

Fire Protection Systems and Equipment

Marine & Offshore



Tyco is now Johnson Controls

Tyco has been branded Johnson Controls and as Johnson Controls, we continue to sell, install and service the fire, security and retail products you have come to know and respect, including Tyco, Simplex, Ansul, Grinnell and Sensormatic.

Fire Protection Systems and Equipment Introduction



Johnson Controls (Seaplus) is one of leaders and manufacturers for fire fighting systems & safety equipment in Korea and we have taken our expertise & experience into the world wide market to establish a reputation for excellence and customer support.

We are confident that you will find our presentation of interest and assure you of our competence and desire to realize your contract in away totally satisfactory to you, our prospective client.

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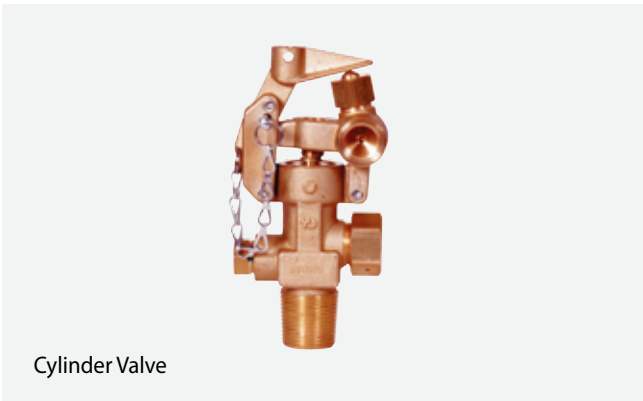
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High Pressure CO₂ System

Carbon Dioxide(CO₂) Gas, the fastest and most efficient extinguishing agent against fires in protected spaces, suffocates the fire within designated time and minimize the damage in protected spaces. The Fire Extinguishing System extinguishes the fire by means of CO₂ gas. The system consists essentially of CO₂ cylinders, main isolating valve(s), manifold, CO₂ nozzles in compartment protected space, and pipe lines connecting these main parts. The system is to be designed by the required discharging time, CO₂ cylinders quantity and which are stored in a independent CO₂ room. For further security in ship's cargo holds, a smoke detection system can be combined with the CO₂ system. CO₂ gas, the fastest and most efficient extinguishing agent against fires in protected spaces, suffocates the fire within designated time and minimize the damage in protected spaces.



Master Control Cabinet



Cylinder Valve



Pressure Operating Distribution Valve(1"~6")

Low Pressure CO₂ System

The required quantity of CO₂ gas is stored in one or two large tank. The tank unit is furnished with its own refrigeration machinery to keep the temperature and also to adjust the pressure at the correct level. The system is designed and installed so that CO₂ gas can be discharged into relevant protected area using valve control cabinet. At that moment, the required quantity of CO₂ gas is adjusted by timer which is installed at relevant valve control cabinet.



Low Pressure CO₂ Storage Unit



Refrigerating unit & Control Panel



Other Gas Fire Fighting System

/// Novec™1230

Long-term Technology

Novec™1230 fire protection fluid is C6 Fluor ketone, a breakthrough compound which provides tremendous environmental advantages over hydro fluorocarbons. In a word: "SUSTAINABLE"

Earth-safe Numbers

Novec™1230 fluid has ZERO ozone depletion potential (ODP) and the lowest atmospheric lifetime for halocarbons: FIVE DAYS (the closest alternative is 33 years). Plus, a global warming potential (GWP) of just is 99.9% lower than any halocarbon agent acceptable for use in occupied spaces.

Widest Margin of Safety

Novec™1230 fluid is used at concentrations of 5.2% (for Class C fires) by volume which is significantly lower than its 10% NOAEL (No Observable Effects Level). This provides the widest safety margin of any chemical clean agent on the market.

Total Flooding Performance

Every Novec™1230 system is custom engineered for the specific application using the most effective, yet efficient arrangement of storage, actuation, distribution and discharge components. Novec™1230 fluid is stored as a liquid and quickly vaporizes upon discharge to flood the protected space & extinguish the fire by absorbing heat.

Fast Acting

Novec™1230 fluid puts fires out quickly, before they can do any serious damage. It does this by reaching extinguishing concentrations in ten seconds or less. It is effective on a wide range of Class A, B & C fires.

Playing Safe

Toxicity testing shows Novec™1230 fluid to be safe for use in occupied areas. Studies conducted in independent laboratories demonstrated that the agent is very low in both acute and chronic toxicity and because its design concentration is much lower than the No Observable Adverse Effect Level (NOAEL) – this makes Novec™1230 fluid the safest alternative to Halons currently available.



Other Gas Fire Fighting System

FM-200[®]

PyroChem FM-200[®] system is an engineered system utilizing a fixed nozzle agent distribution network. When properly designed, PyroChem FM-200[®] will suppress burning fire in Class A, B & C fires. FM-200[®] is the clean, safe and environmentally friendly gaseous extinguishing agent internationally accepted and approved as the leading choice for the protection of people, high value assets and business continuity. It is electrically non-conductive, occupies minimal storage space and has zero effect on the earth's stratospheric ozone layer. Its primary action is through cooling the fire and removing heat energy so that the combustion reaction cannot be sustained. This pace-setting compound does more than prevent fire damage. Containing no particulates or residues, it virtually eliminates the risk of damage to delicate equipment caused by the extinguishing itself.



INERGEN[®]



INERGEN[®] is a mixture of 52% Nitrogen, 40% Argon and 8% CO₂. However, in the event of a fire, when INERGEN[®] is discharged, it mixes with the air present in the area to create a mixture that comprises of 67.3% Nitrogen, 12.5% Oxygen, 17% Argon and 3.2% Carbon Dioxide.

This discharge mixture makes INERGEN[®] singularly unique. No other inert gas has the unique ability to rapidly extinguish a fire yet at the same time provide a safe environment for any person within the occupied area by actually decreasing cardiac distress and maintaining arterial blood oxygenation and mental performance in low oxygen levels.

INERGEN[®] does not affect the atmospheric ozone layer and does not contribute to global warming.

Equally important, unlike some chemical gaseous fire suppression agents, INERGEN[®] does not, and could never create a reaction with a fire to create extremely harmful toxic or corrosive by-products.

Cost studies have shown that INERGEN is cost competitive when compared with the most popular chemical agents on typical systems. INERGEN does not take up premium deckhead space as the cylinders can be placed remotely from the protected risk.

Water Mist Fire Fighting System

Using spraying water in all fires, the water mist system is to suppress and fight all fires in protected areas. In this fire extinguishing system, water is sprayed in high or low pressure to make small water droplets. Using water droplets, vaporization effect gets increased as much as surface area expansion. Water mist is sprayed into flame so that to promote vaporization and decrease in oxygen concentration as suffocation. Extinguishing effect becomes increased by cooling. The system has two types of local fire fighting system and total fire fighting system. Especially, in case of local application, it is designed and installed to cover main engine, aux. engine, boiler, incinerator and purifiers as protected area respectively. The arrangements of nozzle will be provided according to capacity of nozzle in relevant protected area. In case UMA, after fire happens, using fire alarm system by detecting fire automatically, water mist pump shall be runned. And water is discharged into fire area through nozzle to extinguish it. During spraying water, audible and visible alarms are provided in the protected space.



Water Mist Controller



Local Operating Box



Water Mist Skid(Low)



Water Mist Skid(High)

Water Mist Fire Fighting System

Local Application System

Model : SPF-1



Working Pressure (bar)	K-Factor (Flow rate)	Installation (m)			Projection
		Spacing	Min. Height	Max. Height	
50 ~ 60	1.5 (10.6~11.6LPM)	1.5	0.6	3.0	Vertical Downward
90 ~ 100	1.5 (14.2~15.0LPM)	2.5	3.0	8.0	Vertical Downward

Model : HSN-510



Working Pressure (bar)	K-Factor (Flow rate)	Installation (m)			Projection
		Spacing	Min. Height	Max. Height	
40 ~ 90	1.65 (10.6~44LPM)	4.0	0.6	3.0	Vertical Downward

Model : SPF-3



Working Pressure (bar)	K-Factor (Flow rate)	Installation (m)			Projection
		Spacing	Min. Height	Max. Height	
Min. 7.5	4.76 (13LPM)	4.0	0.5	17.0	Vertical Downward Inclined angle (30°~60° form vertical)
		8.0	0.5	5.0	Side Shooting

Total Application System



Model : SPF-1C (Accomodation)



Working Pressure (bar)	K-Factor (Flow rate)	Installation (m)			Projection
		Spacing	Min. Height	Max. Height	
50 ~ 60	1.5 (10.6~11.6LPM)	1.5	0.6	3.0	Vertical Downward
90 ~ 100	1.5 (14.2~15.0LPM)	2.5	3.0	8.0	Vertical Downward

Model : SPF-2 (Engine Room)



Nozzle	Model	Working Pressure (bar)	K-Factor (Flow rate)	Installation (m)			Projection
				Spacing	Location	Max. distance to wall	
Celling nozzle	SPF-2	60	0.46 (3.56LPM)	4.0×4.0	Max. 1.5 below Celling	2.0	Vertical Downward
Bilge nozzle	SPF-2		0.46 (3.56LPM)	3.2×3.2	Bilge plate mounted	-	
Doorway nozzle	SPF-2D		0.21 (1.62LPM)	0.4(tip to tip)	Max. 0.3 Above Doorway	-	

High Expansion Foam System

High expansion foam system is used as alternative system of Halon extinguishing system.

As halon replacement being phased out due to environmental reasons, high expansion foam system is good replacement. It is also excellent alternative system of CO₂ and sprinkler systems. High expansion foam system is suitable for installation in engine room together with adjacent spaces as local and /or total flooding. The system is manually operated but may be supplied upon request with remote operation.

High expansion foam system has been extensively full scale tested for fires in machinery spaces, class 1, 2&3, following IMO guidelines. High expansion foam system extinguishes fires with a combination of water and foam. Foam fills all the voids and seals the fire from the air supply, and steam absorbs heat energy when water is vaporized. An inert atmosphere is created and the fire is extinguished. When a fire occurs, fire fighting can immediately begin by the user of high expansion foam system and there is a further advantage of reduced damage due to the cooling effect created by the water and the foam on surfaces.

When installing high expansion foam system there is no need for large air ducts or unnatural hull opening to produce foam. simplified piping system and low weight generators in combination with seaplug traditionally and well proven foam central unit makes the whole system easy to install.



High Expansion Foam System



Certificate

Foam Generator



Proportioner

High Expansion Foam Generators

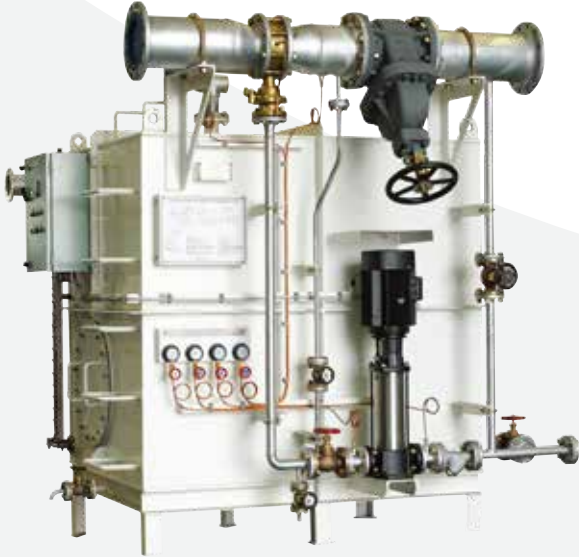
V : Vertical downward H : Horizontal

Model	Flow rate (LPM)	Foam capacity (m ³ /min)	Working pressure(Mpa)	Expansion ratio(Times)	Connection method	K-factor	Weight (kg)
SPFG-25	28	> 19.6	0.3		JIS 10K-25A Flange	16.17	6.5
SPFG-50	55	> 46.2				31.75	9
SPFG-100	100	> 80				57.74	13

SPECIFICATION

- 1) High expansion foam concentrate : HEF 2%
- 2) Mixing ratio : 2%(foam concentrate) + 98% (sea-water)

Low Expansion Foam System (Deck Foam System)



Foam Tank Unit

Foam system for the protection of chemical and oil tank decks or heli-decks in accordance with class requirements and IBC code. Calculated and designed in accordance with international regulations. The foam monitors may be delivered as manually operated (electric or hydraulic type)



Balanced Pressure mixer



Foam Hose Box

Foam Proportioner

Model	Max. Water Flow Rate (LPM)	Connection Size	
		Water Side	Foam Side
50F - 100W	3,000	JIS10K-100A	JIS10K-50A
50F - 150W	6,000	JIS10K-150A	JIS10K-50A
80F - 200W	13,000	JIS10K-200A	JIS10K-80A
80F - 250W	20,000	JIS10K-250A	JIS10K-80A



Foam Monitor

Foam Monitor

Model	Capacity (LPM)	Connection Size
FM-65A	500 ~ 1,500	JIS 10K-65A
FM-80A	1,500 ~ 3,000	JIS 10K-80A
FM-100A	3,000 ~ 5,000	JIS 10K-100A
FM-125A	5,000 ~ 8,000	JIS 10K-125A

Dry Chemical Powder System

Johnson Controls Seaplus dry powder system is designed specifically for marine application so that can be met with SOLAS requirements for LPG and LNG tankers.



Hose Station



Dry Chemical Powder Tank Skid



Model	Flow rate (kg/sec)	Minimum discharge range (m)
Monitor (D-65)	10	10
	12.5	13.34
	16	18
	20	23.33
	25	30
Hand Hose Gun (DPHG-3.5)	3.5	5~10

External Fire Fighting System

Johnson Controls Marine brings to the market a unique solution for External Fire Fighting systems to ensure customer satisfaction and confidence of optimum system performance.

Johnson Controls with its world-wide proven first in class marine fire- fighting solutions and Kumera with its renowned quality in marine transmission systems have joined forces to produce a new compact integrated gearbox–pump and monitor offering to the market.

This concept offers the customer the worldwide technical support and response from teams of specialists wholly concentrating on its own speciality.

Water monitor system capacity	(ABS Rule 5-9-1/Table.1, 2006)			
	Class I	Class II		Class III
Class Notation	Class I	Class II		Class III
Number of water monitors	2	3	4	4
Discharge rate per monitor, m ³ /h	1,200	2,400	1,800	2,400
Number of pumps	1-2	2-4		2-4
Total capacity, m ³ /h	2,400	7,200		9,600
Monitor range, m	120	150		150
Height, monitor, m	45	70		70
Number of hose connection each side of vessel	4	8		10
Number of fireman's outfits	4	8		10
Fuel oil capacity	24	96		96

- 1) Range : measured horizontally from the monitor outlet to the mean impact area.
- 2) Height : minimum height of the trajectory of water monitor jet measured vertically from sea level assuming a mean impact area located at a horizontal distance not less than 70m from the nearest part of the fire fighting vessel.
- 3) Fuel oil capacity is to include provisions for continuous operation of all monitors in addition to the total capacity of the vessel's fuel oil tanks required for continuous fire fighting operation. See also 5-9-2/5.



