PETROBRAS	TECHNICAL SPECIFICATION	N°: I-ET-3010.2Q-5266-622-P4X-601	
	CLIENT: MARLIM LESTE E SUL		SHEET: 1 of 13
	JOB: BASIC DESIGN – REVIT I		
	AREA: MARLIM LESTE E SUL		
	TITLE: **ACCOMMODATION ELEVATOR (EL-5266001)**		ESUP
			INTERNAL

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INDEX OF REVISION

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DATE	SEP/19/23	MAI/23/24	JUL/19/24			
EXECUTION	**CX4T**	**CX4T**	DVHD			
CHECK	**HR7O**	**CLYZ**	HR7O			
APPROVAL	**CXM6**	**CXM6**	CXM6			

SUMMARY

1 OBJECTIVE

This Technical Specification covers the minimum requirements for the design, manufacture, assembly and commissioning of the ACCOMMODATION ELEVATOR to be installed in the accommodation module of the UNIT (FPSO).

2 INTRODUCTION

The ACCOMMODATION ELEVATOR shall be supplied as a complete package, in full compliance with the provisions of this document and its references, all relevant codes, standards, regulations and, wherever applicable, the requirements of the classification society.
The item shall be supplied as a complete unit, including all required accessories for normal operation and maintenance:

Tag	Description	Operation area
EL-5266001	Accommodation Elevator	Accommodation Module – from Main Deck to F Deck (see sketch)

The Elevator shall be designed and constructed for offshore service. All equipment and components shall be suitable to withstand marine environment and to operate safely at full load and rated speed under the ship motions stated on I-RL-3010.2Q-1350-960-P4X-002 - Motion Analysis.

3 SCOPE OF SUPPLY

The package shall include, but not be limited to, the following:

- ✓ Elevator;
- ✓ Drive units with electric motor and control panel;
- ✓ Car and counterweights;
- ✓ Car doors and all Landing doors;
- ✓ Guide rails and bracket supports;
- ✓ Travelling cables and sheaves;
- ✓ Electric cables inside the trunks;
- ✓ Landings and enclosures;
- ✓ Buffer springs;
- ✓ Complete field instrument/ control packages including all necessary items for the safe and proper operation of the systems;
- ✓ All interconnecting/ interfacing cabling (electrical, instrumentation and telecom) within the package limits including cable trays, ladders and supports, terminating at suitable junction boxes at the package limit;
- ✓ Fabricated carbon steel package bases for fixing and supporting all package equipment including lifting lugs, earthing bosses, supports, drip pans and drainage piping;

- ✓ All necessary platforms and access ladders;
- ✓ 02 speakers (ceiling mounted, taps 0.25 – 0.5 – 1.5 – 3.0 – 6.0W) and 01 telephone set (bulkhead mounted) inside the car;
- ✓ Spare parts for commissioning and recommended spare parts list for 2-year operation;
- ✓ All materials and accessories required for installation on the vessel's structure;
- ✓ Elevator installation, testing, documentation, certification and commissioning.

4 MATERIALS

Materials shall be supplied in accordance with item 5 of the current document, or MANUFACTURER's standard for items/ materials not specified herein. Materials shall be suitable for operation in corrosive offshore environment throughout the UNIT's design life. Material specifications shall be included in the Technical Proposal.
Elevator shall be designed and constructed considering 25 (Twenty-five) years operational life for the UNIT, without the need for replacement of any major component due to wear, corrosion, fatigue, or material failure. MANUFACTURER shall include a schedule stating the expected period between major overhauls.

5 TECHNICAL REQUIREMENTS

Item		Specification
		Accommodation Elevator (EL-5266001)
Capacity	No. of Passengers	15
	Maximum Load	~ 1500 kg
	Special Requirements	The elevator shall be able to carry a stretcher in horizontal position.
Rated Hoisting Speed		0.6 ~ 1.0 m/s
Access		One (01) side
Minimum Car Inner Dimensions W x L x H		~ 1400 x 2100 x 2200 mm
Overhead		*Required height to be informed by MANUFACTURER.*
Pit Depth		*Required depth to be informed by MANUFACTURER.*
Required Trunk Inner Dimensions		Available trunk area: 2332 x 2692 mm discounting the structure stiffeners; *MANUFACTURER shall confirm if these dimensions are suitable for the intended elevator dimensions.*
Drive Type		Traction type driven by TEFC electric motor. Motors with VVVF (Variable Voltage Variable Frequency) for control are acceptable. MANUFACTURER shall ensure the motor is suitable and well-proven for offshore/marine elevator applications regarding protection of the motor windings to foreign materials, showing a reference list of supply to similar units.

