

**GENERAL DATA FOR COMPRESSOR**

**SERIAL NUMBER/SHOP ORDER NUMBER F108251/F108252**

**FRAME:** 15MB3

**APPROXIMATE MASS:**

Heaviest Piece for Maintenance (Top Half)	<u>6750</u> lb	<u>3061.7</u> kg
Rotor	<u>254</u> lb	<u>115.2</u> kg
Total Compressor	<u>13250</u> lb	<u>6010.1</u> kg

**BEARINGS:**

Flooded Thrust Bearing With Three Embedded Duplex Element RTDs on the Active Side and Two Embedded Duplex Element RTDs on the Inactive Side - Total 5

Spherical Seat Tilt Pad Journal Bearings with Two Embedded Duplex Element RTDs per Bearing, One RTD in each of Two Shoes - Total 4

**SEALS:**

- Casing End Seals – Flowserve Tandem with Intermediate Laby
- Impeller Eye Seals – Nickel-Graphite
- Interstage Shaft Seals - Nickel-Graphite
- Balance Piston Seal - Nickel-Graphite
- Bearing Housing Shaft End Seal - ASTM B26-443.0 Al
- Buffer Laby Seals – Fluorosint Grade 500
- Separation Seal – Carbon Ring Non-Contact

**SEAL BUFFER GAS:**

- Buffer Gas to Primary Gas Seals - Process
- Buffer Gas to Separation Seals – Nitrogen
- Buffer Gas to Secondary Seals - Nitrogen

**SHAFT ROTATION:**

Viewed From Driven End – Counter Clockwise

**CASING SPLIT LINE SEALING:**

- O-ring Lubricant - Parker Super "O"
- O-ring Sealing     Discharge Volute - Viton
- Inlet & Disch. End Seal Housing Walls - Viton



**COMPRESSOR OPERATING DATA**  
**SERIAL NUMBER/SHOP ORDER NUMBER F108251/F108252**

**FRAME:** 15MB3

**BAROMETER:** 14.6 mbar 10.95 mmHg

**INLET CAPACITY:**

Inlet Flow at Flange 1733 ICFM 2944.4 m<sup>3</sup>/h  
 Mass Flow at Flange 2843.07 lb/min 77375.68 kg/h

**TEMPERATURE:**

Inlet 77 °F 25 °C  
 Final Discharge 156.60 °F 69.2 °C  
 Maximum Discharge 350 °F 176.6 °C  
 Minimum Inlet -20 °F -29 °C

**PRESSURE:**

Inlet 465 psia 32.7 kg/cm<sup>2</sup>  
 Final Discharge 702.0 psia 49.35 kg/cm<sup>2</sup>  
 Maximum Discharge 900 psig 63.27 kg/cm<sup>2</sup>

**SHAFT HORSEPOWER (±4%):** 1893 hp 1411.61 kW

**SPEED:**

Normal 12053 rpm  
 Maximum Continuous 12053 rpm  
 1st Calculated Critical 8100-9600 rpm  
 2nd Calculated Critical 14900 rpm

**GAS INLET CONDITIONS:**

Gas Process  
 Molecular Mass 20.300  
 Specific Heat Ratio (k<sub>1</sub>) 1.423  
 Compressibility (Z<sub>1</sub>) 0.999

**GAS DISCHARGE CONDITIONS:**

Specific Heat Ratio (k<sub>2</sub>) 1.420  
 Compressibility (Z<sub>2</sub>) 1.008



## Compressor Data Sheets

Recycle Gas Compressor  
 T-Req: MJ2-0003

**CERTIFIED FOR CONSTRUCTION**

Purchaser: **Mississippi Power Company**  
 Purchaser's Order No.: **MPC18137-0001**  
 User: **Mississippi Power Company**  
 Shop Order No.: **F128251 / F128252**  
 Serial No.: **C01008 / C02008**  
 General Order No.: **H11005**

**FOR APPROVAL**

Avoid delay - to:  
 establish  maintain  
 shipping promise. One approved  
 print must be returned by:  
July 8th, 2011

By: Ivan Donahey  
 Date: June 24th, 2011

**FOR RECORD**

Any requested change of this  
 equipment will result in:  
 1. Contract price adjustment.  
 2. Extended shipping promise as this  
 contract is in manufacturing process.

By: \_\_\_\_\_  
 Date: \_\_\_\_\_

**VDSS CODE**

A7.1

**Southern Company Doc No.**

MM78011

Elliott Document No.	Rev.
DOC000000058601	2

Sheet **1** of **10**





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**CENTRIFUGAL AND AXIAL COMPRESSOR  
DATA SHEET (API 617-7TH Chapter 2)  
U.S. CUSTOMARY**

REVISION	0	1	2		
DATE	07-Apr-11	07-Jun-11	24-Jun-11		
BY	I. Donahey	I. Donahey	I. Donahey		
REV/APPR	WJT/ TRC	J. Zebrak	J. Laskoski		
JOB NO.	C462		ITEM NO.	CO1008/2008	
PAGE	1	OF	9	REQ'N NO.	C462-MJ-TREQ-MJ2-0003

1 APPLICABLE TO:  PROPOSAL  PURCHASE  AS BUILT

2 FOR SOUTHERN COMPANY SERVICES UNIT KEMPER COUNTY IGCC UNIT 1 PROJECT

3 SITE KEMPER COUNTY, MS SERIAL NO. \_\_\_\_\_

4 SERVICE RECYCLE GAS COMPRESSOR NO. REQUIRED TWO

5 MANUFACTURER Elliott DRIVER TYPE (1-3.1.1) INDUCTION MOTOR

6 MODEL 15MB3 DRIVER ITEM NO. CO1008M/2008M

8 INFORMATION TO BE COMPLETED:  BY PURCHASER  BY MANUFACTURER  MUTUAL AGREEMENT (PRIOR TO PURCHASE)

**OPERATING CONDITIONS**

(ALL DATA ON PER UNIT BASIS)

