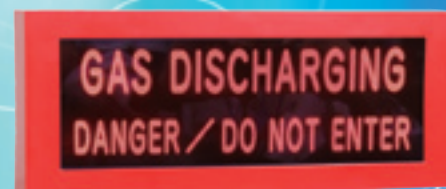


Fire Extinguishing Systems

Product Range Guide



NITTAN



GLOBAL LIFE SAFETY SOLUTIONS

BUSINESS OVERVIEW

Since founded, the Nittan Group has dedicated itself to this foremost mission through and through. Our motto today is "Closest to Our Customer," which reflects our intent to engage with our feet planted even firmer to the ground. As our commitment to forging a safe and secure society, we have established the following management fundamentals:

Take action from the customer' s perspective

Improve quality in all products and services

Provide products sought by the customer and consideration of global environment preservation

Optimize Nittan Group organization to enable rapid response

We joined Secom Group in April 2012, and intend to take up the challenge of building new business models while further solidifying our industry-renowned brand image. For our future domain, we envision the merger of our previous fire protection business—with vigilance over residential and commercial building fires—to monitoring that can prevent disasters and crime. Our engagement will go further in proactive responses to environmental issues, energy conservation, and aging societies, as we reach beyond national borders and expand globally.

Beneath a mantle founded on safety and security, I personally promise you Nittan Group' s willingness to challenge all matters positively for the future in creating a comfortable, pleasant society. Thank you for your continued support to Nittan.

FIRE EXTINGUISHING SYSTEMS



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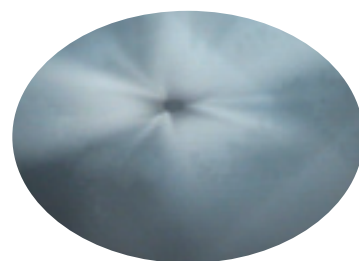
In addition and as a completion to the fire protection solutions listed in this catalogue, NITTAN offers also a complete selection of advanced products. For further information, please contact NITTAN overseas business division at <http://www.nittan.com>

Gerbera (FK-5-1-12 Fire EXtinguishing System)

Environmentally Friendly Fire Extinguishing System

Features

- Gerbera—FK-5-1-12 Fire Extinguishing System—is a fire extinguishing system using a gaseous fire extinguishing agent of FK-5-1-12.
- It has an excellent environmental capability, i.e. Ozone Depletion Potential (ODP) is zero and Global Warming Potential for 100-year time horizon (GWP) is less than one.
- A necessary quantity of storage cylinder is almost same as that of the halogenated fire extinguishing system since the extinguishing concentration is low, hence cylinder space can be effectively utilized.
- Electrical insulation is high and no residual material remains after discharging fire extinguishing agent. This minimizes damage to delicate equipment furnished in the room.



Applications

Gerbera is adapted to applications requiring the solution that is safe for people and the environment, as well as that is fast and efficient to critical equipment in the room.

- Telecommunication Facilities
- Generator Rooms (excluding Gas Turbine Room), Electric Rooms
- Server Rooms, Data Centers etc.

* The system shall be installed in the place or a part thereof where the protected area is less than 1,000 m² and less than 3,000 m³ and people do not stay at all times.

Physicality Comparison Table

Fire Extinguishing Agent	Halogenated Agents			Inert Gas	
	HFC -23	Halon 1301	FK-5-1-12	Nitrogen	Carbon Dioxide
Molecular Formula	CHF ₃	CF ₃ Br	CF ₃ CF ₂ C(O)CF(CF ₃) ₂	N ₂	CO ₂
Molecular Weight	70	149	316	28	44
ODP	0	10	0	0	0
GWP	9100	4900	Less than 1	0	1
Design Concentration	16.2 %	5.0 %	5.8 %	40.3 %	34.0 %
Comparison of Cylinder Q'ty	1.6	1.0	2.0	4.0	2.6
Storage Cylinder Size	68 L	68 L	68 L	83 L	68 L
Pipe Type	Sch80	Sch40	Sch40	Sch80	Sch80

Design Specification

Design Concentration	5.8 -10 %
Minimum Design Q'ty	0.84 kg/m ³
Storage Cylinder Size	68 L (43-95kg)
Filling Ratio	0.7 -1.6 L/kg
Pipe Type	JIS Sch40
Discharge Time	10 sec.

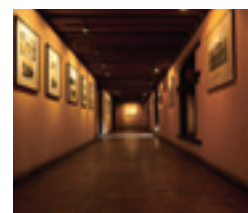
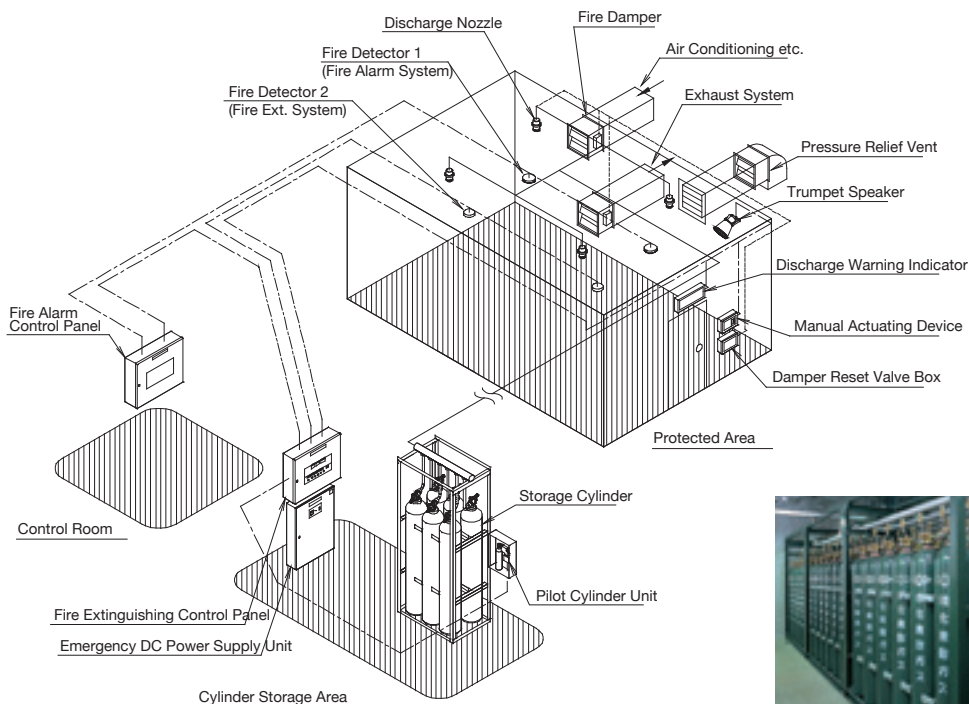
Typical Physicality

Molecular Formula	CF ₃ CF ₂ C(O)CF(CF ₃) ₂
Molecular Weight	316
Boiling Point	49 °C @ 1 atm
Freezing Point	-108 °C
Liquid Density	1616 kg/m ³
Heat of Vaporization @ Boiling Point	88 kJ/kg

* Typical physicality is measured at 25°C (except boiling point, freezing point and vaporization point)

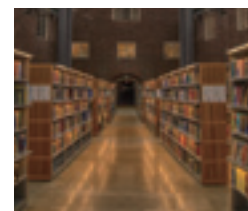
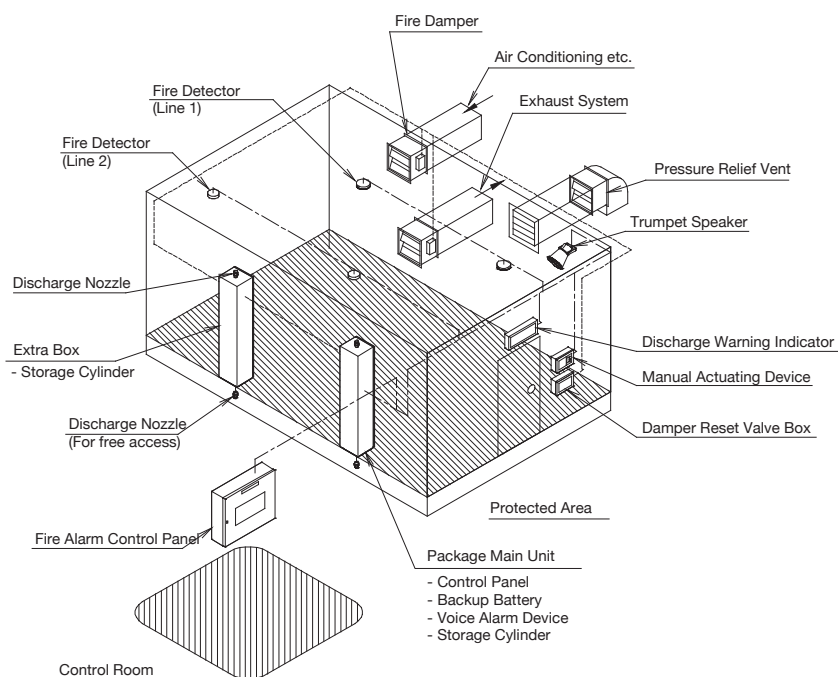
Fixed System

Fixed systems are commonly used to protect large compartments and multiple partitions. The system is usually operated in automatic mode and activates if the fire extinguishing control panel receives two different signals from fire detectors. The pressure relief vent is required in a protected area in order to prevent a rise of internal pressure in excess of a specified value at the time of discharging.



Package System

Package systems are commonly used to protect small compartments like a server room. The package has a built-in extinguishing agent and a control unit so that the installation become easy. Package units are equipped in the protected area. When the extinguishing agent with one main unit is short for the area, extra boxes are available to make up for the defect.



Typical System Layout

• Following drawing shows typical gas suppression system configuration. Before designing system, the following differences are concerned;

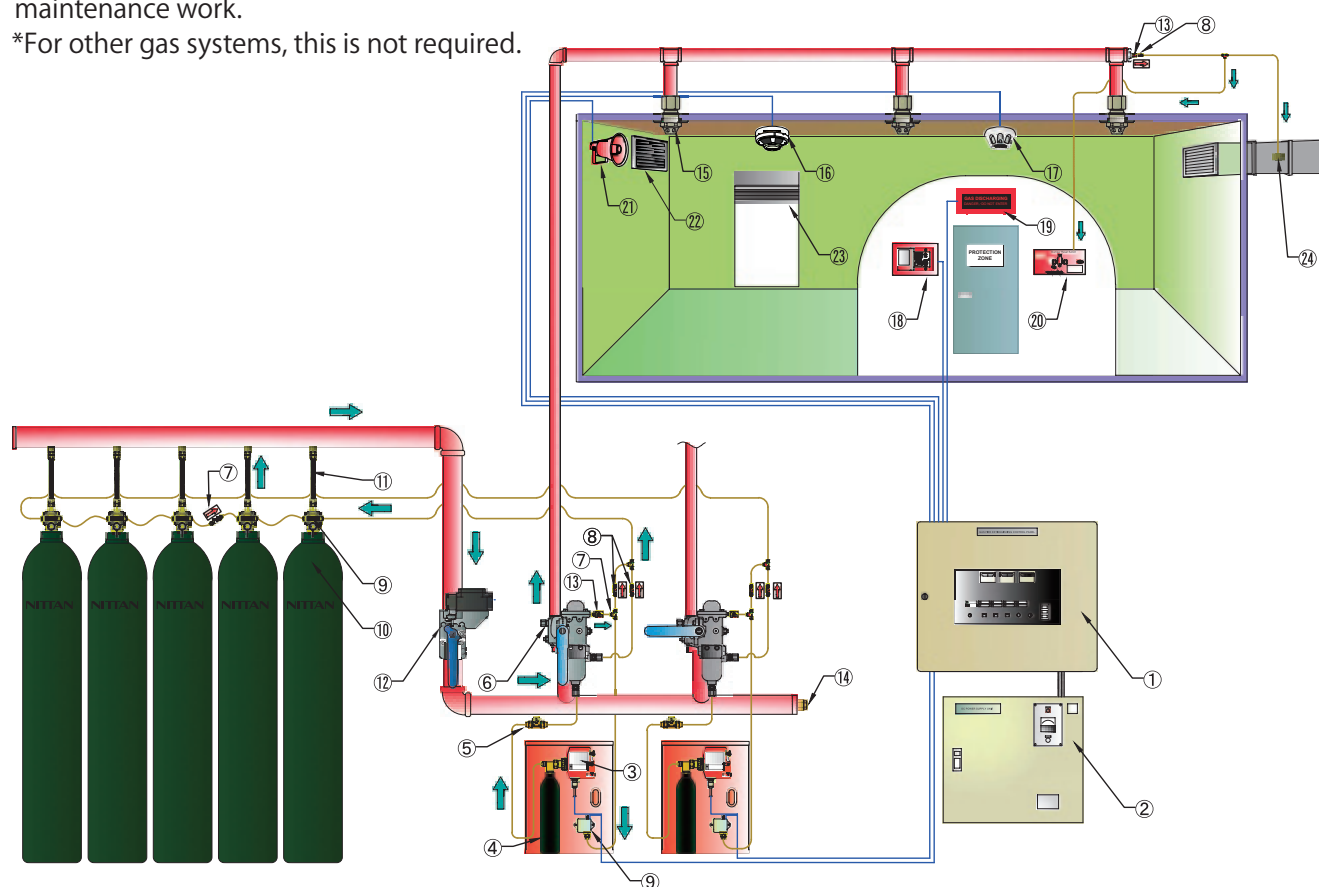
1. Pressure relief vent

For high pressure systems typified by N₂, HFC-227ea, HFC-23 and FK-5-1-12, installation of pressure relief vent is required for prevention from demolition of components like wall, ceiling and door in protection zone.

2. Shut-off valve

CO₂ fire suppression system has higher harmful risk to human health due to principal of fire suppression is reducing Oxygen level. For more safety to operate CO₂ gas suppression system, we suggest customer to install "Shut-off valve" for prevention from unexpected CO₂ gas discharging and accident of suffocation on maintenance work.

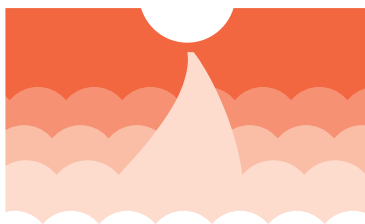
*For other gas systems, this is not required.



Typical System Components

1	Control panel
2	DC power supply unit
3	Cylinder valve releaser / 1L pilot cylinder
4	1L pilot cylinder
5	Relief valve
6	Selection valve
7	Three ways joint
8	Check valve
9	Cylinder valve releaser /Main cylinder
10	Cylinder
11	Guide pipe
12	Shut-off valve

13	Strainer
14	Safety valve
15	Discharge nozzle
16	Smoke detector
17	Heat detector
18	Manual Actuating Device
19	Gas discharge warning indicator
20	Damper Reset box
21	Speaker
22	Pressure relief vent
23	Automatic shutter
24	Damper



Gaseous Fire Extinguishing System

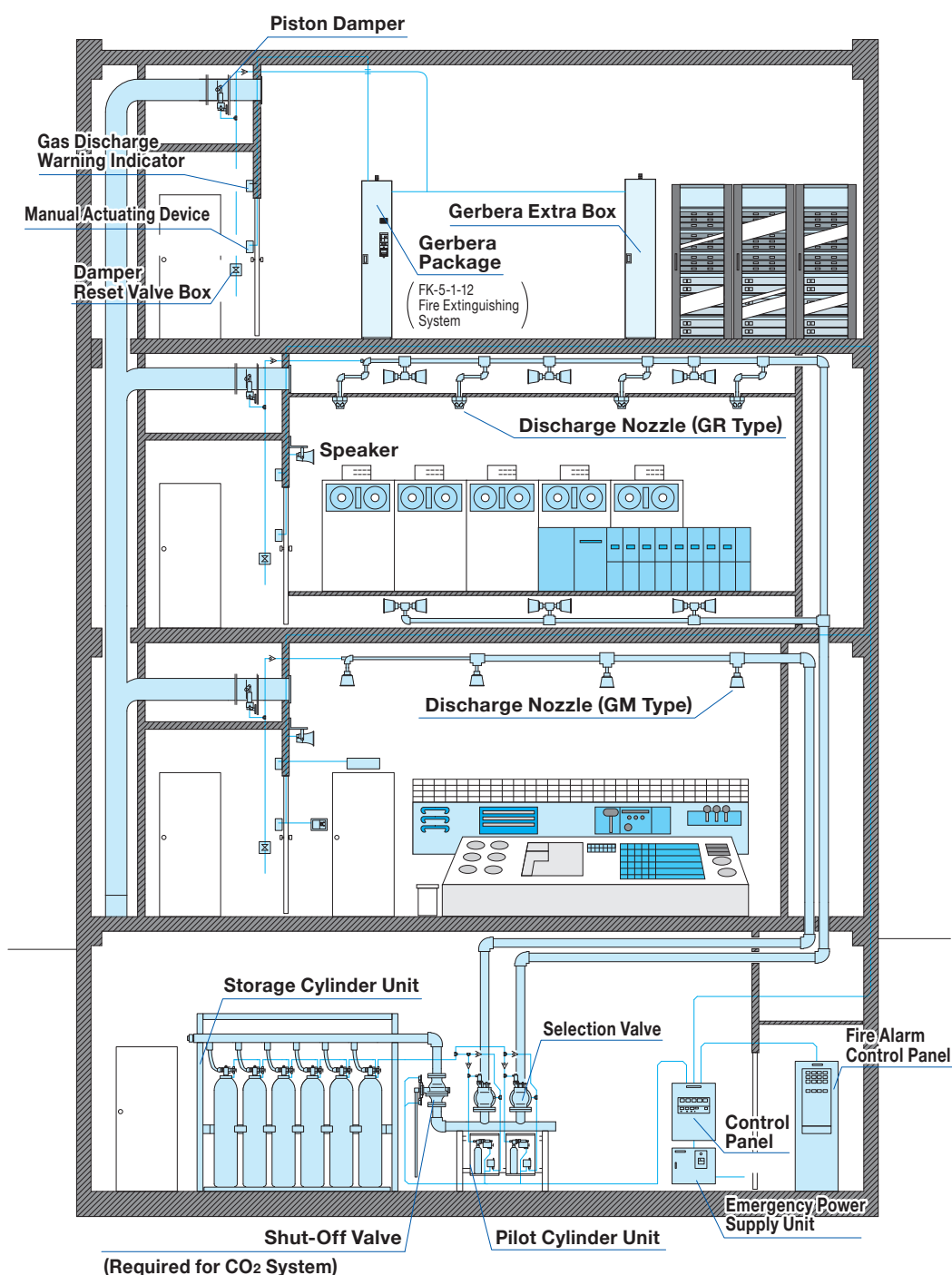
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Gaseous Fire Extinguishing System

System Configuration

Nittan gaseous fire extinguishing system consists of the gas storage cylinder unit, selection valves (to be installed where there are two or more discharge zones), shut-off valves (to be installed in case of CO₂ system), pilot cylinder units, manual actuating devices, discharge nozzles, discharge warning indicators, speakers, fire detectors, control panel (for electric control), emergency power supply unit, high pressure piping and electric wiring.

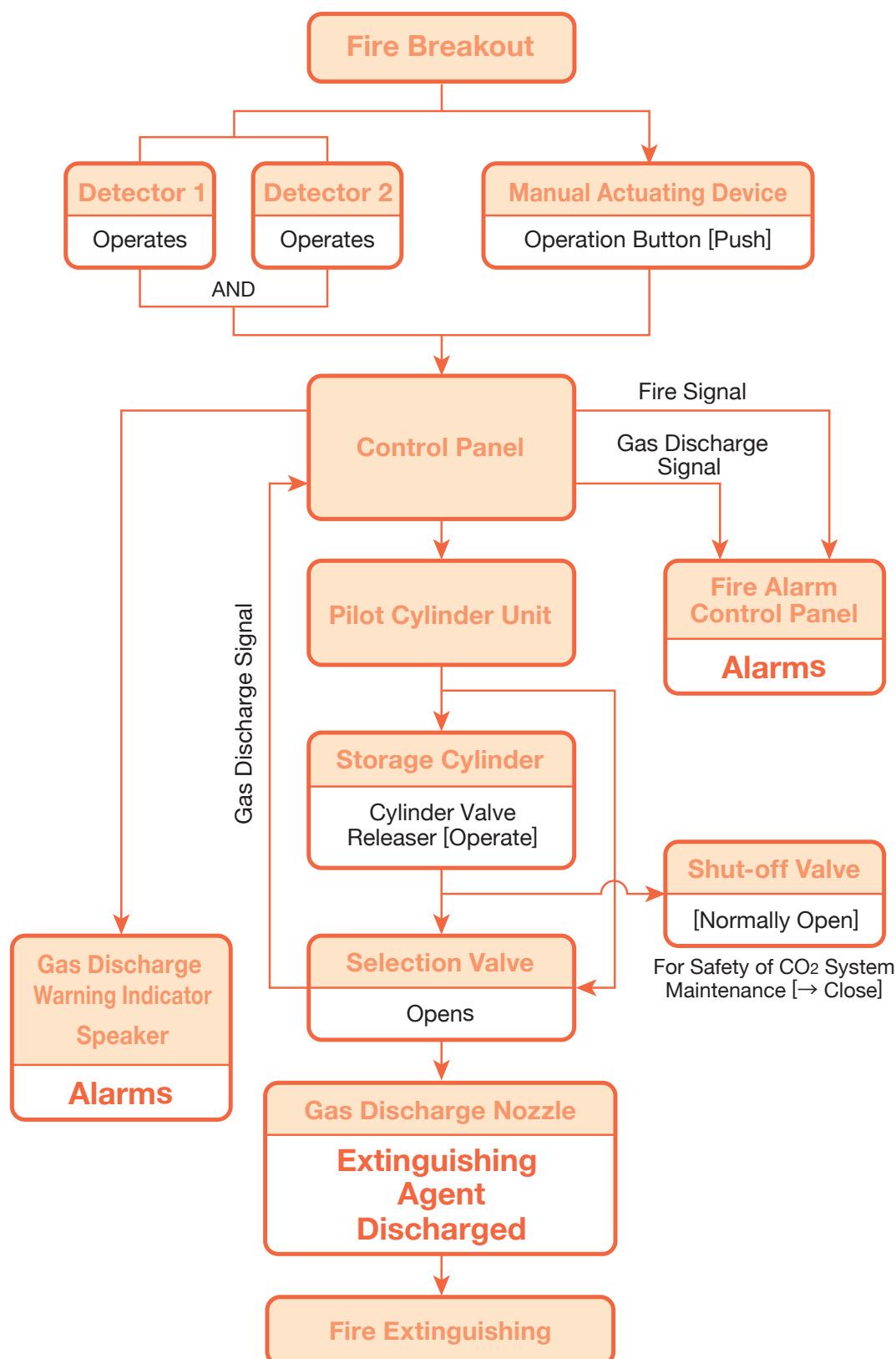
■ Gaseous Fire Extinguishing System



Gaseous Fire Extinguishing System

Operation Flow Chart

■ Gaseous Fire Extinguishing System



Gaseous Fire Extinguishing System

Comparison of Fire Extinguishing Agent

The gaseous fire extinguishing system has been used to protect the facilities where quick recovery and less damage must be required, such as electric rooms, art museums, precision machineries, telecommunication rooms, etc. It is classified roughly into an inert gas fire extinguishing system and a halogenated agent fire extinguishing system.

Nittan company deals in N₂ and CO₂ system as an inert gas system, and HFC-23, HFC-227ea and FK-5-1-12 as a halogenated agent system.



Storage Cylinder Unit



Control Panel / Emergency Power Supply Unit



Selection Valve / Manifold Pipe / Pilot Cylinder Unit

Comparison Table

Specification	Inert Gas		Halogenated Agents			
	CO ₂	N ₂	Halon1301	FK-5-1-12	HFC-23	HFC-227ea
Molecular Formula	CO ₂	N ₂	CF ₃ Br	CF ₃ CF ₂ C(O)CF(CF ₃) ₂	CHF ₃	CF ₃ CHFCF ₃
Molecular Weight	44	28	148.93	316	70.01	170.03
Boiling Point	-78.5°C	-195.8°C	-57.8°C	49.0°C	-82.0°C	-16.4°C
Specific Volume (m ³ /kg)	0.56	0.85	0.16	0.0719	0.34	0.138
Fire Extinguishing Principle	Oxygen dilution, Cooling	Oxygen dilution	Restraint for combustion chain reactions	Restraint for combustion chain reactions, Cooling	Restraint for combustion chain reactions	Restraint for combustion chain reactions
Extinguishing Concentration Against Flame	20.0 %	33.6 %	3.5 %	4.8 %	12.4 %	6.4 %
Design Concentration	34.0 %	40.3 %	5.0 %	5.8 %	16.2 %	7.3 %
Min. Design Q'ty (kg/m ³)	0.75-1.0	0.516 (m ³ /m ³)	0.32	0.84	0.52	0.55
Max. Design Concentration *1	-	52.0 %	10.0 %	10.0 %	23.8 %	9.5 %
Oxygen Concentration *2	12.0 %	10.0 %	18.9 %	19.8 %	16.0 %	19.0 %
ODP	0	0	10	0	0	0
GWP	1	0	4900	< 1	9100	4300
NOAEL	-	43.0 %	5.0 %	10.0 %	50.0 %	9.0 %
LOAEL	-	52.0 %	7.5 %	> 10.0 %	> 50.0 %	10.5 %
LC50	-	-	> 80.0 %	> 10.0 %	> 65.0 %	> 80.0 %
Max. Applicable Pressure	10.8 MPa	10.8 MPa	5.2 MPa	4.2 MPa	10.2 MPa	4.8 MPa
Pipe Type	Sch80	Sch80	Sch40	Sch40	Sch80	Sch40
Discharge Time	60 sec.	60 sec.	10-30 sec.	10 sec.	10 sec.	10 sec.
Filling Ratio (L/kg)	1.5-1.9	30 (MPa)	0.9-1.6	0.7-1.6	1.2-1.5	0.9-1.6
Storing Condition	Liquid	Vapor	Liquid (N ₂ pressurizing)	Liquid (N ₂ pressurizing)	Liquid	Liquid (N ₂ pressurizing)
Comparison of Cylinder Q'ty	2.6	4.0	1.0	2.0	1.6	1.7
Human Safety	Hazardous	Safe	Safe	Safe	Safe	Safe

*1 Max. Design Concentration : To be designed up to this agent density.

*2 Oxygen Concentration: Oxygen concentration in Max. Design Concentration

Features

CO2 System

- By releasing carbon dioxide, it extinguishes fires primarily with the mechanism of lowering the level of oxygen that supports combustion in a protected area.
- It needs alarms by voice message or siren to evacuate people in the protected area before discharging carbon dioxide.
- It needs to display off-limit on the warning indicators not to let people come into the protected area while discharging carbon dioxide.
- In case of the installation of the CO2 fire extinguishing system, the ventilation equipment may be necessary to exhaust carbon dioxide after the fire extinguishing.

N2 System

- By releasing nitrogen, which is a natural component of the air with a concentration of 78 %, it extinguishes fires primarily with the mechanism of lowering the level of oxygen that supports combustion in a protected area.
- Nitrogen is non-toxic. It has excellent safety for human exposure.
- Nitrogen does not cause any influence to deplete the ozone layer because of its [Zero] ozone depletion potential.
- Nitrogen is environmentally friendly fire extinguishing agent that does not bring about any global warming.
- In case of the installation of the nitrogen fire extinguishing system, the ventilation equipment may be necessary to exhaust nitrogen after the fire extinguishing.

Halon1301 System

- By releasing Halon1301, it extinguishes fires primarily with the mechanism of breaking the chain reaction of the combustion by chemically disrupting combustion.
- Halon1301 is non-toxic. It has excellent safety for human exposure.
- Halon1301 has good electrical insulating characteristics and is effective on electrical fires.
- It is the safe extinguishing equipment which is able to minimize pollution in fire extinguishing and damage of the supercooling
- In case of the installation of the Halon1301 fire extinguishing system, the ventilation equipment may be necessary to exhaust nitrogen after the fire extinguishing.
- Halon1301 causes an influence to deplete the ozone layer.

FK-5-1-12 System

- By releasing FK-5-1-12, it extinguishes fires primarily with the mechanism of breaking the chain reaction of the combustion by chemically disrupting combustion.
- FK-5-1-12 is very friendly to the environment, minimizing environmental load in [Zero] ozone depletion potential and [Less Than 1] global warming potential.
- FK-5-1-12 is able to more minimize the amount of fire extinguishing agent necessary for the protected area in comparison to the inert gas system, because of its lower density against flame.
- FK-5-1-12 has good electrical insulating characteristics and is effective on electrical fires.
- It has a low discharge pressure and is able to employ the pipe size of schedule 40.
- In case of the installation of the FK-5-1-12 fire extinguishing system, the ventilation equipment may be necessary to exhaust extinguishing agent and combustion gas after the fire extinguishing.

HFC-23 System

- By releasing HFC-23, it extinguishes fires primarily with the mechanism of breaking the chain reaction of the combustion by chemically disrupting combustion.
- HFC-23 is non-toxic. It has excellent safety for human exposure.
- HFC-23 does not cause any influence to deplete the ozone layer because of its [Zero] ozone depletion potential. But it has a high rate of global warming potential.
- HFC-23 does not require the nitrogen pressurizing because of the high gas pressure.
- In case of the installation of the HFC-23 fire extinguishing system, the ventilation equipment may be necessary to exhaust the trifluoromethane after the fire extinguishing.

HFC-227ea System

- By releasing HFC-227ea, it extinguishes fires primarily with the mechanism of breaking the chain reaction of the combustion by chemically disrupting combustion.
- HFC-227ea is non-toxic. It has excellent safety for human exposure.
- HFC-227ea does not cause any influence to deplete the ozone layer because of its [Zero] ozone depletion potential. But it has a high rate of global warming potential.
- HFC-227ea has good electrical insulating characteristics and is effective on electrical fires.
- HFC-227ea is a colorless and almost odorless gas.
- It has a low discharge pressure and is able to employ the pipe size of schedule 40.
- In case of the installation of the HFC-227ea fire extinguishing system, the ventilation equipment may be necessary to exhaust the heptafluoropropane after the fire extinguishing.

Gaseous Fire Extinguishing System

Storage Cylinder

The storage cylinder contains the extinguishing agent within the filling ratio specified. An adaptable cylinder valve and guide pipe shall be used corresponding to each storage cylinder.

Cylinder



Specification

Fire Extinguishing Agent		Water Capacity	Supply Volume	Filling Ratio (L / kg)	Cylinder Valve	Option	
						Cylinder Valve Releaser	Guide Pipe
Inert Gas	CO ₂	82.5 L	44-55 kg	1.5-1.9	15C1	GNC-PM-2	GFT-400
		68 L	36-45 kg	1.5-1.9	15C1	GNC-PM-2	GFT-400
	N ₂	83 L	20.3 m ³	30 MPa (at 35°C)	15N	GNC-PM-N	GFT-420
		83 L	14.6 m ³	20 MPa (at 35°C)	15N	GNC-PM-NV	GFT-400
Halogenide	FK-5-1-12	68 L	43-97 kg	0.7-1.6	32HA	GNC-P-32	HFL-375
		41 L	26-58 kg	0.7-1.6	32HA	GNC-P-32	HFL-375
		24 L	15-34 kg	0.7-1.6	32HA	GNC-P-32	HFL-375
	HFC-23	68 L	46-56 kg	1.2-1.5	32HA	GNC-P-32	HFL-375
		41 L	28-34 kg	1.2-1.5	32HA	GNC-P-32	HFL-375
		24 L	16-20 kg	1.2-1.5	32HA	GNC-P-32	HFL-375
		20 L	14-16 kg	1.2-1.5	15C1	GNC-PM-2	GFT-400
		14 L	10-12 kg	1.2-1.5	15C1	GNC-PM-2	GFT-400
	HFC-227ea	68 L	43-75 kg	0.9-1.6	32HA	GNC-P-32	HFL-375
		41 L	26-45 kg	0.9-1.6	32HA	GNC-P-32	HFL-375
		24 L	15-26 kg	0.9-1.6	15C1	GNC-PM-2	GFT-400
		14 L	9-15 kg	0.9-1.6	15C1	GNC-PM-2	GFT-400

Gaseous Fire Extinguishing System

Storage Cylinder Unit

Category	Model	Description	Specification
N ₂ Storage Cylinder Unit 1 Line	N20102	1 Line x 2 Cylinders	Components: - 83L Cylinder *1 - Cylinder Valve Releaser - Cylinder Rack *2 - Manifold Pipe - Control Pipe - Guide Pipe - Reducing Valve *1 Filled with 20.3 m ³ of N ₂ / 1 Cylinder *2 Quake -Proof: Horizontal=0.6G / Vertical=0.3G)
	N20103	1 Line x 3 Cylinders	
	N20104	1 Line x 4 Cylinders	
	N20105	1 Line x 5 Cylinders	
	N20106	1 Line x 6 Cylinders	
	N20107	1 Line x 7 Cylinders	
N ₂ Storage Cylinder Unit 2 Lines	N20204	2 Lines x 4 Cylinders	Components: - 83L Cylinder *1 - Cylinder Valve Releaser - Cylinder Rack *2 - Manifold Pipe - Control Pipe - Guide Pipe - Reducing Valve *1 Filled with 20.3 m ³ of N ₂ / 1 Cylinder *2 Quake -Proof: Horizontal=0.6G / Vertical=0.3G)
	N20205	2 Lines x 5 Cylinders	
	N20206	2 Lines x 6 Cylinders	
	N20207	2 Lines x 7 Cylinders	
	N20208	2 Lines x 8 Cylinders	
	N20209	2 Lines x 9 Cylinders	
	N20210	2 Lines x 10 Cylinders	
	N20211	2 Lines x 11 Cylinders	
	N20212	2 Lines x 12 Cylinders	
	N20213	2 Lines x 13 Cylinders	
	N20214	2 Lines x 14 Cylinders	
Cylinder Valve	15C1	Cylinder Valve for Cylinders of CO ₂ , HFC -23 and HFC-227ea	Applicable Guide Pipe: GFT -400, φ 15
	15N	Cylinder Valve for 83 L Cylinder of N ₂	Applicable Guide Pipe: GFT -420, φ 15
	32HA	Cylinder Valve for Cylinders of FK-5-1-12, 68L/4IL HFC-23 and 68L/4IL HFC-227ea	Applicable Guide Pipe: HFL -375, φ 32
Cylinder Valve Releaser	*See Page 13,14,23		
Control Pipe	CUT300L	Control Pipe	L=300 mm
	CUT500L	Control Pipe	L=500 mm
Guide Pipe	GFT -400	Guide Pipe	φ 15, L=400 mm
	GFT -420	Guide Pipe	φ 15, L=420 mm for 83L N ₂ Cylinder
	HFL -375	Guide Pipe	φ 32, L=375 mm
Reducing Valve	15RG	Reducing Valve for 15N	Max. Adjustable Pressure: Less than 10.8 MPa
	TG12	Reducing Valve for 15N (Small Pressure -Relief -Opening Type)	Max. Adjustable Pressure: Less than 5.6 MPa

Cylinder Valve Releaser

Specification	Cylinder Valve Releaser								
	GNC -1(E)	GNC -3	GNC -4	GNC -5	GNC -M	GNC -P-32	GNC -PM -2	GNC -PM -N	GNC -PM -NV
Operating Method	Elec. / Manu.	Elec. / Manu.	Elec. / Manu.	Elec. / Manu.	Manu.	Gas	Gas / Manu.	Gas / Manu.	Gas / Manu.
Rating	DC24V / 1.67A	DC24V / 1.67A	DC24V / 3.33A	DC24V / 1.67A	N/A	N/A	N/A	N/A	N/A
Compatible Cylinder Valve	C4-EM -1	15C1	32HA	15N	C4-EM -1	32HA	15C1	15N (30Mpa)	15N (20Mpa)
Weight	1.6 kg	1.6 kg	1.6 kg	1.6 kg	1.6 kg	1.1 kg	0.3 kg	0.4 kg	0.4 kg

Gaseous Fire Extinguishing System

Piping Components

Cylinder Valve Releaser



GNC-PM-NV

Damper Reset Valve & Box



NDR-2R

Bursting Type Safety Valve



CSV-10 / HSV-10

Relief Valve $\phi 4$



GLV-41

Check Valve $\phi 4$



GCV-4

Copper Tube



Copper Tube

Copper Tube Joint Two Way



2 Way

Copper Tube Joint Three Way



3 Way

Gaseous Fire Extinguishing System

Piping Components

Category	Model	Description	Specification
Pilot Cylinder Unit	GASB-EM	1L Pilot Cylinder Unit	Components: 1L Cylinder, Cylinder Valve Releaser, Pressure Switch, Box
	GASB-EM-2	2L Pilot Cylinder Unit	Components: 2L Cylinder, Cylinder Valve Releaser, Pressure Switch, Box
		1L Pilot Cylinder Unit Box	Cabinet: SPG, Color: 7.5R4/14 (Red)
		2L Pilot Cylinder Unit Box	Cabinet: SPG, Color: 7.5R4/14 (Red)
		1L Pilot Cylinder	Agent: CO ₂ , Color: Green, Capacity:1L
		2L Pilot Cylinder	Agent: CO ₂ , Color: Green, Capacity:2L
Pressure Switch	GPS-1	Pressure switch	Contact Capacity: 5A@AC125V/ 5A@DC30V
Damper Reset Valve Box	NDR-2R	Damper Reset Valve and Box (Surface Type)	Cabinet: SPCC, Color: 7.5R4/14 (Red)
	NDR-2U	Damper Reset Valve and Box (Recessed Type)	Cabinet: SPCC, Color: 7.5R4/14 (Red)
Check Valve / Relief / Safety Valve	CSV-10	Safety Valve for CO ₂ , N ₂ and HFC-23 System, Bursting Type	Operating Pressure: 10.8-16.2 MPa
	HSV-10	Safety Valve for HFC-227ea, FK-5-1-12 System	Operating Pressure: 5.7-7.8 MPa
	GLV-41	Relief Valve ϕ 4	Operating Pressure: Less than 0.25MPa
	GF-04	Strainer	ϕ 4
	GCV-4	Check Valve ϕ 4	For ϕ 4 Copper Tube
	GCV-15-2	Check Valve ϕ 15	For ϕ 15 Guide Pipe
	Copper Tube	High Pressure Copper Tube	ϕ 4 x ϕ 6 (20m/1 Lot) with PVC coating
	2 Way	Copper Tube Joint	2 Way
	3 Way	Copper Tube Joint	3 Way

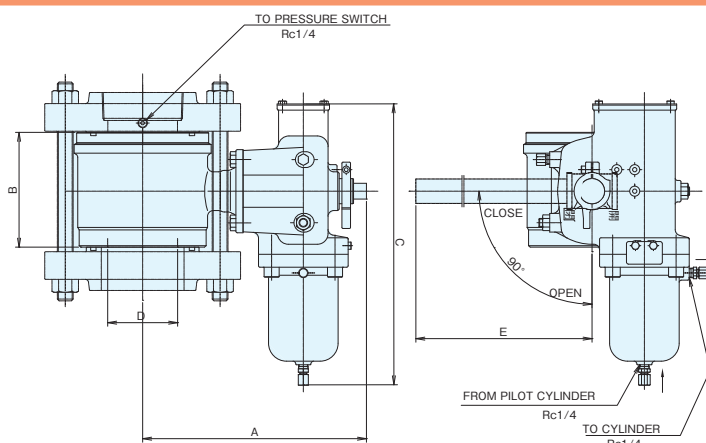
Selection Valve

In case of protecting multiple protected areas using a common cylinder bank, Selection Valves are used to select the protected area where gas is released. Our selection valves are the gas releasing type by gas pressure of Pilot Cylinder. There are various sizes from 25A to 150A. In case of emergency, you can release gas manually by using manual operation lever.

Selection Valve



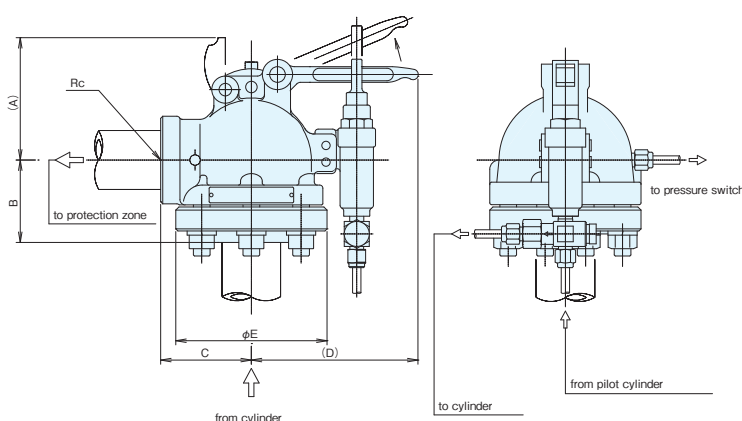
GF14 Series



Model	Size	Dimensions (mm)					Equivalent Length (m)		Mass (kg)
		A	B	C	D	E	Sch 40	Sch 80	
GF14-25A	25A	213	75	210	70	240	0.2	0.2	5.5
GF14-32A	32A	224	80	210	80	240	0.3	0.3	6.0
GF14-40A	40A	241	90	210	93	240	0.4	0.4	7.0
GF14-50A	50A	264	100	210	108	240	0.5	0.5	9.0
GF14-65A	65A	302	120	266.5	128	350	0.7	0.6	15.0
GF14-80A	80A	318	125	266.5	146	350	0.8	0.8	17.5
GF14-100A	100A	408	160	368.5	191	650	1.2	1.1	39.0
GF14-125A	125A	473	190	368.5	238	650	1.5	1.4	55.0
GF14-150A	150A	501	225	368.5	258	650	1.9	1.8	79.0



PD Series

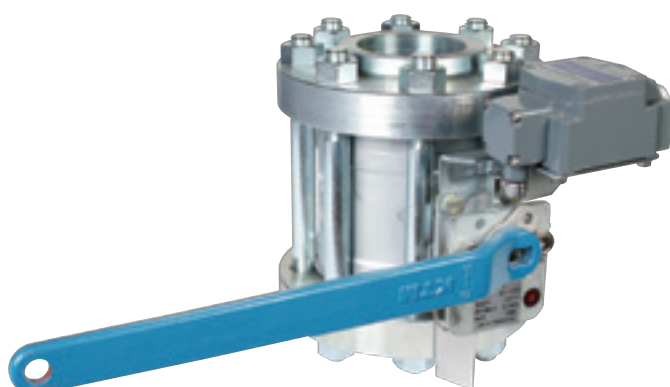


Model	Size	Dimensions (mm)					Equivalent Length (m)		Mass (kg)
		A	B	C	D	E	Sch 40	Sch 80	
PD25KC	25A	220	60	60	100	98	3.6	2.4	5.0
PD32KC	32A	232	72	69	108	120	5.8	4.0	7.0
PD40KC	40A	235	75	72	112	125	6.3	4.4	8.0
PD50KC	50A	247	87	79	118	145	8.6	6.3	11.0
PD65KC	65A	283	88	97	148	175	11.0	8.3	19.0
PD80KC	80A	295	100	111.5	151	190	11.6	8.8	25.0
PD100KC	100A	359	139	134	211	235	23.3	18.0	46.0
PD125KC	125A	495	235	152	216	282	25.0	19.9	88.0
PD150KC	150A	528	268	173	247	325	26.6	20.6	141.0

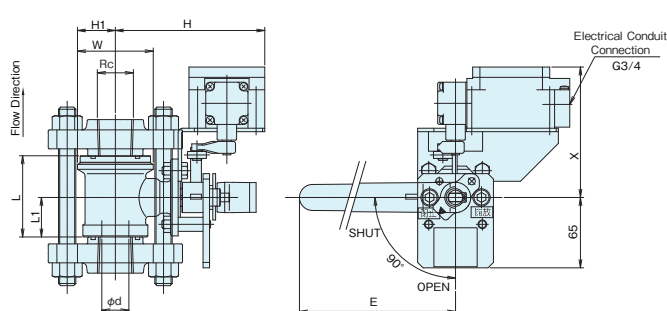
Shut-Off Valve

The shut-off valves are devices used to isolate the CO₂ fire extinguishing system when personnel are required to enter a protected area for maintenance works. If the shut-off valve is closed, an extinguishing agent is not released in the protected area even if the system happened to start for some reason. In order to prevent from forgetting to reopen the valve after maintenance works, the shut-off valve enable a control panel and manual actuating devices to display open/close conditions.

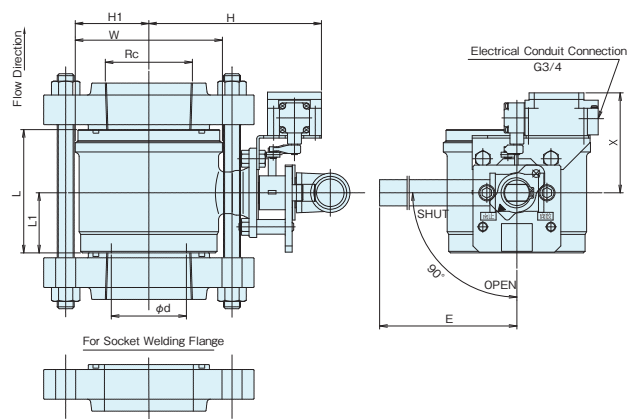
Shut-Off Valve



HGF14 Series



HGF14 25A-50A



HGF14 65A-150A

(mm)

Dimensions

Model	Dimensions (mm)										Mass (kg)
	Size	Rc	d	W	L	L1	(H)	(H1)	X	E	
HGF14-25A	25A	1	25	70	75	36.5	138	35	119	240	3.5
HGF14-32A	32A	1-1/4	32	80	80	36.5	144	40	119	240	4.0
HGF14-40A	40A	1-1/2	38	93	90	40	154	46.5	119	240	5.0
HGF14-50A	50A	2	51	108	100	49	170	54	119	240	7.0
HGF14-65A	65A	2-1/2	64	128	120	56	183	64	119	350	10.5
HGF14-80A	80A	3	74	146	125	61	190	73	119	350	13.0
HGF14-100A	100A	4	97.5	191	160	78	224	95	130	650	24.0
HGF14-125A	125A	5	121	238	190	95	266	119	130	650	40.0
HGF14-150A	150A	6	143.5	258	225	112	284	129	130	650	64.0

Gaseous Fire Extinguishing System

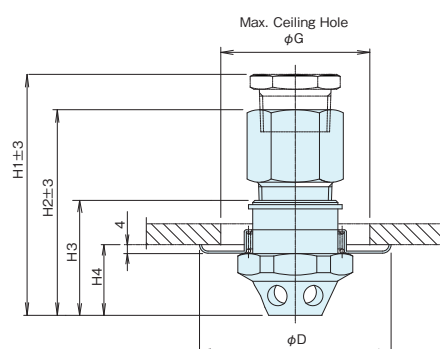
Discharge Nozzle

Discharge nozzles are so arranged that the extinguishing agent will be uniformly and promptly distributed over the zone to be protected.

