



**SAFE227**  
**Fire Protection System**  
**for utilizing HFC227ea**  
**42 bar systems**  
**50 bar systems**



### **ABOUT VdS**

VdS stands for Inspected. Approved. Safe. and is Europe's largest expert organization for fire Protection. It is independent institution which has been ensuring safety and trust in the fields of fire protection and security for many decades.

VdS develops advanced safety concepts for significant industrial and commercial enterprises, leading manufacturers and system businesses as well as specialist firms and independent specialists. Its experts assess more than 21.000 fire protection systems worldwide every year.



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SAFE227 System components are approved and certified compliant With recognized international norms. Certification relate to individual Products and are clearly indicated on each respective product page.

SAFE227 Systems certified with system approval by VdS.

In addition, all SAFE manufacturing sites comply with ISO 9001 quality standards.



- 1 Compliant with the Construction Product Regulation (CPR) V3 Oct.2014
- 2 According to the Pressure Equipment Directive (2014/68/EU)
- 3 According to the Transportable Pressure Equipment Directive (2010/35/EU)
- 4 VdS – approved components
- 5 Components part of VdS approved system
- 6 Low Voltage Directive (LVD) (2014/35/EU)

## COMPONENTS FOR A COMPLETE SAFE227 SYSTEM

SAFE227 System by SAFE Technology Ltd. is a complete VdS Certified clean agent fire protection systems that helps you save time and improves productivity.

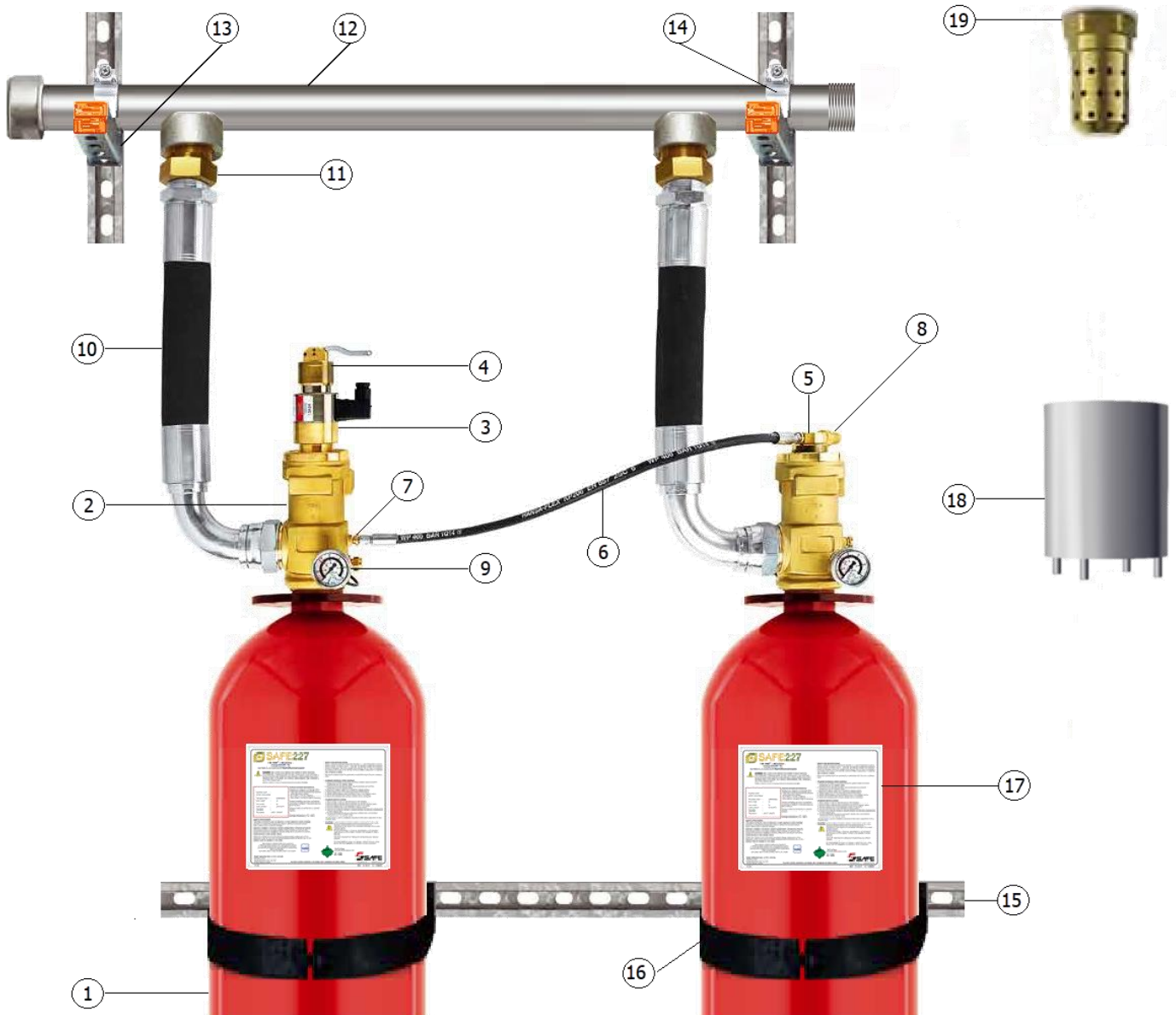
SAFE, has done the compatibility, performance testing and certification work for you. The system is ready to configure and requires less space to protect high-value assets in areas difficult to Access. **Safe, effective and VdS-Certified.**