External Fire Fighting System

Model	Capacity		Actuating Method
	L/min	m ³ /h	
FE-65	500 ~ 1,500	30 ~ 90	Electric
FE-80	1,500 ~ 3,000	90 ~ 180	Electric
FE-100	3,000 ~ 5,000	180 ~ 300	Electric
FE-150	8,000 ~ 11,333	480 ~ 680	Electric
FE-200	11,333 ~ 20,000	680 ~ 1,200	Electric
FE-200D			Electric
SFE-200			Electric
SFE-200S			Electric
SFE-200D			Electric
SFE-200DS			Electric
DN200	20,000	1,200	Electric
DN200S			Electric
DN200D			Electric
DN200DS			Electric
FEH-200	11,333 ~ 25,000	680 ~ 1,500	Electro-Hydraulic
FEH-200D			Electro-Hydraulic
FEH-250	25,000 ~ 40,000	1,500 ~ 2,400	Electro-Hydraulic
FEH-300	40,000 ~ 60,000	2,400 ~ 3,600	Electro-Hydraulic



FE-100D Fire Monitor Equipment



Controller



Fire Pump Unit



Integrated Gear Box & Fire Pump



Monitor



Control panel

Automatic Sprinkler System

This system is installed in accommodation spaces and other service on the vessels such as passenger ships and car ferries. The sprinkler system is the most effective at its early stage in extinguishing fire. Statistics estimates that about 70% of all fires has been extinguishing by less than three sprinkler heads.



Operation of sprinkler-system

Immediately after fire breaks out in a protected area, the intense heat rises rapidly under ceiling zone. As soon as the ambient temperature has reached the set release temperature, the glass bulb bursts and the sprinkler is activated. The sprinkler pressure tank contains fresh water, which being discharged into protected area, at a constant pressure level. When sprinkler nozzles are actuated, the sprinkler system is activated resulting in a pressure drop in the sprinkler storage tank.

Water supply is provided with adequate pressure by dedicated pump set which is arranged to start automatically when the pressure falls down below set point of the pump's start-up relay. The sea ensures an inexhaustible supply as fire extinguishing agents, posing no threat to passenger and crew. For safety reasons, the sprinkler pumps can be operated from the ship's main and emergency switchboard.



Sprinkler Nozzle Release



Sprinkler Heads



Sprinkler MIMIC Panel



Nozzle Escutcheons

Fire Detection & Alarm System

Johnsons Controls provides a wide range of Fire Detection products and systems specifically designed for marine applications. Products hold an extensive range of approvals from marine approval bodies around the globe and as such can be used onboard shipping and platforms.

T2000 Marine Detection Panels

The T2000 is a fully Marine approved EN54 compliant 1 to 8 loop networkable detection panel.

- The T2000 sub-panel supports up to eight loops supporting up to 1000 addressable devices and can be expanded using additional loop sub-panels
- FIM800 field interface PCB incorporating two MZX DIGITAL loops
- CPU800 32 bit processor and memory card
- Optional network card, additional loop card(s) and remote diagnostic modem
- Optional IOB800 input/output expansion card mounted on the PSB800



Marine Flame Detectors

FV300 Array Based Infrared Flame Detectors

- Volt-free relay contacts for alarm and fault, programmable as normally open or normally closed
- An analogue output current, in the range 4 to 20mA, proportional to the flame detection signal.
- RS485 serial data port suitable for network connection using a MODBUS protocol.
- Video output compatible with twisted pair video cable.
- Built-in CCTV option to assist with rapid response
- Automatic monitoring of detector functionality including signal transmission through window status
- Over 50m detection range with 90° field of view
- Remote video monitoring with fire location and detector information



850 Series Generation 6 Detectors

- 851PH Photo Heat Detector
- 851P Photo Detector
- 851H Heat Detector
- 851PC 3oTec Triple Sensor Detector
- A wide range of accessories are available including the 851EMT Engineering Management Tool



