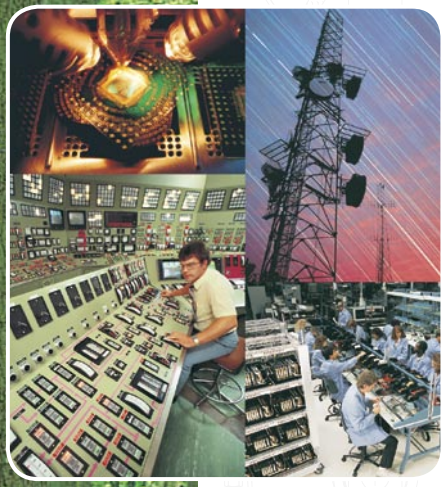
LEADING THE FIGHT AGAINST FIRE

SRI

inertec®55

FIRE SUPPRESSION SYSTEMS

IG-55 (Argon/Nitrogen)



Safe, Effective, Environment-friendly

Introduction

With the phase out of the most commonly used but environmentally damaging *Halon 1301* and CO_2 fire suppressant, *inert gases* are becoming the global alternatives of choice in view of the following:

- Proven safety for people, property and the environment were natural requirements in addition to the desirable properties of effectiveness, cleanliness and zero secondary damage.

- Inert gases are the best choice for extinguishing agents as they extinguish fires by oxygen depletion by lowering the normal oxygen concentration in the air from 21% to about 12%, below the limit required for combustion whilst still providing a safe and breathable atmosphere.

- The composition of a naturally occurring gas of inertec®55 is a preferred choice as it provides users with all the advantages of an internationally accredited and environmentally friendly protection solution without the high costs of traditional implementation of equivalents.

inertec®55 FIRE SUPPRESSION SYSTEMS ...The Natural Solution

The Montreal Protocol in 1987* and more recently, the Kyoto Protocol** of 2005 required that in addition to protecting lives and properties from fire, safeguarding the environment now plays an equally important role in the development of today 's fire suppression agents. As a result, **SRI** introduced the inertec®55 fire suppression system which meets all the three objectives of a responsible and modern fire protection system; ***Protect Lives, Protect Properties and Protect the Environment.***

- inertec®55 is a gaseous clean fire suppressant comprised of 50% nitrogen and 50% argon which are naturally occruing gases. As inertec®55 is derived from gases present in the atmosphere, it exhibits no ozone depleting potential, does not contribute to global warming, nor does it contribute unique chemical species with extended atmospheric lifetimes. Because inertec®55 is totally composed of atmospheric gases, it does not pose the problems of toxicity associated with the chemically derived Halon alternatives.

- inertec®55 fire suppression systems are developed to meet and exceed international standards and have been approved by VdS SCHADENVERHÜTUNG

Protecting Life

Although early warning detection systems normally allow people to evacuate the protected area well before any kind of fire suppression agent is discharged, any number of unforeseen circumstances may prevent immediate escape. This is why it is important that your fire suppression agent be safe to use in automatic total flooding systems for possible and normally occupied areas.

- Almost all fires are extinguished at the oxygen concentration level of below 15%. inertec®55 fire suppression systems reduces the oxygen concentration to around 12.5% to 10.5%, a level which is acceptable to human exposure over short periods of time.

- One of the advantages of the inertec®55 fire suppression agent is that it won't produce a fog, so that occupants are not visibly impaired on the way to the exit. Furthermore, the inertec®55 fire suppressant is not toxic, and more importantly, it **will not** break down into toxic or corrosive decomposition by products. Halocarbon alternative agents can create dangerous levels of hydrogen fluoride when they contact with fire.

Protecting Property

inertec®55 fire suppressant is ideally suited to protecting property.
Upon deployment, inertec®55

- Produces no condensation or temperature shocks that can cause harm to equipment
- Produces no harmful or decomposition by products upon contact with heat or fire
- Produces no residue to clean up, is colourless, odourless and electrically non-conductive

- That's why inertec®55 fire suppression systems are ideally suited for the protection of sensitive electronics and delicate high value irreplaceable assets.

- With virtually the same density as air, the inertec®55 fire suppressant spreads quickly throughout the protected area and holds its concentration longer to snuff out fires in their early stages. Most other heavier than air Halon alternatives sink to the floor and seep under doors and wells.

- inertec®55 is also suitable for gas and liquid class B fires in addition to class A surface fires involving material such as wood,cloth and paper. However, it is not suitable for fires in substances that generates oxygen, like some reactive metals.

