



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	Hydro Group Ltd.																
Address	Aberdeen Science and Energy Park, Hydro House, Claymore Avenue, Aberdeen, AB23 8GW, United Kingdom																
Type	Submersible Pressure Hull Electrical Penetrators																
Description	Design and Manufacture of Submersible Electrical Penetrators for use on Diving Bells and Deck Decompression Chambers (DDC) Systems to a working depth of 650 meters.																
Trade Name	<table><tr><td><u>HBE Diving Bell Penetrators</u></td><td><u>HBE DDC Penetrators</u></td></tr><tr><td>HPS20, 1$\frac{3}{4}$"UNF</td><td>HPS435, 1"NPT</td></tr><tr><td>HPS21, 1$\frac{1}{2}$"UNF</td><td>HPS436, $\frac{3}{4}$"NPT</td></tr><tr><td>HPS22(S), 1"UNF</td><td></td></tr><tr><td>HPS17, $\frac{1}{2}$"NPT</td><td></td></tr><tr><td>HPS16, $\frac{3}{4}$"NPT</td><td></td></tr><tr><td>HPS15, 1"NPT</td><td></td></tr><tr><td>HPS14, 1$\frac{1}{4}$"NPT</td><td></td></tr></table>	<u>HBE Diving Bell Penetrators</u>	<u>HBE DDC Penetrators</u>	HPS20, 1 $\frac{3}{4}$ "UNF	HPS435, 1"NPT	HPS21, 1 $\frac{1}{2}$ "UNF	HPS436, $\frac{3}{4}$ "NPT	HPS22(S), 1"UNF		HPS17, $\frac{1}{2}$ "NPT		HPS16, $\frac{3}{4}$ "NPT		HPS15, 1"NPT		HPS14, 1 $\frac{1}{4}$ "NPT	
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Application	Diving Bells and Deck Decompression Chambers																
Specified Standard	Lloyd's Register Rules and Regulations for the Construction and Classification of Submersibles and Diving Systems (July 2022)																

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Ratings	Working depth (metres): 650 msw Working temperature (deg. C): -40 to 60 Working voltage (Volts): 500V (all types, except for the following) 300V (HPS17, ½" NPT)
Additional Tests	Moulded In-line Moulded Right Angle
Other Conditions	<ol style="list-style-type: none">1. Penetrators are to be selected and installed in accordance with the manufacturer's instructions and recommendations.2. The certificate is not valid for equipment, the design, ratings, or operating parameters which have been varied from the original designs submitted for design review and testing at various accredited test facilities. The manufacturer should inform Lloyd's Register of any modification or changes to the equipment to obtain a valid certificate.3. The Type Approval Design Appraisal Doc. no: UKI/ENG/TA/WD/PRJ11100420309, and the Supplementary Type Approval Terms and Conditions form part of this Certificate.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment to obtain a valid Certificate.

Previous Version: 14/00069; 17/90008