

**FOR APPROVAL**



**PROVISION OF EPCIC AND LEASING FOR  
LAYANG FPSO FACILITIES  
HP GAS COMPRESSOR**

**COMPRESSOR DATA SHEET**



DELIVERY		ORDER No.	 <b>Kawasaki</b> KOBE WORKS MACHINERY DIVISION AERO-DYNAMIC MACHINERY DEPARTMENT COMPRESSOR ENGINEERING SECTION	
THHE	1E	31F3224-10		
		NOTES		
		1. Issued for approval 2014/11/4		
流込	1			
管理				
生管				
検査	1	REVISION		
生技		R1. Revised as per customer's comment and issued for Approval. 2015/4/28 <i>TL, SL, YK</i>		
外注				
購買			APPROVED	
海調			Y. Kurashiki	
品証			CHECKED	
回覧	1		J. Inai <i>JA.</i>	
控	1		DRAWN	
ISSUE			T. Ito	
		DATE	DRAWING No.	REV.
		Nov. 4, 2014	F3224-1060	R1



JOB NO. 31F3224 ITEM NO. K-2430/K-2440 & K-2530/K-2540  
 PURCHASE ORDER NO. \_\_\_\_\_  
 INQUIRY NO. \_\_\_\_\_  
 REVISION NO. 1 DATE 31-Oct-14  
 PAGE 1 - a OF 6 BY T. Ito

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1 APPLICABLE TO  PROPOSAL  PURCHASE  AS-BUILT  
 2 FOR Provision of EPCIC and Leasing for Layang FPSO Facilities UNIT -  
 3 SITE FPSO Layang SERIAL NO. 31F3224-A/B  
 4 SERVICE Hydrocarbon Gas / Export Gas NO. REQUIRED 2 (Two)  
 5  CONTINUOUS  INTERMITTENT  STAND BY DRIVER TYPE (1-3.1.1) Electric Motor with VFD  
 6 MANUFACTURER Kawasaki Heavy Industries, Ltd. MODEL RB8-7B DRIVER ITEM NO. -  
 7 INFORMATION TO BE COMPLETED:  BY PURCHASER  BY MANUFACTURER  MUTUAL AGREEMENT (PRIOR TO PURCHASE)

**OPERATING CONDITIONS**

( ALL DATA ON PER UNIT BASIS )

- SECTION
- GAS HANDLED ( ALSO SEE PAGE 2 )
  - GAS PROPERTIES (1-2.1.1.4)
  - STANDARD VOLUME FLOW (MMSCFD) (1.013 BarA & 15.6 °C DRY)
  - WEIGHT FLOW ( kg/h ) (WET)
  - INLET CONDITIONS :**
  - PRESSURE (BarG)\*3
  - TEMPERATURE (°C)
  - RELATIVE HUMIDITY ( % )
  - MOLECULAR WEIGHT (WET)
  - Cp/Cv ( K<sub>1</sub> )
  - COMPRESSIBILITY ( Z<sub>1</sub> )
  - ACTUAL INLET VOLUME ( m<sup>3</sup>/h ) (WET)
  - DISCHARGE CONDITIONS :**
  - PRESSURE (BarG)
  - TEMPERATURE (°C)
  - Cp/Cv ( K<sub>2</sub> )
  - COMPRESSIBILITY ( Z<sub>2</sub> )
  - GAS POWER REQUIRED (kW)
  - TRAIN BRAKE POWER REQUIRED (kW)
  - BRAKE POWER REQUIRED AT DRIVER INCL. EXT. LOSSES (kW)
  - SPEED ( RPM )
  - ESTIMATED SURGE (MMSCFD) (AT ABOVE SPEED)
  - POLYTROPIC HEAD ( kJ/kg )
  - POLYTROPIC EFFICIENCY ( % )
  - CERTIFIED POINT
  - PERFORMANCE CURVE NUMBER

