-74
 DATE

TEMPERATURE & VIBRATION SENSING SYSTEM FOR COMPRESSORS AND TURBINES

1. GENERAL DESCRIPTION

This data sheet describes the equipment to be furnished and installed by the compressor and turbine vendors to permit monitoring temperature and vibration of their machinery.

- A. Shaft radial vibration on each centrifugal compressor, turbine and gear.
- B. Shaft axial position on each compressor and turbine case.
- C. Temperature of supply oil and oil exiting each bearing on each centrifugal compressor, turbine and gear.

The equipment to be furnished shall consist of RTD's, vibration probes, proximitors, weatherheads, conduit and explosion proof terminal boxes.

The compressors and turbines will be located in a hazardous area-Class I, Group D, Division 2.

Wiring from compressors and turbines to the control room will be furnished by the purchaser.

2. TEMPERATURE SENSING EQUIPMENT

The following specific equipment shall be provided to monitor the supply and return lube oil temperature at the points indicated.

- A. Resistance temperature detectors (RTD's) shall be of the 3 wire type, 100 ohms at 0°C platinum.
- B. A single junction box shall be located on each baseplate. Each junction box shall contain a terminal strip for all RTD's provided by the compressor/turbine manufacturers. The junction box shall be of ~~explosion~~ WEATHER proof type.
- C. All RTD's shall be protected by an enclosed weatherhead cover and all lead wires shall be protected by either flexible or formed conduit to the junction box.
- D. Compressor and/or turbine vendor to advise alarm setpoints.

REVISION	NO.	1	2	3	4	5	6	7
	DATE	7-31-74						



EQUIPMENT SPECIFICATION

ITEM 105-J
 SERVICE NH₃ REFRIG. COMP.

JOHN NO. 5058
 SPEC. NO. _____
 PAGE 105J - 7
 BY W. ZITTERICH

3. VIBRATION SENSING EQUIPMENT

The following specific equipment shall be provided to continuously monitor the radial shaft vibrations and axial shaft displacement at the points indicated.

- A. Two Bently-Nevada proximity type probes mounted 90° apart sensing radial vibration, shall be installed at each compressor and turbine journal bearing.
- B. One Bently-Nevada proximity type probe, sensing axial shaft position, shall be installed at the thrust end of each compressor case and turbine case.
- C. One Bently-Nevada proximity type probe sensing radial vibration shall be installed on each coupling end of gear. (Only if gear is required)
- D. Local detectors or other signal conditioning equipment required shall be furnished with each proximity type probe. Connectors for probe extension cables shall be API type. Connectors for the monitor cable shall be spade lug type. Detectors shall be mounted in an explosion proof junction box.
- E. A single junction box shall be located on each compressor and turbine body. The junction boxes in addition to housing the detectors shall be the junction between the probe cables and monitor cables, which terminate at the monitor in the control house.
- F. All probes mounted on the machines shall be protected by an enclosed weather head cover and all lead wires shall be protected by either flexible or formed conduit to the junction box. Conduit shall be neatly piped to allow maintenance on the machines without damage to the probes or lead wires.
- G. Where machine design permits, probe shall be so mounted as to permit gap adjustment or replacement while the machine is running. Otherwise, probes shall be mounted by means of suitable brackets inside the bearing housings, and shall have pigtail leads of sufficient length to terminate outside the bearing housing. On machines handling flammable or toxic gases, probes need not be replaceable when gas is present in the probe area. On these machines, probes or probe cables passing through the bearing housing shall be fitted with seals designed to contain the maximum gas pressure that can exist in the probe area.
- H. Compressor and/or turbine vendor to advise alarm setpoints.



EQUIPMENT LUBRICATION DATA
(TO BE COMPLETED BY VENDOR)

JOB NO. 5058
ITEM NO. 105-J
PAGE 105-J-8
DATE 4-8-74
BY W. ZITTERCH
REVISION _____

ENG EQUIP 62 3-72

* 105-J/JT

1. TYPE OF LUBRICATION SYSTEM (STATE GREASE-GUN, GREASE PACKED, DRIP, SPLASH, CONTINUOUS)			
2. RECOMMENDED LUBRICANT FOR BREAK-IN (LIST THREE ACCEPTABLE ALTERNATES BY TRADE NAME & NUMBER, WHICH WILL MEET TECHNICAL SPECIFICATION)			
3. QUANTITY OF LUBRICANT REQUIRED FOR INITIAL FILL (LITERS, OR KG) <u>54L</u>			
4. RECOMMENDED BREAK-IN PERIOD FOR INITIAL APPLICATION (HOURS)			
5. RECOMMENDED LUBRICANT FOR NORMAL OPERATION (LIST THREE ACCEPTABLE ALTERNATES BY TRADE NAME & NUMBER, WHICH WILL MEET TECHNICAL SPECIFICATION)			
6. REFILL QUANTITIES IF DIFFERENT FROM INITIAL CHARGE. (LITERS, KG) <u>54L</u>			
7. QUANTITY OF LUBRICANT SHIPPED WITH INITIAL ORDER (LITERS, KG) <u>54L</u>			
8. RECOMMENDED TIME BETWEEN CHANGES OF LUBRICANT (HOURS)			
9. EXPECTED ANNUAL CONSUMPTION OF LUBRICANT (LITERS, KG) <u>54L</u>			

NOTES: 1. VENDOR SHALL ATTACH A TECHNICAL SPECIFICATION FOR EACH LUBRICANT TO BE USED, INCLUDING VISCOSITY, SAE NUMBER, POUR POINT, ETC.
2. ANY SPECIAL PRECAUTIONS TO BE OBSERVED SHALL BE NOTED.
3. INFORMATION CONTAINED ON THIS PAGE SHALL ALSO BE INCLUDED IN THE MAINTENANCE MANUALS TO BE FURNISHED BY SELLER.
4. WHERE MARKED *, VENDOR SHALL DESIGNATE THE OIL SYSTEM, IF MORE THAN ONE SYSTEM IS USED.



EQUIPMENT SPECIFICATION

CLIENT MONSANTO COMPANY
 LOCATION HOULING, LA.
 ITEM NO. 105-J11T
 SERVICE REFRIGERANT COMPRESSOR AND DRIVER
 NUMBER REQUIRED ONE
 MANUFACTURER DELAVAL TURBINE INC

JOB NO. 5058-P
 SPEC. NO. —
 REQ'N. NO. J21-102
 PAGE 105J-9
 BY J. KAUCHER
 DATE Nov. 25, 1975

For a complete listing of the DeLaval "standard" exceptions to MWK Specifications and Standards J47-1E70, J31-1E68, J31-1S68, and 1-3S68, see Data Sheets for Item 101-J.

REVISION	NO.	1	2	3	4	5	6	7
	DATE					12-1-75		