UL LISTED INFERNO SHIELD (FK-5-1-12) CLEAN AGENT SYSTEM

Fire Suppression System

GENERAL INFORMATION

Inferno Shield (FK-5-1-12) Clean agent system is employed to protect critical installations formerly protected by Halon 1301.

These include: -

- Data Processing Centers
- Telephone Switches
- Process Control Rooms
- Art and Historical Collections
- Archive & Museums
- Marine, Oil & Gas
- Aerospace, Aviation & Military

INFERNO SHIELD (FK-5-1-12) FIRE SUPPRESSION AGENT

Part Number – HN-FK-GAS

INFERNO SHIELD (FK-5-1-12) agent compiles with NFPA Standard 2001: standard for Clean Agent fire Extinguishing systems, EPA SNAP Program (Significant New Alternate Policy).

These agents are classified as suitable for use in occupied areas and are considered to have no ozone depleting potential (ODP)

INFERNO SHIELD (FK-5-1-12) fire suppressant can be safely used where people are present.

AGENT	CLASS A MEC	CLASS A DESIGN	CLASS B MEC	CLASS B DESIGN	CLASS C DESIGN
FK-5-1-12	3.3	4.5	4.5	5.85	4.5
NFPA 2001 REQUIREMENTS FOR MINIMUM VALUES					

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DESCRIPTION

INFERNO SHIELD (FK-5-1-12) systems reach extinguishing levels in 10 seconds or less, stopping ordinary combustible, electrical, and flammable liquid fires before they cause significant damage. That's the fastest fire protection available, period. When fire is extinguished this quickly, it means less damage, lower repair costs, and an extra margin of safety for people. It also means less downtime and disruption of business.

CLASS B CONCENTRATION

FLAMMABLE LIQUID	DESIGN CONCENTRATION (VOL%)
ACETONE	5.6
ETHANOL	7.2
N-HEPTANE	5.9
TRANSFORMER OIL	5.9
DIESEL FUEL	5.85
JP4	9.0
PYRROLIDINE	6.1

PHYSICAL & CHEMICAL PROPERTIES

Empirical formulae	$CF3CF2C(O)CF3)_2$
IUPAC Designation	Dodecafiuoro-2-methylpentan-3one
ASHRAE Designation	FK-5-1-12
Molecular Weight	316.04
Boiling Point at 1 Atm	49.2 °C (120.6 °F)
Freezing Point	-108.0°C (-162.4°F)
Ozone Depletion Potentia	0
Atmospheric Lifetime	5 days
No Observed Adverse Effect Level	10%

ENVIRONMENTALLY FRIENDLY

DESCRIPTION	FK-5-1-12 (INFERNO SHIELD)
OZONE DEPLETION POTENTIAL	0.0
GLOBAL WARMING POTENTIAL	1
ATMOSPHERIC LIFETIME (YEARS)	5 DAYS
SNAP (YES/NO)	YES

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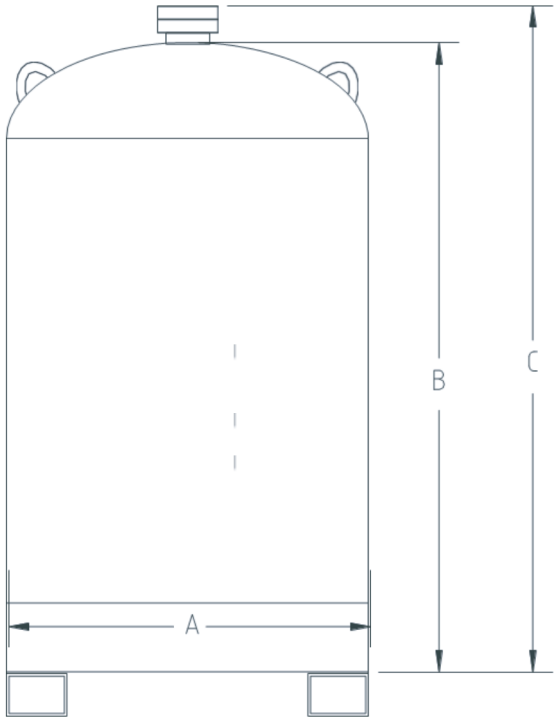
227, 368 & 946 LITER CAPACITY CYLINDER - STANDARD UNIT

The ASME (Tank) storage containers are factory filled and transported uncharged.

