DNV·GL

Certificate No:
TAA00000MW

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Condition Monitoring System

with type designation(s)
BCM-1

Issued to
Mitsui Zosen Systems Research Inc.
Tamano Okayama Pref., Japan

is found to comply with
GL Rules for Classification and Construction I - Ship Technology

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed according to GL Rules.

Temperature
Humidity
Vibration
EMC
Enclosure
Location classes can be found on page 2.
This Certificate is valid until **2019-01-04**.

Issued at **Hamburg** on **2017-01-05**

for **DNV GL**

DNV GL local station: **Kobe**

Approval Engineer: **Marco Rinkel**

Duy Nam Le
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.

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Job Id:
Certificate No: **TAA00000MW**

Product description

The System is a Condition Monitoring Component according to the GL Guidelines for Machinery Condition Monitoring, Edition 2008 according to GL I-1-17, Section 2, D.2.

The BCM-1 Bearing Condition Monitoring System is designed to measure critical wear in the major bearings, namely the main, crank pin and crosshead bearings, in two stroke crosshead engines.

List of hardware									
Apparatus		Number of cylinders on Engine							
Description	Model	4	5	6	7	8	9	10	11	12
		Number of system units per engine cylinder number							
Display for Control desk	DSP-3 or DSP-5	1	1	1	1	1	1	1	1	1
Display for Control desk	DSP-5	1	1	1	1	1	1	1	1	1
Signal Interface panel	SIP-1	1	1	1	1	1	1	1	1	1
Bearing Wear Processing Unit	BWPU-1	1	1	1	1	1	1	1	1	1
Intermediate box for BWM	BIBB	2	2	3	3	4	4	5	5	6
	BIBB		1		1		1		1	
Inductive displacement sensor	BIDS-1	4	5	6	7	8	9	10	11	12
Controller for Water in Oil	MMT330	1	1	1	1	1	1	1	1	1
Sensor for Water in Oil	MMT338	1	1	1	1	1	1	1	1	1
Sensor for Resistance bulb	PTR-M	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Hardware location classes					
Type	Temperature	Humidity	Vibration	EMC	Enclosure
Display for Control desk "DSP-3"	B	B	A	A	*)
Display for Control desk "DSP-5"	B**	B**	A**	B**	*)
Signal Interface panel "SIP-1"	B	B	A	A	*)
Bearing Wear Processing Unit "BWPU-1"	B	B	B	A	*)
Intermediate box for BWM "BIBB"	B	B	B	A	*)
Inductive displacement sensor "BIDS-1"	B	B	B	A	*)
Controller for Water in Oil "MMT330"	B	B	B	A	*)
Sensor for Water in Oil "MMT338"	B	B	B	A	*)
Sensor for Resistance bulb "PTR-M"	B	B	B	A	*)
*) Required protection according to the Rules to be provided upon installation onboard **) Location classes based on DNV Type Approval Certificate A-13723					

Software version:
Bearing Wear Processor Unit: 1.20.000
BWM Display Unit: 1.20.000

Application/Limitation

Rules GL I-1-17 to be observed for Condition Monitoring (CM). Alarm settings have to be specified by engine manufacturer if sensor is used for CM.

When the hardware is used in applications to be classed according to DNV or DNVGL Rules, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV and DNVGL Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

Type Approval documentation

Tests carried out

Tests according to the GL Guidelines for the Performance of Type Approvals Chapter 2, Edition 2006

Regulations for the Use of Computers and Computer Systems

Marking of product

Manufacturer: Mitsui Zosen Systems Research Inc.
Model name: As listed under Product description
Serial number: Unique for each delivered item

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE