

CONTEC

Comissão de Normalização
Técnica

SC-11

Machines

Rotating Pump - Data Sheet

Revalidation

Revalidated in 03/2020.

Rotating Pump - Data Sheet

Standardization

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

Technical Requirement: A provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

Recommended Practice: A provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

"The present Standard is the exclusive property of PETRÓLEO BRASILEIRO S.A. - PETROBRAS, for internal use in the Company, and any reproduction for external use or disclosure, without previous and express authorization from the owner, will imply an unlawful act pursuant to the relevant legislation through which the applicable responsibilities shall be imputed. External circulation shall be regulated by a specific clause of Secrecy and Confidentiality pursuant to the terms of intellectual and industrial property law."

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Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard [N-1](#). For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

Foreword

This Standard is the English version (issued in 04/2013) of PETROBRAS N-1713 REV. C 04/2013. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

1 Scope

1.1 This Standard standardizes the Datasheet for a Rotating Pump used in designs for PETROBRAS.

1.2 This Standard applies to design starting from its issue date.

1.3 This Standard only contains Technical Requirements.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

API [STD 541](#) - Form-Wound Squirrel-Cage Induction Motors - 500 Horsepower and Larger;

API [STD 546](#) - Brushless Synchronous Machines - 500 kVA and Larger;

API [STD 671](#) - Special-Purpose Couplings for Petroleum, Chemical, and Gas Industry Services;

API [STD 676](#) - Positive Displacement Pumps - Rotary;

API [STD 682](#) - Pumps - Shaft Sealing Systems for Centrifugal and Rotary Pumps;

ASTM [A153/A153M](#) - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware;

IEEE [841](#) - Petroleum and Chemical Industry - Premium- Efficiency, Severe-Duty, Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors-Up to and Including 370 kW (500 hp);

NACE [MR0103](#) - Standard Material Requirements Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments;

NACE [MR0175/ISO 15156-1](#) - Petroleum and Natural Gas Industries - Materials for Use in H₂S-Containing Environments in Oil and Gas Production - Part 1: General Principles for Selection of Cracking-Resistant Materials.

NOTE For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1

S.F.

service factor

3.2

GVF

gas volume fraction

3.3

NPIP

net positive inlet pressure

3.4

NPSH

net positive suction head

3.5

PLV

pressure limiting valve

3.6

PMI

positive material identification

3.7

PTFE

polytetrafluoroethylene

3.8

hazardous service

refers to the following fluids and operational conditions:

- a) H₂S (Hydrogen Sulphide) concentrations above 500 ppm;
- b) hydrocarbons with hydrogen at a partial pressure above 7 bar (abs);
- c) hydrocarbons at pumping temperatures above their auto-ignition temperatures;
- d) other toxic and lethal substances, which will result in death or permanent personal injury through inhalation, exposition, or contact, to be specified and defined in the inquiry documents.

3.9

SI

international system of units

3.10

ST

international system of modified units

3.11

HT

heat treatment

3.12

VSD

variable speed drive

4 General Requirements

4.1 In order to purchase a rotating pump, ANNEX A or ANNEX B Datasheet, after being completed, shall be attached to a Material Requisition (RM), in order to constitute a purchase document.


4.2 Annex A or Annex B Datasheet, after being completed by the designer and supplemented by manufacturer, if such is the case, shall constitute a permanent document of the equipment.


5 Annexes


This Standard contains the following annex:

- a) Annex A - Data Sheet - Rotary Pump (SI Unit);
- b) Annex B - Data Sheet - Rotary Pump (ST Unit).

[illegible]


