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	JOB:		-				
	AREA:		-				
	TITLE:		TOPSIDE ARRANGEMENT AND INTERFACES WITH SUBSEA UMBILICAL SYSTEMS			EDF	
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<p>1 OBJECTIVE</p> <p>1.1 To define minimum requirements for topside arrangement and interfaces with subsea umbilical systems.</p> <p>2 REFERENCES</p> <p>[1]. IEC 60079 Explosive atmosphere [2]. IEC 60529 Degrees of protection provided by enclosures (IP Code)</p> <p>3 TERMS AND DEFINITIONS</p> <p>3.1 CONTRACTOR: CONTRACTED company by PETROBRAS responsible for the basic project and/or construction of the Floating Production Unit.</p> <p>3.2 EJB: Electrical Junction Box</p> <p>3.3 May: Optional requirement</p> <p>3.4 Shall: Mandatory requirement</p> <p>3.5 TUTU: Topside Umbilical Termination Unit</p> <p>3.6 Unit: same as Floating Production Unit</p> <p>4 GENERAL ARRANGEMENT</p> <p>4.1 Figure 4-1 and Figure 4-2 presents the general arrangement of components and interfaces.</p> <p>4.2 The presentation of TUTU PLATE and EJB in opposite sides of unit support in Figure 4-1 and Figure 4-2 is for better visualization only. The position of TUTU PLATE and EJB in the surroundings of support shall be defined by CONTRACTOR respecting all requirements herein presented.</p> <p>4.3 The presentation of one TUTU PLATE and one EJB in Figure 4-1 and Figure 4-2 is for better visualization only. Quantity of EJBs will be informed by PETROBRAS in the Subsea Production Control System Technical Specification. Regarding the quantity of TUTU PLATES, CONTRACTOR may propose, for PETROBRAS approval, arranges with multiple TUTU PLATES since respecting all requirements herein presented.</p> <p>4.4 The area above unit support shall be free from any fixed structure to avoid interference with umbilical pull-in and pull-out operations. At least the unit support projected volume shall be a free area, as illustrated in Figure 4-3 and Figure 4-4.</p> <p>4.5 TUTU PLATE and EJB shall be identified with plate/tag. The plate/tag shall be in AISI 316L, have lettering in low relief and, if screwed, use AISI 316L screws.</p>			