PART NUMBER	CAPACITY	AGENT FILL RANGE (KG.)	HEIGHT (C) (MM)	DIAMETER (A) (MM)
HN-CYL-227	227 L	109 to 272.5	1457.33	Ø 508
HN-CYL-368	368 L	177 to 442	1720.9	Ø 622.3
HN-CYL-946	946 L	454 to 1136	1836	Ø 927.1

NOTE : Approximate. +/- 4% Variation expected



STORAGE TEMPERATURE

Operating temperature for INFERNO SHIELD (FK-5-1-12) Zero Pressure container is 70°F (21.1°C).

MATERIALS

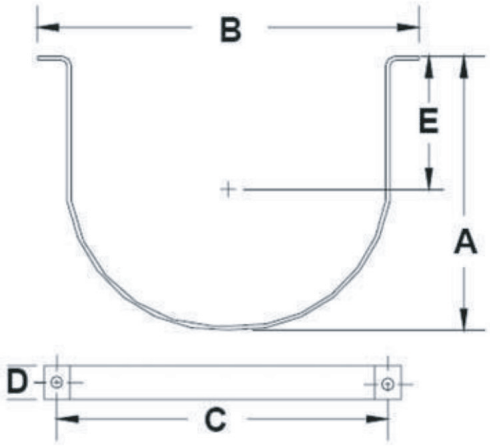
Cylinder: Welded type, steel pressure vessel manufactured and tested in accordance with ASME Boiler and Pressure Vessel Code. Section VIII

NOTE :

1. Clean Agent Cylinder must be installed in vertical position only.
2. Do not cover remove or deface caution label

CYLINDER MOUNTING STRAP

Cylinder straps are used to mount the clean agent cylinders in vertical position.



TECHNICAL DATA

Body: Steel

PART NUMBER	CYL. SIZE	A	B	C	D	E
		MM	MM	MM	MM	MM
HN-CYL-STRP-227	227 L	514.35	606.55	571.5	35.56	254
HN-CYL-STRP-368	368 L	609.6	682.24	657.1	41.4	311.25
HN-CYL-STRP-946	946 L	914.4	944.9	1041	41.4	476.2

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ELECTRIC ACTUATOR (ELECTRIC CONTROL HEAD)

Part Number – HN-N2-EA, HN-EA-RESET, HN-PH-ADAPT

The Electromagnetic Release Device is used to actuate the system electrically from the Nitrogen Cylinder. It is mounted on top of the master Nitrogen Valve and is operated by an electrical signal from a fire detection system. In order to actuate the Electromagnetic Release Device a constant DC voltage of 24V is required.

The Electromagnetic Release Device can be combined with the Manual/Pneumatic Release Device or the Pneumatic Release Device.

PART NUMBER	HN-N2-EA
Valve Connection	M42 x 1.5
Nominal Voltage	24 VDC
Electrical Connection	-
Nominal Current	0.5 A
Protection Class	IP65
Material	Brass and stainless steel Plastic protection cap
Conformity	UL

RESET TOOL FOR ELECTROMAGNETIC RELEASE DEVICES

PART NUMBER	HN-EA-RESET
Connection	M42 x 1.5

The reset tool is used to reset the Electromagnetic Release Device pin after system discharge. The reset tool is screwed into the bottom of the Electromagnetic Release Device.

ADAPTER

PART NUMBER	HN-EA-ADAPTER
Connection	G1/8" / M12 x 1.5
Material	Brass

The adapter is used for the connection of pilot hoses to the Manual/Pneumatic Release Device or to the Pneumatic Release Device.

HONEYWELL INFERNO SHIELD RELEASE

Part Number – HN-N2-MA, HN-N2-PA

MANUAL RELEASE DEVICE

PART NUMBER	HN-N2-MA
Valve Connection	M42 x 1.5
Working Pressure	300 bar / 4350 psi
Pneumatic Connection	G 1/8"
Material	Brass and stainless steel
Actuation Force	<150 N / < 33.72 lbf
Actuation Pressure	Min. 21 bar/304.6 psi for 300 bar/4351.1 psi nitrogen feed: p max = 360 bar / 5221.3 psi Min. 15 bar/217.6 psi for 200 bar/2900.8 psi nitrogen feed: p max = 240 bar / 3480.9 psi
Conformity	UL

The Manual/Pneumatic release device allows manual or pneumatic actuation of several system components. This release device is used for pneumatic actuation of multiple cylinders in series, which are connected to the master cylinder by a pilot hose. Manual actuation is accomplished by pulling the hand lever on the Manual/Pneumatic release device. In the closed position the Manual/Pneumatic release device is secured with a safety pin. By removing the safety pin, the hand lever can be manually pressed down to activate the valve so that the nitrogen is released.