**RATED CONDITIONS**

13  GAS HANDLED ( (See page 3)

14  GAS PROPERTIES (1-2.1.1.4)

15  MMSCFD/SCFM (14.7 psia & 60°F DRY)

16  WEIGHT FLOW, (lb/hr) (WET) (DRY)

17 **INLET CONDITIONS**

18  PRESSURE (psia)

19  TEMPERATURE (°F)

20  RELATIVE HUMIDITY %

21  MOLECULAR WEIGHT

22  Cp/Cv (K<sub>1</sub>) OR (K<sub>AVG</sub>) (NOTE 1)

23  COMPRESSIBILITY (Z<sub>1</sub>) OR (Z<sub>AVG</sub>) (NOTE 1)

24  INLET VOLUME, (cfm) (WET / DRY)

25 **DISCHARGE CONDITIONS**

26  PRESSURE (psia)

27  TEMPERATURE (°F) (Estimated)

28  Cp/Cv (K<sub>2</sub>) OR (K<sub>AVG</sub>) (NOTE 1)

29  COMPRESSIBILITY (Z<sub>2</sub>) OR (Z<sub>AVG</sub>) (NOTE 1)

30  GAS POWER REQUIRED (HP)

31  TRAIN POWER REQUIRED (HP)

32  POWER REQ'D AT DRIVER INCL. EXT. LOSSES (HP)

33  SPEED (rpm)

34  TURNDOWN (%)

35  POLYTROPIC HEAD (ft-lb/lb)

36  POLYTROPIC EFFICIENCY (%)

37  CERTIFIED POINT

38  PERFORMANCE CURVE NUMBER RC-043-

39 **PROCESS CONTROL (1-3.4.2.1) (See note 2)**

40 METHOD  SUCTION THROTTLING  VARIABLE INLET  SPEED VARIATION  DISCHARGE  COOLED BYPASS

41 FROM \_\_\_\_\_ (psia) GUIDE VANES FROM \_\_\_\_\_ % BLOWOFF FROM \_\_\_\_\_

42 TO \_\_\_\_\_ (psia) (2-2.4.1) TO \_\_\_\_\_ % TO \_\_\_\_\_ TO \_\_\_\_\_

43 SIGNAL  SOURCE (1-3.4.2.1) Volume Flow Sensor

44 TYPE  ELECTRONIC  PNEUMATIC  OTHER Microprocessor capable of communication with DCS

45 RANGE 4-20 MA \_\_\_\_\_ (psig) Redundant CPU is required in compressor controller.

47  ANTI-SURGE SYSTEM (1-3.4.2.2)

Design	Alternate	Turndown			
170,584	170,584	99217			
*120,000			*Includes Recycle Flow		
465	493	442			
77	77	77			
20.3	20.3	19.9			
1.423	1.425	1.421			
0.999	0.999	1			
1,733	1,635	1310			
** Discharge Throttle					
702	753.6**	688.7**			
156.6	159.2	165.8			
1.42	1.422	1.417			
1.008	1.009	1.009			
1893	1955	1526			
1933	1995	1566			
12053	12053	12053			
18118	18720	20073			
83.8	83.8	81.4			
X					
1,2	3,4	5,6			

48 REMARKS: 1. Compressor provides 100% of required capacity for one train. Flows are for one compressor.

49 \_\_\_\_\_

50 3. Supplier to provide recycle flow, power, etc, required for the Turndown (T/D) case.

51 4. Cooling water is available for interstage colling @ 94 deg F (maximum summer). Max coolin water return is 119 deg F.





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REVISION	0	1	2	0	0
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**1 OPERATING CONDITIONS (Continued) (1-2.1.1.1) (1-3.1.2) (1-3.1.3)**

2	GAS ANALYSIS:		OTHER CONDITIONS					REMARKS:	
	3	4	NORMAL	RATED	TURNDOWN	C	D		E
5	<input type="radio"/> MOL %								
6		MW							
7	AIR	28.966							
8	OXYGEN	32.000							
9	NITROGEN	28.016		57.86	55.97				
10	WATER VAPOR	18.016		168 ppm	168 ppm				
11	CARBON MONOXIDE	28.010		2.01	2.17				
12	CARBON DIOXIDE	44.010		4.9	5.02				
13	HYDROGEN SULFIDE	34.076		1 ppm	1 ppm				(1-2.2.1.6)
14	HYDROGEN	2.016		31.61	33.23				(1-2.2.1.9)
15	METHANE	16.042		2.96	2.96				
16	ETHYLENE	28.052							
17	ETHANE	30.068							
18	PROPYLENE	42.078							
19	PROPANE	44.094							
20	I-BUTANE	58.120							
21	n-BUTANE	58.120							
22	I-PENTANE	72.146							
23	n-PENTANE	72.146							
24	AMMONIA			<1 ppm	<1 ppm				
25	COS			1 ppm	1 ppm				(1-2.2.1.3)
26	ARGON			0.66	0.64				
27	HCN			<1 ppm	<1 ppm				
28	AVG. MOL. WT.			20.3	19.9				

