Kidde Fire Protection

KiddeFenwal

NATURA™ (400 Series) Inert Gas Fire Suppression System

Effective: October 2026
KDS 38-400000-000 Rev AD

Flexible. Efficient. Sustainable.

The NATURA™ (400 Series) Inert Gas System is an environmentally safe, competitive, and cost-effective fire extinguishing system for protecting assets in commercial, light, and heavy industry. With global approvals and a selection of agents and hardware profiles, NATURA IGS can be the natural choice for inert gas fire suppression systems.

Environmentally safe

- Uses naturally occurring gases.
- Zero Global Warming Potential (GWP)
- Zero Ozone Depletion Potential (ODP)

Wide range of applications - broad opportunity

- Data Centers
- Hospitals & Medical Facilities
- Libraries and Archives
- Museums & Cultural Heritage Buildings
- Petroleum, Oil & Gas Facilities
- Pharmaceutical Manufacturing
- Telecommunication Facilities and more

Choice of agents and hardware profile - suits regional requirements and filling capabilities

- Fire Classification
  NFPA (UL/FM)
  - Class A (Ordinary Combustible Materials)
  - Class B (Flammable Liquids)
  - Class C (Electrical Hazards Energized)
  - Class D (Combustible Metals)

  ISO & EN (LPCB, A2P)
  - Class A (Ordinary Combustible Materials)
  - Class A Higher (Electrically Energized Equipment)
  - Class A Cable (LPCB Only)
  - Class B (Flammable Liquids or liquifiable solids)
  - Class C (Flammable Gas)
  - Class D (Combustible Metals)
- System pressures suitable for regional capabilities
  - 200 bar
  - 300 bar
- Cylinder sizes to suit floor space
  - 80 Liter
  - 140 Liter
- Nozzles types add design & installation flexibility
  - 180° (pendent or upright style)
  - 360° (pendent or upright style)
  - 360° Acoustic (pendent or upright style)

Designed for quick and easy installation

- Pre-fabricated manifolds
- Quick connect actuation tube fittings
- Daisy chained pressure supervision via plug-in connections

Wide operating temperature

- ISO 14520/EN 15004: -20° to 50°C (-4° to 122°F)
- FM Approved/UL Listed: -20° to 54°C (-4° to 130°F)*

*Unless superseded by local/national standards



Superior valve design - enables lower cost installation

- In most cases, schedule 40 pipe now suitable vs. higher cost Sch 80 or 160 for unregulated systems.
- Regulated flow reduces pressure vent size and cost.

Specify and ship worldwide with confidence, certified for:

- Transportation
  - TPED/TPER and/or UN/DOT
- Performance
  - Redbook Listed (LPCB)
  - UL Listed
  - FM Approved
  - A2P (CNPP)
  - Construction Products Regulation, CPR

Design Flexibility

Global approvals allow for selection of the design concentrations based on approval type.

Inert Gases

The NATURA IGS offers four inert gases for use in the fire suppression system. These gases are:

- IG-01: Pure Argon
- IG-55: Gaseous Mixture of 50% Nitrogen and 50% Argon
- IG-100: Pure Nitrogen
- IG-541: An inert-gas mixture of 52% nitrogen, 40% argon, and 8% carbon dioxide.

Hazard Protection

The NATURA IGS can be designed to cover a single hazard or multiple hazards from a common cylinder bank. KiddeFenwal (KF) recommends wherever possible to have a fully connected reserve bank of cylinders to ensure your assets remain fully protected, even after a discharge from the main bank.

Multi Zone System

Multi zone systems can protect multiple hazards with one bank of cylinders. Multi zone systems require the use of one two-way, pneumatically operated selector valve for each protected zone.The following depicts an example of a multi-zone NATURA™ IGS setup which protects 3 separate hazard zones.

