Teledyne Oil & Gas

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Contents

1.0 Purpose

This is intended to be a general instruction manual covering all Teledyne Oil & Gas, Inc. products listed. Any specialty optical products or other unique project specific products will demand instructions outlined in and as specified in the contract.

2.0 Symbols

Symbols used in this document convey important information. Please take special note whenever any of the following symbols are used:

⚠ **CAUTION!** This symbol brings attention to actions that may be harmful to the assembly.

NOTE: In addition to these symbols, **NOTES** throughout this document specify information critical to quality of the assembly.

3.0 Scope

This storage and handling manual covers oil-filled jumper assemblies. Specific product description of Teledyne Oil & Gas, Inc. connectors can be found below.

⚠ **CAUTION!** Inline fiber connectors are not to be handled and packaged per this procedure.

Teledyne Oil & Gas, Inc. Products	Description of Product
Jumpers	All pressure balanced oil filled hose assemblies with attached interconnection accessories on one end or both ends
Sensor Jumpers	All sensor products with attached point to point hose connections
Sensor Harnesses	All sensor products with attached point to multi-point hose connections

Table 1: Description of Products

4.0 Materials Needed

Related Documents:

- **DN 19421** Jumper Hose Customer Specification Drawing

5.0 General Handling Instructions

In general, oil-filled jumpers are robust and require few special handling requirements.

NOTE: Where jumper termination work and mounting are carried out by those other than Teledyne Oil & Gas, Inc., the responsibility for that work lies with the customer or the subcontractor.

CAUTION! This procedure may contain products that are Electrostatic Discharge Sensitive (ESDS). Electrostatic discharge (ESD) can change the electrical characteristics of a semiconductor device, degrading or destroying it. Always follow all instructions that pertain to ESD requirements for the safety of the assembly.

5.1 Connector protective caps should always remain installed except as needed for test or deployment. Refer to the following instructions for removal if required.

5.1.1 Firmly grip the ROV handle with one hand.

5.1.2 With the other hand, push on the back of the termination shell as you pull on the handle. This will splay the latch fingers disengaging the latch fingers from the lip on the protective cap.

5.1.3 Grasp the protective cap around the knurled handle and pull removing the protective cap from the connector.

5.2 Excessive loads should be avoided. At no time should any heavy or sharp object be placed on top of a hose assembly. Hoses should also be supported to avoid kinking. The minimum bend radii and maximum working load for Teledyne Oil & Gas, Inc. hose is provided below. **DN 19421** offers detail specifications of Teledyne Oil & Gas, Inc. hose. Bends with smaller radii must be avoided. The weight of unsupported hose must be considered when calculating actual axial loads.

5.3 Keep sharp objects away from the oil-filled hose at all times. Do not contact the oil-filled hose with a knife, or other sharp objects, while removing the packaging.

Teledyne Oil & Gas, Inc. Jumper Hose	Minimum Bend Radius	Maximum Axial Working Load
0.700 OD (ODHOSE-6 5/16 NOMINAL BORE)	3 inches (80mm)	300 LB (1334N)
0.850 OD (ODHOSE-8 13/32 NOMINAL BORE)	4 inches (100mm)	400 LB (1780N)
1.150 OD (ODHOSE-12 5/8 NOMINAL BORE)	5 inches (130mm)	600 LB (2670N)

Table 2: Minimum Allowable Bend Radius and Maximum Allowable Axial Loads

5.4 Under no circumstances should any of the fasteners be removed from any connector or hose termination.

5.5 If tie-wraps or hose clamps are used to retain the jumpers, then they must not be over-tightened. When tightened, the hose should not be deformed or squeezed by the tie or clamp.

5.6 When the jumper spans an unsupported length, the maximum distance between supports should not exceed 1.5 M (5 feet).

5.7 In the event that the jumpers or connectors are damaged, please contact Teledyne Oil & Gas, Inc. for instructions on the necessary rework/replacement.

5.8 At no time should any object be inserted into a Teledyne Oil & Gas, Inc. connector; proper test connectors should always be utilized.

