پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	PEDCO	120	ME	DT	0022	D08

طرح نگهداشت و افزایش تولید ۲۷ مخزن

MECHANICAL DATA SHEETS FOR CLOSED DRAIN PUMPS

نگهداشت و افزایش تولید میدان نفتی بینک

REV.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval
D08	NOV. 2024	AFC	V.Amjadi	M.Fakharian	M.Sadeghian	
D07	JUN. 2024	IFA	V.Amjadi	M.Fakharian	M.Sadeghian	
D06	OCT. 2023	IFA	H.Ghadyani	M.Fakharian	S.Faramarzpour	
D05	MAY. 2023	IFA	H. Adineh	M.Fakharian	A.M.Mohseni	
D04	SEP. 2022	IFA	H. Adineh	M.Fakharian	M. Mehrshad	
D03	APR. 2022	IFA	H. Adineh	M.Fakharian	M. Mehrshad	
D02	MAR. 2022	IFA	H. Adineh	M.Fakharian	M. Mehrshad	
D01	JAN. 2022	IFA	H. Adineh	M.Fakharian	M. Mehrshad	
D00	NOV.2021	IFC	H. Adineh	M.Fakharian	M. Mehrshad	

Class: 1 — **CLIENT Doc. Number: F0Z-708853**

status:

IDC: Inter-Discipline Check

IFC: Issued For Comment

IFA: Issued For Approval

AFD: Approved For Design

AFC: Approved For Construction

AFP: Approved For Purchase

AFQ: Approved For Quotation

IFI: Issued For Information

AB-R: As-Built for CLIENT Review

AB-A: As-Built –Approved

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	PEDCO	120	ME	DT	0022	D08

REVISION RECORD SHEET

page	D00	D01	D02	D03	D04
1	x	x	x	x	x
2	x	x	x	x	x
3	x	x		x	x
4	x				
5	x	x	x	x	x
6	x	x	x	x	x
7	x				
8	x	x			x
9	x	x			x
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page	D05	D06	D07	D08	D09
1	x	x	x	x	
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3	x	x		x	
4					
5	x		x	x	
6	x	x	x		
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MECHANICAL DATA SHEETS FOR CLOSED DRAIN PUMPS

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D08	0022	DT	ME	120	PEDCO	GCS	BK

GENERAL NOTES

1 Pumping fluid might be hydrocarbon, water or a mixture of both and also is corrosive / erosive / hazardous agents / flammable and its contamination is allowed.

2 Mass Density [kg/m3] at Min. / Norm / Max. Temp: 829/980/1023

3 Viscosity [cP] At Min. / Normal / Max. Temp: 0.443/0.46/1.37

4 Mechanical seal shall be as per API 682, 4th edition Data Sheet.

5 PMI Testing For Alloy Steel Shall be Done.

6 If NPSH margine be less than 1m, NPSH Test Shall be Done.

7 Pump drain shall be terminated at skid edge with flange connection and valved. Valves in the piping system shall be Welded Flanged type.

8 Design Condition:

Min./Max. Design Temperature: 5 / 85 ℃ Max. Design Pressure: 14.5 barg

9 API Seal Plan 31-53B shall be considred.(vendor to confirm)

10 Vendor shall submit ITP (Inspection & Testing Plan) with his proposal.

11 The motors, pump mechanical seal, pump coupling and pump accessories shall be supplied from the project's approved vendor list (A.V.L.). Chinese & Indian vendors are not acceptable for Mechanical seal , Electro motor and coupling subvendors.

12 Vendor is requested to confirm the material, or propose appropriate alternative.

13 The Tie-in flanges shall conform to ASME B-16.5

14 Ultrasonic Test shall be performed for forged shaft.

15 For pumps with vacuum suction pressure the minimum NPSH margin shall be 2 m. for other pumps the minimum NPSH margin shall be 1 m.

