طرح نگهداشت و افزایش تولید ۲۷ مخزن

DATA SHEETS (W/PERFORMANCE CURVE) FOR FIRE WATER JOCKEY PUMPS

نگهداشت و افزایش تولید میدان نفتی بینک

V00	Nov-2024	IFA	KP	M.Fakharian	M.Sadeghian	
Rev.	**Date**	**Purpose of Issue / Status**	**Prepared by:**	**Checked by:**	**Approved by:**	**CLIENT Approval**

status:

IFA: Issued For Approval

AFC: Approved For Construction

IFI: Issued For Information

REVISION RECORD SHEET

page	00	01	02	03	04	05
1	x					
2	x					
3	x					
4	x					
5	x					
6	x					
7	x					
8	x					
9	x					
10	x					
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						

page	00	01	02	03	04	05
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						
94						
95						
96						
97						
98						
99						
100						
101						
102						
103						
104						
105						
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						
116						
117						
118						
119						
120						
121						
122						
123						
124						
125						
126						
127						
128						

DATA SHEETS (W/PERFORMANCE CURVE) FOR FIRE WATER JOCKEY PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	KP	120	ME	DS	0003	V00

GENERAL NOTES

1	Vendor shall fill in the blanks and return the completed data sheet along with Motor data sheet, "DOC NO.: BK-GCS-PEDCO-120-EL-DT-0008 & 0009 with his proposal.	KPC : Confirmed
2	Vendor shall submit ITP (Inspection & Testing Plan) with his proposal.	KPC : Confirmed
3	Vendor is requested to confirm the material, or propose appropriate alternative.	KPC : Confirmed
4	For Instrumentation, Project specification 'Specification For Instrument and Control of package Unit System (PU)' Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0004, shall be followed.	KPC : Confirmed
5	Mechanical seal data sheet shall fill in by vendor as per API 682, 4th edition.	KPC : Confirmed
6	NPSH test shall be done & witnessed if the margin of NPSHr & NPSHa is less than 1.	KPC : Confirmed
7	The Tie-in flanges shall conform to ASME B-16.1.	KPC : Confirmed
8	Pump drain shall be terminated at skid edge with flange connection and valved.	KPC : Confirmed
9	Supplier to indicate which minimum flow pumps can achieve.	KPC : Confirmed
10	Nozzle loads shall be 2 times the loads shown in API 610 11th Edition.	KPC : Confirmed
11	Electrical motor shall be rated for the end of curve.	KPC : Confirmed
12	The Suction line size is 2 " and discharge line is 2 ".	KPC : Confirmed
13	Pump Manufacturer shall supply all instrumentation for mechanical seals as per API 682 4th Edition and project requirements.	KPC : Confirmed
14	Based on project instrumentation specification, these equipments are classified as Type C. Electro pump shall include a dedicated controller/ starter panel installed on pump skid as per NFPA 20 (2019). Pressure switch and pressure sensing line and its accessories are in vendor scope of work and supply. As per NFPA 20 dedicated sensing line and control panel for jockey pumps and separated from main pumps shall be considered by vendor.	KPC : Based on project instrumentation specification, these equipments are classified as Type A
15	Welding repair procedures shall be submitted for approval.	KPC : Confirmed
16	If pump is self venting there is no need for vent .	KPC : Confirmed
17	For information on site conditions refer to Process Basis of Design document; Doc.No: BK-GNRAL-PEDCO-000-PR-DB-0001., electrical motor shall be rated according to project site condition. any required protection for pumps in this regard shall be considered by pump manufacturer.	KPC : Confirmed
18	Ultrasonic Test shall be performed for forged shaft.	KPC : Confirmed
19	Couplings shall be dry, flexible and spacer type.	KPC : Confirmed
20	For electrical motor descriptions, refer to 'Specification For LV Induction Motors' Doc. No. BK-GNRAL-PEDCO-000-EL-SP-0010.	KPC : Confirmed
21	A local control panel shall be considered by vendor to be located next to the pumps as per "Specification For Fire Water Network", Doc.No.BK-GCS-PEDCO-120-SA-PI-0001. Pump LCP shall be designed to manage all required monitoring and control signals , as minimum in accordance with "P&ID For Fire Water Network", Doc.No.BK-GCS-PEDCO-120-SA-PI-0001.	KPC : Confirmed
22	Pressure sensing lines are in the vendor's scope of supply.	KPC : Confirmed
23	For technical requirements of electrical lv motors refer to "Data sheets "for lv induction motors: DOC NO:BK-GCS-PEDCO-120-EL-DT-0008". Power Factor, efficeincy, frequent, voltage, frequent variation and voltage variation of motor shall be specified by vendor in data sheet.	KPC : Confirmed