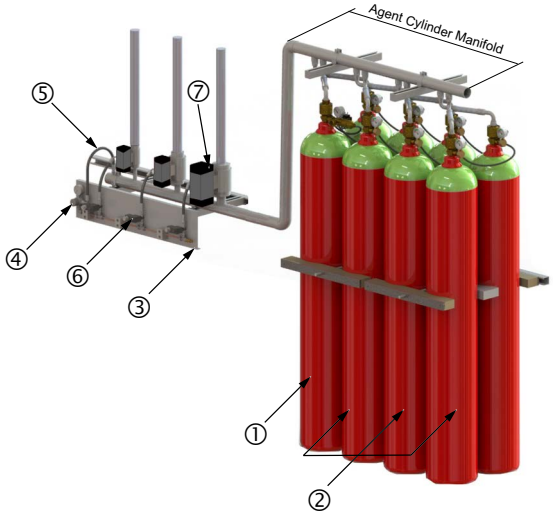


Figure 1. Multi-Hazard System Example

Table 1: Multi-Hazard System Example Component List

Item	Description
1	Primary Agent Storage Cylinder and Valve Assembly
2	Secondary Agent Storage Cylinder and Valve Assemblies
3	Manifold Pressure Gauge*
4	Back-Plate Manifold
5	Back-Plate Manifold Pressure Regulator
6	Back-Plate Manifold Hose
7	Back-Plate Manifold Solenoid
8	Selector Valve

*Other pressure indication methods are available.

Component Description

Cylinder and Valve Assemblies

The NATURA IGS uses seamless steel cylinders compliant with ISO 9809-2 and certified to TPED/TPER and/or UN/DOT. System activation and gas discharge is controlled via a pressure operated, mass flow regulated, and pressure controlling valve. The valve is equipped with a safety burst disc in compliance with DOT/ADR/ADN/RID and TPED/TPER requirements (ISO 17871) and has connection ports for the release unit or secondary gauge assembly, pilot line actuation hoses, and an agent discharge port.

Cylinders are available in 80 litre or 140 litre at either 200 bar or 300 bar pressure. All pressures are determined at a filling temperature of 15°C (59°F).

Cylinder shells are painted red with green shoulder for easy identification and include agency markings where applicable.

When shipped, cylinder-valve assemblies include an anti-recoil cap and a Safety Transport cap (Compliant to ADR/ADN/RID - ISO 11117) as a safety feature designed to prevent uncontrolled, accidental discharge and damage during transport. The outlet cap can be used to perform the system pilot line commissioning test/discharge test without discharging agent from the NATURA IGS cylinder.

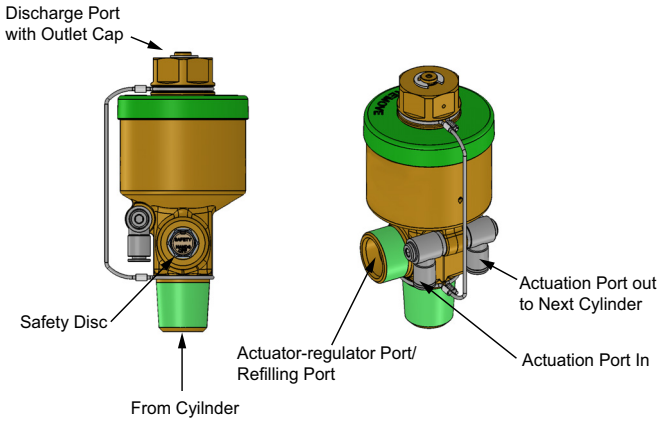


Figure 2. Valve Components

The NATURA IGS valve assembly has a 3/4 in. (20mm) discharge port with BSP male threads.

Note: All cylinders in a system must be of equal size and pressure.

Release Unit

Release units connect to the gauge port of the primary cylinder and activate the Cylinder-Valve to release agent into the system piping. Release units can either be electric operated or a combination manual & electric setup.

Release units have an integral pressure gauge that can be ordered with contacts that are normally open or normally closed under pressure, dependent on jurisdictional requirements.

Release units that include manual operation have a tamper proof seal on the operation pin.

Solenoid Specifications

- Operating Voltage: 24 VDC
- Current Draw: 0.75 Amps

To comply with FM, UL, NFPA, ISO, and EN requirements, the solenoid in the Release unit assembly is fixed with an anti-tamper nut, which cannot be removed. However, the Release unit assembly can be detached from the valve. For code compliance, such detachment should cause a supervisory signal at the extinguishing control panel.