Discharge Nozzle, Ceiling Mount Type (for CO₂, N₂, HFC-23, HFC-227ea)



GR type



Dimensions

Model	M.S.S.	φ D	H1	H2	H3	H4	φ G
GR15	Rc 1/2	90	(121) 75	100	54	33-43	70
GR20	Rc 3/4	90	(121) 75	100	54	33-43	70
GR25	Rc1	90		100	54	33-43	70
GR32	Rc1 1/4	100			65	39-52	75
GR40	Rc1 1/2	110			75	46-60	80

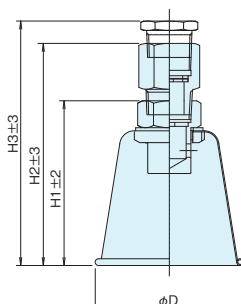
*M.S.S. Mounting Screw Size

(mm)

Discharge Nozzle, Surface Mount Type (for CO₂, N₂, HFC-23, HFC-227ea)



GM type



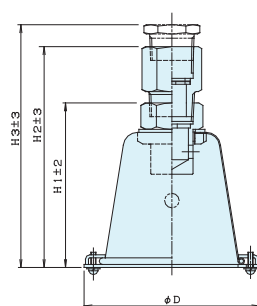
Dimensions

Model	M.S.S.	φ D	H1	H2	H3
GM15	Rc 1/2	110	123.3	169.3	(189.3) 143.3
GM20	Rc 3/4	110	123.3	169.3	(189.3) 143.3
GM25	Rc1	110	123.3	169.3	
GM32	Rc1 1/4	130	141.3		
GM40	Rc1 1/2	130	140.3		

*M.S.S. Mounting Screw Size

(mm)

Discharge Nozzle, Encapsulated Type (for CO₂, N₂, HFC-23, HFC-227ea)



GMC type

Dimensions

Model	M.S.S.	φ D	H1	H2	H3
GMC15	Rc1 1/2	133	125.6	171.6	(191.6) 145.6
GMC20	Rc1 3/4	133	125.6	171.6	(191.6) 145.6
GMC25	Rc1	133	125.6	171.6	
GMC32	Rc1 1/4	153	143.6		
GMC40	Rc1 1/2	153	142.6		

*M.S.S. Mounting Screw Size

(mm)

Specification	GR / GRA						GM				
	GR15	GR20	GR25	GR32	GR40	GRA	GM15	GM20	GM25	GM32	GM40
Mounting Pipe Size	15A	20A	25A	32A	40A	32A	15A	20A	25A	32A	40A
Code No. / Sch40	10-45	10-50	10-50	20-58	30-60	20-48	10-45	10-50	10-50	20-58	30-60
Code No. / Sch80	10-42	10-48	10-50	20-58	30-60	N/A	10-42	10-48	10-50	20-58	30-60
E.A. / Sch40	2.54-137	2.54-254	2.54-254	7.79-616	24.6-779	7.79-201	2.54-137	2.54-254	2.54-254	7.79-616	24.6-779
E.A. / Sch80	2.54-109	2.54-201	2.54-254	7.79-616	24.6-779	N/A	2.54-109	2.54-201	2.54-254	7.79-616	24.6-779
Weight (kg)	0.77-0.46	0.8-0.51	0.36-0.34	0.57-0.54	0.81-0.77	0.6	0.88-0.58	0.83-0.53	0.44-0.43	0.83-0.79	1.27-1.23
Color	Main Body : Nikkel Half Luster Coating Dressing Plate : Colored Alumite Coating						7.5R4/14 (Red)				

*E.A. Equivalent Orifice Area (mm²)

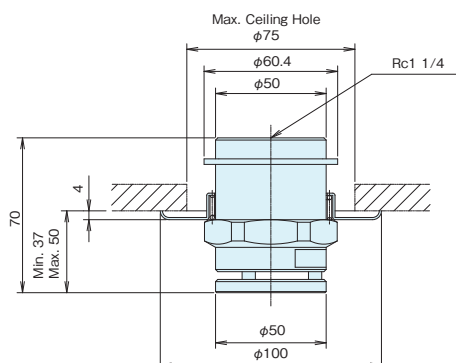
Gaseous Fire Extinguishing System

Discharge Nozzle

Discharge Nozzle, Ceiling Mount Type (for FK-5-1-12)



GRA type



Orifice Code

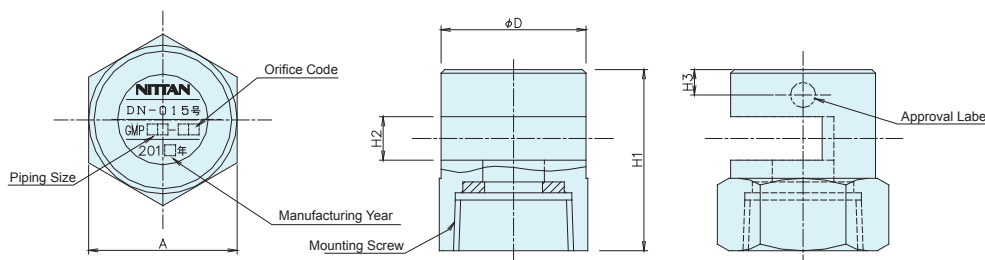
Code No.	E.A. (mm)	Code No.	E.A. (mm)
20	7.79	35	44.2
21	8.81	36	50.3
22	9.90	37	56.7
23	11.0	38	63.6
24	12.6	39	70.9
25	14.2	40	78.5
26	15.9	41	88.2
27	17.7	42	98.5
28	19.6	43	109.0
29	22.1	44	123.0
30	24.6	45	137.0
31	28.3	46	154.0
32	31.2	47	177.0
33	35.3	48	201.0
34	39.6		

*E.A. Equivalent Orifice Area

Discharge Nozzle, 180°Angle Type (for N₂, HFC-23, HFC-227 and FK-5-1-12 package systems)



GMP type



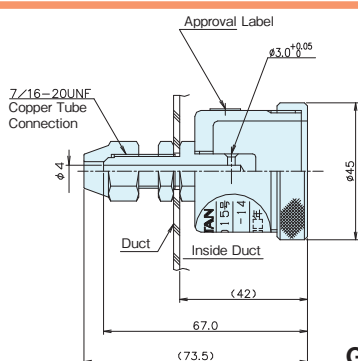
Dimensions

Model	M.S.S.	A	φD	H1	H2	H3
GMP25	Rc1	41	40	50	12	7
GMP32	Rc1 1/4	50	49	60	15	8

*M.S.S. Mounting Screw Size

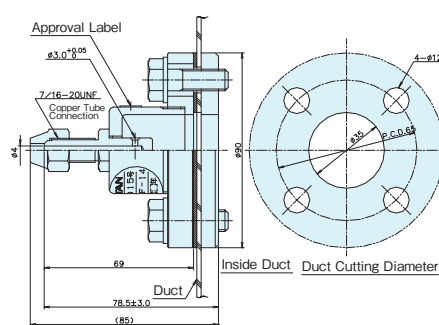
(mm)

Duct Nozzle



GDN4

(mm)



GDN4F

(mm)

Specification	GMC					GMP		GDN	
	GMC15	GMC20	GMC25	GMC32	GMC40	GMP25	GMP32	GDN4	GDN4F
Mounting Pipe Size	15A	20A	25A	32A	40A	25A	32A	φ 4	φ 4
Code No. / Sch40	10-45	10-50	10-50	20-58	30-60	15-45	20-49	w/o Flange, E.A.* 3.94	c/w Flange, E.A.* 3.94
Code No. / Sch80	10-42	10-48	10-50	20-58	30-60	15-45	20-49		
E.A.* / Sch40	2.54-137	2.54-254	2.54-254	7.79-616	24.6-779	4.37-137	7.79-227		
E.A.* / Sch80	2.54-109	2.54-201	2.54-254	7.79-616	24.6-779	4.37-137	7.79-227		
Weight (kg)	1.20-0.72	0.98-0.68	0.88-0.58	0.98-0.94	1.71-1.67	0.355-0.350	0.59-0.58		
Color	7.5R4/14 (Red)					Nikkel Half Luster Coating			

*E.A. Equivalent Orifice Area (mm²)

Gaseous Fire Extinguishing System

Control Panel

CO₂ / N₂ / Halon1301 / HFC-23 / HFC-227ea / FK-5-1-12

Gaseous Fire Extinguishing Control Panel



GNA0-3L-E

Main Features:

- Compatible with Clean Agents and CO₂
- Extensive lineup: 1, 3, 5, 10, 15, 20, 25, 30 Zones
- Voice alarm selectable from English, Vietnamese, Indonesian and Thai.
- Discharge Countdown timer
- Selectable AUTO/ MANUAL actuating operation mode
- Simultaneous extinguishing function to multiple zones available with individual countdown timers
- Periodical Automatic System Test
- Event logs up to 1000 events
- Custom-made pre-programmed signal transfers and indicators
- Monitoring of open-circuits, short-circuits and ground faults on essential circuits
- Error Code Indicator
- Assist function for maintenance by Maintenance switch, Buzzer Silence, Relay Disconnect and System Test switches

■ Gaseous Fire Extinguishing Control Panel

Model	Zones	Mount type	Releasing method	Shut-off valve status indicator	Releasing to multiple zones	CO ₂ gas alarm
GNM0-1L-E	1	Wall mount	MANUAL	Optional	Optional	Optional
GNM0-3L-E	3		MANUAL			
GNM0-5L-E	5		MANUAL			
GNM0-10L-E	10		MANUAL			
GNM0-15L-E	15		MANUAL			
GNM0-20L-E	20	Floor standing	MANUAL			
GNM0-25L-E	25		MANUAL			
GNM0-30L-E	30		MANUAL			

Model	Zones	Mount type	Releasing method	Shut-off valve status indicator	Releasing to multiple zones	CO ₂ gas alarm	Tamper-proof
GNA0-1L-E	1	Wall mount	AUTO/MANUAL	Optional	Optional	Optional	Optional
GNA0-3L-E	3		AUTO/MANUAL				
GNA0-5L-E	5		AUTO/MANUAL				
GNA0-10L-E	10		AUTO/MANUAL				
GNA0-15L-E	15		AUTO/MANUAL				
GNA0-20L-E	20	Floor standing	AUTO/MANUAL				
GNA0-25L-E	25		AUTO/MANUAL				
GNA0-30L-E	30		AUTO/MANUAL				

* All optional settings can be configured just on NITTAN production lines.

Gaseous Fire Extinguishing System

Types/Functions

■ Manual actuating type [GNM]

This type can actuate gas fire suppression system only by manual actuating device.

■ Auto / Manual actuating type (for individual zones) [GNA *Optional]

This type can select either Automatic actuating mode or Manual actuating mode for each zones individually by key switches on manual actuating devices. Though the control panel has a key switch, it can switch Automatic actuating mode or Manual actuating mode for the all zones.

■ Auto/Manual actuating type (for all zones) [GNA *Optional]

This type can select either Automatic actuating mode or Manual actuating mode of of fire suppression system by key switches on both manual actuating device and control panel.

■ Tamper proof [GNA *Optional]

This function can prevent the system from discharging gas accidentally. Unless a detector is activated, fire suppression system does not release gas even when actuating button on manual actuating device is pressed. (* On manual actuating typed control panel, fire suppression system can release gas only when the actuating button is pressed and the control panel receive the alarm signal from other fire alarm system.)

■ Simultaneously discharging to multiple zones [GNM · GNA *Optional]

This function enables control panel to discharge gas to multiple zones simultaneously.

■ CO2 gas monitoring [GNM · GNA *Optional]

This function prevents anyone from entering into gas discharged area accidentally. when this function is used, CO2 gas densitometer shall be installed with fire suppression system. During CO2 gas density is high, gas discharge indicators keep flashing to alart not to enter into gas discharged area.

■ Specification

Specification		GNM0	GNA0
Number of zones		1 ,3 ,5 ,10 ,15 ,20 ,25 ,30	
Power supply		DC24V (DC20.4V - 31.0V)	
Alarm Device	Control Panel	Buzzer	
	Local Zones	Voice Alarm / High Impedance, English, Vietnamese, Indonesian and Thai.	
Monitoring Function	Open Circuit	Regular open-circuit monitoring for detectors, manual actuating devices (actuating/door open/abort), cylinder valve releaser, pressure switch and programable inputs.	
	Short Circuit	Regular short-circuit monitoring for detectors, manual actuating devices (actuating/door open/abort), cylinder valve releaser and pressure switch.	
	Ground Fault	Regular ground fault monitoring for positive and negative signal lines.	
	Periodical Test	Periodical operation tests for detector circuits, actuating circuits and programmable input	
Operaion temperature		0 to +40°C	
Connectable Devices		Pilot Cylinder valve releaser, Fire detector, Manual actuating device, Shut-off valve, Pressure switch, Gas discharge warning indicator , Audio device	
Connectable numbers of detector	Detector line	N/A	2 lines for 1 zone
	Maximum number of detectors	N/A	Smoke : up to 40 pcs / line Heat: No limitation (except for thermista type) Thermista Heat: 24 pcs / line * Remote test: up to 32 pcs / line
Countdown timer		Default: 20 sec. (Opetional time can be set within 0-999 sec.)	
End of Line Resister		5.1KΩ	
History log		Up to 1000 logs	

Gaseous Fire Extinguishing System

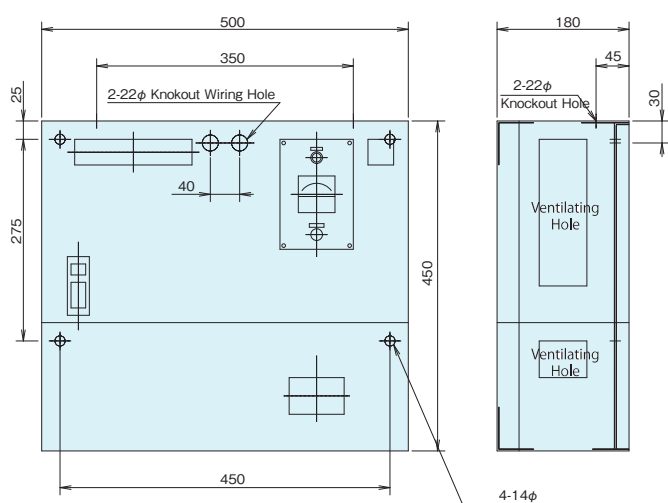
DC Power Supply Unit

The DC power supply unit is provided with the storage battery which is to be used as an emergency power supply. The unit is supplied with 100/200 VAC, and supplies 24 VDC to the fire extinguishing system control panel.

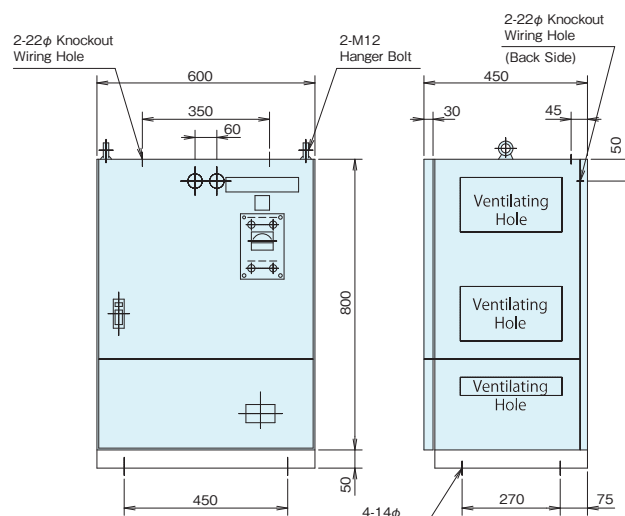
DC Power Supply Unit



NHS1-24 Series



NHS1-24 3.5 Ah-10.0 Ah



NHS1-24 12.0 Ah-30.0 Ah

(mm)

■ Specification

Model	Output		Battery			Mass (kg)	Mounting
	Voltage	Current	Model	Capacity	Type		
NHS1-24-0.14A	DC24V	3 A	20-D3.5	3.5 Ah	Ni-Cd	25 kg	Wall
NHS1-24-0.24A	DC24V	5 A	20-F6.0	6.0 Ah	Ni-Cd	26 kg	Wall
NHS1-24-0.32A	DC24V	6 A	20-M8.0	8.0 Ah	Ni-Cd	29 kg	Wall
NHS1-24-0.4A	DC24V	8 A	20-M10.0	10.0 Ah	Ni-Cd	30 kg	Wall
NHS1-24-2x0.24A	DC24V	10 A	20-F6.0×2P	12.0 Ah	Ni-Cd	91 kg	Floor
NHS1-24-2x0.32A	DC24V	12 A	20-M8.0×2P	16.0 Ah	Ni-Cd	98 kg	Floor
NHS1-24-2x0.4A	DC24V	15 A	20-M10.0×2P	20.0 Ah	Ni-Cd	100 kg	Floor
NHS1-24-3x0.4A	DC24V	20 A	20-M10.0×3P	30.0 Ah	Ni-Cd	120 kg	Floor

Gaseous Fire Extinguishing System

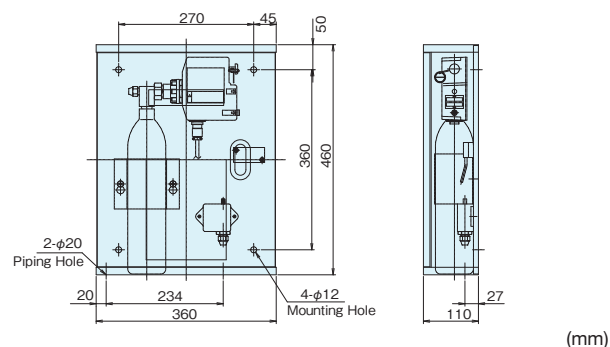
Pilot Cylinder Unit

The pilot cylinder unit incorporates one actuating gas cylinder of 1 or 2 liters in volume, one cylinder valve releaser (electromagnetic solenoid) and one pressure switch.

Pilot Cylinder Unit



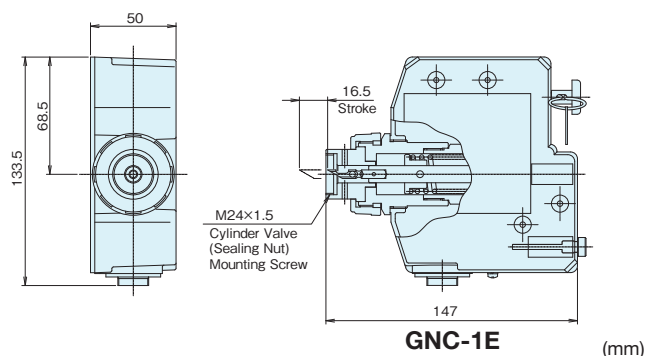
GASB-EM



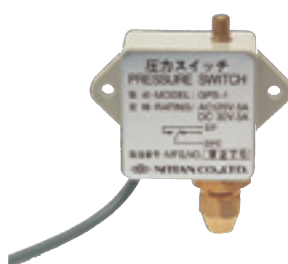
Cylinder Valve Releaser (Electric Style)



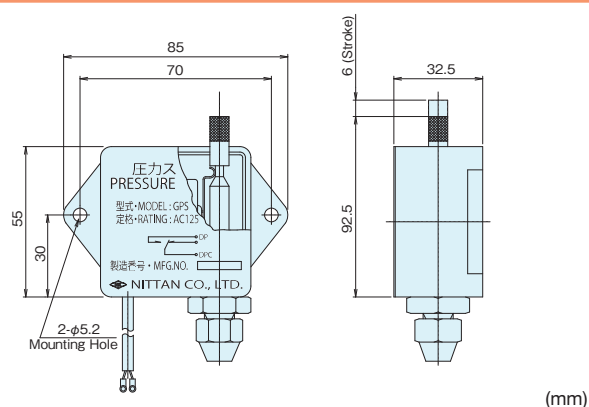
GNC-1E



Pressure Switch



GPS-1



Specification	Pilot Cylinder Unit	
	GASB-EM	GASB - EM - 2
Cylinder	1 L CO ₂ Cylinder	2 L CO ₂ Cylinder
Cylinder Valve Releaser	GNC-1E (Rating:DC24V/1.67A)	GNC-1E (Rating:DC24V/1.67A)
Pressure Switch	GPS-1	GPS-1
Cabinet	SPG, 7.5R4/14 (Red)	SPG, 7.5R4/14 (Red)

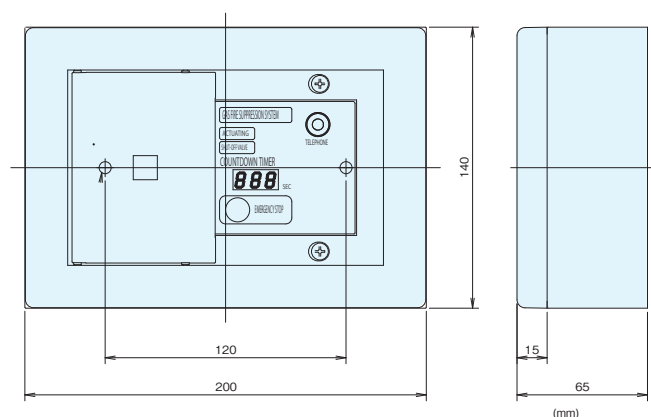
Manual Actuating Device

The manual actuating device of fire extinguishing system is used to manually start the gas release in a fire emergency. It is installed at the easy-to-find position on the wall by the entrance door on the outside of the protected area. There are two types of a surface mount type and a flush mount type. In addition, we have prepared various lineups, which are compatible with Auto/Manual changeover function, Tamper proof function and Countdown function according to the control panel types.

Manual Actuating Device (MANUAL Type)



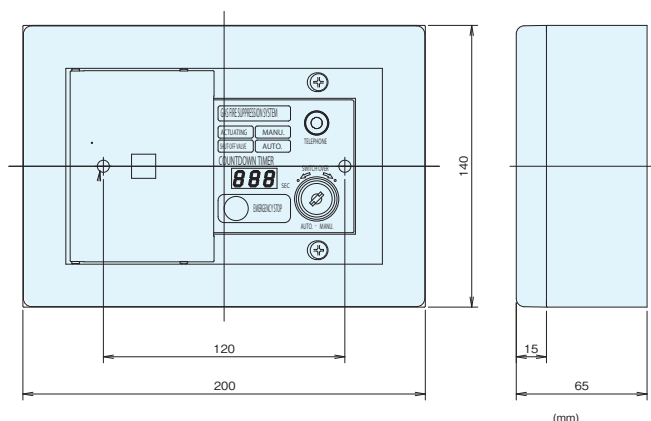
NRS-4, NRS-5 series



Manual Actuating Device (AUTO/MANUAL Switch Type)



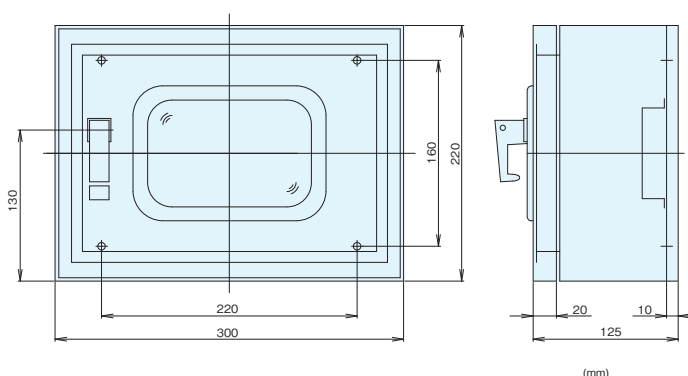
NRSA-4, NRSA-5 series



Water-proof Manual Actuating Device



NRS(A)-WS series



Gaseous Fire Extinguishing System

Manual Actuating Device

Specification

	NRS(A)-4 series	NRS(A)-5 series
Compatible Control Panel	Type GN Type 5C,5H, 3C, 3H, 2C, 2H(Obsolete type) Type NP (Package type)	Type GN
Rated	24 VDC, 40mA	
Operating Voltage Range	14 VDC to 33 VDC	
Operating Temperature	-10°C to +50°C	
Relative Humidity	Up to 85% RH, non-condensing	
Body Material	SPCC t=1.2	
Body Color	Munsell 7.5R4/14(Red)	
Dimensions	Surface mounting type : H140 x W200 x D65 Recessed mounting type : H140 x W200 x D72	
Weight	0.30 kg to 0.36 kg (main body only)	

Ordering information

N

R

S

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E

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None	Manual type
A	Auto/Manual switch

4	For old control panel
5	For GN type control panel
None	with status lamp of shut-off valve
H	No status lamp of shut-off valve
None	Not for package system
P	For package system

None	Surface mounting type (supplied with backbox)
U	Recessed mounting type
WS	Waterproof surgace monting type (supplied with backbox)

	Model	Compatible control panel				Available functions			
		Fixed sytem			Package NP	Status lamp of shut-off valve	Auto/Manual switch	Telephone	Mounting style
		5C/5H	GNM	GNA					
NRS(A)-5 series	NRS-5E		✓			✓		✓	Surface
	NRS-5E-U		✓			✓		✓	Recessed
	NRS-5E-WS		✓			✓		✓	Water-proof / Surface
	NRSA-5E			✓		✓	✓	✓	Surface
	NRSA-5E-U			✓		✓	✓	✓	Recessed
	NRSA-5E-WS			✓		✓	✓	✓	Water-proof / Surface
	NRS-5HE		✓					✓	Surface
	NRS-5HE-U		✓					✓	Recessed
	NRS-5HE-WS		✓					✓	Water-proof / Surface
	NRSA-5HE			✓			✓	✓	Surface
	NRSA-5HE-U			✓			✓	✓	Recessed
	NRSA-5HE-WS			✓			✓	✓	Water-proof / Surface
NRS(A)-4 series	NRS-4E	✓	✓			✓		✓	Surface
	NRS-4E-U	✓	✓			✓		✓	Recessed
	NRS-4E-WS	✓	✓			✓		✓	Water-proof / Surface
	NRSA-4E	✓		✓		✓	✓	✓	Surface
	NRSA-4E-U	✓		✓		✓	✓	✓	Recessed
	NRSA-4E-WS	✓		✓		✓	✓	✓	Water-proof / Surface
	NRS-4HE	✓	✓					✓	Surface
	NRS-4HE-U	✓	✓					✓	Recessed
	NRS-4HE-WS	✓	✓					✓	Water-proof / Surface
	NRSA-4HE	✓		✓			✓	✓	Surface
	NRSA-4HE-U	✓		✓			✓	✓	Recessed
	NRSA-4HE-WS	✓		✓			✓	✓	Water-proof / Surface
package series	NRSA-4PE				✓	✓	✓		Surface
	NRSA-4PE-U				✓	✓	✓		Recessed
	NRSA-4PE-WS				✓	✓	✓		Water-proof / Surface
	NRSA-4HPE				✓		✓		Surface
	NRSA-4HPE-U				✓		✓		Recessed
	NRSA-4HPE-WS				✓		✓		Water-proof / Surface

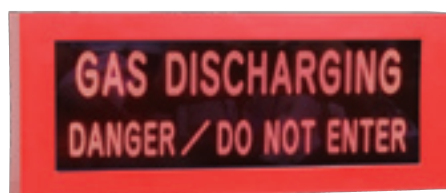
* The recessed mounting models which are shown with -U as suffix attached to model name are provided without backbox. The compatible backbox is JIS C8340 switch box for 3 switch plates.