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<input type="checkbox"/> DRAINS *																																																																																											
<input type="checkbox"/> VENTS *																																																																																											
<input type="checkbox"/> JACKET																																																																																											
21	<input type="checkbox"/> PUMP TYPE <table border="1" style="float: right;"> <thead> <tr> <th>DRIVERS</th> <th>HEATING</th> <th>CONTROL</th> <th>SHUTDOWN</th> </tr> </thead> <tbody> <tr> <td colspan="4"><input type="checkbox"/> INTERNAL GEAR <input type="checkbox"/> TWIN-SCREW <input type="checkbox"/> VANE <input type="checkbox"/> LOBE</td> </tr> <tr> <td colspan="4"><input type="checkbox"/> EXTERNAL GEAR <input type="checkbox"/> 3-SCREW <input type="checkbox"/> PROGRESSING CAVITY</td> </tr> <tr> <td colspan="4"><input type="checkbox"/> ROTARY GEAR TYPE</td> </tr> </tbody> </table>			DRIVERS	HEATING	CONTROL	SHUTDOWN	<input type="checkbox"/> INTERNAL GEAR <input type="checkbox"/> TWIN-SCREW <input type="checkbox"/> VANE <input type="checkbox"/> LOBE				<input type="checkbox"/> EXTERNAL GEAR <input type="checkbox"/> 3-SCREW <input type="checkbox"/> PROGRESSING CAVITY				<input type="checkbox"/> ROTARY GEAR TYPE																																																																											
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ROTARY PUMP (SI UNITS)																																																																												
1	CONSTRUCTION		MATERIALS																																																																									
2	CASING		<input type="checkbox"/> MIN DESIGN METAL TEMP _____ (°C)																																																																									
3	<input type="checkbox"/> MAX. ALLOWABLE CASING PRESS.: _____ (kPa g) @ _____ (°C)		<input type="checkbox"/> CASING _____																																																																									
4	<input type="checkbox"/> MAXIMUM ALLOWABLE SUCTION PRESSURE: _____ (kPa g) @ _____ (°C)		<input type="checkbox"/> STATOR / LINER _____																																																																									
5	<input type="checkbox"/> HYDROSTATIC TEST PRESSURE - SUCT / DISCH: _____ / _____ (kPa g)		<input type="checkbox"/> END PLATES _____																																																																									
6	<input type="checkbox"/> RELIEF VALVES OPEN PRESSURE: _____ (kPa g)		<input type="checkbox"/> ROTOR (S) _____																																																																									
7	ROTATING ELEMENTS		<input type="checkbox"/> VANES _____																																																																									
8	<input type="checkbox"/> ROTOR MOUNT <input type="checkbox"/> BTWN. BEARINGS <input type="checkbox"/> OVERHUNG		<input type="checkbox"/> SHAFT _____																																																																									
9	TIMING GEARS <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> TYPE _____		<input type="checkbox"/> SLEEVE (S) _____																																																																									
10	BEARING TYPE: <input type="checkbox"/> RADIAL <input type="checkbox"/> THRUST _____		<input type="checkbox"/> GLAND (S) _____																																																																									
11	BEARING NUMBER: <input type="checkbox"/> RADIAL <input type="checkbox"/> THRUST _____		<input type="checkbox"/> BEARING HOUSING _____																																																																									
12	LUBRICATION TYPE: <input type="checkbox"/> CONSTANT LEVEL OILERS		<input type="checkbox"/> TIMING GEARS _____																																																																									
13	<input type="checkbox"/> PUMPED FLUID <input checked="" type="checkbox"/> RING OIL <input checked="" type="checkbox"/> OIL MIST		<input type="checkbox"/> ELASTOMERS / GASKETS _____																																																																									
14	<input type="checkbox"/> EXTERNAL <input type="checkbox"/> OIL FLOOD <input type="checkbox"/> GREASE																																																																											
15	<input type="checkbox"/> LUBRICANT INFO (Visc etc.) _____																																																																											
16	<input type="checkbox"/> MECHANICAL SEALS		QA INSPECTION AND TEST																																																																									
17	<input type="checkbox"/> MANUFACTURER AND MODEL _____		<input type="checkbox"/> SPECIAL MATERIAL TESTS																																																																									
18	<input type="checkbox"/> SIZE / TYPE _____		<input type="checkbox"/> LOW AMBIENT TEMP. MATERIALS TESTS																																																																									
19	<input type="checkbox"/> MANUFACTURER CODE _____		<input type="checkbox"/> COMPLIANCE WITH INSPECTORS CHECK LIST																																																																									
20	<input type="checkbox"/> API STD 682 AND DATA SHEETS _____		<input type="checkbox"/> CERTIFICATION OF MATERIALS (user to define affected components in remarks)																																																																									