Item		Specification Accommodation Elevator (EL-5266001)
Car Construction		Car shall be mounted on isolated rubber pads, fastened to a rigid steel sled through individually mounted ball bearing guide rollers, heavy duty type. Fully enclosed cabin of rigid steel structure with access opening(s), ceiling hatch and ladder leading to the roof. Car shall be fitted with at least one handrail and non-slip flooring.
Brake System		Electromechanical multiple disc type or equivalent, according to MANUFACTURER's standard, automatically activated by a stop command or under power failure. Centrifugal brake to restrict descent speed.
Speed Control System		MANUFACTURER's standard (variable speed drive (VSD) or equivalent).
Car Door	Type	Single or double panel horizontal sliding type, power operated.
	Dimensions	Same as landing doors.
Landing Doors	Type	• Single or double panel horizontal sliding type, power operated, or swinging/hinged type. • A0 class certified lining. • Vision panels (or fixed windows) shall be installed for orientation or safety reasons and shall be an integral part of the certified door. The vision panels shall not impair the function of the sliding door sealing. The glazed area shall be approximately 200 x 400 mm (W x H).
	Dimensions	W = 900 mm (minimum) x H = 2100 mm
	Installation Requirements	All the required materials and components for installation of landing doors and enclosures shall be supplied.
Installation/ Fastening (Inside the Trunk)		MANUFACTURER shall supply all required components and accessories for installation and fastening of guide rails, brackets etc. inside the trunk.
Materials & Finishing	Car	• Wall and Ceiling Linings: stainless steel or carbon steel plate with halogen free finishing; • Floor: synthetic rubber sheet, minimum thickness 2mm; • Doors: stainless steel or painted carbon steel plate with stainless steel profiles; • Handrail: stainless steel.
	Landings	• Doors: stainless steel or painted carbon steel plate with stainless steel profiles; • Sills and hardware: stainless steel; • Counterframe: stainless steel plate or painted carbon steel.

Item		Specification Accommodation Elevator (EL-5266001)
Facilities for Maintenance and Emergency Escape		Emergency exits shall be provided to enable passengers rescue and escape from the elevator. The escape hatch and/ or trap shall be locked with mechanical latches having internal and external handles. Opening of escape hatch and/ or trap shall break the safety circuit, thus stopping the car. The safety circuit shall remain open until closure of the escape hatch and/ or trap. Resuming of operation only by manual resetting of the circuit on the car roof. In case of elevator abandon, this operation shall be safely performed, for example by means of a ladder with cage, intermediate platform for resting etc. Emergency escape procedure labels/ plates shall be supplied with text in English and Portuguese (Brazil), together with graphic escape directions. Signaling shall be placed as follows: ❑ Inside the cabin; ❑ On the car roof; ❑ Inside the trunk, next to each exit; ❑ Inside the elevator machine room.
Inspection Facilities		Facilities shall be provided to enable safe inspection procedures in all elevator components.
Emergency Operation		Auxiliary manual device to enable moving the car to the nearest landing, in case of power failure. Required effort < 400 N.
Controls	Car Operating Panels	Car control stations including the following switches: stop switch, lighting switch, final limit override key switch, alarm switch and floor pushbuttons for each landing. Clearly visible signaling to show passengers inside, at which level the car stops.
	Landing Panels	Control panels for each landing, with “up” and “down” pushbuttons and digital floor indicator + “up/down” indicator.
	Car Roof Top Panel	Including all the necessary controls and safety devices, according to MANUFACTURER’s standard.
Traveling Cables		Traveling cables shall be protected against damage inside the trunks. Protection may be provided by an internal smooth metal trough, wide enough and having rounded slots to allow the free hanging cable loops to run.
Safety Devices		❑ Overspeed safety switch to detect safety break activation and to shut down the drive motor; ❑ Final limit switch to cut off motor power supply in case of travel limit switch failure; ❑ Emergency stop switch located at the elevator pit; ❑ Phase failure relay to enable operation only when correct phase is supplied; ❑ Emergency lighting for the car, elevator machinery and shaft in case of power distribution failure; ❑ In case any lifting component fails, the car shall be stopped and secured by safety device as specified in the applicable regulations.
Alarms		Alarm system to provide acoustic and visual signals to a permanently manned control area. Alarm circuit shall be powered from an independent source. Means shall be provided to allow passengers acknowledge possible platform alarms from inside the elevator cabin.
Interlocking Devices		Mechanical and electrical interlocking devices to prevent opening of the car gates and/ or landing gates during elevator operation and to prevent elevator operation if any car gate is open.