5.9 When removing a jumper from a box or crate, do not remove entire jumper at once. Remove one loop at a time in order to avoid injury and not damage jumper(s).

5.10 Avoid pulling on termination shell or applying excessive loads to harness assemblies. Refer to the "Assembly Drawing" or Table 1 for the maximum axial load based on hose/cable type. The weight of unsupported hose/cable must be considered when calculating actual axial loads.

5.11 Do not weld, braze or grind near hose/cable harnesses. Take proper precaution to prevent hot slag and/or projectiles from damaging assemblies. Do not connect ground terminal of welding equipment to connector or supporting structure.

5.12 During jumper handling operations, do not drop the connector on the ground. Damage can result, especially when a protective cover is not installed.

5.13 Avoid placing the entire jumper assembly in tension during handling and deployment operations.

5.14 Do not drag hose/cables over abrasive surfaces, and avoid axial snag loads to hose.

6.0 Deployment Handling Instructions

NOTE: Where jumper termination work and mounting are carried out by those other than Teledyne Oil & Gas, then the responsibility for that work lies with the customer or the subcontractor.

In general, Pressure Balanced Oil Filled and hard-cable harness assemblies are robust and require few special deployment handling requirements.

6.1 Prior to deployment unspool assemblies and thoroughly inspect for signs of damage and oil leakage. Inspect all alignment features with respect to the assembly drawing and ensure all matches.

6.2 Prior to deployment a function check should be performed to ensure the equipment is functioning with established parameters, refer to the associated bill of material or project specific documentation.

6.3 For flying leads (non-preinstalled equipment) a figure “8” pattern is recommended for deployment. Spooled assemblies may not allow for free movement of wire/fiber, so lesser loads could cause damage.

NOTE: Greater deployment speeds are possible, consult Teledyne Oil & Gas prior to deployment to ensure scenario is suitable for desired deployment speed.

6.4 Assemblies should deployed/un-spooled at a rate no more than 40 inches per second (1 m/sec). Care should be taken during this operation to prevent undue loading or kinking of hoses/cables/conductor/fibers.

6.5 Refer to general guidelines of the general handling section.

7.0 Storage

Subsea jumper and connector assemblies are designed for operation in harsh conditions; therefore, storage is straightforward with only a few guidelines.

7.1 Materials used in the manufacture of jumper and connector assemblies include elastomers. Therefore, jumpers and connectors should not be stored in direct sunlight. Wrapping the assemblies in UV blocking plastic sheeting or equivalent will limit degradation due to UV light. If possible, storing in the original packaging is recommended.

7.2 Elastomers are also prone to degradation when left in an open-air environment (due to ozone damage, etc.). Wrapping in UV blocking plastic sheeting will also help reduce this degradation.

7.3 Exposure to aggressive fluids must be avoided since elastomers may have adverse reactions. Contact Teledyne Oil & Gas, Inc. if in doubt of a fluid's compatibility.

7.4 Connector protective caps should always remain installed except as needed for test or deployment.

7.5 During storage, the assembly temperature should not exceed the temperature range below:

$-20^{O}C$ ($-4^{O}F$) to $+60^{O}C$ ($+140^{O}F$)

NOTE: If an application is outside of this range, contact Teledyne Oil & Gas Engineering.

NOTE: +60°C Maximum allowable product temperature including ambient, solar, and internal contributions.

7.6 Assemblies should be stored in a manner that will not kink or bind hoses. The minimum bend radius for the hose is provided in Table 2. Bends with smaller radii must be avoided. No sharp or heavy objects should be placed on top of assemblies for storage.

7.7 Shelf Life - If unused after 2 years, contact Teledyne Oil & Gas, Inc. for instructions on refurbishment.

NOTE: In the event of damage, or for more information, contact Teledyne Oil & Gas, Inc.

8.0 Revision History

Revision	CO #	Revised By	Summary of Changes	Release Date
F	3798	C. Brink	Add section 5.3	12/08/15
E	33537	K. Hanecki	Changed email address on cover page	8/5/14
D	30957	S. Jackson	Added removal steps of protective cap	2/11/14