



CERTIFICATE NUMBER	23-2435211-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:** Diving Bell Pin Type Penetrators HPS (Hydro Bond Penetrator Series) Types: HPS-17, HPS-16, HPS-15, HPS-22, HPS-14, HPS-21, HPS-20. 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**

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**Product:** Electrical Penetrator and Cable Assembly

**Model:** Diving Bell Pin Type Penetrators HPS (Hydro Bond Penetrator Series) Types: HPS-17, HPS-16, HPS-15, HPS-22, HPS-14, HPS-21, HPS-20. Inline or Right Angle

**Endorsements:**

#### **Intended Service:**

Electrical Pin Type Penetrators and Cable Assemblies for underwater vehicles, diving systems and hyperbaric facilities. Intended for pressure applied from either side (e.g. Diving Bell)

#### **Description:**

Electrical penetrators type HPS consists of the body, the insert, "O" rings, the insert collar retainer and the nut. The 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 pressure application from both sides (e.g. Diving bells)

For manned applications maximum 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 catalog.

#### **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 Pin Type penetrators and cable assemblies are to be inspected and tested to the satisfaction of the attending ABS Surveyor in accordance with the requirements of Section 10/17.3 and 10/17.17 of the ABS Underwater Rules and the reviewed procedures HTS-111/A and HTS-120/A.

#### **Notes/Drawing/Documentation:**

Drawing No. HTS 111/A, TEST SPECIFICATION FOR BATCH TESTING AND ACCEPTANCE OF PRESSURE BLOCK INSERTS, Revision: 07, Pages: 10

Drawing No. HTS 120/A Issue 06, Routine Acceptance Testing of Helium / Hydrostatic Electrical Penetrators A.B.S. Standard, Revision: 09, Pages: 14

Drawing Num. HPS-17/TA , Rev. 02 , 1/2" NPT BELL PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-17 , Rev. 05 , PENETRATOR BODY 1/2" NPT

Drawing Num. HPI-08 , Rev. 06 , INSERT DIAM 12.5 X 16 LONG

Drawing Num. GMP-003/XX , Rev. 06 , INSERT RETAINING COLLAR

Drawing Num. HPS-16/TA , Rev. 01 , 3/4" NPT BELL PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-16, Rev. 05 , MP BODY FOR 3/4" NPT PENETRATOR

Drawing Num. HPI-10/X , Rev. 11 , INSERT 17.5 DIA X 18 LONG

Drawing Num. GMP-004/XX , Rev. 06 , INSERT RETAINING RING (DIAM 17.5 X 7.0)

Drawing Num. HPS-15/TA , Rev. 01 , 1" NPT BELL PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-15, Rev. 04 , 1" NPT PENETRATOR BODY

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

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

Drawing Num. HPS-22/TA , Rev. 01 , 1" - 12 UNF BELL PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-22, Rev. 05 , BODY BELL PENETRATOR 1" - 12 UNF

Drawing Num. HPI-10X , Rev. 11 , INSERT 17.5 DIA X 18 LONG

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Drawing Num. GMP-106/XX , Rev. 04 , RETAINING COLLAR

Drawing Num. GMP-1016012/XX , Rev. 03 , THIN HEX NUT 1" - 12 UNF THREAD

Drawing Num. GMP-5024016-048-A/XX , Rev. 03 , IMPERIAL PLAIN WASHER TO SUIT 1" - 12 UNF THIN HEX NUT

Drawing Num. HPS-14/TA , Rev. 01 , 1 1/4" NPT BELL PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-14/XX , Rev. 06 , 1-1/4" NPT PENETRATOR BODY

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)

Drawing Num. HPS-21/TA , Rev. 01 , 1 1/2" NPT -12 UNF BELL PENETRATOR TYPE ASSEM

Drawing Num. HPS-21, Rev. 04 , BODY BELL PENETRATOR 1-1/2" - 12 UNF

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

Drawing Num. GMP-025 , Rev. 02 , SPACER COLLAR 1 1/2" - BELL PEN

Drawing Num. GMP-024/XX , Rev. 03 , INSERT RETAINING COLLAR 1 1/2" BELL PEN

Drawing Num. GMP-1024012/XX , Rev. 05 , THIN HEX NUT 1 1/2" - 12 UNF THREAD

Drawing Num. GMP-5036024/XX , Rev. 03 , IMPERIAL PLAIN WASHER TO SUIT 1" - 12 UNF THIN HEX NUT

Drawing Num. HPS-20/TA , Rev. 01 , 1 3/4" NPT BELL PENETRATOR TYPE ASSEMBLY

Drawing Num. HPS-20, Rev. 12 , BODY BELL PENETRATOR 1-3/4"-12 UN

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

Drawing Num. GMP-014/XX , Rev. 05 , SPACER RING TO SUIT VARIOUS PENETRATOR ASS'Y WITH HPI 16 OR DIAM 30 INSERT

Drawing Num. GMP-015/XX , Rev. 03 , INSERT RETAINING COLLAR 1 3/4" BELL PEN

Drawing Num. GMP-1028012/XX , Rev. 03 , THIN HEX NUT 1 3/4"- 12 UN THREAD

Drawing Num. GMP-5044028-0805/XX , Rev. 03 , PLAIN WASHER IMPERIAL - SPECIAL

**Terms of Validity:**

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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

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**Government:**

NA

**EUMED:**

NA

**OTHERS:**

NA