PNEUMATIC RELEASE DEVICE

PART NUMBER	HN-N2-PA
Valve Connection	M42 x 1.5
Working Pressure	300 bar / 4350 psi
Pneumatic Connection	G 1/8"
Material	Brass
Actuation Force	<150 N / < 33.72 lbf
Actuation Pressure	Min. 10 bar/145 psi for 300 bar/4351.1 psi nitrogen feed: p max = 360 bar / 5221.3 psi Min. 10 bar/145 psi for 200 bar/2900.8 psi nitrogen feed: p max = 240 bar / 3480.9 psi
Conformity	UL

This release device is used for pneumatic actuation of multiple cylinders in series, which are connected to the master cylinder by a pilot hose. Cylinders equipped with the pneumatic release device serve as slave cylinders.

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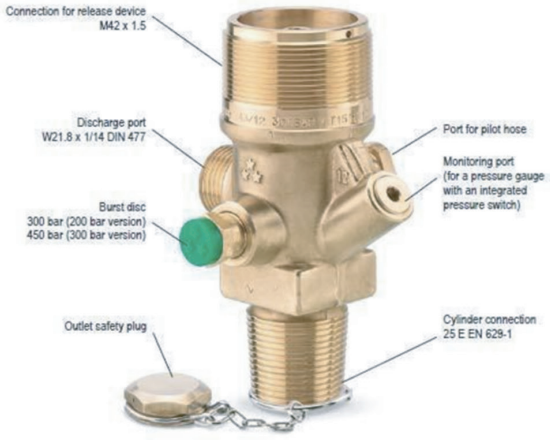
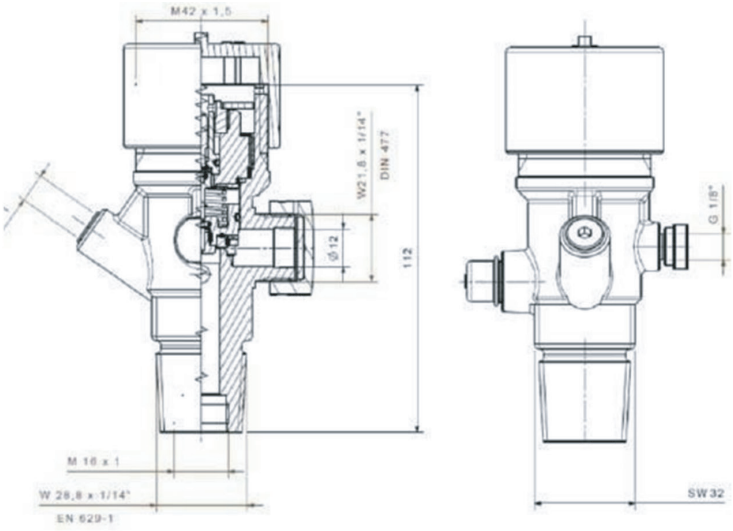
HONEYWELL INFERNO SHIELD NITROGEN VALVE

Part Number – HN-NCR-VA200, HN-NCR-VA300

Nitrogen Valve sits on top of the Nitrogen Cylinder. The working pressure is either 200 or 300 bar.

PART NUMBER	HN-NCR-VA200	HN-NCR-VA300
Connection for release device	M42 x 1.5	M42 x 1.5
Discharge Port	W21.8 x 1/14" DIN 477	W21.8 x 1/14" DIN 477
Burst Disc	300 bar / 4350 psi	450 bar / 6525 psi
Port for Pilot Hose	G 1/8"	G 1/8"
Monitoring Port	M10 x 1	M10 x 1
Working Pressure	200 bar / 2900 psi	300 bar / 4350 psi
Outlet Orifice Size	12 mm / .47"	12 mm / .47"
Flow Rate	Kv = 2.66 / Cv = 3.09	Kv = 2.66 / Cv = 3.09
Operating Pressure	200 bar at 15 °C / 2900 psi at 59 °F	300 bar at 15 °C / 4350 psi at 59 °F
Leak Rate at 20 bar to 200 bar	10 ¯4 mbar l/s	10 ¯4 mbar l/s
Torque Moment	max. 200 Nm / 147.5 ft·lb with 3 layers of PTFE tape (EN 751-3)	max. 200 Nm / 147.5 ft·lb with 3 layers of PTFE tape (EN 751-3)
Material Valve	Brass	Brass
Conformity	UL, PESO (B04802020)	UL, PESO (B04802020)





