

# Reciprocating Compressors

## Specification

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.

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## CONTEC

Comissão de Normalização  
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## SC - 11

Machines

## 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 12/2012) of PETROBRAS N-1854 REV. D 12/2012. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used. This Standard is based on API [STD 618:2007](#), 5th edition, december 2007.

## 1 Scope

1.1 The requirements of this Standard are additions to, or modifications of the API [STD 618:2007](#), which is an integral part of this Standard.

1.2 Compressors and auxiliary equipment covered of this Standard shall be in accordance with API [STD 618:2007](#), plus the following changes, as noted for each clause, according to the definitions stated below. The information of each clause shall be read as follows, whenever starting with:

- **Addition:** is the continuation of that particular API [STD 618:2007](#) paragraph;
- **Modification:** is the replacement of part of that affected API [STD 618:2007](#) paragraph;
- **Substitution:** is the replacement of that API [STD 618:2007](#) paragraph in its entirety;
- **New:** is the insertion of a requirement not found in API [STD 618:2007](#);
- **Deletion:** is the removal of that particular API [STD 618:2007](#) paragraph.

1.3 Except for new clauses, API item numbers, as noted in parenthesis in this Standard are the same API [STD 618:2007](#), paragraph ones.

1.4 All deviations from the requirements in this Standard and/or API [STD 618:2007](#), must be clearly identified in the proposal and submitted to PETROBRAS for approval. Any requirement exception or deviation from any of the listed documents not clearly mentioned in tender will be considered by PETROBRAS as full compliance with the material requisition.

1.5 All deviations from the contracted design or scope of supply made by vendor during time of drawings and documents review shall be clearly mentioned in the particular document to be approved.

1.6 Vendor's compliance with the requirements of these specifications does not exempt him from the responsibility of supplying equipment and accessories suitable for the specified service conditions.

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

1.8 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.

IEC [60079-0](#) - Explosive Atmospheres - Part 0: Equipment - General Requirements;

ISO [10441](#) - Petroleum, Petrochemical and Natural Gas Industries - Flexible Couplings for Mechanical Power Transmission - Special-Purpose Applications;

ANSI/NACE [MR0175](#)/ISO 15156-1 - Petroleum and Natural Gas Industries - Materials for Use in H<sub>2</sub>S-Containing Environments in Oil and Gas Production - Part 1: General Principles For Selection of Cracking-Resistant Materials;

API [STD 618:2007](#) - Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services;

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

ASME BPVC [Section VIII - Division I](#) - Boiler and Pressure Vessel Code - Section VIII - Division 1 - Rules for Construction of Pressure Vessels.

**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 term and definition apply.

#### **New (3.63)**

**hazardous service:** shall apply to all parts of compressor, seal system, piping, instruments and auxiliary equipment that are to (or may eventually) be in contact with the process gas, and refers to the following fluids and operational conditions:

- a) H<sub>2</sub>S (hydrogen sulphide) concentrations above 500 ppm;
- b) hydrocarbons with hydrogen at a partial pressure above 7 bar a (101 psi a);
- c) hydrogen-rich services (more than 90 percent molal concentration at any pressure);
- d) other toxic and lethal substances, which shall result in death or permanent personal injury through inhalation, exposition, or contact, to be specified and defined in the inquiry documents;
- e) air compression services above 12 bar g (175 psi g).

### 4 Basic Considerations

4.1 The Annex A is the data sheet to be used to reciprocating compressors for SI units according to API [STD 618:2007](#).

4.2 The Annex B is the data sheet to be used to reciprocating compressors for SI units, except for pressure unit that will be in kgf/cm<sup>2</sup>, according to API [STD 618:2007](#).

4.3 The Annex C is the Vendor Drawing and Data Requirements (VDDR) to be used to reciprocating compressors according to API [STD 618:2007](#).

### 5 Requirements - Substitution (5.3 of API [STD 618:2007](#)):

In case of conflict between the inquiry documents, the following priority shall govern:

- a) data sheets;
- b) supplementary job or technical specifications (if any);
- c) this Standard and all other PETROBRAS standards specifically referenced in the inquiry;
- d) API [STD 618:2007](#).

Concerning any conflict after placement of order, the following priority shall govern:

- a) formal correspondence regarding any changes in the scope of supply or technical specifications, mutually agreed upon by PETROBRAS and vendor;
- b) approved documentation;
- c) revised data sheets and other material requisition documents (applicable to purchase);
- d) this Standard and all other PETROBRAS standards specifically referenced in the inquiry or order;
- e) API [STD 618:2007](#);
- f) vendor's proposal.

## **6 Basic Design**

### **6.1 Substitution (6.1.5 of API [STD 618:2007](#))**

Unless otherwise agreed upon by the purchaser, the pressure design code shall be ASME BPVC [Section VIII - Division I](#).

### **6.2 Modification (6.1.6 of API [STD 618:2007](#))**

Replace the first and second paragraphs by: Unless otherwise specified, the whole train furnished by the vendor (compressor, driver, gear and auxiliary equipment) shall conform to the maximum allowable sound pressure level of 85 dB (A), slow-response, measured at 1 m (3.28 ft) from the equipment surfaces. Additionally, bidder/vendor shall guarantee that equipment actual sound pressure level will remain within allowable limits, informing in his proposal the expected or guaranteed maximum sound pressure level and sound power level data per octave band for the equipment of quoted equipment and including copies of noise level test certificates performed on similar equipment.

### **6.3 Substitution (6.1.12 of API [STD 618:2007](#))**

Motors, electrical components, and electrical installations including field instruments and controls shall be suitable for the area classification (zone, group, temperature class) specified by PETROBRAS on the data sheets and shall meet the requirements of IEC [60079-0](#) as well as local codes specified and furnished by PETROBRAS on request.

### **6.4 Substitution (6.1.17 of API [STD 618:2007](#))**

The purchaser and the manufacturer shall agree on the details of an initial installation check by the vendor's representative and an operating temperature alignment check at a later date. Such checks shall include, but not be limited to, initial alignment check, grouting, crankshaft web deflection, piston-rod runout, driver alignment, motor air gap, outboard bearing insulation, bearing checks, and piston end clearance.

### **6.5 Addition (6.1.20 of API [STD 618:2007](#))**

Unless otherwise specified, the equipment, including all auxiliaries, shall be suitable for outdoor installation and operation.

### **6.6 Addition (6.1.24 of API [STD 618:2007](#))**

Vendor is required to clearly state in proposal the compressor zero percent load maximum allowable operating time. See also item 7.6.2.4 of API [STD 618:2007](#).

**6.7 New (6.1.27 of API STD 618:2007)**

New models or prototypes are not acceptable. A minimum of 25 000 hours continuous operation under similar operating conditions shall be demonstrated for 50 machines of the same model and 25 machines of the same size as the one offered, unless otherwise specified. Refurbished equipment or parts are not acceptable.

The following parameters shall be considered to indicate similar operating conditions and shall be plotted in an experience plot: power, discharge pressure, capacity, special services (H<sub>2</sub>, H<sub>2</sub>S etc.) and number of cylinders.

**6.8 Addition (6.2.2 of API STD 618:2007)**

If extended studs are provided for hydraulic tensioning, the exposed threads shall be protected by a cover.

**6.9 Substitution (6.4 of API STD 618:2007)**

Compressors shall be conservatively rated at a speed not in excess of that known by the manufacturer to result in low maintenance and trouble-free operation under the specified service conditions. The maximum average piston speed for nonlubricated services shall be 3,3 m/s (650 fpm). For lubricated cylinders the respective limit shall be 4,4 m/s (866 fpm). Higher piston speeds may be submitted for PETROBRAS' specific approval provided that vendor can prove successful experience with similar designs at similar applications. Nevertheless, such higher speeds shall be considered an important parameter to determine equipment choice.

**6.10 Deletion (6.7.4 of API STD 618:2007)**

Removed from API STD 618:2007.

**6.11 Addition (6.8.1.2 of API STD 618:2007)**

Cylinders, including valve chambers and clearance pockets, shall be designed so as to prevent the possibility of liquid trapping.

**6.12 Addition (6.8.2.2 of API STD 618:2007)**

Liners shall have an interference fit, and shall be held in place by positive mechanical means, such as a shoulder. Liners held in place only by an interference fit are unacceptable.

**6.13 Addition (6.8.3.4.3 of API STD 618:2007)**

In case of risk of gas condensation, vendor is required to comment on PETROBRAS cooling system specification before proposal.

**6.14 Modification (6.8.4.1.16 of API STD 618:2007)**

Replace the first sentence by: Unless otherwise specified, compressors with shaft power above 400 kW, shall be provided with DN 12 (NPT 1/2) indicator taps at each cylinder end.

**6.15 Substitution (6.10.3.2 of API STD 618:2007)**

Replace the first paragraph by: Wear bands shall be of single-piece construction designed to prevent underside pressurization. If feasible, pistons shall be segmented to facilitate wear band installation. Piston ring carriers for multi-piece pistons shall be furnished in wear resistant material. Wear bands shall be nonmetallic for lubricated and nonlubricated services, and shall not overrun fully-open singlehole valve ports or liner counterbores by more than one half the width of the wear band.

**6.16 Addition (6.10.4.1 of API STD 618:2007)**

Chrome plated piston rods are not acceptable.

**6.17 New (6.10.4.7 of API STD 618:2007)**

Special consideration shall be given to gas entrained between piston and piston rod. Vendor is required to provide means of adequate depressurization before disassembly of such components.

**6.18 Substitution (6.11.1 of API STD 618:2007)**

Crankshafts shall be forged in one piece (but may have provision for removable counterweights) and shall be heat-treated and machined on all working surfaces and fits. They shall be free of sharp corners. Main and crankpin journals shall be ground to size. Drilled holes or changes in section shall be finished with generous radii and shall be highly polished. Forced lubrication passages in crankshafts shall be drilled. See 8.2.2.3.3 of API STD 618:2007 for ultrasonic testing of crankshafts.

**6.19 Modification (6.11.3 of API STD 618:2007)**

Replace the first and second sentence by: Connecting rods shall be forged steel with removable caps.

**6.20 Modification (6.11.5 of API STD 618:2007)**

Replace the first sentence by: The crankcase shall be provided with relief devices to protect against rapid pressure rise.

**6.21 Modification (6.12.1.4 of API STD 618:2007)**

Replace the last sentence of the first paragraph by: Provisions for the injection of buffer gas shall also be provided.

**6.22 Modification (6.12.1.5 of API STD 618:2007)**

Replace the last sentence of the first paragraph by: If necessary, provisions for lubrication of this segmental packing shall be furnished by the vendor. Provisions for the injection of buffer gas shall also be provided.

**6.23 Modification (6.12.2.1 of API STD 618:2007)**

Replace the last sentence of the first paragraph by: Unless otherwise specified, distance pieces (or compartments) shall be equipped with solid metal covers.

**6.24 Modification (6.13.1.1 of API STD 618:2007)**

Replace the last sentence by: If necessary, shields shall be provided in the crosshead housings over the oil return drains from the wiper-packing stuffing boxes to prevent splash flooding.

**6.25 Modification (6.13.1.2 of API STD 618:2007)**

Replace second sentence by: Packing case flanges and cups shall be supplied in stainless steel.

**6.26 Substitution (6.14.2.1.4 b. of API STD 618:2007)**

Main oil pump - (materials in accordance with 6.14.2.1.5 of API STD 618:2007) which, unless otherwise specified, shall be shaft-driven, either directly or through gears or a chain, and shall be accessible for maintenance without draining the oil from crankcase.

**6.27 Addition (6.14.2.1.7 of API STD 618:2007)**

Vents shall be provided with restriction orifices of 1/8 inch (3 mm) size.

**6.28 Addition (6.14.2.1.9 of API STD 618:2007)**

Crankcase bottom (oil reservoir) shall be sloped, and provided with a tapped drain opening at the lowest point and a vent opening at the highest point.

**6.29 New (6.14.2.1.11 of API STD 618:2007)**

Oil pumps shall not require priming for proper operation.

**6.30 New (6.14.2.1.12 of API STD 618:2007)**

Both main and auxiliary pumps shall be provided with stainless steel suction strainers, sized not less than 60 mesh. Losses shall not exceed 14 kPa (2 psi).

**6.31 New (6.14.2.1.13 of API STD 618:2007)**

All fixed bearings shall be provided with individual oil supply on external parts. Other design solutions, such as lubrication of these bearings through crankshaft channels or grooves shall be submitted for approval.

**6.32 Modification (6.14.3.1.2 of API STD 618:2007)**

Replace first sentence by: Unless otherwise specified, lubricators shall be crankshaft-driven.

**6.33 Modification (6.14.3.1.9 of API STD 618:2007)**

Replace first sentence by: Unless otherwise specified, lubricants for frame and cylinders shall be mineral oil. If vendor's design requires a synthetic type, oil specification shall be submitted to PETROBRAS for approval during bid clarifications.



**6.34 Addition (6.15.1.1 of API STD 618:2007)**

Even when the severity of operating conditions may eventually preclude the compressor of meeting the objective of a high uninterrupted service time, valve materials shall be suitable for, at least, 8 000 hours of compressor continuous operation at rated conditions.

**6.35 Modification (6.15.1.2 of API STD 618:2007)**

Replace the last sentence by: When no such designation is available, the vendor's material specification, giving physical properties, chemical composition, and test requirements shall be submitted before proposal for purchaser's approval.

**6.36 Modification (6.15.1.15 of API STD 618:2007)**

Replace the first sentence by: The minimum quality bolting material for all pressure joints shall be high temperature alloy steel such as ASTM A 193, Grade B7.

**6.37 Addition (6.15.2.1 of API STD 618:2007)**

If not specified differently in the data sheet, the cast iron acceptable for pressure-containing cylinders parts in H<sub>2</sub>S/H<sub>2</sub> service is ASTM A395 type I or II. For H<sub>2</sub>S service, ductile cast iron ASTM A 395 type I or II shall follow ANSI/NACE MR0175/ISO 15156-1.

**6.38 Addition (6.15.2.2 of API STD 618:2007)**

Valve covers shall also be in steel.

**6.39 Modification (6.15.8.3 of API STD 618:2007)**

Replace the third sentence by: For materials and thickness' not covered by ASME Section VIII - Division I or the specified pressure design code, testing requirements shall be specified by the vendor and approved by the purchaser.

**6.40 Addition (6.16.1 of API STD 618:2007)**

The nameplates shall be written in Portuguese.

**7 Accessories****7.1 Substitution (7.1.1.10 of API STD 618:2007)**

The supporting feet of drivers shall be provided with vertical jackscrews regardless of the weight.

**7.2 Substitution (7.1.2.2 of API STD 618:2007)**

For motor-driven units, the motor nameplate rating (exclusive of service factor) shall be a minimum of 110 percent of the greatest power required (including gear and coupling losses) for any of the specified operating conditions.



**7.3 Modification (7.2.1.2 of API STD 618:2007)**

Replace the second sentence by: The coupling shall be non-lubricated, stainless steel flexible membrane, torsionally-rigid, spacer-type.

**7.4 Substitution (7.2.1.3 of API STD 618:2007)**

Unless otherwise specified, couplings shall conform to API STD 671/ISO 10441 for rated power greater than 1 200 kW. Coupling mountings shall conform to API STD 671/ISO 10441.

**7.5 Addition (7.2.1.11 of API STD 618:2007)**

The coupling shall be designed to enable replacement of component parts without removing the driver shaft or any other main drive component from the system.

**7.6 New (7.2.1.12 of API STD 618:2007)**

The coupling shall be sized to meet maximum power, torque and torque fluctuation requirements for the specified (normal and transient) or unusual (emergency) operating conditions, with the stress of parts subject to cyclic forces conservatively below fatigue limits.

The coupling shall be suitable for emergency shutdown of the unit under loaded conditions.

The coupling shall be suitable for torsional frequencies of driver and compressor (no resonances within all range of speeds).

**7.7 New (7.2.1.13 of API STD 618:2007)**

Couplings shall be adequate for expansion and other end-movement of shafts without subsequent overstressing or other thrust-absorbing components in the drive system. When the driver is a motor with sleeve bearings, limited end-float couplings shall be furnished to center the driver-rotating element under all operating conditions. Unless specified by PETROBRAS on the data-sheets, end-float limits shall be mutually agreed upon by compressor vendor, coupling manufacturer and motor manufacturer, and shall be submitted to PETROBRAS for approval.

The compressor (or gear, if any) shall be designed to accept the maximum motor thrust.

**7.8 Addition (7.3.2 of API STD 618:2007)**

System shall be furnished with filters and coolers. Filters shall be provided with magnetic plugs.

**7.9 Modification (7.5.3.6 of API STD 618:2007)**

Replace the second sentence by: The vendor shall provide the design for the anchor bolts.

**7.10 Addition (7.6.1.3 of API STD 618:2007)**

The vendor shall provide all necessary system instrumentation within contracted scope of supply. The specification of protective devices for the compressor, auxiliary equipment, driver and accessories is of vendor's concern and responsibility. In those cases when devices are already specified in data sheets, it is also vendor's responsibility to comment on and complement the specifications.

**7.11 Substitution (7.6.6.6 of API STD 618:2007)**

Unless otherwise specified, contacts shall be configured to open (deenergize) to initiate alarms and shutdowns.

NOTE Contacts that open (deenergize) are normally considered to be fail safe.

**7.12 New (7.6.9 of API STD 618:2007)**

The use of solenoid valves directly installed in process piping shall be subjected to previous approval of PETROBRAS.

**7.13 Substitution (7.9.4.1.2 of API STD 618:2007)**

Unless otherwise specified, the analysis shall be performed by the compressor vendor.

**7.14 Addition (7.9.4.2.1 of API STD 618:2007)**

Vendor is responsible for the execution and interpretation of the pulsation analysis. Details of the piping and equipment layout will be supplied by PETROBRAS for the execution of the respective analysis. If analysis indicates the need of thorough modifications in pulsation dampers or piping, a new study shall be performed after such modifications have been made.

**7.15 Substitution (7.9.5.1.2 of API STD 618:2007)**

The maximum allowable working pressure for any component shall not be less than the set pressure of the relief valve (plus accumulation) serving that component and, in any case, shall not be less than a gauge pressure of 4 bar (60 psig).

Suction-side equipment between the block valve and the compressor cylinder shall be rated for discharge pressure or have a protective relief valve provided by vendor.

**7.16 Substitution (7.9.5.1.4 of API STD 618:2007)**

All butt welds shall be 100 % radiographed for hazardous services.

**7.17 Substitution (7.9.5.1.22 of API STD 618:2007)**

The dynamic and static stresses on the pulsation suppression device internals that result from pulsation induced shaking forces and pressure-induced static forces shall be analyzed to confirm compliance with 7.9.4.2.4 of API STD 618:2007.

**7.18 Modification (7.11.2 of API STD 618:2007)**

Replace the last item by: e. If applicable, hydraulic tensioning tools.

**8 Inspection and Testing****8.1 Substitution (8.1.2 of API STD 618:2007)**

The purchaser's representative and the vendor shall indicate compliance in accordance with the inspector's checklist (Annex K) by initialing, dating and submitting the completed checklist to the purchaser before shipment.

**8.2 Substitution (8.1.6 of API STD 618:2007)**

The amount of advanced notification required for a witnessed or observed inspection or test shall be as specified. An observed test shall not be conducted until the specified time.

NOTE The notification shall be issued only after the procedure approval by purchaser.

**8.3 New (8.1.11 of API STD 618:2007)**

At least 6 weeks before the first scheduled test, the vendor shall submit to PETROBRAS, for review and comment, detailed procedures for all applicable inspection and test, either specified in API STD 618:2007 or by PETROBRAS, test program, instrumentation required and acceptance criteria for all monitored parameters. Any relevant anomalous condition such as reduced speed; gear, coupling, control devices or oil system other than purchased, shall be clearly mentioned and demonstrated.

**8.4 New (8.2.2.1.4)**

Cylinders shall be inspected by ultrasonic test or radiography test (whenever feasible) in accordance with 8.2.2.2 or 8.2.2.3 of API STD 618:2007 for Hydrogen and/or H<sub>2</sub>S service.

**8.5 Modification (8.3.3.1 of API STD 618:2007)**

All compressors, drivers, and gear units shall be shop tested in accordance with the specified.

**8.6 Modification (8.3.3.2 of API STD 618:2007)**

Unless otherwise specified, the shop test of the compressor shall comprise a 4-hour unloaded running test.

**8.7 Substitution (8.3.3.7 of API STD 618:2007)**

After 4-hour mechanical running test, Vendor shall carry out:

- a) boroscope inspection for verifying the compressor internals (cylinder, liner, piston rod, piston). In case of any abnormality was observed, vendor shall perform a strip test for all cylinders.
- b) upper half main bearings inspection;
- c) crankshaft web deflection check.

**8.8 New (8.3.3.8 of API STD 618:2007)**

Job flywheel shall be used during the mechanical running test.

**9 Vendor's Data****9.1 Modification (9.2.3 of API STD 618:2007)**

Replace the item "s" by: "When specified, vendor shall include in proposal a special list (vendor's standard reference list shall always be included) of similar machines installed (see 6.7 of this Standard) and operating under conditions at least as severe as the specified on data sheets, including the following information:

- compressed fluid characteristics (density, special service - H<sub>2</sub>, H<sub>2</sub>S etc);
- rated operating point data (capacity, suction and discharge pressure);
- number of stages and number of cylinders per stage;
- power rating;
- material class, as per API STD 618:2007 Appendix H;
- supply and start up dates;
- user's name and location.

**9.2 Addition (9.2.3 of API STD 618:2007)**

x. scope of supply.

z. exceptions to the specifications:


- data sheets;
- supplementary job specifications (if any);
- this Standard and other applicable PETROBRAS standards;
- API Standard 618.

**9.3 Substitution (9.3.3.3 of API STD 618:2007)**

The vendor shall furnish the data required for independent rod load, gas load, and reversal calculations.





	DATA SHEET		No. _____		REV. _____		
	TITLE: RECIPROCATING COMPRESSOR SI UNIT					SHEET _____	of _____

1	GAS ANALYSIS AT OPERATING CONDITIONS								REMARKS	
2	MOLE % (BY VOLUME) ONLY									
3	<input type="checkbox"/> SERVICE / ITEM NO.									
4	<input type="checkbox"/> NORMAL OR ALT									
5	<input type="checkbox"/> STAGE									
6		SYMBOL	MW							
7	AIR		28,966							
8	OXYGEN	O <sub>2</sub>	32,000							
9	NITROGEN	N <sub>2</sub>	28,016							
10	WATER VAPOR	H <sub>2</sub> O	18,016							
11	CARBON MONOXIDE	CO	28,010							
12	CARBON DIOXIDE	CO <sub>2</sub>	44,010							
13	HYDRO SULFITE	H <sub>2</sub> S	34,076							
14	HYDROGEN	H <sub>2</sub>	2,016							
15	METHANE	CH <sub>4</sub>	16,042							
16	ETHYLENE	C <sub>2</sub> H <sub>4</sub>	28,052							
17	ETHANE	C <sub>2</sub> H <sub>6</sub>	30,068							
18	PROPYLENE	C <sub>3</sub> H <sub>6</sub>	42,078							
19	PROPANE	C <sub>3</sub> H <sub>8</sub>	44,094							
20	I-BUTANE	C <sub>4</sub> H <sub>10</sub>	58,120							
21	N-BUTANE	C <sub>4</sub> H <sub>10</sub>	58,120							
22	I-PENTANE	C <sub>5</sub> H <sub>12</sub>	72,146							
23	N-PENTANE	C <sub>5</sub> H <sub>12</sub>	72,146							
24	HEXANE PLUS									
25	AMMONIA	NH <sub>3</sub>	17,031							
26	HYDRO CHLORIDE	HCl	36,461							
27	CHLORINE	Cl	70,914							
28	CHLORIDES-TRACES									
29										
30										
31										
32										
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35										
36										
37										
38										
39										
40										
41										
42	<input type="checkbox"/> CALCULATED MOL WT.									
43	<input type="checkbox"/> C <sub>p</sub> /C <sub>v</sub> (K) @ 65° OR _____ °C.									
44	SITE / LOCATION CONDITIONS									
45	ELEVATION _____	m	BAROMETER _____	kPa	a	AMBIENT TEMPS: MAX _____	°C.	MIN _____	°C.	
46	<input type="checkbox"/> MIN. DESIGN METAL TEMP _____		°C.	RELATIVE HUMIDITY: MAX _____		%	MIN _____	%		
47	COMPRESSOR LOCATION	<input type="checkbox"/> INDOOR	<input type="checkbox"/> HEATED	<input type="checkbox"/> UNHEATED	<input type="checkbox"/> AT GRADE LEVEL	<input type="checkbox"/> ELEVATED _____	m			
48		<input type="checkbox"/> OUTDOOR	<input type="checkbox"/> NO ROOF	<input type="checkbox"/> UNDER ROOF	<input type="checkbox"/> PARTIAL SIDES	<input type="checkbox"/> PLATFORM		<input type="checkbox"/> ON SHORE		
49		<input type="checkbox"/> OFF-SHORE	<input type="checkbox"/> WEATHER PROTECTION REQ.		<input type="checkbox"/> TROPICALIZATION REQ.					
50		<input type="checkbox"/> WINTERIZATION REQUIRED								
51	UNUSUAL CONDITIONS	<input type="checkbox"/> CORROSIVES	<input type="checkbox"/> DUST	<input type="checkbox"/> FUMES	<input type="checkbox"/> OTHER _____					
52			<input type="checkbox"/> SALTY ATMOSPHERE							
53	ELECTRICAL CLASSIFICATIONS									
54			HAZARDOUS				NON-HAZARDOUS			
55	MAIN UNIT	<input type="checkbox"/> ZONE _____	GAS GROUP _____	TEMP. CLASS _____		<input type="checkbox"/>				
56	LO CONSOLE	<input type="checkbox"/> ZONE _____	GAS GROUP _____	TEMP. CLASS _____		<input type="checkbox"/>				
57	CW CONSOLE	<input type="checkbox"/> ZONE _____	GAS GROUP _____	TEMP. CLASS _____		<input type="checkbox"/>				
58										
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	DATA SHEET		No.	REV.
				SHEET
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>			of

