



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-14843

This is to certify that the
Quick Closing Valve

with type designation(s)
MPV Valve

Issued to
Kongsberg Esco mpv AS
KONGSBERG, Norway

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Offshore Standards

Application
See application/limitation

Max design press. 20 bar
Temperature range: -20°C to +90°C
Sizes: See product description

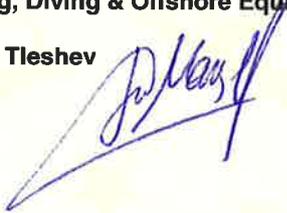

verified by **Erik Carlberg**

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2014-04-09**

DNV local station: **Mooring, Diving & Offshore Equipment**

Approval Engineer: **Maxat Tleshev**



for **Det Norske Veritas AS**




Inger-Helene Hals
Head of Section

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. If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Code and standards

Normative code and standards:

DNV Rules for classification of ships
DNV-OSS-102: Rules for Classification of Floating Production, Storage and Loading Units
DNV-OS-D101: Marine and Machinery Systems and Equipment
DNV-OS-B101: Metallic Materials
DNV Type approval program 5-794.40: Type Approval of Valves

Informative standards:

ASME VIII Div.2 Part 5, ASME B16.34, API Standard 600, API Standard 602, API Standard 603, API Standard 598 and API Standard 598.

Product description

The valve is based upon two existing valve principles: Double expanding gate valve and globe valve. These two principles are put into one valve, called MPV (multi purpose valve). The valve has three discs. The gate part of the valve has two vertical parallel discs, and the globe part one horizontal disc. When opening the valve, the horizontal disc divides the valve in two chambers. In open position the moving parts can be replaced, inspected or maintained with full flow through the valve.

Sizes: 2" to 48" or DN50 to DN1200.

Application/Limitation

Field Application:

The valve can be used for many different applications as a sea water inlet valve for floating vessels. The sea water piping systems for Floating Production Systems and similar can be simplified as redundant or double piping system becomes superfluous, which results in reduced CAPEX and OPEX cost for owner/operator. The valve can be maintained, inspected and classified (ex: 5 year survey of sea water inlet valves) without interrupting any flow in regarded pipeline. For offshore floaters this means they do not have to go ashore or have external assistance, (ex: divers in the ocean or equipment for blocking the sea water intake from outside hull) for mentioned activity.

The Double Block and Bleed function in one valve is space saving and simplifies operation for Cargo systems.

Fluid media:

Sea water and fresh water.

Size:

Dimension is according to following standards: ASME B16.10, table 1, 1. Gate and double disc valves ISO 5752 Table 1, Serie 3

Material specification:

Body, Bonnet, Gates, Dividing disc, Frame, Hinges material: NiAlBrnz according to ASTM B 148, Table 2, Copper Alloy UNS nr. C95500. Equivalent specifications: ASTM B148 C95500 / CC333G / BS 1400 AB2
Bolt material is Super Duplex UNS 32760.

Type Approval documentation

Drawing No.	Rev.	Title
50107	2	FMECA
		Testprosedure according to FMECA (2)
		Test arr, 100 b B test
		Sperre matr cert OSL 13-2039
		Dimensions
		ManometerUM02_12_13
		Calib rec SSR 03977

		Manometer_Logg Rekrtron
		Calib rec SSR 02977
		Manometer_930443
		Calib rec SSR 00122
		Manometer_930442
50161		Assembly drawing
		UM02_12_13
		DNV matr cert OSL 13-2040
50157		Assembly drawing
		Sperre matr cert OSL 13-2040
		DNV matr cert OSL 13-2039
50105		Assembly drawing
		Cycle test unit verification, curve 2
		Cycle test unit verification, curve 1
		051AANA010100 data sheet 1
		Test report nr 57, Endurace test
		Cycle test unit verification, curve 2
		Cycle test unit verification, curve 1
		051AANA010100 data sheet 1
		Test report nr 57, Endurace test
		TQ survey report
		OPERATION AND MAINTENANCE MANUAL
W1300508-BC-001	1	Structural integrity evaluation for Mark III DN 100 rate 150#Valve
50105	A2	Assembly dwg

Design verification letter MOANO374/MAXAT/262.1-017377-J-11 dated 2014-04-08.
Technology qualification report No. 262.1-017377-J-10
Technology qualification certificate No.

Testing

Survey report was issued for technology qualification: MOANO374-14-OSL-TQ. NPS Job ID: MOANO374-158.

Production Testing:

-The valve housing of each valve shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure. Holding time: 15 min. Acceptance criteria: No leakage is permitted.

-The valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at 1.1 times the design pressure. The pressure shall be applied to the disc from the outlet end. The inlet shall be open to atmosphere. Holding time: 5 min. for all sizes.

Acceptable leakage range: No pressure drop.

-If fail safe operation is required by project then fail safe functional test shall be conducted. Fail safe functional test shall simulate loss of signal and actuator needs to be able to close or open the valve, which is under maximum working pressure. Full differential pressure shall be achieved by opening inlet to atmosphere. Open/Closing time should not exceed 2 sec/in or unless specified by project.

DNV GL Product certificate shall be issued for each delivery.

Marking of product

For traceability to this type approval the products are at least to be marked with:

- Manufacturer
- Type designation
- Size

Certificate Retention Survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey - every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.

END OF CERTIFICATE

