DNV·GL

Certificate No:
TAF00000ZX

TYPE APPROVAL CERTIFICATE

This is to certify:

That the CO2 System

with type designation(s)
Fixed high-pressure CO2 fire extinguishing system

Issued to
Johnson Controls International Korea, Inc.
Busan, Republic of Korea

is found to comply with
DNV GL rules for classification – Ships
DNV GL offshore standards
DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations

Application :

Approved for use as a total flooding fire extinguishing system for machinery space and cargo holds.

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

Issued at **Hamburg** on **2018-11-05**
This Certificate is valid until **2023-11-04**.
DNV GL local station: **Busan Station**

Approval Engineer: **Andrii Pishchanskyi**

for **DNV GL**

Olaf Drews
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: **262.1-028021-1**
Certificate No: **TAF00000ZX**

Product description

"High pressure CO2 fire extinguishing system" is a total flooding system for protection of machinery spaces, pump rooms, cargo holds and similar spaces. The system can be actuated remotely (pneumatically) or locally (pneumatically or mechanically) as applicable.

Only the main system concept is approved by this certificate. Cylinders, valves, pipes, couplings and other systems components are subject to case by case approval.

The system is to be designed in accordance with the IMO FSS Code Ch.5 and DNVGL-SI-0364 – SOLAS Interpretations for SOLAS Ch. II-2.

The system is manufactured by Johnson Controls International Korea, Inc., Busan, Republic of Korea.

Application/Limitation

This type approval certificate provides a general design acceptance for the system. The following systems are approved in principle, other system arrangements will have to be considered case by case.

Each system is subject to plan approval and final inspected by a DNV GL surveyor after completion.

For all applications:

1. All CO_2 cylinders are to be certified according to Pt.4 Ch.7 Sec.1, 5.1.2. Flexible hoses are to be DNV GL type approved. CO_2 manifold to be supplied with DNV GL Product Certificate.
2. All CO_2 piping upstream of master valve are to be certified in accordance with DNV GL Rules. Section valve(s) to be at least PN100.
3. All connections on high pressure side are to be of approved type. Restrictions apply to threaded connections (Pt.4 Ch.6 Sec.9, 5.2). Use of section valves with threads will be considered on a case by case basis for valves of sizes up to DN25.
4. An automatic time delay unit, with the possibility to override, is to be installed for spaces that are expected to be manned occasionally.
5. Non-return valves or similar arrangements are to be fitted between the separate bottles and the manifold in order that a bottle, if necessary, can be disconnected from the battery without putting the whole installation out of action.
6. The pilot cylinders shall have capacity to operate the system three times even under unfavourable temperature conditions.

The following documentation is to be submitted in each case for plan approval:

1. The system layout showing operation philosophy and assembly of components.
2. Arrangement plan identifying position of nozzles, routing and dimension of piping and location of the release stations and CO_2 cylinders.
3. CO_2 capacity calculations for all protected spaces.
4. Time discharge calculations, as applicable. Isometric drawings are required in case the piping layout does not provide sufficient information.
5. Documentation of visual and audible alarms and specification of automatic time delay unit for spaces required to have such devices (spaces expected to be manned occasionally).
6. Specification of all components in the system, including CO_2 distribution piping and approvals for the flexible hoses.
7. Arrangements for closing of all ventilation and stopping of fans (can be submitted separately by the yard).
8. Each system is to be supplied with a manual for installation, use and maintenance

Installation testing:

- Alarms inside protected space and at a manned control stations and switchover to emergency power shall be tested.
- Other tests as required by DNVGL-SI-0364 - SOLAS Interpretations for SOLAS Ch.II-2 (pressure and tightness testing of piping, etc.) and according to maker's manual shall be carried out.

Periodical testing:

- A biennial (every 24 months) for passenger ships and at each intermediate, periodical or renewal survey for cargo ships, an inspection is to be carried out by a service supplier acceptable to DNV GL.
- The system should also be tested and inspected as specified by the DNV GL Rules and DNVGL-SI-0364 – SOLAS Interpretations, reference is made to IMO MSC.1/Circ.1432 and IMO MSC.1/Circ.1318.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, September 2018.

1. Operating manual – Fixed high pressure CO2 fire extinguishing system, dated 2017-03-09;
2. Drawings:

Rerefence No.	**Title**
Flexible hoses:	
DNVGL TA No. P-15079	G119-4 and G119-8K
Cylinders:	
ISO267-Mn-02	45 Kg CO2 Cylinder (68 litres)
CH-YZJ2015-2215-00, page 18	45 kg CO2 Cylinder & Cylinder Valve Assembly
Valves - section:	
CH-YZJ2015-2215-00, page 23	POD valves
Valves - cylinder:	
CH-YZJ2015-2215-00, page 19	YFC-2900
Valves – non-return:	
CH-YZJ2015-2215-00, page 29	NRV-1
Manifold:	
CH-YZJ2015-2215-00, page 30-31	Manifold assemblies
Nozzles:	
CH-YZJ2015-2215-00, page 32	CO2 Nozzle
Other:	
CH-YZJ2015-2215-00, page 25	Safety outlet valve
CH-YZJ2015-2215-00, page 27	Pressure switch with 3-way stop valve
CH-YZJ2015-2215-00, page 34-1	Cylinder control cabinet
CH-YZJ2015-2215-00, page 38	Time delay unit (electrical type)
CH-YZJ2015-2215-00, page 39	By-pass valve assembly

Marking of product

The system is to be marked with name of manufacturer and type designation.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in DNVGL-CP-0338 Section 4.