Gaseous Fire Extinguishing System

Warning Device

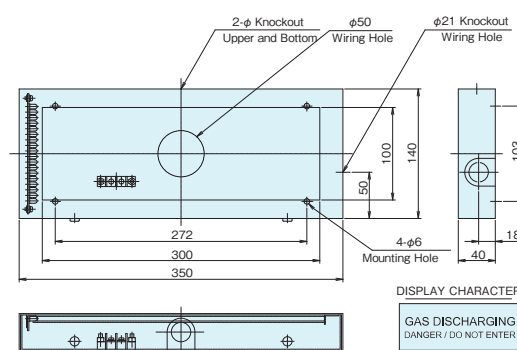
The warning devices flicker or light when the extinguishing agent is discharged so that no people will enter the area where the agent has been discharged.

Gas Discharge Warning Indicator



ST-S

Language : English/Vietnamese



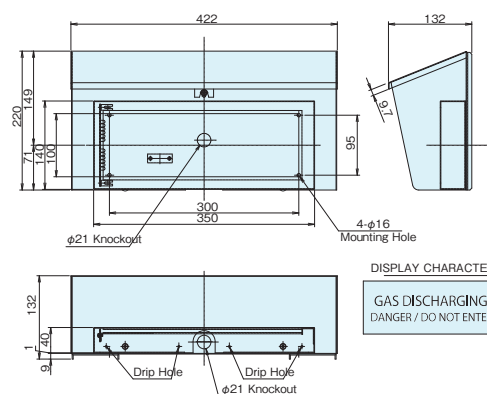
(mm)

Gas Discharge Warning Indicator (Outdoor Type)



ST-L

Language : English/Vietnamese

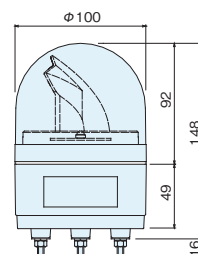


(mm)

Rotating Lamp



RHE Series



(mm)

Specification	Discharge Indicator			Rotating Lamp	
	ST-S	ST-L	TPL-5	RHE-24-R	RHE-24-Y
Installation Location	Indoor	Outdoor	Explosion Proof	Indoor (IP23)	Indoor (IP23)
Rated Voltage	DC24V	DC24V	DC24V	DC24V	DC24V
Power Consumption	1.2 W	1.2 W	25 W		
Current Consumption				0.16 A	0.16 A
Color	Red	Red	Red	Red	Yellow
Weight	1.5 kg	1.5 kg	16 kg	0.4 kg	0.4 kg

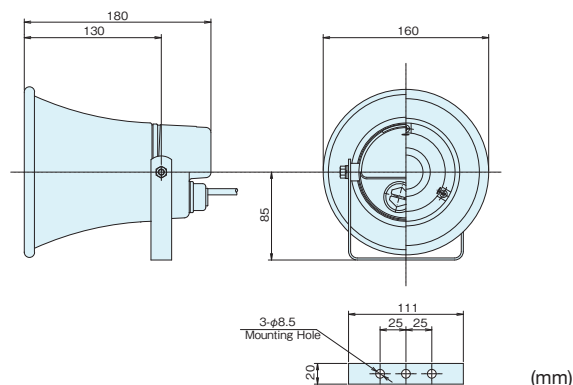
Speaker/Bell

Speakers and Bells are used to urge the occupants within the protected area to evacuate themselves before the extinguishing agent is discharged into the area.

Trumpet Speaker (High impedance type)



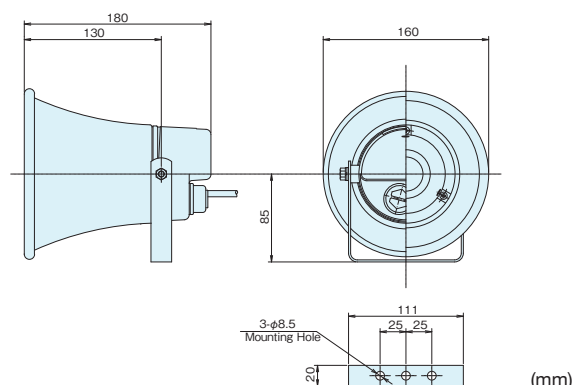
NK-305T



Trumpet Speaker (Low impedance type for Package System)



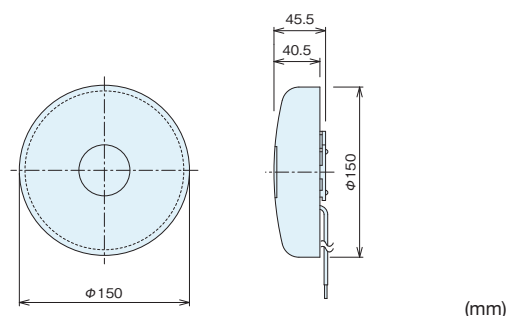
NK-105



Alarm Bell



BD-6-24-11



Specification	Speaker		Bell
	NK-305T	NK-105	BD-6-24-11
Rated Voltage	N/A	N/A	DC 24V
Power Consumption	N/A	N/A	10mA
Rated Input	5 W	5 W	N/A
Impedance	2k, 3.3k, 5k, 10k Ω	8 Ω	N/A
Sound Pressure Level	≥ 104 dB	≥ 104 dB	90 dB
Weight	1.6 kg	0.85 kg	0.45 kg
Others	High impedance	Low impedance	Red

Package Fire Extinguishing System

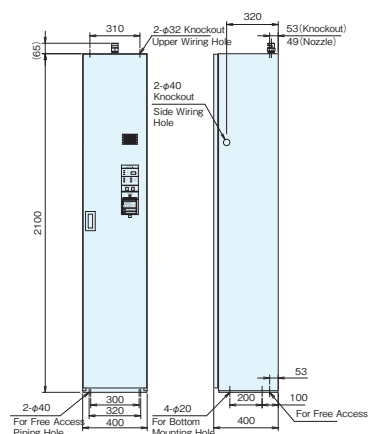
N2 Package System

The N2 Package System uses nitrogen fire extinguishing agent. Therefore, there are following advantages:
Minimizing environmental effects; Clear visibility for evacuation during discharge; Harmless to the human body;
Long-remaining effects; Easy acquisition of the extinguishing agent

N2 Package



NP-N



(mm)

Specification

Specification		N2 Package Main Unit
		NP-N
Agent		Nitrogen
Storage Cylinder		83L / 20.3 m ³ (30MPa)
Input Power Source		AC220V ±10% 50/60 Hz
Circuit Voltage		DC24V
Emergency Power Source		DC24V 3.5Ah/5Hr Ni-Cd Battery (Optionally available 6.0Ah)
Designed Discharge Time		60 sec. or less
Discharge Delay Time in Default Setting(Alterable)		Auto. Operation : 5 sec. Manu. Operation : 5 sec.
Operating Temperature Range		0 – 40°C
Body(Case) Material		SPCC t1.6 mm
Dimensions		H2100 x W400 x D400 mm
Weight		Approx. 80 kg (excluding cylinder)
Discharge Method	Standard	Front Discharge (Discharge outlet not provided)
	Option	1. Front Discharge + Free Access(Discharge beneath the floor) 2. Led from upper piping
Accessory	Main Unit	Control Part, Voice Alarm Device, Manual Actuating Button, Manu./Auto Changeover Key Switch, External Signal Transfer Contact, Discharge Nozzle
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent
Extra Box		Electric type : 25 units max. Gas Pressure type : 50 units max.
Accessories		Terminator CRE, End-of-line resister 20 kΩ 1/4, Spare fuses

Package Fire Extinguishing System

N2 Package Extra Box



(mm)

Specification		N2 Package Extra Box	
		NP-N-E	NP-N-EG
Agent		Nitrogen	
Storage Cylinder		83L / 20.3 m³ (30MPa)	
Actuating Method		Electric	Gas Pressure
Designed Discharge Time		60 sec. or less	
Operating Temperature Range		0 – 40°C	
Body(Case) Material		SPCC t1.6 mm	
Dimensions		H2100 x W400 x D400 mm	
Weight		Approx. 75 kg (excluding cylinder)	
Discharge Method	Standard	Front Discharge (Discharge outlet not provided)	
	Option	1. Front Discharge + Free Access(Discharge beneath the floor) 2. Led from upper piping	
Accessory	Main Unit	Discharge Nozzle	
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent	

Device	Model	Max.connetable number
Manual Acutuating Device	NRSA-4PE / NRSA-4HPE	5
Smoke Detector	Conventional Photoelectric Type 2KH2-LS, 2KW-P	20
Heat Detector	Convetional Fixed Temperature type 1CD-70-LS, 1CC2-70-LW, TCC-60-L	7
Disssharge indicator	ST-S (Indoor), ST-L(Outdoor)	8
Speaker	NK-305T (High Impedance)	Up to 20W
	NK-105 (Low Impedance)	Up to 1 unit (built-in speaker on the package is excluded)

Package Fire Extinguishing System

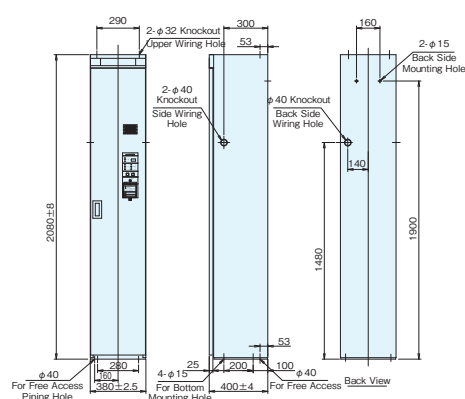
HFC-23 Package System

HFC-23 Package System uses HFC-23 fire extinguishing agent. Therefore, there are following advantages:
Ozone-depletion potential (ODP) of zero; Low toxicity; Harmless to the human body

HFC-23 Package



NP-F



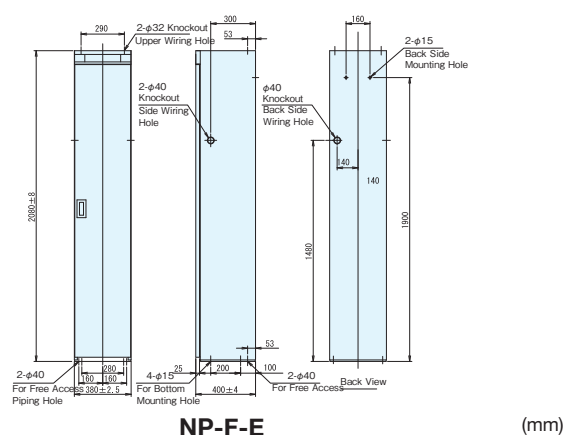
(mm)

■ Specification

Specification		HFC-23 Package Main Unit
		NP-F
Agent		HFC-23
Storage Cylinder		68L, 41L, 24L, 20L, 14L
Input Power Source		AC220V $\pm 10\%$ 50/60 Hz
Circuit Voltage		DC24V
Emergency Power Source		DC24V 3.5Ah/5Hr Ni-Cd Battery (Optionally available 6.0Ah)
Designed Discharge Time		10 sec. or less
Discharge Delay Time in Default Setting(Alterable)		Auto. Operation : 5 sec. Manu. Operation : 5 sec.
Operating Temperature Range		0 – 40°C
Body(Case) Material		SPCC t1.6 mm
Dimensions		H2080 x W380 x D400 mm
Weight		Approx. 80 kg (excluding cylinder)
Discharge Method	Standard	Front Discharge (Discharge outlet provided)
	Option	1. Front Discharge + Free Access (Discharge beneath the floor) 2. Led from upper piping 3. Led from upper piping + Free Access (Discharge beneath the floor) 4. Exclusive for Free Access
Accessory	Main Unit	Control Part, Voice Alarm Device, Manual Actuating Button, Manu./Auto Changeover Key Switch, External Signal Transfer Contacts, Discharge Nozzle
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent
Extra Box		Electric type : 25 units max. Gas Pressure type : 50 units max.
Accessories		Terminator CRE, End-of-line resistor 20 k Ω 1/4, Spare fuses

Package Fire Extinguishing System

HFC-23 Package Extra Box



Specification		HFC-23 Package Extra Box	
		NP-F-E	NP-F-EG
Agent		HFC-23	
Storage Cylinder		68L, 41L, 24L, 20L, 14L	
Actuating Method		Electric	Gas Pressure
Designed Discharge Time		10 sec. or less	
Operating Temperature Range		0 – 40°C	
Body(Case) Material		SPCC t1.6 mm	
Dimensions		H2080 x W380 x D400 mm	
Weight		Approx. 75 kg (excluding cylinder)	
Discharge Method	Standard	Front Discharge (Discharge outlet not provided)	
	Option	1. Front Discharge + Free Access(Discharge beneath the floor) 2. Led from upper piping 3. Led from upper piping + Free Access (Discharge beneath the floor) 4. Exclusive for Free Access	
Accessory	Extra Unit	Discharge Nozzle	
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent	

Device	Model	Max.connetable number
Manual Acutuating Device	NRSA-4PE / NRSA-4HPE	5
Smoke Detector	Conventional Photoelectric Type 2KH2-LS, 2KW-P	20
Heat Detector	Convetional Fixed Temperature type 1CD-70-LS, 1CC2-70-LW, TCC-60-L	7
Disssharge indicator	ST-S (Indoor), ST-L(Outdoor)	8
Speaker	NK-305T (High Impedance)	Up to 20W
	NK-105 (Low Impedance)	Up to 1 unit (built-in speaker on the package is excluded)

Package Fire Extinguishing System

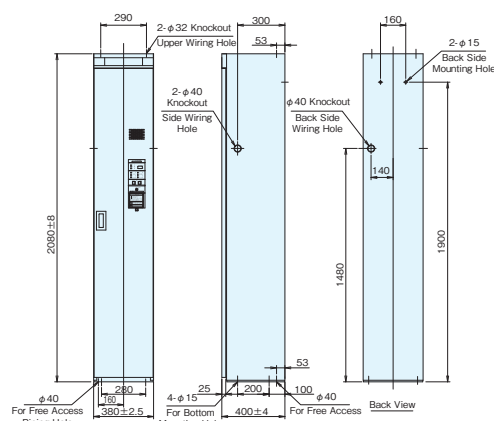
HFC-227ea Package System

HFC-227ea Package System uses HFC-227ea fire extinguishing agent. Therefore, there are following advantages:
Ozone-depletion potential (ODP) of zero; Low toxicity; Harmless to the human body

HFC-227ea Package



NP-E



(mm)

■ Specification

HFC-227ea Package Main Unit		
NP-E		
Specification		
Agent		HFC-227ea
Storage Cylinder		68L, 41L, 24L, 14L
Input Power Source		AC220V $\pm 10\%$ 50/60 Hz
Circuit Voltage		DC24V
Emergency Power Source		DC24V 3.5Ah/5Hr Ni-Cd Battery (Optionally available 6.0Ah)
Designed Discharge Time		10 sec. or less
Discharge Delay Time in Default Setting(Alterable)		Auto. Operation : 5 sec. Manu. Operation : 5 sec.
Operating Temperature Range		0 – 40°C
Body(Case) Material		SPCC t1.6 mm
Dimensions		H2080 x W380 x D400 mm
Weight		Approx. 80 kg (excluding cylinder)
Discharge Method	Standard	Front Discharge (Discharge outlet provided)
	Option	1. Front Discharge + Free Access (Discharge beneath the floor) 2. Led from upper piping 3. Led from upper piping + Free Access (Discharge beneath the floor) 4. Exclusive for Free Access
Accessory	Main Unit	Control Part, Voice Alarm Device, Manual Actuating Button, Manu./Auto Changeover Key Switch, External Signal Transfer Contacts, Discharge Nozzle
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent
Extra Box		Electric type : 25 units max. Gas Pressure type : 50 units max.
Accessories		Terminator CRE, End-of-line resistor 20 k Ω 1/4, Spare fuses

Package Fire Extinguishing System

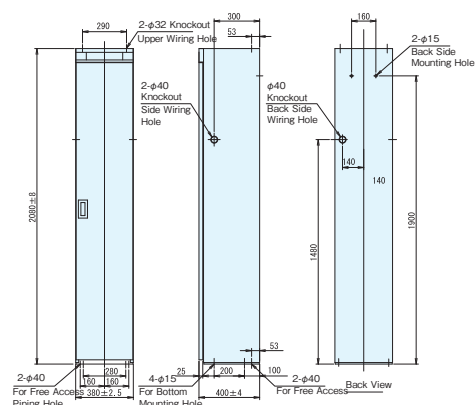
HFC-227ea Package Extra Box

Installed to increase the amount of fire extinguishing agent according to the size of the protected area. Contains one set of extinguishing gas storage cylinder. No control section provided. Interlocked with package operation.

HFC-227ea Package Extra Box



NP-E-E NP-E-EG



NP-E-E

(mm)

Specification

Specification		HFC-227ea Package Extra Box	
		NP-E-E	NP-E-EG
Agent		HFC-227ea	
Storage Cylinder		68L, 41L, 24L, 14L	
Actuating Method		Electric	Gas Pressure
Designed Discharge Time		10 sec. or less	
Operating Temperature Range		0 – 40°C	
Body(Case) Material		SPCC t1.6 mm	
Dimensions		H2080 x W380 x D400 mm	
Weight		Approx. 75 kg (excluding cylinder)	
Discharge Method	Standard	Front Discharge (Discharge outlet not provided)	
		1. Front Discharge + Free Access (Discharge beneath the floor) 2. Led from upper piping 3. Led from upper piping + Free Access (Discharge beneath the floor) 4. Exclusive for Free Access	
Accessory	Extra Unit	Discharge Nozzle	
		Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent	

Connectable device (Optional)

Device	Model	Max.connetable number
Manual Acutuating Device	NRSA-4PE / NRSA-4HPE	5
Smoke Detector	Conventional Photoelectric Type 2KH2-LS, 2KW-P	20
Heat Detector	Convetional Fixed Temperature type 1CD-70-LS, 1CC2-70-LW, TCC-60-L	7
Dissshare indicator	ST-S (Indoor), ST-L(Outdoor)	8
Speaker	NK-305T (High Impedance)	Up to 20W
	NK-105 (Low Impedance)	Up to 1 unit (built-in speaker on the package is excluded)

Package Fire Extinguishing System

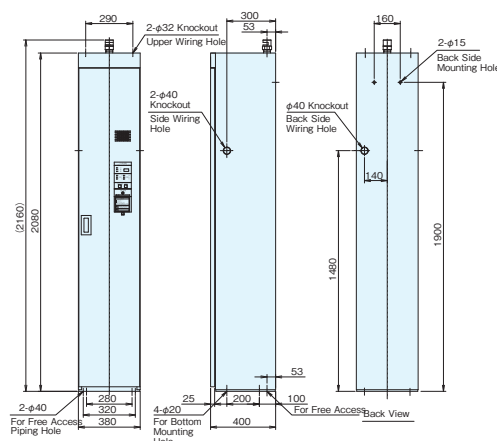
Gerbera (FK-5-1-12) Package System

Gerbera Package System uses FK-5-1-12 fire extinguishing agent. Therefore, there are following advantages: Excellent electrical insulation and suitable for electrical fire; Minimizing environmental effects; Ozone-depletion potential (ODP) of Zero; Less than 1 of Global Warming Potential Value (GWP); Harmless to the human body;

FK-5-1-12 Package



NP-K



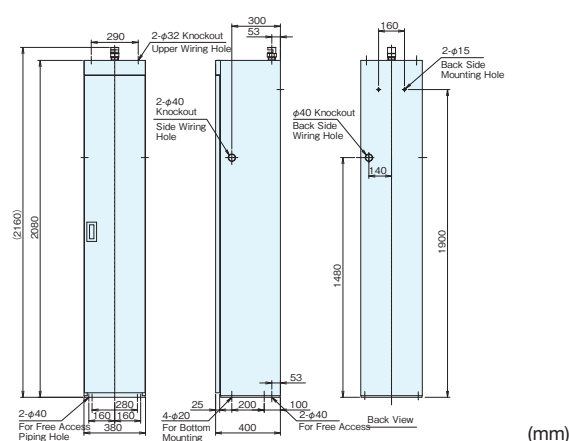
(mm)

■ Specification

Specification		FK-5-1-12 Package Main Unit
		NP-K
Agent		FK-5-1-12
Storage Cylinder		68L, 41L, 24L
Input Power Source		AC100V 50/60 Hz
Circuit Voltage		DC24V
Emergency Power Source		DC24V 6.0Ah Ni-Cd Battery
Designed Discharge Time		10 sec. or less
Discharge Delay Time in Default Setting(Alterable)		Auto. Operation : 5 sec. Manu. Operation : 5 sec.
Operating Temperature Range		0 – 40°C
Body(Case) Material		SPCC t1.6 mm
Dimensions		H2160 x W380 x D400 mm (68L, 41L) H1380 x W380 x D400 mm (24L)
Weight		Approx. 86 kg (excluding cylinder)
Discharge Method	Standard	Front Discharge with Nozzle
	Option	1. Front Discharge + Free Access with external piping (Discharge beneath the floor) 2. Led from upper piping 3. Led from upper piping + Free Access with external piping (Discharge beneath the floor)
Accessory	Main Unit	Control Part, Voice Alarm Device, Manual Actuating Button, Manu./Auto Changeover Key Switch, External Signal Transfer Contact, Discharge Nozzle
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent
Extra Box		50 units max.
Accessories		Terminator CRE, End-of-line resistor 20 kΩ 1/4, Spare fuses

