## طرح نگهداشت و افزایش تولید ۲۷ مخزن

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

## نگهداشت و افزایش تولید میدان نفتی بینک

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| 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 | | | | | |
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**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 |

?
KPC:Noted

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
## (BK-HD-GCS-CO-۰۰۲۳_۰۰ قرارداد)

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 |

**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 |

| | |
|---|---|
| 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) | |

**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 | | |

**SITE AND UTILITY DATA**

**LOCATION:** OUTDOOR — UNHEATED — UNDER ROOF

**MOUNTED AT :** ON REQ'D

**ELECTRIC AREA CLASSIFICAT** SAFE

GROUP

**SITE DATA :**

**ELEVATION (MSL) :** 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 | | | |

Hirgan to be specified site condition
KPC: Noted

**COOLING WATER :**

| | RETURN | DESIGN |
|---|---|---|
| TEMP | | |
| PRESS. | | |

SOURCE

COOLING WATER CHLORIDE CONCENTRATION:

**INSTRUMENT AIR :** kg MIN kg

**STEAM**

| | DRIVERS | HEATING |
|---|---|---|
| TEMP | | |
| PRESS. | | |

to be specified
BEP(m3/h) : 19

in according to API 610, Table 12 it shall be corrected.
API Factor for P<22 is 1.25
KPC:Motor power is sufficient
MAX power is 16.8 kw
(Derating factors such as temperature, elevation will be considered by motor manufacturer.)

| | | | | | |
|---|---|---|---|---|---|
| PROPOSAL CURVE NO. | | | | | |
| 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) | |

| | | |
|---|---|---|
| Driver T | DUCTION MOTOR | |
| GEAR | NO | |
| VARIAT | NO | |
| SOURC | | |
| OTHER | | |
| MANUF | | |
| NAMEP | 18.5 | KW |
| Nomina | 2950 | |
| RATED | | |
| FRAME OR MODEL | | |
| ORIENTATION | HORIZONTAL | |
| LUBE | Grease | |
| BEARING TYPE: | | |
| RADIAL | Ball / 1 | |
| THRUST | Ball / 1 | |
| STARTING METHOD | D.O.L /Open delivery valve | |

Recheck Nss or clarify how did you reach to it?
KPC:Confirmed
NSS(m3/h,m,rpm)=9502
NS (rpm, m3/h,m)=372

Ns and Nss limitation shall be specified @ QBep & max impeller
KPC: NSS & NS Calculation based on Qbep of max impeller diameter
Q(m3/h):23
H(m):128
NPSHr(m):1.7
Speed(rpm):2950

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض
خرید پکیج پمپ های آب آتشنشانی ایستگاه تقویت فشارگاز بینک
(BK-HD-GCS-CO-۰۰۲۳_۰۰ قرارداد)

HIRGAN ENERGY — Kalaye Pump Co.

شماره صفحه: ٦ از ١٠

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 |

by considering of material is it correct to use RF?
KPC:Confirmed

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

CONSTRUCTION

API PUMP TYPE: [tions]

NOZZLE CONNECTIONS:

| | No. | Size | Type | Facing | Rating | Position |
|---|---|---|---|---|---|---|
| SUCTION | | | | | | END |
| DISCHARGE | | | | | | TOP |
| PRESSURE CASING AUX. CO | | | | | | |
| BAL./LEAK OFF | | | | | | |
| DRAIN | 1 | 1/2" | SWF | RF | 150 | SIDE |
| VENT | | | | | | |
| PRESSURE GAGE | | | | | | |
| TEMP GAGE | | | | | | |
| WARM-UP LINE | | | | | | |

according to API 610 ; MAWP shall be at least 40 barg
KPC:MAWP is 15 bar (according to NFPA20)

to be specified completely.
KPC:Noted

Coupling Manufacturer & model shall be specified
KPC:Noted

| | | |
|---|---|---|
| Drain Valve Supplied By | | |
| DRAINS MANIFOLDED | | |
| VENT Valve Supplied By | | |
| VENTS MANIFOLDED | | |
| 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 | |