Fire Protection Systems designs and manufactures components need to configure SAFE227 system.



- Components entirely compatible and interchangeable
- Easier and faster installation – No “bad surprises”
- Everything to the same high-specification
- Greater confidence in performance at the critical time
- Full warranty protection
- Simplicity of a single supplier

SAFE makes it easy for system engineers and installers to select a complete VdS-Approved fixed suppression system. Using HFC227ea with seamless steel high pressure cylinders.



Legent			
1	Agent container (pressure cylinder)	11	Check valve
2	System valve	12	Manifold
3	Electromagnetic actuator	13	Manifold mounting rail
4	Manual/pneumatic actuator	14	Clamp for manifold
5	Pneumatic actuator	15	Agent container wall mounthing rails
6	Pilot hose	16	Clamp for wall mounthing rails
7	Adapter for pilot hose	17	Agent container name plate
8	Bleed valve	18	Safety/shipping valve protection cap
9	Pressure gauge	19	Nozzle
10	Discharge hose		

The **SAFE227** System helps you to reduce the footprint, installation and service cost by offering you a choice from 14L to 180L cylinders in 42 bar or 50 bar confgratons.

- Less cylinders are needed for your installation due to high filling raito that can be up to 1,2 kg/L
- The 50 bar pressure option allows the cylinders to be palced further away from the protection zone.
- Extremely fast discharge of agent withn 10 seconds. The fire is out before it has a change spread. Damages and downtime are at an absolute minimum.

The **SAFE227** System is designed and manufactured by SAFE Technology Ltd. A World leader in reliable control system for pressurized gas applications. The proven technology used in the SAFE227 VdS-Approved Clean Agent Fre Suppression System has been isntalled in thousands of instalations worldwide.



For maximum ease and certain of performance, specify SAFE Technology Ltd. for your entire system.