DESIGN, GROUP 1 (CASE 1)		INITIAL LIFE, GROUP 2 (CASE 2)		INTERIM LIFE, GROUP 2 (CASE 3)	
1st Section	2nd Section	1st Section	2nd Section	1st Section	2nd Section
HC	HC	HC	HC	HC	HC
91.2	91.1	75.9	75.9	63.4	67.2 *2
94,323	93,704	79,034	78,699	66,595	70,110
18.5	47.9	18.5	48.1	15.5	44.2
39.27	44.78	39.24	44.77	39.25	44.77
20.69	20.65	20.82	20.82	21.00	20.94
1.304	1.420	1.304	1.422	1.291	1.404
0.941	0.870	0.941	0.868	0.949	0.876
5,714	2,133	4,754	1,765	4,732	1,715
48.9	132.0	49.1	132.0	45.2	132.0
116.2	137.0	116.7	137.3	123.9	146.6
1.296	1.382	1.296	1.382	1.280	1.364
0.938	0.913	0.938	0.912	0.945	0.920
3,953	4,511	3,315	3,787	3,099	3,766
8,516 *1		7,152		6,918	
12,707		12,342		12,854	
62.9	64.2	60.2	61.6	54.0	60.8
124	129	124	127	136	140
82.2	74.3	82.0	73.3	81.3	72.3
YES					

**PROCESS CONTROL (1-3.4.2.1) ;**

METHOD :  SUCTION THROTTLING  VARIABLE INLET  SPEED VARIATION  DISCHARGE  COOLED BYPASS  
 FROM \_\_\_\_\_ BarA GUIDE VANE FROM 70 % BLOWOFF FROM Discharge  
 TO \_\_\_\_\_ BarA (2-2.4.1) TO 105 % TO \_\_\_\_\_ TO Suction  
 (100% = 13,650 rpm)

SIGNAL:  SOURCE (1-3.4.2.1)  
 TYPE  ELECTRONIC  PNEUMATIC  OTHER \_\_\_\_\_  
 RANGE 4 - 20 mA \_\_\_\_\_ BarA

ANTI-SURGE SYSTEM (1-3.4.2.2)  MANUAL  AUTOMATIC  NONE

**REMARKS**

- \*1. KHI will guarantee this power with +4% API tolerance.
- \*2. Recycled @ surge flow+10%. Customer specified flow is 63.3 MMSCFD. ( 3.9 MMSCFD Recycled. )
- \*3. 1.0 bar pressure drop is considered between 1st & 2nd section.

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JOB NO. 31F3224 ITEM NO. K-2430/K-2440 & K-2530/K-2540  
 PURCHASE ORDER NO. \_\_\_\_\_  
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1 APPLICABLE TO  PROPOSAL  PURCHASE  AS-BUILT  
 2 FOR Provision of EPCIC and Leasing for Layang FPSO Facilities UNIT -  
 3 SITE FPSO Layang SERIAL NO. 31F3224-A/B  
 4 SERVICE Hydrocarbon Gas / Export Gas NO. REQUIRED 2 (Two)  
 5  CONTINUOUS  INTERMITTENT  STAND BY DRIVER TYPE (1-3.1.1) Electric Motor with VFD  
 6 MANUFACTURER Kawasaki Heavy Industries, Ltd. MODEL RB8-7B DRIVER ITEM NO. -  
 7 INFORMATION TO BE COMPLETED:  BY PURCHASER  BY MANUFACTURER  MUTUAL AGREEMENT (PRIOR TO PURCHASE)

**OPERATING CONDITIONS**

( ALL DATA ON PER UNIT BASIS )