Item		Specification Accommodation Elevator (EL-5266001)
Electrical Power Supply	Drive Motor	660 VAC, 3-phase, 60 Hz.
	Drive Control System	*To be informed by MANUFACTURER* (variable speed drive (VSD) or equivalent).
	Car Lighting	220 VAC, 2-phase, 60 Hz.
	Emergency Lighting	220 VDC *(to be confirmed by MANUFACTURER).*
Communication		Wiring for an intercommunication system shall be provided and connected by interface junction boxes to a permanently manned control area. Communication devices/ accessories to be supplied: • 02 speakers connected to PAGA-A and to PAGA-B, ceiling mounted; taps 0.25 – 0.5 – 1.5 – 3.0 – 6.0 W; with the minimum requirement as follow: - sensitivity to 1 kHz / 1 watt / 1 meter > 90 dBA; - frequency response better than 400 to 8,000 Hz (+/- 10 dB); - input transformer of 100 volts audio lines; - output transformer of 8 ohms) • 01 analog telephone set (bulkhead mounted) inside the car connected to the FPSO telephony system.
Cabling		All interconnecting/ interfacing cabling (electrical, instrumentation and telecom) within the package limits, including cable trays and supports, terminating at suitable junction boxes at the package limit.
Classification Society		*To be verified by contractor and MANUFACTURER.*
Paint Schedule		In accordance with I-ET-3010.00-1200-956-P4X-002 - General Painting.
Motion Requirements		Elevator shall be designed to withstand lateral accelerations due to vessel's motion. Automatic level adjustment device shall be provided to allow cabin leveling due to rig motion (see I-RL-3010.2Q-1350-960-P4X-002 - Motion Analysis).
Landing elevations		Preliminary elevations: see Sketch. Final landing elevations to be defined during the Detailing Engineering Design phase.
Noise and Vibration control		Noise and vibration control concerning human exposure shall be performed according to I-ET-3010.00-1200-300-P4X-001 – Noise and Vibration Control Requirements.

6 INSTRUMENTATION

For instrumentation specifications see I-ET-3010.00-1200-800-P4X-013 - GENERAL CRITERIA FOR INSTRUMENTATION PROJECTS and I-ET-3010.2Q-1200-800-P4X-005 - FIELD INSTRUMENTATION.

7 ELECTRICAL

All electrical equipment shall be manufactured and tested in compliance with Classification Society and IEC requirements.

Electrical equipment and material shall comply with requirements of I-ET-3010.00-5140-700-P4X-002 – Specification for Electrical Material for Offshore Units, I-ET-3010.00-5140-700-P4X-007 – Specification Generic Electrical Equipment for Offshore Units, I-ET-3010.00-5140-700-P4X-009 – General Requirements for Electrical Material for Offshore Units, I-ET-3010.00-5140-741-P4X-004 – Specification for Low-Voltage Generic Electrical Panels for Offshore Units and I-ET-3010.00-5140-772-P4X-002 – Specification for Low-Voltage Frequency Converters, Soft-Starters and Inverters for Offshore Units.

Electrical induction motors shall comply with requirements of I-ET-3010.00-5140-712-P4X-001 – Low-Voltage Induction Motors for Offshore Units

Concerning electrical system voltages and feeding for motors, panels and auxiliaries, the elevator package shall be fed according to definitions of I-ET-3010.00-5140-700-P4X-003 – Electrical Requirements for Packages for Offshore Units.