DATA SHEETS (W/PERFORMANCE CURVE) FOR FIRE WATER JOCKEY PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	KP	120	ME	DS	0003	V00

CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2302 A/B (Sheet 1 of 6)

CLIENT: National Iranian South Oil Company (NISOC)

PROJECT TITLE: BINAK Gas Compressor Station

JOB NUMBER:

EQUIPMENT NUMBER: P-2302 A/B

EQUIPMENT SERVICE: Fire Water Jockey Pumps

SERIAL NUMBER:

REQ. / SPEC NO. : BK-GCS-PEDCO-120-ME-SP-0005

PURCH ORDER NO.

Cells coloured thus
- contain drop-down options
- contain calculated values based on input data; do not change.
- identify a cross referenced paragraph in the document note, and may also contain a drop down list

When you have completed the DS, highlight the whole page format cells pattern none
Delete these notes on completion

COMMENTS:

	DATA SHEETS					
	ITEM No.	ATT	ITEM No.	ATT	ITEM No.	ATT
PUMP	P-2302 A	YES	P-2302 B	YES		
MOTOR						
GEAR						
TURBINE						

NISOC

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض
خرید پکیج پمپ های آب آتشنشانی ایستگاه تقویت فشارگاز بینک
(قرارداد ۰۰_۰۰۲۳-BK-HD-GCS-CO)

HIRGAN ENERGY
Kalaye Pump Co.

شماره پیمان: ۰۵۳-۰۷۳-۹۱۸۴

DATA SHEETS (W/PERFORMANCE CURVE) FOR FIRE WATER JOCKEY PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	KP	120	ME	DS	0003	V00

شماره صفحه: ۵ از ۱۰

CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2302 A/B (Sheet 2 of 6)

APPLICABLE TO:	PROPOSAL	APPLICABLE NTL/INTNTL STANDARD:	NFPA20 (2019) & IPS-M-PM-125
FOR	NISOC	UNIT	
SITE	BINAK Gas Compressor Station	SERVICE	Fire Water Jockey Pumps
NO. REQ	2 (1+1)	PUMP SIZE	2 "x 1"
TYPE	OH2 (V.T.A)	No. STAGES	1
MANUFACTURER	KALAYE PUMP CO.	MODEL	V.T.A. KP2532
SERIAL NO.	V.T.A.		

LIQUID CHARACTERISTICS

	Units	Maximum	Minimum	Note
LIQUID TYPE OR NAME :		Water		Max & min
VAPOR PRESSURE :	bara	0.0087	0.1219	values refer
DENSITY :	kg/m³	997		only to the
SPECIFIC HEAT :	kj/kgC	4.186		property
VISCOSITY :	cP	1		listed

OPERATING CONDITIONS (6.1.2)

	Units	Maximum	Rated	Normal	Min
$NPSH_A$ Datum:		C.L. Impeller			
PUMPING TEMPERATURE :	°C	50			5
FLOW :	m³/hr		15.0		
DISCHARGE PRESSURE :(6.3.2)	barg		10.4		
SUCTION PRESSURE :	barg	0.83	0.81		0.08
DIFFERENTIAL PRESSURE :	bar		10.3		
DIFFERENTIAL HEAD :	m		105.0		
$NPSH_A$:	m		8.8		
HYDRAULIC POWER:	KW		4.50		

SERVICE :	INTERMITTENT
• IF INTERMITTENT NO. OF STARTS :	
PUMPS OPERATE IN:	
CORROSION DUE TO : (6.12.1.9)	
EROSION DUE TO : (6.12.1.9)	
H2S CONCENTRATION (ppm) : (6.12.1.12)	N.A.
CHLORIDE CONCENTRATION (ppm) :	
PARTICULATE SIZE (DIA IN MICRONS)	
PARTICULATE CONCENTRATION (PPM)	