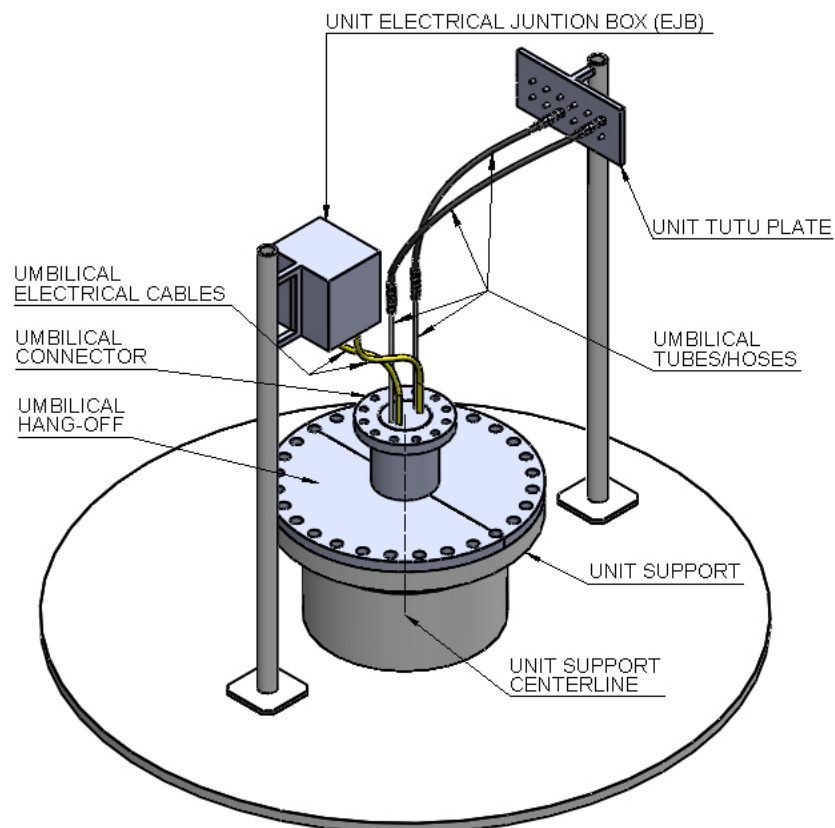


Figure 4-1

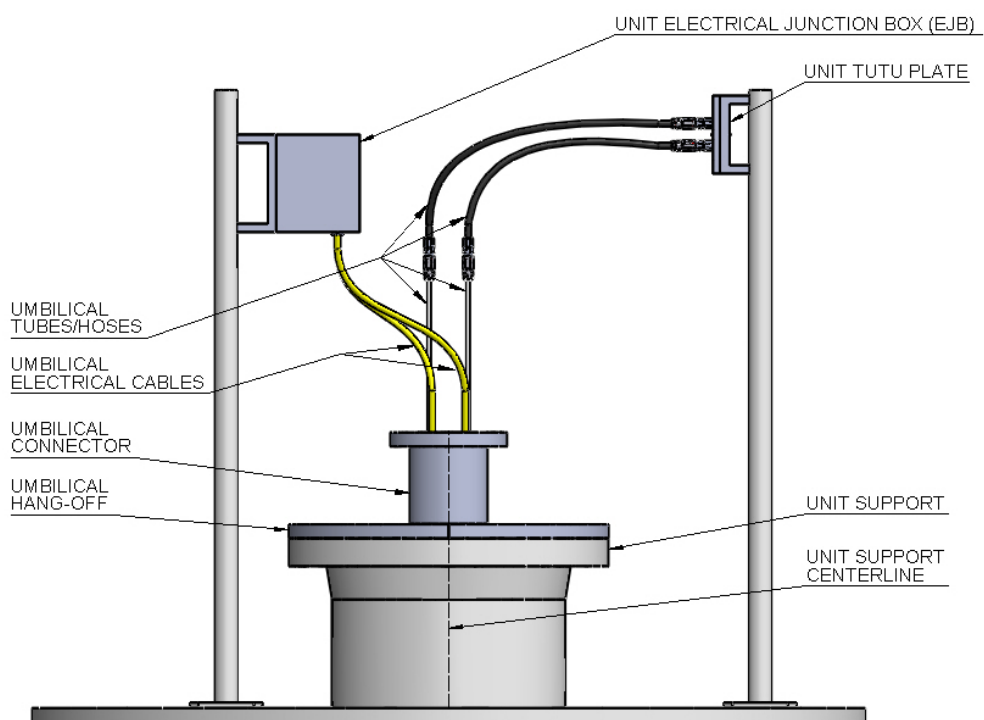


Figure 4-2

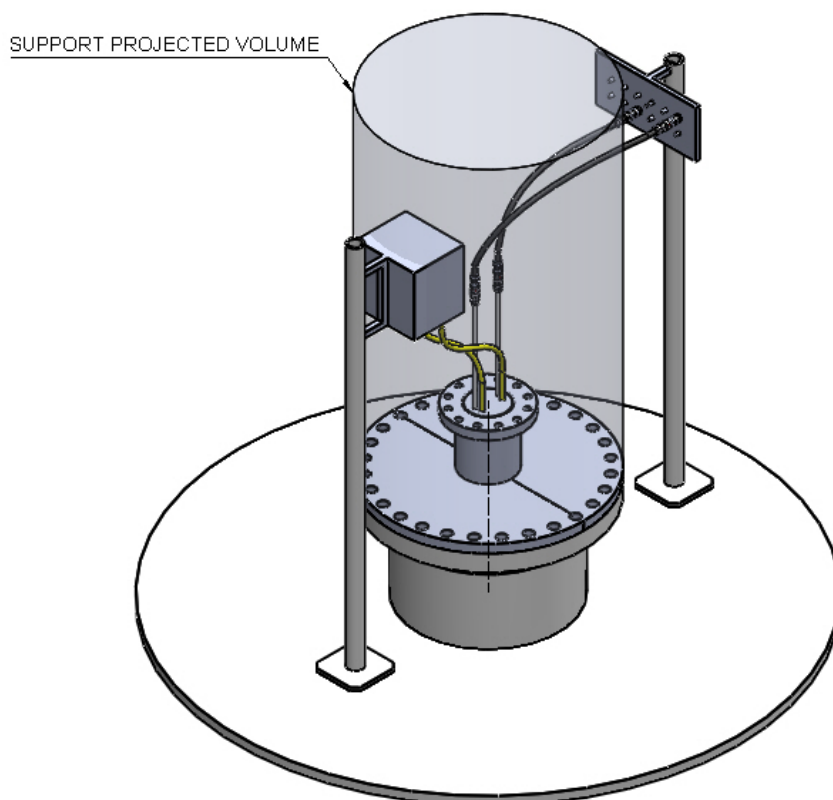


Figure 4-3

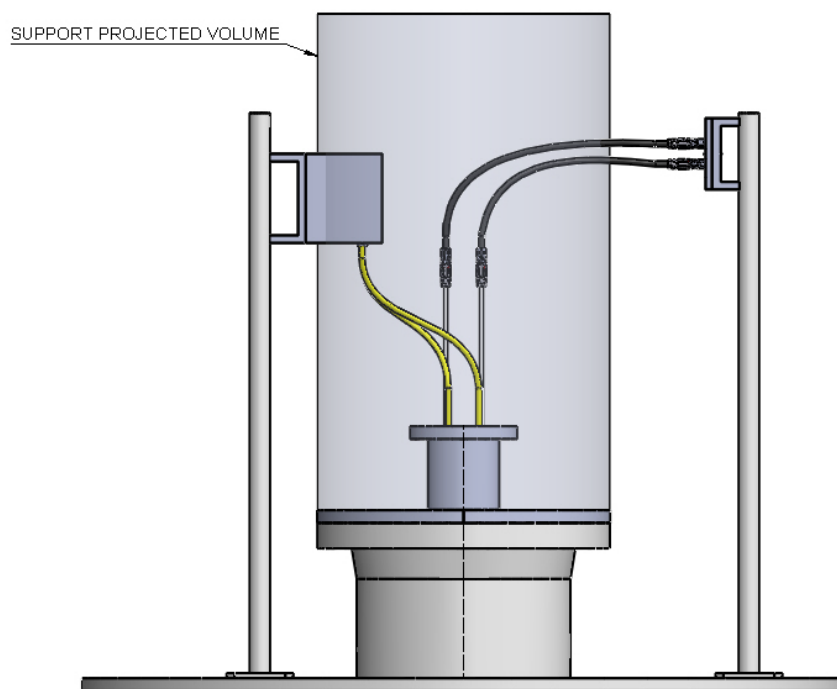


Figure 4-4

5 TOPSIDE UMBILICAL TERMINATION UNIT (TUTU) PLATE

- 5.1 Distances for TUTU PLATE shall be as presented in Figure 5-1 and Figure 5-2. Distances are relative to unit support centerline and TUTU PLATE center point. TUTU PLATE shall face the unit support centerline.
- 5.2 Connections in TUTU PLATE shall comply with Figure 5-3 and Figure 5-4.
- 5.3 For topside working pressure up to 15.000 psi the connection assemblies in TUTU PLATE shall be as presented in Figure 5-5. All components presented in Figure 5-5 are CONTRACTOR scope of supply. Notice that bulkhead shall be 20.000 psi.
- 5.4 For topside working pressure of 20.000 psi the connection assemblies in TUTU PLATE shall be as presented in Figure 5-6. All components presented in Figure 5-6 are CONTRACTOR scope of supply.
- 5.5 The bulkhead fitting for umbilical hoses/tubes connection shall follow the standardization presented in Figure 5-7.
- 5.6 TUTU PLATE shall be in AISI 316L with rounded corners and smooth finished perimeter so to minimize risk for injuries.
- 5.7 Each hydraulic connection in TUTU PLATE shall be identified, in low relief, by number and function as illustrated in Figure 5-8.