Protecting The Environment

inertec®55 fire suppressant is completely environment friendly. It is composed entirely of naturally occurring gases which exists in the air we breathe; ***Nitrogen*** *and* ***Argon***.

- In fact, the inertec®55 gas presents no negative environmental impact which means…
  - **ZERO** ozone depletion potential
  - **ZERO** global warming potential
  - **ZERO** atmospheric lifetime

- When the inertec®55 fire suppressant is used, its components is simply returned to the surrounding atmosphere. And because inertec®55 is not a synthetic chemical, it is not subject to potential future use restriction. In fact, you would have to ban air in order to ban inertec®55.

- Because inertec®55 comprise of only Nitrogen and Argon, it achieves zero ODP and GWP unlike other halon replacement agents which are HFC based and are classified as Greenhouse gases in the same category as CO_2 which contribute to Global warming.

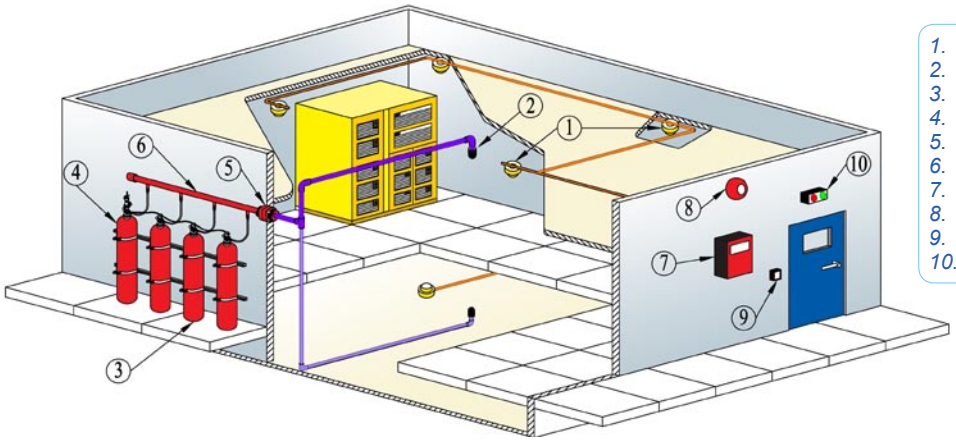
- It is with these considerations in mind that the use of CO^2 is avoided in inertec®55 thus avoiding possible limited product lifetime dictated by changes in global environment legislation. Your inertec®55 fire suppressant could be used forever as there will never be any environmental restrictions on the use of Nitrogen, which is the biggest element of air.

System Design and Operation

SRI's inertec systems are designed, installed and maintained according to NFPA 2001 (Clean Agent Fire Extinguishing Systems and ISO 14520 Gaseous Fire Extinguishing Systems) standards.

inertec 55 is a total flooding system whereby the required amount of gas is discharged into an enclosed area to extinguish fire.The gas is stored as compressed gas at 200bar or 300bar. The system can be actuated electrically from a control panel or manually actuated from the cylinder bank, and the discharged gas pressure is reduced from 200bar to less than 60 bar after the manifold. The system is normally designed as such that 95%of the gas will be discharged into the protected area within 60 seconds.

Multiple storage options are possible with inertec 55 as the system has been designed for long distance delivery. This means that the cylinder bank can be stored remotely from the risk area when storage space is a concern.



1. *Smoke / heat detector*
2. *Nozzle*
3. *Slave cylinders*
4. *Master cylinder*
5. *Pressure reducer unit*
6. *Manifold*
7. *Control panel*
8. *Alarm bell*
9. *Manual Call Point (break glass)*
10. *Discharge light*

When two or more areas of protection do not require flooding of gas at the same time, directional or selector valves can be used to allow the same bank of cylinders to protect multiple areas. Such sub-systems can reduce substantial equipment costs and storage area for cylinders. Maintenance and inspection locations can also be reduced accordingly.

Example of typical calculation for inertec 55 total flooding requirement:

Dimensions of room to be protected	=	10.0m x 5.3m x 3.0m (H)
Volume of room to be protected	=	**159.0m³**
Design Temperature	=	20°C
Extinguishing Design Concentration *(NFPA 2001)*	=	38% (for Class A & C hazards)
Flooding Factor *(NFPA 2001)*	=	**0.48**
Therefore,		
Agent required	=	Volume of room to be protected x Flooding Factor
Volume of agent required	=	**76.32m³**
Agent capacity per 80 litre cylinder	=	15.8m³
Number of cylinders required	=	Agent required / Agent capacity per cylinder
	=	76.32 / 15.8
	=	4.83
Round up to next integer	=	5
Therefore the number of cylinders required	=	**5 numbers of 80L cylinders (providing coverage up to 76m³) of inertec 55**

Room Integrity Test

NFPA 2001 standards (section 6.7.2.3) requires an enclosure integrity test to check for air leaks and holding times as part of the system acceptance procedure. This test can be carried out by us using a calibrated blower door fan test unit.