16 Spare parts shall be supplied by vendor according to 'MR's appendix for Centrifugal Pumps; Doc. No.; BK-GCS-PEDCO-120-ME-MR-0009"

17 Bearing temperature shall be measured during mechanical run test.

18 For electrical motor descriptions, refer to 'Specification For LV induction Motors' Doc. No.BK-GNRAL-PEDCO-000-EL-SP-0010. and Specification for MV induction motors' Doc.No. BK-GNRAL-PEDCO-000-EL-SP-0017.

19 Electrical motor shall be rated for the end of curve.

20 For site conditions refer to Process Basis of Design Document. Doc.No. BK-GNRAL-PEDCO-000-PR-DB-0001.

21 Suction & Discharge line Size is 2".

22 Power Factor, efficiency, frequent, voltage, frequent variation and voltage variation of motor shall be specified by vendor in data sheet.

23 Allowable external forces and moments on nozzle equal to two times of table 5 of API 610-11th edition.

24 The material shall be in compliance with NACE MR0175/ISO15156 and Specification For Material Requirements in Sour service Document No. BK-GNRAL-PEDCO-000-PI-SP-0008

25 Range of ambient design temperature: Min. ambient design temperature: 5 °C , Max. ambient design temperature: 50 °C

26 Coupling shall be flexible with spacer and coupling guard shall be of Non-Spark type.

27 The elevation of pump centerline from ground is 76 cm.

28 Max allowable pressure at shut-off: 14.5 barg

29 Barometric pressure in Binak new GCS; winter: 14.37 psia summer: 13.26 psia

30 According to API 610-11th edition for ' this type pump minimum MAWP shall be 40 bar @ 38 °C

D08

31 All drain and vents (If any) to be manifolded, valved and routed to the skid edge.

32 vendor shall fill in the blanks and return the complete data sheet along with motor data sheet, Doc.No:BK-GCS-PEDCO-120-EL-DT-0008, With his proposal

33 All of required tests & inspection requirements will be finalized in Pre Inspection Meeting (PIM) with client.

D08

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	PEDCO	120	ME	DT	0022	D08

API Std. 610 CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2202 A/B (Sheet 1 of 6)

CLIENT: National Iranian South Oil Company (NISOC)

PROJECT TITLE: BINAK New Compressor Gas Station

JOB NUMBER:

EQUIPMENT NUMBER: P-2202 A/B

EQUIPMENT SERVICE: CLOSED DRAIN PUMPS

SERIAL NUMBER:

REQ. / SPEC NO. : BK-GCS-PEDCO-120-ME-SP-0003

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

Delete these notes on completion

COMMENTS:

	DATA SHEETS					
	ITEM No.	ATT	ITEM No.	ATT	ITEM No.	ATT
PUMP	P-2202 A		P-2202 B			
MOTOR						
GEAR						
TURBINE						

NISOC

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض
احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک

شرکت توسعه پتروایران

HIRGAN ENERGY

شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸٤

MECHANICAL DATA SHEETS FOR CLOSED DRAIN PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
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شماره صفحه: ۵ از ۹

API Std. 610 CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2202 A/B (Sheet 2 of 6)

APPLICABLE TO: PROPOSAL
FOR NISOC
SITE BINAK Gas Compressor Station
NO. REQ 2(1+1) PUMP SIZE
MANUFACTURER

APPLICABLE NTL/INTNTL STANDARD: API 610 - 11th Edition, IPS-G-PM-105
UNIT
SERVICE Closed Drain Pump
TYPE HORIZENTAL No. STAGES
MODEL OH2 (VTA) SERIAL NO.

LIQUID CHARACTERISTICS

	Units	Maximum	Minimum	Note
LIQUID TYPE OR NAME		Hydrocarbon Drain(HC)(NOTE 1)		Max & min
VAPOR PRESSURE	bara	1		values refer
DENSITY (NOTE 2)	kg/m³	1023	829	only to the
SPECIFIC HEAT	kj/kgC			property
VISCOSITY (NOTE 3)	cP	1.37	0.443	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) 861.46
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			5 (worse case)	
FLOW :	m³/hr		3.30	3.0	
DISCHARGE PRESSURE:	barg		7.2		
SUCTION PRESSURE :	barg	0.9			0.2
DIFFERENTIAL PRESSURE :	bar		7.0		
DIFFERENTIAL HEAD :	m		72.80		
$NPSH_A$:	m		2.5		
HYDRAULIC POWER:	KW		0.60		