21	<input type="checkbox"/> API STD 682 SEAL FLUSH PLAN _____		<input type="checkbox"/> SURFACE / SUBSURFACE EXAM'S (user to define affected components in remarks)																																																																									
22	<input type="checkbox"/> API STD 682 SEAL CODE _____		<input type="checkbox"/> RADIOGRAPHY _____																																																																									
23	DRIVER TYPE		<input type="checkbox"/> ULTRASONIC _____																																																																									
24	<input type="checkbox"/> INDUCTION MOTOR <input type="checkbox"/> STEAM TURBINE GEAR <input type="checkbox"/> OTHER		<input type="checkbox"/> MAGNETIC PARTICLE _____																																																																									
25	DRIVE MECHANISM		<input type="checkbox"/> LIQUID PENETRANT _____																																																																									
26	<input type="checkbox"/> DIRECT-COUPLED <input type="checkbox"/> ASD <input type="checkbox"/> BELT <input type="checkbox"/> OTHER _____		<input type="checkbox"/> COMPONENT PMI _____																																																																									
27	<input checked="" type="checkbox"/> COUPLING MANUFACTURER _____		<input type="checkbox"/> HARDNESS OF PARTS, WELDS & HEAT AFFECTED ZONES																																																																									
28	<input checked="" type="checkbox"/> COUPLING TYPE _____		<input type="checkbox"/> VENDOR SUBMIT TEST PROCEDURES																																																																									
29	<input type="checkbox"/> RATING (MAX TORQUE) _____ <input checked="" type="checkbox"/> MODEL _____		<input type="checkbox"/> SUPPLIER TO KEEP REPAIR AND HT RECORDS																																																																									
30	<input checked="" type="checkbox"/> SPACER LENGTH _____ (mm) <input checked="" type="checkbox"/> S.F. _____		<table border="1"> <thead> <tr> <th></th> <th>NON-WIT</th> <th>WIT</th> <th>OBSERV</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> SHOP INSPECTION</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> HYDROSTATIC</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td> WITH WETTING AGENT</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> PERFORMANCE</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> RETEST ON SEAL LEAKAGE</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input 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<input type="checkbox"/> OTHER _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																																									
31	<input type="checkbox"/> COUPLING BALANCED <input type="checkbox"/> MANF STD																																																																											
32	<input type="checkbox"/> COUPLING PER API STD 671																																																																											
33	<input type="checkbox"/> COUPLING HUB ATTACHMENT																																																																											
34	<input type="checkbox"/> STRAIGHT <input type="checkbox"/> KEYED <input type="checkbox"/> TAPERED																																																																											
35	COUPLING GUARD TYPE																																																																											
36	<input type="checkbox"/> STEEL <input type="checkbox"/> BRASS NON-METALLIC <input type="checkbox"/> OTHER																																																																											
37	<input checked="" type="checkbox"/> NON SPARK COUPLING GUARD _____																																																																											
38																																																																												
39	<input type="checkbox"/> MOTOR DRIVER (SEE MOTOR DATA SHEET)																																																																											
40	<input type="checkbox"/> IEEE 841 <input type="checkbox"/> API 541 <input type="checkbox"/> API STD 546 <input type="checkbox"/> OTHER																																																																											
41	<input type="checkbox"/> ASD SUPPLIED BY <input type="checkbox"/> PURCHASER <input type="checkbox"/> MOTOR SUPPLIER																																																																											
42	<input type="checkbox"/> MANUFACTURER _____ <input type="checkbox"/> TYPE _____																																																																											
43	<input type="checkbox"/> FRAME _____ <input checked="" type="checkbox"/> ENCLOSURE _____																																																																											
44	<input checked="" type="checkbox"/> HORIZONTAL <input checked="" type="checkbox"/> VERTICAL																																																																											
45	<input type="checkbox"/> (kW) _____ (rpm) _____																																																																											
46	<input type="checkbox"/> VOLTS _____ PHASE _____ HERTZ _____ SERVICE FACTOR _____																																																																											
47	<input type="checkbox"/> VARIABLE SPEED RANGE _____ (rpm)																																																																											