SITE AND UTILITY DATA

LOCATION: OUTDOOR | UNHEATED | UNDER ROOF

MOUNTED AT : ● **TROPICALISATION REQ'D**

ELECTRIC AREA CLASSIFICATION: (6.1.22) ZONE: SAFE

GROUP | TEMP CLASS

SITE DATA :

ELEVATION (MSL) : 12.5 m **BAROMETER :** 990.77 mBar

RANGE OF DESIGN TEMPS:MIN / MAX: 5 / 85 °C

RELATIVE HUMIDITY: MIN / MAX: 0 / 100 % (@ 25.6 °C)

UNUSUAL CONDITIONS: NA

UTILITY CONDITIONS :

ELECTRICITY :	DRIVERS	HEATING	CONTROL	SHUTDOWN
VOLTAGE	400			
PHASE	3			
HERTZ	50			

COOLING WATER :

	RETURN	DESIGN
TEMP		
PRESS.		

SOURCE

COOLING WATER CHLORIDE CONCENTRATION:

INSTRUMENT AIR : kg MIN kg

STEAM

	DRIVERS	HEATING
TEMP		
PRESS.		

PERFORMANCE

PROPOSAL CURVE NO.	KP 2532	RPM	2950	
As Tested Curve No.			KP 2532	
IMPELLER DIA.: RATED	286	MAX. 324	MIN. 250	mm
RATED POWER	14.8 Kw	EFFICIENCY	29	(%)
RATED CURVE BEP FLOW (at rated impeller dia)				m³/hr
MIN FLOW :			5.7	m³/hr
PREFERRED OPERATING REGION (6.1.11)	13.3	to	22.8	m³/hr
ALLOWABLE OPERATING REGION	5.7	to	22.8	m³/hr
MAX HEAD @ RATED IMPELLER			119	m
MAX POWER @ RATED IMPELLER			16.8	kW
NPSH3 AT RATED FLOW :			1.5	m
CL PUMP TO U/S BASEPLATE				m
NPSH MARGIN AT RATED FLOW :			7.3	m
SPECIFIC SPEED (6.1.9)				
SUCTION SPECIFIC SPEED LIMIT				
SUCTION SPECIFIC SPEED			9502	
MAX. ALLOW. SOUND PRESS. LEVEL REQD (6.1.14)			85	(dBA) @ 1 m
EST MAX SOUND PRESS. LEVEL			85	(dBA)
MAX. SOUND POWER LEVEL REQ'D (6.1.14)				
EST MAX SOUND POWER LEVEL				

DRIVER (7.1.5) (NOTES 11,20,17)

Driver Type			INDUCTION MOTOR
GEAR			NO
VARIABLE SPEED REQUIRED			NO
SOURCE OF VARIABLE SPEED			
OTHER			
MANUFACTURER			
NAMEPLATE POWER	@Site Condition	18.5	KW
Nominal RPM		2950	
RATED LOAD RPM			
FRAME OR MODEL			
ORIENTATION		HORIZONTAL	
LUBE		Grease	
BEARING TYPE:			
RADIAL		Ball / 1	
THRUST		Ball / 1	
STARTING METHOD		D.O.L /Open delivery valve	
SEE DRIVER DATA SHEET		Note 1	
Max Voltage Variation		±5%	
Max Frequency Variation		±2%	
Max Voltage and Frequency Variation together		±5%	

NISOC

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض
خرید پکیج پمپ های آب آتشنشانی ایستگاه تقویت فشارگاز بینک
(قرارداد ۰۰_۰۰۲۳-BK-HD-GCS-CO)

HIRGAN ENERGY — شرکت توسعه هیرگان — Kalaye Pump Co.