1	SCOPE OF BASIC SUPPLY			
2	<input type="checkbox"/> COMPRESSOR	<input type="checkbox"/> LUBE	<input type="checkbox"/> NON-LUBE	
3	<input type="checkbox"/> DRIVER	<input type="checkbox"/> VARIABLE SPEED	SPEED RANGE _____ rpm TO _____ rpm	<input type="checkbox"/> ENGINE <input type="checkbox"/> OTHER _____
4	<input type="checkbox"/> INDUCTION MOTOR	<input type="checkbox"/> SYNCHRONOUS MOTOR	<input type="checkbox"/> STEAM TURBINE	<input type="checkbox"/> API STD 612
5	<input type="checkbox"/> API STD 541	<input type="checkbox"/> API STD 546	<input type="checkbox"/> API STD 611	<input type="checkbox"/> API STD 612
6	<input type="checkbox"/> OUTBOARD BEARING	<input type="checkbox"/> PROVISION FOR DRY AIR PURGE FOR OUTBOARD BEARING		
7	<input type="checkbox"/> SLIDE BASE FOR DRIVER	<input type="checkbox"/> SOLEPLATE FOR DRIVER	<input type="checkbox"/> BASEPLATE FOR COMP. TRAIN	
8	<input type="checkbox"/> MOTOR STARTING EQUIPMENT / DEFINE			
9	<input type="checkbox"/> GEAR:	<input type="checkbox"/> BASEPLANTE FOR GEAR	<input type="checkbox"/> API STD 613	<input type="checkbox"/> API STD 677
10	<input type="checkbox"/> COUPLING(S):	<input type="checkbox"/> LOW SPD <input type="checkbox"/> HI-SPD	<input type="checkbox"/> QUILL SHAFT	<input type="checkbox"/> KEYLESS DRIVE <input type="checkbox"/> KEYED DRIVE
11		<input type="checkbox"/> API STD 671		
12	<input type="checkbox"/> V-BELT DRIVE:	<input type="checkbox"/> SHEAVES & V-BELTS:	<input type="checkbox"/> STATIC CONDUCTION V-BELTS	<input type="checkbox"/> BANDED V-BELT
13	<input type="checkbox"/> DRIVE GUARD(S):	<input type="checkbox"/> MANUFACTURER'S STD	<input type="checkbox"/> NON-SPARKING	<input type="checkbox"/> CALIF CODE <input type="checkbox"/> API STD 671 - APPENDIX C
14	<input type="checkbox"/> OTHER _____			
15				
16	<input type="checkbox"/> PULSATION SUPPRESSORS WITH INTERNALS:	<input type="checkbox"/> INITIAL INLET & FINAL DISCHARGE	<input type="checkbox"/> SUPPORTS	
17		<input type="checkbox"/> INTERSTAGE	<input type="checkbox"/> SUPPORTS	
18	<input type="checkbox"/> PULSATION SUPPRESSORS WITHOUT INTERNALS:	<input type="checkbox"/> INITIAL INLET & FINAL DISCHARGE	<input type="checkbox"/> SUPPORTS	
19		<input type="checkbox"/> INTERSTAGE	<input type="checkbox"/> SUPPORTS	
20	<input type="checkbox"/> SUPPRESSOR(S) TO HAVE MOISTURE REMOVAL SECTION:	<input type="checkbox"/> INITIAL INLET ONLY	<input type="checkbox"/> ALL INLET SUPPRESSORS	
21	<input type="checkbox"/> ACOUSTICAL SIMUL. STUDY (DESIGN APPROACH)	<input type="checkbox"/> 1 <input type="checkbox"/> 1, W / SIMPLIFIED ANALYSIS OF PIPING SYSTEM		
22	<input checked="" type="checkbox"/> DIGITAL <input checked="" type="checkbox"/> ANALOG	<input type="checkbox"/> 2, WITH ACOUSTIC SIMULATIO		
23		<input type="checkbox"/> 3, WITH ACOUSTIC SIMULATION AND MECH RESP. OF PIPING		
24	STUDY TO CONSIDER:	ALL SPECIFIED LOAD COND., INCL.	<input type="checkbox"/> SINGLE ACT., PLUS	
25		<input type="checkbox"/> COMP. OPER. IN PARALLEL	<input type="checkbox"/> ALTERNATE GASES	
26		<input type="checkbox"/> WITH EXISTING COMPRESSORS AND PIPING SYSTEMS		
27	<input type="checkbox"/> STUDY TO BE WITNESSED	<input type="checkbox"/> COMPRESSOR VALVE DYNAMIC RESPONSE		
28	<input type="checkbox"/> VENDOR REVIEW OF PURCHASERS PIPING ARRANGEMENT	<input type="checkbox"/> PULSATION SUPPRESSION DEVICE LOW CYCLE FATIGUE ANALYSIS		
29		<input type="checkbox"/> PIPING SYSTEM FLEXIBILITY		
30				
31	PACKAGE: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
32	<input type="checkbox"/> SKID <input type="checkbox"/> SOLEPLATE <input type="checkbox"/> BASEPLATE <input type="checkbox"/> BOLTS OR STUDS FOR SOLEPLATE TO FRAME <input type="checkbox"/> RAILS <input type="checkbox"/> CHOCK BLOCKS <input type="checkbox"/> SHIMS			
33	<input type="checkbox"/> SUITABLE FOR COLUMN MOUNTING (UNDER SKID AND/OR BASEPLATE)			
34	<input type="checkbox"/> LEVELING SCREWS <input type="checkbox"/> NON-SKID DECKING <input type="checkbox"/> SUB SOLEPLATES			
35	<input type="checkbox"/> DIRECTED GROUTED <input type="checkbox"/> CEMENTED/MORTAR GROUT <input type="checkbox"/> EPOXY GROUT; MFG/TYPE _____ / _____			
36	<input type="checkbox"/> INTERCOOLER(S) <input type="checkbox"/> SEPARATOR(S) <input type="checkbox"/> AFTERCOOLER(S)	<b>INTERCOOLERS:</b>		
37	<input type="checkbox"/> INTERSTAGE PIP.: <input type="checkbox"/> PIPING MATCHMARKED <input type="checkbox"/> SHOP FITTED	<input type="checkbox"/> MACHINE MOUNTED		
38	<input type="checkbox"/> CONDENSATE SEPARATION & COLLECTION FACILITY SYSTEM	<input type="checkbox"/> OFF MOUNTED		
39	<input type="checkbox"/> INLET STRAINER(S) <input type="checkbox"/> INITIAL INLET <input type="checkbox"/> SIDESTREAM INLET <input type="checkbox"/> SPOOL PIECE FOR INLET STRAINERS			
40	<input type="checkbox"/> MANIFOLD PIPING <input type="checkbox"/> DRAINS <input type="checkbox"/> VENTS <input type="checkbox"/> RELIEF VALVES <input type="checkbox"/> AIR/GAS SUPPLY	<b>FLANGE FINISH:</b>		
41	<input type="checkbox"/> RELIEF VALVE(S) <input type="checkbox"/> INITIAL INLET <input type="checkbox"/> INTERSTAGE <input type="checkbox"/> FINAL DISCHARGE	<input type="checkbox"/> API STD 618:2007 - FLANGE FINISH		
42	<input type="checkbox"/> RUPTURE DISC(S) <input type="checkbox"/> THRU STUDS IN PIPING FLANGES	<input type="checkbox"/> FLANGE FINISH PER ASME B16.5		
43	<input type="checkbox"/> CRANKCASE RAPID PRESSURE RELIEF DEVICE(S)	<input type="checkbox"/> SPECIAL FINISH _____		
44	<input type="checkbox"/> NO-RETURN VALVE FOR EACH DISCHARGE COMPRESSOR STAGE	<input type="checkbox"/> PB SEPEC		
45	<input type="checkbox"/> SPECIAL PIPING REQUIREMENTS			
46	<input type="checkbox"/> INITIAL INLET. <input type="checkbox"/> INTERSTAGE SUCTION PIPING ARR'D FOR:	<input type="checkbox"/> INSULATION	<input type="checkbox"/> HEAT TRACING	
47	<input type="checkbox"/> FOR ATMOSPHERIC INLET AIR COMPR. ONLY:	<input type="checkbox"/> INLET AIR FILTER <input type="checkbox"/> INLET FILTER-SILENCER		
48	<input type="checkbox"/> PREFERRED TYPE OF CYLINDER COOLING (NOTE 1)	<input type="checkbox"/> FORCED <input type="checkbox"/> THERMOSYPHON _____	STAGE CYL(S)	
49		<input type="checkbox"/> STATIC (STAND-PIPE) _____	STAGE CYL(S)	
50	<input type="checkbox"/> CYL. COOLING WATER PIPING	<input type="checkbox"/> MATCHMARKED		
51	<input type="checkbox"/> SINGLE INLET / OUTLET MANIFOLD & ALVES	<input type="checkbox"/> SIGHT GLASS(ES)		
52	<input type="checkbox"/> INDIVIDUAL INLET / OUTLET PER CYL.	<input type="checkbox"/> VALVE(S)		
53	<input type="checkbox"/> CLOSED SYS. WITH WATER PUMP, COOLER, SURGE TANK & PIPING			
54	<input type="checkbox"/> SHOP RUN <input type="checkbox"/> ARRANGED FOR HEATING JACKET AS WELL AS COOLING			
55	NOTES:			
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	DATA SHEET		No.	REV.
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>			SHEET
				of


  

1	SCOPE OF BASIC SUPPLY (CONT.) (SEE NOTE 2)				
2	<input type="checkbox"/> SEPARATE COOLING CONSOLE:	<input type="checkbox"/> ONE FOR EA UNIT	<input type="checkbox"/> ONE COMMON TO ALL UNITS	<input type="checkbox"/> DUAL PUMPS (AUX. & MAIN)	
3		<input type="checkbox"/> ARRANGED FOR HEATING JACKET WATER AS WELL AS COOLING			
4	<input type="checkbox"/> FRAME LUBE OIL SYSTEM:	<input type="checkbox"/> AUX. PUMP	<input type="checkbox"/> DUAL FILTERS WITH TRANSFER VALVE	<input type="checkbox"/> SHOP RUN	
5		<input type="checkbox"/> CONTINUOUS FLOW IN SENSING LINE TO PRESSURE TRANSMITTERS			
6	<input type="checkbox"/> SEPARATE LUBE OIL CONSOLE:	<input type="checkbox"/> EXTENDED TO MOTOR OUTBOARD BEARING			<input type="checkbox"/> SHOP RUN
7	API STD 614 - APPLIES?	<input checked="" type="checkbox"/> YES		<input type="checkbox"/> NO	
8	<input type="checkbox"/> CAPACITY CONTROL	<input type="checkbox"/> SEE DATA SHEET PAGE _____	FOR DETAILS		<input type="checkbox"/> IN INSTRUMENT & CONTROL PANEL
9	<input checked="" type="checkbox"/> AUTOMATIC <input checked="" type="checkbox"/> MANUAL	<input type="checkbox"/> SEPARATE MACHINE MOUNTED PANEL	<input type="checkbox"/> SEPARATE FREE STANDING PANEL		
10		<input type="checkbox"/> PNEUMATIC	<input type="checkbox"/> ELETRIC	<input type="checkbox"/> ELECTRONIC	<input type="checkbox"/> HIDRAULIC
11		<input type="checkbox"/> PROGRAMMABLE CONTROLLER			
12	<input type="checkbox"/> INSTRUMENT & CONTROL PANEL	<input type="checkbox"/> ONE FOR EACH UNIT		<input type="checkbox"/> ONE COMMON TO ALL UNITS	
13		<input type="checkbox"/> MACHINE MOUNTED		<input type="checkbox"/> FREE STANDING (OFF UNIT)	
14					
15	<input type="checkbox"/> HEALTERS	<input type="checkbox"/> FRAME LUBE OIL	<input type="checkbox"/> CYL. LUBRICATORS	<input type="checkbox"/> COOLING WATER	<input type="checkbox"/> DRIVER(S) <input type="checkbox"/> GEAR OIL
16		<input type="checkbox"/> ELECTRIC	<input type="checkbox"/> STEAM		
17	<input type="checkbox"/> BARRING DEVICE:	<input type="checkbox"/> MANUAL	<input type="checkbox"/> PNEUMATIC	<input type="checkbox"/> ELECTRIC	<input type="checkbox"/> FLYWHEEL LOCKING DEVICE
18	<input type="checkbox"/> ROD PRESSURE PACKING COOLING SYSTEM:	<input type="checkbox"/> SEPARATE CONSOLE		<input type="checkbox"/> FILTERS	
19	<input type="checkbox"/> SPECIAL CORROSION PROTECTION:	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MFR'S STANDARD	<input type="checkbox"/> OTHER _____
20	<input type="checkbox"/> HYDRAULIC TENSIONING TOOLS:	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO		
21	<input type="checkbox"/> MECHANICAL RUN TEST:	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MFR'S STANDARD	<input type="checkbox"/> API STD 618 <input type="checkbox"/> OTHER _____
22	<input type="checkbox"/> COMPLETE SHOP RUN A TEST OF ALL MACHINE MOUNTED EQUIPMENT, PIPING & APPURTENANCES				
23	PAINTING:	<input type="checkbox"/> MANUFACTURER'S STANDARD		<input type="checkbox"/> SPECIAL _____	
24	NAMEPLATES:	<input type="checkbox"/> U.S. CUSTOMARY UNITS		<input type="checkbox"/> SI UNITS	
25	SHIPMENT:	<input type="checkbox"/> DOMESTIC	<input type="checkbox"/> EXPORT	<input type="checkbox"/> EXPORT BOXING REQUIRED	
26		<input type="checkbox"/> STANDARD _____	MONTHS STORAGE PREPARATION, PER SPEC _____		
27		<input type="checkbox"/> OUTDOOR STORAGE FOR OVER _____		MONTH, PER SPEC _____	
28	<input type="checkbox"/> INITIAL INSTALLATION AND OPERATING TEMP ALIGNMENT CHECK JOBSITE BY VENDOR REPRESENTATIVE				
29	<input type="checkbox"/> COMPRESSOR MANUFACTURER'S USER'S LIST FOR SIMILAR SERVICE				
30	<input type="checkbox"/> PERFORMANCE DATA REQUIRED		<input type="checkbox"/> PERFORMANCE CURVES		
31			<input type="checkbox"/> BkW VS. SUCTION PRESSURE CURVES		
32			<input type="checkbox"/> ROD LOAD / GAS LOAD CHARTS		
33			<input type="checkbox"/> VALVE FAILURE DATA CHARTED		
34			<input type="checkbox"/> SPEDD / TORQUE CURVE DATA		
35	<input type="checkbox"/> BkW VC CAPACITY PERFORMANCE CURVES OR TABLES REQUIRED FOR UNLOADING STEPS AND/OR VARIABLE SUCTION / DISCHARGE PRESSURES				
36	APPLICABLE PURCHASER SPECS:	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO		
37	APPLICABLE USER SPECS:	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO		
38					
39	<input type="checkbox"/> CYLINDER LUBRICATOR				
40	<input type="checkbox"/> INSPECTIONS AND TESTS				
41	<input type="checkbox"/> SPECIAL TOOLS (IF EXISTING)				
42	<input type="checkbox"/> SPARE PARTS FOR 2 YEARS OPERATION, ERECTING, COMMISSIONING, TEST AND START UP				
43	<input type="checkbox"/> INSTRUCTION FOR ERECTION AND MAINTENANCE (SEE VENDOR DRAWING AND DATA REQUIREMENTS)				
44	<input type="checkbox"/> TORSIONAL VIBRATION ANALYSIS OF COMPLETE UNIT				
45	<input type="checkbox"/> SHOP TESTS				
46	<input type="checkbox"/> DESIGN AND COORDINATION OF COMPLETE ARRANGEMENT, INCLUDING DRIVER				
47	<input type="checkbox"/> COMMENT ON PURCHASER'S PIPING AND FOUNDATION DRAWINGS				
48	<input type="checkbox"/> TRAINING COURSE OG PETROBRAS STAFF				
49	<input type="checkbox"/> ERECTION AND START UP SUPERVISION INCLUDING INITIAL ALIGNMENT CHECK				
50	NOTES:				
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	<b>DATA SHEET</b>				No.				REV.		
									SHEET		of
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>										
1	UTILITIES CONDITIONS										
2	ELECTRIACAL POWER	AC VOLTS	PHASE	HERTZ	DC VOLTS		AC VOLTS	PHASE	HERTZ	DC VOLTS	
3	MAIN DRIVER					INSTRUMENT					
4	AUXILIARY MOTORS					ALRM & SHUTDWN					
5	HEATERS										
6											
7	INSTRUMENT AIR:	INLET TEMP		°C	PRESSURE: NORMAL		kPa	MAX/MIN		/	
8		DEW POINT		°C	@		kPa				
9											
10	STEAM FOR:					DRIVES					
11	INLET PRESS		kPa	MAX/MIN		/		kPa	INLET PRESS		kPa
12	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C
13	EXHAUST PRESS		kPa	MAX/MIN		/		kPa	EXHAUST PRESS		kPa
14	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C
15											
16	COOLING WATER FOR					COMPRESSOR CYLINDERS					
17	TYPE WATER					TYPE WATER					
18	SUPPLY PRESS		kPa	MAX/MIN		/		kPa	SUPPLY PRESS		kPa
19	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C
20	RETURN PRESS		kPa	MAX/MIN		/		kPa	RETURN PRESS		kPa
21	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C
22											
23	COOLING FOR ROD PACKING										
24	TYPE FLUID		SUPPLY PRESS		kPa	@		°C	RETURN		kPa
25											
26	FLUED GAS	NORMAL PRESSURE		kPa	MAX/MIN		/		LHV		MJ/m <sup>3</sup>
27		COMPOSITION									
28	FLUED GAS	NORMAL PRESSURE		kPa	MAX/MIN		/		LHV		MJ/m <sup>3</sup>
29		COMPOSITION									
30	FLUED GAS	NORMAL PRESSURE		kPa	MAX/MIN		/		LHV		MJ/m <sup>3</sup>
31		COMPOSITION									
32	CYLINDER UNLOADING MEDIUM:		<input type="checkbox"/> AIR	<input type="checkbox"/> N <sub>2</sub>	<input type="checkbox"/> OTHER						
33	PRESSURE AVAILABLE FOR CYL. UNLOADERS DEVICES		MAX								
34			NORM								
35			MIN								
36											
37	NOTES:										
38											
39											
40											
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<div> <b>PETROBRAS</b></div>	<b>DATA SHEET</b>	No.	REV.			
					SHEET	of
	TITLE: <b>RECIPROCATING COMPRESSOR SI UNIT</b>					
1	CYLINDER DATA AT FULL LOAD CONDITION					
2	SERVICE ITEM NO.					
3	STAGE					
4	INLET PRESSURE (SEE NOTE 3), kPa					
5	DISCHARGE PRESSURE (SEE NOTE 3), kPa					
6	CYLINDERS PER STAGE					
7	SINGLE OR DOUBLE ACTING (SA OR DA)					
8	BORE, mm					
9	STROKE, mm					
10	RPM:	RATED / MAX ALLOW: /				
11	PISTON SPEED, m/s	RATED / MAX ALLOW: /				
12	CYLINDER LINER, YES / NO					
13	LINER NOMINAL THICKNESS, mm					
14	PISTON DISPLACEMENT, m³/h					
15	CYLINDER DESIGN CLEARANCE, % AVERAGE					
16	VOLUMETRIC EFFICIENCY, % AVERAGE					
17	VALVES, INLET/DISCHARGE, QTY PER CYL.	/	/	/	/	/
18	TYPE OF VALVES					
19	VALVE LIFT, INLET/DISCHARGE, mm	/	/	/	/	/
20	VALVE VELOCITY (API STD 618:2007), m/s					
21	SUCTION VALVE(S)					
22	DISCHARGE VALVE(S)					
23	ROD DIAMETER, mm					
24	MAX ALLOW. COMBINED ROD LOADING, kN, °C					
25	MAX ALLOW. COMBINED ROD LOADING, kN, T*					
26	CALCULATED GAS ROD LOAD, kN, C*					
27	CALCULATED GAS ROD LOAD, kN, T*					
28	COMBINED ROD LOAD (GAS + INERTIA <sub>0</sub> , kN, C*					
29	COMBINED ROD LOAD (GAS + INERTIA <sub>0</sub> , kN, T*					
30	ROD VER., DEGRESS MIN @ X-HD PIN**					
31	RECIP WT. (PISTON, ROD, X-HD & NUTS), kg**					
32	MAX ALLOW, WORKING PRESSURE, kPa					
33	MAX ALLOW, WORKING TEMPERATURE, °C					
34	HYDROSTATIC TEST PRESSURE, kPa					
35	HELIUM TEST PRESSURE, kPa					
36	INLET FLANGE SIZE / RATING	/	/	/	/	/
37	FACING					
38	DISCHARGE FLANGE SIZE / RATING	/	/	/	/	/
39	FACING					
40	DISCHARGE RELIEF VALVE SETTING BASED ON DATA FOR INLET PRESSURE GIVEN ABOVE					
41	RECOMMENDED SETTING, kPa					
42	GAS ROAD LOAD, kN, C*					
43	GAS ROAD LOAD, kN, T*					
44	COMBINED ROAD LOAD, kN, C*					
45	COMBINED ROAD LOAD, kN, T*					
46	ROD REVERSAL, DEGREE MIN. @ X-HD PIN**					
47	(NOTE CALCULATED @ INLET PRESSURES GIVEN ABOVE & RECOMMENDED PSV SETTING)					
48	SETTLE-OUT GAS PRESSURE					
49	(DATA REQUIRED FOR STARTING)					
50						
51						
52	C* = COMPRESSION / T = TENSION      **X-HD = CROSSHEAD					
53						
54	NOTES:					
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	<b>DATA SHEET</b>		No.		REV.	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>				SHEET	
					of	
1	<b>CONSTRUCTION FEATURES</b>					
2	SERVICE ITEM NO.					
3	STAGE					
4						
5	CYLINDER SIZE (BORE DIA), mm					
6	ROD RUN-OUT NORMAL COLD VERTICAL, mm					
7	<b>MATERIALS OF CONSTRUCTION</b>					
8	CYLINDER(S)					
9	CYLINDER LINER(S)					
10	PISTON(S)					
11	PISTON RINGS					
12	WEAR BANDS <input type="checkbox"/> REQUIRED					
13	PISTON ROD(S): MATERIAL/YIELD, N/mm <sup>2</sup>					
14	THREAD ROOT STRESS @ MACRL* @ X-HD END					
15	PISTON ROD HARDNESS, BASE MATERIAL, Rc					
16	PISTON ROD COATING <input type="checkbox"/> REQUIRED					
17	COATING HARDNESS, Rc					
18	VALVE SEATS/SEAT PLATE					
19	VALVE SEAT MIN HARDNESS, Rc					
20	VALVE GUARDS (STOPS)					
21	VALVE DISCS					
22	VALVE SPRINGS					
23	ROD PRESSURE PACKING RINGS					
24	ROD PRESSURE PACKING CASE					
25	ROD PRESSURE PACKING SPRINGS					
26	SEAL/BUFFER PACKING, DISTANCE PIECE					
27	SEAL/BUFFER PACKING, DISTANCE INTERMEDIATE					
28	WIPER PACKING RINGS					
29	MAIN JOURNAL BEARINGS, CRANKSHAFT					
30	CONNECTING ROD BEARING, CRANKPIN					
31	CONNECTING ROD BUSHING, X-HD END					
32	CROSSHEAD (X-HD) PIN BUSHING					
33	CROSSHEAD PIN					
34	CROSSHEAD					
35	CROSSHEAD SHOES					
36	CYLINDER INDICATOR VALVES					
37	INDICATOR CONNECTIONS ABOVE 34,5 MPa					
38	FLUOROCARBON SPRAYED CYLINDER					
39	INSTRUMENTATION IN COLD SIDE					
40	CONTACT W/ PROCESS GAS HOT SIDE					
41	*MAXIMUM ALLOWABLE COMBINED ROD LOAD					
42	<input type="checkbox"/> COMPRESSOR CYLINDER ROD PACKING		DISTANCE PIECES: <input type="checkbox"/> TYPE A <input type="checkbox"/> TYPE B <input type="checkbox"/> TYPE C <input type="checkbox"/> TYPE D			
43	<input type="checkbox"/> FULL FLOATING PACKING		COVERS <input type="checkbox"/> SOLID METAL <input type="checkbox"/> SCREEN <input type="checkbox"/> LOUVERED			
44	<input type="checkbox"/> VENTED TO: <input type="checkbox"/> FLARE @ _____ kPa <input type="checkbox"/> ATMOSPHERE		CYLINDER COMPARTMENT: <input type="checkbox"/> VENTED TO _____ kPa g			
45	<input type="checkbox"/> SUCTION PRESS @ _____ kPa		(OUTBOARD DISTANCE PIECE) <input type="checkbox"/> PURGED AT _____ kPa g			
46	<input type="checkbox"/> FORCED LUBRICATED <input type="checkbox"/> NON-LUBE <input type="checkbox"/> TFE		<input type="checkbox"/> PRESSURIZED TO _____ kPa g			
47	<input type="checkbox"/> WATER COOLER _____ STAGE(S) _____ m <sup>3</sup> /h REQ'D		<input type="checkbox"/> SOLID METAL <input type="checkbox"/> WITH RELIEF VALVE			
48	<input type="checkbox"/> OIL COOLER _____ STAGE(S) _____ m <sup>3</sup> /h REQ'D		FRAME COMPARTMENT: <input type="checkbox"/> VENTED TO _____ kPa g			
49	<input type="checkbox"/> WATER FILTER <input type="checkbox"/> PROV. FUTURE WATER/OIL COOLING		<input type="checkbox"/> PURGED AT _____ kPa g			
50	<input type="checkbox"/> VENT/BUFFER GAS SEAL PACKING ARR.		<input type="checkbox"/> PRESSURIZED TO _____ kPa g			
51	<input type="checkbox"/> CONSTANT OR <input type="checkbox"/> VARIABLE DISPOSAL SYSTEM		<input type="checkbox"/> WITH RELIEF VALVE			
52	<input type="checkbox"/> BUFFER GAS PRESSURE _____ kPa		DISTANCE PIECE MAWP _____ kPa g			
53	<input type="checkbox"/> SPLASH GUARDS FOR WIPER PACKING					
54						
55						
56						
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<div></div>	DATA SHEET		No.	REV.	
				SHEET	of
	TITLE:				
	RECIPROCATING COMPRESSOR				
SI UNIT					

1	CONSTRUCTION FEATURES (CONT.)			
2	<input type="checkbox"/> FABRICATED CYLINDER, HEADS & CONNECTION SKETCHES FOR DESIGN REVIEW BY			
3	PURCHASER			
4				
5	COUPLING(S)	<input type="checkbox"/> LOW-SPEED	<input type="checkbox"/> HIGH-SPEED	
6		(BETWEEN COMPRESSOR	(BETWEEN & DRIVE	
7		& DRIVER OR GEAR)	OR GEAR)	
8	<input type="checkbox"/> BT MFR			
9	<input type="checkbox"/> MODEL			
10	<input type="checkbox"/> TYPE			
11	API STD 671 APPLIES	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	
12				
13	INSPECTION AND SHOP TESTS	REQ'D	WIT	OBS.
14	SHOP INSPECTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	ACTUAL RUNNING CLEARANCES AND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	RECORDS			
17	MFR STANDARD SHOP TESTS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	CYLINDER HYDROSTATIC TEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	CYLINDER PNEUMATIC TEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	CYLINDER HELIUM LEAK TEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	CYLINDER JACKET WATER HYDRO TEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	MECHANICAL RUN TEST 4 h	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	BAR-OVER TO CHECK ROD RUN OUT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	LUBE OIL CONSOLE RUN/TEST 4 h	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	COOLING H <sub>2</sub> O CONSOLE RUN/TEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	RADIOGRAPHY BUTT WELDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	<input type="checkbox"/> GAS <input type="checkbox"/> OIL <input type="checkbox"/> FAB CYLS (100 %)			
28	MAG PARTICLE/LIQUID PENETRANT OF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	WELDS			
30	SPECIFY ADDITIONAL REQ.			
31	QC OF INACCESSIBLE WELDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	SHOP FIT-UP PULSATION SUPPL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	DEVICES & ALL ASSOCIATED GAS PIPING			
34	CLEANLINESS OF EQUIP., PIPING &	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	APPURTENANCES			
36	HARDNESS OF PARTS, WELDS & HEAT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	AFFECTED ZONES			
38	DISMANTLING AND ASSEMBLING INSPEC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	NOTIFICATION TO PURCHASER OF ANY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	REPAIRS TO MAJOR COMPONENTS			
41		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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**BUFFER GAS PACKING ARR.**  
☐ OIL WIPPER PACKING PURGE  
☐ INTERMEDIATE PARTITION PURGE  
☐ INERT BUFFER / PURGE GAS: ☐ N<sub>2</sub> ☐ OTHER \_\_\_\_\_  
☐ VENT, DRAIN, PURGE PIPING BY MFG'S ☒ YES ☒ NO

**V-BELT DRIVE**

DRIVE SHEAVE  
(Compressor Shaft)

DRIVE SHAFT  
(Drive Shaft)