48	<input type="checkbox"/> MINIMUM STARTING VOLTAGE																																																																											
49	<input checked="" type="checkbox"/> INSULATION _____ <input type="checkbox"/> TEMP. RISE _____																																																																											
50	<input checked="" type="checkbox"/> FULL LOAD AMPS _____																																																																											
51	<input checked="" type="checkbox"/> LOCKED ROTOR AMPS _____																																																																											
52	<input checked="" type="checkbox"/> STARTING METHOD _____																																																																											
53	<input checked="" type="checkbox"/> LUBE _____																																																																											
54	BEARINGS (TYPE/NUMBER):																																																																											
55	<input type="checkbox"/> RADIAL _____ / _____																																																																											
56	<input type="checkbox"/> THRUST _____ / _____																																																																											
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 DATA SHEET		No.	REV.
TITLE:		SHEET of	
ROTARY PUMP (SI UNITS)			
1	PIPING & APPURTENANCES	PREPARATION FOR SHIPMENT	
2	MANIFOLD PIPING FOR PURCHASER CONNECTION	<input type="checkbox"/> DOMESTIC <input type="checkbox"/> EXPORT <input type="checkbox"/> EXPORT BOXING REQ'D <input type="checkbox"/> OUTDOOR STORAGE FOR AT LEAST _____ MONTHS	
3	<input type="checkbox"/> VENT <input type="checkbox"/> DRAIN <input type="checkbox"/> STEAM / COOLING WATER	SURFACE PREPARATION AND PAINT	
4	<input type="checkbox"/> HEATING JACKET REQ'D <input type="checkbox"/> COOLING REQ'D	<input type="checkbox"/> MANUFACTURER'S STANDARD <input type="checkbox"/> OTHER (SEE BELOW) <input type="checkbox"/> SPECIFICATION NO. _____	
5	<input type="checkbox"/> PIPE <input type="checkbox"/> TUBING; FITTINGS _____	PUMP:	
6	<input type="checkbox"/> CARBON STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> STAINLESS STEEL	<input type="checkbox"/> PRIMER _____	
7	<input type="checkbox"/> VALVES: <input type="checkbox"/> CARBON STEEL <input type="checkbox"/> STAINLESS STEEL	<input type="checkbox"/> FINISH COAT _____	
8	<input type="checkbox"/> FLANGES REQUIRED IN PLACE OF SOCKET WELD UNIONS	BASEPLATE:	
9	<input type="checkbox"/> MOUNT SEAL POT OFF BASEPLATE	<input type="checkbox"/> PRIMER _____	
10	CONNECTION BOLTING <input type="checkbox"/> CADMIUM PLATED BOLTS PROHIBITED	<input type="checkbox"/> FINISH COAT _____	
11	<input type="checkbox"/> PTFE COATING <input type="checkbox"/> ASTM A153/A153M GALVANIZED		
12	<input type="checkbox"/> PAINTED <input type="checkbox"/> STAINLESS STEEL		
13	HEATING AND COOLING	WEIGHTS (N)	
14	HEATING MEDIUM: <input type="checkbox"/> STEAM <input type="checkbox"/> OTHER	<input type="checkbox"/> PUMP _____ <input type="checkbox"/> BASE _____ <input type="checkbox"/> GEAR _____ <input type="checkbox"/> DRIVER _____ TOTAL WEIGHT _____	
15	<input type="checkbox"/> STEAM JACKET/COOLING WATER PRES: _____ (kPa g) @ _____ (°C)	BASEPLATE	
16	COOLING WATER REQUIREMENTS:	<input type="checkbox"/> BY PUMP MANUFACTURER SUITABLE FOR EPOXY GROUT <input type="checkbox"/> EXTENDED FOR _____	
17	<input type="checkbox"/> BEARING HOUSING _____ (m³/h) @ _____ (kPa g)	<input type="checkbox"/> DRAIN-RIM <input type="checkbox"/> DRAIN-PAN	
18	<input type="checkbox"/> LUBE OIL COOLER _____ (m³/h) @ _____ (kPa g)	<input type="checkbox"/> NON-GROUT CONSTRUCTION	
19	<input type="checkbox"/> SEAL OIL COOLER _____ (m³/h) @ _____ (kPa g)	<input type="checkbox"/> MOUNTING PADS	
20	<input type="checkbox"/> OTHER _____ (m³/h) @ _____ (kPa g)	OTHER PURCHASER REQUIREMENTS	
21	TOTAL COOLING WATER _____ (m³/h) @ _____ (kPa g)	NAMEPLATE UNITS <input type="checkbox"/> ST <input type="checkbox"/> SI	
22	INSTRUMENTATION	<input type="checkbox"/> RELIEF VALVES BY PUMP MFRG <input type="checkbox"/> INTERNAL <input type="checkbox"/> EXTRNL.	
23	<input type="checkbox"/> ACCELEROMETER _____	MANUFACTURER / MODEL: _____ / _____	
24	<input type="checkbox"/> PROVISION FOR MTG ONLY	PIPING FOR SEAL FLUSH FURNISHED BY:	
25	<input type="checkbox"/> FLAT SURFACE REQUIRED	<input type="checkbox"/> FLUID _____ <input type="checkbox"/> FLOW _____ (m³/h) INLET PRESS: _____ (kPa g) INLET TEMP.: _____ (°C)	
26	<input type="checkbox"/> RADIAL BEARING TEMP. <input type="checkbox"/> THRUST BEARING TEMP.	<input type="checkbox"/> PUMP VENDOR <input type="checkbox"/> OTHERS	
27	<input type="checkbox"/> TEMP. GAUGES (WITH THERMOWELLS) _____	PIPING FOR COOLING/HEATING FURNISHED BY:	
28	<input type="checkbox"/> PRESSURE GAUGE TYPE _____ <input type="checkbox"/> OTHER _____	<input type="checkbox"/> PUMP VENDOR <input type="checkbox"/> OTHERS <input type="checkbox"/> PROVIDE TECHNICAL DATA MANUAL <input checked="" type="checkbox"/> INSTALLATION LIST IN PROPOSAL	
29			
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35			
36	REMARKS:		
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FORM OWNED TO PETROBRAS N-1713 REV. C ANNEX A - SHEET 04/04.