شماره پیمان: ۰۵۳-۰۷۳-۹۱۸٤

DATA SHEETS (W/PERFORMANCE CURVE) FOR FIRE WATER JOCKEY PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	KP	120	ME	DS	0003	V00

شماره صفحه: ٦ از ١٠

CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2302 A/B (Sheet 3 of 6)

CONSTRUCTION

API PUMP TYPE: OH2 [Based on API 610 definitions]

NOZZLE CONNECTIONS: (6.5.5) NOTES 7, 12

	Size	Facing	Rating	Position
SUCTION	2"	RF	300	END
DISCHARGE	1"	RF	300	TOP

PRESSURE CASING AUX. CONNECTIONS: (6.4.3.2)

	No.	Size	Type	Facing	Rating	Posn.
BAL./LEAK OFF						
DRAIN	1	1/2"	SWF	RF	150	SIDE
VENT						
PRESSURE GAGE						
TEMP GAGE						
WARM-UP LINE						

Drain Valve Supplied By	SUPPLIER	
DRAINS MANIFOLDED	YES	
VENT Valve Supplied By	SUPPLIER	
VENTS MANIFOLDED	YES	
THREAD. CONS FOR PIPELINE SERVICE & < 50°C (6.4.3.2)	NO	
SPECIAL FITTINGS FOR TRANSITIONING (6.4.3.3)	NO	
CYLINDRICAL THREADS REQUIRED (6.4.3.8)	NO	
GUSSET SUPPORT REQUIRED	YES	If Needed
MACHINED AND STUDDED CONNECTIONS (6.4.3.12)	NO	
VS 6 DRAIN	N/A	
DRAIN TO SKID EDGE	YES	

CASING MOUNTING: CENTERLINE

CASING TYPE: (6.3.10) SINGLE VOLUTE

OH3 BACKPULLOUT LIFTING DEVICE REQD. (9.1.2.6)

CASE PRESSURE RATING:

MAWP : (6.3.5) 15 barg @ °C

HYDROTEST : 1.5*MAWP barg @ °C

HYDROTEST OH PUMP AS ASSEMBLY	YES
SUCT'N PRESS. REGIONS DESIGNED FOR MAWP	YES
ROTATION: (VIEWED FROM COUPLING END)	
• IMPELLERS INDIVIDUALLY SECURED :	
• BOLT OH 3/4/5 PUMP TO PAD / FOUNDATION :	
• PROVIDE SOLEPLATE FOR OH 3/4/5 PUMPS	
ROTOR:	
SHAFT FLEXIBILITY INDEX (SFI) (9.1.1.3)	
First Critical Speed Wet (Multi stage pumps only)	
COMPONENT BALANCE TO ISO 1940 G1.0	NO
SHRINK FIT -LIMITED MOVEMENT IMPELLERS (9.2.2.3)	
COUPLING:(7.2.3) (7.2.13.f) NOTE 19	
MANUFACTURER	
MODEL	FLEXIBLE SPACER TYPE
RATING (POWER/100 RPM)	
SPACER LENGTH	mm
SERVICE FACTOR	Min 1.5
RIGID	NO
COUPLING WITH HYDRAULIC FIT (7.2.10)	
COUPLING BALANCED TO ISO 1940-1 G6.3 (7.2.3)	YES
COUPLING WITH PROPRIETARY CLAMPING DEVICE (7.2.11)	
COUPLING IN COMPLIANCE WITH (7.2.4)	API 610 compliant
COUPLING GUARD STANDARD PER (7.2.13.a)	ISO 14120
Window on Coupling Guard	

MATERIAL (6.12.1.1)

APPENDIX H CLASS	I-2 NOTE 3	
MIN DESIGN METAL TEMP (6.12.4.1)	5	°C
REDUCED-HARDNESS MATERIALS REQ'D (6.12.1.12.1)		
Applicable Hardness Standard (6.12.1.12.3)		
BARREL :		
CASE :	GGG40(A536 60-40-15)	
DIFFUSERS		
IMPELLER :	C95200	
IMPELLER WEAR RING :	C95200	
CASE WEAR RING :		
SHAFT:	A276 T420	
Bowl (if VS-type)		
Inspection Class (Note 2)		

BEARINGS AND LUBRICATION (6.10.1.1) (VTC)

BEARING (TYPE / NUMBER): (6.11.4)

RADIAL ROLLER / 1

THRUST BALL / 2

REVIEW AND APPROVE THRUST BEARING SIZE : (9.2.5.2.4)

LUBRICATION : (6.10.2.2) (6.11.3) (9.2.6) RING OIL

PRESSURE LUBE SYSTEM TO ISO 10438- (9.2.6.5)

ISO 10438 DATA SHEETS ATTACHED

Pressurized Lube Oil System mtd on pump baseplate

Location of Pressurized Lube Oil System mounted on baseplate :