**27 LOCATION: (1-2.1.8)**

28  INDOOR     OUTDOOR     GRADE

29     HEATED     UNDER ROOF     MEZZANINE

30     UNHEATED     PARTIAL SIDES   

31  ELEC. AREA CLASS. (1-2.1.14)     NEC     IEC

32 CLASS 1 GROUP C/D DIV. 2

33 ZONE \_\_\_\_\_ GROUP \_\_\_\_\_ TEMP CLASS \_\_\_\_\_

**34 SITE DATA (1-2.1.8)**

35  ELEVATION \_\_\_\_\_ (ft)    BAROMETER \_\_\_\_\_ (psia)

36  RANGE OF AMBIENT TEMPS:

37    DRY BULB    WET BULB

38    NORMAL    (°F)    \_\_\_\_\_    \_\_\_\_\_

39    MAXIMUM    (°F)    \_\_\_\_\_    \_\_\_\_\_

40    MINIMUM    (°F)    \_\_\_\_\_    \_\_\_\_\_

41    \_\_\_\_\_    (°F)    \_\_\_\_\_    \_\_\_\_\_

**42 UNUSUAL CONDITIONS:**     DUST     FUMES

43    \_\_\_\_\_    Coal Dust    \_\_\_\_\_

44  OTHER (1-2.1.8) \_\_\_\_\_

45    See project design data doc.# C462-MJ-DAS-GEN-0001

46  COPPER AND COPPER ALLOYS PROHIBITED (1-2.2.1.14)

**47 COATING: (1-2.2.1.16)**

48  ROTATING COMPONENTS

49  STATIONARY COMPONENTS

**NOISE SPECIFICATIONS: (1-2.1.9)**

APPLICABLE TO MACHINE: See C462-MJ-DAS-MJ2-0054

SEE SPECIFICATION 85 dBa @ 3 ft from any surface

APPLICABLE TO NEIGHBORHOOD:

SEE SPECIFICATION \_\_\_\_\_

ACOUSTIC HOUSING:     YES     NO

**APPLICABLE SPECIFICATIONS:**

API 617, 7TH CHAPTER 2

VENDOR HAVING UNIT RESPONSIBILITY (1-1.5.54) (1-1.8) (1-2.1.3)

Elliott Group

GOVERNING SPECIFICATION (IF DIFFERENT)

MJ21-1E

**PAINTING:**

MANUFACTURER'S STD.

OTHER \_\_\_\_\_

**SHIPMENT: (4.4)**    MJ1-4TS-03

DOMESTIC     EXPORT     EXPORT BOXING REQ'D.

OUTDOOR STORAGE MORE THAN 6 MONTHS (1-4.4.1) 12 MO

SPARE ROTOR ASSEMBLY PACKAGE (1-4.4.3.10)

HORIZONTAL STORAGE     VERTICAL STORAGE



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REVISION	0	1	2	0	0
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JOB NO. C462 ITEM NO. CO1008/2008  
PAGE 4 OF 9 REQ'N NO. C462-MJ-TREQ-MJ2-0003