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DATA SHEET		No.	REV.																																								
		SHEET _____ of _____																																									
TITLE: ROTARY PUMP (ST UNITS)																																											
1	APPLICABLE TO: <input checked="" type="checkbox"/> PROPOSAL <input checked="" type="checkbox"/> PURCHASE <input checked="" type="checkbox"/> AS BUILT	PO NO. _____																																									
2	FOR _____	UNIT _____																																									
3	SITE _____	NO. OF PUMPS REQUIRED _____																																									
4	SERVICE _____	SIZE AND TYPE _____																																									
5	MANUFACTURER/MODEL _____	SERIAL NO. _____																																									
6																																											
7	NOTE: <input type="checkbox"/> INDICATES INFORMATION TO BE COMPLETED BY PURCHASER <input type="checkbox"/> BY MANUFACTURER <input checked="" type="checkbox"/> BY MANUFACTURER OR PURCHASER																																										
8	GENERAL																																										
9	NO. MOTORS DRIVEN _____	OTHER DRIVER TYPE _____																																									
10	PUMP ITEM NO'S _____	PUMP (ITEM NO'S) _____																																									
11	MOTOR ITEM NO'S _____	DRIVER (ITEM NO'S) _____																																									
12	MOTOR PROVIDED BY _____	DRIVER (PROVIDED BY) _____																																									
13	MOTOR MOUNTED BY _____	DRIVER (MOUNTED BY) _____																																									
14	MOTOR NO. _____ DATA _____ SHEET _____	DRIVER (DATA SHEET NO.) _____																																									
15		GEAR (ITEM NO'S) _____																																									
16		BY GEAR (PROVIDED BY) _____																																									
17		GEAR (MOUNTED BY) _____																																									
18		GEAR (DATA SHEET NO.) _____																																									
19	<input type="checkbox"/> OPERATING CONDITIONS																																										
20	<input type="checkbox"/> PUMPED FLUID																																										
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23	<input type="checkbox"/> NPSH AVAILABLE _____ (m) <input type="checkbox"/> NPIP AVAILABLE _____ (kgf/cm² a) <input type="checkbox"/> NPSHa / NPIP DATUM: <input type="checkbox"/> C.L. SUCTION NOZZLE <input type="checkbox"/> TOP OF FOUNDATION <input type="checkbox"/> DUTY CYCLE <input type="checkbox"/> CONTINUOUS <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> STARTS / DAY _____ / _____ (1) Maximum - mechanical design																																										
24	<input type="checkbox"/> TYPE OR NAME OF PUMPED FLUID _____ <input type="checkbox"/> SPECIFIC HEAT _____ Cp (kJ/kg °C) <input type="checkbox"/> CORROSIVE/EROSIVE AGENTS DESCRIPTION <input type="checkbox"/> ERODIVE _____ <input type="checkbox"/> CORROSIVE _____ <input type="checkbox"/> CHLORIDE CONCENTRATION (ppm) _____ <input type="checkbox"/> H₂S CONCENTRATION (ppm) _____ <input type="checkbox"/> FLUID HAZARDOUS <input type="checkbox"/> FLAMMABLE <input type="checkbox"/> OTHER _____ <input type="checkbox"/> GAS <input type="checkbox"/> ENTRAINED <input type="checkbox"/> SLUG FLOW % BY VOLUME or GVF _____ <input type="checkbox"/> SOLIDS: PARTICLE SIZE DISTRIBUTION & MIN/MAX _____ (µm) <input type="checkbox"/> SHAPE _____ <input type="checkbox"/> CONCENTRATION _____ <input type="checkbox"/> HARDNESS _____																																										