- SECTION
- GAS HANDLED ( ALSO SEE PAGE 2 )
  - GAS PROPERTIES (1-2.1.1.4)
  - STANDARD VOLUME FLOW (MMSCFD) (1.013 BarA & 15.6 °C DRY)
  - WEIGHT FLOW ( kg/h ) (WET)
  - INLET CONDITIONS :**
  - PRESSURE (BarG)\*3
  - TEMPERATURE (°C)
  - RELATIVE HUMIDITY ( % )
  - MOLECULAR WEIGHT (WET)
  - Cp/Cv ( K<sub>1</sub> )
  - COMPRESSIBILITY ( Z<sub>1</sub> )
  - ACTUAL INLET VOLUME ( m<sup>3</sup>/h ) (WET)
  - DISCHARGE CONDITIONS :**
  - PRESSURE (BarG)
  - TEMPERATURE (°C)
  - Cp/Cv ( K<sub>2</sub> )
  - COMPRESSIBILITY ( Z<sub>2</sub> )
  - GAS POWER REQUIRED (kW)
  - TRAIN BRAKE POWER REQUIRED (kW)
  - BRAKE POWER REQUIRED AT DRIVER INCL. EXT. LOSSES (kW)
  - SPEED ( RPM )
  - ESTIMATED SURGE (MMSCFD) (AT ABOVE SPEED)
  - POLYTROPIC HEAD ( kJ/kg )
  - POLYTROPIC EFFICIENCY ( % )
  - CERTIFIED POINT
  - PERFORMANCE CURVE NUMBER

END OF FIELD LIFE, GROUP 1 (CASE 4)		REFERENCE CASE (CASE 5)			
1st Section	2nd Section	1st Section	2nd Section		
HC	HC	HC	HC		
52.9 *1	67.4 *2	91.2	91.1		
55,413	69,682	94,323	93,703		
12.5	40.2	18.5	46.4		
39.20	44.77	39.3	44.8		
20.91	20.74	20.69	20.65		
1.280	1.385	1.304	1.413		
0.958	0.888	0.941	0.874		
4,880	1,914	5,714	2,210		
41.2	132.0	47.4	122.0		
134.0	156.2	113.6	132.4		
1.264	1.346	1.296	1.380		
0.954	0.931	0.938	0.910		
2,960	4,192	3,815	4,283		
7,211		8,148			
13,650		12,540			
47.9	61.0	61.8	60.4		
155	157	120	122		
80.5	72.5	82.1	74.3		

**PROCESS CONTROL (1-3.4.2.1) ;**

METHOD :  SUCTION THROTTLING  VARIABLE INLET  SPEED VARIATION  DISCHARGE  COOLED BYPASS  
 FROM \_\_\_\_\_ BarA GUIDE VANE FROM 70 % BLOWOFF FROM Discharge  
 TO \_\_\_\_\_ BarA (2-2.4.1) TO 105 % TO \_\_\_\_\_ TO Suction  
 (100% = 13,650 rpm)

SIGNAL:  SOURCE (1-3.4.2.1)  
 TYPE  ELECTRONIC  PNEUMATIC  OTHER \_\_\_\_\_  
 RANGE 4 - 20 mA \_\_\_\_\_ BarA

ANTI-SURGE SYSTEM (1-3.4.2.2)  MANUAL  AUTOMATIC  NONE

**REMARKS**

\*1. Recycled @ surge flow+10%. Customer specified flow is 50.4 MMSCFD. ( 3.4 MMSCFD Recycled. )  
 \*2. Recycled @ surge flow+10%. Customer specified flow is 50.2 MMSCFD. ( 17.2 MMSCFD Recycled. )  
 \*3. 1.0 bar pressure drop is considered between 1st & 2nd section.

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**Kawasaki**  
**CENTRIFUGAL COMPRESSOR**  
**DATA SHEET (API 617-7th Chapter 2)**  
**SI UNITS (1-1.6.5)**

JOB NO. 31F3224 ITEM NO. K-2430/K-2440 & K-2530/K-2540  
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**HP Gas Compressor RB8-7B**

**CONSTRUCTION FEATURES**

■ **SPEEDS :**  
 MAX CONTINUOUS 14333 rpm TRIP 14476 rpm  
 MAX TIP SPEED 313 m/s @ 100% SPEED  
329 m/s @ MAX CONTINUOUS SPEED

■ **LATERAL CRITICAL SPEEDS (DAMPED) :**  
 FIRST CRITICAL 5600 rpm 1st Bending MODE  
 SECOND CRITICAL 21200 rpm 2nd Bending MODE  
 THIRD CRITICAL N/A rpm - MODE  
 FOURTH CRITICAL N/A rpm - MODE