System Components

All system components as listed must be sourced from SRI to ensure effective and safe operation.

Installation and maintenance shall be carried out according to the inertec System manuals.

Item	Code No.	Description	Material
1	ING011	Valve	Brass
2	ING012	Pneumatic and Manual actuator	Brass
3	ING017	Pressure gauge c/w leakage monitoring switch	Plastic
4	ING008	Discharge hose DN12	Wire braided rubber hose
5	ING001	Check valve 3/4”	Brass
6	ING009	Pressure reducer unit, DN50	Steel Alloy
7	ING038	Manifold single socket	Sch 160
	ING039	Manifold double socket	Sch 160
8	ING010	Pilot hose DN8	Wire braided rubber hose
9	ING013	Electrical Actuator	Brass
10	ING024	80L/140L high pressure seamless cylinder	Steel Alloy
11	ING046	Cylinder Strap	Steel
12	ING044	Cylinder wall bracket	Steel
13	ING047	Safety Relief valve	Brass
14	ING027	Selector Valve DN50	Steel Alloy
15	ING026	Discharge pressure switch	Aluminium Alloy
16	ING021	Solenoid valve 24VDC	Brass
17	ING033	Pressure regulator	Brass
*	ING002	1/2” Nozzle	Brass
*	ING004	1” Nozzle	Brass

Flow Calculations

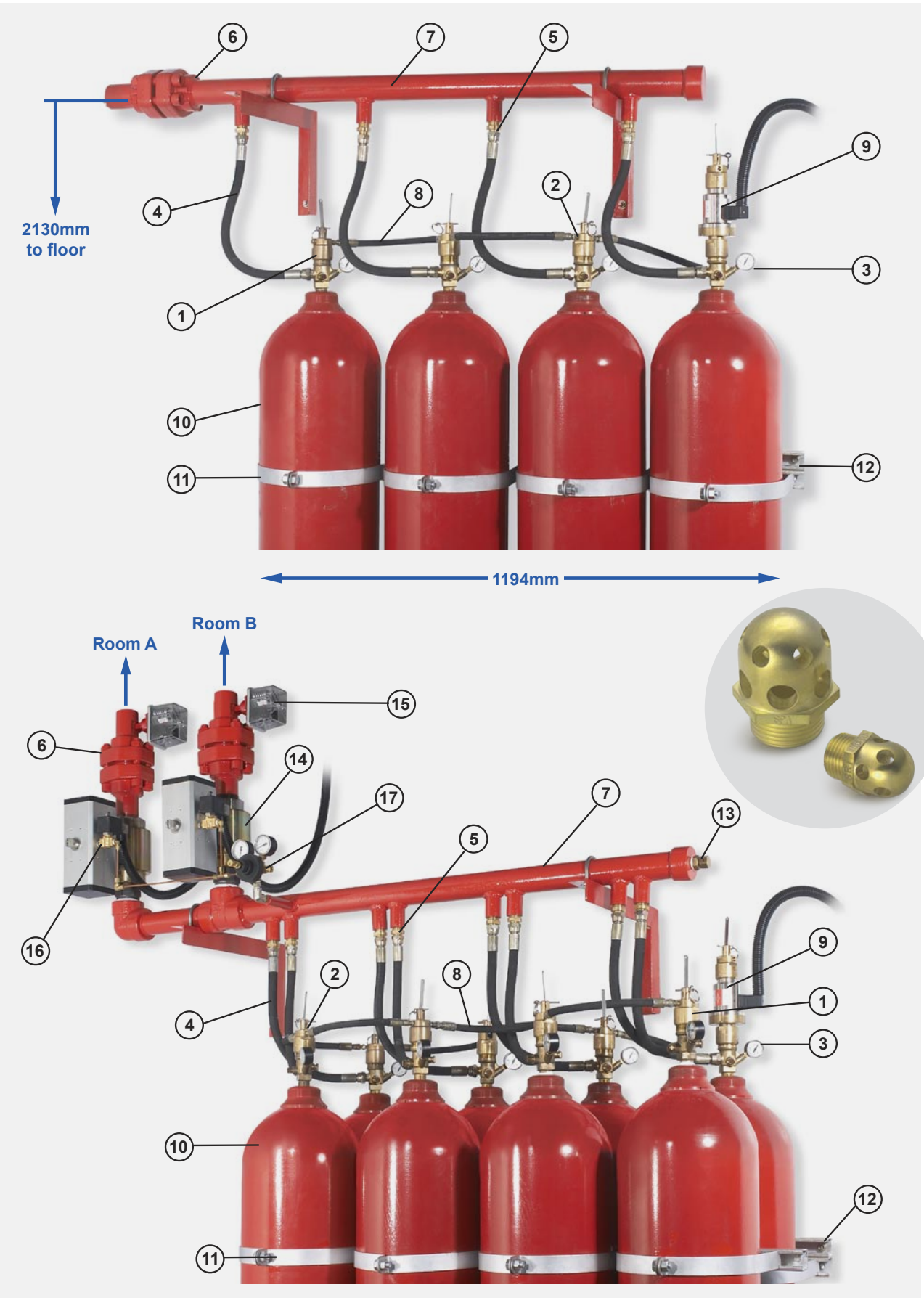
All inertec gas extinguishing system flow calculations are performed using VdS computer software program endorsed by VdS to ensure the required design concentration can be achieved within the specified time.The software will provide the orifice of the pressure reducer, pipe sizes, orifice diameter of nozzles and oxygen concentration after discharge.