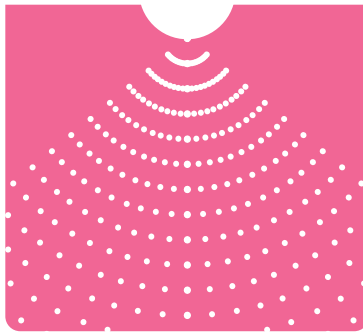
Package Fire Extinguishing System

FK-5-1-12 Package Extra Box



Specification		FK-5-1-12 Package Extra Box
		NP-K-EG
Agent		FK-5-1-12
Storage Cylinder		68L, 41L
Actuating Method		Gas Pressure
Designed Discharge Time		10 sec. or less
Operating Temperature Range		0 – 40°C
Body(Case) Material		SPCC t1.6 mm
Dimensions		H2160 x W380 x D400 mm (68L, 41L)
Weight		Approx. 68 kg (excluding cylinder)
Discharge Method	Standard	Front Discharge with Nozzle
	Option	1. Front Discharge + Free Access (Discharge beneath the floor) 2. Led from upper piping 3. Led from upper piping + Free Access (Discharge beneath the floor) 4. Exclusive for Free Access
Accessory	Extra Unit	Discharge Nozzle
	Cylinder	Cylinder Valve, Cylinder Valve Releaser, Extinguishing Agent

Device	Model	Max.connetable number
Manual Acutuating Device	NRSA-4PE / NRSA-4HPE	5
Smoke Detector	Conventional Photoelectric Type 2KH2-LS, 2KW-P	20
Heat Detector	Convnetional Fixed Temperature type 1CD-70-LS, 1CC2-70-LW, TCC-60-L	7
Disssharge indicator	ST-S (Indoor), ST-L(Outdoor)	8
Speaker	NK-305T (High Impedance)	Up to 20W
	NK-105 (Low Impedance)	Up to 1 unit (built-in speaker on the package is excluded)



Sprinkler Fire Extinguishing System

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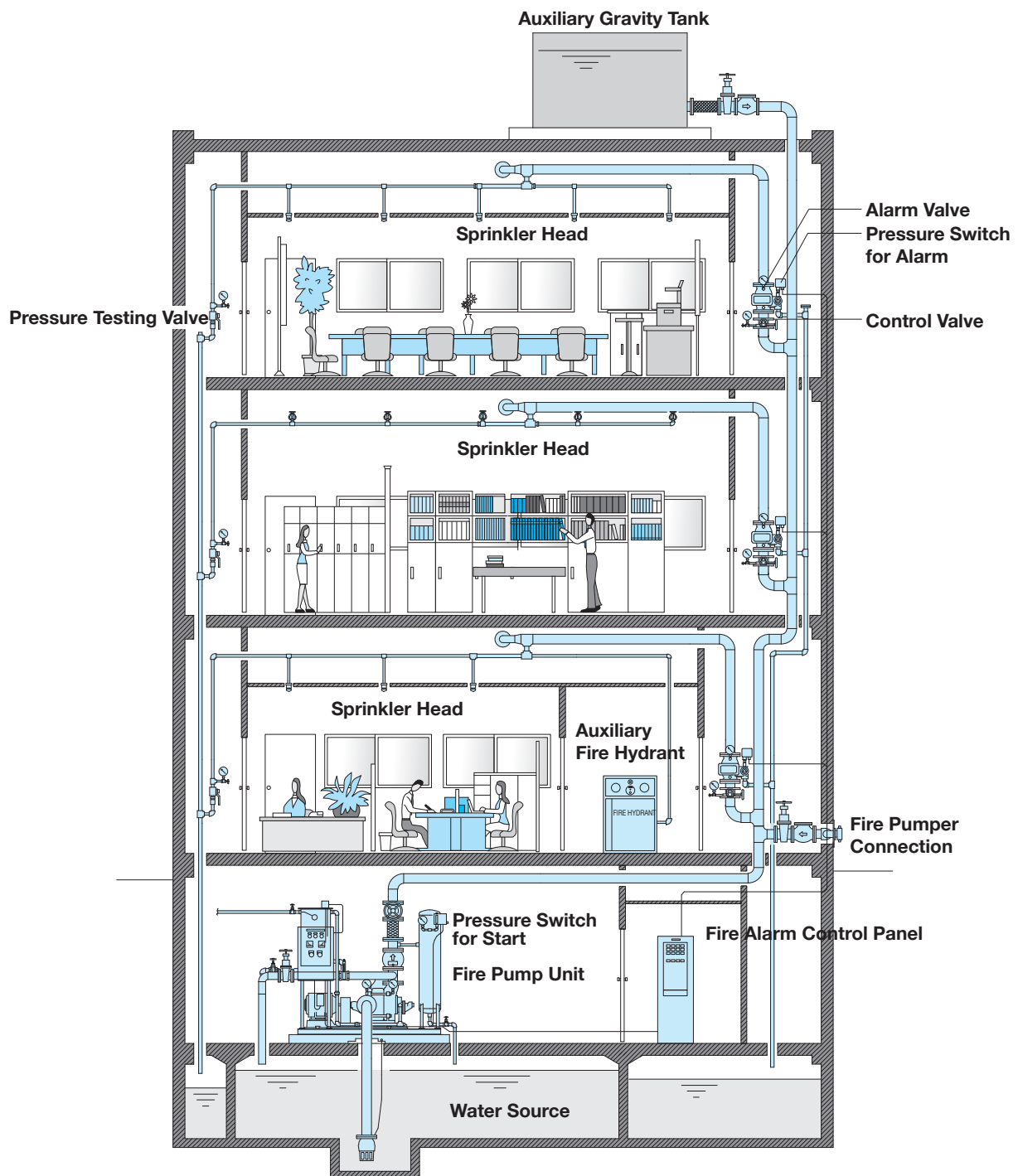
Sprinkler Fire Extinguishing System

System Configuration

Sprinkler systems are fixed system for automatically distributing water upon a fire in sufficient quantity either to extinguish or to prevent its spread at its incipient stage. Sprinkler systems are mainly classified as Wet-pipe system and Dry-pipe system. The wet-pipe system employs automatic sprinklers attached to a piping system containing water, while the dry-pipe system requires air under pressure in place of water. The dry-pipe system is installed in an area subject to freezing.

Sprinkler systems consist of sprinkler heads, alarm valves, pressure switches, control valves, piping, fire pump unit, fire water source, etc.

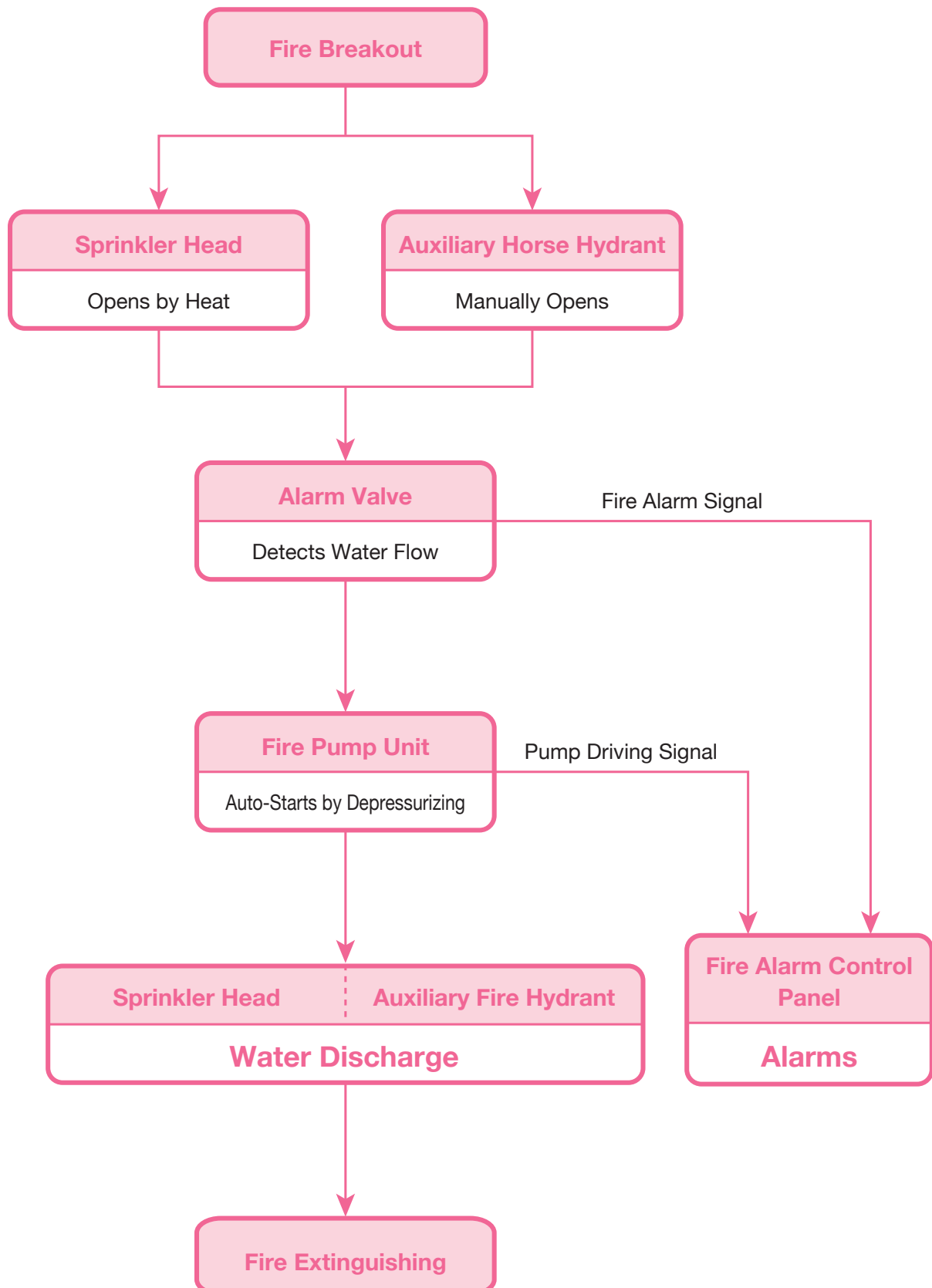
■ Wet-Pipe Closed Head Sprinkler System



Sprinkler Fire Extinguishing System

Operation Flow Chart

■ Wet-Pipe Closed Head Sprinkler System



Sprinkler Fire Extinguishing System

UL Listed Sprinkler Head

Closed type sprinkler heads operate at a predetermined temperatures, utilizing a fusible element, a portion of which melts, or frangible glass bulb containing liquid which breaks, allowing the plug in the orifice to be pushed out of the orifice by the water pressure in the fire sprinkler piping, resulting in water flow from the orifice. NITTAN provide UL listed glass bulb type sprinkler heads and JP certified fusible solder type sprinkler heads to markets.

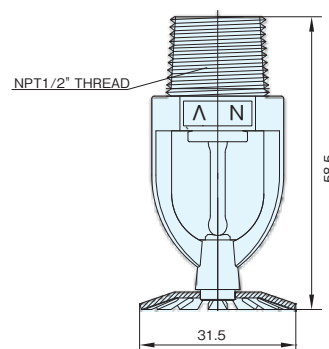
Pendent Type



NV005



NV006



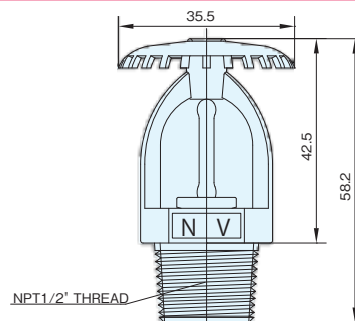
Upright Type



NV003



NV004



Specification	Upright		Pendent	
	NV003	NV004	NV005	NV006
Response & Bulb Nominal Diameter	Standard response φ5mm	Quick response φ3mm	Standard response φ5mm	Quick response φ3mm
Nominal Temp. Rating & Glass Bulb Color	155°F/68°C (Red) , 175°F/79°C (Yellow)			
Nominal K Factor	5.6 (U.S.) / 80L/min.			
Thread Size	NPT1/2			
Listing and Approval	UL			

Sprinkler Fire Extinguishing System

UL Listed Sprinkler Head

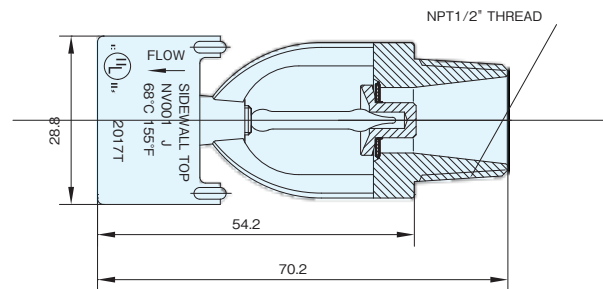
Sidewall Type



NV001



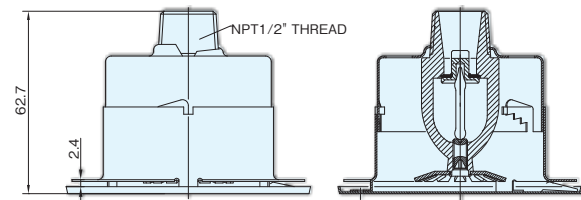
NV002



Concealed Type



NV007 / NV008



Specification	Sidewall		Concealed	
	NV001	NV002	NV007	NV008
Response & Bulb Nominal Diameter	Standard response φ5mm	Quick response φ3mm	Standard response φ5mm	Quick response φ3mm
Nominal Temp. Rating & Glass Bulb Color	155°F/68°C (Red) , 175°F/79°C (Yellow)			
Nominal K Factor	5.6(U.S.) / 80L/min.			
Thread Size	NPT1/2			
Listing and Approval	UL			

Sprinkler Fire Extinguishing System

JP certified Sprinkler Head

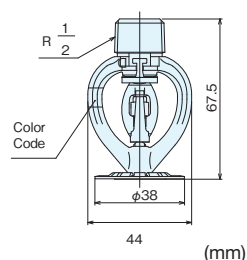
* "JP certified" means that equipment is certified by JFEII, Japan Fire Equipment Inspection Institute.

JP certified sprinkler heads are configured by metal parts fixed with fusible solder which can be melt at a predetermined temperature. After solder is melt, a plug into sprinkler orifice falls down and water start flow down to hazard zones. Fusible solder type is tougher for accidental impact than glass valve and then often used in quake-prone areas.

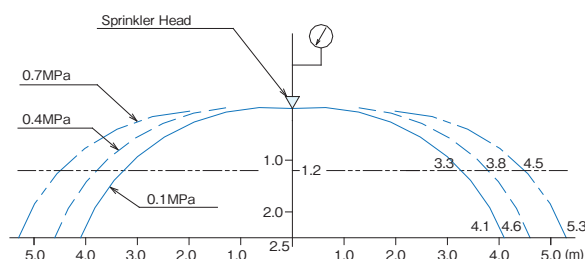
Pendent Type



DP



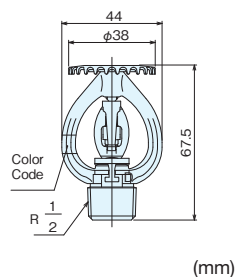
Discharge Pattern



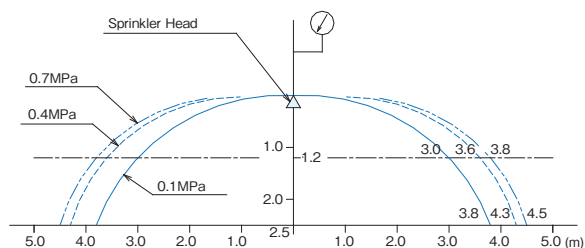
Upright Type



DU



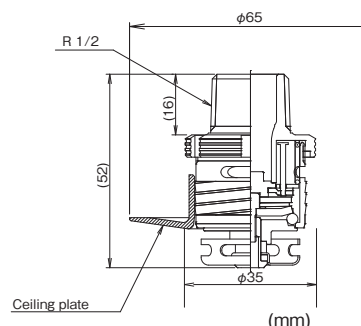
Discharge Pattern



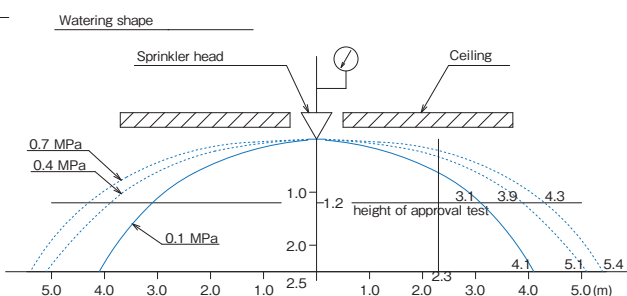
Flush Type



KFII



Discharge Pattern



Specification	Pendent			Upright			Flush		
	DP72	DP96	DP139	DU72	DU96	DU139	KFII72	KFII96	KFII139
Nominal temperature	72°C	96°C	139°C	72°C	96°C	139°C	72°C	96°C	139°C
Nominal flow rate	80L/min.	80L/min.	80L/min.	80L/min.	80L/min.	80L/min.	80L/min.	80L/min.	80L/min.
Thread Size	R 1/2	R 1/2	R 1/2	R 1/2	R 1/2	R 1/2	R 1/2	R 1/2	R 1/2
Effective discharge radius	r2.3m	r2.3m	r2.3m	r2.3m	r2.3m	r2.3m	r2.3m	r2.3m	r2.3m
Ceiling Plate (Optional)	S-6M, S-9M, S-15M			N/A			K-5mm, K-10mm, K-15mm		

Sprinkler Fire Extinguishing System

Sprinkler Head

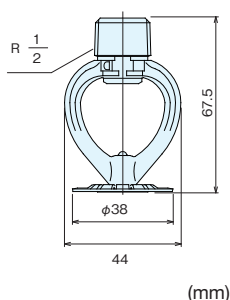
Open Type Sprinkler Head

Open type sprinkler heads are used in deluge sprinkler systems like a system installed at a stage of a theater.

Pendent Type



DP-O

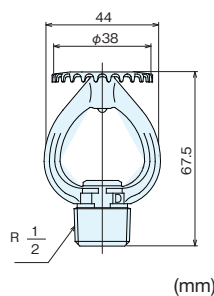


(mm)

Upright Type



DU-O

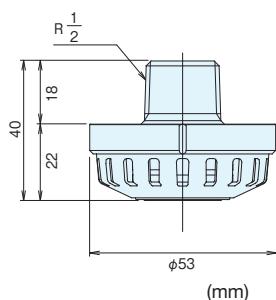


(mm)

Multi Slit Type



MFJ III -O



(mm)

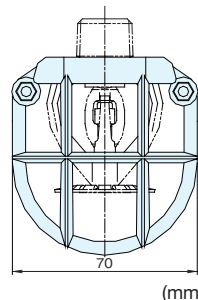
Accessory

Ceiling plates are used for concealing mounting holes.

Protection Guard



S-G

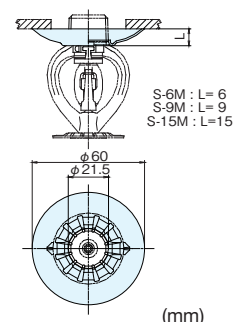


(mm)

Ceiling Plate for DP/DO



S-6M

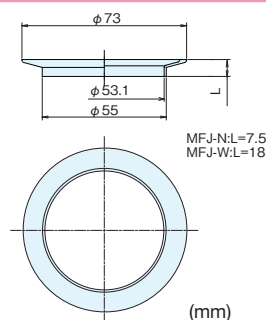


(mm)

Ceiling Plate for MFJ



MFJ-N



(mm)

Specification	Pendent	Upright	Multi Slit
	DP-O	DU-O	MFJ III -O
Temperature	N/A	N/A	N/A
Rated Flow (@0.1MPa)	80L/min	80L/min	80L/min
Thread Size	R 1/2	R 1/2	R 1/2
Mounting	Pendant	Upright	Pendant
Effective Radius	r2.3m	r2.3m	r2.3m
Ceiling Plate (Optional)	S-6M S-9M S-15M	N/A	MFJ-N MFJ-W

Sprinkler Fire Extinguishing System

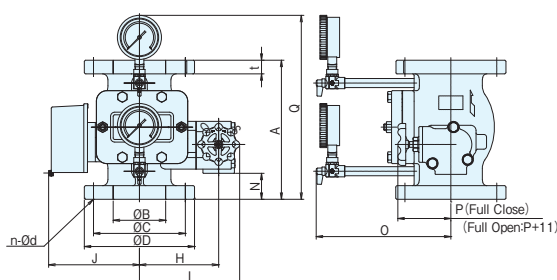
Alarm Valve

Alarm Valves are used to give an alarm signal to a control panel and a fire pump unit when detecting water flow in its pipings. Alarm valves prevent a reverse flow of water or air pressure from the secondary side into the primary side. In case a fire sprinkler is activated due to fire, the alarm valve will open and permit water flow into the system and a pressure switch gives a signal to activate the fire-pump.

Wet-Pipe Alarm Valve



XV II



Dimensions

Model	Size	A	B	C	D	H
XV II 65	65A	240	65	140	175	148
XV II 80	80A	260	80	150	185	151
XV II 100	100A	265	100	175	210	151
XV II 125	125A	286	125	210	250	193
XV II 150	150A	290	150	240	280	193

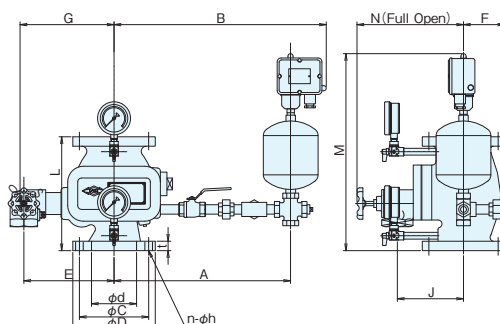
I	J	N	O	P	Q	t	n-φd
188	181	41.5	(274)	(101)	(345)	22	4-19
191	172	46.5	(247)	(101)	(348)	22	8-19
191	172	49.5	(257)	(101)	(351)	24	8-19
233	197	55	(294)	(101)	(366)	24	8-23
233	197	57	(294)	(101)	(368)	26	8-23

(mm)

Wet-Pipe Alarm Valve with Water Motor Gong



SV-P2 III



Dimensions

Model	Size	n-φd	d	C	D	L
NITTAN SV100-P2 III A	100A	8-19	100	175	210	290
NITTAN SV100-P2 III B	100A	8-19	100	175	210	290
NITTAN SV150-P2 III A	150A	8-23	150	240	280	360
NITTAN SV150-P2 III B	150A	8-23	150	240	280	360

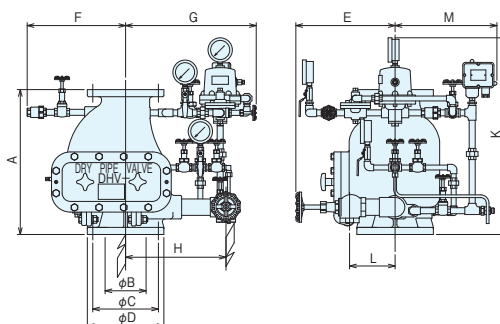
B	F	G	A	E	M	N	t	J
500	105	275	420	235	600	280	24	169
500	105	275	420	235	600	280	24	169
530	140	300	450	260	620	280	26	169
530	140	300	450	260	620	280	26	169

(mm)

Dry-Pipe Alarm Valve



DHV



Dimensions

Model	Size	A	B	C	D
DHV4 II	100A	430	100	175	210
DHV6 II	150A	530	150	240	280

E	F	G	H	K	L	M	n-φd
340	410	500	320	710	150	440	8-19
340	430	500	345	730	150	440	8-23

(mm)

Specification	Wet-Pipe Valve							Dry-Pipe Valve	
	XV II 65	XV II 80	XV II 100	XV II 125	XV II 150	SV100-P2 III	SV150-P2 III	DHV4 II	DHV6 II
Size	65A	80A	100A	125A	150A	100A	150A	100A	150A
Working Water Pressure Range (MPa)	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.25-1.4	0.3-1.4
Equivalent Pipe Length (m)	5.9	5.0	14.5	15.9	29.1	8.7	10.0	6.4	24.1
Installation Direction	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Weight (kg)	27	28	32	47	54	45	75	95	145

Sprinkler Fire Extinguishing System

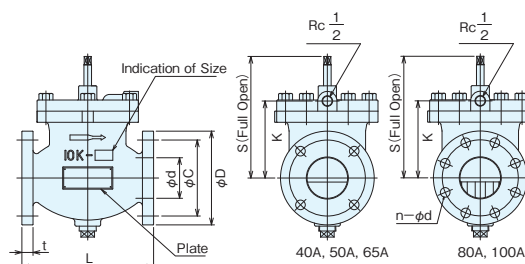
Deluge Valve

Deluge valves are installed in every protected area of a deluge sprinkler system and a foam system. Inside the valve body, there is a small chamber to control the valve operation. When the manual actuating valve or the detecting sprinkler head is opened, pressurized water/air is supplied to or released from the small chamber, which causes the valve to open.