## SAFE227 SYSTEM 42 BAR VARIANTS

SAFE227 System article	Agent container article	SAFE227 System pressure [Bar]	Agent container			Valve with integrated electromagnetic actuator	Outlet connection (A)
			size [liter]	height [mm]	diameter [mm]		
SFC 3101442	SFC 0101416	42	14	950	165	---	W21.8 x 1/14"
SFC 3102742	SFC 0102722	42	27	945	229	---	W21.8 x 1/14"
SFC 2202742	SFC 0102723	42	27	1010	229	•	1 7/8" – 12 UN
SFC 2203042	SFC 0103027	42	30	910	267	•	1 7/8" – 12 UN
SFC 2205042	SFC 0105023	42	50	1635	229	•	1 7/8" – 12 UN
SFC 2205142	SFC 0105027	42	50	1250	267	•	1 7/8" – 12 UN
SFC 2207542	SFC 0107527	42	75	1725	267	•	1 7/8" – 12 UN
SFC 2208042	SFC 0108027	42	80	1885	267	•	1 7/8" – 12 UN
SFC 2212042	SFC 0112035	42	120	1650	356	•	1 7/8" – 12 UN
SFC 2212142	SFC 0112033	42	120	1680	348	•	1 7/8" – 12 UN
SFC 2302742	SFC 0102723	42	27	1010	229	---	1 7/8" – 12 UN
SFC 2303042	SFC 0103027	42	30	910	267	---	1 7/8" – 12 UN
SFC 2305042	SFC 0105023	42	50	1635	229	---	1 7/8" – 12 UN
SFC 2305142	SFC 0105027	42	50	1250	267	---	1 7/8" – 12 UN
SFC 2307542	SFC 0107527	42	75	1725	267	---	1 7/8" – 12 UN
SFC 2308042	SFC 0108027	42	80	1885	267	---	1 7/8" – 12 UN
SFC 2312042	SFC 0112035	42	120	1650	356	---	1 7/8" – 12 UN
SFC 2312142	SFC 0112033	42	120	1680	348	---	1 7/8" – 12 UN
SFC 2412042	SFC 0112036	42	120	1705	356	•	2 1/2" – 12 UNJ
SFC 2412142	SFC 0112034	42	120	1730	348	•	2 1/2" – 12 UNJ
SFC 2414042	SFC 0114036	42	140	1915	356	•	2 1/2" – 12 UNJ
SFC 2414142	SFC 0114034	42	140	1945	348	•	2 1/2" – 12 UNJ
SFC 2418042	SFC 0118040	42	180	1860	406	•	2 1/2" – 12 UNJ
SFC 2418142	SFC 0118039	42	180	1975	390	•	2 1/2" – 12 UNJ
SFC 2512042	SFC 0112036	42	120	1705	356	---	2 1/2" – 12 UNJ
SFC 2512142	SFC 0112034	42	120	1730	348	---	2 1/2" – 12 UNJ
SFC 2514042	SFC 0114036	42	140	1915	356	---	2 1/2" – 12 UNJ
SFC 2514142	SFC 0114034	42	140	1945	348	---	2 1/2" – 12 UNJ
SFC 2518042	SFC 0118040	42	180	1860	406	---	2 1/2" – 12 UNJ
SFC 2518142	SFC 0118039	42	180	1975	390	---	2 1/2" – 12 UNJ

### A COMPLETE CYLINDER/VALVE ASSEMBLY

- 27L to 180L cylinder for 42 bar working pressure
- 4000210 or 4000220 valves
- steel valve protection cap included acc. ISO 11117

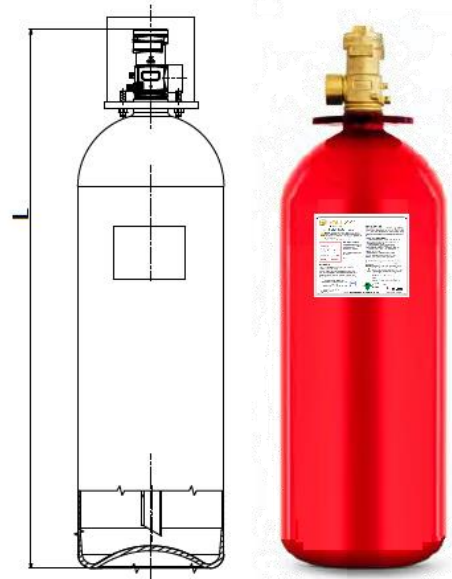


### KEY FEATURES

- Improves productivity: Cylinder/valves assemblies arrive pre-assembled
- VdS approved
- System are available either empty or filled with HFC227ea agent. Contact us for filled product code