RPM (EXPECTED) \_\_\_\_\_  
PITCH DIA, mm \_\_\_\_\_  
☐ QTY & GROOVE X-SEC \_\_\_\_\_  
POWER TRANSMITTED \_\_\_\_\_  
(Incl. Belt Losses)  
DRIVER NAMEPLATE kW RATING \_\_\_\_\_  
☐ CENTER DISTANCE, mm \_\_\_\_\_  
☐ QTY, TYPE \_\_\_\_\_  
X-SEC., & LENGHT BELTS \_\_\_\_\_  
☐ BELT SERVICE FACTOR (RELATIVE TO DRIVER NAMEPLATE HP RATING) \_\_\_\_\_

**CYLINDER LUBRICATION**  
☐ NON-LUBE \_\_\_\_\_ STAGE(S) / SERVICE  
☐ LUBRICATED \_\_\_\_\_ STAGE(S) / SERVICE  
TYPE OF LUBE OIL ☐ SYNTHETIC \_\_\_\_\_  
☐ HYDROCARBON \_\_\_\_\_  
LUBRICATOR ☐ COMP. CRANKSHAFT. DIRECT  
DRIVER BY: ☐ CHAIN, FROM CRANKSHAFT  
☐ ELECTRIC MOTOR  
☐ OTHER \_\_\_\_\_  
☐ LUBRICATED MFR \_\_\_\_\_  
☐ MODEL \_\_\_\_\_  
TYPE LUBRICATOR ☐ SINGLE PLUNGER PER POINT  
☐ DIVIDER BLOCKS  
☐ COMPARTMENT, TOTAL QTY \_\_\_\_\_  
☐ PLUNGERS (PUMPS), TOTAL QTY \_\_\_\_\_  
☐ SPARE PLUNGERS, QTY \_\_\_\_\_  
☐ SPARE COMPARTMENT W/OUT PLUNGERS \_\_\_\_\_  
☐ HEATERS: ☐ ELECTRIC W/THERMOSTAT ☐ STEAM

**ESTIMATED WEIGHTS AND NOMINAL DIMENSIONS**  
☐ TOTAL COMPR. WT., LESS DRIVER & GEAR \_\_\_\_\_ kg  
☐ WT. OF COMPLETE UNIT. (LESS CONSOLES) \_\_\_\_\_ kg  
☐ MAXIMUM ERECTION WEIGHT \_\_\_\_\_ kg  
☐ MAXIMUM MAINTENANCE WEIGHT \_\_\_\_\_ kg  
☐ DRIVER WEIGHT/GEAR WEIGHT \_\_\_\_\_ / \_\_\_\_\_ kg  
☐ LUBE OIL / COOLING H<sub>2</sub>O CONSOLE \_\_\_\_\_ / \_\_\_\_\_ kg  
☐ FREE STANDING PANEL \_\_\_\_\_ kg  
SPACE REQUIREMENTS, m

LEGTH

WIDTH

HEIGHT


☐ COMPLETE UNIT \_\_\_\_\_  
☐ LUBE OIL CONSOLE \_\_\_\_\_  
☐ COOLING H<sub>2</sub>O CONSOLE \_\_\_\_\_  
☐ FREE STANDING PANEL \_\_\_\_\_  
☐ PISTON ROD REMOVAL DIST. \_\_\_\_\_


**OTHER EQUIPMENT SHIPPED LOOSE (DEFINE)**  
☐ PULSATION SUPPRESSOR, WEIGHT \_\_\_\_\_ kg  
☐ PIPING \_\_\_\_\_ kg  
☐ INTERSTAGE EQUIPMENT \_\_\_\_\_ kg

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	<b>DATA SHEET</b>		No.		REV.		
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>					SHEET	of
1	UTILITY CONSUMPTION						
2	ELECTRIC MOTORS						
3					MAIN DRIVER NON-STEADY		
4	NAMEPLATE	LOCKED ROTOR	FULL LOAD		STATE AMPS COMPRESSOR		
5			STEADY STATE		RATED HORSEPOWER		
6	kw	AMPS	AMPS		(induction Motors Only)		
7	<input type="checkbox"/> MAIN DRIVER	_____	_____	_____	_____ AMPS		
8	<input type="checkbox"/> MAIN LUBE OIL PUMP	_____	_____	_____	@ COMPRESSOR RATED		
9	<input type="checkbox"/> AUX LUBE OIL PUMP	_____	_____	_____	kW OF _____		
10	<input type="checkbox"/> MAIN COOLING WATER PUMP	_____	_____	_____	@ CURRENT PULSATIONS		
11	<input type="checkbox"/> ROS PACKING COOLING PUMP	_____	_____	_____	OF _____ %		
12	<input type="checkbox"/> CYLINDER LUBRICATOR	_____	_____	_____			
13	<input type="checkbox"/>	_____	_____	_____			
14	<input type="checkbox"/>	_____	_____	_____			
15							
16	ELECTRIC HEATERS						
17		WATTS	VOLTS	HERTZ			
18		_____	_____	_____			
19	<input type="checkbox"/> FRAME OIL HEATER(S)	_____	_____	_____			
20	<input type="checkbox"/> COOLING WATER HEATER(S)	_____	_____	_____			
21	<input type="checkbox"/> CYL. LUB. HEATER(S)	_____	_____	_____			
22	<input type="checkbox"/>	_____	_____	_____			
23	<input type="checkbox"/>	_____	_____	_____			
24							
25	STEAM						
26		FLOW	PRESSURE	TEMPERATURE	BACK PRESSURE		
27	<input type="checkbox"/> MAIN DRIVER	_____ kg/h @ _____	_____ kPa	_____ °C TT TO _____	_____ kPa		
28	<input type="checkbox"/> FRAME OIL HEATER(S)	_____ kg/h @ _____	_____ kPa	_____ °C TT TO _____	_____ kPa		
29	<input type="checkbox"/> CYL. LUB. HEATER(S)	_____ kg/h @ _____	_____ kPa	_____ °C TT TO _____	_____ kPa		
30	<input type="checkbox"/>	_____ kg/h @ _____	_____ kPa	_____ °C TT TO _____	_____ kPa		
31	<input type="checkbox"/>	_____ kg/h @ _____	_____ kPa	_____ °C TT TO _____	_____ kPa		
32							
33	COOLING WATER REQUIREMENTS						
34		FLOW	INLET TEMP	OUTLET TEMP	INLET PRESS	OUTLET PRESS	MAX PRESS
35		m <sup>3</sup> /h	°C	°C	kPa	kPa	kPa
36	<input type="checkbox"/> CYLINDER JACKETS	_____	_____	_____	_____	_____	_____
37	<input type="checkbox"/> INTERCOOLER(S)	_____	_____	_____	_____	_____	_____
38	<input type="checkbox"/> AFTERCOOLER	_____	_____	_____	_____	_____	_____
39	<input type="checkbox"/> FRAME LUBE OIL COOLER	_____	_____	_____	_____	_____	_____
40	<input type="checkbox"/> ROD PRESSURE PACKING	_____	_____	_____	_____	_____	_____
41	<input type="checkbox"/>	_____	_____	_____	_____	_____	_____
42	<input type="checkbox"/>	_____	_____	_____	_____	_____	_____
43	<input type="checkbox"/>	_____	_____	_____	_____	_____	_____
44	<input type="checkbox"/> TOTAL QUANTITY, m <sup>3</sup> /h	_____	_____	_____	_____	_____	_____
45							
46	NOTES:						
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	DATA SHEET		No.		REV.		
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>					SHEET	of

1	FRAME LUBE OIL SYSTEM							
2	<b>BASIC LUBE OIL SYSTEM FOR FRAME:</b> <input type="checkbox"/> SPLASH <input type="checkbox"/> PRESSURE (FORCED) <input type="checkbox"/> HEATERS REQUIRED:							
3	REF.: TYPE MAIN BEARINGS: <input type="checkbox"/> TAPERED ROLLER <input type="checkbox"/> PRECISION SLEEVE <input type="checkbox"/> ELEC. W/ THERMOSTAT(S) <input type="checkbox"/> STEAM							
4	PRESSURE SYSTEM: <input type="checkbox"/> MAIN OIL PUMP DRIVEN BY <input type="checkbox"/> COMP. CRANKSHAFT <input type="checkbox"/> ELEC. MOTOR <input type="checkbox"/> OTHER _____							
5								
6	<input type="checkbox"/> AUX OIL PUMP DRIVEN BY: <input type="checkbox"/> PSV FOR MAIN PUMP EXTERNAL TO CRANKCASE <input type="checkbox"/> ELEC. MOTOR <input type="checkbox"/> OTHER _____							
7	<input type="checkbox"/> HAND OPERATED PRE-LUBE PUMP FOR STARTING <input type="checkbox"/> OPERATIONAL TEST & 4 HOUR MECH RUN TEST							
8	<input type="checkbox"/> API STD 614 LUBE SYSTEM: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> CHECK VALVE ON MAIN PUMP							
9	<input type="checkbox"/> CONTINUOUS FLOW THROUGH OF OIL							
10	SEP. CONSOLE PRESS. LUBE SYS.: <input type="checkbox"/> ONE CONSOLE FOR EA. COMP <input type="checkbox"/> ONE CONSOLE FOR _____ COMPRESSORS							
11	<input type="checkbox"/> CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR. MULTI-POINT SUPPORT AND GROUTING WITH GROUND & VENT HOLES							
12								
13	ELECTRICAL CLASSIFICATION: ZONE _____ GROUP _____ CLASS _____ <input type="checkbox"/> NON-HAZARDOUS							
14								
15	BASIC SYS. REQ'MTS (NORM. OIL FLOWS & VOLUMES)							
16	<input type="checkbox"/> LUBE OIL         FLOW PRESSURE VISCOSITY SUMP VOLUME							
17	m <sup>3</sup> /h kPa Pa.s@40 °C Pa.s@100 °C m <sup>3</sup>							
18	<input type="checkbox"/> COMPRESSOR FRAME _____							
19	<input type="checkbox"/> DRIVER _____							
20	<input type="checkbox"/> GEAR _____							
21								
22	<input type="checkbox"/> SYSTEM PRESSURES: <input type="checkbox"/> DESIGN _____ kPa <input type="checkbox"/> HYDROTEST _____ kPa							
23	<input type="checkbox"/> PRESS. CTRL VALVE SETTING _____ kPa <input type="checkbox"/> PUMP RELIEF VALVE(S) SET _____ kPa							
24								
25	PIPING MATERIALS							
26	CARBON STEEL STAINLESS STEEL WITH SS FLANGES STAINLESS STEEL WITH CARBON STEEL FLANGES							
27	<input type="checkbox"/> UPSTREAM OF PUMPS & FILTERS <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
28	<input type="checkbox"/> DOWNSTREAM OF FILTERS <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
29	<input type="checkbox"/> _____ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
30	<input type="checkbox"/> _____ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
31								
32	PUMPS (Gear or <input type="checkbox"/> RATED FLOW <input type="checkbox"/> PRESSURE <input type="checkbox"/> COLD START <input type="checkbox"/> DRIVER <input type="checkbox"/> SPEED COUPLING MECH. SEAL							
33	Screw Type Only) m <sup>3</sup> kPa REQ'D kW kW rpm REQ'D REQ'D							
34	<input type="checkbox"/> MAIN _____ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
35	<input type="checkbox"/> AUXILIARY _____ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>							
36	<input type="checkbox"/> PUMP CASING MATERIAL: MAIN PUMP _____ AUX PUMP _____							
37	<input type="checkbox"/> GUARD(S) REQ. FOR COUPLING(S): <input type="checkbox"/> MAIN PUMP <input type="checkbox"/> AUX PUMP <input type="checkbox"/> GUARD TYPE OR CODE _____							
38	<input type="checkbox"/> AUXILIARY PUMP CONTROL: <input type="checkbox"/> MANUAL <input type="checkbox"/> AUTOMATIC <input type="checkbox"/> ON-OFF-AUTO SEL. SWITCH <input type="checkbox"/> BY PURCH <input type="checkbox"/> BY MFR.							
39	<input type="checkbox"/> WIRING TO TERMINAL BOX: <input type="checkbox"/> BY PURCH <input type="checkbox"/> BY MFR.							
40	<input type="checkbox"/> SWITCHES <input type="checkbox"/> RTD'S/THERMOCOUPLES							
41	COOLERS							
42	<input type="checkbox"/> SHELL & TUBE <input type="checkbox"/> SINGLE <input type="checkbox"/> DUAL W/TRANSFER VALVE <input type="checkbox"/> MFG'S STD <input type="checkbox"/> TEMA C <input type="checkbox"/> TEMA R							
43	<input type="checkbox"/> REMOVABLE BUNDLE <input type="checkbox"/> WATER COOLER <input type="checkbox"/> AIR COOLED W/AUTO TEMP CONTROL							
44	<input type="checkbox"/> W/BY-PASS & TEMP CONTROL VALVE <input type="checkbox"/> MANUAL <input type="checkbox"/> AUTO         SEE SEPARATE HEAT EXCHANGER DATA SHEET FOR DETAILS, SPECIFY % GLYCOL ON COOLING WATER SIDE							
45	FILTER(S)							
46	<input type="checkbox"/> SINGLE <input type="checkbox"/> DUAL W/TRANSFER VALVE <input type="checkbox"/> ASME CODE DESIGN <input type="checkbox"/> ASME CODE STAMPED							
47	<input type="checkbox"/> DESIGN PRESSURE, _____ kPa <input type="checkbox"/> ΔP CLEAN _____ kPa <input type="checkbox"/> ΔP COLLAPSE _____ kPa							
48	<input type="checkbox"/> MICRON RATING, _____ <input type="checkbox"/> CARTRIDGE MATERIAL, _____ <input type="checkbox"/> CARTRIDGE P/N, _____							
49	<input type="checkbox"/> BONNET MATERIAL, _____ <input type="checkbox"/> CASING MATERIAL, _____ <input type="checkbox"/> FURN, SPARE CARTR., QTY _____							
50	SYS. COMPONENT SUPP.							
51	MAIN PUMP		MANUFACTURER		MODEL		OIL COOLER(S)	
52	AUXILIARY PUMP		_____		_____		TRANSFER VALVE(S)	
53	MECHANICAL SEALS		_____		_____		PUMP COUPLING(S)	
54	ELECTRIC MOTORS		_____		_____		SUCTION STRAINER(S)	
55	STEAM TURBINES		_____		_____		CHECK VALVE(S)	
56	OIL FILTER(S)		_____		_____		_____	
57								
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	<b>DATA SHEET</b>		No.		REV.	
					SHEET	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>				of	

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**COOLING WATER SYSTEM**

**BASIC COOLING SYS. FOR:** ☐ COMPRESSOR CYL.(S) ☐ INTERCOOLER(S) ☐ AFTERCOOLER ☐ OIL COOLER(S)  
☐ HEATERS REQ'D FOR PRE-HEATING: ☐ ELEC. W/THERMOSTAT(S) ☐ STEAM  
PRESSURE FORCED CIRCULATING SYS: ☐ OPEN PIPING BY: ☐ PURCH ☐ MFR ☐ CLOSED, PIPING BY \_\_\_\_\_  
MAIN WATER PUMP DRIVEN BY: ☐ ELEC. MOTOR ☐ STEAM TURBINE ☐ OTHER \_\_\_\_\_  
AUX WATER PUMP DRIVEN BY: ☐ ELEC. MOTOR ☐ STEAM TURBINE ☐ OTHER \_\_\_\_\_  
SEP. CONSOLE FOR COOL. WATER SYS. ☐ ONE CONSOLE FOR EA. COMP. ☐ ONE CONSOLE FOR \_\_\_\_\_ COMPRESSORS  
☐ CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR MULTI-POINT SUPPORT AND GROUTING WITH GROUT &  
VENT HOLES  
ELECTRICAL CLASSIFICATION: ZONE \_\_\_\_\_ GAS GROUP \_\_\_\_\_ TEMP CLASS \_\_\_\_\_ ☐ NON-HAZARDOUS

**BASIC SYS. REQ'MTS (NORM. COOLING WATER FLOW DATA)**

COOLING WATER TO BE \_\_\_\_\_ % ETHYLENE GLYCOL

	FORCED	THERMO	STAND	FLOW	PRESSURE	INLET TEMP	OUTLET TEMP	SIGHT FLOW
	COOL'G	SIPHON	PIPE	m³/h	kPa	°C	°C	INDICATORS
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
PISTON ROD PACK'G TOTAL	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
INTERCOOLER(S) TOTAL	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
AFTERCOOLER	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
OIL COOLER(S)	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
_____	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>

TOTAL FLOW \_\_\_\_\_

☐ SYS. PRESSURES: ☐ DESIGN \_\_\_\_\_ kPa ☐ HYDROTEST \_\_\_\_\_ kPa ☐ RELIEF VALVE(S), SETTING \_\_\_\_\_ kPa  
☐ WATER RESERVOIR: ☐ SIZE: \_\_\_\_\_ mm DIA X \_\_\_\_\_ mm HT ☐ CAPACITY \_\_\_\_\_ m³ @ NORMAL OPERATING LEVEL  
☐ RESERVOIR MATERIAL \_\_\_\_\_ ☐ INTERNAL COATING, TYPE \_\_\_\_\_  
☐ LEVEL GAUGE ☐ LEVEL TRANSMITTERS ☐ DRAIN VALVE ☐ INSPECTION & CLEAN-OUT OPENINGS

**PUMPS (Centrifugal Only)** ☐ RATED FLOW ☐ PRESSURE ☐ REQ'D ☐ DRIVER ☐ SPEDD ☐ COUPLING ☐ MECH. SEAL  
m³/h kPa kW kW rpm REQ'D REQ'D  
☐ MAIN \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_  
☐ AUXILIARY \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_  
☐ PUMP CASING MATERIAL MAIN PUMP \_\_\_\_\_ AUX PUMP \_\_\_\_\_  
☐ GUARD(S) REQ. FOR COUPLING(S) ☐ MAIN PUMP ☐ AUX PUMP ☐ GUARD TYPE OR CODE \_\_\_\_\_  
☐ AUXILIARY PUMP CONTROL ☐ MANUAL ☐ AUTOMATIC ☐ ON-OFF-AUTO SEL. SWITCH: ☐ BY PURCH ☐ BY MFR  
☐ WIRING TO TERMINAL BOX: ☐ BY PURCH ☐ BY MFR


**COOLING WATER HEAT EXCH:** ☐ SHELL & TUBE ☐ SINGLE ☐ DUAL W/ TRANSFER VALVE ☐ TEMA C ☐ TEMA R  
☐ AIR COOLED EXCHANGER W/ AUTO TEMP CONTROL  
☐ W/BY-PASS & TEMP CONTROL VALVE: ☐ MANUAL ☐ AUTO ☐ LOUVERS FOR AIR EXCH.  
☐ SEE SEPARATE COOLER DATA SHEET FOR DETAILS; SPECIFY % GLYCOL ON BOTH SIDE OF SHELL & TUBE

SYS. COMPONENT SUPP	MANUFACTURER	MODEL		MANUFACTURER	MODEL
<input type="checkbox"/> MAIN PUMP	_____	_____	<input type="checkbox"/> TEMP CONTROL VALVE(S)	_____	_____
<input type="checkbox"/> AUXILIARY PUMP	_____	_____	<input type="checkbox"/> TRANSFER VALVE(S)	_____	_____
<input type="checkbox"/> MECHANICAL SEALS	_____	_____	<input type="checkbox"/> _____	_____	_____
<input type="checkbox"/> ELECTRIC MOTORS	_____	_____	<input type="checkbox"/> _____	_____	_____
<input type="checkbox"/> STEAM TURBINES	_____	_____	<input type="checkbox"/> _____	_____	_____
<input type="checkbox"/> HEAT EXCHANGERS	_____	_____	<input type="checkbox"/> _____	_____	_____
<input type="checkbox"/> PUMP COUPLING	_____	_____	<input type="checkbox"/> _____	_____	_____

NOTES:

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	DATA SHEET		No.	REV.	
	TITLE: RECIPROCATING COMPRESSOR SI UNIT			SHEET	of

1	APPLICABLE TO:	<input checked="" type="checkbox"/> PROPOSAL	<input type="checkbox"/> PURCHASE	<input type="checkbox"/> AS BUILT
2	FOR:			
3	SITE:			
4	NO. REQ'D:			
5	MODEL:			
6	SIZE/TYPE:			
7	SERIAL NO.:			
8				
9	PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS			
10	THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION			
11	GENERAL INFORMATION APPLICABLE TO ALL SUPPRESSORS			
12	TOTAL NUMBER OF SERVICES AND/OR STAGES _____			
13	TOTAL NUMBER OF COMPRESSOR CYL. _____ TOTAL NUMBER OF CRANKTHROWS _____ STROKE _____ mm rpm _____			
14	<input type="checkbox"/> ASME CODE STAMP <input type="checkbox"/> GOVERNMENTAL CODES OF _____ CODE REGULATIONS APPLY			
15	<input type="checkbox"/> OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE _____			
16	<input type="checkbox"/> LUBE SERVICE <input type="checkbox"/> NON-LUBE SERV. <input type="checkbox"/> NO OIL ALLOWED INTERNALLY			
17	DRY TYPE INTERNAL CORROSION COATING <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
18	RADIOGRAPHY OF WELDS <input type="checkbox"/> NONE <input type="checkbox"/> SPOT <input type="checkbox"/> 100 % <input type="checkbox"/> IMPACT TEST <input type="checkbox"/> SPECIAL WELDING REQUIREMENTS			
19	<input type="checkbox"/> SHOP INSPECTION <input type="checkbox"/> WITNESSED <input type="checkbox"/> OBSERVED			
20	<input type="checkbox"/> WITNESS HYDROTEST			
21	<input type="checkbox"/> OUTDOOR STORAGE OVER _____ MONTHS <input type="checkbox"/> SPECIAL PAINT SPEC _____			
22	<input type="checkbox"/> ACOUSTICAL SIMULATION STUDY <input type="checkbox"/> DESIGN APPROACH: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
23	CYLINDER, GAS, OPERATING, AND SUPPRESSOR DESIGN DATA			
24		SERVICE		STAGE NO.
25	<input type="checkbox"/> COMPRESSOR MANUFACTURER'S RATED CAPACITY	kg/h _____	m <sup>3</sup> /h _____	101,3 kPa @ 0 °C
26	<input type="checkbox"/> LINE SIDE IOERATING PRESSURE	INLET. _____ kPa a	DISCHARGE _____ kPa a	
27	<input type="checkbox"/> OPERATING TEMP. WITHIN SUPPRESSORS	INLET. _____ °C	DISCHARGE _____ °C	
28	<input type="checkbox"/> ALLOWABLE PRESSURE DROP THROUGH SUPPRESSORS	ΔP _____ kPa a    %	ΔP _____ kPa a    %	
29		INLET SUPPRESSOR		DISCHARGE SUPPRESSOR
30	<input type="checkbox"/> SUPPRESSOR TAG NUMBER			
31	<input type="checkbox"/> COMBINATION INLET SUPP SEPARATOR / INTERNALS	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO    / <input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> YES <input type="checkbox"/> NO
32	<input type="checkbox"/> NO. (QTY) OF INLET & DISCH. SUPP. PER STAGE			
33	<input type="checkbox"/> ALLOWABLE PEAK-PEAK PULSE @ LINE SIDE NOZZLE	_____ kPa a / _____ %		_____ kPa a / _____ %
34	<input type="checkbox"/> ALLOWABLE PEAK-PEAK PULSE @ CYL FLANGE NOZZLE	_____ kPa a / _____ %		_____ kPa a / _____ %
35	<input type="checkbox"/> DESIGN FOR FULL VACUUM CAPABILITY	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
36	<input type="checkbox"/> MIN REQ'D WORKING PRESSURE & TEMPERATURE	_____ kPa a @ _____ °C		_____ kPa a @ _____ °C
37				
38	<input type="checkbox"/> INITIAL SIZING VOLUME	_____ m <sup>3</sup>		_____ m <sup>3</sup>
39	<input type="checkbox"/> AS BUILT VOLUME	_____ m <sup>3</sup>		_____ m <sup>3</sup>
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41	NOTES:			
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 THIS FORM IS PART OF PETROBRAS N-1854 REV. D ANNEX A - SHEET 14/21.