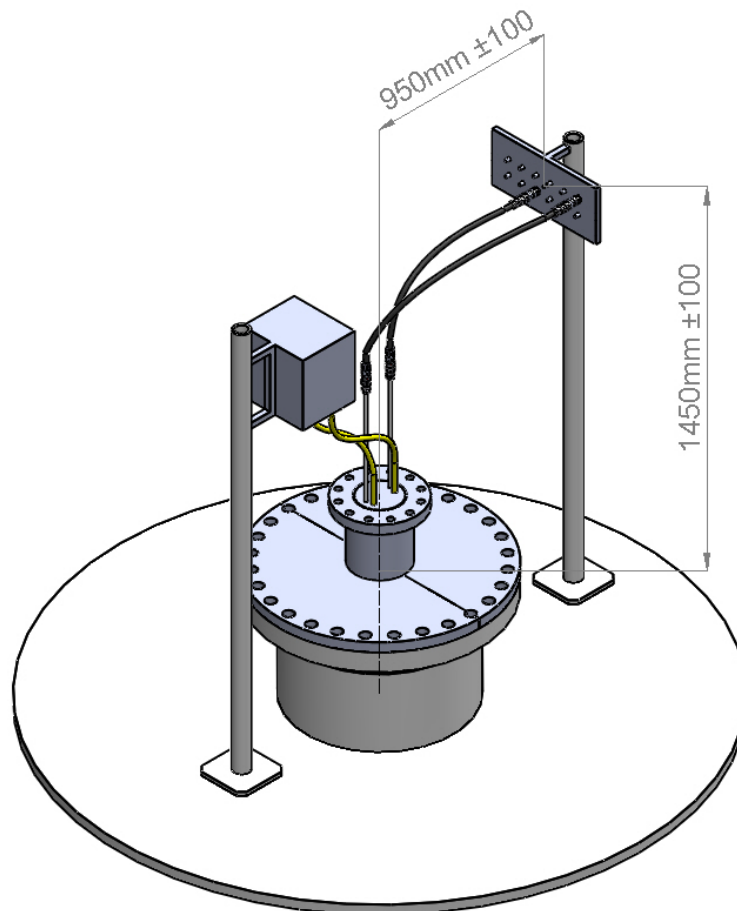


Figure 5-1

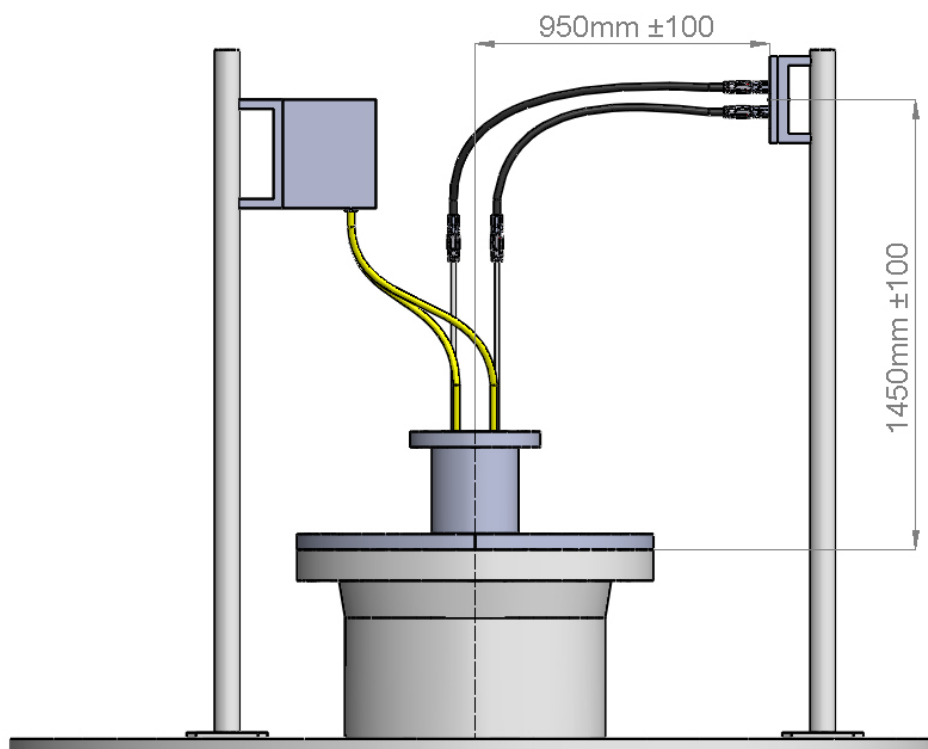


Figure 5-2

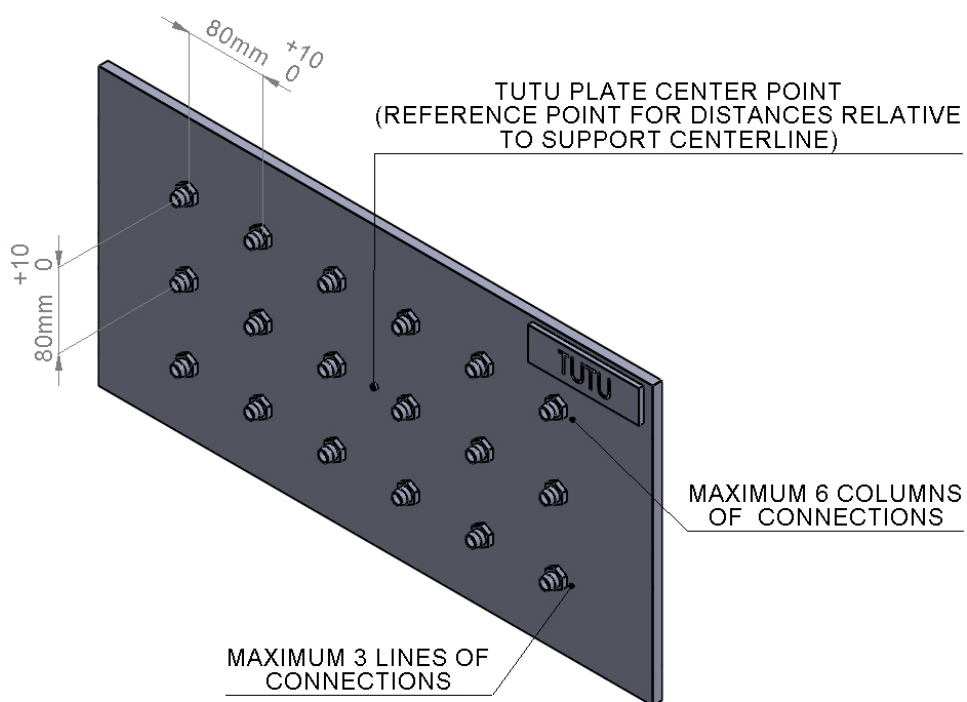


Figure 5-3