SITE AND UTILITY DATA

LOCATION: OUTDOOR UNHEATED
MOUNTED AT : TROPICALISATION REQ'D
ELECTRIC AREA CLASSIFICATION: (6.1.22) ZONE 1
GROUP II A TEMP CLASS T3
SITE DATA :
ELEVATION (MSL) : 12.5 m BAROMETER : (Note 28) mBar
RANGE OF DESIGN TEMPS:MIN / MAX 5 85 °C
RELATIVE HUMIDITY: MIN / MAX 0 100 % (@ 25.6 °C)
UNUSUAL CONDITIONS:
UTILITY CONDITIONS :

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

COOLING WATER :(Not Available)

	RETURN	DESIGN
TEMP		
PRESS.		

SOURCE
COOLING WATER CHLORIDE CONCENTRATION:
INSTRUMENT AIR : kg MIN kg
STEAM

	DRIVERS	HEATING
TEMP		
PRESS.		

PERFORMANCE

PROPOSAL CURVE NO.	RPM	
As Tested Curve No.		
IMPELLER DIA.: RATED	MAX. MIN.	mm
RATED POWER Kw	EFFICIENCY	(%)
RATED CURVE BEP FLOW (at rated impeller dia)		m³/hr
MIN. FLOW: kJ/Nm³		m³/hr
PREFERRED OPERATING REGION (6.1.11)	to	m³/hr
ALLOWABLE OPERATING REGION	to	m³/hr
MAX HEAD @ RATED IMPELLER		m
MAX POWER @ RATED IMPELLER		kW
NPSH3 AT RATED FLOW :		m
CL PUMP TO U/S BASEPLATE		m
NPSH MARGIN AT RATED FLOW :		m
SPECIFIC SPEED (6.1.9)		
SUCTION SPECIFIC SPEED LIMIT		
SUCTION SPECIFIC SPEED		
MAX. ALLOW. SOUND PRESS. LEVEL REQD (6.1.14)	85 @ 1m	(dBA)
EST MAX SOUND PRESS. LEVEL		(dBA)
MAX. SOUND POWER LEVEL REQ'D (6.1.14)		
EST MAX SOUND POWER LEVEL		

DRIVER (7.1.5) (NOTE 22)

Driver Type	MOTOR
GEAR	NO
VARIABLE SPEED REQUIRED	NO
SOURCE OF VARIABLE SPEED	
OTHER	
MANUFACTURER	
NAMEPLATE POWER AND POWER FACTOR @Site Condition	KW
Nominal RPM	
RATED LOAD RPM	
FRAME OR MODEL	
ORIENTATION	HORIZENTAL
LUBE	
BEARING TYPE:	
RADIAL	/
THRUST	/
STARTING METHOD	OPEN DISCHARGE VALVE
INSULATION/TEMP. RISE	F/B
Max Voltage Variation	±10%
Max Frequency Variation	±5%
Max Voltage and Frequency Variation together	±10%

NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک	شرکت توسعه نیروگاهی ایران HIRGAN ENERGY

شماره پیمان: ۰۵۳ – ۰۷۳ – ۹۱۸٤

MECHANICAL DATA SHEETS FOR CLOSED DRAIN PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
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شماره صفحه: ٦ از ٩

API Std. 610 CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2202 A/B (Sheet 3 of 6)

CONSTRUCTION

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

NOZZLE CONNECTIONS: (6.5.5)

	Size	Facing	Rating	Position
SUCTION	Note 21	RF	300	END
DISCHARGE	Note 21	RF	300	TOP

PRESSURE CASING AUX. CONNECTIONS: (6.4.3.2)

	No.	Size	Type	Facing	Rating	Posn.
BAL./LEAK OFF						
DRAIN				RF	300	
VENT				RF	300	
PRESSURE GAGE						
TEMP GAGE						
WARM-UP LINE						