1 <b>CONSTRUCTION FEATURES</b>	
2 <b>SPEEDS:</b>	3 <b>INTERMEDIATE MAIN PROCESS CONNECTIONS (2-2.4.4)</b>
3 MAX. CONT. <u>12036</u> (rpm) TRIP _____ (rpm)	DISCH. PRESSURE: (psig) MAX _____ MIN _____
4 MAX. TIP SPEEDS: <u>627.2</u> (fps) @ 100% SPEED	INLET PRESSURE: (psig) MAX _____ MIN _____
5 <u>627.2</u> (fps) @ MAX. CONT. SPEED	<input type="checkbox"/> <b>GUIDE VANES</b>
6 <b>LATERAL CRITICAL SPEEDS (DAMPED)</b> Preliminary	<input type="checkbox"/> IGV EXTERNAL PURGE (2-2.4.2) _____
7 FIRST CRITICAL <u>8100 - 9600</u> (rpm) <b>Bending</b> MODE	<input type="checkbox"/> VANE CONTROL SYSTEM (2-2.4.3) _____
8 SECOND CRITICAL <u>14900</u> (rpm) <b>Bending</b> MODE	NUMBER OF AXIAL BLADE ROWS _____
9 THIRD CRITICAL _____ (rpm) _____ MODE	NUMBER OF ADJUSTIBLE ROWS _____
10 FOURTH CRITICAL _____ (rpm) _____ MODE	NO. VANES GUIDE VANE _____ MATERIAL _____
11 <input checked="" type="checkbox"/> LATERAL ANALYSIS ADDITIONAL REQUIREMENTS (1-2.6.2.14)	<input checked="" type="checkbox"/> <b>IMPELLERS:</b>
12 <input type="checkbox"/> TRAIN LATERAL ANALYSIS REQUIRED (1-2.6.2.6)	NO. <u>3</u> DIAMETERS <u>11.93"</u>
13 <input checked="" type="checkbox"/> TRAIN TORSIONAL ANALYSIS REQUIRED (1-2.6.6.1)	NO. VANES EA. IMPELLER <u>15</u>
14 <b>TORSIONAL CRITICAL SPEEDS:</b>	TYPE (OPEN, ENCLOSED, ETC.) <b>Enclosed</b>
15 FIRST CRITICAL _____ <b>Later</b> (rpm)	TYPE FABRICATION <b>Brazed</b> MATERIAL <b>UNS S42400</b>
16 SECOND CRITICAL _____ <b>Later</b> (rpm)	MIN. YIELD STRENGTH (psi) <b>80,000</b>
17 THIRD CRITICAL _____ (rpm)	HARDNESS:(BRINNEL) MAX <u>255</u> MIN <u>212</u>
18 FOURTH CRITICAL _____ (rpm)	SMALLEST TIP INTERNAL WIDTH (in) <u>0.6</u>
19 <input checked="" type="checkbox"/> LIST OF TRAIN UNDESIRABLE SPEEDS (1-2.6.1.4)	MAX. MACH. NO. @ IMPELLER EYE <u>0.269</u>
20 <input checked="" type="checkbox"/> STABILITY ANALYSIS (1-2.6.5)	MAX. IMPELLER HEAD @ 100% SPD (ft-lb/lb) <u>6700</u>
21 <b>VIBRATION:</b>	<input checked="" type="checkbox"/> <b>SHAFT:</b>
22 ALLOWABLE TEST LEVEL <u>1</u> (mil)	<input checked="" type="radio"/> ONE PIECE <input type="radio"/> BUILT UP
23 (PEAK TO PEAK) Excluding measured run out	MATERIAL <b>AISI 4340/4330</b>
24 <b>NAMEPLATE (2-2.11.2)</b>	DIA @ IMPELLERS (in) <u>4.07</u> DIA @ COUPLING (in) <u>2.875</u>
25 <input checked="" type="radio"/> US CUSTOMARY <input type="radio"/> METRIC	SHAFT END: <input checked="" type="radio"/> TAPERED <input type="radio"/> CYLINDRICAL
26 <input type="checkbox"/> ROTATION, VIEWED FROM DRIVEN END <input type="radio"/> CW <input checked="" type="radio"/> CCW	<input type="radio"/> SPLINED <input type="radio"/> INTEGRAL FLANGE
27 <input checked="" type="checkbox"/> <b>MATERIALS INSPECTION REQUIREMENTS (1-4.2.1.3)</b>	MIN. YIELD STRENGTH (psi) <u>105000</u>
28 <input checked="" type="checkbox"/> RADIOGRAPHY REQUIRED FOR <u>10 % piping</u>	SHAFT HARDNESS (BNH) <u>248-302</u>
29 <input checked="" type="checkbox"/> ULTRASONIC REQUIRED FOR <u>Shaft, fab. Casing</u>	MAX TORQUE CAPABILITY (ft-lb) <u>2680</u>
30 <input checked="" type="checkbox"/> MAGNETIC PARTICLE REQUIRED FOR <u>Shaft, Impeller</u>	<input checked="" type="checkbox"/> <b>BALANCE PISTON:</b>
31 <input checked="" type="checkbox"/> LIQUID PENETRANT REQUIRED FOR <u>Welds, fab. Impel.</u>	MATERIAL <b>AISI 4140</b> AREA <u>19.24</u> (in <sup>2</sup> )
32 <input type="checkbox"/> LOW TEMPERATURE (2.2.1.15.3)	FIXATION METHOD <b>Shrink Fit</b>
33 MIN.DESIGN METAL TEMPERATURE (°F) _____	NORMAL CLEARANCE (in) _____
34 AT CONCURRENT PRESSURE (psig) _____	FLOW WITH NORMAL CLEARANCE (lb/min) _____
35 <input type="checkbox"/> OTHER TRAIN COMPONENTS (2.2.1.15.2)	FLOW WITH 2x NORMAL CLEARANCE (lb/min) _____
36 <input checked="" type="checkbox"/> <b>CASING: ( By Supplier with Proposal)</b>	<input type="checkbox"/> PRESS. CONN. BAL LINE DOWNSTREAM (2-2.5.4.3)
37 MODEL <u>15MB3</u>	<input checked="" type="checkbox"/> <b>SHAFT SLEEVES:</b>
38 CASING SPLIT <u>Vertical</u>	AT INTERSTG. CLOSE MATL <u>410SS</u>
39 MATERIAL <u>ASTM A516 Grade 60</u>	CLEARANCE POINTS
40 THICKNESS (in) <u>4.25</u> CORR. ALLOW. (in) <u>0.125</u>	AT SHAFT SEALS MATL <u>410SS</u>
41 MAX. ALLOWABLE PRESS <u>900</u> (psig)	<input type="checkbox"/> ACCESSIBLE (2-2.8.3)
42 TEST PRESS: (psig) HELIUM _____ HYDRO <u>1350</u>	<b>ROTOR</b>
43 MAX. ALLOWABLE TEMPERATURE <u>400</u> (°F)	<input type="checkbox"/> DISASSEMBLY AND REASSEMBLY (1-2.6.8.2.1.1)
44 MAX OPER. TEMP. <u>400</u> (°F) MIN. OPER. TEMP. <u>-20</u> (°F)	<input checked="" type="checkbox"/> AT SPEED BALANCING (1-2.6.8.3)
45 MAX CASING CAPACITY <u>3100</u> (icfm)	<input type="checkbox"/> SEQUENTIAL LOW SPEED BAL. PREC. AT SPEED BAL. (1-2.6.8.6)
46 <input checked="" type="checkbox"/> SYSTEM RELIEF VALVE SET PT. (2-2.3.1.1) <u>Later</u> (psig)	<input checked="" type="checkbox"/> RESIDUAL BALANCE CHECK (1-2.6.8.7)
47 <input type="checkbox"/> Q.C. OF INACCESSIBLE WELDS (1-2.3.1.11.2)	<input checked="" type="checkbox"/> <b>LABYRINTHS:</b>
48 <b>DIAPHRAGMS:</b>	INTERSTAGE
49 MATERIAL <b>ASTM A36</b>	TYPE <b>Abradable</b> MATERIAL <b>Nickel-Graphite</b>
50 AXIALLY SPLIT <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (2-2.4.7)	BALANCE PISTON
51 DIAPHRAGM MAX. Δ P (BAR)(kPa) _____	TYPE <b>Abradable</b> MATERIAL <b>Nickel-Graphite</b>