Gr. 60-40-15 is not correct.it shall be corrected.
KPC:GGG40(A536 60-40-18)

| | | |
|---|---|---|
| APPE | | |
| 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: | | |
| Bowl (if VS-type) | | |
| Inspection Class (Note 2) | | |

case wear ring to be specified
KPC:Bronze(C95200)

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 :

CASI

CASI (6.3.10) CENTERLINE

OH3 BACKPULLOUT LIFTING DEVICE REQD. (9.1.2.6) SINGLE VOLUTE

to be specified
KPC:22.5 bar

CASE PRESSURE RATING

| | | | | |
|---|---|---|---|---|
| MAWP : | (6.3.5) | 15 | barg | @ KPC:AMB °C |
| HYDROTEST : | | 1.5*MAWP | barg | @ KPC:AMB °C |

| | |
|---|---|
| ROTOTEST OH PUMP AS ASSEMBLY | YES |
| N PRESS. REGIONS DESIGNED FOR MAWP | YES |
| ROTATION: (VIEWED FROM COUPLING END) | KPC:CW |
| • IMPELLERS INDIVIDUALLY SECURED : | KPC:Yes |
| • 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 | KPC:Colossus |
| MODEL | FLEXIBLE SPACER TYPE |
| RATING (POWER/100 RPM) | |
| SPACER LENGTH | KPC:140 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 | KPC:Coupling Guard |

BASEPLATE

| | |
|---|---|
| API BASEPLATE NUMBER : | |
| BASEPLATE CONSTRUCTION (7.3.14) | KPC:PARTIAL TOP DECKING |
| 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 :

Construction shall be specified
KPC:Noted

**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

shall be cartridge type and manufacturer shall be specified
KPC:Confirmed

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)

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 ۰۰۲۳_۰۰-BK-HD-GCS-CO)

This section shall be as per Approved ITP
KPC:Confirmed

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 |

**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 :**

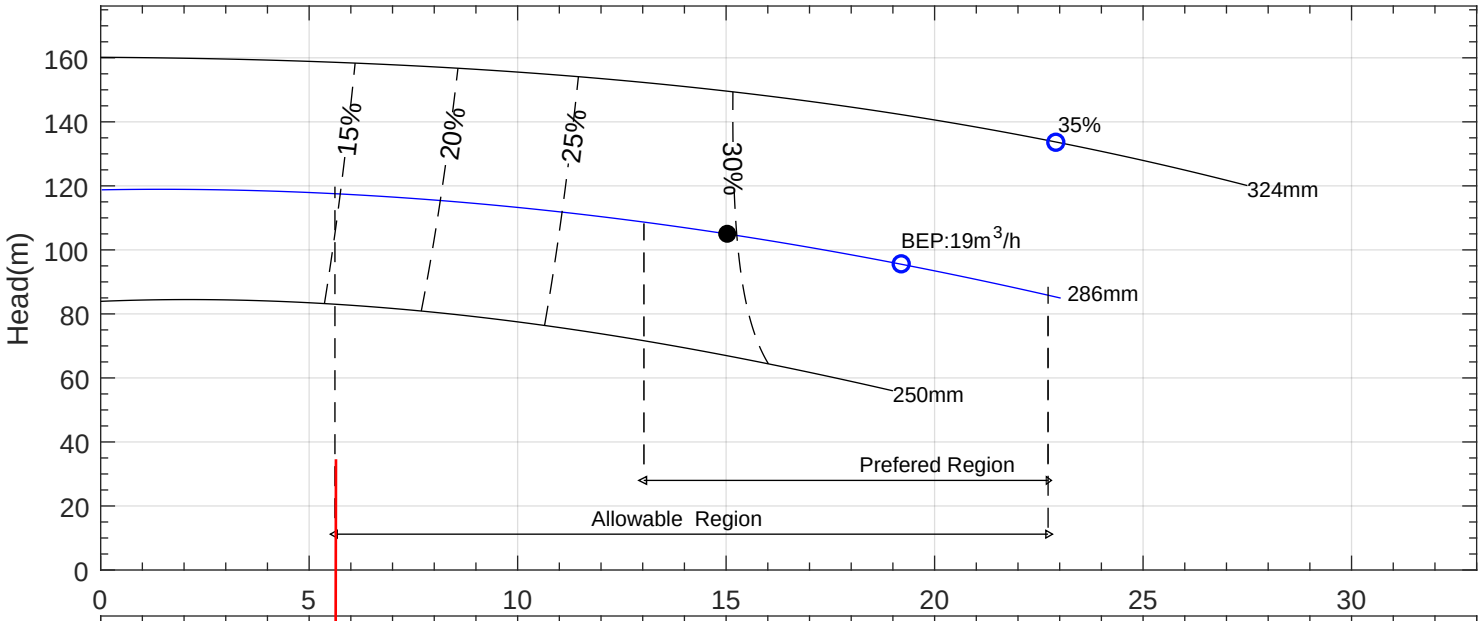
1- Min/Max continues stable flow shall be shown on curve.
KPC:Min continues stable flow is 5.7 m3/h
Max continues stable flow is 22.8 m3/h