HONEYWELL INFERNO SHIELD CYLINDER

Part Number – HN-N2-80-200, HN-N2-80-300

The cylinder for vertical installation only is a gray-coated steel construction. The cylinders are constructed, tested and marked in accordance with UL, PESO regulations. Each cylinder is delivered with a protection cap. Design Drawing will recommend usage of either 200 or 300 bar UL, PESO Approved Seamless cylinder.

PART NUMBER	HN-N2-80-200	HN-N2-80-300
Water Volume	80 liters / 176.4 lb	80 liters / 176.4 lb
External Diameter	267+/- 1 mm (10.5+/-0.04 inch)	267+/- 1 mm (10.5+/-0.04 inch)
Height	1740 +/- 10 mm	1825 +/- 10 mm
Working Pressure	200 bar / 2900.8 psi	300 bar / 4351.1 psi
Test Pressure	300 bar / 4351.1 psi	500 bar / 7251.9 psi
Material	CrMo-steel	CrMo-steel
Protection Cap Thread	W80 x 1/11"	W80 x 1/11"
Conformity	UL, PESO	UL, PESO

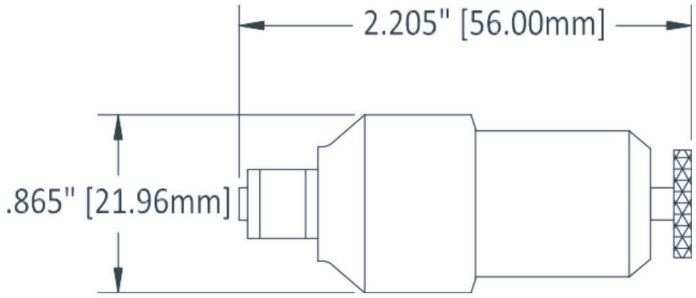
HONEYWELL INFERNO SHIELD BLEED VALVE

Part Number – HN-N2-80-200, HN-N2-80-300

BLEED VALVE

PART NUMBER	HN-PH-BLEED
Nominal Diameter	DN 1.5
Connection Thread Inlet	G1/8" DIN ISO 228-1
Working Pressure	360 bar / 5221.4 psi at 20˚C (68˚F)
Closing Pressure	0.7 – 1.5 bar (10.2 - 21.8 psi)
Material	Brass
Conformity	UL

The Bleed Valve is installed at the end of the pilot line, connected to the last Pneumatic Release Device. Its primary function is to prevent accidental system release. The valve is equipped with a G1/8" DIN ISO 228-1 connection thread, allowing secure installation at the end of the pilot line.



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HONEYWELL INFERNO SHIELD NITROGEN PRESSURE GAUGE

Part Number – HN-NCR

NITROGEN PRESSURE GAUGE

The Pressure Gauge measures the pressure in the nitrogen cylinder. It is equipped with an option for an integrated pressure switch to supervise the loss of pressure in the nitrogen cylinder.

Each Nitrogen Valve must be equipped with a Nitrogen Pressure Gauge. The Nitrogen Pressure Gauge is connected to the monitoring port of the Nitrogen Valve (below).

The connecting parts can be mounted and removed with the valve pressurized. Orientation of pressure gauge: Screw in the pressure gauge in the fitting up to the stop and turn back a **maximum of one revolution** for correct orientation.