Approval

The inertec 55 gas extinguishing system is approved by VdS Schadenverhütung (Loss Prevention) Germany to VDS 2452 Gas Extinguishing System Requirements and Test Methods.

All INERTEC gas extinguishing system equipment such as valve, actuator, pressure reducer, nozzle, discharge hose and check valves are certified by VdS.

VdS is a company of the German Insurance Association Gesamtverband der Deutschen Vesi cherungswi rtschaft (GDV), for further details visit www.vds.de



Directional valves system for the protection of multiple rooms

inertec® 55
FIRE SUPPRESSION SYSTEMS

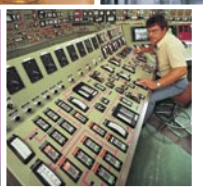
Fire Suppression System Applications

inertec fire suppression systems protect enclosed areas where there is a need for quick reaction to fire, where people may be present, where fire may strike anytime or where damage from conventional agents cannot be tolerated.

Some examples of such areas are:







Telecommunications Facilities

- Telephone Exchanges
- Communication Centres
- Central & Remote Cellular Sites
- Satellite Ground Stations

Commercial & Institutional Facilities

- Bank Vaults & Document Storage
- Medical Diagnostic Rooms
- Art Galleries & Archives
- Museums & Libraries
- Aviation & Marine Applications

Data Centres & Industrial Applications

- Computer Rooms & Electronics
- Tape & Back Up Storage
- Server Rooms & Process Control Rooms
- Power Plants & Distribution, Electrical Switchgears & Battery Rooms
- Laboratories & Clean Rooms
- Pharmaceutical / Medical Facilities
- Military Installations

Low-cost refills that's Always Available

Nitrogen and Argon gases, agent of the inertec® 55 fire suppressant is readily available everywhere and are very affordable. This advantage allows the facility manager to carry out discharge tests regularly to ensure system functionality. Due to the simple gas make up, long delivery times and often proprietary sources of refills for other inert and chemical based agents can be avoided.

* *The Montreal Protocol (1987) calls for a planned reduction and phase-out in the production and consumption of ozone depleting substances.*

** *The Kyoto Protocol (2005) treaty is an international agreement to reduce the greenhouse gas emissions causing climate change. The Kyoto Protocol commits 38 industrialized countries to cut their key greenhouse gas emissions to specific levels by the year 2012.*

LEADING THE FIGHT AGAINST FIRE
SRI global research, manufacturing, sales and service:

Steel Recon Industries Sdn. Bhd.
No 8, Jalan Subang 7, Taman Perindustrian Subang, 47610 Subang Jaya,
Selangor Darul Ehsan, Malaysia.
Tel: +603-8023 2323
Fax: +603-8023 2828
E-mail: info@sri.com.my

SRI EUROPE GmbH
Henrich-Rau-Str. D-16816,
Neuruppin, Germany.
Tel: +49/3391/508866
Fax: +49/3391/508867
E-mail: sri.neuruppin@online.de

CERTIFIED IQNet MANAGEMENT SYSTEM
Quality System™ Quality Endorsed Company

Distributor:

Inertec 55 extinguishant comprise of 50% Nitrogen and 50% Argon and is addressed in NFPA 2001 and ISO 14520 standards as IG-55.