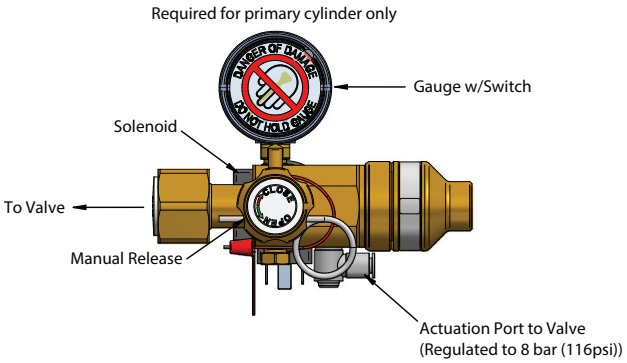


Figure 3. Release Unit

Secondary Cylinder Gauge Assembly

Installing a Secondary Cylinder Gauge assembly enables monitoring the pressure of the secondary cylinders in the system. The Secondary Cylinder gauges assemblies are connected to the Cylinder-Valve gauge port and can have contacts that are either normally open or normally closed under pressure. One gauge is required for each secondary cylinder.



Figure 4. Secondary Cylinder Gauge

Actuation Hoses

1/4 in. (6 mm) diameter Actuation hoses are used to provide pressure to the valve to actuate the system. The Actuation hoses are also used in multi-cylinder systems to convey pilot pressure at 8 bar (116 psig) from the prior cylinder-valve to the next cylinder-valve. The hoses include quick connect couplings which allows ease of installation and maintenance.

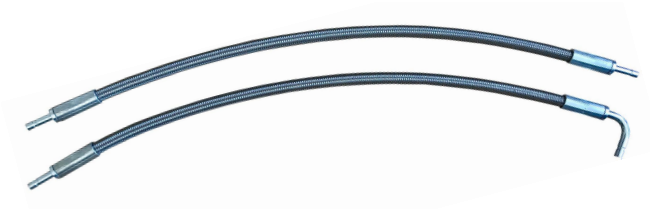


Figure 5. Actuation Hose

Discharge Hoses

3/4 in. (20 mm) diameter Discharge hoses route the agent from the cylinder-valve assemblies to the system piping. Hoses connect to the discharge outlet of the agent cylinder-valve and terminate at the system piping or discharge manifold.

Hoses with 90° to 90° couplings are typically used in conjunction with manifolds to allow for easy installation and adjustments.



Figure 6. Discharge Hoses

Manifold Check Valve

Manifold Check Valve are required to be installed where the discharge hose connects with a manifold in order to prevent backflow to the cylinder-valve. Manifold check valves have 3/4 in. (20 mm) BSP male threads at both ends and are marked with the direction of agent flow.

The pre-built NATURA IGS manifolds are shipped with Manifold Check Valves pre-installed, one per stub.

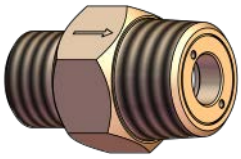


Figure 7. Manifold Check Valve

Note: If procuring a manifold elsewhere, only approved NATURA IGS Manifold Check valves may be used. Ensure each discharge connection uses a manifold check valves.

Manifolds

2 in. (50 mm) diameter Manifolds of varying lengths in single or double row configuration are available for the NATURA IGS. The Manifolds are available for 80 and 140 Liter cylinders.

Manifolds include a 3/4 in. Manifold Check valve at each inlet port. Manifolds can be coupled together using a 2 in. BSP Manifold Coupling and capped off using a 2 in. BSP Manifold End-cap.



Figure 8. Single Row Manifold



Figure 9. Double Row Manifold

Selector Valves

Selector valves route agent from a central cylinder bank to the specific hazard where fire has been detected. Selector valve actuators operate pneumatically using agent pressure routed from the manifold via a pressure regulator on the back-plate manifold and the respective back-plate solenoid valve.