Drain Valve Supplied By: SUPPLIER
DRAINS MANIFOLDED: BY SUPPLIER
VENT Valve Supplied By: SUPPLIER
VENTS MANIFOLDED:
THREAD. CONS FOR PIPELINE SERVICE & < 50°C (6.4.3.2):
SPECIAL FITTINGS FOR TRANSITIONING (6.4.3.3):
CYLINDRICAL THREADS REQUIRED (6.4.3.8):
GUSSET SUPPORT REQUIRED: If Needed
MACHINED AND STUDDED CONNECTIONS (6.4.3.12):
VS 6 DRAIN:
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: Note 30
MAWP : (6.3.5) 40 barg @ 38 °C
HYDROTEST : 1.5*MAWP barg @ °C

HYDROTEST OH PUMP AS ASSEMBLY
SUCT'N PRESS. REGIONS DESIGNED FOR MAWP: YES
ROTATION: (VIEWED FROM COUPLING END)
- IMPELLERS INDIVIDUALLY SECURED : 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:
SHRINK FIT -LIMITED MOVEMENT IMPELLERS (9.2.2.3):
COUPLING:(7.2.3) **(7.2.13.f)**
MANUFACTURER:
MODEL:
RATING (POWER/100 RPM):
SPACER LENGTH: mm
SERVICE FACTOR: min 1.5
RIGID (Note 26): 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) (VTA)

APPENDIX H CLASS: S-6
MIN DESIGN METAL TEMP (6.12.4.1): 5 °C
REDUCED-HARDNESS MATERIALS REQ'D (6.12.1.12.1): YES (Note 24)
Applicable Hardness Standard (6.12.1.12.3):
BARREL :
CASE :
DIFFUSERS
IMPELLER :
IMPELLER WEAR RING :
CASE WEAR RING :
SHAFT:
Bowl (if VS-type)
Inspection Class: Level 2

BEARINGS AND LUBRICATION (6.10.1.1)

BEARING (TYPE / NUMBER): (6.11.4)
RADIAL /
THRUST /

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 : REQUIRED

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):
MOUNTING PADS TO BE MACHINED (7.3.6):
PROVIDE SPACER PLATE UNDER ALL EQUIPMENT FEET:
OTHER

REMARKS :

MECHANICAL DATA SHEETS FOR CLOSED DRAIN PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
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API Std. 610 CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2202 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) YES

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)

IDENTIFY LOCATION ON BASEPLATE

INTERCONNECTING PIPING BY Supplier

MECHANICAL SEAL (6.8.1) (VTS)

SEE ATTACHED ISO 21049/API 682 DATA SHEET (NOTE 4)

ADDITIONAL CENTRAL FLUSH PORT (6.8.9)

HEATING JACKET REQ'D. (6.8.11)

FLUSH PLAN 31+53B (NOTE 9,1)

HEATING AND COOLING (6.1.17) (VTS)

COOLING REQ'D

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 7)

COOLING WATER NO D08

TAG ALL ORIFICES (7.5.2.4) YES

SOCKET WELD CONN ON SEAL GLAND (7.5.2.8)

MECHANICAL DATA SHEETS FOR CLOSED DRAIN PUMPS

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
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API Std. 610 CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2202 A/B (Sheet 5 of 6)