Wet-Pipe Deluge Valve, Depressurizing Open Type



XDV/NDV/N-DVII



Dimensions

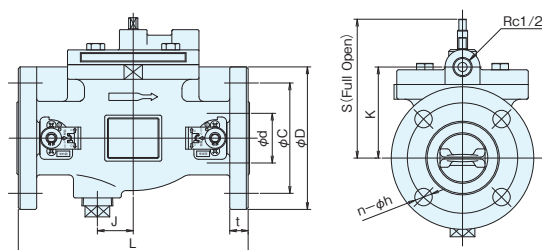
Model	Size	L	S	φC	φD	K	t	n-φh
XDV40	40	180	150	105	140	100	20	4-19
XDV50	50	190	150	120	155	100	20	4-19
NDV65	65	220	165	140	175	120	22	4-19
N-DVII 80	80	260	240	150	185	152	22	8-19
N-DVII 100	100	300	270	175	210	174	24	8-19

(mm)

Wet-Pipe Deluge Valve, Depressurizing Open, with built-in Butterfly Valves Type



NDVW/XDVW



Dimensions

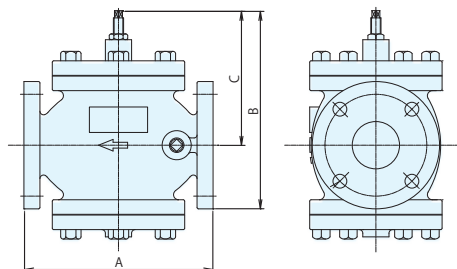
Model	Size	L	S	φC	φD	A	t	n-φh
XDVW40	40	200	149	105	140	96	20	4-19
XDVW50	50	210	149	120	155	96	20	4-19
NDVW65	65	290	165	140	175	120	19	4-19

(mm)

Wet-Pipe Deluge Valve, Pressurizing Open Type



YDVK



Dimensions

Model	Size	A	B	C
YDVK-65	65	260	311	185
YDVK-80	80	300	369	229
YDVK-100	100	330	400	249
YDVK-125	125	360	502	304
YDVK-150	150	440	536	311

(mm)

Specification	XDV		NDV	N-DVII		XDVW		NDVW
	XDV40	XDV50	NDV65	N-DVII80	N-DVII100	XDVW40	XDVW50	NDVW65
Size	40	50	65	80	100	40	50	65
Max.Flow (L/Min.)	450	700	1200	1800	2100	450	700	1200
Working Water Pressure (MPa)	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4
Equivalent Pipe Length (m)	8.7	13.6	19.3	23.2	44.7	12.2	18.9	19.7
Installation	Horizontal	Horizontal	Horizontal	Horizontal / Vertical	Horizontal / Vertical	Horizontal	Horizontal	Horizontal
Weight (kg)	13	14	21	30	44	11	12	22

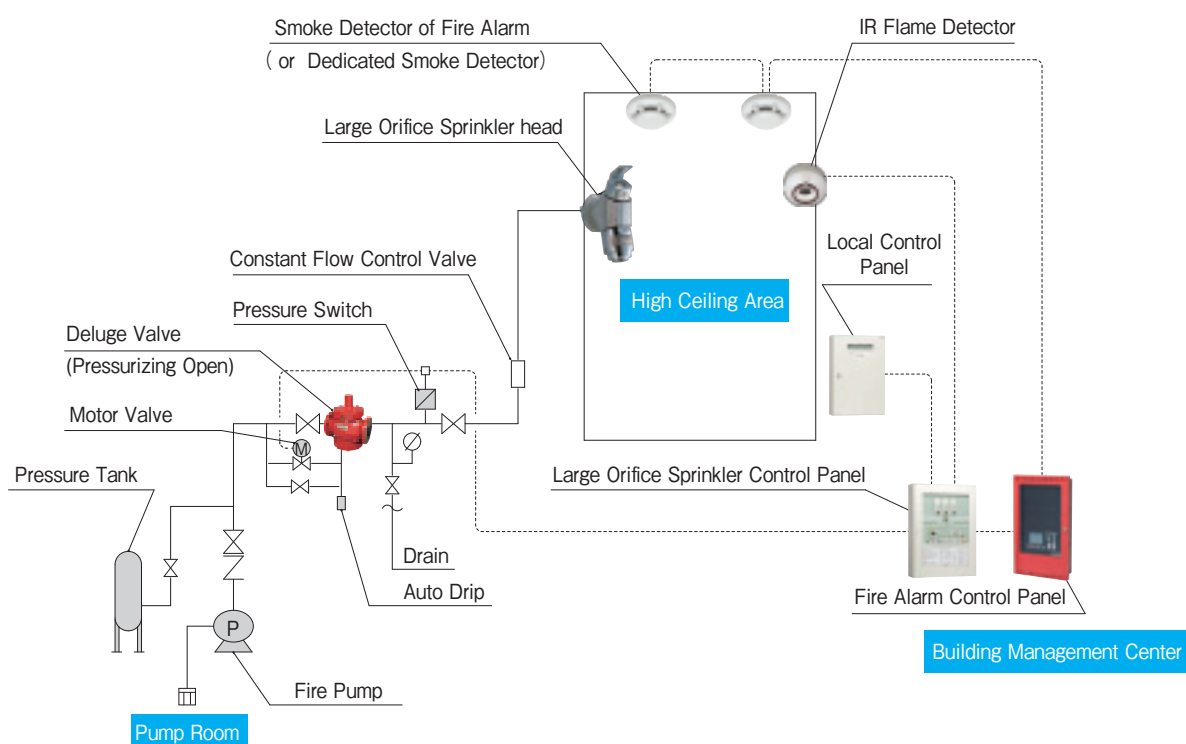
Specification	YDVK-65	YDVK-80	YDVK-100	YDVK-125	YDVK-150
Size	65	80	100	125	150
Max.Flow (L/Min.)	1200	1800	2100	3300	4800
Working Water Pressure (MPa)	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4	0.15-1.4
Equivalent Pipe Length (m)	20.8	28.3	45.3	50.6	60.7
Installation	Horizontal / Vertical	Horizontal / Vertical	Horizontal / Vertical	Horizontal / Vertical	Horizontal / Vertical
Weight (kg)	32.4	40.7	56.0	91.2	117.5

Sprinkler Fire Extinguishing System

Large Orifice Sprinkler System

Large orifice sprinkler systems are intended for the protection of high ceiling areas such as huge exhibition halls and atriums where the standard sprinkler system is unable to effectively detect and extinguish a fire.

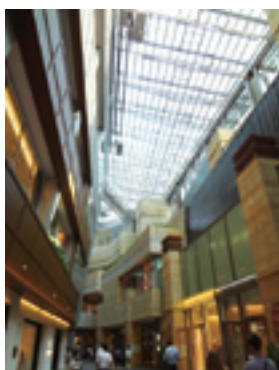
■ System Configuration



■ Applications



Exhibition Hall



Atrium

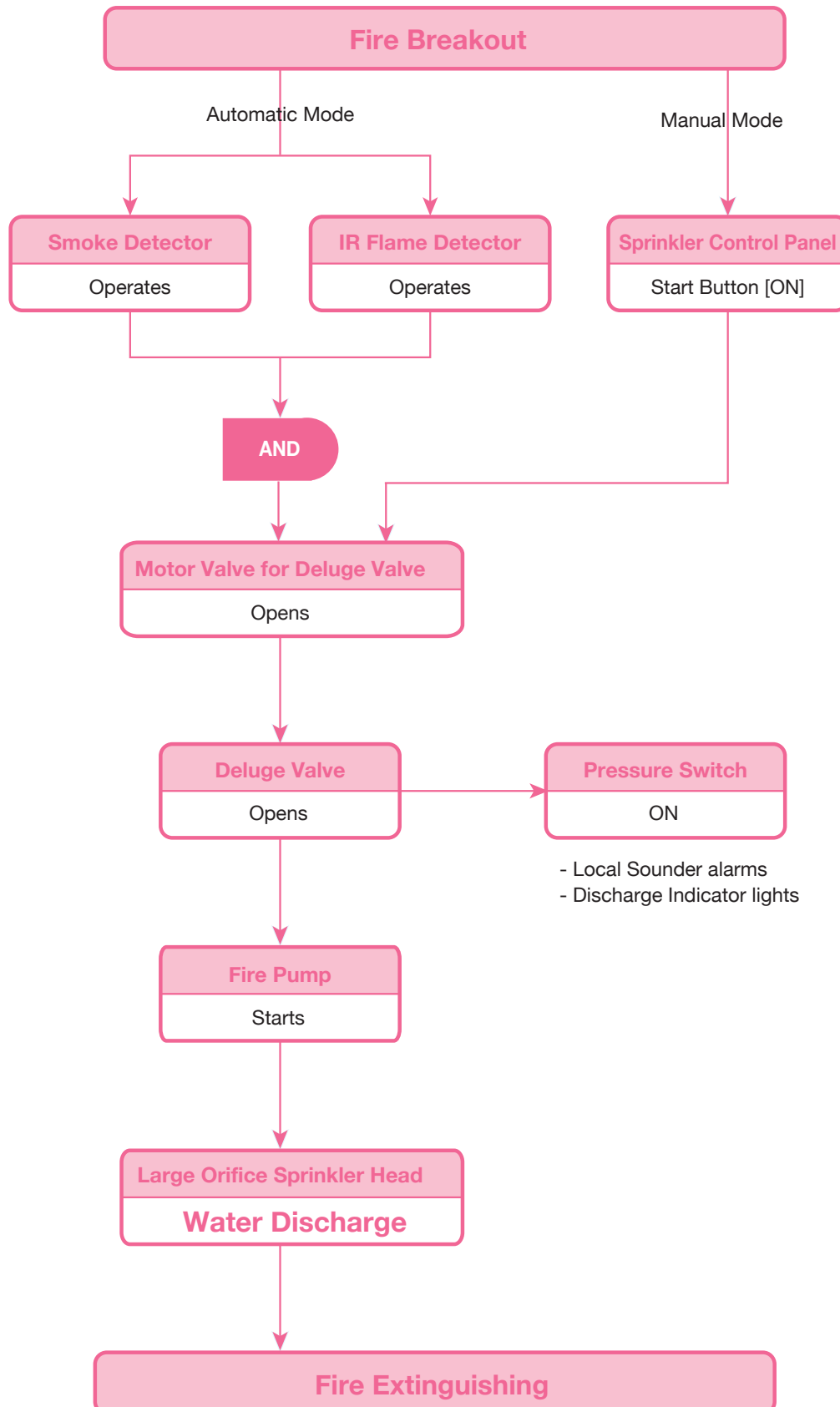


Entrance Hall

Sprinkler Fire Extinguishing System

Operation Flow Chart

■ Large Orifice Sprinkler System



Sprinkler Fire Extinguishing System

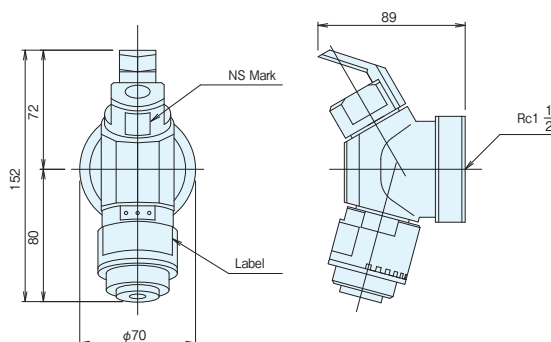
Large Orifice Sprinkler Head / Control Panel

Large orifice sprinkler heads are available in both wall-mount type and ceiling-mount type in order to cope with any size and shape of high ceiling areas. One large orifice sprinkler system can be controlled by both of a main control panel and a local control panel.

Large Orifice Sprinkler Head, Wall Mount Type



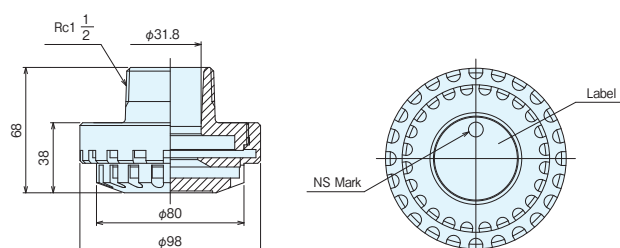
NJ10



Large Orifice Sprinkler Head, Ceiling Mount Type



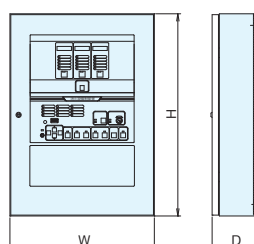
HNC7.5



Large Orifice Sprinkler Control Panel



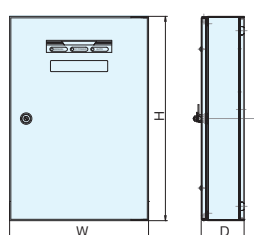
NDH series



Large Orifice Sprinkler Local Control Panel



NDHS



Sprinkler Fire Extinguishing System

Large Orifice Sprinkler Head / Control Panel

Large Orifice Sprinkler Head

Specification	Wall Mount Type						
	NJ10	NJ15	NJ20	HNW-S	HNW-M	HNW-L	NJ10A
Discharge Pressure (MPa)	0.35 - 0.5	0.35 - 0.5	0.35 - 0.5	0.35 - 0.5	0.35 - 0.5	0.35 - 0.5	0.35 - 0.5
Discharge Flow (L/min)	385 - 460	560 - 670	530 - 634	350 - 420	410 - 490	550 - 660	385 - 460
Mounting Height (m)	5 - 11	6 - 16	6 - 16	3 - 13	3 - 13	3 - 13	4 - 11
Effective Discharge Range (m)	L : -1 to 10 W : 7	L : -1 to 15 W : 7	L : -1 to 20 W : 5	L : -0.16 to 9 W : 7 (*1)	L : -0.16 to 10 W : 7 (*2)	L : 0.16 to 17 W : 4	L : -1 to 11.5 W : 5

Specification	Ceiling Mount Type					
	HNCⅡ2.3	HNC4.0	HNC5.0	HNC7.5	HNC9.0	HNC11.0
Discharge Pressure (MPa)	0.1 - 0.4	0.25 - 0.5	0.25 - 0.5	0.25 - 0.5	0.25 - 0.4	0.35 - 0.5
Discharge Flow (L/min)	84 - 168	300 - 425	480 - 680	1000 - 1420	1800 - 2280	2400 - 2860
Mounting Height (m)	2 - 18	6 - 18	6 - 18	6 - 18	6 - 18	6 - 18.5
Effective Discharge Range (m)	r2.3	r4.0	r5.0	r7.5	r9.0	r11.0

Large Orifice Sprinkler Control Panel

Specification	Main Control Panel						
	NDH0-nL-E						
Number of zones	1	3	5	10	15	20	25
Dimensions	W500 x H700x D160		W500 x H1100 x D160	W500 x H1500x D200		W600 x H2000x D350	
Weight	28 kg		33 kg	43 kg		131 kg	
Mount style	Wall mount					Floor standing	
Power supply	AC220V±10% 50/60Hz						
Power capacity	0.36kVA						
Standby battery	Sealed nickel-cadmium battery 1-15L: DC24V 3.5Ah 20-25L: DC24V 6.0Ah						
Output for motor valve	DC24V 500mA						
Local indicators	Discharge, Fire, Detector A, Flame detector, Motor valve						
Control switches	Discharge, Discharge stop, Control switchover, Auto/Manual						
Intercom	Communicaiton between main control panel and local control panel						
Output signal power capacity	DC24V 2A						

Specification	Local Control Panel				
	NDH0-nL-E				
Number of zones	1	3	5	10	
Dimensions	W340 x H500 x D105				
Weight	9 kg				
Mount style	Wall mount				
Input power	DC24V				
Indicators	Auto/Manual, Cener / Local				
Control switches	Discharge, Discharge stop, Control switchover				

Others

Model	Description	Specification
2RA1-P	IR Flame Detector	DC24V, L-C:65mA, P-C:100mA, Detection Range:17m-30m, Detection Angle:100° Max
FKD-90	Flame Detector Angle Adjuster with B3-A base	Adjustable Angle:0° to 90° (5° pitch)
SBSP7-1/2	Motor Valve	DC24V, Rated Current: Less than 120mA, Peak Current: Less than 350mA
M20C-15-0	Solenoid Valve	Working Pressure Range: 0.05-1.6MPa (Water or Oil)
PL-650SW	Pressure Switch	Operating Pressure: 0.03MPa
YADR-15	Auto Drip	15A

Sprinkler Fire Extinguishing System

Pre-action Sprinkler System Control Panel

Pre-action sprinkler systems are specialized for use in locations where accidental activation is especially undesirable, such as in museums with rare art works, manuscripts, or books and data centers, for protection of computer equipment from accidental water discharge.

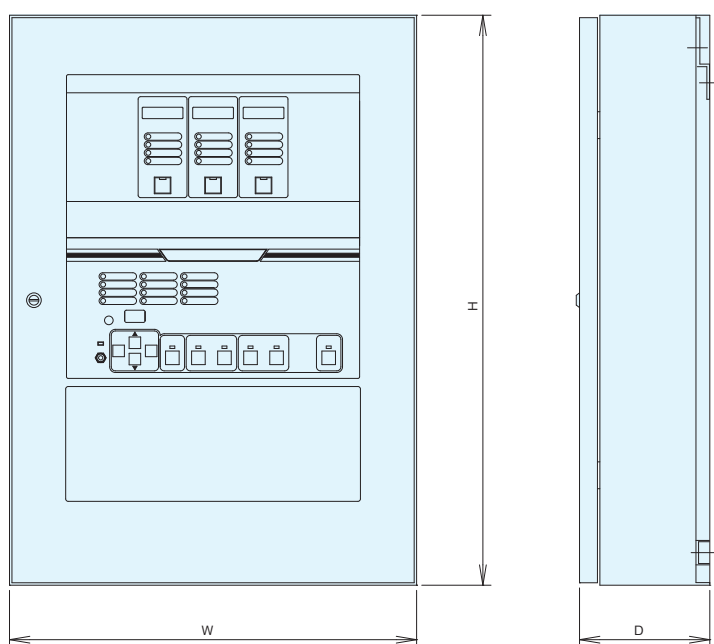
Pre-action systems are hybrids of wet, dry, and deluge systems.

Typically the activation of a heat or smoke detector starts to open deluge valve and water discharge from sprinkler heads consequently.

Pre-action Sprinkler System Control Panel



NDP0-3L-E



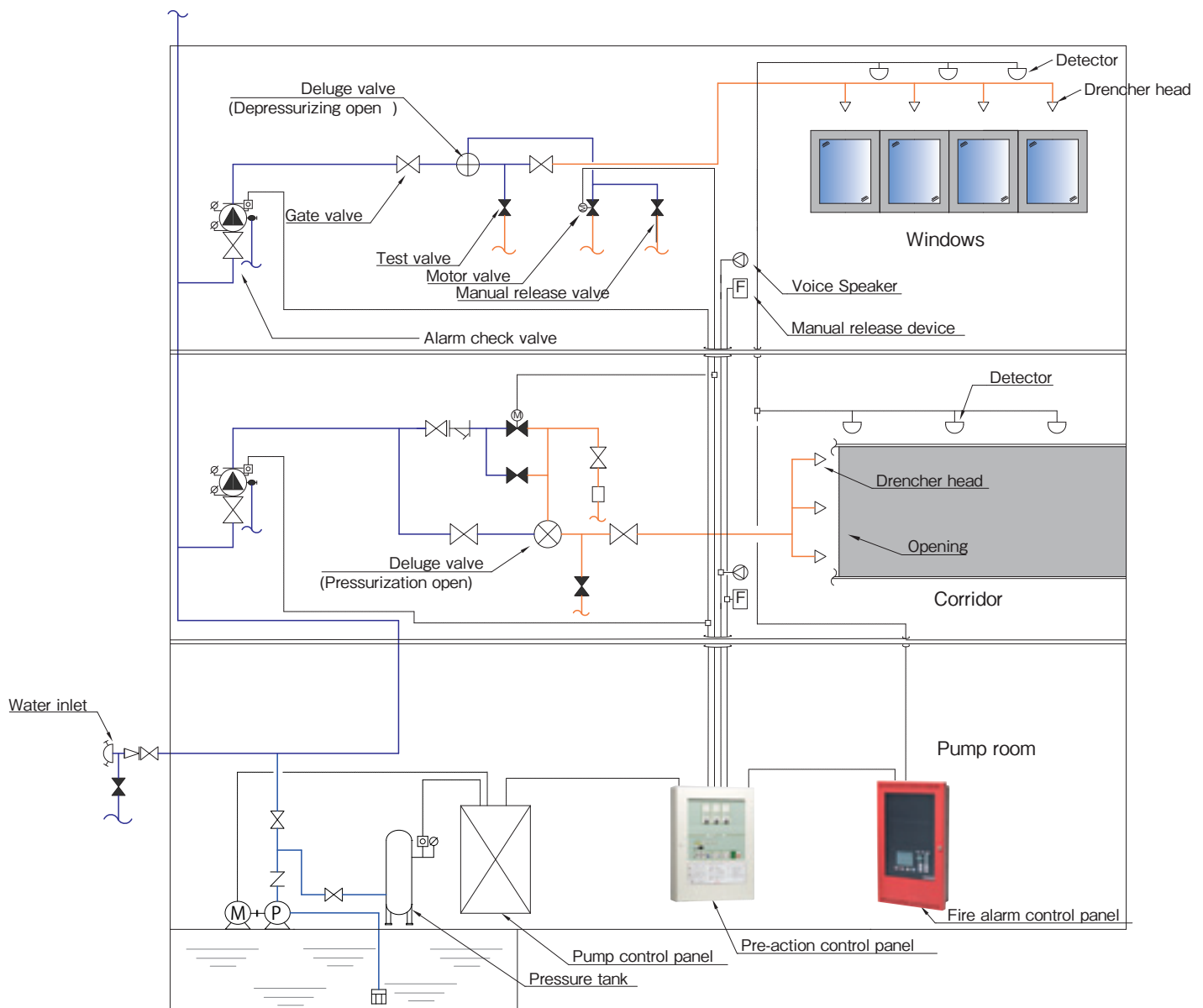
Specification	Main control panel						
	NDP0-nL-E						
Number of zones	1	3	5	10	15	20	25
Dimensions	W500 x H700 x D160		W500 x H1100 x D160	W500 x H1500 x D200		W600 x H2000 x D350	
Weight	27 kg	28 kg	33 kg	43 kg		131 kg	
Mount style	Wall mount					Floor standing	
Power supply	AC220V±10% 50/60Hz						
Power capacity	0.36kVA						
Standby battery	Sealed nickel-cadmium battery 1L: DC24V 1.65Ah 3-15L: DC24V 3.5Ah 20-25L: DC24V 6.0Ah						
Output for motor valve	DC24V 500mA						
Local indicators	Pressure Switch (Water flow) ,Detector, Secondary Low-Pressure Switch, Motor valve						
Control switches	Actuating, Reset						
Intercom	Communication between main control panel and local control panel						
Output signal power capacity	DC24V 2A						

Sprinkler Fire Extinguishing System

Drencher System

Drenchers are a system of water heads that are used to protect against a fire from neighboring area. Discharged water from the drenchers block off radiation heat and a fire effectively. Difference between sprinklers and drenchers is that all nozzles in the drencher system are activated simultaneously by quick-opened deluge valves, whereas individual nozzles in a sprinkler system open when activated by melted plate into a sprinkler head. They tend to be positioned on roofs, over windows and external openings.