CP Series Call-points

CP820 Indoor Call-point

- Indoor MZX addressable manual callpoint with programmable status LED
- Designed for LPCB approvals
- High speed communication to the MZX panel of a manual fire alarm



CP830 Outdoor Call-point

- Outdoor MZX addressable manual callpoint with programmable status LED
- Designed for LPCB approvals
- High speed communication to the MZX panel of a manual fire alarm









Loose Fire Fighting Equipment








Fire Man's Outfit Equipments

Fire Suit	Air Breathing Apparatus	Fire Axe With Beit and Life Line		Safety Lamp
				

Fire Extinguisher

Fire Extinguisher (Portable Type)			Fire Extinguisher (Wheel Type)		Portable Foam Applicator Assembly
					
9L Foam	6.8kg CO2	6.5kg Dry Powder	45L Foam	135L Foam	

Sea water Fire Fighting Equipments

Fire Hose Rack	Fire Hose Box	Fire Hose Reel	Spanner
			
International Shore Connection	Fire Hose With Coupling	Jet / Spray Nozzle	
			

Specialists in Fire, Security & Life Safety

Over 130 years experience and specialised marine expertise you can trust. Johnson Controls actively helps protect vessels at sea, safeguarding what matters most - life and assets. Maintaining vessels no matter where they are in the world to ensure they are safe, reliable and efficient is essential for our customers. Johnson Controls provides through-life support and maintenance for vessels worldwide

At sea or inland we can offer you...

Complete Fire Fighting Package Dry chemical powder, deck foam, high/ low pressure CO₂, local detection and alarm system.

Electronic Security Ship perimeter protection, access control, video surveillance and 24/7 monitoring to demonstrate continuous compliance with ISPS.

Life Safety Gas detection, general alarm, personal breathing devices, emergency shutdown systems, onboard hospital/ healthcare as well

Communication Networking of audio, video and data signals.

Service & Maintenance

Together we can help, support and protect your maritime assets. Our customer service strategy has a global reach meaning we are global by local to you. In addition to our dedicated Service and Maintenance teams we have an increasing number of contracted Marine Distributors located throughout the world to help provide you with the best service possible.

Worldwide Total Fire Protection Solution Provider

Manufacturing & Product Development ISO 9001:2008 standards at our 36 manufacturing facilities and 14 R&D centres.

Application Engineering Customer focused approach in developing innovative solutions.

Project Management Multidisciplined teams co-ordinated across countries with a single point of contact.

Installation & Commissioning in port, at sea or in the shipyards.

After Sales Remote servicing facility providing after sales support.