CONNECTIONS COLUMNS AND LINES DONT NEED
TO BE ALIGNED

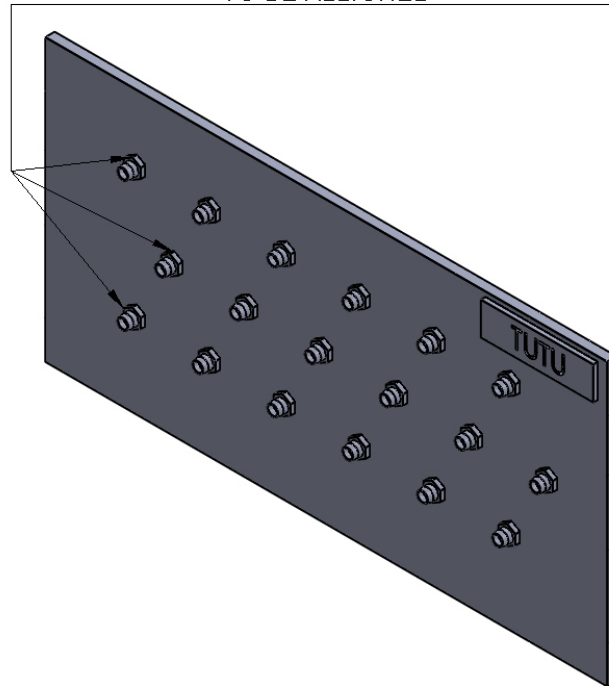


Figure 5-4

ASSEMBLIES FOR TOPSIDE WORKING PRESSURE UP TO 15.000PSI