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JOB NO. <u>C462</u> ITEM NO. <u>CO1008/2008</u> PAGE <u>5</u> OF <u>9</u> REQ'N NO. <u>C462-MJ-TREQ-MJ2-0003</u>						

1	<b>LOW PRESSURE CASING CONSTRUCTION FEATURES (CONTINUED)</b>	
2	<b>SHAFT SEALS:</b>	<input type="radio"/> BUFFER GAS CONTROL SYSTEM SCHEMATIC BY VENDOR <input type="radio"/> PRESSURIZING GAS FOR SUBATMOSPHERIC SEALS (1-2.8.2.4) <input type="radio"/> EDUCTOR <input type="radio"/> INJECTION (1-2.8.2.3)
3	<input checked="" type="radio"/> SEAL TYPE (1-2.8.1.3) <u>3.125" TANDEM DRY GAS</u>	<input checked="" type="checkbox"/> SEAL MANUFACTURER <u>Flowserve Lift Off Circpac</u>
4	<input checked="" type="radio"/> SETTLING OUT PRESSURE (1-2.8.1.1) (psig) <u>589.1</u>	<input type="checkbox"/> LEAKAGE TO PROCESS      (gal/day/seal) _____
5	<input type="radio"/> MIN. SEALING PRESSURE      (psig) _____	<b>BUFFER GAS REQUIRED FOR:</b>
6	<input type="radio"/> SUPPLEMENTAL DEVICE REQUIRED FOR CONTACT	<input type="checkbox"/> AIR RUN-IN <input checked="" type="checkbox"/> OTHER <u>All Pressurized Conditions</u>
7	SEALS (1-2.8.3.4)      TYPE _____	<input type="checkbox"/> FLOW (PER SEAL):
8	<input type="radio"/> BUFFER GAS SYSTEM REQUIRED (2-2.8.1.5)	NORM: _____ (lb/min) @ _____ (psi)      Δ P _____
9	<input checked="" type="radio"/> TYPE BUFFER GAS (1-2.8.1.5) <u>Process discharge</u>	MAX. _____ (lb/min) @ _____ (psi)      Δ P _____
10	<input type="checkbox"/> PRESSURE (1-2.8.1.6)      _____ (psig)	<input checked="" type="checkbox"/> BEARING HOUSING CONSTRUCTION:
11	<input type="checkbox"/> FLOWRATE (1-2.8.1.6)      _____ (lb/min)	TYPE (SEPARATE, INTEGRAL) <u>Separate</u> SPLIT      Axial
12	<input type="checkbox"/> FILTRATION (1-2.8.1.6)      _____ (μm)	MATERIAL      carbon steel
13	<input type="radio"/> MANIFOLD (1-3.5.1.4)	
14	<input type="radio"/> METHOD OF CONTROL (1-2.8.1.5)	

<b>AXIAL COMPRESSOR</b>									
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>

17	<b>ROTOR</b>									
18	<input type="checkbox"/> BLADE MATERIAL									
19	<input type="checkbox"/> BLADE ROOT TYPE									
20	<input type="checkbox"/> CORD WIDTH (in)									
21	<input type="checkbox"/> OUTER DIAMETER (in)									
22	<input type="checkbox"/> BLADE HEIGHT (in)									
23	<input type="checkbox"/> BLADE QUANTITY									

24	<b>STATOR</b>									
25	<input type="checkbox"/> BLADE MATERIAL									
26	<input type="checkbox"/> TYPE (MOVABLE, FIXED, ADJUSTABLE)									
27	<input type="checkbox"/> CORD WIDTH (in)									
28	<input type="checkbox"/> BLADE QUANTITY									

31	<b>STAGE</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>
32	<b>ROTOR</b>									
33	<input type="checkbox"/> BLADE MATERIAL									
34	<input type="checkbox"/> BLADE ROOT TYPE									
35	<input type="checkbox"/> CORD WIDTH (in)									
36	<input type="checkbox"/> OUTER DIAMETER (in)									
37	<input type="checkbox"/> BLADE HEIGHT (in)									
38	<input type="checkbox"/> BLADE QUANTITY									

39	<b>STATOR</b>									
40	<input type="checkbox"/> BLADE MATERIAL									
41	<input type="checkbox"/> TYPE (MOVABLE, FIXED, ADJUSTABLE)									
42	<input type="checkbox"/> CORD WIDTH (in)									
43	<input type="checkbox"/> BLADE QUANTITY									