INTERCONNECTING PIPING PROVIDED BY Supplier

OIL VISC. ISO GRADE VG

CONSTANT LEVEL OILER :

BASEPLATE

API BASEPLATE NUMBER :	
BASEPLATE CONSTRUCTION (7.3.14)	
BASEPLATE DRAINAGE (7.3.1)	Entire Baseplate Drain Pan
MOUNTING :	
NON-GROUT CONSTRUCTION : (7.3.13)	
VERTICAL LEVELING SCREWS :	REQUIRED
LONGITUDINAL DRIVER POSITIONING SCREWS :	REQUIRED
SUPPLIED WITH : • GROUT AND VENT HOLES	YES
• DRAIN CONNECTION	YES
MOUNTING PADS SIZED FOR BASEPLATE LEVELING (7.3.5)	YES
MOUNTING PADS TO BE MACHINED (7.3.6)	YES
PROVIDE SPACER PLATE UNDER ALL EQUIPMENT FEET	YES
OTHER	

REMARKS :

CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2302 A/B (Sheet 4 of 6)

INSTRUMENTATION

SEE ATTACHED API-670 DATA SHEET

ACCELEROMETER (7.4.2.1)

Number of Accelerometers

Mounting Location of Accelerometers

PROVISION FOR MTG ONLY (6.10.2.10)

Number of Accelerometers

Mounting Location of Accelerometers

FLAT SURFACE REQUIRED (6.10.2.11)

Number of Accelerometers

Mounting Location of Accelerometers

VIBRATION PROBES (7.4.2.2)

PROVISIONS FOR VIB. PROBES

NUMBER PER RADIAL BEARING

NUMBER PER AXIAL BEARING

MONITORS AND CABLES SUPPLIED BY (7.4.2.4)

TEMPERATURE (7.4.2.3)

PROVISIONS FOR TEMP PROBES

RADIAL BEARING TEMP.

NUMBER PER RADIAL BEARING

THRUST BEARING TEMP.

NUMBER PER THRUST BEARING ACTIVE SIDE

NUMBER PER THRUST BEARING INACTIVE SIDE

TEMP. GAUGES (WITH THERMOWELLS) (9.1.3.6)

PRESSURE GAUGE TYPE

Remarks

SEAL SUPPORT SYSTEM MOUNTING

SEAL SUPPORT SYSTEM MOUNTED ON PUMP BASEPLATE (7.5.1.4) **YES**

IDENTIFY LOCATION ON BASEPLATE

INTERCONNECTING PIPING BY **Supplier**

MECHANICAL SEAL (6.8.1) (NOTE 13)

SEE ATTACHED ISO 21049/API 682 DATA SHEET **N / A** **NOTE 5**

ADDITIONAL CENTRAL FLUSH PORT (6.8.9)

HEATING JACKET REQ'D. (6.8.11) **N / A**

FLUSH PLAN **11+61** **(VTC)**

HEATING AND COOLING (6.1.17)

COOLING REQ'D **NO**

COOLING WATER PIPING PLAN

COOLING WATER PIPING

FITTINGS

COOLING WATER PIPING MATERIALS

COOLING WATER REQUIREMENTS:

TOTAL COOLING WATER

HEATING MEDIUM

OTHER

HEATING PIPING

PIPING & APPURTENANCES

MANIFOLD PIPING FOR PURCHASER CONNECTION (7.5.1.6)

VENT **YES**

DRAIN **YES**

VALVES **YES (NOTE 8)**

COOLING WATER **NO**

TAG ALL ORIFICES (7.5.2.4) **YES**

SOCKET WELD CONN ON SEAL GLAND (7.5.2.8)

CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2302 A/B (Sheet 5 of 6)