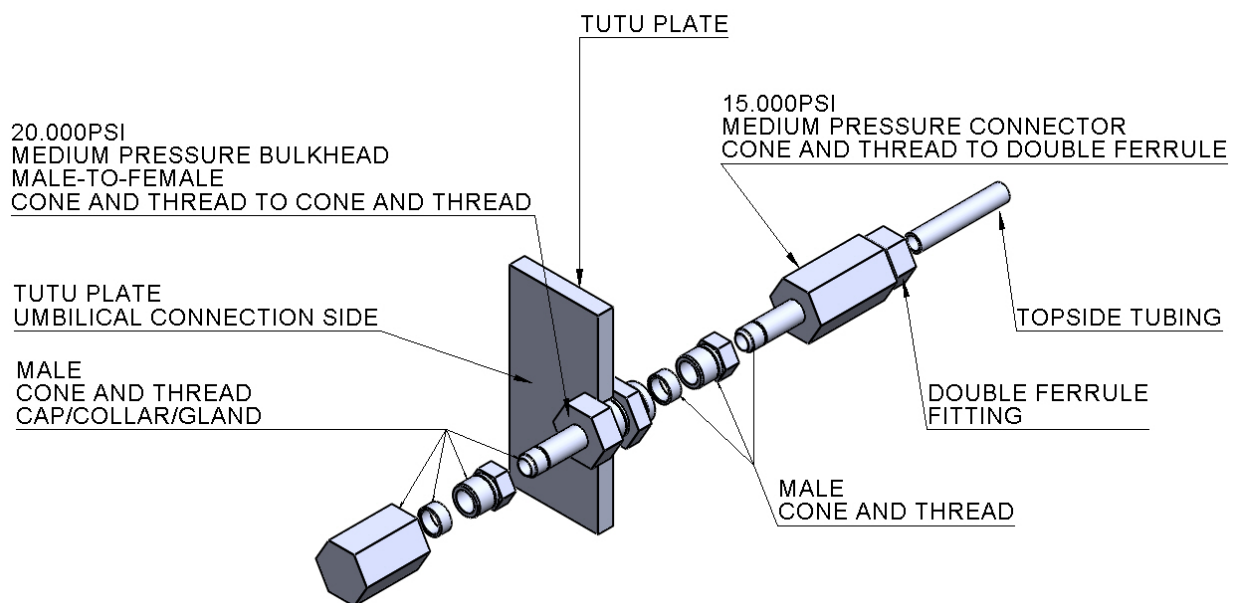


Figure 5-5

ASSEMBLIES FOR TOPSIDE WORKING PRESSURE OF 20.000PSI

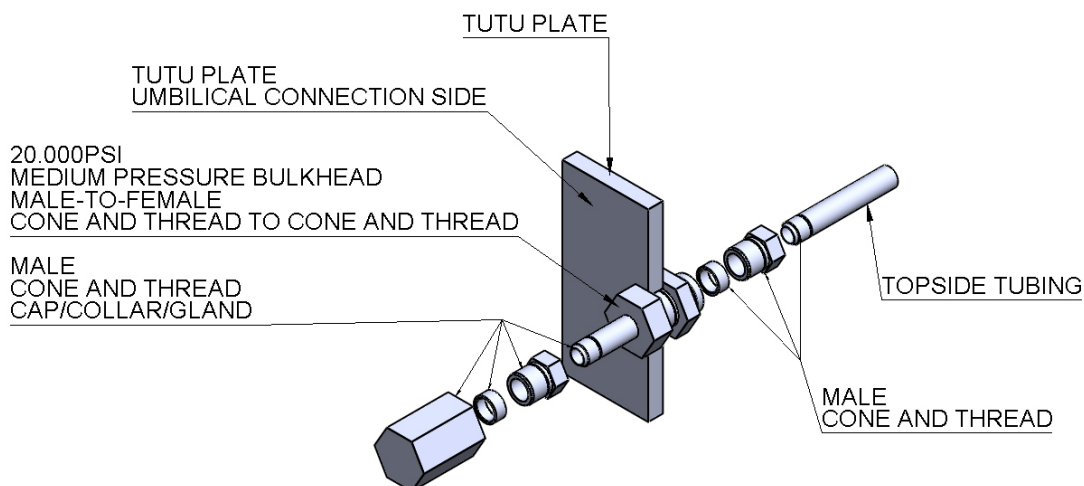
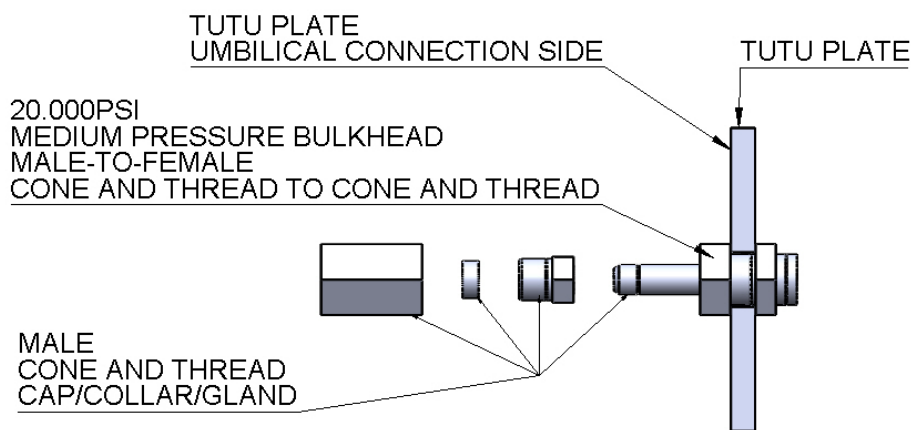



