



CERTIFICATE NUMBER	23-2435212-PDA
EFFECTIVE DATE	11-Aug-2023
EXPIRY DATE	10-Aug-2028
ABS TECHNICAL OFFICE	Houston ESD - Electrical

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

HYDRO GROUP LTD

located at

**HYDRO HOUSE, CLAYMORE AVENUE, ABERDEEN SCIENCE &
ENERGY PARK, BRIDGE OF DON , ABERDEEN, United Kingdom,
AB23 8GW**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Electrical Penetrator and Cable Assembly
Model: DDC Penetrators Types HPS (Hydro Bond Penetrator Series): HPS-435, HPS-436 (Inline or Right Angle)
Endorsements:
Tier: 5 - Unit Certification Required

This Product Design Assessment (PDA) Certificate remains valid until 10/Aug/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Soheni Haque

Soheni Haque,Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

HYDRO GROUP LTD

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Tier: 5 - Unit Certification Required

Product: Electrical Penetrator and Cable Assembly

Model: DDC Penetrators Types HPS (Hydro Bond Penetrator Series): HPS-435, HPS-436 (Inline or Right Angle)

Endorsements:

Intended Service:

Electrical Pin Type Penetrators and Cable Assemblies for underwater vehicles, systems and hyperbaric facilities. Intended for mono-directional pressure application.

Description:

The DDC Electrical Penetrators consists of the body, the insert, "O" rings, the insert collar retainer and the nut. The DDC penetrator body top end casing can be finished moulded into either an in-line or a right angle shape version as per customer requirement. See attachment for available configurations.

Rating:

Intended for one side pressure application (e.g. Deck Decompression Chamber)

For manned application max working depth is limited to 455 MSW.

Max voltage for manned application is 250 VAC or VDC, applications with higher voltage rating are to be submitted to ABS technical office for case by case approval

Max amperage as per Manufacturer catalogue

Service Restriction:

Unit Certification is required for these products.

Comments:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

The Electrical Penetrators and Cable Assemblies are to be inspected and tested to the satisfaction of the attending Surveyor in accordance with the requirements of Sections 10/17.3 and 10/17.17 of the Underwater Rules and the reviewed procedures HTS111A and HTS 120A

Notes/Drawing/Documentation:

Spec. HTS-111/A, Rev 02, "Test Specification for Batch Testing and Acceptance of Pressure Block Inserts"

Spec. HTS-120/A, Rev 09, "Routine Acceptance Testing of Helium / Hydrostatic Electrical Penetrators A.B.S. Standard"

Drawing Num. HPS-436/TA , Rev. 01 , 3/4" NPT DDC PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-53-MP/XX , Rev. 04 , PENETRATOR BODY 3/4" NPT - D.D.C.

Drawing Num. HPI-12 , Rev. 13 , INSERT 22.0 DIAM X 20 LONG

Drawing Num. GMP-005 , Rev. 04 , INSERT RETAINING COLLAR TO SUIT HPI-12 INSERTS

Drawing Num. HPS-435/TA , Rev. 01 , 1" NPT DDC PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-52-MP , Rev. 05 , PENETRATOR BODY (1" NPT- 30 DIAM INSERT)

Drawing Num. HPI-16 , Rev. 18 , INSERT 30.0 DIA X 20 LONG (2 SHEETS)

Drawing Num. GMP-021 , Rev. 03 , INSERT RETAINING COLLAR (1 1/4" NPT PEN)

Terms of Validity:

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Tier: 5 - Unit Certification Required

Rules and Standards.

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STANDARDS**ABS Rules:**

2023 Rules for Conditions of Classification, Part 1 – Marine Vessels Rules: 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-8-3/9;
2023 Rules for Conditions of Classification, Part 1 – Offshore Units and Structures: 1-1-4/9.7, 1-1-A2, 1-1-A3;
2023 Rules for Building and Classing Underwater Vehicles, Systems and Hyperbaric Facilities: 10/17

National:

NA

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

NA