	<b>DATA SHEET</b>		No.	REV.	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>			SHEET	of
1	PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS (CONT.)		SERVICE		
2	THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION		STAGE NO.		
3	<b>CONSTRUCTION REQUIREMENTS &amp; DATA</b>		<b>INLET SUPPRESSOR</b>	<b>DISCHARGE SUPPRESSOR</b>	
4	<input type="checkbox"/> SUPPRESSOR TAG NUMBER				
5	<input type="checkbox"/> BASIC MATERIAL REQUIRED, CS, SS ETC.				
6	<input type="checkbox"/> ACTUAL MATERIAL DESIGNATION SHELL/HEAD <input type="checkbox"/> YES <input type="checkbox"/> NO		/	/	
7	<input type="checkbox"/> SPECIAL HARDNESS LIMITATION, Rc		<b>SHELL &amp; HEADS WELDS</b>	<b>SHELL &amp; HEADS WELDS</b>	
8	<input type="checkbox"/> CORROSION ALLOWANCE, mm		mm	mm	
9	<input type="checkbox"/> WALL THICKNESS, mm		mm / mm	mm / mm	
10	<input type="checkbox"/> NOM. SHELL DIA X OVERALL LGTH.		X mm / m <sup>3</sup>	X mm / m <sup>3</sup>	
11	<input type="checkbox"/> PIPE OR ROLLED PLATE CONSTRUCTION		<input type="checkbox"/> PIPE <input type="checkbox"/> ROLLED PLATE	<input type="checkbox"/> PIPE <input type="checkbox"/> ROLLED PLATE	
12	<input type="checkbox"/> ACT. MAX. ALLOW. WORKING PRESS. AND TEMPERATURE		kPa a @ °C	kPa a @ °C	
13	<input type="checkbox"/> MINIMUM DESIGN METAL TEMP		°C	°C	
14	<input type="checkbox"/> INLET SUPPRESSOR TO BE SAME MAWP AS DISCHARGE SUPP.		<input type="checkbox"/> YES <input type="checkbox"/> NO		
15	<input type="checkbox"/> MAX. EXPECTED PRESSURE DROP ΔP, % LINE PRESS		ΔP kPa a / %	ΔP kPa a / %	
16	<input type="checkbox"/> WEIGHT, (EACH)		kg	kg	
17	<input type="checkbox"/> INSUL. NUTS & ALLOW. FOR INSULATION REQUIRED				
18	<input type="checkbox"/> EXPECTED P-P PULSE @ LINE SIDE/CYL. FLG, % LINE PRESS BASED ON FINAL SUPPRESSOR DESIGN		% / %	% / %	
19	<input type="checkbox"/> SUPPORTS, TYPE/QUANTITY				
20					
21	<b>CONNECTION REQUIREMENTS &amp; DATA</b>				
22	<input type="checkbox"/> LINE SIDE FLANGE, SIZE/RATING/TYPE				
23	<input type="checkbox"/> COMP. CYL. FALNGE(S), QTY/SIZE/RATING/FACING/TYPE				
24	<input type="checkbox"/> FLANGE FINISH <input type="checkbox"/> PER 3.9.3.15 > 125 < 250 <input type="checkbox"/> SPECIAL (SPECIFY)				
25	<input type="checkbox"/> PER ASME B16.5				
26	<input type="checkbox"/> INSPECTION OPENINGS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> BLINDED	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> BLINDED	
27	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
28	<input type="checkbox"/> QTY, SIZE, /FLG TYPE & RATING (SEE NOTE 4)				
29	<input type="checkbox"/> VENT CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
30	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
31	<input type="checkbox"/> QTY, SIZE, /FLG TYPE & RATING (SEE NOTE 4)				
32	<input type="checkbox"/> DRAIN CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
33	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
34	<input type="checkbox"/> QTY, SIZE, /FLG TYPE & RATING (SEE NOTE 4)				
35	<input type="checkbox"/> PRESSURE CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
36	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
37	<input type="checkbox"/> QTY, SITE, /FLG TYPE & RATING (SEE NOTE 4)				
38	<input type="checkbox"/> TEMPERATURE CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
39	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
40	<input type="checkbox"/> CYL NOZZLE <input type="checkbox"/> MAIN BODY				
41	<input type="checkbox"/> QTY, SITE, /FLG TYPE & RATING (SEE NOTE 4)				
42					
43					
44					
45	<b>OTHER DATA AND NOTES</b>				
46	<input type="checkbox"/> COMPRESSOR MFG'S SUPP, OUTLINE OR DRAWING NO.				
47	<input type="checkbox"/> SUPP, MFG'S OUTLINE OR DRAWING NO.				
48	NOTES:				
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<div><div></div><div>PETROBRAS</div></div>		DATA SHEET		No.	REV.	
					SHEET	of
		TITLE:				
RECIPROCATING COMPRESSOR SI UNIT						
1	APPLICABLE TO: <input type="checkbox"/> PROPOSAL <input type="checkbox"/> PURCHASE <input type="checkbox"/> AS BUILT					
2	FOR: _____			UNIT: _____		
3	SITE: _____			SERVICE: _____		
4	NO. REQ'D: _____			MANUFACTURER: _____		
5	MODEL: _____			VENDOR: _____		
6	SIZE/TYPE: _____			DRIVER/DRIVEN MFR: _____		
7	SERIAL NO.: _____			MANUFACTURER NO.: _____		
8						
9	GENERAL INFORMATION APPLICABLE TO ALL EXCHANGER (SEE NOTES 5 AND 6)					
10	REF TOTAL NUMBER OF SERVICES AND/OR STAGES FOR COMPRESSOR _____					
11	<input type="checkbox"/> ASME CODE STAMP <input type="checkbox"/> STATE / COUNTRY / PROVINCE OF _____ <input type="checkbox"/> CODE REGULATIONS APPLY					
12	<input type="checkbox"/> OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE _____					
13	<input type="checkbox"/> LUBE SERVICE <input type="checkbox"/> NON-LUBE SERV. <input type="checkbox"/> NO OIL ALLOWED INTERNALLY <input type="checkbox"/> DRY TYPE INTER. CORR. COATING					
14	<input type="checkbox"/> OUTDOOR STORAGE OVER _____ MONTHS <input type="checkbox"/> SPECIAL PAINT SPEC. <input type="checkbox"/> GLYCOL ON WATER					
15	<input type="checkbox"/> SHOP INSPECTION <input type="checkbox"/> WITNESSED <input type="checkbox"/> OBSERVED <input type="checkbox"/> WITNESS HYDROTEST					
16	<input type="checkbox"/> TEMA C					
17	<input type="checkbox"/> TEMA R (API STD 660 DATA SHT. ATTACHED)					
18						
19	PERFORMANCE OF ONE EXCHANGER					
20	<input type="checkbox"/> THIS EXCHANGER IS FOR: <input type="checkbox"/> INTERCOOLER BETW. STAGE & STAGE <input type="checkbox"/> AFTERCOOLER <input type="checkbox"/> DBL PIPE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO					
21	<input type="checkbox"/> SPECIAL OIL COOLER <input type="checkbox"/> SPECIAL COOLING WATER COOLER					
22	<input type="checkbox"/> HORIZONTAL <input type="checkbox"/> VERTICAL <input type="checkbox"/> TOTAL NUMBER OF IDENTICAL EXCHANGERS PER THIS COMPLETED DATA SHEET					
23						
24	DESIGN DUTY _____ W                      SIZE _____ / _____ / _____					
25	TRANSFER RATE, W/m <sup>2</sup> °C:         SERVICE _____ CLEAN _____ MTD (CORR.) _____ °C					
26	TOTAL SURFACE (EFF) _____ m                      SHELL / UNIT _____ SURFACE / SHELL (EFF) _____ m <sup>2</sup>					
27						
28	SHELL SIDE				TUBE SIDE	
29	FLUID					
30	TOTAL FLOW, kg/h					
31	INLET		OUTLET		INLET	
32						
33	LIQUID, Kg/h					
34	MOLECULAR WT.					
35	SPEC. GRAVITY					
36	THERM COND, W/m °C					
37	SPEC. HEAT, kcal/kg °C					
38	VISCOSITY, Pa.s					
39	VAPOR, kg/h					
40	MOLECULAR WT.					
41	DENSITY, kg/m <sup>3</sup>					
42	THERMAL COND, W/m °C					
43	SPEC. HEAT, kcal/kg °C					
44	VISCOSITY, Pa.s					
45	LATEN HEAT, kcal/kg					
46	DEW POINT, °C					
47	NON-CONDENSABLES, kg/h					
48	MOLECULAR WT.					
49	STEAM LEFT IN GAS, kg/h					
50	WATER CONDENSED, kg/h					
51	NOTES:					
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<div><div><div>BR</div><div>PETROBRAS</div></div></div>		DATA SHEET				No.		REV.	
						SHEET of			
TITLE: RECIPROCATING COMPRESSOR SI UNIT									
1 HEAT EXCHANGER FOR RECIPROCATING COMPRESSOR (CONT.)						SERVICE			
2						<input type="checkbox"/> INTERCOOLER BETW. STG & STG			
3						<input type="checkbox"/> AFTERCOOLER			
4									
5 PERFORMANCE OF ONE EXCHANGER (CONT.)									
		INLET / SHELL SIDE / OUTLET		INLET / TUBE SIDE / OUTLET					
7 TEMPERATURE, °C									
8 PRESSURE (ATMOS), kPa									
9 PRESSURE DROP, kPa		ALLOW:		CALC.:		ALLOW:		CALC.:	
10 VELOCITY, m/s									
11 FOULING FACTOR, m² °C/W									
12 DESIGN PRESSURE, kPa g									
13 TEST PRESSURE, kPa g									
14 DESIGN TEMPERATURE, °C									
15 CORR. ALLOWANCE, mm									
16 NUMBER OF PASSES									
17 DIF. DES PRESSURE, kPa g									
18 FLOW ARRANGEMENT									
19									
20 CONSTRUCTION									
21 SHELL DIA (OD) (ID)		mm		BAFFLE TYPE		WT. BUNDLE & SHELL		kg	
22 NO. TUBES / SHELL				NO. SPACING X mm		WT. BUNDLE		kg	
23 OD X LENGTH		X		SEGMENTAL CUT %		WT. FULL ON WATER		kg	
24 GAUGE BWG		mm (AVE)(MIN)		IMPIGEMENT BAFLE <input type="checkbox"/> YES <input type="checkbox"/> NO		V² INLET NOZZLE			
25 TUBE PITCH		mm		EXPANSION JOINT <input type="checkbox"/> YES <input type="checkbox"/> NO		V² BUNDLE ENTR			
26 TEMA CLASS				EXP. JOINT DES TEMP °C		V² BUNDLE EXIT			
27 CODE REQ ASME				SURFACE PREP		SPECIFICATIONS			
28 CODE STAMP <input type="checkbox"/> YES <input type="checkbox"/> NO				PAINT		FLOATING TYPE TUBE SHT			
29 REMVBL TUBE BUNDLE <input type="checkbox"/> YES <input type="checkbox"/> NO				INSULATION <input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> YES <input type="checkbox"/> NO			
30 TUBES <input type="checkbox"/> U-BEND <input type="checkbox"/> STRAIGHT				BY-PASS SEAL ARR'MT <input type="checkbox"/> YES <input type="checkbox"/> NO		SEAL TYPE LONG BAFFLE			
31 SHELL COVER <input type="checkbox"/> INTEG. <input type="checkbox"/> REMVBL				TUBE-TUBE SHT JT <input type="checkbox"/> ROLLED		<input type="checkbox"/> WELDED			
32 MATERIALS (MARK "SR" FOR STRESS RELIVED, "XR" FOR RADIOGRAPHED)									
33 TUBES / TUBESSHEET				SHELL / SHELL COVER					
34 BAFFLES / TUBESUPPORTS				SHELL FLANGE					
35 TIE RODS & SPACERS				CHANNEL / BONNET					
36 LONG BAFFLE				CHANNEL COVER / FLANGE					
37 GASKET SHELL SIDE / TUBE SIDE				FLOATING HEAD COVER					
38 BOLTING				EXPANSION JOINT					
39 FLOATING HEAD GASKET				FLOATING HEAD SEAL					
40									
41									
42 INLET									
43 OUTLET									
44 VENT									
45 DRAIN									
46 PRESSURE GAUGE (EA. NOZZLE)									
47 THERMOWELL CONN (EA. NOZZLE)									
48 INTERCONNECTING CONN.									
49 SPECIFY GAS SIDE FLANGE FINISH									
50									
51 NOTES:									
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<div></div>	DATA SHEET		No.		REV.	
					SHEET	
					of	
	TITLE: RECIPROCATING COMPRESSOR SI UNIT					

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INSTRUMENTATION								
INSTRUMENT & CONTROL		<input type="checkbox"/> ONE FOR EA. UNIT <input type="checkbox"/> ONE COMMON TO ALL UNITS						
PANEL:		<input type="checkbox"/> MACHINE MT'ED <input type="checkbox"/> FREE STANDING (OFF UNIT) <input type="checkbox"/> LOCAL <input type="checkbox"/> REMOTE <input type="checkbox"/> OUTDOORS						
		<input type="checkbox"/> PNEUMATIC <input type="checkbox"/> ELEC. <input type="checkbox"/> ELETRONIC <input type="checkbox"/> HYDRAULIC <input type="checkbox"/> PROGRAMMABLE CONTRLR						
		<input type="checkbox"/> NEMA 7 CLASS    _____, GROUP _____, DIVISION _____ <input type="checkbox"/> INTRINAICALLY SAFE						
		<input type="checkbox"/> IEC    _____, ZONE _____, GROUP _____, TEMPERATURE CLASS _____ <input type="checkbox"/> NON HAZARDOUS AREA						
		<input type="checkbox"/> I/S BARRIERS						
		<input type="checkbox"/> NEMA 4, WATERTIGHT & DUSTTIGHT <input type="checkbox"/> PURGED TO NFPA 496    TYPE <input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> Z						
		<input type="checkbox"/> OTHER NEMA _____ LOW PURGE PRESS <input type="checkbox"/> ALARM <input type="checkbox"/> SHUTDOWN						
		<input checked="" type="checkbox"/> VIB. ISOLATORS <input type="checkbox"/> STRIP HEATERS <input type="checkbox"/> PURGE CONN. <input type="checkbox"/> EXTRA CUTOUTS						
		<input type="checkbox"/> ANNUNCIATOR W/FIRST-OUT INDICATION LOCATION LOCATED ON CONTROL PANEL						
		<input type="checkbox"/> PURCHASER'S CONN. BROUGHT OUT TO TERMINAL BOX BY VENDOR						
ADDITIONAL PANEL REMARKS: _____								
<input type="checkbox"/> INSTRUMENTATION SUITABLE FOR: <input type="checkbox"/> INDOORS <input type="checkbox"/> OUTDOORS <input type="checkbox"/> OTHER _____								
PREFERRED INSTRUMENT SUPPLIERS, (TO BE COMPLETED BY PURCHASER), OTHERWISE MFR'S STANDARD APPLIES								
PRESSURE GAUGES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
TEMPERATURE GAUGES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
LIQUID LEVEL GAUGES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
DIFF. PRESSURE GAUGES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
PRESSURE TRANSMITTERS		MFR	_____	SIZE & TYPE	_____	MTL	_____	
TEMPERATURE TRANSMITTERS		MFR	_____	SIZE & TYPE	_____	MTL	_____	
LIQUID LEVEL TRANSMITTERS		MFR	_____	SIZE & TYPE	_____	MTL	_____	
DIFF. PRESSURE TRANSMITTERS		MFR	_____	SIZE & TYPE	_____	MTL	_____	
FLOW TRANSMITTERS		MFR	_____	SIZE & TYPE	_____	MTL	_____	
TACHOMETER		MFR	_____	SIZE & TYPE	_____	MTL	_____	
CONTROL VALVES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
PRESSURE SAFETY VALVES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
SIGHT FLOW INDICATORS		MFR	_____	SIZE & TYPE	_____	MTL	_____	
VIBRATION MONITORS & EQUIP.		MFR	_____	SIZE & TYPE	_____	MTL	_____	
THERMOCOUPLES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
RTD'S		MFR	_____	SIZE & TYPE	_____	MTL	_____	
SOLENOID VALVES		MFR	_____	SIZE & TYPE	_____	MTL	_____	
ANNUNCIATOR		MFR	_____	MODEL & (QTY SPARE POINTS)	_____	( _____ )		
PROGRAMMABLE CONTROLLER		MFR	_____	SIZE & TYPE	_____	MTL	_____	
_____		MFR	_____	SIZE & TYPE	_____	MTL	_____	
PRESSURE GAUGE REQUIREMENTS (LIQUID FILLED PRESSURE GAUGES: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO )								
		LOCALLY	LOCAL	CONTROL		LOCALLY	LOCAL	CONTROL
FUNCTION		MOUNTED	PANEL	ROOM	FUNCTION	MOUNTED	PANEL	ROOM
LUBE OIL MAIN PUMP DISCHARGE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PROCESS GAS:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL AUX PUMP DISCHARGE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	INLET PRESS (@ EA. STAGE)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL PRESS. AT FRAME HEADER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DISCH PRESS (@ EA. STAGE)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL FILTER ΔP		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING WATER INLET HEADER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NOTES:								

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THIS FORM IS PART OF PETROBRAS N-1854 REV. D ANNEX A - SHEET 18/21.

<div></div>	DATA SHEET		No.		REV.	
					SHEET	
	TITLE: RECIPROCATING COMPRESSOR SI UNIT				of	

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INSTRUMENTATION (CONT.)										
TEMPERATURE GAUGE REQUIREMENTS				LOCALLY	LOCAL	CONTROL	GAUGE W/	THERMO	RTD	I/S
FUNCTION				MOUNTD	PANEL	ROOM	CAPILLARY	COUPLE SYS	SYS	SYS
LUBE OIL <input type="checkbox"/> INLET TO <input type="checkbox"/> OUT OF FRAME				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL <input type="checkbox"/> INLET TO <input type="checkbox"/> OUT OF COOLER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MAIN JOURNAL BEARINGS (THERMOCOUPLES OR RTD'S ONLY)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOTOR BEARING(S) (THERMOCOUPLES OR RTD'S ONLY)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING WATER HEADER: <input type="checkbox"/> INLET <input type="checkbox"/> OULET				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CYL. COOLING WATER: <input type="checkbox"/> INLET <input type="checkbox"/> OULET <input type="checkbox"/> EACH CYL				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROCESS GAS: <input type="checkbox"/> INLET <input type="checkbox"/> DISCHARGE <input type="checkbox"/> EACH CYL				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INTERCOOLER(S): <input type="checkbox"/> INLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> OUTLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AFTERCOOLER: <input type="checkbox"/> INLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> OUTLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING WATER: <input type="checkbox"/> INLET <input type="checkbox"/> OUTLET COOLED PKG CASE				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PRESS. PKG CASE, CYL PIST ROD (THERMOCOUPLES OR RTD'S ONLY)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COMPRESSOR VALVES <input type="checkbox"/> SUCT. <input type="checkbox"/> DISCH. TC'S OR RTD'S ONLY				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


ANNUNCIATION POINTS					
ALARM			SHUTDOWN		TOTAL
IN PNL	IN CTL ROOM	IN PNL	IN CTL ROOM	NO. OF	
BY MFR	PNL OTHERS	BY MFR	PNL OTHERS	POINTS	
FUNCTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW LUBE OIL PRESSURE @ BEARING HEADER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH LUBE OIL ΔP ACROSS FILTER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW LUBE OIL LEVEL, FRAME	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AUX LUBE OIL PUMP, FAIL TO START	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CYLINDER LUBE SYSTEM PROTECTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH COMPRESSOR VIBRATION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIBRATION WITH CONTINUOUS MONITORING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ROD DROP DETECTOR CONTACT TYPE (1 / CYL)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ROD DROP PROXIMITY PROBES (1 / CYL)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH OIL TEMP OUT OF FRAME	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH JACKET WATER TEMPERATURE, EACH CYLINDER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH GAS DISCHARGE TEMPERATURE, EACH CYLINDER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW SUCTION PRESSURE <input type="checkbox"/> FIRST STG <input type="checkbox"/> EA STG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH SUCTION PRESSURE <input type="checkbox"/> FIRST STG <input type="checkbox"/> EA STG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH DISCHARGE PRESSURE <input type="checkbox"/> FINAL <input type="checkbox"/> EA STG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH CYLINDER GAS ΔP EACH STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH LIQUID LEVEL, EACH MOISTURE SEPARATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW PURGE GAS PRESSURE DISTANCE PIECE(S)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH X-HD PIN TEMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PRESSURE PACKING CASE (PISTON ROD TEMP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TOTAL NUMBER OF ANNUNCIATION POINTS					

SWITCH CONTACT OPERATION (SEE NOTE 2)	
ALARM CONTACTS SHALL <input type="checkbox"/> OPEN (DE-ENERGIZED) TO SOUND ALARM & BE ENERGIZED WHEN COMPRESSOR IS IN OPERATION	
<input type="checkbox"/> CLOSE (ENERGIZE) TO SOUND ALARM & BE DE-ENERGIZED WHEN COMPRESSOR IS IN OPERATION	
SHUTDOWN CONTACTS SHALL <input type="checkbox"/> OPEN (DE-ENERGIZED) TO SHUTDOWN BE ENERGIZED WHEN COMPRESSOR IS IN OPERATION	
<input type="checkbox"/> CLOSE (ENERGIZE) TO SHUTDOWN BE DE-ENERGIZED WHEN COMPRESSOR IS IN OPERATION	

NOTES:

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	DATA SHEET		No.		REV.	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>SI UNIT</b>				SHEET	of


1	INSTRUMENTATION (CONT.)					
2	MISCELLANEOUS INSTRUMENTATION		<input type="checkbox"/> INTERCOOLER(S) <input type="checkbox"/> AFTERCLR <input type="checkbox"/> OIL CLR <input type="checkbox"/> H <sub>2</sub> O CLR			
3	SIGHT FLOW IND. (COOLING H <sub>2</sub> O ONLY)	<input type="checkbox"/>	FOR:	<input type="checkbox"/> CYL JACKET WATER <input type="checkbox"/> ROD PRESS. PACKING CASES		
4	PNEUMATIC PRESSURE TRANSMITTERS	<input type="checkbox"/>	FOR:	_____		
5	PRESSURE TRANSMITTERS (ELEC. OUTP.)	<input type="checkbox"/>	FOR:	_____		
6	PNEUMATIC LEVEL TRANSMITTERS	<input type="checkbox"/>	FOR:	_____		
7	ALARM HORN & ACK'N LMT TEST BUTTON	<input type="checkbox"/>	FOR:	_____		
8	CONDUIT & WIRING W/JUNCT. BOXES (CONSOLES)	<input type="checkbox"/>	FOR:	_____		
9	TEST VALVES	<input type="checkbox"/>	FOR:	_____		
10	DRAIN VALVES	<input type="checkbox"/>	FOR:	_____		
11	GAUGE GLASS(ES)	<input type="checkbox"/>	FOR:	_____		
12	TACHOMETER	<input type="checkbox"/>	FOR:	_____ SPEED RANGE _____ TO _____ rpm		
13	CRANKSHAFT KEY PHASOR AND TRANSDUCER	<input type="checkbox"/>	FOR:	_____		
14	_____	<input type="checkbox"/>	FOR:	_____		
15						
16	SEPARATE LUBE OIL CONSOLE INSTRUMENTATION: PURCH, TO LIST REQ'MTS IN ADDITION TO ANY ABOVE REQ'MTS					
17	_____	<input type="checkbox"/>	FOR:	_____		
18	_____	<input type="checkbox"/>	FOR:	_____		
19	_____	<input type="checkbox"/>	FOR:	_____		
20	_____	<input type="checkbox"/>	FOR:	_____		
21	_____	<input type="checkbox"/>	FOR:	_____		
22						
23	SEPARATE COOLING WATER CONSOLE INSTRUMENT: PURCH, TO LIST REQ'MTS IN ADDITION TO ANY ABOVE REQ'MTS					
24	_____	<input type="checkbox"/>	FOR:	_____		
25	_____	<input type="checkbox"/>	FOR:	_____		
26	_____	<input type="checkbox"/>	FOR:	_____		
27	_____	<input type="checkbox"/>	FOR:	_____		
28	_____	<input type="checkbox"/>	FOR:	_____		
29						
30	RELIEF VALVES					
31	LOCATION	BY	MANUFACTURER	TYPE	SIZE	SETTING
32	_____		<input type="checkbox"/>	_____	_____	_____
33	_____		<input type="checkbox"/>	_____	_____	_____
34	_____		<input type="checkbox"/>	_____	_____	_____
35	_____		<input type="checkbox"/>	_____	_____	_____
36	_____		<input type="checkbox"/>	_____	_____	_____
37	_____		<input type="checkbox"/>	_____	_____	_____
38	_____		<input type="checkbox"/>	_____	_____	_____
39	_____		<input type="checkbox"/>	_____	_____	_____
40	_____		<input type="checkbox"/>	_____	_____	_____
41	_____		<input type="checkbox"/>	_____	_____	_____
42						
43	NOTES:					
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	DATA SHEET	No.	REV.
			SHEET of
	TITLE:  RECIPROCATING COMPRESSOR  SI UNIT		
NOTES:			
<p>NOTE 1     Manufacturer shall recommend best type of cooling after final engineering review of all operating conditions.</p> <p>NOTE 2     All tubing wiring &amp; connections between off-unit free standing panels and compressor unit by others.</p> <p>NOTE 3     At cylinder flanges.</p> <p>NOTE 4     As-built</p> <p>NOTE 5     Use this data sheet for all process gas exchanger and special oil and cooling water coolers. Use standard tema heat exchanger specific data sheet for standard oil and cooling cooling water coolers.</p> <p>NOTE 6     These sheets to be filled out for each exchanger.</p> <p>NOTE 7     Alarm and shutdown shall be individually separate annunciator points.</p>			
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<div> PETROBRAS</div>	DATA SHEET					No.				
	CLIENT:							SHEET <div>1 of 21</div>		
	JOB:									
	AREA:									
		TITLE: <div>RECIPROCATING COMPRESSOR - METRIC UNIT (kgf/cm²)</div>								
INDEX OF REVISIONS										
REV.	DESCRIPTION AND/OR REVISED SHEETS									
	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H	
DATE										
DESIGN										
EXECUTION										
CHECK										
APPROVAL										
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	DATA SHEET		No. _____		REV. _____		
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>					SHEET _____ of _____	