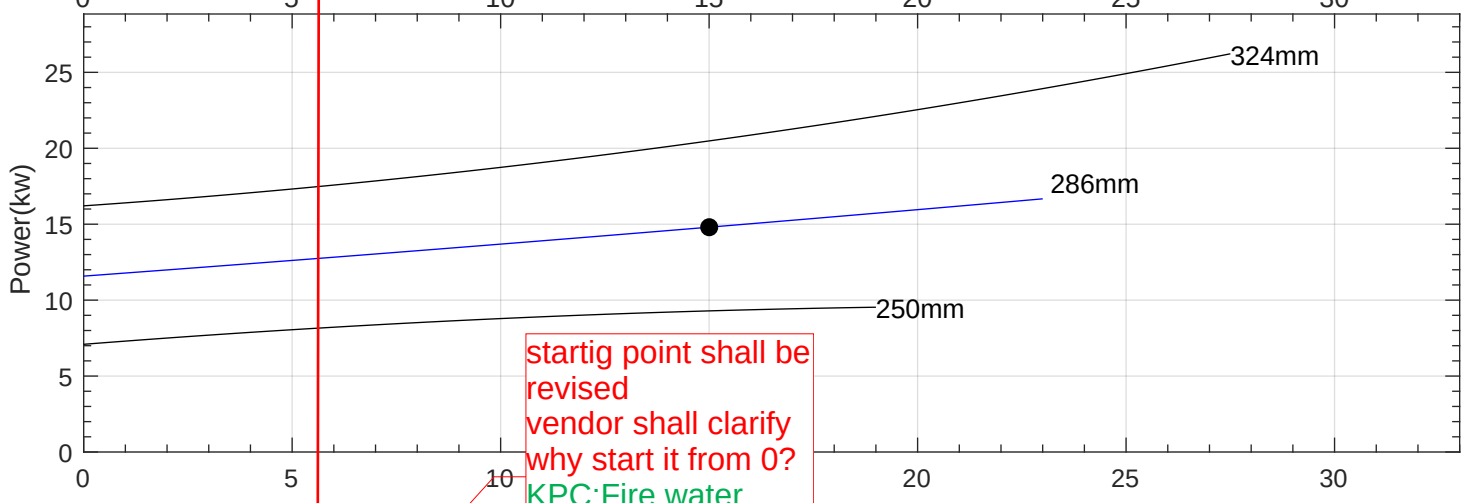
2-Efficiency curve shall be added
KPC:It is not possible

# UMP CO.

ce curve

| | | | | | |
|---|---|---|---|---|---|
| | | | 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 |




startig point shall be revised
vendor shall clarify why start it from 0?
KPC:Fire water pump should be capable to work in shut of point.