■ **TORSIONAL CRITICAL SPEEDS :**  
 FIRST CRITICAL 779 rpm  
 SECOND CRITICAL 3670 rpm  
 THIRD CRITICAL 21347 rpm  
 FOURTH CRITICAL 34681 rpm

LATERAL ANALYSIS ADDITIONAL REQUIREMENTS (1-2.6.2.14)  
 TRAIN LATERAL ANALYSIS REQUIRED (1-2.6.2.6)  
 TRAIN TORSIONAL ANALYSIS REQUIRED (1-2.6.7.1)  
 LIST OF UNDESIRABLE SPEEDS (1-2.6.1.4)  
 STABILITY ANALYSIS (1-2.6.5)

■ **VIBRATION :**  
 ALLOWABLE TEST LEVEL (PEAK TO PEAK) 23.2 μm

■ **SHAFT :**  
 MATERIAL AISI 4140 or eq.  
 DIAMETERS : 153 mm @ IMPELLERS 102 mm @ COUPLING  
 SHAFT END :  TAPERED  CYLINDRICAL  
 SPLINED  INTEGRAL FLANGE  
 YIELD STRENGTH min 6550 Bar  
 BRINNEL HARDNESS : MAX 302 MIN 235  
 MAX TORQUE CAPABILIT 14200 N-m

■ **BALANCE PISTON :**  
 MATERIAL AISI 4140 or eq. AREA 3400 mm<sup>2</sup>  
 FIXIATION METHOD Shrink Fit

■ **SHAFT SLEEVES :**  
 @ INTERSTAGE CLOSE CLEARANCE POINTS MATERIAL SS403 eq.  
 @ SHAFT SEALS MATERIAL -

ACCESSIBLE (2-2.8.3)

■ **LABYRINTHS ;**  
 INTERSTAGE :  
 TYPE Knife Edge, Damper Seal MATERIAL Aluminium Alloy  
 BALANCE PISTON :  
 TYPE Knife Edge MATERIAL Aluminium Alloy

**NAMEPLATE (2-2.11.2) : Metric**

■ **ROTATION, VIEWED FROM DRIVEN END :**  CW  CCW

\*1 ■ **MATERIALS INSPECTION REQUIREMENTS (1-4.2.2.1) :**  
 RADIOGRAPHY REQUIRED FOR \_\_\_\_\_  
 ULTRASONIC REQUIRED FOR \_\_\_\_\_  
 MAGNETIC PARTICLE REQUIRED FOR \_\_\_\_\_  
 LIQUID PANETRANT REQUIRED FOR \_\_\_\_\_

■ **CASING :**  
 MODEL RB8-7B CASING SPLIT Vertical (Radial)  
 MATERIAL Forged Steel (A266 Gr.2 or eq.)  
 THICKNESS 183 mm CORROSION ALLOWANCE 3 mm  
 MAX ALLOWABLE PRESSURE 147.0 BarG  
 TEST PRESSURE : HELIUM \_\_\_\_\_ BarG  
 HYDRO 220.5 BarG  
 ALLOWABLE TEMPRETURE : MAX 180 °C MIN -29 °C \*2  
 OPERATING TEMPRETURE : MAX \_\_\_\_\_ °C MIN -11 °C \*3  
 MAX CASING CAPACITY 7500 m<sup>3</sup>/h  
 CASING SPLIT SEALING O-Ring (Viton) (1st/  
 SYSTEM RELIEF VALVE SET PRESSURE (2-2.3.1.1) 75 / 147 BarG (2nd)  
 QUALITY CONTROL OF INACCESSIBLE WELDS (1-2.3.1.11.2)

■ **DIAPHRAGMS & VOLUTE :**  
 MATERIAL Carbon Steel

■ **IMPELLERS :**  
 NO. 7 \*4 DIAMETERS 438, 419, 381, 349 mm  
 NO. OF VANES 17 x 3, 15 x 4 for each impeller  
 TYPE Enclosed, Welded  
 MATERIAL 3 x SS630 (17-4PH) eq. / for 1st Section  
2 x SS630 (17-4PH) eq. +  
2 x USS Carilloy T-1 (A517 Gr.F) eq. / for 2nd Section  
 YIELD STRENGTH \*5 Bar  
 BRINNEL HARDNESS : MAX \*6 MIN \*6  
 SMALLEST TIP INTERNAL WIDTH 5.7 mm  
 MAX MACH NO. @ IMPELLER EYE 0.50 / 0.39  
 MAX IMPELLER HEAD @ 100% SPEED 134200 / 126500 N-m/kg  
 (Total head of each sections @ surge)