SURFACE PREPARATION AND PAINT

MANUFACTURER'S STANDARD	
OTHER (SEE BELOW)	YES
SPECIFICATION NO.	As per Project Specification.
"Specification for Painting; BK-GNRAL-PEDCO-000-PI-SP-0006"	
PUMP:	
PUMP SURFACE PREPARATION	BY VENDOR
PRIMER	BY VENDOR
FINISH COAT	BY VENDOR
BASEPLATE:	
BASEPLATE SURFACE PREPARATION	BY VENDOR
PRIMER:	BY VENDOR
FINISH COAT	BY VENDOR
DETAILS OF LIFTING DEVICES	
SHIPMENT: (8.4.1)	EXPORT
EXPORT BOXING REQUIRED	YES
OUTDOOR STORAGE MORE THAN 6 MONTHS	YES
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	
MAX RELATIVE DENSITY	YES 1023 kg/m³
OPERATION TO TRIP SPEED	
MAX DIA. IMPELLERS AND/OR NO OF STAGES	YES
CONNECTION DESIGN APPROVAL (9.2.1.4)	
TORSIONAL ANALYSIS / REPORT (6.9.2.10)	
PROGRESS REPORTS	
OUTLINE OF PROC FOR OPTIONAL TESTS (10.2.5)	
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1)	
LATERAL ANALYSIS REQUIRED (9.1.3.4) (9.2.4.1.3)	
MODAL ANALYSIS REQUIRED (9.3.9.2)	
DYNAMIC BALANCE ROTOR (6.9.4.4)	YES D08
INSTALLATION LIST IN PROPOSAL (10.2.3.l)	YES
VFD STEADY STATE DAMPED RESPONSE ANALYSIS (6.9.2.3)	
TRANSIENT TORSIONAL RESPONSE	
BEARING LIFE CALCULATIONS REQUIRED (6.10.1.6)	YES
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)	YES
INCLUDE PLOTTED VIBRATION SPECTRA (6.9.3.3)	
CONNECTION BOLTING (7.5.1.7)	SS
CADMIUM PLATED BOLTS PROHIBITED	
VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)	YES
VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)	YES
SUBMIT INSPECTION CHECK LIST (8.1.5)	YES

TEST (Note 36)

SHOP INSPECTION (8.1.1)			
PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPMENT.			YES
TEST WITH SUBSTITUTE SEAL (8.3.3.2.b)			NO
MATERIAL CERTIFICATION REQUIRED		CASING	YES
SHAFT	YES (6.12.1.8)	IMPELLER	YES
OTHER	YES		
CASTING REPAIR WELD PROCEDURE APPR REQD			YES
INSPECTION REQUIRED FOR CONNECTION WELDS (6.12.3.4.d)			
LIQUID PENETRANT	YES	MAG PARTICLE	YES
ULTRASONIC		RADIOGRAPHY	
INSPECTION REQUIRED FOR CASTINGS			
LIQUID PENETRANT	YES	MAG PARTICLE	YES
ULTRASONIC (NOTE 14)		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) (NOTE 5)			YES
COMPONENTS TO BE TESTED			
RESIDUAL UNBALANCE TEST (J.4.1.2)			
NOTIFICATION OF SUCCESSFUL SHOP			
PERFORMANCE TEST (8.1.1.c) (8.3.3.5)		(WIT)	YES
BASEPLATE TEST (7.3.21)			
HYDROSTATIC			WIT
HYDROSTATIC TEST OF BOWLS & COLUMN (9.3.13.2)			WIT
PERFORMANCE TEST			WIT
TEST IN COMPLIANCE WITH (8.3.3.2)			8.3.3.2
TEST DATA POINTS TO (8.3.3.3)			8.3.3.3
TEST TOLERANCES TO (8.3.3.4)			
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)			
RETEST REQUIRED AFTER FINAL HEAD ADJ (8.3.3.7.b)			
COMPLETE UNIT TEST (8.3.4.4.1)			
SOUND LEVEL TEST (8.3.4.5)			WIT
CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)			NON-WIT
LOCATION OF CLEANLINESS INSPECTION			
NOZZLE LOAD TEST			
CHECK FOR CO-PLANAR MOUNTING PAD SURFACES			
MECHANICAL RUN TEST UNTIL OIL TEMP STABLE			WIT
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			

API Std. 610 CENTRIFUGAL PUMP DATA SHEET (SI UNIT) - P-2202 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

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) — REQUIRED

WELDER/OPERATOR QUALIFICATION — REQUIRED

WELDING PROCEDURE QUALIFICATION

NON-PRESSURE RETAINING STRUCTURAL WELDING SUCH AS BASEPLATES OR SUPPORTS

MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION OF PLATE EDGES

POSTWELD HEAT TREATMENT

POSTWELD HEAT TREATMENT OF CASING FABRICATION WELDS

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 :