TYPE	HN-NCR-PG4350	HN-NCR-PG6100
Nominal size	50	50
Connection	M10x1	M10x1
Accuracy class	1.6	1.6
Temperature range	-20°C to 60°C (-4°F to 140°F)	-20°C to 60°C (-4°F to 140°F)
Pressurized medium	IG 100	IG 100
Switch point	2824 psi (194.8 bar) (NO)	4230 psi (291.7 bar) (NO)
Mechanical precision class	± 1.6%	± 1.6%
Switch point precision class	± 145 psi (10 bar)	± 217.5 psi (± 15 bar)
Completer indication range	0 to 4351 psi (0 to 300 bar)	0 to 6100 psi (0 to 420.6 bar)
Red sector	2480 - 2824 & 3270-3321 psi (171 – 195 & 225.5- 229 bar)	3785 - 4230 & 4838-4931 psi (261 – 292 & 333.6-340 bar)
Green sector	2824-3270 psi (195-225.5 bar)	4230-4838 psi (292-333.6 bar)
Electrical connection	3 pole with connector M8x1	3 pole with connector M8x1
Inlet	Connector Plug	Connector Plug
Outlet	Cable with cable socket, Length 700mm (27.6 inch)	Cable with cable socket, Length 700mm (27.6 inch)
Switch voltage	4.5 to 24 VDC / AC	4.5 to 24 VDC / AC
Switch current	5mA-100 mA	5mA-100 mA
Contact load	max. 3 W no current	max. 3 W no current
MATERIAL AND SURFACE		
Body housing	CrNi Steel	CrNi Steel
Pressure gauge connection	Brass	Brass
Restrictor	Sintered metal insert	Sintered metal insert

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180° & 360° NOZZLE

360° Nozzle Part Number **HN-NZ360-XX-XX**
180° Nozzle Part Number **HN-NZ180-XX-XX**

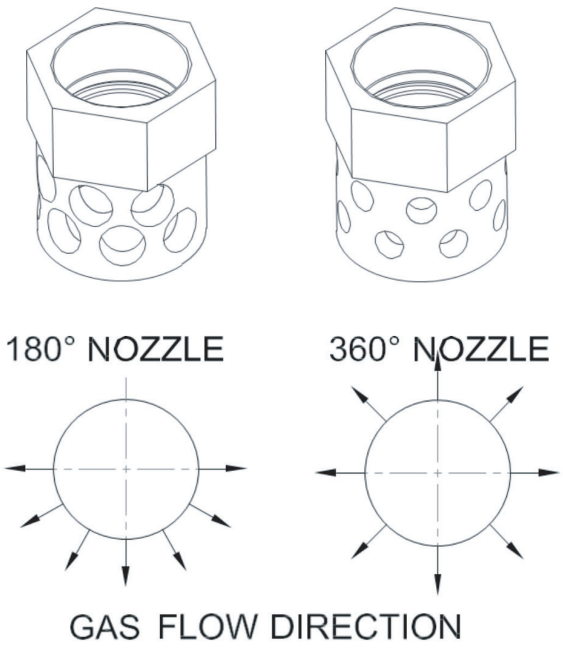
INFERNO SHIELD (FK-5-1-12) Nozzles are available in two discharge pattern 180 & 360 degree.

Discharge nozzles have a NPT female pipe thread for attachment to the discharge piping network. The nozzles are selected based on the hazard to be protected to achieve best the flow rate and distribution of INFERNO SHIELD (FK-5-1-12) in protected hazard area.

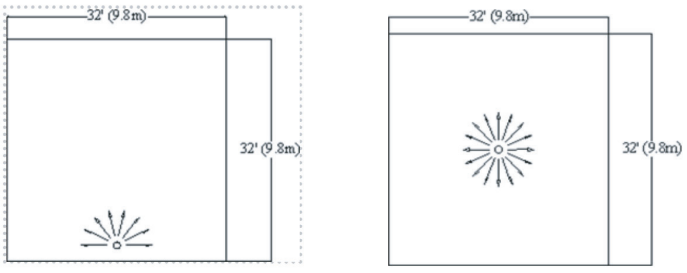
Part number / orifice for nozzle will be generated by INFERNO SHIELD (FK-5-1-12) fire suppression system design software.

TECHNICAL DATA

MOC	Aluminium, Brass
Thread Type	Female, NPT
Nozzle Type	180 degree & 360 degree nozzle
Sizes	15NB, 25NB, 40NB & 50NB.