Grounding installations inside the PACKAGE shall comply with requirements of I-ET-3010.00-5140-700-P4X-001 – Specification for Electrical Design for Offshore Units and I-DE-3010.00-5140-700-P4X-003 – Grounding Installations Typical Details.

8 WEIGHT CONTROL

MANUFACTURER shall inform the equipment weight and coordinates of the center of gravity, for input into BUYER's Weight Control database. MANUFACTURER shall fulfill the form in item 15.

9 INSPECTION AND TESTING

Equipment shall be submitted to the applicable package functional tests. Inspection and testing procedures shall be performed according to MANUFACTURER's standards, BUYER's requirements, Classification Society Rules and with the specific applicable elevator regulations.

10 COMMISSIONING AND TRAINING REQUIREMENTS

Recommendations for training, commissioning, pre-operation, start-up assistance and equipment acceptance shall be provided by MANUFACTURER.

11 QUALITY ASSURANCE REQUIREMENTS

MANUFACTURER and its Sub-Suppliers are required to operate a Quality Management System, in accordance with ISO 9000, independent from BUYER's actions.

12 DOCUMENTATION

12.1 MANUFACTURER shall provide all required documentation, including list of all documents, certificate drawings, data sheets, technical specifications, performance curves, calculation reports, maintenance and operating manuals, instructions for preservation, transportation and commissioning, materials and test certificates, nameplates drawings and description including emergency escape procedure labels/ plates supplied with text in English and Portuguese (Brazil), together with graphic escape directions, etc.

12.2 Operating and Maintenance Manual shall contain at least:

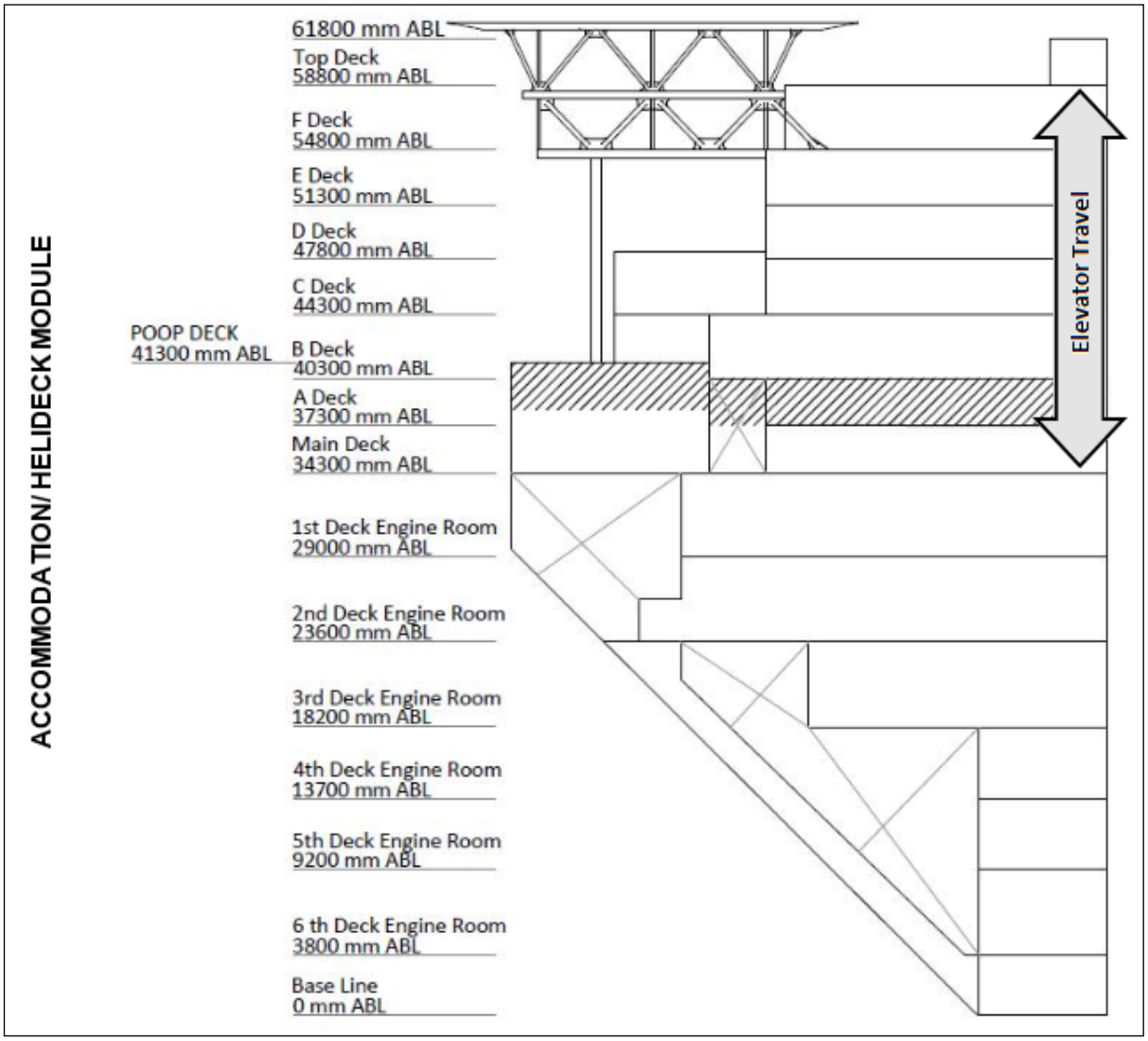
Instructions for installation, operation and step-by-step maintenance procedure of the equipment and accessories, including information on spare parts and use of special tools. Maintenance periods (working hours), tolerances, adjustments and tightening torques to be applied during maintenance, after disassembly and reassembly shall be informed;

