TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00000TS
Revision No:
4

This is to certify:

that the BOP control system

with type designation(s)
Acoustic BOP Control System ACS500

issued to
Kongsberg Discovery AS
HORTEN, **Norway**

is found to comply with
DNV-OS-E101 – Drilling facilities, Edition July 2024

Application:

See next page.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Temperature	**A**
Humidity	**B**
Vibration	**A**
EMC	**B**
Enclosure	**A**

Issued at **Høvik** on **2025-08-04**

This Certificate is valid until **2030-08-03**.
DNV local unit: **Sandefjord**

Approval Engineer: **Ole Osuldsen**

for **DNV**

Digitally Signed By: Moen, Jan Olav
Location: DNV Høvik, Norway
Signing Date: 05.08.2025

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

The Type Approval is valid with the following Operational Modes and System Functions:

Item:	Description	P/N
ACU30	Acoustic Command Unit	320101
SCU 35-24V 37P TC WA	Subsea Control Unit 5000m 24V with Gisma 37 pin test port connector wiring A	413507
SCU 35-48V 37P TC WA	Subsea Control Unit 5000m 48V with Gisma 37 pin test port connector wiring A	413517
SCU 34-24V 37P WA	Subsea Control Unit 24V with Gisma 37 pin connector wiring A	417592
SCU 34-24V 37P WB	Subsea Control Unit 24V with Gisma 37 pin connector wiring B	417593
SCU 34-24V 37P WC	Subsea Control Unit 24V with Gisma 37 pin connector wiring C	417595
SCU 34-24V 37P WD	Subsea Control Unit 24V with Gisma 37 pin connector wiring D	417597
SCU 34-24V 37P WE	Subsea Control Unit 24V with Gisma 37 pin connector wiring E	417599
SCU 34-24V 37P WF	Subsea Control Unit 24V with Gisma 37 pin connector wiring F	417600
SCU 34-48V 37P WA	Subsea Control Unit 48V with Gisma 37 pin connector wiring A	417603
SCU 34-48V 37P WB	Subsea Control Unit 48V with Gisma 37 pin connector wiring B	417604
SCU 34-48V 37P WC	Subsea Control Unit 48V with Gisma 37 pin connector wiring C	417605
SCU 34-24V 24P TC WA	Subsea Control Unit 24V with MacArtney 24 pin test port connector wiring A	417606
SCU 34-24V 24P TC WB	Subsea Control Unit 24V with MacArtney 24 pin test port connector wiring B	417610
SCU 34-24V 24P TC WC	Subsea Control Unit 24V with MacArtney 24 pin test port connector wiring C	417611
SCU 34-24V-37p 10Ch-X	Subsea Control Unit 24V with Gisma 37 pin 10Ch-X	415881
SCU 34-48V 24P TC WA	Subsea Control Unit 48V with MacArtney 24 pin test port connector wiring A	369340
SCU 34-24V 37P TC WA	Subsea Control Unit 24V with Gisma 37 pin test port connector wiring A	336600
SCU 34-48V 37P TC WA	Subsea Control Unit 48V with Gisma 37 pin test port connector wiring A	336633
SCU 34-24V 55P TC WA	Subsea Control Unit 24V with Gisma 55 pin test port connector wiring A	336644
SCU 34-48V 55P TC WA	Subsea Control Unit 48V with Gisma 55 pin test port connector wiring A	336648
SCU 34 – 24V 24P TC	Subsea Control Unit 24V with MacArtney 24 pin test port connector	332255
SCU 34 24V-37p	Subsea Control Unit 24V with Gisma 37 pin connector	317950
SCU 34 – 48V 37p	Subsea Control Unit 48V with Gisma 37 pin connector	363668
TDD30V	Dunking Transducer Unit TDD30V	320680
TDD301 MF	Dunking Transducer TDD301 MF	129-220871
TDD303 MF	Dunking Transducer TDD303 MF	301518
TDD180	Dunking Transducer TDD180	320822
TDD50V 30L	Dunking Transducer TDD50V with 30m transducer cable and backpack	369519
TDR30V SCU St	Transducer Remote TDR30V SCU St	320098
TDR40V 34S	Transducer Remote TDR40V 34S	364096
TDR180 SCU St	Transducer Remote TDR180 SCU St	320890
TDR30V 34T	Transducer Remote TDR30V 34T	368967
TDR180 34T	Transducer Remote TDR180 34T	370168
TDR30V 34GT	Transducer Remote TDR30V 34GT	336611
TDR90V 34GT	Transducer Remote TDR90V 34GT	336615
TDR180V 34GT	Transducer Remote TDR180V 34GT	336616
TDR30V 35GT	Transducer Remote TDR30V 35GT	413587
External Quad Battery Unit SCU	External Quad Battery Unit SCU	347007

Software Version
ACU30:

Unit	Description
Panel PC	PC R12ID3S-MRM-2 Microsoft windows 7
UTB circuit board	DSP software: ACS Release: v_5_06
UTB circuit board	FPGA firmware: UTBFPGA_v_2_11
SIO circuit board	Microcontroller software: EME software v_1.6

SCU 34:

Unit	Description
UTB circuit board	DSP software: ACS Release: v_5_07 bin & Hex
UTB circuit board	FPGA firmware: UTB_fpga_2.11.pdb
SIO circuit board	Microcontroller software: scu_flash_1_30
bin SIB circuit board	FPGA firmware: SIB_FW_version 1.3\top.pdb

Application/Limitation

The system is found to comply according to DNV's current understanding of interpretation and implementation of:

• DNV Statutory Interpretations DNV-SI-0166 Verification for Compliance with Norwegian Shelf Regulations, July 2021
• DNV Offshore Standard DNV-OS-E101, "Drilling facilities", January 2024
• Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment, API Specification 16D, Third Edition, November 2018
• Well Control Equipment System for Drilling Wells, API Standard 53, Fifth edition, December 2018

The Type Approval covers the type-tested hardware as listed under Product description.

Product certificate
Each delivery of the application system is to be certified according to DNV-OS-D202 Ch.3 Sec.1 [4] / DNV-OS-E101 Ch.3 Sec.3. The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

Clause for application software control
All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Type Approval documentation

322135O Instruction Manual, ACS500 Emergency Acoustic BOP Control System
331046aa Report, ACS500 FMECA Workshop 9 – 11 February 2009
804047A Report, Transponder Analysis on the effect of external pressure
804827B Report, Transponder Analysis on the effect of external pressure
331172K Factory Acceptance Test, Emergency Acoustic BOP Control System
2009-3103 EMC and environmental testing of emergency acoustic BOP control system ACS500
2012-3354 EMC Test of ACS500 Emergency BOP control system
20355 Applica report: Testing of Subsea Control Unit SCU and Subsea Transducer Unit with new connectors GISMA series 16.

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, November 2015.

Type Test of Software was carried out. The test was according to an approved test program. After the Type Test of Software the software version nos. were registered.

Periodical assessment

For retention of this Type Approval, a DNV surveyor shall perform a periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days). The objective of the periodical assessment is to verify that the conditions for the Type Approval have not been altered. (Ref DNV-CP-0338 Type approval scheme).

This type approval certificate replaces type approval certificate TA00000TS rev 1.

END OF CERTIFICATE