1	GAS ANALYSIS AT OPERATING CONDITIONS								REMARKS	
2	MOLE % (BY VOLUME) ONLY									
3	<input type="checkbox"/> SERVICE / ITEM NO. <input type="checkbox"/> NORMAL OR ALT <input type="checkbox"/> STAGE									
4										
5										
6		SYMBOL	MW							
7	AIR		28,966							
8	OXYGEN	O <sub>2</sub>	32,000							
9	NITROGEN	N <sub>2</sub>	28,016							
10	WATER VAPOR	H <sub>2</sub> O	18,016							
11	CARBON MONOXIDE	CO	28,010							
12	CARBON DIOXIDE	CO <sub>2</sub>	44,010							
13	HYDRO SULFITE	H <sub>2</sub> S	34,076							
14	HYDROGEN	H <sub>2</sub>	2,016							
15	METHANE	CH <sub>4</sub>	16,042							
16	ETHYLENE	C <sub>2</sub> H <sub>4</sub>	28,052							
17	ETHANE	C <sub>2</sub> H <sub>6</sub>	30,068							
18	PROPYLENE	C <sub>3</sub> H <sub>6</sub>	42,078							
19	PROPANE	C <sub>3</sub> H <sub>8</sub>	44,094							
20	I-BUTANE	C <sub>4</sub> H <sub>10</sub>	58,120							
21	N-BUTANE	C <sub>4</sub> H <sub>10</sub>	58,120							
22	I-PENTANE	C <sub>5</sub> H <sub>12</sub>	72,146							
23	N-PENTANE	C <sub>5</sub> H <sub>12</sub>	72,146							
24	HEXANE PLUS									
25	AMMONIA	NH <sub>3</sub>	17,031							
26	HYDRO CHLORIDE	HCl	36,461							
27	CHLORINE	Cl	70,914							
28	CHLORIDES-TRACES									
29										
30										
31										
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34										
35										
36										
37										
38										
39										
40										
41										
42										
43										
44	SITE / LOCATION CONDITIONS									
45	ELEVATION _____	m	BAROMETER _____	kgf/cm²	a	AMBIENT TEMPS: MAX _____	°C.	MIN _____	°C.	
46			<input type="checkbox"/> MIN. DESIGN METAL TEMP _____	°C.		RELATIVE HUMIDITY: MAX _____	%	MIN _____	%	
47	COMPRESSOR LOCATION		<input type="checkbox"/> INDOOR	<input type="checkbox"/> HEATED	<input type="checkbox"/> UNHEATED	<input type="checkbox"/> AT GRADE LEVEL	<input type="checkbox"/> ELEVATED _____	m		
48			<input type="checkbox"/> OUTDOOR	<input type="checkbox"/> NO ROOF	<input type="checkbox"/> UNDER ROOF	<input type="checkbox"/> PARTIAL SIDES	<input type="checkbox"/> PLATFORM		<input type="checkbox"/> ON SHORE	
49			<input type="checkbox"/> OFF-SHORE		<input type="checkbox"/> WEATHER PROTECTION REQ.		<input type="checkbox"/> TROPICALIZATION REQ.			
50			<input type="checkbox"/> WINTERIZATION REQUIRED							
51	UNUSUAL CONDITIONS		<input type="checkbox"/> CORROSIVES	<input type="checkbox"/> DUST	<input type="checkbox"/> FUMES	<input type="checkbox"/> OTHER _____				
52				<input type="checkbox"/> SALTY ATMOSPHERE						
53	ELECTRICAL CLASSIFICATIONS									
54			HAZARDOUS				NON-HAZARDOUS			
55	MAIN UNIT	<input type="checkbox"/> ZONE _____	GAS GROUP _____	TEMP. CLASS _____				<input type="checkbox"/>		
56	LO CONSOLE	<input type="checkbox"/> ZONE _____	GAS GROUP _____	TEMP. CLASS _____				<input type="checkbox"/>		
57	CW CONSOLE	<input type="checkbox"/> ZONE _____	GAS GROUP _____	TEMP. CLASS _____				<input type="checkbox"/>		
58										
59										
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	<b>DATA SHEET</b>		No.	REV.
				SHEET
	TITLE:			of
	<b>RECIPROCATING COMPRESSOR</b>			
<b>METRIC UNIT (kgf/cm²)</b>				
1	SCOPE OF BASIC SUPPLY			
2	<input type="checkbox"/> COMPRESSOR <input type="checkbox"/> LUBE <input type="checkbox"/> NON-LUBE			
3	<input type="checkbox"/> DRIVER <input type="checkbox"/> VARIABLE SPEED      SPEED RANGE      rpm TO      rpm			
4	<input type="checkbox"/> INDUCTION MOTOR <input type="checkbox"/> SYNCHRONOUS MOTOR <input type="checkbox"/> STEAM TURBINE <input type="checkbox"/> ENGINE <input type="checkbox"/> OTHER			
5	<input type="checkbox"/> API STD 541 <input type="checkbox"/> API STD 546 <input type="checkbox"/> API STD 611 <input type="checkbox"/> API STD 612			
6	<input type="checkbox"/> OUTBOARD BEARING <input type="checkbox"/> PROVISION FOR DRY AIR PURGE FOR OUTBOARD BEARING			
7	<input type="checkbox"/> SLIDE BASE FOR DRIVER <input type="checkbox"/> SOLEPLATE FOR DRIVER <input type="checkbox"/> BASEPLATE FOR COMP. TRAIN			
8	<input type="checkbox"/> MOTOR STARTING EQUIPMENT / DEFINE			
9	<input type="checkbox"/> GEAR: <input type="checkbox"/> BASEPLANTE FOR GEAR <input type="checkbox"/> API STD 613 <input type="checkbox"/> API STD 677			
10	<input type="checkbox"/> COUPLING(S): <input type="checkbox"/> LOW SPD <input type="checkbox"/> HI-SPD <input type="checkbox"/> QUILL SHAFT <input type="checkbox"/> KEYLESS DRIVE <input type="checkbox"/> KEYED DRIVE			
11	<input type="checkbox"/> API STD 671			
12	<input type="checkbox"/> V-BELT DRIVE: <input type="checkbox"/> SHEAVES & V-BELTS: <input type="checkbox"/> STATIC CONDUCTION V-BELTS <input type="checkbox"/> BANDED V-BELT			
13	<input type="checkbox"/> DRIVE GUARD(S): <input type="checkbox"/> MANUFACTURER'S STD <input type="checkbox"/> NON-SPARKING <input type="checkbox"/> CALIF CODE <input type="checkbox"/> API STD 671 - APPENDIX C			
14	<input type="checkbox"/> OTHER			
15				
16	<input type="checkbox"/> PULSATION SUPPRESSORS WITH INTERNALS: <input type="checkbox"/> INITIAL INLET & FINAL DISCHARGE <input type="checkbox"/> SUPPORTS			
17	<input type="checkbox"/> INTERSTAGE <input type="checkbox"/> SUPPORTS			
18	<input type="checkbox"/> PULSATION SUPPRESSORS WITHOUT INTERNALS: <input type="checkbox"/> INITIAL INLET & FINAL DISCHARGE <input type="checkbox"/> SUPPORTS			
19	<input type="checkbox"/> INTERSTAGE <input type="checkbox"/> SUPPORTS			
20	<input type="checkbox"/> SUPPRESSOR(S) TO HAVE MOISTURE REMOVAL SECTION: <input type="checkbox"/> INITIAL INLET ONLY <input type="checkbox"/> ALL INLET SUPPRESSORS			
21	<input type="checkbox"/> ACOUSTICAL SIMUL. STUDY      (DESIGN APPROACH) <input type="checkbox"/> 1 <input type="checkbox"/> 1, W / SIMPLIFIED ANALYSIS OF PIPING SYSTEM			
22	<input checked="" type="checkbox"/> DIGITAL <input checked="" type="checkbox"/> ANALOG <input type="checkbox"/> 2, WITH ACOUSTIC SIMULATIO			
23	<input type="checkbox"/> 3, WITH ACOUSTIC SIMULATION AND MECH RESP. OF PIPING			
24	STUDY TO CONSIDER:      ALL SPECIFIED LOAD COND., INCL. <input type="checkbox"/> SINGLE ACT., PLUS			
25	<input type="checkbox"/> COMP. OPER. IN PARALLEL <input type="checkbox"/> ALTERNATE GASES			
26	<input type="checkbox"/> WITH EXISTING COMPRESSORS AND PIPING SYSTEMS			
27	<input type="checkbox"/> STUDY TO BE WITNESSED <input type="checkbox"/> COMPRESSOR VALVE DYNAMIC RESPONSE			
28	<input type="checkbox"/> VENDOR REVIEW OF PURCHASERS PIPING ARRANGEMENT <input type="checkbox"/> PULSATION SUPPRESSION DEVICE LOW CYCLE FATIGUE ANALYSIS			
29	<input type="checkbox"/> PIPING SYSTEM FLEXIBILITY			
30				
31	PACKAGE: <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
32	<input type="checkbox"/> SKID <input type="checkbox"/> SOLEPLATE <input type="checkbox"/> BASEPLATE <input type="checkbox"/> BOLTS OR STUDS FOR SOLEPLATE TO FRAME <input type="checkbox"/> RAILS <input type="checkbox"/> CHOCK BLOCKS <input type="checkbox"/> SHIMS			
33	<input type="checkbox"/> SUITABLE FOR COLUMN MOUNTING (UNDER SKID AND/OR BASEPLATE)			
34	<input type="checkbox"/> LEVELING SCREWS <input type="checkbox"/> NON-SKID DECKING <input type="checkbox"/> SUB SOLEPLATES			
35	<input type="checkbox"/> DIRECTED GROUTED <input type="checkbox"/> CEMENTED/MORTAR GROUT <input type="checkbox"/> EPOXY GROUT; MFG/TYPE      /			
36	<input type="checkbox"/> INTERCOOLER(S) <input type="checkbox"/> SEPARATOR(S) <input type="checkbox"/> AFTERCOOLER(S) <b>INTERCOOLERS:</b>			
37	<input type="checkbox"/> INTERSTAGE PIP.: <input type="checkbox"/> PIPING MATCHMARKED <input type="checkbox"/> SHOP FITTED <input type="checkbox"/> MACHINE MOUNTED			
38	<input type="checkbox"/> CONDENSATE SEPARATION & COLLECTION FACILITY SYSTEM <input type="checkbox"/> OFF MOUNTED			
39	<input type="checkbox"/> INLET STRAINER(S) <input type="checkbox"/> INITIAL INLET <input type="checkbox"/> SIDESTREAM INLET <input type="checkbox"/> SPOOL PIECE FOR INLET STRAINERS			
40	<input type="checkbox"/> MANIFOLD PIPING <input type="checkbox"/> DRAINS <input type="checkbox"/> VENTS <input type="checkbox"/> RELIEF VALVES <input type="checkbox"/> AIR/GAS SUPPLY <b>FLANGE FINISH:</b>			
41	<input type="checkbox"/> RELIEF VALVE(S) <input type="checkbox"/> INITIAL INLET <input type="checkbox"/> INTERSTAGE <input type="checkbox"/> FINAL DISCHARGE <input type="checkbox"/> API STD 618:2007 - FLANGE FINISH			
42	<input type="checkbox"/> RUPTURE DISC(S) <input type="checkbox"/> THRU STUDS IN PIPING FLANGES <input type="checkbox"/> FLANGE FINISH PER ASME B16.5			
43	<input type="checkbox"/> CRANKCASE RAPID PRESSURE RELIEF DEVICE(S) <input type="checkbox"/> SPECIAL FINISH			
44	<input type="checkbox"/> NO-RETURN VALVE FOR EACH DISCHARGE COMPRESSOR STAGE <input type="checkbox"/> PB SEPEC			
45	<input type="checkbox"/> SPECIAL PIPING REQUIREMENTS			
46	<input type="checkbox"/> INITIAL INLET. <input type="checkbox"/> INTERSTAGE SUCTION PIPING ARR'D FOR: <input type="checkbox"/> INSULATION <input type="checkbox"/> HEAT TRACING			
47	<input type="checkbox"/> FOR ATMOSPHERIC INLET AIR COMPR. ONLY: <input type="checkbox"/> INLET AIR FILTER <input type="checkbox"/> INLET FILTER-SILENCER			
48	<input type="checkbox"/> PREFERRED TYPE OF CYLINDER COOLING (NOTE 1) <input type="checkbox"/> FORCED <input type="checkbox"/> THERMOSYPHON      STAGE CYL(S)			
49	<input type="checkbox"/> STATIC (STAND-PIPE)      STAGE CYL(S)			
50	<input type="checkbox"/> CYL. COOLING WATER PIPING <input type="checkbox"/> MATCHMARKED			
51	<input type="checkbox"/> SINGLE INLET / OUTLET MANIFOLD & ALVES <input type="checkbox"/> SIGHT GLASS(ES)			
52	<input type="checkbox"/> INDIVIDUAL INLET / OUTLET PER CYL. <input type="checkbox"/> VALVE(S)			
53	<input type="checkbox"/> CLOSED SYS. WITH WATER PUMP, COOLER, SURGE TANK & PIPING			
54	<input type="checkbox"/> SHOP RUN <input type="checkbox"/> ARRANGED FOR HEATING JACKET AS WELL AS COOLING			
55	NOTES:			
56				
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	<b>DATA SHEET</b>		No.	REV.
				SHEET
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>			of
1	<b>SCOPE OF BASIC SUPPLY (CONT.) (SEE NOTE 2)</b>			
2	<input type="checkbox"/> SEPARATE COOLING CONSOLE: <input type="checkbox"/> ONE FOR EA UNIT <input type="checkbox"/> ONE COMMON TO ALL UNITS <input type="checkbox"/> DUAL PUMPS (AUX. & MAIN)			
3	<input type="checkbox"/> ARRANGED FOR HEATING JACKET WATER AS WELL AS COOLING			
4	<input type="checkbox"/> FRAME LUBE OIL SYSTEM: <input type="checkbox"/> AUX. PUMP <input type="checkbox"/> DUAL FILTERS WITH TRANSFER VALVE <input type="checkbox"/> SHOP RUN			
5	<input type="checkbox"/> CONTINUOUS FLOW IN SENSING LINE TO PRESSURE TRANSMITTERS			
6	<input type="checkbox"/> SEPARATE LUBE OIL CONSOLE: <input type="checkbox"/> EXTENDED TO MOTOR OUTBOARD BEARING <input type="checkbox"/> SHOP RUN			
7	API STD 614 - APPLIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
8	<input type="checkbox"/> CAPACITY CONTROL <input type="checkbox"/> SEE DATA SHEET PAGE _____ FOR DETAILS <input type="checkbox"/> IN INSTRUMENT & CONTROL PANEL			
9	<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/> SEPARATE MACHINE MOUNTED PANEL <input type="checkbox"/> SEPARATE FREE STANDING PANEL			
10	<input type="checkbox"/> PNEUMATIC <input type="checkbox"/> ELETRIC <input type="checkbox"/> ELECTRONIC <input type="checkbox"/> HIDRAULIC			
11	<input type="checkbox"/> PROGRAMMABLE CONTROLLER			
12	<input type="checkbox"/> INSTRUMENT & CONTROL PANEL <input type="checkbox"/> ONE FOR EACH UNIT <input type="checkbox"/> ONE COMMON TO ALL UNITS			
13	<input type="checkbox"/> MACHINE MOUNTED <input type="checkbox"/> FREE STANDING (OFF UNIT)			
14				
15	<input type="checkbox"/> HEALTERS <input type="checkbox"/> FRAME LUBE OIL <input type="checkbox"/> CYL. LUBRICATORS <input type="checkbox"/> COOLING WATER <input type="checkbox"/> DRIVER(S) <input type="checkbox"/> GEAR OIL			
16	<input type="checkbox"/> ELECTRIC <input type="checkbox"/> STEAM			
17	<input type="checkbox"/> BARRING DEVICE: <input type="checkbox"/> MANUAL <input type="checkbox"/> PNEUMATIC <input type="checkbox"/> ELECTRIC <input type="checkbox"/> FLYWHEEL LOCKING DEVICE			
18	<input type="checkbox"/> ROD PRESSURE PACKING COOLING SYSTEM: <input type="checkbox"/> SEPARATE CONSOLE <input type="checkbox"/> FILTERS			
19	<input type="checkbox"/> SPECIAL CORROSION PROTECTION: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> MFR'S STANDARD <input type="checkbox"/> OTHER _____			
20	<input type="checkbox"/> HYDRAULIC TENSIONING TOOLS: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
21	<input type="checkbox"/> MECHANICAL RUN TEST: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> MFR'S STANDARD <input type="checkbox"/> API STD 618 <input type="checkbox"/> OTHER _____			
22	<input type="checkbox"/> COMPLETE SHOP RUN A TEST OF ALL MACHINE MOUNTED EQUIPMENT, PIPING & APPURTENANCES			
23	PAINTING: <input type="checkbox"/> MANUFACTURER'S STANDARD <input type="checkbox"/> SPECIAL _____			
24	NAMEPLATES: <input type="checkbox"/> U.S. CUSTOMARY UNITS <input type="checkbox"/> SI UNITS			
25	SHIPMENT: <input type="checkbox"/> DOMESTIC <input type="checkbox"/> EXPORT <input type="checkbox"/> EXPORT BOXING REQUIRED			
26	<input type="checkbox"/> STANDARD _____ MONTHS STORAGE PREPARATION, PER SPEC _____			
27	<input type="checkbox"/> OUTDOOR STORAGE FOR OVER _____ MONTH, PER SPEC _____			
28	<input type="checkbox"/> INITIAL INSTALLATION AND OPERATING TEMP ALIGNMENT CHECK JOBSITE BY VENDOR REPRESENTATIVE			
29	<input type="checkbox"/> COMPRESSOR MANUFACTURER'S USER'S LIST FOR SIMILAR SERVICE			
30	<input type="checkbox"/> PERFORMANCE DATA REQUIRED			
31	<input type="checkbox"/> PERFORMANCE CURVES			
32	<input type="checkbox"/> BkW VS. SUCTION PRESSURE CURVES			
33	<input type="checkbox"/> ROD LOAD / GAS LOAD CHARTS			
34	<input type="checkbox"/> VALVE FAILURE DATA CHARTED			
35	<input type="checkbox"/> SPEDD / TORQUE CURVE DATA			
36	<input type="checkbox"/> BkW VC CAPACITY PERFORMANCE CURVES OR TABLES REQUIRED FOR UNLOADING STEPS AND/OR VARIABLE SUCTION / DISCHARGE PRESSURES			
37	APLLICABLE PURCHASER SPECS: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
38	APPLICABLE USER SPECS: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
39	<input type="checkbox"/> CYLINDER LUBRICATOR			
40	<input type="checkbox"/> INSPECTIONS AND TESTS			
41	<input type="checkbox"/> SPECIAL TOOLS (IF EXISTING)			
42	<input type="checkbox"/> SPARE PARTS FOR 2 YEARS OPERATION, ERECTING, COMMISSIONING, TEST AND START UP			
43	<input type="checkbox"/> INSTRUCTION FOR ERECTION AND MAINTENANCE (SEE VENDOR DRAWING AND DATA REQUIREMENTS)			
44	<input type="checkbox"/> TORSIONAL VIBRATION ANALYSIS OF COMPLETE UNIT			
45	<input type="checkbox"/> SHOP TESTS			
46	<input type="checkbox"/> DESIGN AND COORDINATION OF COMPLETE ARRANGEMENT, INCLUDING DRIVER			
47	<input type="checkbox"/> COMMENT ON PURCHASER'S PIPING AND FOUDATION DRAWINGS			
48	<input type="checkbox"/> TRAINING COURSE OG PETROBRAS STAFF			
49	<input type="checkbox"/> ERECTION AND START UP SUPERVISION INCLUDING INITIAL ALIGNMENT CHECK			
50	NOTES:			
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	<b>DATA SHEET</b>				No.				REV.							
									SHEET		of					
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>															
1	UTILITIES CONDITIONS															
2	ELECTRIACAL POWER	AC VOLTS	PHASE	HERTZ	DC VOLTS		AC VOLTS	PHASE	HERTZ	DC VOLTS						
3	MAIN DRIVER					INSTRUMENT										
4	AUXILIARY MOTORS					ALRM & SHUTDWN										
5	HEATERS															
6																
7	INSTRUMENT AIR:	INLET TEMP		°C	PRESSURE: NORMAL		kgf/cm²	MAX/MIN		/		kgf/cm²				
8		DEW POINT		°C	@		kgf/cm²									
9																
10	STEAM FOR:					DRIVES										
11	INLET PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²	INLET PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²
12	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C	MAX/MIN		/		°C
13	EXHAUST PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²	EXHAUST PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²
14	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C	MAX/MIN		/		°C
15																
16	COOLING WATER FOR					COMPRESSOR CYLINDERS										
17	TYPE WATER						TYPE WATER									
18	SUPPLY PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²	SUPPLY PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²
19	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C	MAX/MIN		/		°C
20	RETURN PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²	RETURN PRESS		kgf/cm²	MAX/MIN		/		kgf/cm²
21	NORMAL TEMP		°C	MAX/MIN		/		°C	NORMAL TEMP		°C	MAX/MIN		/		°C
22																
23	COOLING FOR ROD PACKING															
24	TYPE FLUID		SUPPLY PRESS		kgf/cm²	@		°C	RETURN		kgf/cm²	@		°C		
25																
26	FLUED GAS	NORMAL PRESSURE		kgf/cm²	MAX/MIN		/		kgf/cm²	LHV		MJ/m³				
27		COMPOSITION														
28	FLUED GAS	NORMAL PRESSURE		kgf/cm²	MAX/MIN		/		kgf/cm²	LHV		MJ/m³				
29		COMPOSITION														
30	FLUED GAS	NORMAL PRESSURE		kgf/cm²	MAX/MIN		/		kgf/cm²	LHV		MJ/m³				
31		COMPOSITION														
32	CYLINDER UNLOADING MEDIUM:		<input type="checkbox"/> AIR	<input type="checkbox"/> N <sub>2</sub>	<input type="checkbox"/> OTHER											
33	PRESSURE AVAILABLE FOR CYL. UNLOADERS DEVICES		MAX													
34			NORM													
35			MIN													
36																
37	NOTES:															
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<div> <b>PETROBRAS</b></div>	<b>DATA SHEET</b>	No.	REV.			
				SHEET		
	TITLE:			of		
<div>RECIPROCATING COMPRESSOR</div> <div>METRIC UNIT (kgf/cm²)</div>						
1	CYLINDER DATA AT FULL LOAD CONDITION					
2	SERVICE ITEM NO.					
3	STAGE					
4	INLET PRESSURE (SEE NOTE 3), kgf/cm²					
5	DISCHARGE PRESSURE (SEE NOTE 3), kgf/cm²					
6	CYLINDERS PER STAGE					
7	SINGLE OR DOUBLE ACTING (SA OR DA)					
8	BORE, mm					
9	STROKE, mm					
10	RPM: RATED / MAX ALLOW:	/				
11	PISTON SPEED, m/s RATED / MAX ALLOW:	/				
12	CYLINDER LINER, YES / NO					
13	LINER NOMINAL THICKNESS, mm					
14	PISTON DISPLACEMENT, m³/h					
15	CYLINDER DESIGN CLEARANCE, % AVERAGE					
16	VOLUMETRIC EFFICIENCY, % AVERAGE					
17	VALVES, INLET/DISCHARGE, QTY PER CYL.	/	/	/	/	/
18	TYPE OF VALVES					
19	VALVE LIFT, INLET/DISCHARGE, mm	/	/	/	/	/
20	VALVE VELOCITY (API STD 618:2007), m/s					
21	SUCTION VALVE(S)					
22	DISCHARGE VALVE(S)					
23	ROD DIAMETER, mm					
24	MAX ALLOW. COMBINED ROD LOADING, kgf, °C					
25	MAX ALLOW. COMBINED ROD LOADING, kgf, T°					
26	CALCULATED GAS ROD LOAD, kgf, C°					
27	CALCULATED GAS ROD LOAD, kgf, T°					
28	COMBINED ROD LOAD (GAS + INERTIA), kgf, C°					
29	COMBINED ROD LOAD (GAS + INERTIA), kgf, T°					
30	ROD VER., DEGREE MIN @ X-HD PIN**					
31	RECIP WT. (PISTON, ROD, X-HD & NUTS), kg**					
32	MAX ALLOW. WORKING PRESSURE, kgf/cm²					
33	MAX ALLOW. WORKING TEMPERATURE, °C					
34	HYDROSTATIC TEST PRESSURE, kgf/cm²					
35	HELIUM TEST PRESSURE, kgf/cm²					
36	INLET FLANGE SIZE / RATING	/	/	/	/	/
37	FACING					
38	DISCHARGE FLANGE SIZE / RATING	/	/	/	/	/
39	FACING					
40	DISCHARGE RELIEF VALVE SETTING BASED ON DATA FOR INLET PRESSURE GIVEN ABOVE					
41	RECOMMENDED SETTING, kgf/cm²					
42	GAS ROD LOAD, kgf, C°					
43	GAS ROD LOAD, kgf, T°					
44	COMBINED ROD LOAD, kgf, C°					
45	COMBINED ROD LOAD, kgf, T°					
46	ROD REVERSAL, DEGREE MIN. @ X-HD PIN**					
47	(NOTE CALCULATED @ INLET PRESSURES GIVEN ABOVE & RECOMMENDED PSV SETTING)					
48	SETTLE-OUT GAS PRESSURE					
49	(DATA REQUIRED FOR STARTING)					
50						
51						
52	C° = COMPRESSION / T° = TENSION      **X-HD = CROSSHEAD					
53						
54	NOTES:					
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	<b>DATA SHEET</b>		No.		REV.	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>				SHEET	
					of	
1	<b>CONSTRUCTION FEATURES</b>					
2	SERVICE ITEM NO.					
3	STAGE					
4						
5	CYLINDER SIZE (BORE DIA), mm					
6	ROD RUN-OUT NORMAL COLD VERTICAL, mm					
7	<b>MATERIALS OF CONSTRUCTION</b>					
8	CYLINDER(S)					
9	CYLINDER LINER(S)					
10	PISTON(S)					
11	PISTON RINGS					
12	WEAR BANDS <input type="checkbox"/> REQUIRED					
13	PISTON ROD(S): MATERIAL/YIELD, kgf/cm²					
14	THREAD ROOT STRESS @ MACRL* @ X-HD END					
15	PISTON ROD HARDNESS, BASE MATERIAL, Rc					
16	PISTON ROD COATING <input type="checkbox"/> REQUIRED					
17	COATING HARDNESS, Rc					
18	VALVE SEATS/SEAT PLATE					
19	VALVE SEAT MIN HARDNESS, Rc					
20	VALVE GUARDS (STOPS)					
21	VALVE DISCS					
22	VALVE SPRINGS					
23	ROD PRESSURE PACKING RINGS					
24	ROD PRESSURE PACKING CASE					
25	ROD PRESSURE PACKING SPRINGS					
26	SEAL/BUFFER PACKING, DISTANCE PIECE					
27	SEAL/BUFFER PACKING, DISTANCE INTERMEDIATE					
28	WIPER PACKING RINGS					
29	MAIN JOURNAL BEARINGS, CRANKSHAFT					
30	CONNECTING ROD BEARING, CRANKPIN					
31	CONNECTING ROD BUSHING, X-HD END					
32	CROSSHEAD (X-HD) PIN BUSHING					
33	CROSSHEAD PIN					
34	CROSSHEAD					
35	CROSSHEAD SHOES					
36	CYLINDER INDICATOR VALVES					
37	INDICATOR CONNECTIONS ABOVE 352 kgf/cm²					
38	FLUOROCARBON SPRAYED CYLINDER					
39	INSTRUMENTATION IN COLD SIDE					
40	CONTACT W/ PROCESS GAS HOT SIDE					
41	*MAXIMUM ALLOWABLE COMBINED ROD LOAD					
42	<input type="checkbox"/> COMPRESSOR CYLINDER ROD PACKING		DISTANCE PIECES: <input type="checkbox"/> TYPE A <input type="checkbox"/> TYPE B <input type="checkbox"/> TYPE C <input type="checkbox"/> TYPE D			
43	<input type="checkbox"/> FULL FLOATING PACKING		COVERS <input type="checkbox"/> SOLID METAL <input type="checkbox"/> SCREEN <input type="checkbox"/> LOUVERED			
44	<input type="checkbox"/> VENTED TO: <input type="checkbox"/> FLARE @ _____ kgf/cm² <input type="checkbox"/> ATMOSPHERE		CYLINDER COMPARTMENT: <input type="checkbox"/> VENTED TO _____ kgf/cm² g			
45	<input type="checkbox"/> SUCTION PRESS @ _____ kgf/cm²		(OUTBOARD DISTANCE PIECE) <input type="checkbox"/> PURGED AT _____ kgf/cm² g			
46	<input type="checkbox"/> FORCED LUBRICATED <input type="checkbox"/> NON-LUBE <input type="checkbox"/> TFE		<input type="checkbox"/> PRESSURIZED TO _____ kgf/cm² g			
47	<input type="checkbox"/> WATER COOLER _____ STAGE(S) _____ m³/h REQ'D		<input type="checkbox"/> SOLID METAL <input type="checkbox"/> WITH RELIEF VALVE			
48	<input type="checkbox"/> OIL COOLER _____ STAGE(S) _____ m³/h REQ'D		FRAME COMPARTMENT: <input type="checkbox"/> VENTED TO _____ kgf/cm² g			
49	<input type="checkbox"/> WATER FILTER <input type="checkbox"/> PROV. FUTURE WATER/OIL COOLING		<input type="checkbox"/> PURGED AT _____ kgf/cm² g			
50	<input type="checkbox"/> VENT/BUFFER GAS SEAL PACKING ARR.		<input type="checkbox"/> PRESSURIZED TO _____ kgf/cm² g			
51	<input type="checkbox"/> CONSTANT OR <input type="checkbox"/> VARIABLE DISPOSAL SYSTEM		<input type="checkbox"/> WITH RELIEF VALVE			
52	<input type="checkbox"/> BUFFER GAS PRESSURE _____ kgf/cm²		DISTANCE PIECE MAWP _____ kgf/cm² g			
53	<input type="checkbox"/> SPLASH GUARDS FOR WIPER PACKING					
54						
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<div><div><div>BR</div><div>PETROBRAS</div></div></div>		DATA SHEET		No.		REV.	
						SHEET	
						of	
TITLE:		RECIPROCATING COMPRESSOR					
		METRIC UNIT (kgf/cm²)					
CONSTRUCTION FEATURES (CONT.)							
<div><div><div><div>FABRICATED CYLINDER, HEADS &amp; CONNECTION SKETCHES FOR DESIGN REVIEW BY</div><div>PURCHASER</div></div></div></div>				<div><div><div>BUFFER GAS PACKING ARR.</div><div><div><div><div><div><input type="checkbox"/> OIL WIPPER PACKING PURGE</div><div><input type="checkbox"/> INTERMEDIATE PARTITION PURGE</div><div><input type="checkbox"/> INERT BUFFER / PURGE GAS:</div><div><input type="checkbox"/> VENT, DRAIN, PURGE PIPING BY MFG'S</div></div><div><div><div><div><input type="checkbox"/> N<sub>2</sub></div><div><input type="checkbox"/> OTHER</div></div><div><div><div><input checked="" type="checkbox"/> YES</div><div><input checked="" type="checkbox"/> NO</div></div></div></div></div></div></div></div></div></div>			
<div><div><div><div><div>COUPLING(S)</div><div><div><div><input type="checkbox"/> LOW-SPEED</div><div><input type="checkbox"/> HIGH-SPEED</div></div><div><div><div>(BETWEEN COMPRESSOR &amp; DRIVER OR GEAR)</div><div>(BETWEEN &amp; DRIVE OR GEAR)</div></div></div></div><div><div><div><input type="checkbox"/> BT MFR</div><div><input type="checkbox"/> MODEL</div><div><input type="checkbox"/> TYPE</div></div><div><div><div>API STD 671 APPLIES</div><div><div><div><input checked="" type="checkbox"/> YES</div><div><input checked="" type="checkbox"/> NO</div></div></div></div></div></div></div></div></div></div>				<div><div><div><div>V-BELT DRIVE</div><div>DRIVE SHEAVE</div><div>DRIVE SHAFT</div></div><div><div><div>(Compressor Shaft)</div><div>(Drive Shaft)</div></div></div><div><div><div>RPM (EXPECTED)</div><div>PITCH DIA, mm</div><div><input type="checkbox"/> QTY &amp; GROOVE X-SEC</div><div>POWER TRANSMITTED</div><div>(Incl. Belt Losses)</div><div>DRIVER NAMEPLATE kW RATING</div><div><input type="checkbox"/> CENTER DISTANCE, mm</div><div><input type="checkbox"/> QTY, TYPE</div><div>X-SEC., &amp; LENGHT BELTS</div><div><input type="checkbox"/> BELT SERVICE FACTOR (RELATIVE TO DRIVER NAMEPLATE HP RATING)</div></div></div></div></div>			
<div><div><div><div>INSPECTION AND SHOP TESTS</div><div>REQ'D</div><div>WIT</div><div>OBS.</div></div><div><div><div>SHOP INSPECTION</div><div>ACTUAL RUNNING CLEARANCES AND RECORDS</div><div>MFR STANDARD SHOP TESTS</div><div>CYLINDER HYDROSTATIC TEST</div><div>CYLINDER PNEUMATIC TEST</div><div>CYLINDER HELIUM LEAK TEST</div><div>CYLINDER JACKET WATER HYDRO TEST</div><div>MECHANICAL RUN TEST 4 h</div><div>BAR-OVER TO CHECK ROD RUN OUT</div><div>LUBE OIL CONSOLE RUN/TEST 4 h</div><div>COOLING H<sub>2</sub>O CONSOLE RUN/TEST</div><div>RADIOGRAPHY BUTT WELDS</div><div><div><input type="checkbox"/> GAS</div><div><input type="checkbox"/> OIL</div><div><input type="checkbox"/> FAB CYLS (100 %)</div></div><div>MAG PARTICLE/LIQUID PENETRANT OF WELDS</div><div>SPECIFY ADDITIONAL REQ.</div><div>QC OF INACCESSIBLE WELDS</div><div>SHOP FIT-UP PULSATION SUPPL</div><div>DEVICES &amp; ALL ASSOCIATED GAS PIPING</div><div>CLEANLINESS OF EQUIP., PIPING &amp; APPURTENANCES</div><div>HARDNESS OF PARTS, WELDS &amp; HEAT</div><div>AFFECTED ZONES</div><div>DISMANTLING AND ASSEMBLING INSPEC.</div><div>NOTIFICATION TO PURCHASER OF ANY</div><div>REPAIRS TO MAJOR COMPONENTS</div><div></div><div></div><div></div></div><div><div><div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div></div></div></div></div></div></div></div></div>							
				<div><div><div><div>CYLINDER LUBRIFICATION</div><div><div><div><input type="checkbox"/> NON-LUBE</div><div><input type="checkbox"/> LUBRICATED</div></div><div><div><div>TYPE OF LUBE OIL</div><div>TYPE OF LUBE OIL</div></div><div><div><div>LUBRICATOR</div><div>DRIVER BY:</div></div><div><div><div><input type="checkbox"/> LUBRICATED MFR</div><div><input type="checkbox"/> MODEL</div></div><div><div><div>TYPE LUBRICATOR</div><div><input type="checkbox"/> SINGLE PLUNGER PER POINT</div><div><input type="checkbox"/> DIVIDER BLOCKS</div></div><div><div><div><input type="checkbox"/> COMPARTMENT, TOTAL QTY</div><div><input type="checkbox"/> PLUNGERS (PUMPS), TOTAL QTY</div><div><input type="checkbox"/> SPARE PLUNGERS, QTY</div><div><input type="checkbox"/> SPARE COMPARTMENT W/OUT PLUNGERS</div><div><input type="checkbox"/> HEATERS:</div></div><div><div><div><div><input type="checkbox"/> SYNTHETIC</div><div><input type="checkbox"/> HYDROCARBON</div></div><div><div><div><input type="checkbox"/> COMP. CRANKSHAFT. DIRECT</div><div><input type="checkbox"/> CHAIN, FROM CRANKSHAFT</div><div><input type="checkbox"/> ELECTRIC MOTOR</div><div><input type="checkbox"/> OTHER</div></div></div></div></div></div></div></div></div></div></div></div></div></div>			
				<div><div><div><div>ESTIMATED WEIGHTS AND NOMINAL DIMENSIONS</div><div><div><div><div><input type="checkbox"/> TOTAL COMPR. WT., LESS DRIVER &amp; GEAR</div><div><input type="checkbox"/> WT. OF COMPLETE UNIT. (LESS CONSOLES)</div><div><input type="checkbox"/> MAXIMUM ERECTION WEIGHT</div><div><input type="checkbox"/> MAXIMUM MAINTENANCE WEIGHT</div><div><input type="checkbox"/> DRIVER WEIGHT/GEAR WEIGHT</div><div><input type="checkbox"/> LUBE OIL / COOLING H<sub>2</sub>O CONSOLE</div><div><input type="checkbox"/> FREE STANDING PANEL</div></div><div><div><div>SPACE REQUIREMENTS, m</div><div>LEGTH</div><div>WIDTH</div><div>HEIGHT</div></div><div><div><div><div><input type="checkbox"/> COMPLETE UNIT</div><div><input type="checkbox"/> LUBE OIL CONSOLE</div><div><input type="checkbox"/> COOLING H<sub>2</sub>O CONSOLE</div><div><input type="checkbox"/> FREE STANDING PANEL</div><div><input type="checkbox"/> PISTON ROD REMOVAL DIST.</div></div></div></div></div></div></div></div></div></div>			
				<div><div><div><div>OTHER EQUIPMENT SHIPPED LOOSE (DEFINE)</div><div><div><div><div><input type="checkbox"/> PULSATION SUPPRESSOR, WEIGHT</div><div><input type="checkbox"/> PIPING</div><div><input type="checkbox"/> INTERSTAGE EQUIPMENT</div></div></div></div></div></div></div>			
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	<b>DATA SHEET</b>		No.		REV.		
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>					SHEET	of
1	UTILITY CONSUMPTION						
2	ELECTRIC MOTORS						
3							MAIN DRIVER NON-STEADY
4	NAMEPLATE	LOCKED ROTOR	FULL LOAD		STATE AMPS COMPRESSOR		
5			STEADY STATE		RATED HORSEPOWER		
6	kw	AMPS	AMPS		(induction Motors Only)		
7	<input type="checkbox"/> MAIN DRIVER	_____	_____	_____	_____ AMPS		
8	<input type="checkbox"/> MAIN LUBE OIL PUMP	_____	_____	_____	@ COMPRESSOR RATED		
9	<input type="checkbox"/> AUX LUBE OIL PUMP	_____	_____	_____	kW OF _____		
10	<input type="checkbox"/> MAIN COOLING WATER PUMP	_____	_____	_____	@ CURRENT PULSATIONS		
11	<input type="checkbox"/> ROS PACKING COOLING PUMP	_____	_____	_____	OF _____ %		
12	<input type="checkbox"/> CYLINDER LUBRICATOR	_____	_____	_____			
13	<input type="checkbox"/> _____	_____	_____	_____			
14	<input type="checkbox"/> _____	_____	_____	_____			
15							
16	ELECTRIC HEATERS						
17		WATTS	VOLTS	HERTZ			
18		_____	_____	_____			
19	<input type="checkbox"/> FRAME OIL HEATER(S)	_____	_____	_____			
20	<input type="checkbox"/> COOLING WATER HEATER(S)	_____	_____	_____			
21	<input type="checkbox"/> CYL. LUB. HEATER(S)	_____	_____	_____			
22	<input type="checkbox"/> _____	_____	_____	_____			
23	<input type="checkbox"/> _____	_____	_____	_____			
24							
25	STEAM						
26		FLOW	PRESSURE	TEMPERATURE	BACK PRESSURE		
27	<input type="checkbox"/> MAIN DRIVER	_____ kg/h @ _____	kgf/cm²	_____ °C TT TO _____	kgf/cm²		
28	<input type="checkbox"/> FRAME OIL HEATER(S)	_____ kg/h @ _____	kgf/cm²	_____ °C TT TO _____	kgf/cm²		
29	<input type="checkbox"/> CYL. LUB. HEATER(S)	_____ kg/h @ _____	kgf/cm²	_____ °C TT TO _____	kgf/cm²		
30	<input type="checkbox"/> _____	_____ kg/h @ _____	kgf/cm²	_____ °C TT TO _____	kgf/cm²		
31	<input type="checkbox"/> _____	_____ kg/h @ _____	kgf/cm²	_____ °C TT TO _____	kgf/cm²		
32							
33	COOLING WATER REQUIREMENTS						
34		FLOW	INLET TEMP	OUTLET TEMP	INLET PRESS	OUTLET PRESS	MAX PRESS
35		m³/h	°C	°C	kgf/cm²	kgf/cm²	kgf/cm²
36	<input type="checkbox"/> CYLINDER JACKETS	_____	_____	_____	_____	_____	_____
37	<input type="checkbox"/> INTERCOOLER(S)	_____	_____	_____	_____	_____	_____
38	<input type="checkbox"/> AFTERCOOLER	_____	_____	_____	_____	_____	_____
39	<input type="checkbox"/> FRAME LUBE OIL COOLER	_____	_____	_____	_____	_____	_____
40	<input type="checkbox"/> ROD PRESSURE PACKING	_____	_____	_____	_____	_____	_____
41	<input type="checkbox"/> _____	_____	_____	_____	_____	_____	_____
42	<input type="checkbox"/> _____	_____	_____	_____	_____	_____	_____
43	<input type="checkbox"/> _____	_____	_____	_____	_____	_____	_____
44	<input type="checkbox"/> TOTAL QUANTITY, m³/h	_____	_____	_____	_____	_____	_____
45							
46	NOTES:						
47							
48							
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	DATA SHEET		No. _____		REV. _____		
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm<sup>2</sup>)</b>					SHEET _____ of _____	