Figure 10. Selector Valve

Selector valves are 2-way ball valves with full bore. Selector valves of 1 in., 1 1/2 in., and 2 in. size have BSP threaded inlet and outlet ports for connection to the distribution piping. 3 in. and 4 in. Selector valves use EN 1092-1 (DIN 2638) flanges for this connection. Selector valves include a limit switch. The limit switch must be wired to the control panel to indicate a trouble if the valve is closed.

The solenoids are mounted on a back-plate with tamper proof screws and cannot be removed.

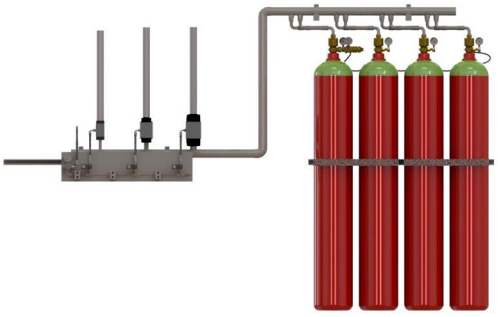


Figure 11. Selector Valve Setup

Lockout Valve

A lockout valve is a manually operated valve installed between the agent manifold and the discharge pipe network leading to the protected area. Lockout valves can be locked in the closed position to prevent agent from going into the protected area.

Lockout valves can be installed at the end of the manifold or, if a common manifold protects multiple hazards, downstream of each selector valve. Lockout valves include a limit switch. The limit switch must be wired to the control panel to indicate a trouble if the valve is closed.



Figure 12. Lockout Valve

Pilot Line Non-Return Valve[1]

Use the pilot line non-return valve in the pilot lines (6mm Quick Connect) of systems protecting multiple hazards to isolate sections of the cylinders[2]. Releasing cylinders downstream of the pilot line non-return valve will not activate cylinders upstream, preventing excess agent from being discharged into a hazard.

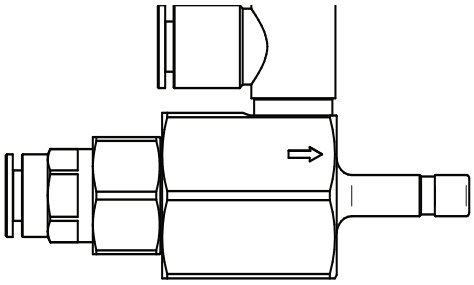


Figure 13. Pilot Line Non-Return Check Valve

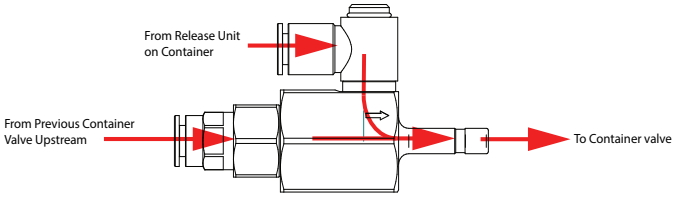


Figure 14. Pilot Line Non-Return Check Valve Direction of Flow

[1] Not for use in FM Approved or UL Listed systems

[2] Maximum of 3 units can be used in-line.

Agent Discharge Nozzles

The NATURA IGS offers regular nozzles with 360° and 180° discharge patterns which can be mounted in either upright or pendent style. An acoustic 360° nozzle is also available for select NATURA IGS agents. The number and size of the orifice on each nozzle is custom calculated using the Flow Calculation Software Suite version 4.0 and higher.



360° Nozzle 180° Nozzle Acoustic Nozzle

Figure 15. Nozzles

Note: The pictured Acoustic Nozzle does not have LPCB approval, but an alternative with LPCB approval is available.

Cylinder Racking

The racking system for the NATURA IGS is modular and can be adjusted to fit any number of cylinders in a variety of row combinations.

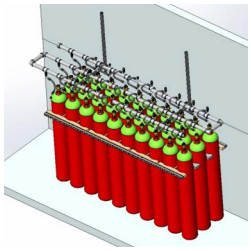


Figure 16. Racking Example

Quick Connect Cables

Quick Connect cables provide an expedient method of wiring the pressure gauges of the Release Unit and Secondary Cylinder Gauge Assemblies. The open contacts of the supervisory pressure switch are connected in parallel through Quick Connect cables in a daisy chain form.