■ System Configuration

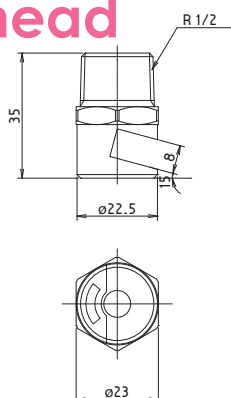


Sprinkler Fire Extinguishing System

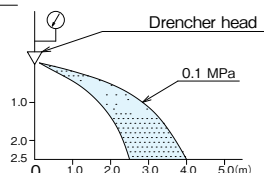
Drencher head



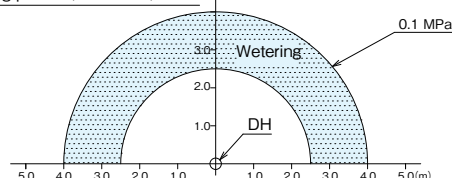
DH series



Watering pattern (Vertical)

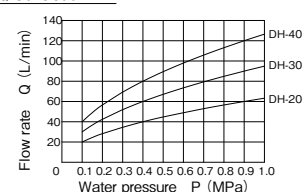


Watering pattern (Horizontal)

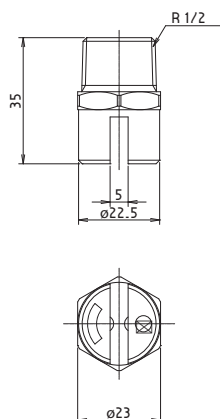


DH type

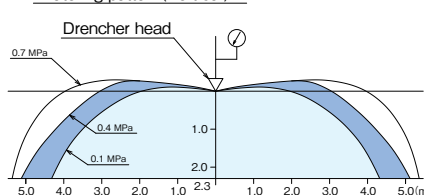
P-Q Correlation



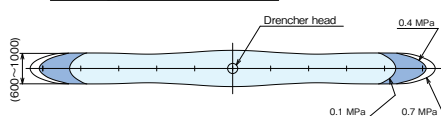
DHC series



Watering pattern (Vertical)

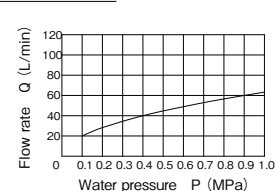


Watering pattern (Horizontal)

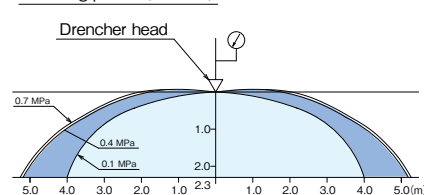


DHC-20

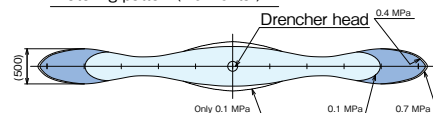
P-Q Correlation



Watering pattern (Vertical)

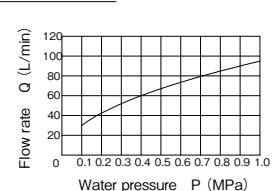


Watering pattern (Horizontal)

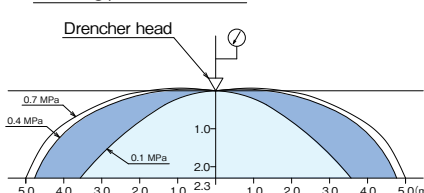


DHC-30

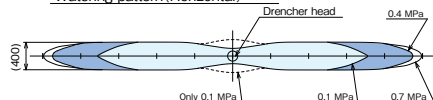
P-Q Correlation



Watering pattern (Vertical)

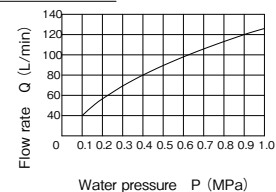


Watering pattern (Horizontal)

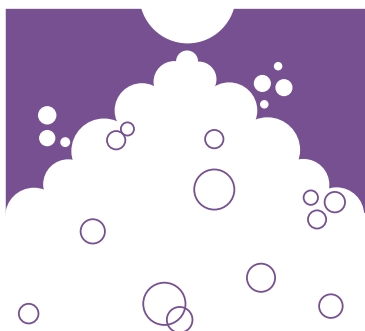


DHC-40

P-Q Correlation



Specification	Drencher Head					
	DH-20	DH-30	DH-40	DHC-20	DHC-30	DHC-40
Watering type	Horizontal			Vertical		
Type	Open type					
Flow rate	20 L/min.	30 L/min.	40 L/min.	20 L/min.	30 L/min.	40 L/min.
Thread Size	R 1/2					
Weight	Approx. 75g			Approx.55g		
Fishish	Chrome					



Foam Fire Extinguishing System

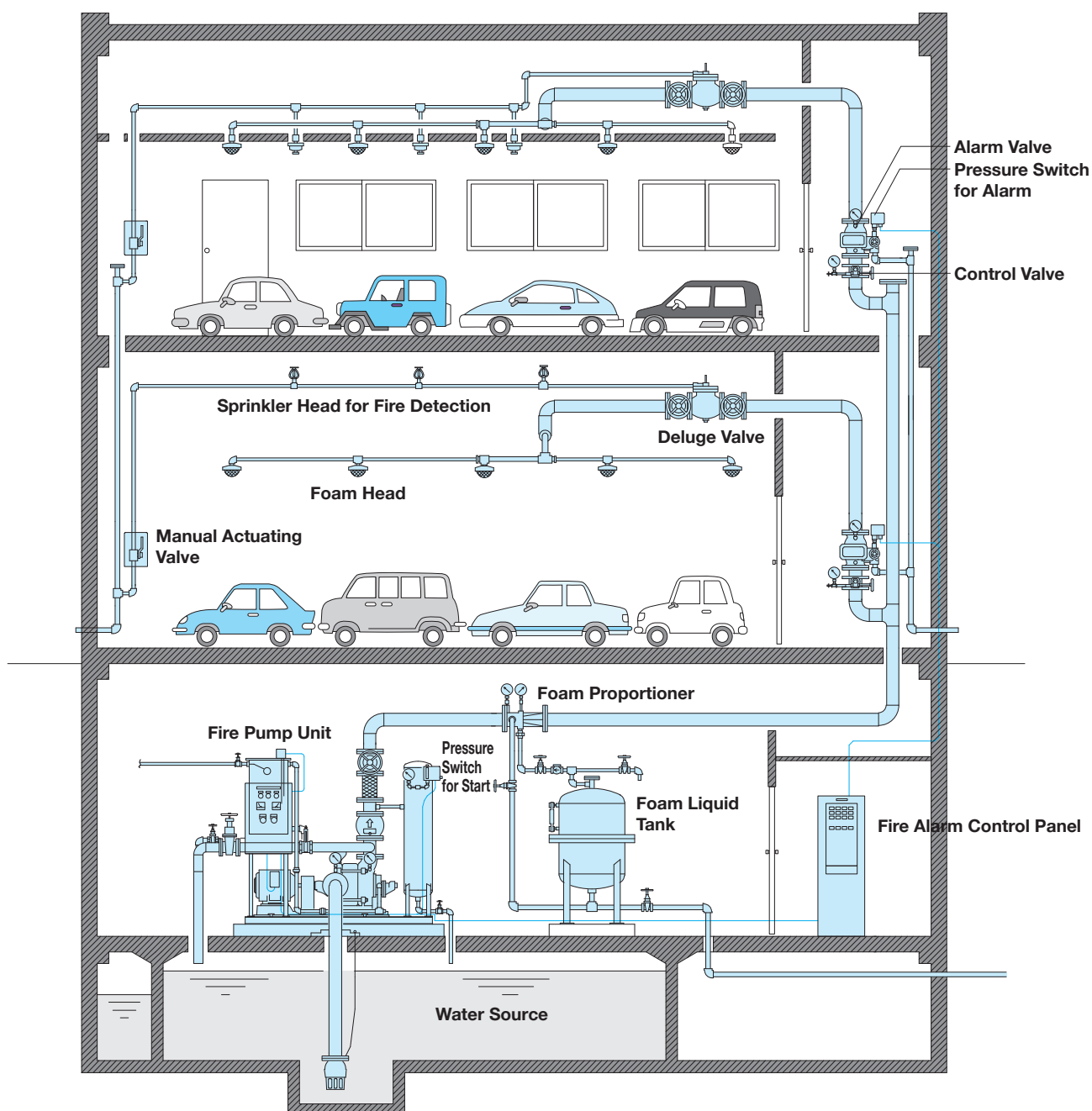
System Configuration	54
Operation Flow Chart	55
Foam Discharge Head	56
Foam Liquid Tank / Proportioner	57
Manual Actuating Valve / Self Contained Foam Fire Hydrant	58
High Expansion Foam System Configuration	59
High Expansion Foam Generator (Blower type)	60
High Expansion Foam Generator (Aspirator type)	61

Foam Fire Extinguishing System

System Configuration

Foam fire extinguishing systems are suited for suppressing a fire where water would be ineffective and/or dangerous, such as oil refineries, oil storage, depots car parks, garages, warehouses containing high hazardous material, heliports, aircraft hangers, etc. There are two basic types of systems; a fixed system and a portable system. Foam concentrates are mainly classified as aqueous film forming foam (AFFF) concentrates, synthetic foam concentrates and protein foam concentrates.

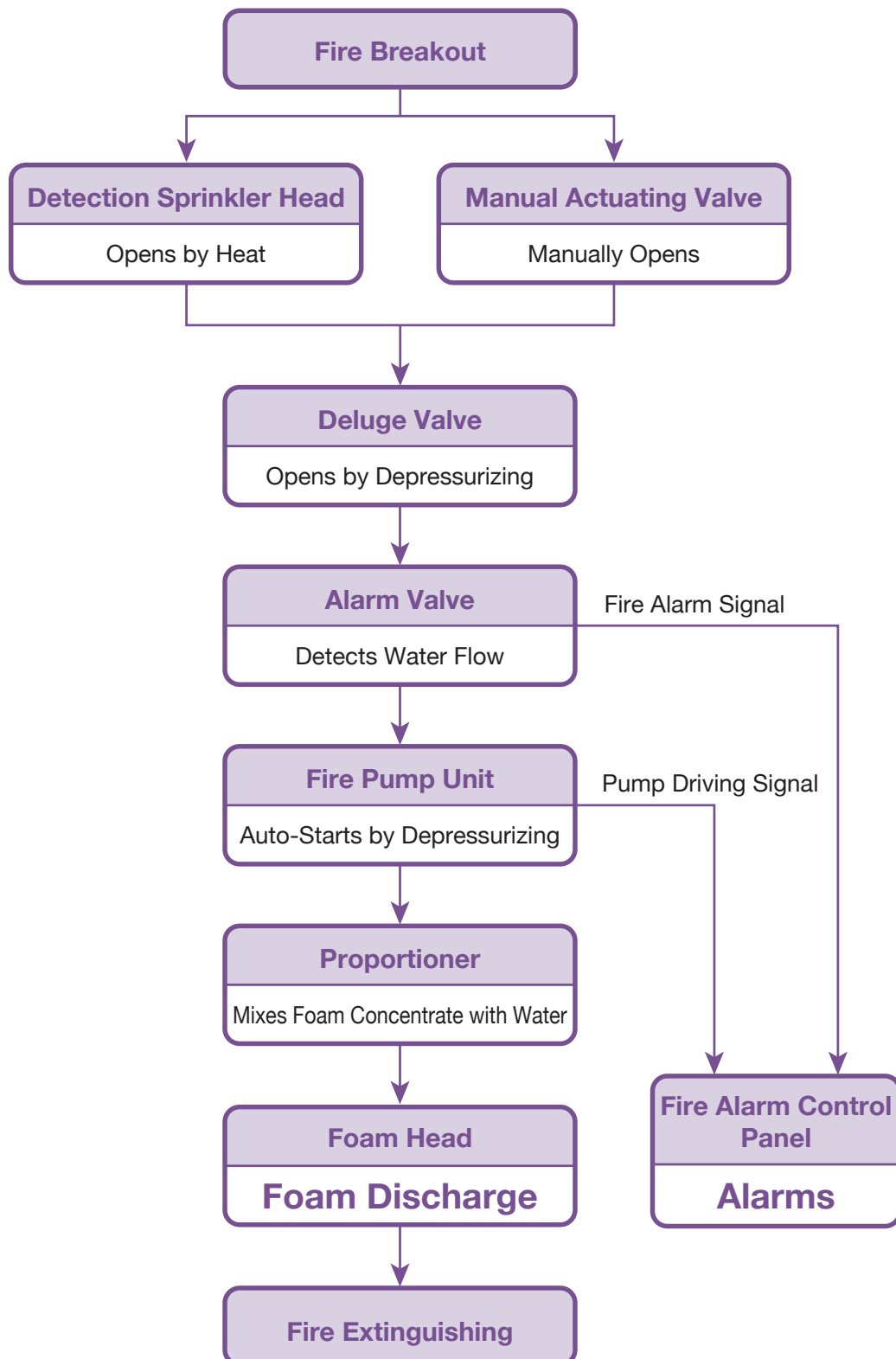
■ Fixed Foam System (Low-Expansion Foam)



Foam Fire Extinguishing System

Operation Flow Chart

Foam Fire Extinguishing System



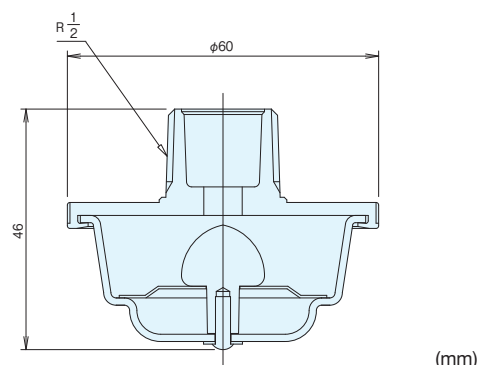
Foam Discharge Head

Foam discharge heads can be used in combination with designated concentrate. Nittan's heads are applicable with aqueous film forming foam concentrate (AFFF) of 1 %, 3% and 6%. The ceiling mount type is designed to discharge foam vertically in a solid corn pattern, while the side wall mount type horizontally gives a downward paraboloid pattern discharge in a semicircle-shape. The side wall mount type is commonly installed at the bottom or middle section of the mechanical parking apparatus.

Foam Discharge Head for AFFF (Ceiling Mount Type)



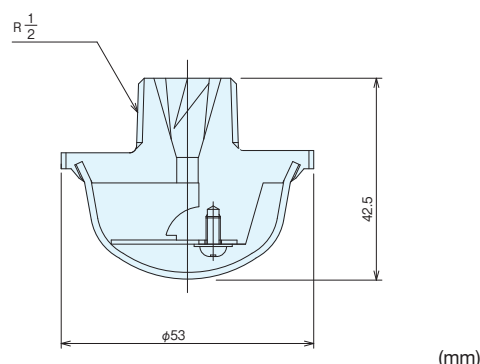
NFL35



Foam Discharge Head for AFFF (Side Wall Mount Type)



FL20



Specification

Specification	Foam Discharge Head				
	NFL35			FL20	
Standard Discharge Quantity	35 L / min.			20 L / min.	
Standard Discharge Pressure	0.25 MPa			0.25 MPa	
Strength Test Pressure	0.9 MPa			0.9 MPa	
Mounting Pitch	3 m			3 m	
Effective Radius	2.1 m			2.1 m	
Foam Concentrate	AFFF 6%	AFFF 3%	AFFF 1%	AFFF 3%	AFFF 1%
Mounting Height	1.5 – 11.5 m	1.5 – 11.5 m	1.5 – 8.0 m	1.5 – 2.1 m	1.5 – 2.1 m
Concentration Range	6 – 8 %	3 – 4 %	1 – 1.33 %	3 – 4 %	1 – 1.33 %
Discharge Pressure Range	0.25 – 0.6 MPa			0.25 – 0.6 MPa	
Discharge Quantity Range	35 – 53.5 L / min.			20 – 29.5 L / min.	

Foam Fire Extinguishing System

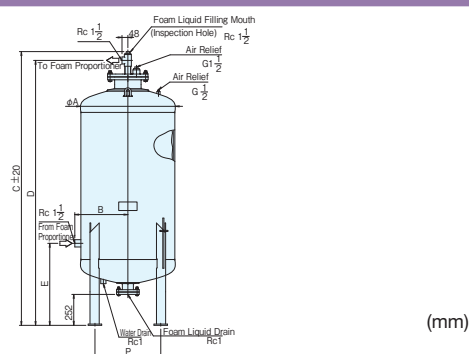
Foam Liquid Tank / Proportioner

The foam liquid tank is made of steel, consisting of storage tank, diaphragm bag and measuring mouth. It stores the foam liquid concentrate of aqueous film forming foam (AFFF). Upon an operation of a sprinkler detector head, the foam fire pump is activated, causing water to pressurize diaphragm inside, supplying water to the foam proportioner.

Foam Liquid Tank



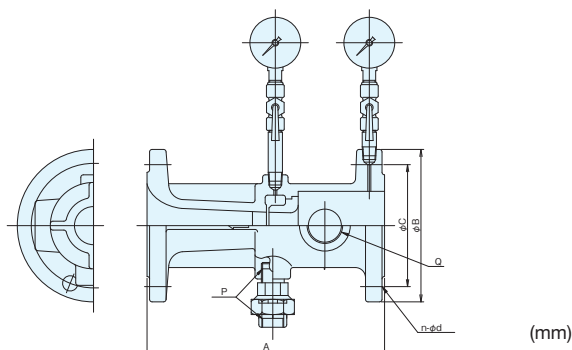
FST Series



Foam Proportioner



PPV Series



Specification

Specification	Foam Liquid Tank										
	Max. Capacity	Available Capacity	Empty Weight	A	B	C	D	E	P	Max. Working Pressure	Pressure Test
FST-200F	212 L	200 L	205 kg	568	325	1671	1598	620	372	1.4 MPa	2.1 MPa
FST-300F	313 L	300 L	260 kg	568	325	2113	2040	620	372	1.4 MPa	2.1 MPa
FST-400F	416 L	400 L	295 kg	668	375	2059	1986	620	456	1.4 MPa	2.1 MPa
FST-600F	616 L	600 L	395 kg	774	425	2225	2152	620	528	1.4 MPa	2.1 MPa
FST-800F	816 L	800 L	545 kg	874	475	2287	2214	620	612	1.4 MPa	2.1 MPa
FST-1000F	1016 L	1000 L	640 kg	978	525	2291	2218	650	684	1.4 MPa	2.1 MPa

Specification	Foam Proportioner										
	Size	Flow Capacity (L/min.)	Weight	A	B	C	P	Q	n-φ d	Max. Working Pressure	Pressure Test
PPV-40-3L	40A	60-400	6 kg	200	140	105	R1/2	R1	4 - 19	1.4 MPa	2.1 MPa
PPV-50-3L	50A	80-500	8 kg	200	155	120	R1/2	R1	4 - 19	1.4 MPa	2.1 MPa
PPV-65-3L	65A	150-900	11 kg	220	175	140	R3/4	R1 1/4	4 - 19	1.4 MPa	2.1 MPa
PPV-80-□	80A	180-1200	14 kg	280	185	150	R3/4	R1 1/4	8 - 19	1.4 MPa	2.1 MPa
PPV-100-□	100A	350-2100	19 kg	320	210	175	R1	R1 1/2	8 - 19	1.4 MPa	2.1 MPa
PPV-125-□	125A	500-3400	29 kg	400	250	210	R1	R1 1/2	8 - 23	1.4 MPa	2.1 MPa
PPV-100-1L	100A	280-2300	19 kg	320	210	175	R1	R1 1/2	8 - 19	1.4 MPa	2.1 MPa
PPV-125-1L	125A	315-3800	29 kg	400	250	210	R1	R1 1/2	8 - 23	1.4 MPa	2.1 MPa

*□ : Applicable for AFFF3% = 3L, Surfactant foam = K, Protein foam = T

*1L : Applicable for AFFF1%

Foam Fire Extinguishing System

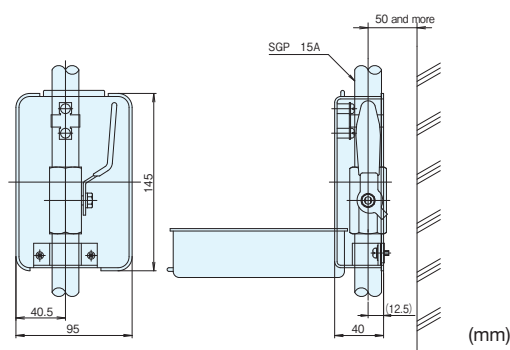
Manual Actuating Valve Self Contained Foam Fire Hydrant

Manual actuating valves are used to start discharging the foam into the fire zone by hand. Self contained foam fire hydrants are apparatuses containing a foam tank in itself, allowing easy installation.