FRAME LUBE OIL SYSTEM																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>BASIC LUBE OIL SYSTEM FOR FRAME:</b> <input type="checkbox"/> SPLASH            REF.: TYPE MAIN BEARINGS: <input type="checkbox"/> TAPERED ROLLER            PRESSURE SYSTEM: <input type="checkbox"/> MAIN OIL PUMP DRIVEN BY    <input type="checkbox"/> AUX OIL PUMP DRIVEN BY:  <input type="checkbox"/> HAND OPERATED PRE-LUBE PUMP FOR STARTING  <input type="checkbox"/> API STD 614 LUBE SYSTEM:  <input type="checkbox"/> CONTINUOUS FLOW THROUGH OF OIL         </div> <div style="width: 45%;"> <input type="checkbox"/> PRESSURE (FORCED)  <input type="checkbox"/> PRECISION SLEEVE  <input type="checkbox"/> COMP. CRANKSHAFT  <input type="checkbox"/> PSV FOR MAIN PUMP EXTERNAL TO CRANKCASE  <input type="checkbox"/> ELEC. MOTOR    <input type="checkbox"/> ONE CONSOLE FOR EA. COMP  <input type="checkbox"/> ONE CONSOLE FOR _____ COMPRESSORS  <input type="checkbox"/> CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR. MULTI-POINT SUPPORT AND GROUTING WITH GROUND &amp; VENT HOLES            ELECTRICAL CLASSIFICATION: ZONE _____ GROUP _____ CLASS _____ <input type="checkbox"/> NON-HAZARDOUS         </div> <div style="width: 45%;"> <input type="checkbox"/> HEATERS REQUIRED:  <input type="checkbox"/> ELEC. W/ THERMOSTAT(S) <input type="checkbox"/> STEAM  <input type="checkbox"/> ELEC. MOTOR <input type="checkbox"/> OTHER _____  <input type="checkbox"/> OTHER _____  <input type="checkbox"/> OPERATIONAL TEST &amp; 4 HOUR MECH RUN TEST  <input type="checkbox"/> CHECK VALVE ON MAIN PUMP         </div> </div>																																																	
BASIC SYS. REQ'MTS (NORM. OIL FLOWS & VOLUMES)																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <input type="checkbox"/> LUBE OIL   <input type="checkbox"/> COMPRESSOR FRAME  <input type="checkbox"/> DRIVER  <input type="checkbox"/> GEAR         </div> <div style="width: 20%;">           FLOW m<sup>3</sup>/h _____ _____ _____         </div> <div style="width: 20%;">           PRESSURE kgf/cm<sup>2</sup> _____ _____ _____         </div> <div style="width: 20%;">           VISCOSITY Pa.s@40 °C _____ _____ _____         </div> <div style="width: 20%;">           VISCOSITY Pa.s@100 °C _____ _____ _____         </div> <div style="width: 20%;">           SUMP VOLUME m<sup>3</sup> _____ _____ _____         </div> </div>																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> SYSTEM PRESSURES: <input type="checkbox"/> DESIGN _____ kgf/cm<sup>2</sup>  <input type="checkbox"/> PRESS. CTRL VALVE SETTING _____ kgf/cm<sup>2</sup> </div> <div style="width: 45%;"> <input type="checkbox"/> HYDROTEST _____ kgf/cm<sup>2</sup>  <input type="checkbox"/> PUMP RELIEF VALVE(S) SET _____ kgf/cm<sup>2</sup> </div> </div>																																																	
PIPING MATERIALS																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input type="checkbox"/> UPSTREAM OF PUMPS &amp; FILTERS  <input type="checkbox"/> DOWNSTREAM OF FILTERS  <input type="checkbox"/> _____  <input type="checkbox"/> _____         </div> <div style="width: 30%;">           CARBON STEEL _____ _____ _____ _____         </div> <div style="width: 30%;">           STAINLESS STEEL WITH SS FLANGES _____ _____ _____ _____         </div> <div style="width: 30%;">           STAINLESS STEEL WITH CARBON STEEL FLANGES _____ _____ _____ _____         </div> </div>																																																	
PUMPS (Gear or Screw Type Only)																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 15%;"> <input type="checkbox"/> RATED FLOW m<sup>3</sup> _____ _____ _____         </div> <div style="width: 15%;"> <input type="checkbox"/> PRESSURE kgf/cm<sup>2</sup> _____ _____ _____         </div> <div style="width: 15%;"> <input type="checkbox"/> COLD START REQ'D KW _____ _____ _____         </div> <div style="width: 15%;"> <input type="checkbox"/> DRIVER kW _____ _____ _____         </div> <div style="width: 15%;"> <input type="checkbox"/> SPEED rpm _____ _____ _____         </div> <div style="width: 15%;">           COUPLING REQ'D _____ _____ _____         </div> <div style="width: 15%;">           MECH. SEAL REQ'D _____ _____ _____         </div> </div>																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> MAIN  <input type="checkbox"/> AUXILIARY  <input type="checkbox"/> PUMP CASING MATERIAL: MAIN PUMP _____ AUX PUMP _____  <input type="checkbox"/> GUARD(S) REQ. FOR COUPLING(S): <input type="checkbox"/> MAIN PUMP <input type="checkbox"/> AUX PUMP <input type="checkbox"/> GUARD TYPE OR CODE _____  <input type="checkbox"/> AUXILIARY PUMP CONTROL: <input type="checkbox"/> MANUAL <input type="checkbox"/> AUTOMATIC <input type="checkbox"/> ON-OFF-AUTO SEL. SWITCH <input type="checkbox"/> BY PURCH <input type="checkbox"/> BY MFR.  <input type="checkbox"/> WIRING TO TERMINAL BOX: <input type="checkbox"/> BY PURCH <input type="checkbox"/> BY MFR.  <input type="checkbox"/> SWITCHES <input type="checkbox"/> RTD'S/THERMOCOUPLES         </div> </div>																																																	
COOLERS																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input type="checkbox"/> SHELL &amp; TUBE  <input type="checkbox"/> REMOVABLE BUNDLE  <input type="checkbox"/> W/BY-PASS &amp; TEMP CONTROL VALVE         </div> <div style="width: 30%;"> <input type="checkbox"/> SINGLE  <input type="checkbox"/> WATER COOLER  <input type="checkbox"/> MANUAL <input type="checkbox"/> AUTO         </div> <div style="width: 30%;"> <input type="checkbox"/> DUAL W/TRANSFER VALVE  <input type="checkbox"/> AIR COOLED W/AUTO TEMP CONTROL  <input type="checkbox"/> SEE SEPARATE HEAT EXCHANGER DATA SHEET FOR DETAILS, SPECIFY % GLYCOL ON COOLING WATER SIDE         </div> <div style="width: 30%;"> <input type="checkbox"/> MFG'S STD  <input type="checkbox"/> TEMA C <input type="checkbox"/> TEMA R         </div> </div>																																																	
FILTER(S)																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input type="checkbox"/> SINGLE  <input type="checkbox"/> DESIGN PRESSURE, _____ kgf/cm<sup>2</sup>  <input type="checkbox"/> MICRON RATING, _____  <input type="checkbox"/> BONNET MATERIAL, _____         </div> <div style="width: 30%;"> <input type="checkbox"/> DUAL W/TRANSFER VALVE  <input type="checkbox"/> ΔP CLEAN _____ kgf/cm<sup>2</sup>  <input type="checkbox"/> CARTRIDGE MATERIAL, _____  <input type="checkbox"/> CASING MATERIAL, _____         </div> <div style="width: 30%;"> <input type="checkbox"/> ASME CODE DESIGN  <input type="checkbox"/> ΔP COLLAPSE _____ kgf/cm<sup>2</sup>  <input type="checkbox"/> CARTRIDGE P/N, _____  <input type="checkbox"/> FURN, SPARE CARTR., QTY _____         </div> <div style="width: 30%;"> <input type="checkbox"/> ASME CODE STAMPED         </div> </div>																																																	
SYS. COMPONENT SUPP.																																																	
<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;"></th> <th style="width: 20%;">MANUFACTURER</th> <th style="width: 20%;">MODEL</th> <th style="width: 30%;"></th> <th style="width: 20%;">MANUFACTURER</th> <th style="width: 20%;">MODEL</th> </tr> <tr> <td>MAIN PUMP</td> <td>_____</td> <td>_____</td> <td>OIL COOLER(S)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>AUXILIARY PUMP</td> <td>_____</td> <td>_____</td> <td>TRANSFER VALVE(S)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>MECHANICAL SEALS</td> <td>_____</td> <td>_____</td> <td>PUMP COUPLING(S)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>ELECTRIC MOTORS</td> <td>_____</td> <td>_____</td> <td>SUCTION STRAINER(S)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>STEAM TURBINES</td> <td>_____</td> <td>_____</td> <td>CHECK VALVE(S)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>OIL FILTER(S)</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> </table>									MANUFACTURER	MODEL		MANUFACTURER	MODEL	MAIN PUMP	_____	_____	OIL COOLER(S)	_____	_____	AUXILIARY PUMP	_____	_____	TRANSFER VALVE(S)	_____	_____	MECHANICAL SEALS	_____	_____	PUMP COUPLING(S)	_____	_____	ELECTRIC MOTORS	_____	_____	SUCTION STRAINER(S)	_____	_____	STEAM TURBINES	_____	_____	CHECK VALVE(S)	_____	_____	OIL FILTER(S)	_____	_____			
	MANUFACTURER	MODEL		MANUFACTURER	MODEL																																												
MAIN PUMP	_____	_____	OIL COOLER(S)	_____	_____																																												
AUXILIARY PUMP	_____	_____	TRANSFER VALVE(S)	_____	_____																																												
MECHANICAL SEALS	_____	_____	PUMP COUPLING(S)	_____	_____																																												
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	DATA SHEET		No.	REV.	
	<div style="font-weight: bold; font-size: 1.5em;">RECIPROCATING COMPRESSOR</div> <div style="font-weight: bold; font-size: 1.2em;">METRIC UNIT (kgf/cm<sup>2</sup>)</div>			SHEET	of
TITLE:					

COOLING WATER SYSTEM

**BASIC COOLING SYS. FOR:**
☐ COMPRESSOR CYL.(S)   
 ☐ INTERCOOLER(S)   
 ☐ AFTERCOOLER   
 ☐ OIL COOLER(S)

☐ HEATERS REQ'D FOR PRE-HEATING:   
 ☐ ELEC. W/THERMOSTAT(S)   
 ☐ STEAM

PRESSURE FORCED CIRCULATING SYS:   
 ☐ OPEN PIPING BY:   
 ☐ PURCH   
 ☐ MFR   
 ☐ CLOSED, PIPING BY \_\_\_\_\_

MAIN WATER PUMP DRIVEN BY:   
 ☐ ELEC. MOTOR   
 ☐ STEAM TURBINE   
 ☐ OTHER \_\_\_\_\_

AUX WATER PUMP DRIVEN BY:   
 ☐ ELEC. MOTOR   
 ☐ STEAM TURBINE   
 ☐ OTHER \_\_\_\_\_

SEP. CONSOLE FOR COOL. WATER SYS.   
 ☐ ONE CONSOLE FOR EA. COMP.   
 ☐ ONE CONSOLE FOR \_\_\_\_\_ COMPRESSORS

☐ CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR MULTI-POINT SUPPORT AND GROUTING WITH GROUT & VENT HOLES

ELECTRICAL CLASSIFICATION: ZONE \_\_\_\_\_ GAS GROUP \_\_\_\_\_ TEMP CLASS \_\_\_\_\_   
☐ NON-HAZARDOUS

**BASIC SYS. REQ'MTS (NORM. COOLING WATER FLOW DATA)**

COOLING WATER TO BE \_\_\_\_\_ % ETHYLENE GLYCOL

	FORCED	THERMO	STAND	FLOW	PRESSURE	INLET TEMP	OUTLET TEMP	SIGHT FLOW
	COOL'G	SIPHON	PIPE	m <sup>3</sup> /h	kgf/cm <sup>2</sup>	°C	°C	INDICATORS
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
CYLINDER(S), _____ STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	<input type="checkbox"/>
PISTON ROD PACK'G TOTAL	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
INTERCOOLER(S) TOTAL	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
AFTERCOOLER	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
OIL COOLER(S)	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>
_____	<input type="checkbox"/>			_____	_____	_____	_____	<input type="checkbox"/>

**TOTAL FLOW** \_\_\_\_\_

☐ SYS. PRESSURES:   
 ☐ DESIGN \_\_\_\_\_ kgf/cm<sup>2</sup>   
 ☐ HYDROTEST \_\_\_\_\_ kgf/cm<sup>2</sup>   
 ☐ RELIEF VALVE(S), SETTING \_\_\_\_\_ kgf/cm<sup>2</sup>

☐ WATER RESERVOIR:   
 ☐ SIZE: \_\_\_\_\_ mm   
 DIA X \_\_\_\_\_ mm HT   
☐ CAPACITY \_\_\_\_\_ m<sup>3</sup> @ NORMAL OPERATING LEVEL

☐ RESERVOIR MATERIAL \_\_\_\_\_   
☐ INTERNAL COATING, TYPE \_\_\_\_\_

☐ LEVEL GAUGE   
☐ LEVEL TRANSMITTERS   
☐ DRAIN VALVE   
☐ INSPECTION & CLEAN-OUT OPENINGS

**PUMPS (Centrifugal Only)**   
☐ RATED FLOW   
☐ PRESSURE   
☐ REQ'D   
☐ DRIVER   
☐ SPEDD   
☐ COUPLING   
☐ MECH. SEAL

\_\_\_\_\_ m<sup>3</sup>/h   
 \_\_\_\_\_ kgf/cm<sup>2</sup>   
 \_\_\_\_\_ kW   
 \_\_\_\_\_ kW   
 \_\_\_\_\_ rpm   
 \_\_\_\_\_ REQ'D   
 \_\_\_\_\_ REQ'D

☐ MAIN   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_

☐ AUXILIARY   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_   
 \_\_\_\_\_

☐ PUMP CASING MATERIAL MAIN PUMP \_\_\_\_\_ AUX PUMP \_\_\_\_\_

☐ GUARD(S) REQ. FOR COUPLING(S)   
☐ MAIN PUMP   
☐ AUX PUMP   
☐ GUARD TYPE OR CODE \_\_\_\_\_

☐ AUXILIARY PUMP CONTROL   
☐ MANUAL   
☐ AUTOMATIC   
☐ ON-OFF-AUTO SEL. SWITCH:   
☐ BY PURCH   
☐ BY MFR

☐ WIRING TO TERMINAL BOX:   
☐ BY PURCH   
☐ BY MFR

**COOLING WATER HEAT EXCH:**   
☐ SHELL & TUBE   
☐ SINGLE   
☐ DUAL W/ TRANSFER VALVE   
☐ TEMA C   
☐ TEMA R

☐ AIR COOLED EXCHANGER W/ AUTO TEMP CONTROL

☐ W/BY-PASS & TEMP CONTROL VALVE:   
☐ MANUAL   
☐ AUTO   
☐ LOUVERS FOR AIR EXCH.