Type Approval Certificate

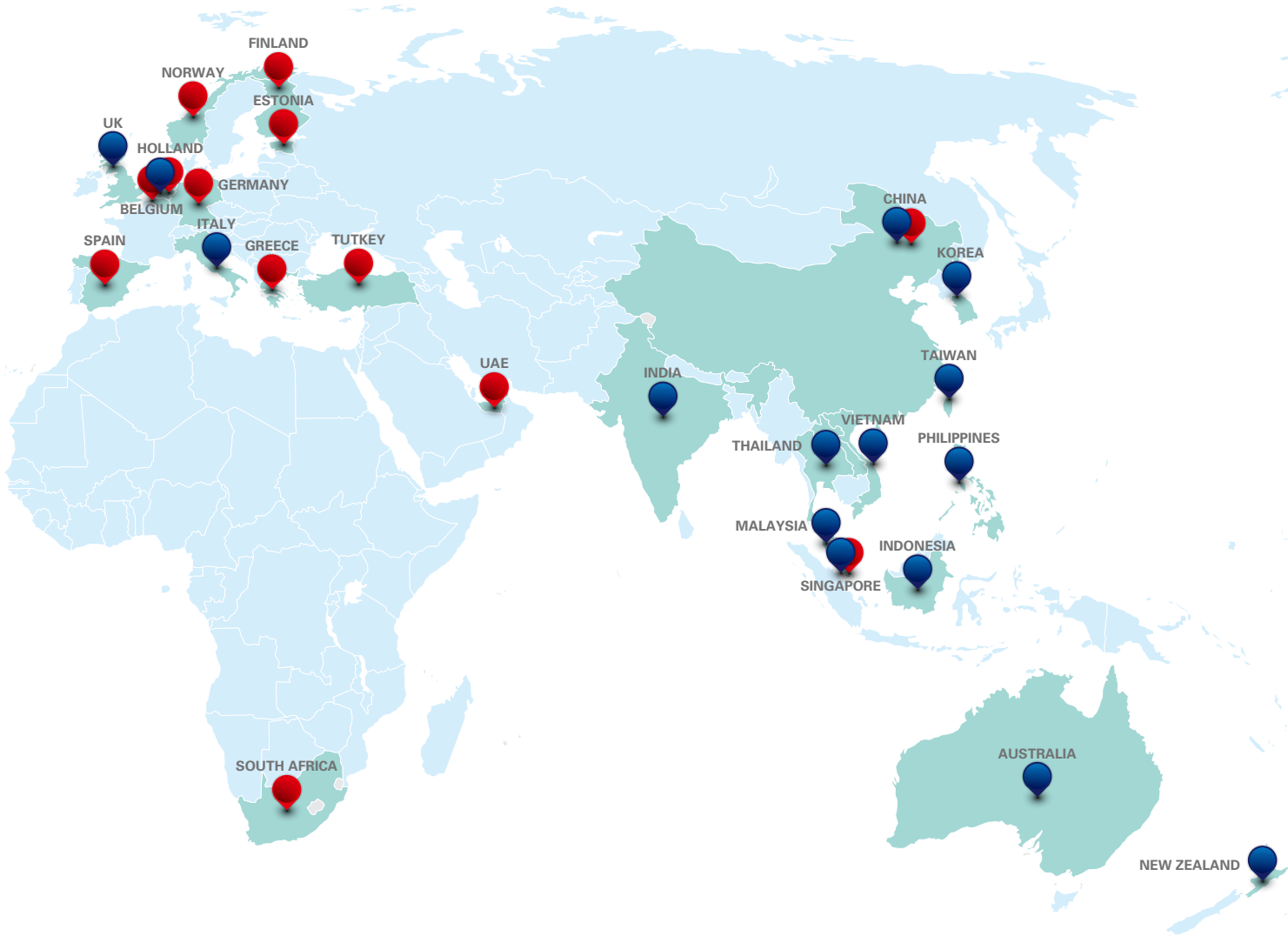
Approval Item	CLASS										
	MED	ABS	BV	CCS	DNV	GL	KG	KR	LR	NK	RINA
Factory Approval		●	●		●			●			
HP CO₂ system											
HP CO ₂ System				●		●					
Cylinder			●	●	●	●	●	●	●	●	●
Flexible Hose (G119-8K)						●					
Flexible Hose (FH-1 / FH-2)				●			●				
Safety Valve (MSO-1)							●				
Non Return Check Valve (NRV-1)							●				
PM-1 Valve				●			●				
SDV Valve				●			●				
CO ₂ Manifold (20A~150A)							●				
POD Valve (POD 25A, 40A, 50A, 80A, 100A, 150A)				●							
POD Valve (POD 1, 1-1/2, 2, 3, 4)							●				
POD Valve (PODN 25A, 40A)							●				
POD Valve (PODS 25A, 40A, 50A, 80A, 100A, 150A)							●				
LP CO₂ system											
LP CO ₂ system											
Local Watermist system											
Fixed Water-Based Local Application Fire Extinguishing Systems (Plusfog, HSN-510)						●		●		●	
SPF-1 (High Pressure)							●				
Fixed Water-Based Local Application Fire Extinguishing Systems (Plusfog, SPF-2)								●			
Plusfog Nozzle (SPF-2 : Total Floating)		●					●				
Fixed Water-Based Local Application Fire Extinguishing Systems (Plusfog, SPF-3)	●		●	●	●			●	●		●
Plusfog Nozzle (SPF-3 : Low Pressure)		●					●			●	
Controller Panel (TMS-SP-MIST)						●					
Flame Detector (FD-IR-001)											
HI-EX FOAM system											
Inside Air High Expansion Foam System (SP-HIEX)	●	●	●	●	●			●	●		●
Foam Generator (For SP-HIEX, SPFG-25, SPFG-50, SPFG-100)										●	
Foam Concentrate (2% HEF)	●									●	
High Expansion Foam Fire-extinguishing Medium (SP-HEF)							●				
Foam Proportioner (SP40F-150W)					●		●				
LO-EX FOAM system											
Foam Concentrate (FP/AR 3-3%)	●									●	●
Foam Concentrate (SL-P 3%)	●									●	



