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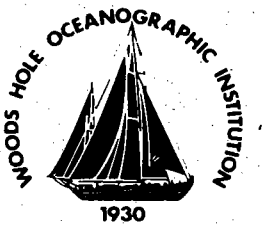

CTD Electromechanical Termination Users Manual

by

H.O. Berteaux, S. Kery, P. O'Malley

August 1990

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Woods Hole, Massachusetts 02543

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Technical Report

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Albert J. Williams 3rd, Chairman

Department of Applied Ocean Physics
and Engineering

Acknowledgments

The electromechanical termination presented in this report has been designed by H.O. Berteaux and S. Kery, Ocean Systems & Moorings Laboratory, Applied Ocean Physics and Engineering Department, Woods Hole Oceanographic Institution, Woods Hole, MA. P. O'Malley greatly contributed to the assembly and maintenance procedure hereafter presented. The CAD drawings were made by R. Arthur.

This work was accomplished as part of the Water Sampler project sponsored by NSF under contract number OCE8821977.

Table of Contents

Abstract

This report describes a new, easy to install, reliable electromechanical cable termination to mechanically attach and electrically, connect cable lowered instrument packages to their lowering cable.

1.0 INTRODUCTION:

1.1 Design Objectives: Provide means to mechanically attach and electrically connect oceanographic cable lowered packages, such as the NSF Water Sampler (Figure #1), or a standard CTD rosette (Figure #2), to the .322 inch CTD electromechanical cable (Figure #3), presently used by vessels of the UNOLS fleet.

The electromechanical termination had to be easy to install at sea, without special tools or epoxy. It should be safe, reliable, and allow for rapid mechanical attachment and simple electrical connection. Holding power had to be greater than the cable breaking strength.

1:2 General Description:

The general configuration of the termination is shown in Figure #4. The termination is attached to the package to be lowered by a clevis and pin arrangement. This facilitates the use of the same termination on different types of packages.

The mechanical strength of the electromechanical (E/M) cable is transferred to the termination backshell through dual cones that grip the two armor wire layers. The strength is transferred from the backshell to the clevis through a robust 2 inch 12 thread per inch, threaded connection.

The E/M termination has been designed to meet the following specifications:

Safe working load in tension, 12,000 lbs. which exceeds the rated breaking strength of the cable (11,600 lbs).

Pressure: All electrical parts are rated for a working pressure of 10000 psi (6000 meters).