☐ SEE SEPARATE COOLER DATA SHEET FOR DETAILS; SPECIFY % GLYCOL ON BOTH SIDE OF SHELL & TUBE

SYS. COMPONENT SUPP	MANUFACTURER	MODEL	MANUFACTURER	MODEL
<input type="checkbox"/> MAIN PUMP	_____	_____	<input type="checkbox"/> TEMP CONTROL VALVE(S)	_____
<input type="checkbox"/> AUXILIARY PUMP	_____	_____	<input type="checkbox"/> TRANSFER VALVE(S)	_____
<input type="checkbox"/> MECHANICAL SEALS	_____	_____	<input type="checkbox"/> _____	_____
<input type="checkbox"/> ELECTRIC MOTORS	_____	_____	<input type="checkbox"/> _____	_____
<input type="checkbox"/> STEAM TURBINES	_____	_____	<input type="checkbox"/> _____	_____
<input type="checkbox"/> HEAT EXCHANGERS	_____	_____	<input type="checkbox"/> _____	_____
<input type="checkbox"/> PUMP COUPLING	_____	_____	<input type="checkbox"/> _____	_____

NOTES:


	DATA SHEET		No.	REV.	
	TITLE: <span style="font-size: 1.5em; font-weight: bold;">RECIPROCATING COMPRESSOR METRIC UNIT (kgf/cm²)</span>			SHEET	of

1	APPLICABLE TO:	<input checked="" type="checkbox"/> PROPOSAL	<input checked="" type="checkbox"/> PURCHASE	<input checked="" type="checkbox"/> AS BUILT
2	FOR:			
3	SITE:			
4	NO. REQ'D:			
5	MODEL:			
6	SIZE/TYPE:			
7	SERIAL NO.:			
8				
9	PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS			
10	THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION			
11	GENERAL INFORMATION APPLICABLE TO ALL SUPPRESSORS			
12	TOTAL NUMBER OF SERVICES AND/OR STAGES _____			
13	TOTAL NUMBER OF COMPRESSOR CYL. _____ TOTAL NUMBER OF CRANKTHROWS _____ STROKE _____ mm rpm _____			
14	<input type="checkbox"/> ASME CODE STAMP <input type="checkbox"/> GOVERNMENTAL CODES OF _____ CODE REGULATIONS APPLY			
15	<input type="checkbox"/> OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE _____			
16	<input type="checkbox"/> LUBE SERVICE <input type="checkbox"/> NON-LUBE SERV. <input type="checkbox"/> NO OIL ALLOWED INTERNALLY			
17	DRY TYPE INTERNAL CORROSION COATING <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
18	RADIOGRAPHY OF WELDS <input type="checkbox"/> NONE <input type="checkbox"/> SPOT <input type="checkbox"/> 100 % <input type="checkbox"/> IMPACT TEST <input type="checkbox"/> SPECIAL WELDING REQUIREMENTS			
19	<input type="checkbox"/> SHOP INSPECTION <input type="checkbox"/> WITNESSED <input type="checkbox"/> OBSERVED			
20	<input type="checkbox"/> WITNESS HYDROTEST			
21	<input type="checkbox"/> OUTDOOR STORAGE OVER _____ MONTHS <input type="checkbox"/> SPECIAL PAINT SPEC _____			
22	<input type="checkbox"/> ACOUSTICAL SIMULATION STUDY <input type="checkbox"/> DESIGN APPROACH: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
23	CYLINDER, GAS, OPERATING, AND SUPPRESSOR DESIGN DATA			
24		SERVICE		STAGE NO.
25	<input type="checkbox"/> COMPRESSOR MANUFACTURER'S RATED CAPACITY	kg/h _____ m³/h _____	1,03 kgf/cm² @ 0 °C	
26	<input type="checkbox"/> LINE SIDE IOERATING PRESSURE	INLET. _____ kgf/cm² a	DISCHARGE _____ kgf/cm² a	
27	<input type="checkbox"/> OPERATING TEMP. WITHIN SUPPRESSORS	INLET. _____ °C	DISCHARGE _____ °C	
28	<input type="checkbox"/> ALLOWABLE PRESSURE DROP THROUGH SUPPRESSORS	ΔP _____ a %	ΔP _____ kgf/cm² a %	
29		INLET SUPPRESSOR		DISCHARGE SUPPRESSOR
30	<input type="checkbox"/> SUPPRESSOR TAG NUMBER			
31	<input type="checkbox"/> COMBINATION INLET SUPP SEPARATOR / INTERNALS	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO    / <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO
32	<input type="checkbox"/> NO. (QTY) OF INLET & DISCH. SUPP. PER STAGE			
33	<input type="checkbox"/> ALLOWABLE PEAK-PEAK PULSE @ LINE SIDE NOZZLE	_____ kgf/cm² a / _____ %		_____ kgf/cm² a / _____ %
34	<input type="checkbox"/> ALLOWABLE PEAK-PEAK PULSE @ CYL FLANGE NOZZLE	_____ kgf/cm² a / _____ %		_____ kgf/cm² a / _____ %
35	<input type="checkbox"/> DESIGN FOR FULL VACUUM CAPABILITY	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO
36	<input type="checkbox"/> MIN REQ'D WORKING PRESSURE & TEMPERATURE	_____ kgf/cm² a @ _____ °C		_____ kgf/cm² a @ _____ °C
37				
38	<input type="checkbox"/> INITIAL SIZING VOLUME	_____ m³		_____ m³
39	<input type="checkbox"/> AS BUILT VOLUME	_____ m³		_____ m³
40				
41	NOTES:			
42				
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	<b>DATA SHEET</b>		No.	REV.	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>			SHEET	of
1	PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS (CONT.)		SERVICE		
2	THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION		STAGE NO.		
3	<b>CONSTRUCTION REQUIREMENTS &amp; DATA</b>		<b>INLET SUPPRESSOR</b>	<b>DISCHARGE SUPPRESSOR</b>	
4	<input type="checkbox"/> SUPPRESSOR TAG NUMBER				
5	<input type="checkbox"/> BASIC MATERIAL REQUIRED, CS, SS ETC.				
6	<input type="checkbox"/> ACTUAL MATERIAL DESIGNATION         SHELL/HEAD <input type="checkbox"/> YES <input type="checkbox"/> NO		/	/	
7	<input type="checkbox"/> SPECIAL HARDNESS LIMITATION, Rc		<b>SHELL &amp; HEADS WELDS</b>	<b>SHELL &amp; HEADS WELDS</b>	
8	<input type="checkbox"/> CORROSION ALLOWANCE, mm <input type="checkbox"/> REQUIRED		mm	mm	
9	<input type="checkbox"/> WALL THICKNESS, mm SHELL/HEAD		mm / mm	mm / mm	
10	<input type="checkbox"/> NOM. SHELL DIA X OVERALL LGTH.		X mm / m³	X mm / m³	
11	<input type="checkbox"/> PIPE OR ROLLED PLATE CONSTRUCTION		<input type="checkbox"/> PIPE <input type="checkbox"/> ROLLED PLATE	<input type="checkbox"/> PIPE <input type="checkbox"/> ROLLED PLATE	
12	<input type="checkbox"/> ACT. MAX. ALLOW. WORKING PRESS. AND TEMPERATURE		kgf/cm² a °C	kgf/cm² a °C	
13	<input type="checkbox"/> MINIMUM DESIGN METAL TEMP		°C	°C	
14	<input type="checkbox"/> INLET SUPPRESSOR TO BE SAME MAWP AS DISCHARGE SUPP.		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
15	<input type="checkbox"/> MAX. EXPECTED PRESSURE DROP ΔP, % LINE PRESS		ΔP kgf/cm² a %	ΔP kgf/cm² a %	
16	<input type="checkbox"/> WEIGHT, (EACH)		kg	kg	
17	<input type="checkbox"/> INSUL. NUTS & ALLOW. FOR INSULATION REQUIRED				
18	<input type="checkbox"/> EXPECTED P-P PULSE @ LINE SIDE/CYL. FLG, % LINE PRESS BASED ON FINAL SUPPRESSOR DESIGN		% / %	% / %	
19	<input type="checkbox"/> SUPPORTS, TYPE/QUANTITY				
21	<b>CONNECTION REQUIREMENTS &amp; DATA</b>				
22	<input type="checkbox"/> LINE SIDE FLANGE, SIZE/RATING/TYPE				
23	<input type="checkbox"/> COMP. CYL. FALNGE(S), QTY/SIZE/RATING/FACING/TYPE				
24	<input type="checkbox"/> FLANGE FINISH <input type="checkbox"/> PER 3.9.3.15 > 125 < 250 <input type="checkbox"/> SPECIAL (SPECIFY)				
25	<input type="checkbox"/> PER ASME B16.5				
26	<input type="checkbox"/> INSPECTION OPENINGS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> BLINDED	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> BLINDED	
27	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
28	<input type="checkbox"/> QTY, SIZE, /FLG TYPE & RATING (SEE NOTE 4)				
29	<input type="checkbox"/> VENT CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
30	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
31	<input type="checkbox"/> QTY, SIZE, /FLG TYPE & RATING (SEE NOTE 4)				
32	<input type="checkbox"/> DRAIN CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
33	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
34	<input type="checkbox"/> QTY, SIZE, /FLG TYPE & RATING (SEE NOTE 4)				
35	<input type="checkbox"/> PRESSURE CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
36	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
37	<input type="checkbox"/> QTY, SITE, /FLG TYPE & RATING (SEE NOTE 4)				
38	<input type="checkbox"/> TEMPERATURE CONNECTIONS REQUIRED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	
39	<input type="checkbox"/> SPEC. QTY, SIZE, /FLG TYPE & RATING				
40	<input type="checkbox"/> CYL NOZZLE <input type="checkbox"/> MAIN BODY				
41	<input type="checkbox"/> QTY, SITE, /FLG TYPE & RATING (SEE NOTE 4)				
42					
43					
45	<b>OTHER DATA AND NOTES</b>				
46	<input type="checkbox"/> COMPRESSOR MFG'S SUPP, OUTLINE OR DRAWING NO.				
47	<input type="checkbox"/> SUPP, MFG'S OUTLINE OR DRAWING NO.				
48	NOTES:				
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THIS FORM IS PART OF PETROBRAS N-1854 REV. D ANNEX B - SHEET 15/21.

	DATA SHEET		No. _____		REV. _____	
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>				SHEET _____ of _____	
1	APPLICABLE TO: <input type="checkbox"/> PROPOSAL <input type="checkbox"/> PURCHASE <input type="checkbox"/> AS BUILT					
2	FOR: _____		UNIT: _____			
3	SITE: _____		SERVICE: _____			
4	NO. REQ'D: _____		MANUFACTURER: _____			
5	MODEL: _____		VENDOR: _____			
6	SIZE/TYPE: _____		DRIVER/DRIVEN MFR: _____			
7	SERIAL NO.: _____		MANUFACTURER NO.: _____			
8						
9	GENERAL INFORMATION APPLICABLE TO ALL EXCHANGER (SEE NOTES 5 AND 6)					
10	REF TOTAL NUMBER OF SERVICES AND/OR STAGES FOR COMPRESSOR _____					
11	<input type="checkbox"/> ASME CODE STAMP		<input type="checkbox"/> STATE / COUNTRY / PROVINCE OF _____		<input type="checkbox"/> CODE REGULATIONS APPLY	
12	<input type="checkbox"/> OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE _____					
13	<input type="checkbox"/> LUBE SERVICE <input type="checkbox"/> NON-LUBE SERV.		<input type="checkbox"/> NO OIL ALLOWED INTERNALLY		<input type="checkbox"/> DRY TYPE INTER. CORR. COATING	
14	<input type="checkbox"/> OUTDOOR STORAGE OVER _____ MONTHS		<input type="checkbox"/> SPECIAL PAINT SPEC.		<input type="checkbox"/> GLYCOL ON WATER	
15	<input type="checkbox"/> SHOP INSPECTION <input type="checkbox"/> WITNESSED		<input type="checkbox"/> OBSERVED		<input type="checkbox"/> WITNESS HYDROTEST	
16	<input type="checkbox"/> TEMA C					
17	<input type="checkbox"/> TEMA R (API STD 660 DATA SHT. ATTACHED)					
18						
19	PERFORMANCE OF ONE EXCHANGER					
20	<input type="checkbox"/> THIS EXCHANGER IS FOR:		<input type="checkbox"/> INTERCOOLER BETW. STAGE & STAGE		<input type="checkbox"/> AFTERCOOLER <input type="checkbox"/> DBL PIPE <input type="checkbox"/> YES <input type="checkbox"/> NO	
21			<input type="checkbox"/> SPECIAL OIL COOLER		<input type="checkbox"/> SPECIAL COOLING WATER COOLER	
22			<input type="checkbox"/> HORIZONTAL <input type="checkbox"/> VERTICAL		<input type="checkbox"/> TOTAL NUMBER OF IDENTICAL EXCHANGERS PER THIS COMPLETED DATA SHEET	
23						
24	DESIGN DUTY _____ W		SIZE _____ / _____ / _____			
25	TRANSFER RATE, W/m² °C:    SERVICE _____		CLEAN _____		MTD (CORR.) _____ °C	
26	TOTAL SURFACE (EFF) _____ m		SHELL / UNIT _____		SURFACE / SHELL (EFF) _____ m²	
27						
28			SHELL SIDE		TUBE SIDE	
29	FLUID					
30	TOTAL FLOW, kg/h					
31			INLET                      OUTLET		INLET                      OUTLET	
32	LIQUID, Kg/h					
33	MOLECULAR WT.					
34	SPEC. GRAVITY					
35	THERM COND, W/m °C					
36	SPEC. HEAT, kcal/kg °C					
37	VISCOSITY, Pa.s					
38	VAPOR, kg/h					
39	MOLECULAR WT.					
40	DENSITY, kg/m³					
41	THERMAL COND, W/m °C					
42	SPEC. HEAT, kcal/kg °C					
43	VISCOSITY, Pa.s					
44	LATENT HEAT, kcal/kg					
45	DEW POINT, °C					
46	NON-CONDENSABLES, kg/h					
47	MOLECULAR WT.					
48	STEAM LEFT IN GAS, kg/h					
49	WATER CONDENSED, kg/h					
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51	NOTES:					
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	DATA SHEET		No. _____	REV. _____
	TITLE: <b>RECIPROCATING COMPRESSOR</b> <b>METRIC UNIT (kgf/cm²)</b>			SHEET _____ of _____

1 **HEAT EXCHANGER FOR RECIPROCATING COMPRESSOR (CONT.)**

2 SERVICE \_\_\_\_\_

3 ☐ INTERCOOLER BETW. \_\_\_\_\_ STG & \_\_\_\_\_ STG

4 ☐ AFTERCOOLER

5 **PERFORMANCE OF ONE EXCHANGER (CONT.)**

	INLET / SHELL SIDE / OUTLET	INLET / TUBE SIDE / OUTLET	INLET / TUBE SIDE / OUTLET
6 TEMPERATURE, °C			
7 PRESSURE (ATMOS), kgf/cm²			
8 PRESSURE DROP, kgf/cm²	ALLOW:	CALC.:	ALLOW:
9 VELOCITY, m/s			
10 FOULING FACTOR, m² °C/W			
11 DESIGN PRESSURE, kgf/cm² g			
12 TEST PRESSURE, kgf/cm² g			
13 DESIGN TEMPERATURE, °C			
14 CORR. ALLOWANCE, mm			
15 NUMBER OF PASSES			
16 DIF. DES PRESSURE, kgf/cm² g			
17 FLOW ARRANGEMENT			

20 **CONSTRUCTION**

21 SHELL DIA (OD) (ID) _____ mm	BAFFLE TYPE _____	WT. BUNDLE & SHELL _____ kg
22 NO. TUBES / SHELL _____	NO. SPACING _____ X _____ mm	WT. BUNDLE _____ kg
23 OD X LENGTH _____ X _____	SEGMENTAL CUT _____ %	WT. FULL ON WATER _____ kg
24 GAUGE BWG _____ mm (AVE)(MIN)	IMPIGEMENT BAFLE <input type="checkbox"/> YES <input type="checkbox"/> NO	V² INLET NOZZLE _____
25 TUBE PITCH _____ mm	EXPANSION JOINT <input type="checkbox"/> YES <input type="checkbox"/> NO	V² BUNDLE ENTR _____
26 TEMA CLASS _____	EXP. JOINT DES TEMP _____ °C	V² BUNDLE EXIT _____
27 CODE REQ ASME _____	SURFACE PREP _____	SPECIFICATIONS _____
28 CODE STAMP <input type="checkbox"/> YES <input type="checkbox"/> NO	PAINT _____	FLOATING TYPE TUBE SHT <input type="checkbox"/> YES <input type="checkbox"/> NO
29 REMVBL TUBE BUNDLE <input type="checkbox"/> YES <input type="checkbox"/> NO	INSULATION <input type="checkbox"/> YES <input type="checkbox"/> NO	SEAL TYPE LONG BAFFLE _____
30 TUBES <input type="checkbox"/> U-BEND <input type="checkbox"/> STRAIGHT	BY-PASS SEAL ARR'MT <input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> WELDED
31 SHELL COVER <input type="checkbox"/> INTEG. <input type="checkbox"/> REMVBL	TUBE-TUBE SHT JT <input type="checkbox"/> ROLLED	

32 **MATERIALS (MARK "SR" FOR STRESS RELIVED, "XR" FOR RADIOGRAPHED)**

33 TUBES / TUBESHEET _____	SHELL / SHELL COVER _____
34 BAFFLES / TUBESUPPORTS _____	SHELL FLANGE _____
35 TIE RODS & SPACERS _____	CHANNEL / BONNET _____
36 LONG BAFFLE _____	CHANNEL COVER / FLANGE _____
37 GASKET SHELL SIDE / TUBE SIDE _____	FLOATING HEAD COVER _____
38 BOLTING _____	EXPANSION JOINT _____
39 FLOATING HEAD GASKET _____	FLOATING HEAD SEAL _____

NO.	SIZE	SHELL SIDE	RATING & FACING	NO.	SIZE	TUBE SIDE	RATING & FACING
42 INLET							
43 OUTLET							
44 VENT							
45 DRAIN							
46 PRESSURE GAUGE (EA. NOZZLE)							
47 THERMOWELL CONN (EA. NOZZLE)							
48 INTERCONNECTING CONN.							

49 SPECIFY GAS SIDE FLANGE FINISH \_\_\_\_\_

51 NOTES:

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INSTRUMENTATION							
INSTRUMENT & CONTROL		<input type="checkbox"/> ONE FOR EA. UNIT <input type="checkbox"/> ONE COMMON TO ALL UNITS					
PANEL:		<input type="checkbox"/> MACHINE MT'ED <input type="checkbox"/> FREE STANDING (OFF UNIT) <input type="checkbox"/> LOCAL <input type="checkbox"/> REMOTE <input type="checkbox"/> OUTDOORS					
		<input type="checkbox"/> PNEUMATIC <input type="checkbox"/> ELEC. <input type="checkbox"/> ELETRONIC <input type="checkbox"/> HYDRAULIC <input type="checkbox"/> PROGRAMMABLE CONTRLR					
		<input type="checkbox"/> NEMA 7 CLASS    _____, GROUP _____, DIVISION _____ <input type="checkbox"/> INTRINAICALLY SAFE					
		<input type="checkbox"/> IEC    _____, ZONE _____, GROUP _____, TEMPERATURE CLASS _____ <input type="checkbox"/> NON HAZARDOUS AREA					
		<input type="checkbox"/> I/S BARRIERS					
		<input type="checkbox"/> NEMA 4, WATERTIGHT & DUSTTIGHT <input type="checkbox"/> PURGED TO NFPA 496    TYPE <input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> Z					
		<input type="checkbox"/> OTHER NEMA _____ LOW PURGE PRESS <input type="checkbox"/> ALARM <input type="checkbox"/> SHUTDOWN					
		<input type="checkbox"/> VIB. ISOLATORS <input type="checkbox"/> STRIP HEATERS <input type="checkbox"/> PURGE CONN. <input type="checkbox"/> EXTRA CUTOUTS					
		<input type="checkbox"/> ANNUNCIATOR W/FIRST-OUT INDICATION LOCATION LOCATED ON CONTROL PANEL					
		<input type="checkbox"/> PURCHASER'S CONN. BROUGHT OUT TO TERMINAL BOX BY VENDOR					
ADDITIONAL PANEL REMARKS: _____							
<input type="checkbox"/> INSTRUMENTATION SUITABLE FOR: <input type="checkbox"/> INDOORS <input type="checkbox"/> OUTDOORS <input type="checkbox"/> OTHER _____							
PREFERRED INSTRUMENT SUPPLIERS, (TO BE COMPLETED BY PURCHASER), OTHERWISE MFR'S STANDARD APPLIES							
PRESSURE GAUGES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
TEMPERATURE GAUGES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
LIQUID LEVEL GAUGES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
DIFF. PRESSURE GAUGES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
PRESSURE TRANSMITTERS	MFR	_____	SIZE & TYPE	_____	MTL	_____	
TEMPERATURE TRANSMITTERS	MFR	_____	SIZE & TYPE	_____	MTL	_____	
LIQUID LEVEL TRANSMITTERS	MFR	_____	SIZE & TYPE	_____	MTL	_____	
DIFF. PRESSURE TRANSMITTERS	MFR	_____	SIZE & TYPE	_____	MTL	_____	
FLOW TRANSMITTERS	MFR	_____	SIZE & TYPE	_____	MTL	_____	
TACHOMETER	MFR	_____	SIZE & TYPE	_____	MTL	_____	
CONTROL VALVES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
PRESSURE SAFETY VALVES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
SIGHT FLOW INDICATORS	MFR	_____	SIZE & TYPE	_____	MTL	_____	
VIBRATION MONITORS & EQUIP.	MFR	_____	SIZE & TYPE	_____	MTL	_____	
THERMOCOUPLES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
RTD'S	MFR	_____	SIZE & TYPE	_____	MTL	_____	
SOLENOID VALVES	MFR	_____	SIZE & TYPE	_____	MTL	_____	
ANNUNCIATOR	MFR	_____	MODEL & (QTY SPARE POINTS)	_____	( _____ )		
PROGRAMMABLE CONTROLLER	MFR	_____	SIZE & TYPE	_____	MTL	_____	
_____	MFR	_____	SIZE & TYPE	_____	MTL	_____	
PRESSURE GAUGE REQUIREMENTS (LIQUID FILLED PRESSURE GAUGES: <input type="checkbox"/> YES <input type="checkbox"/> NO )							
	LOCALLY	LOCAL	CONTROL		LOCALLY	LOCAL	CONTROL
FUNCTION	MOUNTED	PANEL	ROOM	FUNCTION	MOUNTED	PANEL	ROOM
LUBE OIL MAIN PUMP DISCHARGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PROCESS GAS:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL AUX PUMP DISCHARGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	INLET PRESS (@ EA. STAGE)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL PRESS. AT FRAME HEADER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DISCH PRESS (@ EA. STAGE)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL FILTER ΔP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING WATER INLET HEADER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NOTES:							

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<div></div>	DATA SHEET		No.		REV.	
					SHEET	
	TITLE: RECIPROCATING COMPRESSOR METRIC UNIT (kgf/cm²)				of	

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INSTRUMENTATION (CONT.)										
TEMPERATURE GAUGE REQUIREMENTS				LOCALLY	LOCAL	CONTROL	GAUGE W/	THERMO	RTD	I/S
FUNCTION				MOUNTD	PANEL	ROOM	CAPILLARY	COUPLE SYS	SYS	SYS
LUBE OIL <input type="checkbox"/> INLET TO <input type="checkbox"/> OUT OF FRAME				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL <input type="checkbox"/> INLET TO <input type="checkbox"/> OUT OF COOLER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MAIN JOURNAL BEARINGS (THERMOCOUPLES OR RTD'S ONLY)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOTOR BEARING(S) (THERMOCOUPLES OR RTD'S ONLY)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING WATER HEADER: <input type="checkbox"/> INLET <input type="checkbox"/> OULET				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CYL. COOLING WATER: <input type="checkbox"/> INLET <input type="checkbox"/> OULET <input type="checkbox"/> EACH CYL				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROCESS GAS: <input type="checkbox"/> INLET <input type="checkbox"/> DISCHARGE <input type="checkbox"/> EACH CYL				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INTERCOOLER(S): <input type="checkbox"/> INLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> OUTLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AFTERCOOLER: <input type="checkbox"/> INLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> OUTLET <input type="checkbox"/> GAS <input type="checkbox"/> WATER				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING WATER: <input type="checkbox"/> INLET <input type="checkbox"/> OUTLET COOLED PKG CASE				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PRESS. PKG CASE, CYL PIST ROD (THERMOCOUPLES OR RTD'S ONLY)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COMPRESSOR VALVES <input type="checkbox"/> SUCT. <input type="checkbox"/> DISCH. TC'S OR RTD'S ONLY				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


ANNUNCIATION POINTS					
ALARM		SHUTDOWN		TOTAL	
IN PNL	IN CTL ROOM	IN PNL	IN CTL ROOM	NO. OF	
BY MFR	PNL OTHERS	BY MFR	PNL OTHERS	POINTS	
FUNCTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW LUBE OIL PRESSURE @ BEARING HEADER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH LUBE OIL ΔP ACROSS FILTER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW LUBE OIL LEVEL, FRAME	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AUX LUBE OIL PUMP, FAIL TO START	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CYLINDER LUBE SYSTEM PROTECTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH COMPRESSOR VIBRATION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIBRATION WITH CONTINUOUS MONITORING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ROD DROP DETECTOR CONTACT TYPE (1 / CYL)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ROD DROP PROXIMITY PROBES (1 / CYL)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH OIL TEMP OUT OF FRAME	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH JACKET WATER TEMPERATURE, EACH CYLINDER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH GAS DISCHARGE TEMPERATURE, EACH CYLINDER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW SUCTION PRESSURE <input type="checkbox"/> FIRST STG <input type="checkbox"/> EA STG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH SUCTION PRESSURE <input type="checkbox"/> FIRST STG <input type="checkbox"/> EA STG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH DISCHARGE PRESSURE <input type="checkbox"/> FINAL <input type="checkbox"/> EA STG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH CYLINDER GAS ΔP EACH STAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH LIQUID LEVEL, EACH MOISTURE SEPARATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LOW PURGE GAS PRESSURE DISTANCE PIECE(S)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HIGH X-HD PIN TEMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PRESSURE PACKING CASE (PISTON ROD TEMP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TOTAL NUMBER OF ANNUNCIATION POINTS					

SWITCH CONTACT OPERATION (SEE NOTE 2)	
ALARM CONTACTS SHALL	<input type="checkbox"/> OPEN (DE-ENERGIZED) TO SOUND ALARM & BE ENERGIZED WHEN COMPRESSOR IS IN OPERATION
	<input type="checkbox"/> CLOSE (ENERGIZE) TO SOUND ALARM & BE DE-ENERGIZED WHEN COMPRESSOR IS IN OPERATION
SHUTDOWN CONTACTS SHALL	<input type="checkbox"/> OPEN (DE-ENERGIZED) TO SHUTDOWN BE ENERGIZED WHEN COMPRESSOR IS IN OPERATION
	<input type="checkbox"/> CLOSE (ENERGIZE) TO SHUTDOWN BE DE-ENERGIZED WHEN COMPRESSOR IS IN OPERATION

NOTES:

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	DATA SHEET		No. _____		REV. _____
	TITLE: <span style="font-size: 1.5em;">RECIPROCATING COMPRESSOR</span> <span style="font-size: 1.5em;">METRIC UNIT (kgf/cm<sup>2</sup>)</span>				SHEET _____ of _____


1	INSTRUMENTATION (CONT.)					
2	MISCELLANEOUS INSTRUMENTATION		<input type="checkbox"/> INTERCOOLER(S) <input type="checkbox"/> AFTERCLR <input type="checkbox"/> OIL CLR <input type="checkbox"/> H <sub>2</sub> O CLR			
3	SIGHT FLOW IND. (COOLING H <sub>2</sub> O ONLY)	<input type="checkbox"/>	FOR:	<input type="checkbox"/> CYL JACKET WATER <input type="checkbox"/> ROD PRESS. PACKING CASES		
4	PNEUMATIC PRESSURE TRANSMITTERS	<input type="checkbox"/>	FOR:			
5	PRESSURE TRANSMITTERS (ELEC. OUTP.)	<input type="checkbox"/>	FOR:			
6	PNEUMATIC LEVEL TRANSMITTERS	<input type="checkbox"/>	FOR:			
7	ALARM HORN & ACK'N LMT TEST BUTTON	<input type="checkbox"/>	FOR:			
8	CONDUIT & WIRING W/JUNCT. BOXES (CONSOLES)	<input type="checkbox"/>	FOR:			
9	TEST VALVES	<input type="checkbox"/>	FOR:			
10	DRAIN VALVES	<input type="checkbox"/>	FOR:			
11	GAUGE GLASS(ES)	<input type="checkbox"/>	FOR:			
12	TACHOMETER	<input type="checkbox"/>	FOR:	_____ SPEED RANGE _____ TO _____ rpm		
13	CRANKSHAFT KEY PHASOR AND TRANSDUCER	<input type="checkbox"/>	FOR:			
14		<input type="checkbox"/>	FOR:			
15						
16	SEPARATE LUBE OIL CONSOLE INSTRUMENTATION: PURCH, TO LIST REQ'MTS IN ADDITION TO ANY ABOVE REQ'MTS					
17		<input type="checkbox"/>				
18		<input type="checkbox"/>				
19		<input type="checkbox"/>				
20		<input type="checkbox"/>				
21		<input type="checkbox"/>				
22						
23	SEPARATE COOLING WATER CONSOLE INSTRUMENT: PURCH, TO LIST REQ'MTS IN ADDITION TO ANY ABOVE REQ'MTS					
24		<input type="checkbox"/>				
25		<input type="checkbox"/>				
26		<input type="checkbox"/>				
27		<input type="checkbox"/>				
28		<input type="checkbox"/>				
29						
30	RELIEF VALVES					
31	LOCATION	BY	MANUFACTURER	TYPE	SIZE	SETTING
32			<input type="checkbox"/>			
33			<input type="checkbox"/>			
34			<input type="checkbox"/>			
35			<input type="checkbox"/>			
36			<input type="checkbox"/>			
37			<input type="checkbox"/>			
38			<input type="checkbox"/>			
39			<input type="checkbox"/>			
40			<input type="checkbox"/>			
41			<input type="checkbox"/>			
42						
43	NOTES:					
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[illegible]