- Data-sheets of electric motor and variable speed drive (VSD) full filled;
- Complete functional diagrams of electrical panels;
- Complete list of configuration parameters of variable speed drive (VSD);
- All documents required for electrical equipment in specific technical specifications;
- Drawings of components containing exploded views and part numbers;
- Spare parts list including commercial and technical specifications for non structural componentes;
- List of special tools;
- Repair procedures;
- Schedule for replacement of parts

12.3 Quality Control Manual shall contain at least:

- Inspection procedures;
- Test reports;
- Welding specifications (with applicable requirements for non-destructive examination for all critical welds);
- Certificates (including Classification Society Certificates).

13 SKETCH



14 REFERENCE DOCUMENTS

I-DE-3010.2Q-1200-942-P4X-002	GENERAL ARRANGEMENT
I-DE-3010.2Q-1350-190-P4X-001	MAIN DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-002	A DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-003	B DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-004	C DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-005	D DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-006	E DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-007	F DECK ACCOMMODATION LAYOUT
I-DE-3010.2Q-1350-190-P4X-008	TOP ROOF AND HELIDECK PLAN
I-DE-3010.2Q-1350-190-P4X-014	ACCOMMODATION SECTIONS
I-ET-3010.00-5140-700-P4X-001	SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS
I-ET-3010.00-5140-700-P4X-002	SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS
I-ET-3010.00-5140-700-P4X-003	ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS
I-ET-3010.00-5140-700-P4X-007	SPECIFICATION GENERIC ELECTRICAL EQUIPMENT FOR OFFSHORE UNITS
I-ET-3010.00-5140-700-P4X-009	GENERAL REQUIREMENTS FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS
I-ET-3010.00-5140-712-P4X-001	LOW-VOLTAGE INDUCTION MOTORS FOR OFFSHORE UNITS
I-ET-3010.00-5140-741-P4X-004	SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS
I-ET-3010.00-5140-772-P4X-002	SPECIFICATION FOR LOW-VOLTAGE FREQUENCY CONVERTERS, SOFT-STARTERS AND INVERTERS FOR OFFSHORE UNITS
I-DE-3010.00-5140-700-P4X-003	GROUNDING INSTALLATIONS TYPICAL DETAILS
I-ET-3010.00-1200-800-P4X-013	GENERAL CRITERIA FOR INSTRUMENTATION PROJECTS
I-ET-3010.2Q-1200-800-P4X-005	FIELD INSTRUMENTATION
I-ET-3010.00-1200-956-P4X-002	GENERAL PAINTING
I-RL-3010.2Q-1350-960-P4X-002	MOTION ANALYSIS
I-ET-3010.00-1200-300-P4X-001	NOISE AND VIBRATION CONTROL REQUIREMENTS

15 WEIGHT CONTROL FORM

PACKAGER shall fill in the following weight control form and submit to PURCHASER.