■ **SHAFT SEALS :**  
 SEAL TYPE (1-2.8.1.3) Tandem Dry Gas Seal  
 SETTLING OUT PRESSURE (1-2.8.1.1) 52.5 / 112.5 / 67 BarG (1st / 2nd / Overall)  
 SPECIAL OPERATION (1-2.8.1.1) \_\_\_\_\_  
 SUPPLEMENTAL DEVICE REQUIRED FOR CONTACT SEALS (1-2.8.3.4)  
 TYPE \_\_\_\_\_

BUFFER GAS SYSTEM REQUIRED (1-2.8.1.5)  
 BUFFER GAS TYPE (1-2.8.1.5) Process Gas with IA Separation \*7 \*8  
 BUFFER GAS CONTROL SYSTEM SCHEMATIC BY VENDOR  
 PRESSURISING GAS FOR SUBATOMOSPHERIC SEALS (1-2.8.2.4)  
 EDUCER  INJECTION (1-2.8.2.3)

■ **SEAL MANUFACTURER** John Crane  
 INNER OIL LEAKAGE (PER SEAL) \_\_\_\_\_ m<sup>3</sup>/DAY  
 BUFFER GAS REQUIRED FOR  
 AIR RUN-IN  OTHER \_\_\_\_\_

■ **BUFFER GAS FLOW (PER SEAL) :**  
 N \_\_\_\_\_  
 M \_\_\_\_\_  
Refer to Utility list "Doc. No. F3224-0025"

■ **BEARING HOUSING CONSTRUCTION :**  
 TYPE Separate SPLIT Horizontal  
 MATERIAL Cast Steel / Carbon Steel

**REMARKS**

\*1. NDE will be carried out in accordance with KHI standard.  
 Refer to "Inspection & Test Plan" for details.  
 \*2. -29 degC is only allowable for non-operating conditions (blowdown etc.).  
 External back-up buffer gas shall be supplied for the conditions above.  
 \*3. -11 degC is minimum allowable suction temperature of compressor  
 during full recycle operation.  
 \*4. Three (3) / 1st + Four (4) / 2nd with back-to-back arrangement  
 \*5. Min. 7250 bar / SS630 (17-4PH) eq.  
 Min. 6270 bar / USS Carilloy T-1 eq. (A517 Gr.F eq.)  
 \*6. Min. 277 / SS630 (17-4PH) eq.  
 Min. 241 - Max. 293 / USS Carilloy T-1 eq. (A517 Gr.F eq.)  
 \*7. Compressor discharge gas will be utilized as buffer gas during  
 compressor normal operation.  
 \*8. Back-up buffer gas shall be prepared by others for start-up  
 and any other pressurized conditions.

**Kawasaki**  
**CENTRIFUGAL COMPRESSOR**  
**DATA SHEET (API 617-7th Chapter 2)**  
**SI UNITS (1-1.6.5)**

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**HP Gas Compressor RB8-7B CONSTRUCTION FEATURES (Continued)**

**BEARINGS AND BEARING HOUSINGS**

MAGNETIC BEARINGS (2-2.7.1.1.2)