Figure 5-6

BULKHEAD UMBILICAL CONNECTION SIDE STANDARDIZATION



UMBILICAL HOSE/TUBE INNER DIAMETER	MEDIUM PRESSURE BULKHEAD FITTING
3/8" ; 1/2"	9/16" male cone and thread with cap, collar and gland
3/4"	3/4" male cone and thread with cap, collar and gland
1"	1" male cone and thread with cap, collar and gland

Figure 5-7

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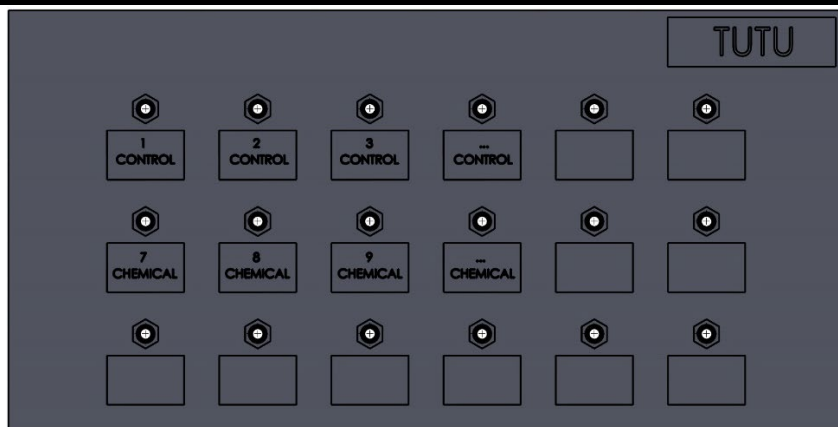


Figure 5-8

6 ELECTRICAL JUNCTION BOX (EJB)

- 6.1 Distances for EJB neutral position, relative to unit support centerline, and EJB minimum position adjustment, relative do EJB neutral position, shall be as presented in Figure 6-1 and Figure 6-2. EJB shall face the unit support centerline.
- 6.2 EJB shall be removable from the area above unit support to avoid interference with umbilical pull-in and pull-out operations. See Figure 4-3 for free area.
- 6.3 The umbilical electrical cables data presented in Table 6-1 shall be used for prevision of quantity and sizes of cable glands. Umbilical electrical cables shall enter through the bottom of EJB. Actual cables shall be confirmed with PETROBRAS before EJB completion. The EJB shall have removable bling plate and the rules for drilling shall be issued with EJB documentation.
- 6.4 All elements of EJB, including terminal blocks, shall be 0.6/1.0 (1.2) kV rated. Terminal blocks shall be suitable for all cables presented in Table 6-1.
- 6.5 EJB shall be suitable for operation in hazardous area classified, adequate for the zone it is installed, and the minimum Ex protection shall be Zone 2, Group IIA, Class T3 and “Ex e” (Increased Safety) according to [1].
- 6.6 EJB shall have an “Ex e” breather drain.
- 6.7 The degree of protection provided by the EJB enclosure shall be IP56 or IP66 according to [2].
- 6.8 Cable glands shall be in AISI 316L.