25	<input type="checkbox"/> PERFORMANCE <input type="checkbox"/> RATED CAPACITY (m³/h) _____ <input type="checkbox"/> NPSHa / NPIP REQUIRED (m) _____ (kgf/cm² a) _____ <input type="checkbox"/> RATED SPEED (rpm) _____ <input type="checkbox"/> RATED VOLUMETRIC EFFICIENCY (%) _____ <input type="checkbox"/> RATED PUMP EFFICIENCY (%) _____ <input type="checkbox"/> REQUIRED POWER @ MAXIMUM VISCOSITY (BkW) _____ <input type="checkbox"/> REQUIRED POWER @ PRESSURE LIMITING VAL (BkW) _____ <input type="checkbox"/> REQUIRED POWER @ RATED CONDITION (BkW) _____ <input type="checkbox"/> MAXIMUM ALLOWABLE SPEED (rpm) _____ <input type="checkbox"/> ROTATION VIEWED FROM DRIVEN END <input checked="" type="checkbox"/> CW <input type="checkbox"/> CCW <input type="checkbox"/> MINIMUM ALLOWABLE SPEED (rpm) _____																																										
26	<input type="checkbox"/> CONSTRUCTION <table border="1"> <thead> <tr> <th></th> <th>SIZE</th> <th>ANSI RATING</th> <th>FACING</th> <th>POSITION</th> </tr> </thead> <tbody> <tr> <td>CONNECTIONS</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SUCTION</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DISCHARGE</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GLAND FLUSH</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DRAINS *</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>VENTS *</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>JACKET</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> * PIPE VENTS & DRAINS TO EDGE OF BASEPLATE				SIZE	ANSI RATING	FACING	POSITION	CONNECTIONS					SUCTION					DISCHARGE					GLAND FLUSH					DRAINS *					VENTS *					JACKET				
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28	<input type="checkbox"/> SITE AND UTILITY DATA LOCATION <input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR <input type="checkbox"/> HEATED <input type="checkbox"/> UNHEATED <input type="checkbox"/> UNDER ROOF <input type="checkbox"/> ELECTRICAL AREA CLASS _____ GROUP _____ DIV _____ ZONE _____ GROUP _____ TEMP CLASS _____ <input type="checkbox"/> WINTERIZATION REQD <input type="checkbox"/> TROPICALIZATION REQD SITE DATA <input type="checkbox"/> ELEVATION _____ (°C) <input type="checkbox"/> BAROMETER _____ (kgf/cm² a) RANGE OF AMBIENT TEMPS: MIN/MAX _____ / _____ (°C) UNUSUAL CONDITIONS <input type="checkbox"/> DUST <input type="checkbox"/> FUMES <input type="checkbox"/> SALT ATMOSPHERE <input type="checkbox"/> OTHER _____ <input type="checkbox"/> UTILITY CONDITIONS <table border="1"> <thead> <tr> <th>ELECTRICITY</th> <th>DRIVERS</th> <th>HEATING</th> <th>CONTROL</th> <th>SHUTDOWN</th> </tr> </thead> <tbody> <tr> <td>VOLTAGE</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>HERTZ</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PHASE</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>COOLING WATER</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TEMP (°C) MAX/MIN</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PRESS. (kgf/cm² g) MAX/MIN</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> SOURCE _____ INSTRUMENT AIR _____ MAX _____ MIN PRESSURE (kgf/cm² g) _____			ELECTRICITY	DRIVERS	HEATING	CONTROL	SHUTDOWN	VOLTAGE					HERTZ					PHASE					COOLING WATER					TEMP (°C) MAX/MIN					PRESS. (kgf/cm² g) MAX/MIN									
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29	REMARKS: _____ _____ _____ _____																																										
30	APPLICABLE SPECIFICATIONS: <input type="checkbox"/> API STD 676 <input type="checkbox"/> GOVERNING SPECIFICATION (IF DIFFERENT) _____ <input type="checkbox"/> NACE MR0103 <input type="checkbox"/> NACE MR0175/ISO 15156-1 <input type="checkbox"/> OTHER _____																																										