SURFACE PREPARATION AND PAINT

MANUFACTURER'S STANDARD	
OTHER (SEE BELOW)	
SPECIFICATION NO.	BK-GNRAL-PEDCO-000-PI-SP-0006, "Specification for Painting"
PUMP:	
PUMP SURFACE PREPARATION	SA 2 1/2
PRIMER	AS PER PROJECT PAINTING SPEC.
FINISH COAT	AS PER PROJECT PAINTING SPEC.
BASEPLATE:	
BASEPLATE SURFACE PREPARATION	SA 2 1/2
PRIMER:	AS PER PROJECT PAINTING SPEC.
FINISH COAT	AS PER PROJECT PAINTING SPEC.
DETAILS OF LIFTING DEVICES	
SHIPMENT: (8.4.1)	EXPORT
EXPORT BOXING REQUIRED	YES
OUTDOOR STORAGE MORE THAN 6 MONTHS	YES
SPARE ROTOR ASSEMBLY PACKAGED FOR:	
ROTOR STORAGE ORIENTATION (9.2.8.2)	
SHIPPING & STORAGE CONTAINER FOR VERT STORAGE (9.2.8.3)	
N_2 PURGE (9.2.8.4)	
SPARE PARTS	
START-UP	YES
NORMAL MAINTENANCE	YES

ITEM No	PUMP	DRIVER	GEAR	BASE	TOTAL

OTHER PURCHASER REQUIREMENTS

COORDINATION MEETING REQUIRED (10.1.3)	YES
MAXIMUM DISCHARGE PRESSURE TO INCLUDE	
OPERATION TO TRIP SPEED	
MAX DIA. IMPELLERS AND/OR NO OF STAGES	YES
CONNECTION DESIGN APPROVAL (9.2.1.4)	YES
TORSIONAL ANALYSIS / REPORT (6.9.2.10)	NO
PROGRESS REPORTS	YES
OUTLINE OF PROC FOR OPTIONAL TESTS (10.2.5)	
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1)	
	YES
LATERAL ANALYSIS REQUIRED (9.1.3.4) (9.2.4.1.3)	NO
MODAL ANALYSIS REQUIRED (9.3.9.2)	
DYNAMIC BALANCE ROTOR (6.9.4.4)	YES
INSTALLATION LIST IN PROPOSAL (10.2.3.l)	YES
VFD STEADY STATE DAMPED RESPONSE ANALYSIS (6.9.2.3)	NO
TRANSIENT TORSIONAL RESPONSE	NO
BEARING LIFE CALCULATIONS REQUIRED (6.10.1.6)	
IGNITION HAZARD ASSMT TO EN 13463-1 (7.2.13.e)	
CASING RETIREMENT THICKNESS DRAWING (10.3.2.3)	
FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.2.8)	
INCLUDE PLOTTED VIBRATION SPECTRA (6.9.3.3)	
CONNECTION BOLTING (7.5.1.7)	
CADMIUM PLATED BOLTS PROHIBITED	
VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)	
VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)	YES
SUBMIT INSPECTION CHECK LIST (8.1.5) NOTE 2	YES