Nozzle Placement and Coverage:



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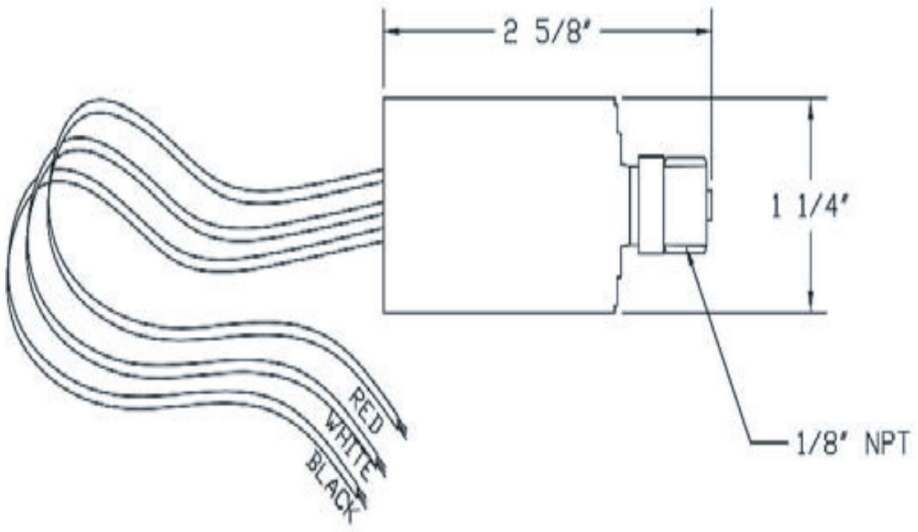
MANIFOLD OR PIPING AGENT DISCHARGE PRESSURE SWITCH

Part Number HN-DPS

The discharge pressure switch is activated by pressure from the agent during discharge and can be used to signal a control panel that the system has discharged.



Manifold Discharge Pressure Switch

TECHNICAL DATA

Pressure Range	25-75 psi (1.7-5 bar)
Switch Type	SPDT
Switch Rating	5 Amps
Repeatability	+/-2.5 psi (0.18 bar) +2% of setting
Diaphragm Material	Nitrile
Fitting Type	1/8" MNPT
Fitting Material	12L14 Zinc-Plated Steel
Electrical Termination	1/2" MNPT / 18" Flying Leads
Deadband	3.5 psi +11% of setting
Proof Pressure	6000 psi (413 Bar)
Burst Pressure	9000 psi (620 Bar)
Weight (Lbs.)	0.4

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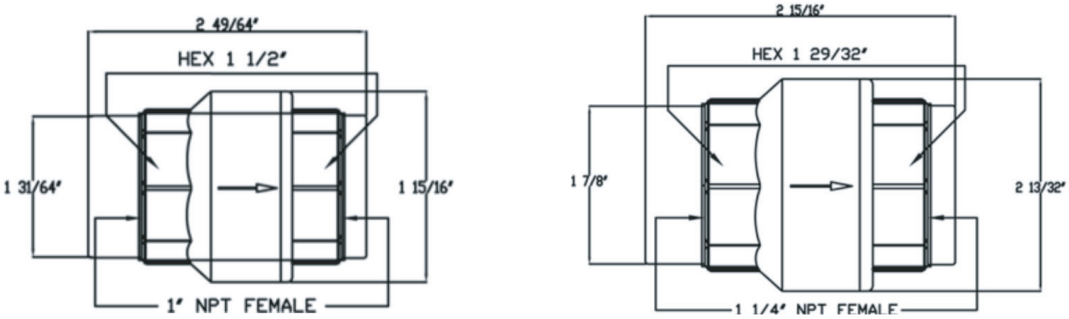
HONEYWELL CHECK VALVE