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3	<input type="checkbox"/> MAX. ALLOWABLE CASING PRESS.: ____ (kgf/cm ² g) @ ____ (°C)																																																																										
4	<input type="checkbox"/> MAXIMUM ALLOWABLE SUCTION PRESSURE: ____ (kgf/cm ² g) @ ____ (°C)																																																																										
5	<input type="checkbox"/> HYDROSTATIC TEST PRESSURE - SUCT / DISCH: ____ / ____ (kgf/cm ² g)																																																																										
6	<input type="checkbox"/> RELIEF VALVES OPEN PRESSURE: ____ (kgf/cm ² g)																																																																										
7	ROTATING ELEMENTS																																																																										
8	<input type="checkbox"/> ROTOR MOUNT <input type="checkbox"/> BTWN. BEARINGS <input type="checkbox"/> OVERHUNG <input type="checkbox"/> TIMING GEARS <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> TYPE _____ <input type="checkbox"/> BEARING TYPE: <input type="checkbox"/> RADIAL <input type="checkbox"/> THRUST _____ <input type="checkbox"/> BEARING NUMBER: <input type="checkbox"/> RADIAL <input type="checkbox"/> THRUST _____ <input type="checkbox"/> LUBRICATION TYPE: <input type="checkbox"/> CONSTANT LEVEL OILERS <input type="checkbox"/> O PUMPED FLUID <input checked="" type="checkbox"/> RING OIL <input checked="" type="checkbox"/> OIL MIST <input type="checkbox"/> EXTERNAL <input type="checkbox"/> OIL FLOOD <input type="checkbox"/> GREASE <input type="checkbox"/> LUBRICANT INFO (Visc etc.) _____																																																																										
9	<input type="checkbox"/> MECHANICAL SEALS																																																																										
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14	<input type="checkbox"/> API STD 682 SEAL FLUSH PLAN _____																																																																										
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18	DRIVE MECHANISM																																																																										
19	<input type="checkbox"/> DIRECT-COUPLED <input type="checkbox"/> ASD <input type="checkbox"/> BELT <input type="checkbox"/> OTHER _____																																																																										
20	<input checked="" type="checkbox"/> COUPLING MANUFACTURER _____																																																																										
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23	<input checked="" type="checkbox"/> SPACER LENGTH ____ (mm) <input checked="" type="checkbox"/> S.F. _____																																																																										
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30	<input checked="" type="checkbox"/> NON SPARK COUPLING GUARD _____																																																																										
31	<input type="checkbox"/> MOTOR DRIVER (SEE MOTOR DATA SHEET)																																																																										
32	<input type="checkbox"/> IEEE 841 <input type="checkbox"/> API 541 <input type="checkbox"/> API STD 546 <input type="checkbox"/> OTHER _____																																																																										
33	<input type="checkbox"/> ASD SUPPLIED BY <input type="checkbox"/> PURCHASER <input type="checkbox"/> MOTOR SUPPLIER																																																																										
34	<input type="checkbox"/> MANUFACTURER _____ <input type="checkbox"/> TYPE _____																																																																										
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36	<input checked="" type="checkbox"/> HORIZONTAL <input checked="" type="checkbox"/> VERTICAL																																																																										
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38	<input type="checkbox"/> VOLTS _____ PHASE _____ HERTZ _____ SERVICE FACTOR _____																																																																										
39	<input type="checkbox"/> VARIABLE SPEED RANGE _____ (rpm)																																																																										
40	<input type="checkbox"/> MINIMUM STARTING VOLTAGE _____																																																																										
41	<input checked="" type="checkbox"/> INSULATION _____ <input type="checkbox"/> TEMP. RISE _____																																																																										
42	<input checked="" type="checkbox"/> FULL LOAD AMPS _____																																																																										
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<input type="checkbox"/> OTHER _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																																								