46 REMARKS: \_\_\_\_\_

47 \_\_\_\_\_

48 \_\_\_\_\_

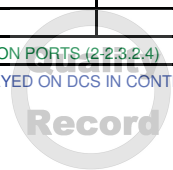
49 \_\_\_\_\_





<p>Engineered by KBR Technical Services, Inc. (License No. F-2397)</p> <p align="center"><b>CENTRIFUGAL AND AXIAL COMPRESSOR DATA SHEET (API 617-7TH Chapter 2) U.S. CUSTOMARY</b></p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>REVISION</td> <td align="center">0</td> <td align="center">1</td> <td align="center">2</td> <td align="center">0</td> <td align="center">0</td> </tr> <tr> <td>DATE</td> <td align="center">07-Apr-11</td> <td align="center">07-Jun-11</td> <td align="center">24-Jun-11</td> <td></td> <td></td> </tr> </table> <p>JOB NO. <u>C462</u> ITEM NO. <u>CO1008/2008</u>          PAGE <u>6</u> OF <u>9</u> REQ'N NO. <u>C462-MJ-TREQ-MJ2-0003</u></p>	REVISION	0	1	2	0	0	DATE	07-Apr-11	07-Jun-11	24-Jun-11		
REVISION	0	1	2	0	0								
DATE	07-Apr-11	07-Jun-11	24-Jun-11										
<b>1 CONSTRUCTION FEATURES (CONTINUED)</b>													
<b>2 BEARINGS AND BEARING HOUSINGS</b>													
<input type="radio"/> <b>3 MAGNETIC BEARINGS (2-2.7.1.1.2)</b>													
<b>4 RADIAL</b>	<b>THRUST</b>	<b>NON-THRUST</b>	<b>THRUST</b>	<b>ACTIVE</b>	<b>INACTIVE</b>								
<b>5 TYPE</b>	Tilt Pad	Tilt Pad	<b>5 TYPE</b>	Double acting, Self Equalizing									
<b>6 MANUFACTURER</b>	Elliott	Elliott	<b>6 MANUFACTURER</b>	Elliott									
<b>7 LENGTH (in)</b>	1.02	1.02	<b>7 UNIT LOADING - MAX (psi)</b>	152	0								
<b>8 SHAFT DIA. (in)</b>	2.95	2.95	<b>8 UNIT LOAD - ULT. (psi)</b>	550	550								
<b>9 UNIT LOAD (ACT/ALLOW) (psi)</b>	40/600	40/600	<b>9 AREA (in²)</b>	12.5	12.5								
<b>10 BASE MATERIAL</b>	Steel	Steel	<b>10 NO. PADS</b>	6	6								
<b>11 BABBIT THICKNESS (in)</b>	0.020-0.025	0.020-0.025	<b>11 PIVOT: CENTER / OFFSET, %</b>	Center	Center								
<b>12 NO. PADS</b>	5	5	<b>12 PAD BASE MATL</b>	Steel	Steel								
<b>13 LOAD: B'TW/N ON PAD</b>	Between	Between	<input checked="" type="radio"/> COPPER BACKED (2-2.7.3.7) <input checked="" type="radio"/> FLOODED <input type="radio"/> DIRECTED (2-2.7.3.6)										
<b>14 PIVOT: CTR/OFFSET, %</b>	Center	Center	THRUST COLLAR: <input type="radio"/> INTEGRAL <input checked="" type="radio"/> REPLACEABLE MATERIAL <u>  AISI 4340  </u>										
<b>15 PAD MATERIAL</b> <input type="radio"/> (2-2.7.2.2) <input type="radio"/> (2-2.7.2.3)			<input type="checkbox"/> <b>SIZING CRITERIUM (2-2.7.3.3)</b>										
<b>16 BEARING SPAN</b> <u>  36.793  </u> (in) Final			<b>18 BEARING TEMPERATURE DETECTORS (2-3.4.7.3)</b> <input type="radio"/> SEE ATTACHED API-670 DATASHEET <input type="radio"/> THERMOCOUPLES TYPE _____ <input checked="" type="radio"/> <b>RESISTANCE TEMP DETECTORS</b> <input checked="" type="radio"/> RESISTANCE MAT'L <u>  Platinum  </u> <input checked="" type="radio"/> <u>  100  </u> OHMS <input type="checkbox"/> ALARM TEMPERATURE (2-2.7.1.3) _____ (°F) <input type="checkbox"/> SHUTDOWN TEMPERATURE (2-2.7.1.3) _____ (°F) <input checked="" type="radio"/> PROVISION FOR LOCAL DISCONNECT (1-2.7.4.6) <input checked="" type="radio"/> <b>LOCATION-JOURNAL BRG</b> NO. <u>  </u> EA PAD <u>  </u> EVERY OTH PAD <u>  2  </u> PER BRG OTHER _____ <input checked="" type="radio"/> <b>LOCATION-THRUST BRG</b> NO. <u>  </u> EA PAD <u>  </u> EVERY OTH PAD <u>  3  </u> PER BRG OTHER _____ NO. (INACT) <u>  </u> EA PAD <u>  </u> EVERY OTH PAD <u>  2  </u> PER BRG OTHER _____ <input checked="" type="radio"/> <b>LOCAL DISCONNECTION (1-2.7.4.6)</b> <input checked="" type="radio"/> <b>MONITOR SUPPLIED BY (2-3.4.7.4) <u>  Compressor Supplier  </u></b> <input checked="" type="radio"/> LOCATION <u>  Note 1  </u> ENCLOSURE <input checked="" type="radio"/> MFR. <u>  Bentley Nevada  </u> <input checked="" type="checkbox"/> MODEL <u>  3500  </u> <input type="checkbox"/> SCALE RGE _____ <input type="radio"/> ALARM <input type="checkbox"/> SET @ _____ (°F) <input type="radio"/> SHTDWN <input type="checkbox"/> SET @ _____ (°F) <input type="radio"/> TIME DELAY _____ SEC										