Part Number HN-NRV-GR-65, HN-NRV-GR-80

DESCRIPTION

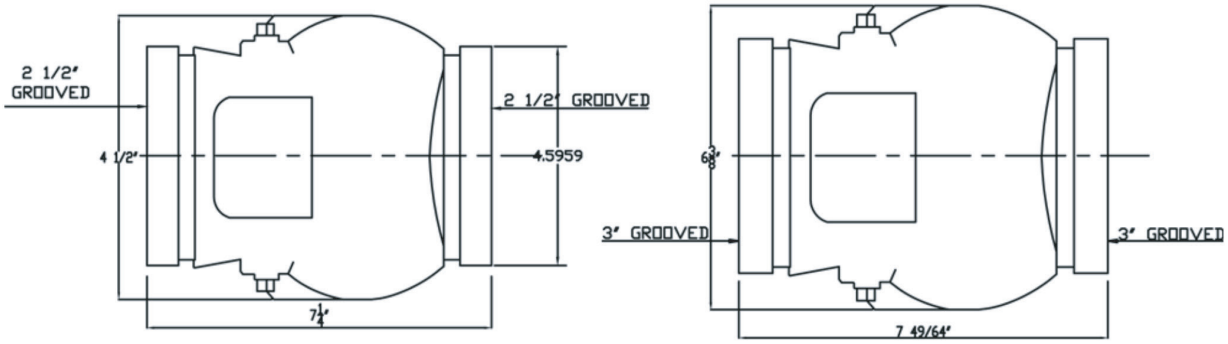
Check Valves are used when two or more agent storage cylinders are manifolded together with one common discharge piping configuration. Their purpose is to prevent loss of agent in the event that any of the agent storage cylinders are not connected to the manifold at time of system discharge.

In a fully open position, the HN-NRV rubber faced swing clapper is held tightly against the valve body, out of the flow steam, to provide maximum flow area and prevention of clapper flutter. The clapper design produces quick, non-slam closure before flow reversal can occur, which provides a leak free sealing of back pressures as low as 1 psi (0.07 bar) equivalent to 28" water head. (Figure 2.11b)



PRESSURE RATING

1" through 3" HN-NRV Check Valves have a maximum working pressure of 500 psi (34.5 bar).



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HONEYWELL NITROGEN PILOT HOSE

Part Number HN-N2-PH700

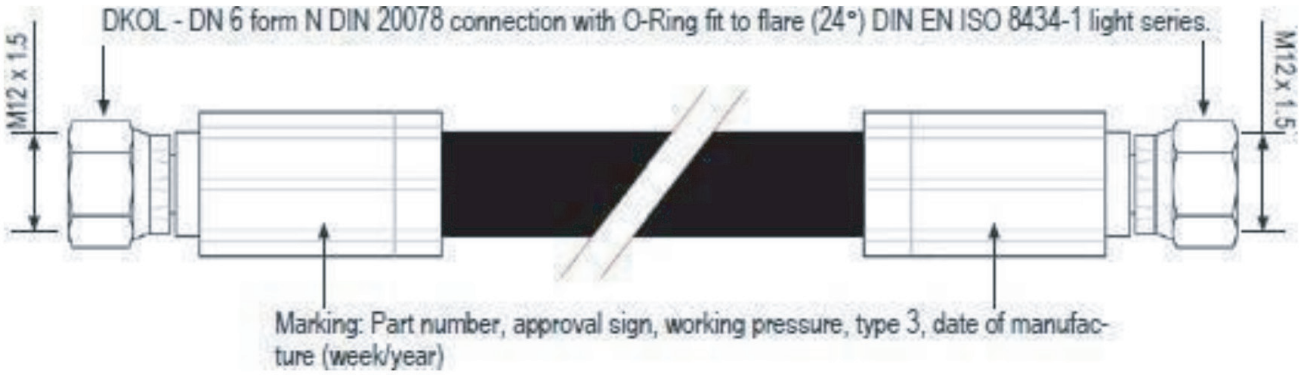
NITROGEN PILOT HOSE

The Nitrogen Pilot Hose is used to build up the pilot line, e.g. for the connection of the several release devices and/or for the connection of the Nitrogen Valve to the Release Device.

PART NUMBER	HN-N2-PH700
Connection	2 x M12 x 1.5
Length	700 mm / 27.56"
Bendig Radius	75 mm / 2.95"
Nominal Diameter	DN 6
Working Pressure	400 bar / 5800 psi
Burst Pressure	1600 bar / 23200 psi
Standard	EN 857 2 SC
Conformity	UL

MATERIAL

Connection	Galvanized Steel
Hose Inner Layer	Oil resistant synthetic rubber
Hose Inner	Two high tensile steel wire braided inserts
Hose Outer Layer	Oil resistant and weatherproof synthetic rubber