	DATA SHEET				No.					
	CLIENT:							SHEET		
	JOB:							of		
	AREA:							C.C.		
		TITLE: VENDOR DRAWINGS AND DATA REQUIREMENTS								
INDEX OF REVISIONS										
REV.	DESCRIPTION AND/OR REVISED SHEETS									
	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H	
DATE										
DESIGN										
EXECUTION										
CHECK										
APPROVAL										
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	<b>DATA SHEET</b>		No.		REV. 0		
	TITLE: <b>VENDOR DRAWINGS AND DATA REQUIREMENTS</b>					SHEET	
						of	
THE DOCUMENTS STATED BELOW SHALL BE SUPPLIED IN ENGLISH OR BRAZILIAN PORTUGUESE (NOTES 4 AND 5)							
PROPOSAL (Note 1)		BIDDER SHALL FURNISH	4	COPIES OF DATA FOR ALL ITEMS INDICATED BY AN X.			
REVIEW (Note 2)		VENDOR SHALL FURNISH	3	COPIES AND	- TRANSPARENCES OF DRAWING AND DATA INDICATED		
FINAL (Note 3)		VENDOR SHALL FURNISH	3	COPIES AND	- TRANSPARENCES OF DRAWING AND DATA INDICATED		
		VENDOR SHALL FURNISH	2	OPERATING AND MAINTENANCE MANUALS.			
		FINAL - RECEIVED FROM VENDOR _____ FINAL - DUE FROM VENDOR (Note 3) _____ REVIEW - RETURNED TO VENDOR _____ REVIEW - RECEIVED FROM VENDOR _____ REVIEW - DUE FROM VENDOR (Note 3) _____					
		<b>DISTRIBUTION RECORD</b>					
		<b>DESCRIPTION</b>					
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1 - CERTIFIED DIMENSIONAL OUTLINE DRAWING (GENERAL ARRANGEMENT) AND LIST OF CONNECTIONS (NOTE 1)				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 - FOUNDATION PLAN SHOWING ANCHOR BOLTS LOCATION FOR FRAME, CYLINDERS, PULSATION DAMPERS AND LOS				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3 - ALLOWABLE FLANGE LOADING (FOR CYLINDERS AND PULSATION SUPPRESSION DEVICES) AND COORDINATES				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4 - DRIVER DIMENSIONAL OUTLINE DRAWING				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5 - DRIVER ARRANGEMENT DRAWING				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6 - DIMENSIONAL OUTLINE DRAWING FOR ALL VENDOR-SUPPLIED MAJOR ACCESSORY EQUIPMENT				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7 - PERFORMANCE DATA AND CURVES				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	8 - PACKING BOXES / SEAL / OIL WIPER RINGS ASSEMBLY DATA, CROSS-SECTIONAL DRAWINGS, PARTS LIST AND ILL OF MATERIALS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9 - GAS LOAD, ROD LOAD AND CROSSHEAD LOAD REVERSAL AND DURATION CHARTS (FOR ALL OPERATING CONDITIONS AND CAPACITIES)				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9a - CALCULATION SHEETS AND COMPUTER PRINTOUTS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	10 - STARTING TORQUE VERSUS SPEED CURVES (FOR DRIVER AND COMPRESSOR)				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11 - DRIVER PERFORMANCE DATA AND CHARACTERISTICS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12 - TABULATION OF UTILITY REQUIREMENTS AND COMSUMPTION (AIR, WATER, STEAM, POWER FOR INSTRUMENTATION, DRIVERS, CONTROL ETC.)				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13 - LIST OF UNSAFE OR UNDESIRABLE SPEEDS				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14 - GEAR DATA AS PER APPLICABLE SPECIFICATIONS				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15 - OTHER DRIVER DATA				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16 - SHAFT COUPLING ASSEMBLY DRAWING, PARTS LIST AND BILL OF MATERIALS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16a - CRITERIA AND CALCULATION FOR COUPLING SIZING				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17 - WELDING PROCEDURES, REPORTS AND DATA				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	17a - WELDERS QUALIFICATION PROCEDURES AND CERTIFICATES				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	17b - MAJOR WELD REPAIRS PROCEDURES, REPORTS AND DATA				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18 - KO DRUMS AND INTERCOOLERS DATA SHEETS, CALCULATION SHEETS, CROSS-SECTIONAL DRAWINGS, PARTS LIST AND BILL OF MATERIALS				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	19 - PARTS LIST WITH SECTIONAL DRAWINGS AND BILL OF MATERIALS FOR MAIN, AUXILIARY EQUIPMENT AND COMPONENTS (INCLUDING LIST OF INTERCHANGEABL PARTS)				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	20 - START UP AND COMMISSIONING SPARES LIST				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	21 - RECOMMENDED NORMAL MAINTENANCE SPARE PARTS (2 AND 4 YEARS OF OPERATION) FOR MAIN & UXILIARY EQUIPMENT				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22 - PROCESS P&I DIAGRAM, PARTS LIST AND BILL OF MATERIALS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	23 - FRAME AND CYLINDER LUBE OIL P&I DIAGRAM, PARTS LIST AND BILL OF MATERIALS				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24 - LUBE-OIL SYSTEM ASSEMBLY, ARRANGEMENT DRAWINGS, LIST OF CONNECTIONS, PARTS LIST AND BILL OF MATERIALS				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	25 - LUBE-OIL SYSTEM COMPONENT DRAWINGS, PARTS LISTS AND DATA SHEETS				
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		<b>DATA SHEET</b>		No.		REV. 0			
		TITLE: <b>VENDOR DRAWINGS AND DATA REQUIREMENTS</b>					SHEET		
							of		
		<b>DESCRIPTION (cont'd)</b>							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	26 - COOLANT & HEATING SYSTEMS P&I DIAGRAM, PARTS LIST AND BILL OF MATERIALS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	27 - COOLANT & HEATING SYSTEMS ASSEMBLY, ARRANGEMENT DRAWINGS, LIST OF CONNECTIONS, PARTS LIST AND BILL OF MATERIALS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	28 - COOLANT & HEATING COMPONENT DRAWINGS AND DATA						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	29 - DISTANCE PIECE VENT, DRAIN, AND BUFFER P&I DIAGRAM, LIST OF CONNECTIONS AND PARTS LIST						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	30 - CAPACITY CONTROL SCHEMATICS, DESCRIPTION, COMPONENTS LIST AND BILL OF MATERIALS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	31 - ELECTRICAL, CONTROL, PROTECTION, MONITORING SYSTEM & INSTRUMENTATION						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	31a - SYSTEM SCHEMATICS, FUNCTIONAL DIAGRAMS, P&I DIAGRAMS AS APPLICABLE / REQUIRED						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	31b - SYSTEM EQUIPMENT & COMPONENT LIST, AND BILL OF MATERIALS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	31c - SYSTEM EQUIPMENT & COMPONENTS DRAWINGS, DETAILS, DATA SHEETS AND DESCRIPTIONS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	31d - LIST OF EQUIPMENT & COMPONENT SUB-SUPPLIERS WITH PARTS / CATALOG ITEM NUMBER						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	32 - INSTRUMENTATION AND ELECTRICAL ARRANGEMENT DRAWING AND LIST OF CONNECTIONS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	33 - INSTRUMENTATION AND ELECTRICAL WIRING AND OTHERS DIAGRAMS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	34 - LIST OF SET POINTS FOR CONTROL / PROTECTION / MONITORING SYSTEM AND INSTRUMENTATION						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	35 - INSTRUMENTATION ISA DATA SHEET						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	36 - PULSATION SUPPRESSION DEVICE(S) DETAIL DRAWINGS AND ASME CALCULATION SHEETS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	37 - SPECIAL TOOLS LIST, WITH PURPOSE, IDENTIFICATION, DESCRIPTION AND DRAWINGS / PICTURES						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	38 - DETAILED ENGINEERING, FABRICATION, AND DELIVERY SCHEDULES (WITH STATUS) FOR MAIN EQUIPMENT AND MASTER SCHEDULES FOR AUXILIARY EQUIPMENT (INCLUDING SUB-SUPPLIERS SCHEDULES)						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	39 - DRAWINGS AND DOCUMENTS INDEX FOR MAIN & AUXILIARY EQUIPMENT						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	40 - WEATHER PROTECTION (IF NECESSARY) AND CLIMATIZATION REQUIRED						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	40a - SPECIAL SYSTEM INTEGRITY PROTECTION REQUIREMENTS FOR INSTRUMENTATION						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	41 - COMMENTS ON PURCHASER'S PIPING AND FOUNDATION DRAWINGS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	42 - PROGRESS REPORTS						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	43 - TORSIONAL ANALYSIS REPORT (INCLUDING TRANSIENT)						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	44 - DATA FOR AN INDEPENDENT TORSIONAL ANALYSIS (INCLUDING TRANSIENT)						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	45 - LATERAL ANALYSIS DATA AND REPORT						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	46 - ACOUSTICAL AND MECHANICAL ANALYSIS REPORT						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	47 - DATA REQUIRED FOR THIRD-PARTY ACOUSTICAL AND MECHANICAL ANALYSIS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	48 - ENGINEERING ANALYSIS FOR FABRICATED CYLINDERS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	49 - BALANCING DATA TABULATION						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50 - VALVE DYNAMICS REPORT						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	51 - DATA FOR AN INDEPENDENT VALVE DYNAMICS ANALYSIS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 - CONNECTION SKETCHES						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	53 - COUPLING ALIGNMENT DIAGRAM						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	54 - AS-BUILT DIMENSIONS AND DATA (MAIN AND AUXILIARY EQUIPMENT)						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	55 - HYDROSTATIC TEST PROCEDURES AND ACCEPTANCE CRITERIA						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	55a - HYDROSTATIC TEST REPORT / CERTIFICATE						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	56 - MECHANICAL RUN TEST PROCEDURES AND ACCEPTANCE CRITERIA						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	56a - MECHANICAL RUN TEST REPORT / CERTIFICATE						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	57 - PERFORMANCE TEST PROCEDURES AND ACCEPTANCE CRITERIA						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	57a - PERFORMANCE TEST REPORT / CERTIFICATE						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	58 - NDT TEST PROCEDURES AND ACCEPTANCE CRITERIA						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	58a - REPORTS / CERTIFICATES FOR FABRICATED CYLINDERS AND ALL CAST PART						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	59 - PROCEDURES FOR SPECIAL OR OPTIONAL TESTS						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	60 - CERTIFIED DATA FROM SPECIAL OR OPTIONAL TESTS						
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	<b>DATA SHEET</b>		No.		REV. 0	
	TITLE: <b>VENDOR DRAWINGS AND DATA REQUIREMENTS</b>				SHEET	
					of	
DESCRIPTION (cont'd)						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	61 - MILL TEST PROCEDURES, ACCEPTANCE CRITERIA, REPORTS AND CERTIFICATES			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	62 - CRANKSHAFT ULTRASONIC TEST CERTIFICATE			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	63 - GAS LEAK TEST CERTIFICATE			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	64 - VALVE LEAK TEST CERTIFICATE			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	65 - AS-BUILT DATA SHEETS FOR MAIN AND AUXILIARY EQUIPMENT			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	66 - INSTALLATION MANUALS FOR MAIN AND AUXILIARY EQUIPMENT			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	66a - HARDWARE AND SOFTWARE MANUALS OF CONTROL AND SHUTDOWN / ALARM SYSTEM (INCLUDING LADDER DIAGRAM, PROGRAMING INSTRUCTION AND COMMUNICATION DRIVERS)			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	67 - OPERATION AND MAINTENANCE MANUALS FOR MAIN AND AUXILIARY EQUIPMENT			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	68 - TECHNICAL DATA BOOKS FOR MAIN AND AUXILIARY EQUIPMENT			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	69 - PAINTING, PRESERVATION, PACKING AND SHIPPING SPECIFICATION, PROCEDURES AND INSPECTION REPORTS. INSTRUCTIONS FOR RE-PRESERVATION OF EQUIPMENT, COMPONENTS AND SPARE PARTS			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	70 - PACKING AND SHIPPING LIST			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	71 - MATERIAL SAFETY DATA SHEETS			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	72 - WEIGHTS, STATIC AND DYNAMIC LOADS, CENTERS OF GRAVITY, AND COORDINATES			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	73 - ITEMIZED SPARE PARTS PRICE LIST WITH VALIDITY FOR REFERENCE			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	74 - EXPECTED AND GUARANTEED SEALS / PACKINGS LEAKAGE RATES			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75 - LIST OF EXCEPTIONS TO THE SPECIFICATIONS			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	76 - EQUIPMENT GENERAL DESCRIPTION AND CATALOGS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	77 - STANDARD REFERENCE LISTS			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	78 - SPECIAL (DETAILED) REFERENCE LIST, COMPRISING SIMILAR SERVICES AND END-USERS DATA (ADDRESS, TELEPHONE, E-MAIL ETC.)			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	79 - ISO 9000 CERTIFICATES FOR VENDOR AND SUB-SUPPLIERS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	80 - QUALITY PLAN, ASSURANCE, INSPECTIONS, TESTING AND NDT PROCEDURES, SCHEDULES, REPORTS, AND DATA (INCLUDING SUB-SUPPLIERS)			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	81 - INSPECTOR'S CHECKLIST			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	82 - FINAL INSPECTION CHECK LIST AND REPORT			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	83 - AS-BUILT ASSEMBLY CLEARANCES REPORT			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	84 - ASSEMBLY / DISASSEMBLY RECORDS FOR MAINTENANCE			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	85 - REQUIRED CLEARANCES FOR PISTON AND PISTON ROD MAINTENANCE			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	86 - MINIMUM AND MAXIMUM ACCEPTABLE DIMENSIONS (REQUIRED FOR MAINTENANCE PURPOSES ONLY)			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	87 - FIT-IN TEST REPORTS AND DATA FOR JOB AND SPARE PARTS			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	88 - MAINTENANCE PLAN (RECOMMENDED BY MANUFACTURER)			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	89 - ALL INSPECTION & TESTING RECORDS, LOGS, AND REPORTS			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	90 - ALL NON-CONFORMANCE REPORTS AND DISPOSITIONS			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	91 - LIST OF EQUIPMENT AND COMPONENT SUB-SUPPLIERS WITH PARTS ITEM NUMBERS			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	92 - MATERIALS CERTIFICATES, TESTS PROCEDURES, REPORTS, AND DATA			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	93 - NAMEPLATE (EQUIPMENT DATA, CODE STAMPS, NR-13) DRAWINGS FOR MAIN AND AUXILIARY EQUIPMENT			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	94 - GROUNDING PLAN			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	95 - EMI AND RFI ACCEPTANCE TEST			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	96 - DRAWINGS, DATA SHEETS AND CALCULATION REQUIRED BY BRAZILIAN STANDARD NR-13			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	97 - RELIEF VALVES DATA SHEETS			
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	<b>DATA SHEET</b>		No.		REV. 0	
	TITLE: <b>VENDOR DRAWINGS AND DATA REQUIREMENTS</b>				SHEET	
					of	
<b>ELECTRIC MOTOR (cont'd)</b>						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1 - CERTIFIED DIMENSIONAL OUTLINE DRAWINGS WITH MAJOR AND MINOR CONNECTIONS (NOTE 1)			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1a - PRIMARY EQUIPMENT			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1b - AUXILIARY EQUIPMENT			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1c - MAINTENANCE WEIGHTS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1d - SIZE OF SHIPPING SECTIONS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1e - SOLE PLATES			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1f - HEAT EXCHANGERS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 FOUNDATION LOADING DIAGRAMS			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3 - SCHEMATIC WIRING AND / OR FLOW DIAGRAMS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3a - SPEED SENSOR			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3b - SPACE HEATERS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3c - LOCKED ROTOR PROTECTION PACKAGE			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3d - COOLING AND EXCHANGER			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3e - LUBRICATION			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3f - VIBRATION MONITORING			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3g - TEMPERATURE SENSORS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3h - DIFFERENTIAL CURRENT TRANSFORMERS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3i - PHASE CURRENT TRANSFORMERS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3j - SPACE REACTORS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3k - EXCITATION/VOLTAGE REGULATION PANEL			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4 - DETAIL DRAWINGS AND CROSS-SECTIONAL DRAWINGS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4a - SHAFT END DETAILS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4b - BEARING ASSEMBLY DRAWING DETAIL (IF HYDRODYNAMIC TYPE)			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5 - ERECTION / ASSEMBLY DRAWINGS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6 - CALCULATIONS ANALYSIS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6a - TORSIONAL RESPONSE			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6b - LATERAL RESPONSE			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7 - PREDICTED PERFORMANCE CURVES			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7a - POWER FACTOR VERSUS SPEED			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7b - MOTOR AND ROTOR HEALING			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7c - TORQUE VERSUS SPEED AT RATED VOLTAGE			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7d - TORQUE VERSUS SPEED AT ____ % VOLTAGE			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7e - CURRENT VERSUS SPEED AT RATED VOLTAGE			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7f - CURRENT VERSUS SPEED AT ____ % VOLTAGE			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7g - EXPECTED EFFICIENCY			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7h - ACCELERATION TIME CURVES			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8 - VENDOR'S DATA REPORTS (AS-BUILT)			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8a - Xm			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8b - RS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8c - R__			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8d - XS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8e - X__			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8f - X__			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8g - T__			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9 - MECHANICAL RUNNING & PERFORMANCE TEST PROCEDURES, REPORTS AND DATA			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	10 - INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS			
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	<b>DATA SHEET</b>		No.		REV. 0		
	TITLE: <b>VENDOR DRAWINGS AND DATA REQUIREMENTS</b>					SHEET	
						of	
<b>ELECTRIC MOTOR</b>							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11 - RECOMMENDED SPARE PARTS LIST				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11a - CONSTRUCTION				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11b - START UP				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11c - MAINTENANCE (2 YEARS)				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12 - COMPLETE SET OF ASSEMBLY PHOTOGRAPHS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13 - MOTOR DATA SHEET				
<b>INSTRUMENTATION AND MONITORING SYSTEM</b>							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1 - CERTIFIED GENERAL ARRANGEMENT OR OUTLINE DRAWING AND LIST OF CONNECTIONS (NOTE 1)				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 - CROSS-SECTIONAL DRAWING AND BILL OF MATERIALS (WITH PARTS LIST)				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2a - DESCRIPTION AND DETAILED DRAWINGS FOR THE INSTRUMENTATION OPERATION, CONTROLS AND AUXILIARY EQUIPMENT				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2b - INSTRUMENTATION CABLE LIST WITH COMPLETE SPECIFICATION				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3 - CONTROL AND ELECTRICAL SYSTEM SCHEMATICS AND BILL OF MATERIALS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3a - P&I DRAWINGS INCLUDING AS A MINIMUM: STEAM, SEAL GAS, ELECTRICITY, FUEL, WATER, LUBRICATION AND PROCESS GAS SYSTEM				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3b - ELETRONIC CARDS SCHEMATIC DRAWINGS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3c - INTERCONNECTION WIRING DIAGRAM				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4 - ELECTRICAL AND INSTRUMENTATION SYSTEM ARRANGEMENT PLANS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4a - CAUSE X EFFECT DIAGRAM				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4b - LOGIC DIAGRAM FOR START UP, ALARM AND SHUTDOWN SYSTEM				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4c - HOOK-UP DIAGRAM (PNEUMATIC, ELECTRICAL, PROCESS)				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4d - LOOP DIAGRAMS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4e - PANEL HARDWARE AND SOFTWARE (DESCRIPTION OF LADDER AND BLOCK DIAGRAM, DRAWINGS, SPECIFICATION LAY-OUT, DATA SHEETS AND CABLE LIST)				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5 - GROUNDING PLAN				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6 - CALIBRATION CURVES (CERTIFIED)				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7 - ROTOR NODAL POINT ANALYSIS DATA				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8 - RECOMMENDED ALARM (ALERT) AND SHUTDOWN (DANGER) SETPOINTS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8a - CONTROL AND SHUTDOWN / ALARM SPECIFICATION				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9 - DATA SHEETS (ISA AND PETROBRAS)				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9a - CALCULATION SHEETS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	10 - DIMENSIONS AND DATA				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11 - INSTALLATION MANUAL				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12 - OPERATING AND MAINTENANCE MANUAL				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12a - HARDWARE AND SOFTWARE MANUALS OF CONTROL AND SHUTDOWN / ALARM SYSTEM (INCLUDING LADDER DIAGRAM, PROGRAMING INSTRUCTION AND COMMUNICATION DRIVERS)				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13 - SPARE PARTS RECOMMENDATION WITH PART NUMBERS AND LIST OF INTERCHANGEABLE PARTS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	14 - ENGINEERING, FABRICATION AND DELIVERY SCHEDULE				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	14a - PROGRESS REPORTS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15 - LIST OF DRAWINGS AND DOCUMENTS INDEX (STATUS AND DELIVERY SCHEDULE)				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16 - SHIPPING LIST				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	17 - SPECIAL WEATHER PROTECTION (IF NECESSARY) AND TROPICALIZATION REQUIREMENTS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	18 - SPECIAL SYSTEM INTEGRITY PROTECTION REQUIREMENTS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	19 - LIST OF SPECIAL TOOLS				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	20 - TECHNICAL DATA MANUAL				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	21 - MATERIAL SAFETY DATA SHEETS				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22 - INSTRUMENTATION VENDOR LIST AND MANUFACTURERS CATALOGUES				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23 - EMI AND RFI TEST ACCEPTANCE				
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	<b>DATA SHEET</b>		No.	REV. 0
	<b>TITLE: VENDOR DRAWINGS AND DATA REQUIREMENTS</b>			SHEET
				of
<b>NOTES</b>				
NOTE 1	Proposal drawings and data do not have to be certified or as-built.			
NOTE 2	Purchaser will inform in contract, official documentation or indicate in this column the desired time frame for submission of materials using the API nomenclature.			
NOTE 3	Bidder shall complete this column to reflect his actual distribution schedule and shall include this form with his proposal.			
NOTE 4	All documents and drawings shall also be provided in magnetic media (CD) and shall be issued by vendor. Files shall be in accordance with contract and PETROBRAS requirements.			
NOTE 5	Manufacturer shall merge similar documents asked in different lists, but it shall be clearly stated in proposal, review and final phase where the information is (items and sub-items).			
NOTE 6	Manufacturer shall fill in PETROBRAS data sheets when it's furnished. Vendor data sheets will be not acceptable in this case. For other equipment, manufacturer shall use API data sheets.			
NOTE 7	All data, drawings, hardware and equipment supplied to this specification shall use the SI system of measurements, except for ordinary piping, flanges, accessories and appurtenances, which shall be in inches.			
NOTE 8	All drawings and documents (including sub-suppliers) shall be identified at least with the following information: <ul style="list-style-type: none"> <li>— client's name;</li> <li>— client's station;</li> <li>— job location;</li> <li>— purchaser's requisition number;</li> <li>— purchaser's order number;</li> <li>— tag number;</li> <li>— service description.</li> </ul>			
NOTE 9	Revision boxes shall be provided to describe the latest revisions in full detail and an indication of revisions shall be made at revised information by such means as circled revision number.			
NOTE 10	Language and translation: <ul style="list-style-type: none"> <li>— documents, drawings, instruction books and other commercial or engineering data shall be in English or Brazilian Portuguese language, except for those from the Brazilian market, which shall be in Brazilian Portuguese language;</li> <li>— Installation, Operation and Maintenance Manuals (IOMs) must be issued by equipment vendor in both Brazilian Portuguese and English, under vendor's responsibility;</li> <li>— independent (third-party) translations are not acceptable;</li> <li>— in case of conflicts between IOM instructions, Portuguese version shall prevail;</li> <li>— PETROBRAS shall not take any responsibility on mistakes, actions or decisions based on, or originated from, mistranslated instructions provided by vendor;</li> <li>— both languages shall be used in all Human-Machine Interfaces (HMI) computer screens installed on control panels (when applicable). Language selection shall be performed at any time, without requiring computer reset or disturbing any monitoring / control process being run by computer PLC;</li> <li>— all warnings, such as caution, danger, hazardous signs and other basic safety instructions to be applied on equipment / component external surfaces, enclosures, doors, handles, levers, emergency stop buttons, etc. shall be supplied by vendor and shall be written in Brazilian Portuguese (primary text, in capital letters) and English (secondary text, with smaller fonts);</li> <li>— ordinary / standard documentation of foreign items (main and auxiliary equipment) may be supplied in English. Whenever documents are written in languages other than English, translations shall be provided as well.</li> </ul>			
NOTE 11	The technical data manuals shall be divided in three sections and shall include at least the topics described below: <ul style="list-style-type: none"> <li>a) Section I:             <ul style="list-style-type: none"> <li>— all certified drawings;</li> <li>— certified and illustrated parts list (exploded views of internal parts);</li> <li>— catalogues;</li> <li>— technical specifications;</li> <li>— performance curves for driven and driver equipment;</li> <li>— calculation sheets;</li> <li>— data sheets;</li> <li>— dynamic loads for all operations conditions;</li> </ul> </li> <li>b) Section II:             <ul style="list-style-type: none"> <li>— Part I - Installation Section:                 <ul style="list-style-type: none"> <li>• instructions for storage and transportation;</li> <li>• instructions for installation (including description of all systems);</li> <li>• pre-commissioning procedures;</li> <li>• commissioning procedure;</li> </ul> </li> <li>— Part II - Operation Section:                 <ul style="list-style-type: none"> <li>• description of operation of instrumentation, controls, panels and auxiliary equipment;</li> <li>• start up procedure and instructions for the operation of the whole compressor train, including troubleshooting guide table;</li> <li>• shutdown procedures;</li> </ul> </li> </ul> </li> </ul>			
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	<b>DATA SHEET</b>		No.	REV. 0
				SHEET
	TITLE: <b>VENDOR DRAWINGS AND DATA REQUIREMENTS</b>			of
<p>— Part III - Maintenance Section:</p> <ul style="list-style-type: none"> <li>• instructions for maintenance of main equipment and auxiliaries;</li> <li>• maintenance procedures (preventive and predictive), including: disassembly, cleaning, inspection (including acceptance criteria), repair and modifications standards, assembly and testing of main equipment and auxiliaries for all maintenance level;</li> <li>• standard practices and technical specifications for maintenance (including check-lists);</li> <li>• special tools catalog;</li> </ul> <p>c) Section III:</p> <ul style="list-style-type: none"> <li>— material certificates;</li> <li>— test reports, data and curves certificates;</li> <li>— welding procedures;</li> <li>— quality plans;</li> <li>— electrical and electronic instrument certificates for area classification.</li> </ul> <p>NOTE 12 Vendor may be requested, at any time during service life of equipment, to provide additional information required to overcome problems related to the performance of supplied equipment.</p> <p>NOTE 13 Purchaser approval of vendor's drawings shall not be considered as relieving the vendor of any responsibility for detailed design, dimension and construction of equipment or deviations from specifications.</p> <p>NOTE 14 Dimensional drawings shall inform all dimensions that may be required by purchaser for installation and to access clearance to adjacent equipment when installing equipment train.</p> <p>NOTE 15 Vendor shall give all necessary data and comments concerning following points (but not limited to):</p> <ul style="list-style-type: none"> <li>a) civil works and foundations drawings and specifications;</li> <li>b) process drawings piping around compressor.</li> </ul> <p>NOTE 16 All equipment and panels shall have a nameplate, easy to access, to see and read. Nameplate shall be made in AISI-316 stainless steel and be bolted (with stainless steel elements) to the equipment. It shall contain the following information:</p> <ul style="list-style-type: none"> <li>a) client's name;</li> <li>b) supplier's name;</li> <li>c) series number and model;</li> <li>d) year of manufacturing;</li> <li>e) main design and test data: pressure, temperature, voltage, rotation etc.;</li> <li>f) specific data;</li> <li>g) client's station;</li> <li>h) tag number;</li> <li>i) purchaser's Requisition Number (RM);</li> <li>j) purchaser's Request for Quotation Number (RFQ);</li> <li>k) purchaser's Order Number (PO);</li> <li>l) empty weight.</li> </ul> <p>In addition to the referred nameplates, every equipment component or package shall have a fixed asset nameplate. All nameplates lay out drawings shall be submitted to purchaser for approval.</p> <p>NOTE 17 Curves shall provide performance for full range of operational conditions (including all limitations). Validation of these curves shall be provided following tests in accordance with PETROBRAS specification.</p> <p>NOTE 18 Foundation and baseplate drawings shall clearly show the weights and other loads at each point of support. If the equipment requires a supporting structure and where such structure is within purchaser scope of supply then vendor shall provide complete loading diagram.</p>				
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## INDEX OF REVISIONS

**REV. A**

There is no index of revisions.

**REV. B**

[illegible]