APPLICABLE TO:	☒ PROPOSAL	☐ PURCHASE	☐ AS BUILT	
FOR:		UNIT / MODULE:		
SITE:		SERVICE:		
No REQ / TAG:		MANUFACTURER:		
MODEL:		VENDOR:		
SIZE / TYPE:		MAIN EQUIPMENT:		
SERIAL No.		MANUFACTURER No:		

WEIGHT DATA

DATA STATUS: ☐ ESTIMATED ☐ CALCULATED ☐ WEIGHTED

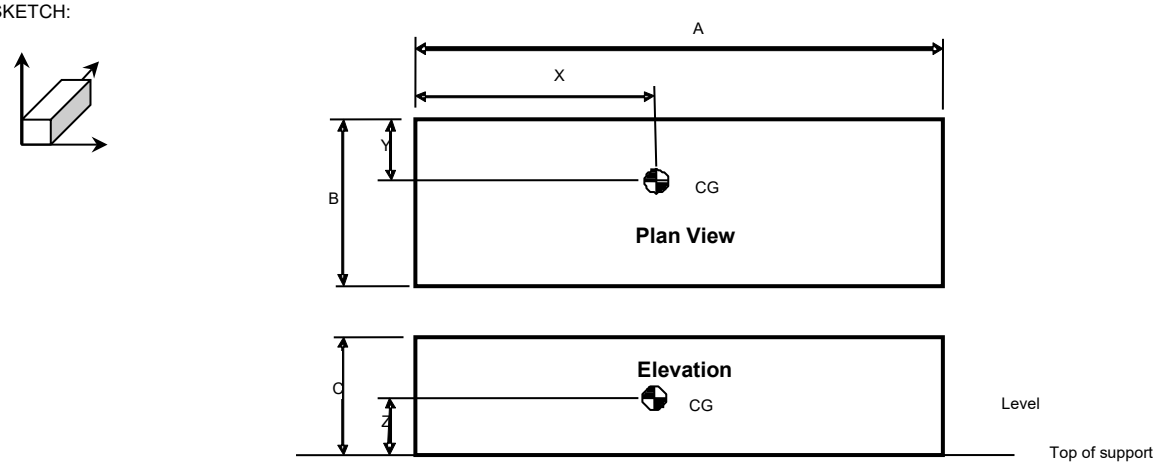
EQUIPMENT WEIGHT:

ACCURACY:					
DRY:	kg	±	%	**REMARKS:**	
OPERATING (NORMAL):	kg	±	%		
OPERATING (MAXIMUM):	kg	±	%		
TEST:	kg	±	%		
MAX MAINTENANCE	kg	±	%		
	kg	±	%		

DIMENSIONS DATA

DATA STATUS: ☐ ESTIMATED ☐ CALCULATED ☐ MEASURED

SKETCH:



OVERALL DIMENSIONS:		DRY DIMENSIONS:		OPERATING DIMENSIONS:		MAINTENANCE DIMENSIONS:	
A:	mm	X:	mm	X:	mm	:	mm
B:	mm	Y:	mm	Y:	mm	:	mm
C:	mm	Z:	mm	Z:	mm	:	mm

NOTES

General:

- Vendor shall fill in all blank spaces in the weight control data sheet (fields and check boxes). All missing information will be considered as not applicable or not according to vendor's proposal.
- Vendor shall fill in data sheets for main and auxiliary equipment, furnished separately or on different skids. If necessary, manufacturer shall produce additional copies of the weight control data sheet.

Weight data:

- Accuracy of weight figures shall be ±10% in the proposal phase. After placing of purchase order, the accuracy shall be refined to ±3%.

Dimensional data:

- Manufacturer shall indicate equipment orientation.
- Any variation in center of gravity from dry to operating mode shall be noted.
- Manufacturer shall indicate with dashed lines on sketch and respective dimensions on the information table all maintenance areas required for assembly and disassembly of equipment.
- Accuracy of dimensions shall be ± 10% in the proposal phase. After placing of the purchase order, the accuracy shall be refined to ± 3%.