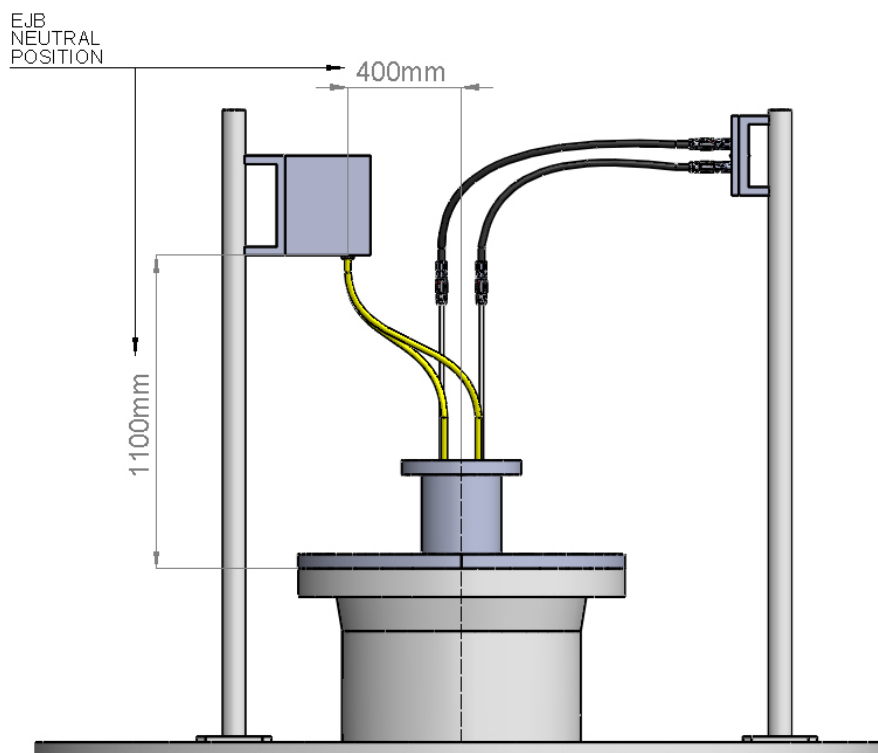


Figure 6-1

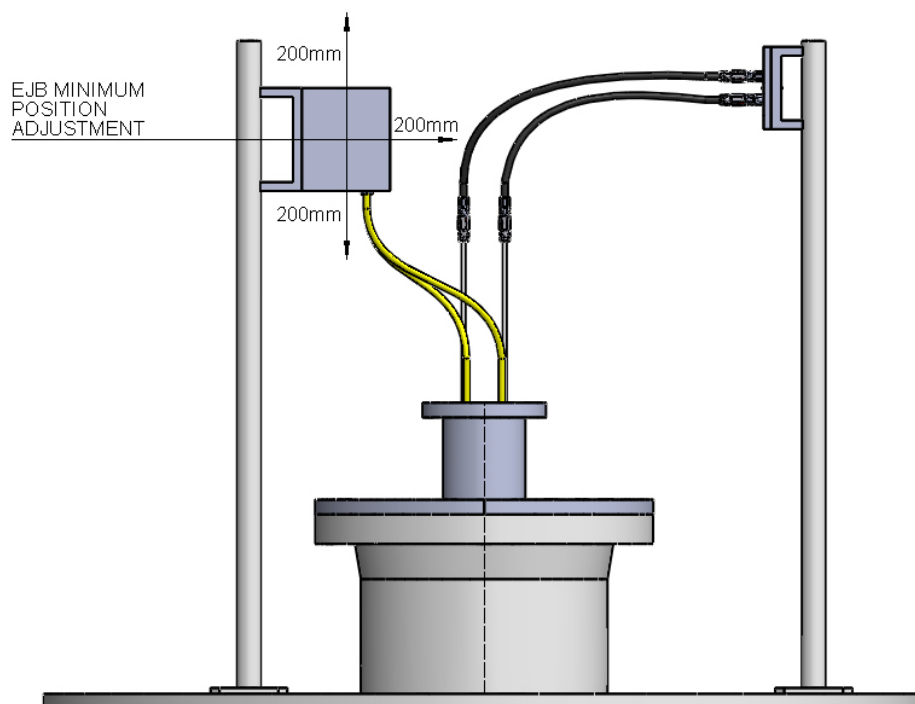
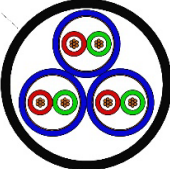




Figure 6-2

Table 6-1

Umbilical electrical cable configuration		Umbilical electrical cable external diameter range (mm)	Example of umbilical electrical cable cross section
Electrical bundle	3x2x2.5mm ²	28 – 31.5	 <p>Outer sheath (interface with cable gland)</p>
	3x2x2.5mm ²	12.5 – 16.5	
Single pairs (single shield)	4x2x4mm ²	13.5 – 15.5	 <p>Outer sheath (interface with cable gland)</p>
	4x2x4mm ²	20.5	
Single pairs (double shield)	4x2x6mm ²	21 – 24	 <p>Outer sheath (interface with cable gland)</p>
	6x2x6mm ²	18.5 – 23.5	
	8x2x6mm ²	28 - 30	
	4x2x10mm ² 8x2x10mm ²		