<input type="checkbox"/> TEST WITH SUBSTITUTE SEAL																																																																											
<input type="checkbox"/> SUPPLIER SUBMIT TEST DATA WITHIN 24 HOURS																																																																											
<input type="checkbox"/> INCLUDE PLOTTED VIBRATION SPECTRA																																																																											
<input type="checkbox"/> RECORD FINAL ASSEMBLY RUNNING CLEARANCES																																																																											
<input type="checkbox"/> PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPMENT																																																																											
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		DATA SHEET	No.	REV.
TITLE:		SHEET of		
ROTARY PUMP (SI UNITS)				
1	PIPING & APPURTENANCES		PREPARATION FOR SHIPMENT	
2	MANIFOLD PIPING FOR PURCHASER CONNECTION		<input type="checkbox"/> DOMESTIC <input type="checkbox"/> EXPORT <input type="checkbox"/> EXPORT BOXING REQ'D	
3	<input type="checkbox"/> VENT <input type="checkbox"/> DRAIN <input type="checkbox"/> STEAM / COOLING WATER		<input type="checkbox"/> OUTDOOR STORAGE FOR AT LEAST _____ MONTHS	
4	<input type="checkbox"/> HEATING JACKET REQ'D <input type="checkbox"/> COOLING REQ'D		SURFACE PREPARATION AND PAINT	
5	<input type="checkbox"/> PIPE <input type="checkbox"/> TUBING; FITTINGS _____		<input type="checkbox"/> MANUFACTURER'S STANDARD <input type="checkbox"/> OTHER (SEE BELOW)	
6	<input type="checkbox"/> CARBON STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> STAINLESS STEEL		<input type="checkbox"/> SPECIFICATION NO. _____	
7	<input type="checkbox"/> VALVES: <input type="checkbox"/> CARBON STEEL <input type="checkbox"/> STAINLESS STEEL		PUMP:	
8	<input type="checkbox"/> FLANGES REQUIRED IN PLACE OF SOCKET WELD UNIONS		<input type="checkbox"/> PRIMER _____	
9	<input type="checkbox"/> MOUNT SEAL POT OFF BASEPLATE		<input type="checkbox"/> FINISH COAT _____	
10	CONNECTION BOLTING <input type="checkbox"/> CADMIUM PLATED BOLTS PROHIBITED		BASEPLATE:	
11	<input type="checkbox"/> PTFE COATING <input type="checkbox"/> ASTM A153 GALVANIZED		<input type="checkbox"/> PRIMER _____	
12	<input type="checkbox"/> PAINTED <input type="checkbox"/> STAINLESS STEEL		<input type="checkbox"/> FINISH COAT _____	
13	HEATING AND COOLING			
14	HEATING MEDIUM: <input type="checkbox"/> STEAM <input type="checkbox"/> OTHER		WEIGHTS (N)	
15	<input type="checkbox"/> STEAM JACKET/COOLING WATER PRES: _____ (kgf/cm ² g) @ _____ (°C)		<input type="checkbox"/> PUMP _____ <input type="checkbox"/> BASE _____ <input type="checkbox"/> GEAR _____ <input type="checkbox"/> DRIVER _____	
16	COOLING WATER REQUIREMENTS:		TOTAL WEIGHT _____	
17	<input type="checkbox"/> BEARING HOUSING _____ (m ³ /h) @ _____ (kgf/cm ² g)		BASEPLATE	
18	<input type="checkbox"/> LUBE OIL COOLER _____ (m ³ /h) @ _____ (kgf/cm ² g)		<input type="checkbox"/> BY PUMP MANUFACTURER SUITABLE FOR EPOXY GROUT	
19	<input type="checkbox"/> SEAL OIL COOLER _____ (m ³ /h) @ _____ (kgf/cm ² g)		<input type="checkbox"/> EXTENDED FOR	
20	<input type="checkbox"/> OTHER _____ (m ³ /h) @ _____ (kgf/cm ² g)		<input type="checkbox"/> DRAIN-RIM <input type="checkbox"/> DRAIN-PAN	
21	TOTAL COOLING WATER _____ (m ³ /h) @ _____ (kgf/cm ² g)		<input type="checkbox"/> NON-GROUT CONSTRUCTION	
22	INSTRUMENTATION		<input type="checkbox"/> MOUNTING PADS	
23	<input type="checkbox"/> ACCELEROMETER _____		OTHER PURCHASER REQUIREMENTS	
24	<input type="checkbox"/> PROVISION FOR MONTAGE ONLY		NAMEPLATE UNITS <input type="checkbox"/> ST <input type="checkbox"/> SI	
25	<input type="checkbox"/> FLAT SURFACE REQUIRED		<input type="checkbox"/> RELIEF VALVES BY PUMP MFRG <input type="checkbox"/> INTERNAL <input type="checkbox"/> EXTRNL.	
26	<input type="checkbox"/> RADIAL BEARING TEMP. <input type="checkbox"/> THRUST BEARING TEMP.		MANUFACTURER / MODEL: _____ / _____	
27	<input type="checkbox"/> TEMP. GAUGES (WITH THERMOWELLS) _____		PIPING FOR SEAL FLUSH FURNISHED BY:	
28	<input type="checkbox"/> PRESSURE GAUGE TYPE _____ <input type="checkbox"/> OTHER _____		<input type="checkbox"/> FLUID _____ <input type="checkbox"/> FLOW _____ (m ³ /h)	
29			INLET PRESS: _____ (kgf/cm ² g) INLET TEMP.: _____ (°C)	
30			<input type="checkbox"/> PUMP VENDOR <input type="checkbox"/> OTHERS	
31			PIPING FOR COOLING/HEATING FURNISHED BY:	
32			<input type="checkbox"/> PUMP VENDOR <input type="checkbox"/> OTHERS	
33			<input type="checkbox"/> PROVIDE TECHNICAL DATA MANUAL	
34			<input checked="" type="checkbox"/> INSTALLATION LIST IN PROPOSAL	
35				
36	REMARKS:			
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