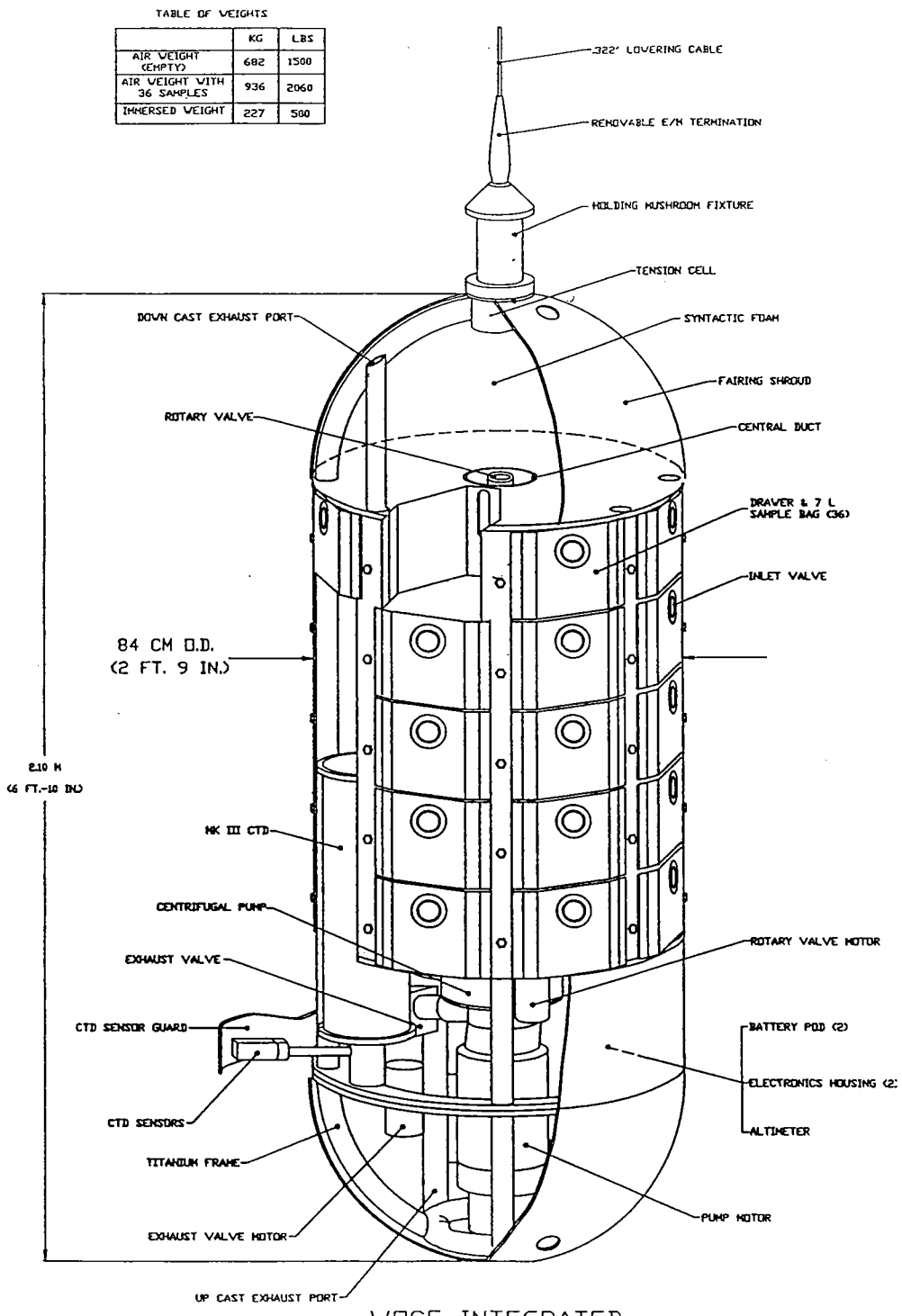

Figure #1: NSF Water Sampler

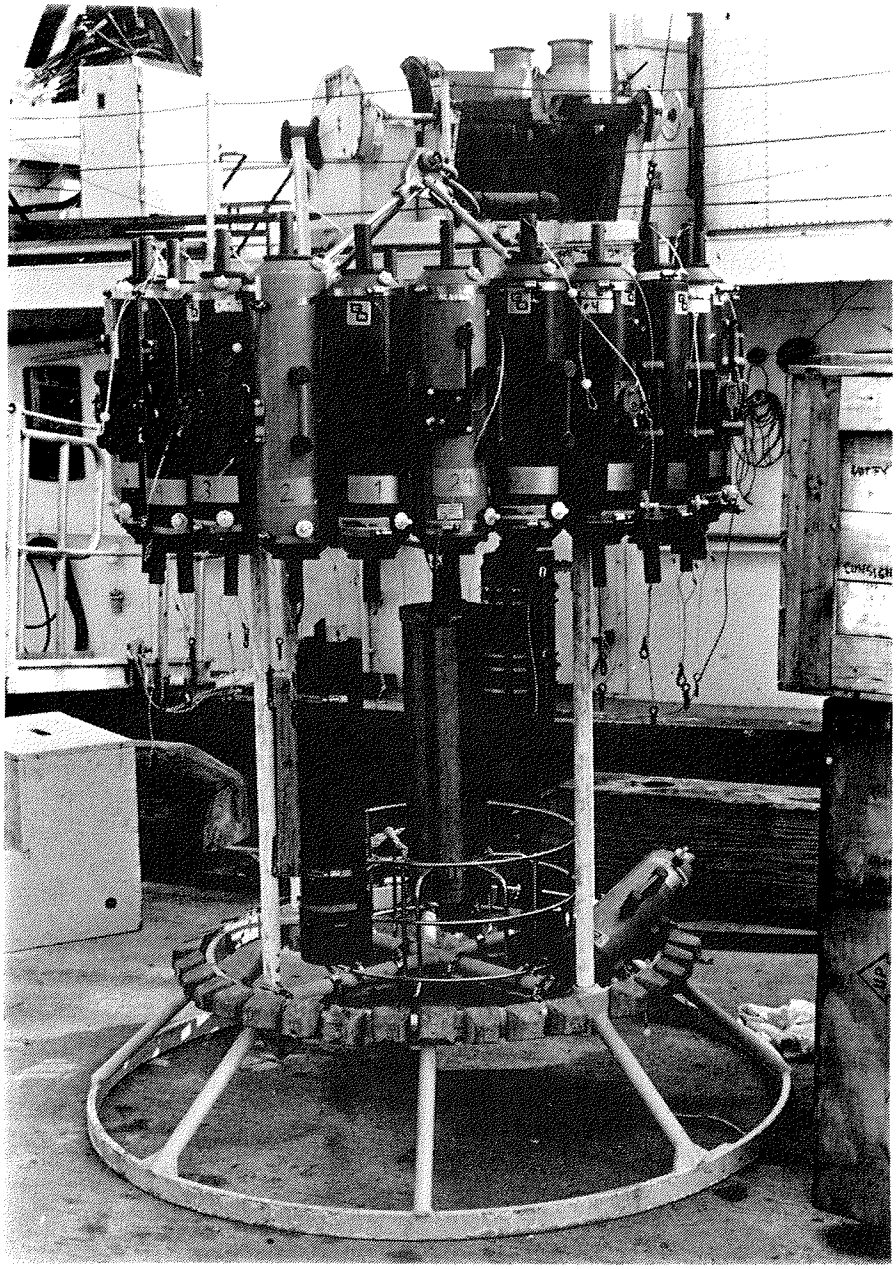

Figure #2: Typical rosette water sampler.

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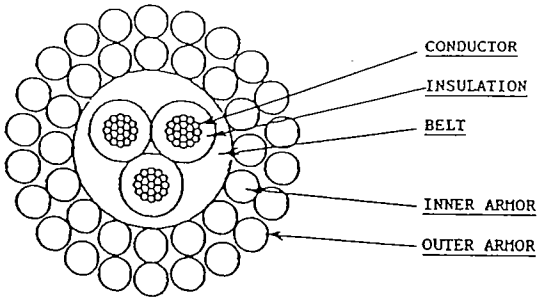

CONDUCTORS - 3

#19 AWG 19/.008" Bare Copper	.039"

INSULATION - 3

.016" Wall Polypropylene Colors: 2 Natural, 1 Black	.071"

CABLED

3 conductors, no fillers	.153"

BELT:

.015" Wall HDPE	.183"

INNER ARMOR

16/.0375" SGXXIPS	.247"

OUTER ARMOR

22/.0375" SGXXIPS	.322"

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NOTE: Sequential marker tape in meters included in cable.

CABLE CHARACTERISTICS (Nominal Values @ 20°C)	METRIC	ENGLISH
PHYSICAL		
Wt. in Air		174 lb/kft
Wt. in Seawater		141 lb/kft
Overall Diameter		.322" ±.004"
MECHANICAL		
Breaking Strength		≥ 11,600 lbf
Maximum Working Load		≤ 5,000 lbf
Recommended Bend Radius		6 in
Torque, Rotation, and Elongation (See Attached Printouts and Graphs)		
ELECTRICAL		
Voltage Rating		600 volts
Insulation Resistance		≥ 10,000 MΩ/kft
dc Resistance		
cdr		≤ 9.4 Ω/kft
armor		2.4 Ω/kft
Capacitance (cdr-armor)		35 pF/ft

the ROCHESTER corporation P.O. BOX 312 CULPEPER, VIRGINIA 22701	TITLE: 3-CONDUCTOR CABLE CODE: I 3 0 0 3 0 1 5 2 P 0 0 0			
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Figure #3: .322 inch CTD Electromechanical Cable.