TEST

SHOP INSPECTION (8.1.1)			Yes
PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPMENT.			YES
TEST WITH SUBSTITUTE SEAL (8.3.3.2.b)			
MATERIAL CERTIFICATION REQUIRED		CASING	YES
SHAFT	YES (6.12.1.8)	IMPELLER	YES
OTHER	YES Casing and impeller Wear ring		
CASTING REPAIR WELD PROCEDURE APPR REQD			YES
INSPECTION REQUIRED FOR CONNECTION WELDS (6.12.3.4.d)	KPC:NOT APPLICABLE		
LIQUID PENETRANT	YES	MAG PARTICLE	
ULTRASONIC		RADIOGRAPHY	YES
INSPECTION REQUIRED FOR CASTINGS			
LIQUID PENETRANT	YES	MAG PARTICLE	NO
ULTRASONIC (NOTE 18)	YES	RADIOGRAPHY	
HARDNESS TEST REQUIRED (8.2.2.7)			
ADDNL SUBSURFACE EXAMINATION (6.12.1.5) (8.2.1.3)			
		FOR	
		METHOD	
PMI TESTING REQUIRED (8.2.2.8)			
COMPONENTS TO BE TESTED			
RESIDUAL UNBALANCE TEST (J.4.1.2)			
NOTIFICATION OF SUCCESSFUL SHOP			YES
PERFORMANCE TEST (8.1.1.c) (8.3.3.5)			YES
BASEPLATE TEST (7.3.21)			
HYDROSTATIC			WIT
HYDROSTATIC TEST OF BOWLS & COLUMN (9.3.13.2)			
PERFORMANCE TEST			WIT
TEST IN COMPLIANCE WITH (8.3.3.2)			NFPA 20
TEST DATA POINTS TO (8.3.3.3)			NFPA 20
TEST TOLERANCES TO (8.3.3.4)			TABLE 16
NPSH (8.3.4.3.1) (8.3.4.3.4) (NOTE 6)			WIT
NPSH-1ST STG ONLY (8.3.4.3.2)			
NPSH TESTING TO HI 1.6 OR ISO 9906 (8.3.4.3.3)			
TEST NPSHA LIMITED TO 110% SITE NPSHA (8.3.3.6)			
RETEST ON SEAL LEAKAGE (8.3.3.2.d)			OBSERVE
RETEST REQUIRED AFTER FINAL HEAD ADJ (8.3.3.7.b)			
COMPLETE UNIT TEST (8.3.4.4.1)			WIT
SOUND LEVEL TEST (8.3.4.5)			WIT
CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)			OBSERVE
LOCATION OF CLEANLINESS INSPECTION			
NOZZLE LOAD TEST			
CHECK FOR CO-PLANAR MOUNTING PAD SURFACES			
MECHANICAL RUN TEST UNTIL OIL TEMP STABLE			
4 HR. MECH RUN AFTER OIL TEMP STABLE (8.3.4.2.1)			WIT
4 HR. MECH RUN TEST (8.3.4.2.2)			
BRG HSG RESONANCE TEST (8.3.4.7)			
STRUCTURAL RESONANCE TEST (9.3.9.2)			
REMOVE / INSPECT HYDRODYNAMIC BEARINGS AFTER TEST (9.2.7.5)			
AUXILIARY EQUIPMENT TEST (8.3.4.6)			
EQUIPMENT TO BE INCLUDED IN AUXILIARY TESTS			
LOCATION OF AUXILIARY EQUIPMENT TEST			
IMPACT TEST	PER EN 13445		
	PER ASME SECTION VIII		
REMOVE CASING AFTER TEST			

CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2302 A/B (Sheet 6 of 6)

PRESSURE VESSEL DESIGN CODE REFERENCES

THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER	
CASTING FACTORS USED IN DESIGN (TABLE 3)	
SOURCE OF MATERIAL PROPERTIES	

WELDING AND REPAIRS (NOTE 15)

THESE REFERENCES MUST BE LISTED BY THE PURCHASER. (DEFAULT TO TABLE 11 IF NO PURCHASER PREFERENCE IS STATED)	
ALTERNATE WELDING CODES AND STANDARDS	
WELDING REQUIREMENT (APPLICABLE CODE OR STANDARD)	DEFAULT PER TABLE 11
WELDER/OPERATOR QUALIFICATION	DEFAULT PER TABLE 11
WELDING PROCEDURE QUALIFICATION	DEFAULT PER TABLE 11
NON-PRESSURE RETAINING STRUCTURAL WELDING SUCH AS BASEPLATES OR SUPPORTS	DEFAULT PER TABLE 11
MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION OF PLATE EDGES	DEFAULT PER TABLE 11
POSTWELD HEAT TREATMENT	DEFAULT PER TABLE 11
POSTWELD HEAT TREATMENT OF CASING FABRICATION WELDS	DEFAULT PER TABLE 11

MATERIAL INSPECTION

THESE REFERENCES MUST BE LISTED BY THE PURCHASER — DEFAULT TO TABLE 14: YES

ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA (SEE TABLE 15) (8.2.2.5)

TYPE OF INSPECTION	METHOD	FOR FABRICATIONS	FOR CASTINGS
RADIOGRAPHY			
ULTRASONIC INSPECTION			
MAGNETIC PARTICLE INSPECTION			
LIQUID PENETRANT INSPECTION			
VISUAL INSPECTION (all surfaces)			

REMARKS :

KALAYE PUMP CO.

Performance curve

Item No.	P-2302 A/B	Pump Model	KP2532	Flow,Rated (m^3/h)	15
Liquid	WATER	Speed (rpm)	2950	Head (m)	105
Temp. (˚c)	50	Rated Imp.Dia. (mm)	286	Efficiency (%)	29
Density(kg/m^3)	997	Suction Size (Inch)	2	NPSHR (m)	1.5
Viscosity (cp)	1	Disch. Size (Inch)	1	Rated Power (kw)	14.8
NPSHA (m)	8.8	NSS (m /h,m,rpm)	9502	Motor Power (kw)	18.5