RADIAL	THRUST	NON-THRUST	THRUST	ACTIVE	INACTIVE
<input checked="" type="checkbox"/> TYPE	<b>Tilting Pad</b>	<b>Tilting Pad</b>	<input checked="" type="checkbox"/> TYPE	<b>Self Leveling / Tilting Pad</b>	
<input checked="" type="checkbox"/> MANUFACTURER	<b>Waukesha</b>		<input checked="" type="checkbox"/> MANUFACTURER	<b>Waukesha</b>	
<input checked="" type="checkbox"/> LENGTH (mm)	<b>48.0</b>	<b>48.0</b>	<input checked="" type="checkbox"/> UNIT LOAD (MAX) (kg/cm2)	<b>12.0</b>	<b>12.0</b>
<input checked="" type="checkbox"/> SHAFT DIAMETER (mm)	<b>102</b>	<b>102</b>	<input checked="" type="checkbox"/> UNIT LOAD (ULTIMATE) (kg/cm2)	<b>41.8</b>	<b>41.8</b>
<input checked="" type="checkbox"/> UNIT LOAD (ACTUAL) (kg/cm2)	<b>3.1</b>	<b>3.7</b>	<input checked="" type="checkbox"/> AREA (mm2)	<b>13100</b>	<b>13100</b>
<input checked="" type="checkbox"/> UNIT LOAD (ALLOWABLE) (kg/cm2)	<b>19.0</b>	<b>19.0</b>	<input checked="" type="checkbox"/> NO. PADS	<b>8</b>	<b>8</b>
<input checked="" type="checkbox"/> BASE MATERIAL	<b>Carbon Steel</b>	<b>Carbon Steel</b>	<input checked="" type="checkbox"/> PIVOT: CENTER / OFFSET	<b>Offset</b>	<b>Offset</b>
<input checked="" type="checkbox"/> BABBIT THICKNESS (mm)	<b>1.6</b>	<b>1.6</b>	<input checked="" type="checkbox"/> PAD BASE MATERIAL	<b>Cr-Cu Alloy</b>	<b>Cr-Cu Alloy</b>
<input checked="" type="checkbox"/> NO. PADS	<b>5</b>	<b>5</b>	LUBRICATION : <input type="radio"/> FLOODED <input checked="" type="radio"/> DIRECTED (2-2.7.3.6)		
<input checked="" type="checkbox"/> LOAD: BETWEEN / ON PAD	<b>On</b>	<b>On</b>	THRUST COLLAR : <input type="radio"/> INTEGRAL <input checked="" type="radio"/> REPLACEABLE		
<input checked="" type="checkbox"/> PIVOT: CENTER / OFFSET	<b>Center</b>	<b>Center</b>	MATERIAL <b>AISI 4140 or eq.</b>		
<input type="checkbox"/> BEARING SPAK _____ mm	<input type="checkbox"/> SIZING CRITERIUM (2-2.7.3.3) _____				

**BEARING TEMPRETURE DETECTORS (2-3.4.7) :**

SEE ATTACHED API-670 DATASHEET  
 THERMOCOUPLES TYPE \_\_\_\_\_  
 RESISTANCE TEMPRETURE DETECTORS  
 RESISTANCE MATERIAL **Platinum**  **100** OHMS  
 ALARM TEMPRETURE (2-2.7.1.3) **105** °C  
 SHUTDOWN TEMPRETURE (2-2.7.1.3) **115** °C  
 PROVISION FOR LOCAL DISCONNECT (1-2.7.4.6)  
 LOCATION - JOURNAL BEARING :  
 NO. - EA. PAD - EVERY OTH. PAD **2** PER BRG  
 OTHER \_\_\_\_\_  
 LOCATION - THRUST BEARING ;  
 ACTIVE :  
 NO. - EA. PAD - EVERY OTH. PAD **3** PER BRG  
 OTHER \_\_\_\_\_  
 INACTIVE :  
 NO. - EA. PAD - EVERY OTH. PAD **2** PER BRG  
 OTHER \_\_\_\_\_  
 MONITOR SUPPLIED BY (2-3.4.7.4) **Kawasaki Heavy Industries**  
 LOCATION **UCP** ENCLOSURE \_\_\_\_\_  
 MFR. **Bently Nevada**  MODEL **BN3500**  
 SCALE RANGE **0 - 200** °C  
 ALARM SET @ **105** °C  SHUTDOWN SET @ **115** °C  
 TIME DELAY **3** seconds