			<b>19 VIBRATION DETECTORS:</b> <input type="radio"/> SEE ATTACHED API-670 DATA SHEET <input checked="" type="radio"/> TYPE <u>  Proximity  </u> <input checked="" type="checkbox"/> MODEL <u>  3300  </u> <input checked="" type="radio"/> MFR. <u>  Bentley Nevada  </u> <input checked="" type="radio"/> NO. AT EA SHAFT BEARING <u>  (2X &amp; 2Y)  </u> TOTAL NO. <u>  4  </u> <input checked="" type="radio"/> OSCILLATOR-DETECTORS SUPPLIED BY _____ <input checked="" type="radio"/> MFR. <u>  Bentley Nevada  </u> MODEL <u>  3300  </u> MONITOR SUPPLIED BY (2-3.4.7.2) _____ <input checked="" type="radio"/> LOCATION <u>  Note 1  </u> ENCLOSURE <input checked="" type="radio"/> MFR. <u>  Bentley Nevada  </u> MODEL <u>  3500  </u> <input type="checkbox"/> SCALE RGE _____ <input type="radio"/> ALARM <input type="checkbox"/> SET @ _____ (mil) <input checked="" type="radio"/> SHTDWN: <input checked="" type="checkbox"/> SET @ _____ (mil) <input type="radio"/> TIME DELAY _____ SEC <input type="radio"/> CASING VIBRATION TRANSDUCERS (2-3.4.7.5) <input type="radio"/> CASING VIBRATION MONITORS (2-3.4.7.6)										
			<b>20 AXIAL POSITION DETECTOR:</b> <input type="radio"/> SEE ATTACH. API-670 DATA SHEET <input checked="" type="radio"/> TYPE <u>  Proximity  </u> <input checked="" type="checkbox"/> MODEL <u>  3300  </u> <input checked="" type="radio"/> MFR. <u>  Bentley Nevada  </u> <input checked="" type="radio"/> NO. REQUIRED <u>  2  </u> <input checked="" type="radio"/> OSCILLATOR-DEMODULATOR SUPPLIED BY <u>  Comp. Vendor  </u> <input checked="" type="radio"/> MFR. <u>  Bentley Nev.  </u> <input checked="" type="checkbox"/> MODEL <u>  3300  </u> <input checked="" type="radio"/> MONITOR SUPPLIED BY (2-3.4.7.2) <u>  Comp. Supplier  </u> <input checked="" type="radio"/> LOCATION <u>  Note 1  </u> ENCLOSURE <input checked="" type="radio"/> MFR. <u>  Bentley Nevada  </u> <input checked="" type="checkbox"/> MODEL <u>  3500  </u> <input type="checkbox"/> SCALE RGE _____ <input type="radio"/> ALARM <input type="checkbox"/> SET @ _____ (mil) <input checked="" type="radio"/> SHTDWN: <input checked="" type="checkbox"/> SET @ _____ (mil) <input type="radio"/> TIME DELAY _____ SEC										
<b>41 KEY PHASOR REQUIRED</b>													
<input checked="" type="radio"/> Motor <input checked="" type="radio"/> GEAR H.S. <input type="radio"/> GEAR L.S.													
<b>43 CASING CONNECTIONS (1-2.3.2.2)</b>													
<b>CONNECTION</b>	<b>ANSI/ASME (B16.1; B16.5; B16.42; B16.47 series A, B; ISO 7005-1, -2; OTHER</b>	<input checked="" type="checkbox"/> <b>FACING</b> <input type="checkbox"/> BORE	<input checked="" type="radio"/> <b>ORIENTATION</b>	<input checked="" type="checkbox"/> <b>FLANGED</b> OR <b>STUDDED (1-2.3.2.2.1)</b>	<input type="radio"/> <b>MATING FLG &amp; GASKET BY VENDOR (1-2.3.2.2.7)</b>	<input checked="" type="checkbox"/> <b>GAS VELOCITY (fps)</b>							
50 INLET	8"600#	RF	UP	Flanged	No	82.8							
51 DISCHARGE	8"600#	RF	UP	Flanged	NO	70.5							
52													
53													
54													
<input type="radio"/> <b>55 BOROSCOPIC INSPECTION PORTS (2-2.3.2.4)</b>													

