

Contract n°241000229

## Supply of inductive connectors

# SPECIAL TECHNICAL TERMS AND CONDITIONS

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	14/10/2024	§2.8. Cables specifications

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## 1 Introduction

Within the framework of an internal project, Ifremer has two applications for a pinless inductive connector:

The first application is a resident AUV which mission is to study a specific seabed area for a long period. The second application is a mooring profiler.

In both cases, the vehicle needs a docking station to recharge its batteries and transfer the data collected during the surveys.

For those applications, Ifremer needs a pinless connector for power and data transmission.

The Resident AUV will be qualified in shallow water (depth < 300m) whereas the mooring profiler will be qualified in deep water (up to 6000m).

## 2 Specifications

### 2.1 General

The inductive connectors shall operate for a minimum of one year without scheduled maintenance.

The inductive connectors shall have a design life of 5 years with a scheduled yearly maintenance operation.

### 2.2 Power

#### 2.2.1 Primary

- Voltage: 48 VDC  $\pm 3\%$

#### 2.2.2 Secondary

- Output power  $\geq 150$  W
- Electrical efficiency at maximum power  $\geq 85\%$
- Charger
  - Shallow water: Adapted to the charge of a 4S Li-ion assembly using CC/CV algorithm.
  - Deep water: Adapted to the charge of a 12S Li-ion assembly using CC/CV algorithm.

### 2.3 Data

- Ethernet
- Output data rate  $\geq 80$  Mbps

### 2.4 Displacement Tolerances

The system must work nominally with the following displacement between the primary and secondary connectors:

- Axial displacement : <4mm
- Lateral displacement : <10mm
- Angular displacement : <4°

## 2.5 Dimensions

- Diameter:  $\leq 150\text{mm}$
- Length with bulkhead connector:  $< 180\text{mm}$
- Weight :  $< 5\text{ kg}$  in air,  $< 3\text{ kg}$  in water.

## 2.6 Material

- Shallow water : To be proposed
- Deep water : Titanium

## 2.7 Electrical connectors

- Shallow water : To be defined (TBD)
- Deep water : To be defined (TBD)

The connectors have to be blocked in rotation to avoid unscrewing the bulkhead when connecting the cable.

## 2.8 Cables

### Option 1

- Shallow water :  
Primary : TBD to SubConn Ethernet 13 pins male, length 50cm to confirm  
Secondary : TBD to SubConn Ethernet 13 pins female, length 50cm to confirm
- Deep water :  
Primary : TBD to SubConn Ethernet 13 pins male, length 50cm to confirm  
Secondary : TBD to SubConn Ethernet 13 pins female, length 50cm to confirm

### Option 2

- Shallow water :  
Primary : plug connector to be overmoulded by Ifremer  
Secondary : plug connector to be overmoulded by Ifremer
- Deep water :  
Primary : plug connector to be overmoulded by Ifremer  
Secondary : plug connector to be overmoulded by Ifremer

## 2.9 Environment

### 2.9.1 Depth rating

- Shallow water: 300m (36 bars with 1.25 security coefficient used to qualify our systems).
- Deep water: 6000m (750 bars with 1.25 security coefficient used to qualify our systems).

### 2.9.2 Temperature

- Operating temperature :  $0^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$
- Storage temperature :  $-10^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$

## 2.10 Quality

The materials used in construction shall be chosen and treated in such a way as to reduce the levels of wear, corrosion and deterioration to allow multiple deployments of each component.

## 3 Deliverable

The following documents will be delivered for both shallow and deep water primary and secondary products:

- Datasheet,
- User Manual,
- Factory Acceptance Test Report delivered after a Factory Acceptance Test performed with Ifremer,
- Pressure test certificate at 36 bars and 750 bars for respectively shallow and deep water connectors.