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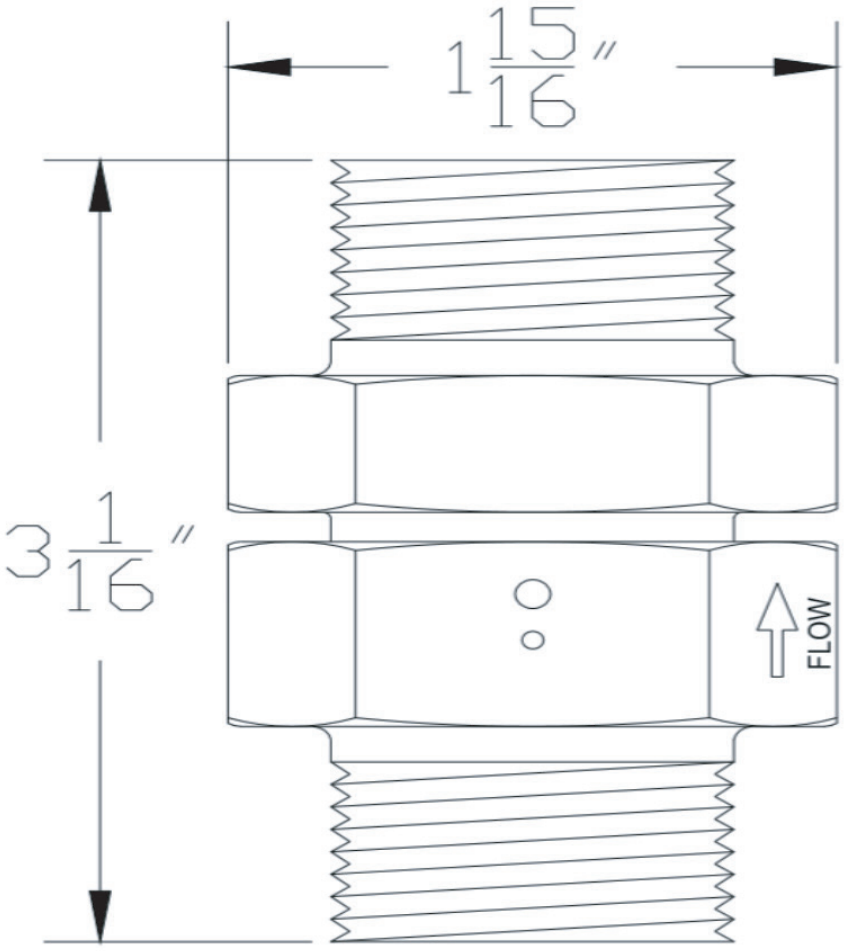
MANIFOLD RELIEF W/ RUPTURE DISC

Part Number HN-MF-BURDSC-1

The Manifold Relief w/ rupture disc (HN-MF-BURDSC-1) are used when two or more agent storage cylinders are manifolded together with common discharge piping configuration. The HN-MF-BURDSC-1 purpose is to provide a safety on the discharge piping in case of excessive pressure build up. The HN-MF-BURDSC-1 are normally installed on the discharge pipe network with flow towards the piping.

PART NUMBER	HN-MF-BURDSC-1
Material	Brass, Nickle
NPT male threads	1"
Burst Pressure Range	725-950 PSI (50-65.5 bar)
Ambient Temperature Range	0°F – 130°F (-17.8°C-54.4°C)
Standard	ANSI / ASME B1.20.1
Conformity	UL



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MULTIPLE ZONE APPLICATION DESCRIPTION

The Honeywell Selector Valve is an extruded aluminum ball-valve that stops the fluid flow to a specific hazard unless activated. Valve actuation is pneumatically accomplished via a pilot cylinder and a solenoid or manual actuator. Multi zone systems are equipped with an electric solenoid and/or release device. The pilot cylinder of these systems is activated electrically when a fire is detected. The N^2 contained in the pilot cylinder flows through the pilot line to the pneumatic release actuators, mounted on the extinguishing agent valves, activating each cylinder.

Electric or Pilot actuated selector valves ensure that the extinguishing agent containers assigned to the associated protected enclosure open and the corresponding piping to required hazard. This prevents the extinguishing agent from flowing into protected enclosures that are not affected by fire.

Just as the extinguishing agent of single zone systems equipped with several extinguishing agent containers, the extinguishing agent of multi zone systems first flows, when the system is activated, from the hose via check valves to a manifold. The extinguishing agent flows from there via the zone valves and the nozzle pipe to the discharge nozzles where it vaporizes and discharges into the protected enclosure.

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UL LISTED
Clean Agent Extinguishing Unit
EX 28543

HFS-IS-01-IN(0226)DS-Y

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