Figure 17. L Plug x 2 Cable (Male & Female)

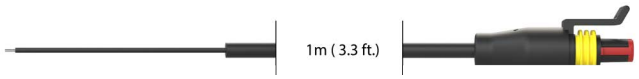


Figure 18. Gauge Signal Line - with 3m Fly-Lead



Figure 19. Gauge Signal Line - with 1m Fly-Lead

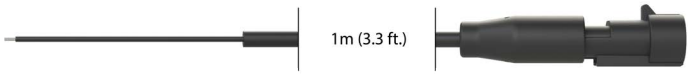


Figure 20. Quick Connect x Dual Core Fly-Lead

Accessories

Bleeder Valve

A Bleeder Valve should be installed on a Pilot Line in the unused actuation hose connection in the last cylinder of a cylinder bank. The end-of-line leak/vent valve prevents a possible gradual pressure build-up in the pilot line should the solenoid release unit develop a leak, thus preventing an unintended system discharge. The bleed valve includes a Quick Connect fitting for ease of installation and maintenance.



Figure 21. Bleeder Valve

Manifold Safety Device

The manifold safety device consists of a safety disc housed in a threaded body. The safety disc is designed to burst at a pressure of 90-100 bar (1305-1450 psi). Manifold safety devices have an NPT fitting on the side that connects to the manifold and a BSPT threading on the side that would connect to the venting pipe if applicable.

The Manifold Safety Device should be used on manifolds with selector valves and lockout valves where the design of the system creates a closed section of piping. The safety outlet is installed in the piping upstream of the valve(s) to prevent over pressurization in the event of entrapment of Agent in the closed pipe segment. The outlet on the safety device may also be piped to vent directly to atmosphere or to vent to the pipe network downstream of any selector valve.

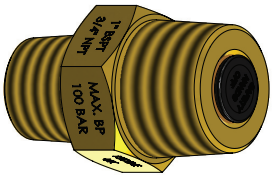


Figure 22. Manifold Safety Device

Discharge Pressure Switch:

The pressure operated switch uses the pressure of the discharging agent for activation and should be connected to the distribution piping. The agent actuates a pressure operated stem which toggles the switch. This can also be operated man ually by pulling up on the stem. These switches are predominantly used to indicate at the control panel that the agent has been discharged hence commonly known as "Gas Gone" switch. Reset by pushing down on the stem to return the switch to the set position. The minimum operating pressure required is 3.5 bar (50 PSI).The toggle on the pressure switch can be set to either N.O. to close or N.C. to open contact transfer upon operation.

Main & Reserve Systems

The NATURA IGS supports a 'Reserve' bank of cylinders, equal in quantity and size to the main bank. A reserve system can minimize downtime prevent service interruption in case of a discharge. A reserve system is also recommended when using selector valves and when downtime cannot be tolerated should a discharge occur.

The system with main and reserve cylinders are connected to Suppression Control Panel through a Main/Reserve Transfer Switch.

Main & Reserve Transfer Switch:

The main & reserve transfer switch, is installed on systems having main and reserve cylinders. Placing the switch in either the "main" or "reserve" position provides uninterrupted fire protection capability during system maintenance or in the event of a system discharge.



Figure 23. Main and Reserve Transfer Switch

Extinguishing Control Panel (Supplied by others)

Multi zone systems using selector valves require an addressable control panel.

Note: The release units of the NATURA™ IGS must be listed with the suppression control panel.

Flow Calculation Software Version 4.0

Using the parameters listed below the Flow Software calculates pressure drops, pipe sizes, orifice sizes and vent area requirements:

- Inert agent selection
- System Pressure 200 Bar/300 Bar
- Cylinder size 80 L/140 L
- Discharge time 60 Sec./120 Sec.
- Nozzle Selection 180º/360º
- Single Zone/Multi Zone Systems

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Jurisdiction: EAR
Classification: EAR99
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P/N: KP-38-2000 Rev. AC