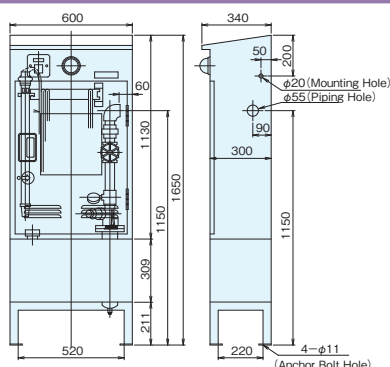
Manual Actuating Valve



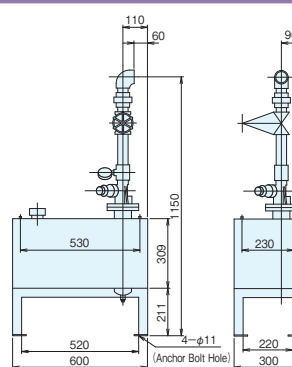
FSB-2M



Self Contained Foam Fire Hydrant



FH100 Cabinet Type



FH100 Open Type

(mm)

Specification

Specification	Manual Actuating Valve
	FSB-2M
Working Pressure	2.0 MPa
Strength Test Pressure	3.0 MPa

Specification	Self Contained Foam Fire Hydrant	
	FH100 Cabinet Type	FH100 Open Type
Standard Discharge Quantity	100 L / min. (@0.5 MPa)	100 L / min. (@0.5 MPa)
Discharge Range	10 m @0.5 MPa	10 m @0.5 MPa
Minimum Working Pressure	0.37 MPa	0.37 MPa
Maximum Working Pressure	0.8 MPa	0.8 MPa
Proportioning Method	Pressure Proportioner	Pressure Proportioner
Foam Liquid Tank	50 L	50 L
Foam Concentrate	Surfactant / Protein	Surfactant / Protein
Hose Size	φ 40 mm x 20 m	φ 40 mm x 20 m
Connecting Pipe Size	40 A	40 A
Color	7.5R4/14 (Red)	7.5R4/14 (Red)

Foam Fire Extinguishing System

High Expansion Foam System

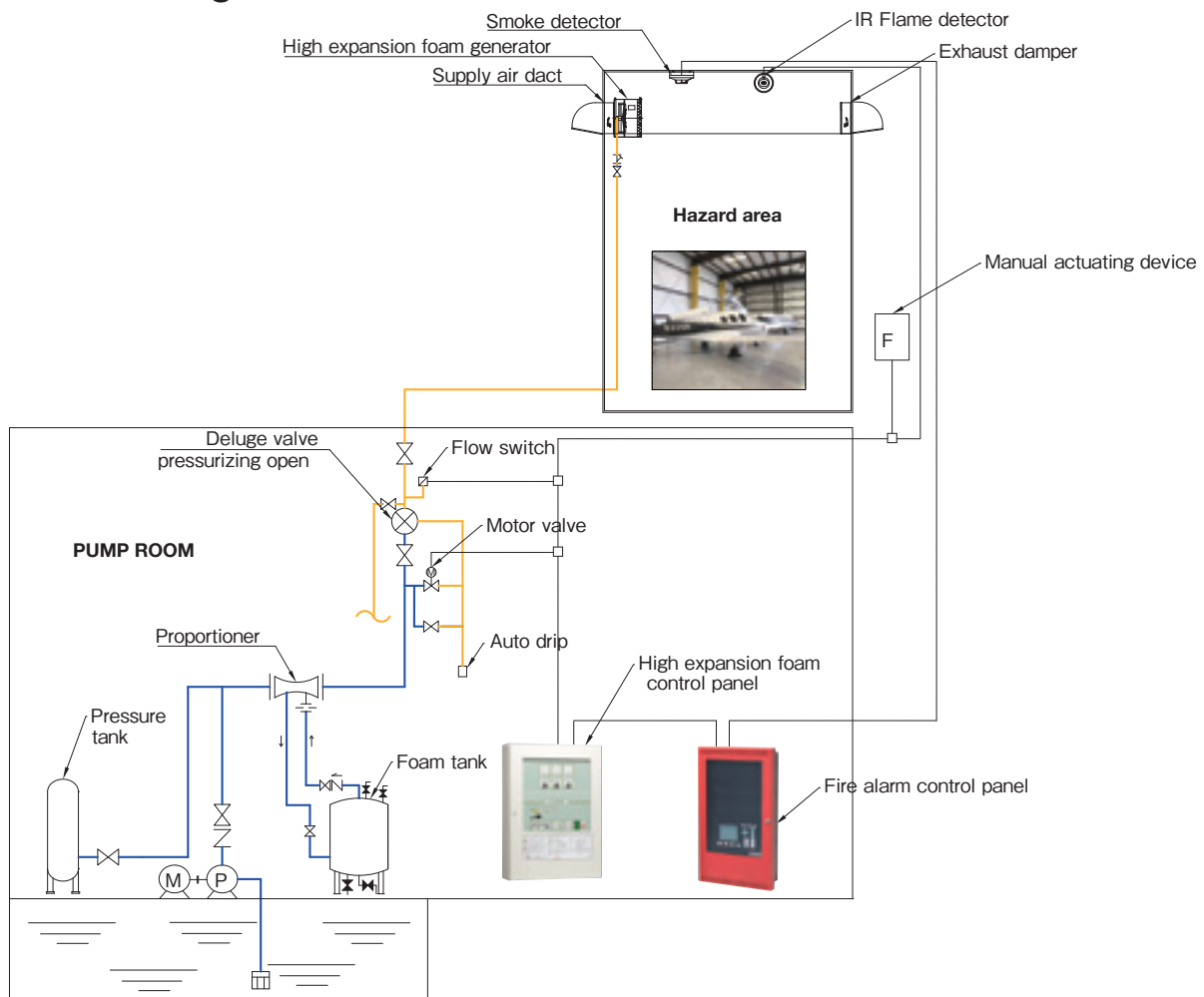
High expansion foam system is a kind of foam fire suppression systems, using high Expansion foam.

Its role is to cool the fire and to coat the fuel, preventing its contact with oxygen, resulting in suppression of the combustion.

High-expansion foams have an expansion ratio over 80–1000 and are suitable for enclosed spaces such as hangars, car parking lot and warehouse of designated combustibles, where quick filling is needed.



System Configuration



Applications



Hangar



Car repair shop



Warehouse

Foam Fire Extinguishing System

High Expansion Foam Generator / Blower Type

Water flow makes a fan built in foam generator rotate after a deluge valve is opened.

Due to that no electric power is required, this system has no any trouble like wire breakdown. Air blow from the fan makes high expansion foam. The foam generator overwhelms plenty of foam to extinguish fire in short time.

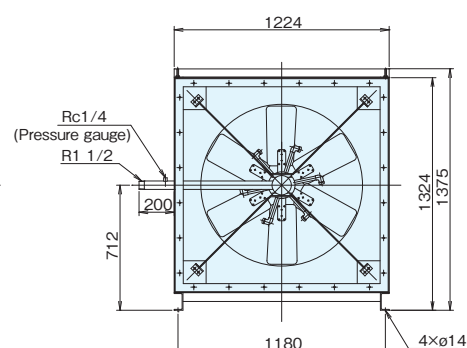
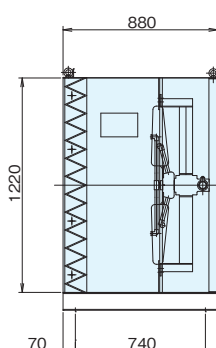
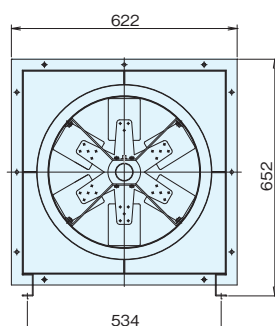
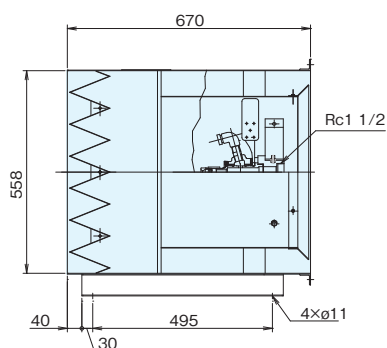
High Expansion Foam Generator / Blower Type



Jet-X2



Jet-X5



Specification

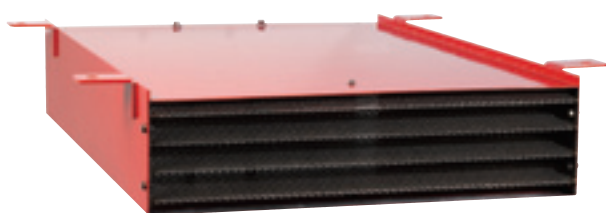
Specification	Blower Type High Expansion Foam Generator	
	Jet-X2	Jet-X5
Rated pressure	0.4MPa	0.5MPa
Rated water flow	125L/min.	260L/min.
Rated discharge volume	52 m³/min.	156 m³/min.
Dedicated foam	NITTAN JET foam 3S, 3% surfactant foam concentrate	
Expansion ratio	400	600
Material	Main body: SPCC Fan: SUS304 Foaming screen: SUS304	Main body: SPCC Fan: SUS304 Foaming screen: SUS304
Weight	41kg	130kg

Foam Fire Extinguishing System

High Expansion Foam Generator / Aspirator Type

On aspirator type high expansion foam generator, high expansion foam is produced by aspirator built-in the foam generator. On this system, no electric power is required. In addition, this system consists of less mechanical parts and then, it is reliable with maintenance-free. The foam generator overwhelms plenty of foam to extinguish fire in short time.

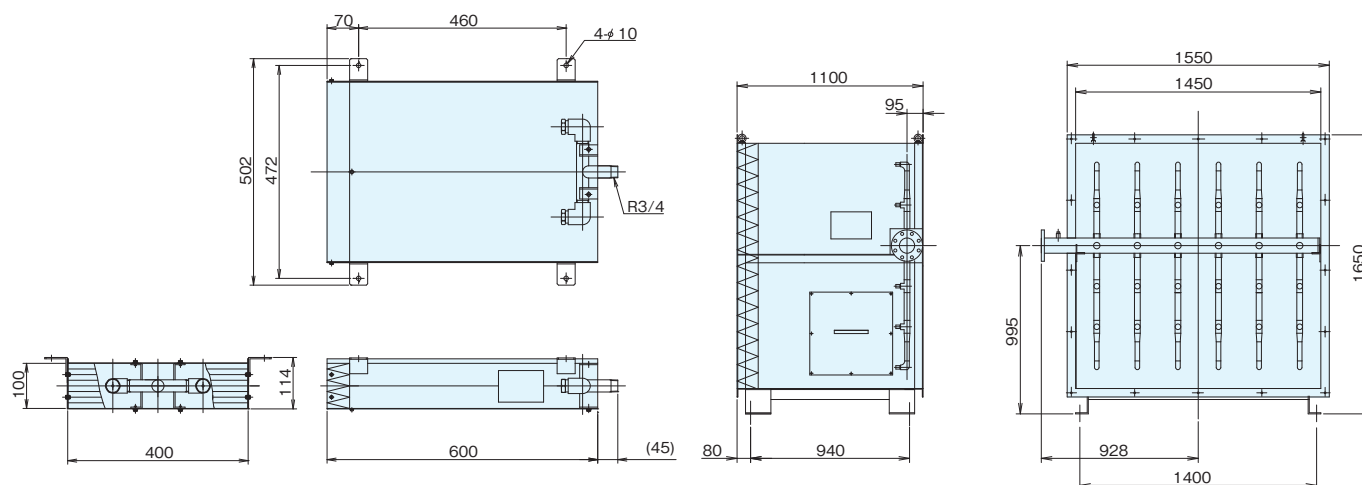
High Expansion Foam Generator / Aspirator Type



AFD-50



AFD-1000



Specification

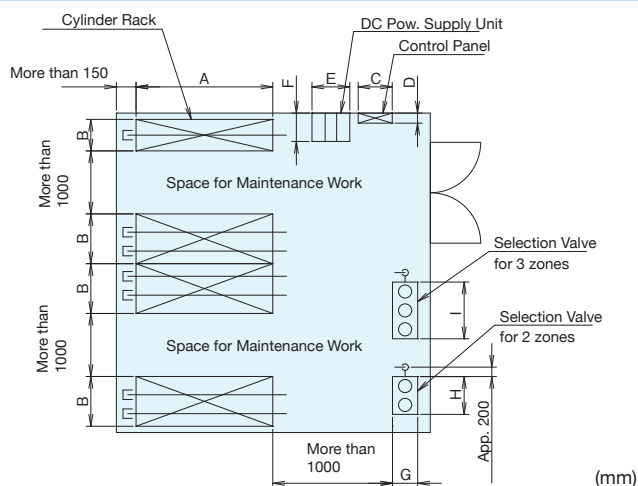
Specification	Aspirator Type High Expansion Foam Generator	
	AFD-50	AFD-1000
Rated pressure	0.4MPa	0.5MPa
Rated water flow	50L/min.	1000L/min.
Rated discharge volume	10 m³/min.	500 m³/min.
Dedicated foam	NITTAN JET foam 3S, 3% surfactant foam concentrate	
Expansion ratio	200	500
Material	Main body: SPCC Nozzle :C3604 Foaming screen: SUS304 Pipe: SUS304	Main body: SPCC Nozzle :C3604 Foaming screen: SUS304 Pipe: SUS305
Weight	7kg	230kg

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Installation Space for Gaseous System

Installation Space for Gaseous Fire Extinguishing System



Dimensions

N2 Cylinder Rack			
Cylinder	A	B	Height
One line, One side open			
2	670	500	2335
3	970	500	2335
4	1270	500	2335
5	1570	500	2335
6	1870	500	2335
7	2170	500	2335
Two lines, One side open			
4	670	790	2335
6	970	790	2335
8	1270	790	2335
10	1570	790	2335
12	1870	790	2335
14	2170	790	2335

FK -5-1 -12 Cylinder Rack			
Cylinder	A	B	Height
One line, One side open			
2	670	510	2255
3	970	510	2255
4	1270	510	2255
5	1570	510	2255
6	1870	510	2255
7	2170	510	2255
Two lines, One side open			
4	670	790	2255
6	970	790	2255
8	1270	790	2255
10	1570	790	2255
12	1870	790	2255
14	2170	790	2255

Control Panel			
Zone	C	D	Height
1	540	160	500
3	540	160	500
5	540	160	500
10	540	160	780
15	540	160	1500
20	540	160	1500

DC Pow. Supply Unit			
Capacity	E	F	Height
3.5Ah	510	180	450
5.0Ah	510	180	450
8.0Ah	510	180	450
10.0Ah	510	180	450
12.0Ah	600	450	750
16.0Ah	600	450	750
20.0Ah	600	450	750
30.0Ah	600	450	750

Selection Valve for 2 zones(reference)			
Size	G	H	Height
25A	328	970	More than 800
32A	334	970	
40A	344	970	
50A	360	1020	
65A	388	1020	
80A	395	1020	Less than 1500
100A	462	1020	
125A	504	1070	
150A	524	1070	

Selection Valve for 3 zones(reference)			
Size	G	I	Height
25A	328	1340	More than 800
32A	334	1340	
40A	344	1340	
50A	360	1390	
65A	388	1390	
80A	395	1390	Less than 1500
100A	462	1390	
125A	504	1440	
150A	524	1440	

Gaseous Agent Quantity Calculation

Calculation Method of Required Agent Quantity

Required Quantity of Gaseous Fire Extinguishing Agent

$$G \text{ (kg)} = V \text{ (m}^3\text{)} \times K \text{ (kg/m}^3\text{)}$$

G : Required quantity of gaseous fire extinguishing agent (kg) or (m³) *1

V*2 : The volume of protected area (m³) *3

K : **Design coefficient** (kg/m³) or (m³/m³) *1

*1 The unit symbol of (m³) or (m³/m³) is applied to Nitrogen.

*2 In case where there is any airtight structure made of incombustible material fixed to the space, its volume is to be subtracted from that of protected area.

*3 All openings are to be closed before discharge of fire extinguishing agent. (No opening to be allowed.)

Required Number of Storage Cylinders

$$N \text{ (Qty)} = G \text{ (kg)} \div Q \text{ (kg)}$$

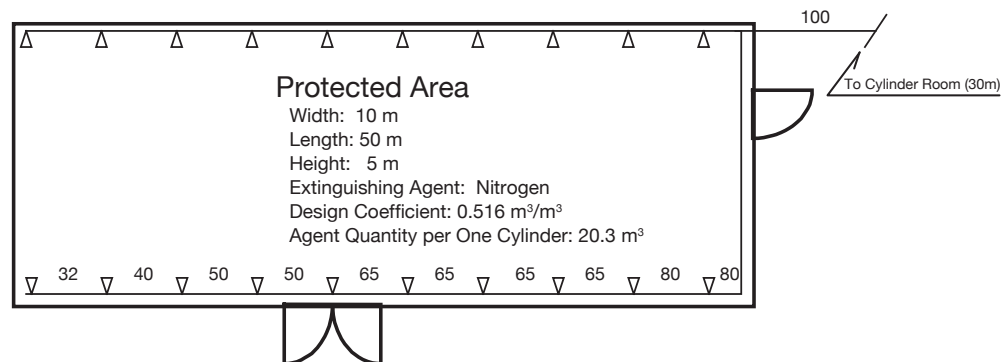
N : Required number of storage cylinders (Qty)

G : Required quantity of gaseous fire extinguishing agent (kg) or (m³) *1

Q : **Quantity of agent per one cylinder** (kg) or (m³) *1

*1 The unit symbol of (m³) is applied to Nitrogen.

Calculation Example



- (1) The volume of the protected area = 10 m × 50 m × 5 m = **2500 m³**
- (2) Required quantity of the agent = 2500 m³ × **0.516 m³/m³** = **1290 m³**
- (3) The number of cylinders = 1290 m³ ÷ **20.3 m³** = 63.55 ÷ **64 (Qty)**

Design Coefficient and One Cylinder Quantity

Specification		Inert Gas		Halogenated Agent		
		CO2	N2	FK-5-1-12	HFC-23	HFC-227ea
Design Coefficient (kg/m ³)		0.75-1.0	0.516 (m ³ /m ³)	0.84	0.52	0.55
Max. Agent Q'ty per One Cylinder	83 L	-	20.3 m ³	-	-	-
	82.5 L	55 kg	-	-	-	-
	68 L	45 kg	-	97 kg	56 kg	75 kg
	41 L	-	-	58 kg	34 kg	45 kg
	24 L	-	-	34 kg	20 kg	26 kg
	20 L	13 kg	-	-	16 kg	-
	14 L	-	-	-	12 kg	15 kg

Pressure-Relief-Opening Area Calculation

Calculation Method of Pressure-Relief-Opening Area

Pressure relief openings appropriate for the protected area are required to release excessive pressure caused by the fire extinguishing agent discharge.

The area of the opening is obtained by the following formulas:

Nitrogen Fire Extinguishing system

$$A = 134 \times \frac{Q}{\sqrt{P - \Delta P - P_u}} \quad Q = N \times 20.3 \times \alpha$$

$$P_u = 0.5 \times 1.20 \times V_a^2$$

A : Area of pressure relief opening (cm²)

P : Permissible pressure within the protected area (Pa)

ΔP : Pressure loss caused by the duct (Pa)

P_u : Outside wind pressure (Pa) *1

V_a : Outside wind speed (m/s) *2

Q : Max flow rate of fire extinguishing agent (m³/min), at the time of agent discharge

N : Total number of cylinders (Qty.)

α : Coefficient to calculate the max flow rate

Reducing Valve TG12: $\alpha = 1.2$
Reducing Valve 15RG: $\alpha = 1.6$

FK-5-1-12 Fire Extinguishing system

$$A = 580 \times \frac{Q}{\sqrt{P - \Delta P - P_u}} \quad Q = N \times M \div 10$$

$$P_u = 0.5 \times 1.20 \times V_a^2$$

A : Area of pressure relief opening (cm²)

P : Permissible pressure within the protected area (Pa)

ΔP : Pressure loss caused by the duct (Pa)

P_u : Outside wind pressure (Pa) *1

V_a : Outside wind speed (m/s) *2

Q : Flow rate of fire extinguishing agent (kg/sec), at the time of agent discharge

N : Total number of cylinders (Qty.)

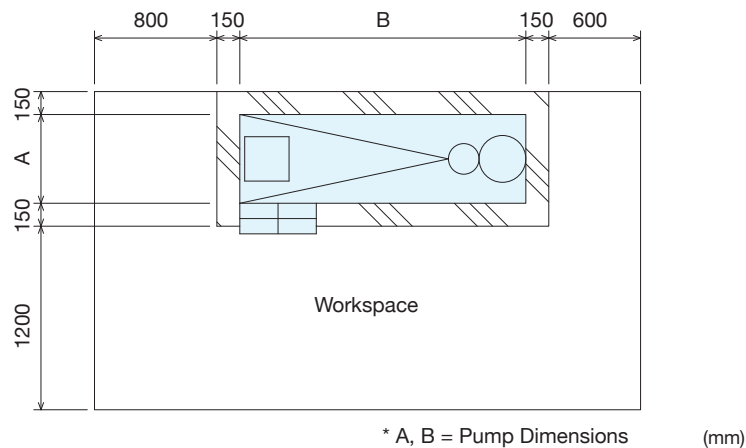
M : Filling quantity per one cylinder (kg)

*1 In cases of some facilities ignorable the wind speed, such as the exhaust chambers and exhaust stacks, the outside wind pressure can be equated to zero.

*2 The wind speed level that the authorities observed in the applicable area, which is usually adopted the maximum wind speed level for the past 10 years.

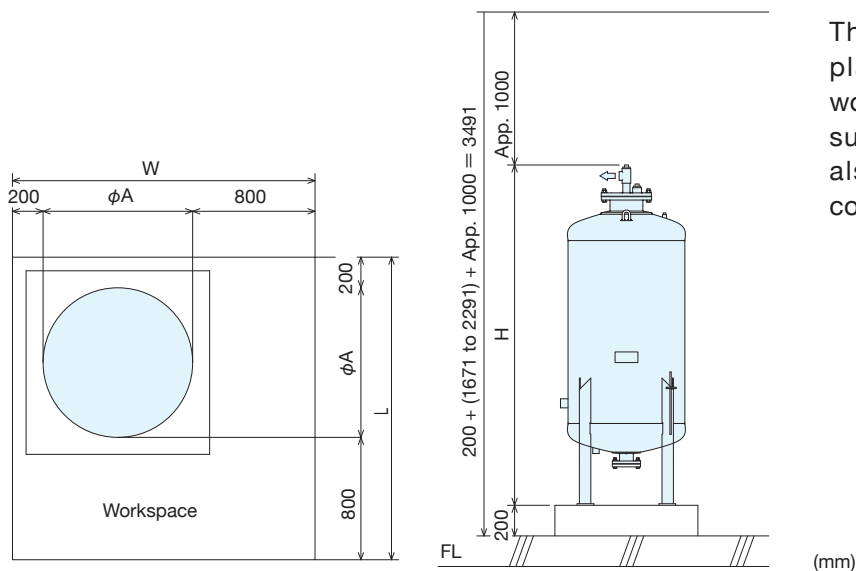
Installation Space for SP/Foam System

Installation Space for Fire Pump Unit



The pump unit shall be installed in places which will facilitate maintenance work, and where there is little possibility of being damaged by fire or disaster.

Installation Space for Foam Liquid Tank



The foam liquid tank shall be installed in places which will facilitate maintenance work, where there is little possibility of being subject to fire occurrence or impact, and also where the deterioration of the foam concentrate is hardly anticipated.

■ Dimensions

Capacity	Nittan's Foam Liquid Tank			
	A	W	L	H
200 L	568	1368	1568	1671
300 L	568	1368	1568	2113
400 L	668	1468	1668	2059
600 L	774	1574	1774	2225
800 L	874	1674	1874	2287
1000 L	978	1778	1978	2291

Foam Concentrate

Specification

Specification		Foam Concentrates		
		DK -Water 1 %	DK -Water 3 %	DK -Water 6 %
Nominal Use Concentration		1 %	3 %	6 %
Use Temperature Range		-10 °C to +30 °C	-10 °C to +30 °C	-10 °C to +30 °C
Appearance		Clear, Slightly Yellow	Clear, Slightly Yellow	Clear, Slightly Yellow
Specific gravity @ 20 °C		1.040	1.032	1.025
Viscosity (mm ² /s)	Mini. Use @ 20 °C	48.0	19.0	19.5
	@ 20 °C	11.0	4.5	4.5
	@ 30 °C	7.0	3.5	3.5
pH @ 20 °C		7.00	7.90	7.95
Flash Point		N/A (BP 102 °C)	N/A (BP 102 °C)	N/A (BP 102 °C)
Pour Point		-12.5 °C	-12.5 °C	-12.5 °C
Diffusion Coefficient		3.5 and more	3.5 and more	3.5 and more
Expansion Ratio	Fresh Water	6.3	5.6	5.6
	Sea Water	5.6	5.6	5.6
PFOS		Not contained	Not contained	Not contained
Applicable Foam Head	FL35	×	○	○
	FL35 -1	×	○	○
	NFL35	○	○	○
	FL20	○	○	×

○ = Applicable, × = Not applicable

Replacement of PFOS

PFOS (Perfluorooctane sulfonic acid) and related derivatives were added to the Annexes of the Stockholm Convention on Persistent Organic Pollutants on May 2009, due to their demonstrated toxicity, bioaccumulation, persistence in the environment and the ability to travel long distances from the point of release or application. Regulations in the United States, Canada, European Union, Australia, and Japan have banned the new production of PFOS-based products, including fire fighting foams. If the foam concentrates of existing equipment include PFOS, Nittan recommends the replacement to PFOS-Free concentrates as mentioned above.

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Nittan implements detailed sales activities and support activities for customers in response to each individual fire prevention issue, with the establishment of 45 branch offices and service centers as well as more than 120 distributors throughout Japan.

Overseas, global coverage encompasses Europe to Africa and the Middle East to Southeast Asia, with a local subsidiary established in the United Kingdom in 1972.

The Nittan brand provides security to sites using state of the art fire prevention technologies.

Distributor