**VIBRATION DETECTORS :**

SEE ATTACHED API-670 DATASHEET  
 TYPE **Non-Contact**  MODEL **BN3300XL**  
 MANUFACTURER **Bently Nevada**  
 NO. @ EA. SHAFT BRG **2** TOTAL NO. **4**  
 OSCILLATOR-DETECTORS SUPPLIED BY **Kawasaki Heavy Industries**  
 MFR. **Bently Nevada**  MODEL **BN3300XL**  
 MONITOR SUPPLIED BY (2-3.4.7.4) **Kawasaki Heavy Industries**  
 LOCATION **UCP** ENCLOSURE \_\_\_\_\_  
 MFR. **Bently Nevada**  MODEL **BN3500**  
 SCALE RANGE **100** µm  
 ALARM SET @ **50** µm  SHUTDOWN SET @ **75** µm  
 TIME DELAY **3** seconds  
 CASING VIBRATION TRANSDUCERS (2-3.4.7.5)  
 CASING VIBRATION MONITORS (2-3.4.7.6)

**AXIAL POSITION DETECTOR :**

SEE ATTACHED API-670 DATASHEET  
 TYPE **Non-Contact**  MODEL **BN3300XL**  
 MANUFACTURER **Bently Nevada**  
 NO. REQUIRED **2**  
 OSCILLATOR-DEMODULATOR SUPPLIED BY **Kawasaki Heavy Industries**  
 MFR. **Bently Nevada**  MODEL **BN3300XL**  
 MONITOR SUPPLIED BY (2-3.4.7.4) **Kawasaki Heavy Industries**  
 LOCATION **UCP** ENCLOSURE \_\_\_\_\_  
 MFR. **Bently Nevada**  MODEL **BN3500**  
 SCALE RANGE **±1.0** mm  
 ALARM SET @ **±0.5** mm  SHUTDOWN SET @ **±0.7** mm  
 TIME DELAY **3** seconds

**KEY PHASOR REQUIRED**

COMPRESSOR  GEAR H. S.  GEAR L. S.

**CASING CONNECTIONS (1-2.3.2.2.1)**

CONNECTION	<input checked="" type="checkbox"/> ANSI / ASME <input type="checkbox"/> OTHER SIZE	<input checked="" type="checkbox"/> FACING <input type="checkbox"/> BORE	<input checked="" type="radio"/> ORIENTATION	<input checked="" type="checkbox"/> FLANGED OR STUDDED (1-2.3.2.2.1)	<input checked="" type="radio"/> MATING FLANGE & GASKET (1-2.3.2.2.7)	<input checked="" type="checkbox"/> GAS VELOCITY
1st INLET	<b>10"</b>	<b>1500#, Sch 80S, RTJ</b>	<b>Up</b>	<b>Flanged</b>	<b>By Others</b>	<b>34</b> m/s
1st DISCHARGE	<b>8"</b>	<b>1500#, Sch 80, RTJ</b>	<b>Up</b>	<b>Flanged</b>	<b>By Others</b>	<b>26</b> m/s
2nd INLET	<b>6"</b>	<b>1500#, Sch 120, RTJ</b>	<b>Up</b>	<b>Flanged</b>	<b>By Others</b>	<b>39</b> m/s
2nd DISCHARGE	<b>6"</b>	<b>1500#, Sch XXS, RTJ</b>	<b>Up</b>	<b>Flanged</b>	<b>By Others</b>	<b>22</b> m/s

**REMARKS**

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**Kawasaki**  
**CENTRIFUGAL COMPRESSOR**  
**DATA SHEET (API 617-7th Chapter 2)**  
**SI UNITS (1-1.6.5)**

JOB NO. 31F3224 ITEM NO. K-2430/K-2440 & K-2530/K-2540  
 PURCHASE ORDER NO. \_\_\_\_\_  
 INQUIRY NO. \_\_\_\_\_  
 REVISION NO. 1 DATE 31-Oct-14  
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**HP Gas Compressor RB8-7B CONSTRUCTION FEATURES (Continued)**