NOTE 1: TO BE DISPLAYED ON DCS IN CONTROL ROOM AND COMPRESSOR CONTROLS HMI IN INSTRUMENT I/O BUILDING



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	DATE	07-Apr-11	07-Jun-11	24-Jun-11		
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1	<input type="checkbox"/> OTHER CONNECTIONS					
2	<b>SERVICE:</b>					
3	NO.	SIZE	TYPE	NO.	SIZE	TYPE
4	LUBE-OIL INLET			PRESSURE		
5	LUBE OIL OUTLET			TEMPERATURE		
6	SEAL-OIL INLET			SOLVENT INJECTION		
7	SEAL-OIL OUTLET			PURGE FOR:		
8	SEAL GAS INLET			BRG. HOUSING		
9	SEAL GAS OUTLET			BTWN BRG & SEAL		
10	CASING DRAINS			BTWN SEAL & GAS		
11	STAGE DRAINS					
12	<input checked="" type="checkbox"/> INDIVIDUAL STAGE DRAINS REQUIRED (1-2.3.2.1.7)					
13	<input type="checkbox"/> VALVED & BLINDED					
14	<input checked="" type="checkbox"/> VALVED & BLINDED & MANIFOLD					

**LUBRICATION AND SEALING SYSTEMS (1-2.10) (1-3.5.1.2)**

15  SEE ATTACHED API 614 DATASHEET

16  SEPARATE       COMBINED (2-2.10.1)

17  INTEGRAL OIL RESERVOIR (1-3.3.2.11)

18  OIL TYPE (2-2.10.2)

**ACCESSORIES**

20 **COUPLING AND GUARDS (3.2)**

21 NOTE: SEE ROTATING ELEMENTS - SHAFT ENDS      Compressor      Motor      Gear

22  SEE ATTACHED API-671 DATA SHEET       KEYLESS HYDRAULIC       KEYED       FLANGED       OTHER \_\_\_\_\_

23 COUPLING FURNISHED BY Compressor Supplier

24 MANUFACTURER Kop-Flex      TYPE Flexible disc      MODEL \_\_\_\_\_

25 COUPLING GUARD FURNISHED BY: Compressor Supplier

26 TYPE:       FULLY ENCLOSED       SEMI-OPEN       OTHER

<p>27 <b>COUPLING DETAILS</b></p> <p>28 <input type="checkbox"/> MAX O.D. _____ (in)</p> <p>29 <input type="checkbox"/> HUB WEIGHT _____ (lb)</p> <p>30 <input type="checkbox"/> SPACER LENGTH _____ (in)</p> <p>31 <input type="checkbox"/> SPACER WEIGHT _____ (lb)</p>	<p><input checked="" type="checkbox"/> PLUG AND RING GAUGES (1-3.2.5)</p> <p>LUBRICATION REQUIREMENTS:</p> <p><input checked="" type="checkbox"/> NON-LUBE      <input type="checkbox"/> CONT. OIL LUBE      <input type="checkbox"/> OTHER _____</p> <p>QUANTITY PER HUB _____ (lb) or (gpm)</p>
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33 **MOUNTING PLATES (1-3.3)**      (Note 1.)

<p>34 <input checked="" type="checkbox"/> BASEPLATES FURNISHED BY (1-3.3.2.1) <u>Compressor Supplier</u></p> <p>35 <input checked="" type="checkbox"/> COMPRESSOR      <input checked="" type="checkbox"/> DRIVER      <input checked="" type="checkbox"/> GEAR</p> <p>36 <input type="checkbox"/> OTHER _____</p> <p>37 <input checked="" type="checkbox"/> NONSKID DECKING (1-3.3.2.4)      <input type="checkbox"/> SLOPED DECK (1-3.3.2.4.1)</p> <p>38 <input checked="" type="checkbox"/> LEVELING PADS OR TARGETS (1-3.3.2.6)</p> <p>39 <input checked="" type="checkbox"/> COLUMN MOUNTING (1-3.3.2.5)</p> <p>40 <input checked="" type="checkbox"/> SUB-SOLE PLATES REQUIRED (1-3.3.2.10)</p> <p>41 <input checked="" type="checkbox"/> STAINLESS STEEL SHIM THICKNESS _____ (in)</p> <p>42 <input checked="" type="checkbox"/> MACHINED MOUNTING PADS REQUIRED (1-3.3.2.9)</p>	<p><input type="checkbox"/> SOLEPLATES FURNISHED BY (1-3.3.3.1) _____</p> <p><input type="checkbox"/> THICKNESS _____ (in)</p> <p><input type="checkbox"/> SUBSOLE PLATES REQUIRED (1-3.3.3.1.3)</p> <p><input type="checkbox"/> EXTENT OF PIPING (2-3.5.1.1) _____</p> <p><input type="checkbox"/> STAINLESS STEEL SHIM THICKNESS _____ (in)</p> <p style="padding-left: 20px;"><input type="checkbox"/> COMPRESSOR _____</p> <p><input type="checkbox"/> COUNTER BORE ANCHOR BOLT HOLES (1-3.3.3.1.2)</p>
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<b>CENTRIFUGAL AND AXIAL COMPRESSOR DATA SHEET (API 617-7TH Chapter 2) U.S. CUSTOMARY</b>		JOB NO.	C462		ITEM NO.	CO1008/2008	
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1							
2							
3							
4							
5							
6							
7							
8	<b>ADDITIONAL REMARKS:</b>						
9	1. Deleted						
10							
11							
12	2. The following components shall be supplied by compressor supplier and shall be located in the						
13	instrument I/O building: Anti-Surge Control System, Vibration and Temperature Monitoring System,						
14	Overall Compressor Controller for compressor logic and Human Machine Interface (HMI) for						
15	Compressor Controls. ( The Lube Oil system logic, Start-up logic, and any functionality shall reside in the						
16	the Overall Compressor Controller). Functional testing of these systems shall be demonstrated and						
17	witnessed by the purchaser. Supplier shall ship PLC CPU for one string of each application to the						
18	customer's DCS supplier shop for interface testing during DCS FAT. Wiring Drawings and Cable						
19	Specification shall be provided by the Supplier for cables to interconnect the skid mounted						
20	instruments, junction boxes, Compressor Control Panels, and Motor Control Center.						
21	Preferred PLC supplier is Allen Bradley (Control Logix). PLC shall be provided with redundant CPU.						
22	3. A Redundant communication link shall be provided for the interface to the customer DCS. Local						
23	interface shall be through HMI in the I/O building. Connection between the customer ESD and the						
24	Supplier's Control system must be hardwired.						
25	4. Supplier shall provide the data base list with the addressed for soft signals to be interfaced with						
26	the DCS from the supplier's system referenced under item 3. The format for the database will be						
27	provided by the customer during detailed engineering stage.						
28	5. Supplier's participation will be required in the SIL/HAZOP review during details engineering stage.						
29	Supplier shall include price for the same in the quote.						
30	6. All the skid mounted instruments shall be terminated in the NEMAX 4X Stainless Steels junction						
31	boxes on the skid. Switches shall not be used. Digital Indicating transmitters with Hart protocol and						
32	4-20 MA output shall be provided.						
33	7. Supplier shall get the Vendor list for instruments approved by the customer before taking						
34	procurement action during detailed engineering stage.						
35	8. Supplier shall provide the instrument installation drawings, instrument location drawings and the						
36	dimensional drawings for all instruments in the supplier's scope.						
37	9. Deleted						
38							
39	10. Deleted						
40							
41							
42	11. Deleted						
43							
44	12. The supplier's scope shall include a Compressor Controls Corp. (CCC) system for surge control						
	per KBR specification MJ21-3E-C462.						
###	13. Deleted						