Approval Item	CLASS										
	MED	ABS	BV	CCS	DNV	GL	KG	KR	LR	NK	RINA
Dry Chemical Powder system											
Dry Chemical Powder System (ABC Dry Chemical Powder)										●	
Dry Chemical Powder System (PTDC : BK Dry Chemical powder 75%)										●	
Dry Chemical Powder System (TMS-SP-DPS : BK Dry Chemical powder 75%)	●		●		●				●		
Gun DPG-3.5 (3.5 kg/sec)			●								
Monitor D-65 (10 kg/sec)			●								
BK Dry Chemical Powder 75%						●					
External Fire fighting system											
Water Fire Monitor (FEH-200 & FE-200 and FEH-200D & FE-200D)			●								
Water Fire Monitor (SFE-200(S) / 200D(S))		●	●		●				●		●
External Fire Monitor (FEH-300)					●						
Fire Detection & Alarm system											
Fire Detection & Alarm System (JB-QB-4508(R), JTY-GD-3100, JTW-ZD-3100 / FD-IR-001, J-SAP-3100A)								●			
Heat Detector (JTW-ZD-3100)							●				
Smoke Detector (JTY-GD-3100)							●				
Manual Call Point (J-SAP-3100(A))							●				
Manual Call Point (J-SAP-3100(B))							●				
Fire Alarm Controller (JB-QB-4508(R))							●				
Fire Alarm Controller (JB-QB-3100/127)							●				
LOOSE & DECK FOAM SYSTEM											
9 L Foam Fire Extinguisher (SP9F)	●										
9 L Foam Fire Extinguisher (SF9)							●				
6 kg Dry Powder Fire Extinguisher (SP6D)	●										
6.5 kg Dry Powder Fire Extinguisher (SPD-6.5)							●				
6.8 kg CO2 Fire Extinguisher (SG6)							●				
Foam Fire Extinguisher (SPF45 / SPF135)							●				
Internation Shore Connection (ISC40 / ISC50 / ISC65)							●				
Fire Hose (F40A / F50A / F65A)							●				
Fire Axe							●				
Jet / Spray Nozzle (N40A / N50A / N65A)							●				
Foam Proportioner (50F-100W / 50F-150W / 80F-200W)							●				
Portable Foam Applicator (SFA-1-50A / 65A)							●				
Portable Foam Release Nozzle (SFA-2-50A / 65A)							●				
Monitor (FM-65A / FM-80A / FM-100A / FM-125A)							●				

Johnson Controls Global Service Network

STEPS TOWARDS THE FUTURE

Johnson Controls makes the future with the challenge to a new world and unswerving R & D efforts. You shall be assured of our efforts for the world-highest precision and quality.



-  Johnson Controls marine services
-  Johnson Controls service partners



Johnson Controls Marine Solutions

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Manufactures of Class Approved Fire Protection System



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Email for vessel solutions: overseas@tycoint.com