SERVICE :	NO.	SIZE	TYPE
LUBE-OIL INLET	3	3/4" , 1"	Flanged
LUBE-OIL OUTLET	3	1-1/2" , 2"	Flanged
SEAL-OIL INLET			
SEAL-OIL OUTLET			
SEAL GAS INLET	2	1"	Flanged
SEAL GAS OUTLET	4	1"	Flanged
CASING DRAINS	5	3/4"	Flanged
VENTS	2	2"	Flanged
PRESSURE			
TEMPRETURE			
PURGE (AIR) FOR :			
BEARING HOUSING			
BETWEEN BEARING & SEAL			
BETWEEN SEAL & GAS			

INDIVIDUAL STAGE DRAINS REQUIRED (1-2.3.2.1.7)  
 VALVED & BLINDED  
 VALVED & BLINDED & MANIFOLD

**ALLOWABLE PIPING FORCES AND MOMENTS (Refer to KHI Doc. F3224-0112)**

	INLET		DISCHARGE		FORCE (N)	MOMENT (N-m)
	FORCE (N)	MOMENT (N-m)	FORCE (N)	MOMENT (N-m)		
AXIAL	<b>(3.7 times the values calculated)</b>					
VERTICAL	<b>in accordance with NEMA SM-23)</b>					
HORIZ. 90°						
	FORCE (N)	MOMENT (N-m)	FORCE (N)	MOMENT (N-m)	FORCE (N)	MOMENT (N-m)
AXIAL	<b>(3.7 times the values calculated)</b>					
VERTICAL	<b>in accordance with NEMA SM-23)</b>					
HORIZ. 90°						

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

SEE ATTACHED API-614 DATA SHEET  
 SEPARATE       COMBINED (2-2.10.1)  
 INTEGRAL OIL RESERVOIR (1-3.3.2.11)  
 OIL TYPE (2-2.10.2) ISO VG32

**ACCESSORIES**

**COUPLINGS AND GUARDS (1-3.2) Gear - Compressor**

NOTE : SEE ROTATING ELEMENTS - SHAFT ENDS

SEE ATTACHED API-671 DATA SHEET       KEYLESS HYDRAULIC       KEYED       FLANGED       OTHER \_\_\_\_\_  
 (GEAR SIDE)

COUPLING FURNISHED BY Kawasaki Heavy Industries  
 MANUFACTURER Eagle Industry or eq. TYPE Diaphragm MODEL 100F310  
 COUPLING GUARD FURNISHED BY Kawasaki Heavy Industries TYPE  FULLY ENCLOSED    SEMI-OPEN    OTHER Non Sparking

**COUPLINGS DETAILS**

Refer to Coupling Outline "Doc. No. F3224-3710"

VENDOR MOUNT HALF COUPLING  
 PLUG AND RING GAUGES (1-3.2.5)  
 LUBRICATION REQUIREMENTS :  
 NON-LUBE    CONT. OIL LUBE    OTHER \_\_\_\_\_  
 QUANTITY PER HUB \_\_\_\_\_ L/min

**MOUNTING PLATES (1-3.3)**

BASEPLATES FURNISHED BY Kawasaki Heavy Industries  
 COMPRESSOR ONLY    DRIVER    GEAR  
 OTHER Dry Gas Seal Console  
 NON-SKID DECKING (1-3.3.2.4)    SLOPED DECK (1-3.3.2.4.1)  
 LEVELING PADS OR TARGETS (1-3.3.2.6)  
 COLUMN MOUNTING (1-3.3.2.5)  
 SUB-SOLE PLATES REQUIRED (1-3.3.2.10)  
 STAINLESS STEEL SHIM THICKNESS \_\_\_\_\_ mm  
 MACHINED MOUNTING PADS REQUIRED (1-3.3.2.9)

SOLEPLATES FURNISHED BY (1-3.3.3.1) \_\_\_\_\_  
 THICKNESS \_\_\_\_\_ mm  
 SUB-SOLE PLATES REQUIRED (1-3.3.3.1.3)  
 EXTENT OF PIPING (2-3.5.1.1) \_\_\_\_\_  
 STAINLESS STEEL SHIM THICKNESS \_\_\_\_\_ mm  
 COUNTER BORE ANCHOR BOLT HOLES (1-3.3.3.1.2)

**REMARKS**

\*1. Common baseplate for compressor, gear unit, driver and lube oil console.

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