Label included for filled cylinder only



## SAFE227 SYSTEM 50 BAR VARIANTS

SAFE227 System article	Agent container article	SAFE227 System pressure [Bar]	Agent container			Valve with integrated electromagnetic actuator	Outlet connection (A)
			size [liter]	height [mm]	diameter [mm]		
SFC 3201450	SFC 0101416	50	14	950	165	---	W21.8 x 1/14"
SFC 3202750	SFC 0102722	50	27	945	229	---	W21.8 x 1/14"
SFC 2602750	SFC 0102723	50	27	1010	229	•	1 7/8" – 12 UN
SFC 2603050	SFC 0103027	50	30	910	267	•	1 7/8" – 12 UN
SFC 2605050	SFC 0105023	50	50	1635	229	•	1 7/8" – 12 UN
SFC 2605150	SFC 0105027	50	50	1250	267	•	1 7/8" – 12 UN
SFC 2607550	SFC 0107527	50	75	1725	267	•	1 7/8" – 12 UN
SFC 2608050	SFC 0108027	50	80	1885	267	•	1 7/8" – 12 UN
SFC 2612050	SFC 0112035	50	120	1650	356	•	1 7/8" – 12 UN
SFC 2612150	SFC 0112033	50	120	1680	348	•	1 7/8" – 12 UN
SFC 2702750	SFC 0102723	50	27	1010	229	---	1 7/8" – 12 UN
SFC 2703050	SFC 0103027	50	30	910	267	---	1 7/8" – 12 UN
SFC 2705050	SFC 0105023	50	50	1635	229	---	1 7/8" – 12 UN
SFC 2705150	SFC 0105027	50	50	1250	267	---	1 7/8" – 12 UN
SFC 2707550	SFC 0107527	50	75	1725	267	---	1 7/8" – 12 UN
SFC 2708050	SFC 0108027	50	80	1885	267	---	1 7/8" – 12 UN
SFC 2712050	SFC 0112035	50	120	1650	356	---	1 7/8" – 12 UN
SFC 2712150	SFC 0112033	50	120	1680	348	---	1 7/8" – 12 UN
SFC 2812050	SFC 0112036	50	120	1705	356	•	2 1/2" – 12 UNJ
SFC 2812150	SFC 0112034	50	120	1730	348	•	2 1/2" – 12 UNJ
SFC 2814050	SFC 0114036	50	140	1915	356	•	2 1/2" – 12 UNJ
SFC 2814150	SFC 0114034	50	140	1945	348	•	2 1/2" – 12 UNJ
SFC 2818050	SFC 0118040	50	180	1860	406	•	2 1/2" – 12 UNJ
SFC 2818150	SFC 0118039	50	180	1975	390	•	2 1/2" – 12 UNJ
SFC 2912050	SFC 0112036	50	120	1705	356	---	2 1/2" – 12 UNJ
SFC 2912150	SFC 0112034	50	120	1730	348	---	2 1/2" – 12 UNJ
SFC 2914050	SFC 0114036	50	140	1915	356	---	2 1/2" – 12 UNJ
SFC 2914150	SFC 0114034	50	140	1945	348	---	2 1/2" – 12 UNJ
SFC 2918050	SFC 0118040	50	180	1860	406	---	2 1/2" – 12 UNJ
SFC 2918150	SFC 0118039	50	180	1975	390	---	2 1/2" – 12 UNJ

### A COMPLETE CYLINDER/VALVE ASSEMBLY

- 27L to 180L cylinder for 50 bar working pressure
- 4000210 or 40002220 valves
- steel valve protection cap included acc. ISO 11117

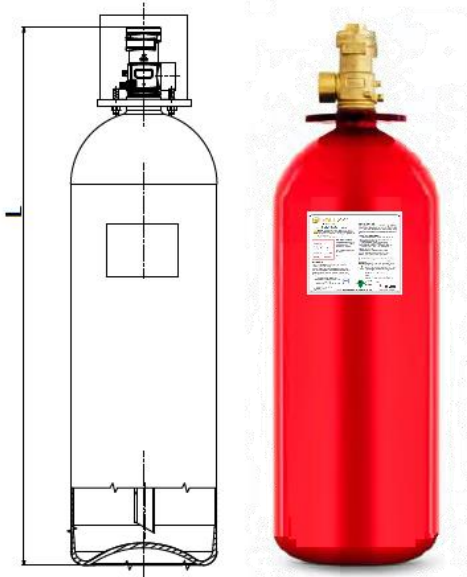


### KEY FEATURES

- Improves productivity: Cylinder/valves assemblies arrive pre-assembled
- VdS approved
- System are available either empty or filled with HFC227ea agent. Contact us for filled product code



Label included for filled cylinder only



## EXTINGUISHING AGENT HFC227ea

Article SFC 0000227

HFC227ea (CF<sub>3</sub>CHFCF<sub>3</sub> - heptafluoropropane) is a compound that consists of carbon, fluorine and hydrogen. It is colorless, odorless, electrically non-conductive, and suppresses fire by interrupting the combustion process and affecting the available oxygen content in the area of the discharge.

HFC227ea is clean, efficient, environmentally acceptable, and leaves no residue, thus minimizing any downtime after a fire. The system should be designed to discharge between a minimum discharge time of 5 seconds and a maximum discharge time of 10 seconds. Since the HFC227ea is released within at a maximum 10 seconds which ensures rapid extinction of flames, the amount of such by-products is minimal and not dangerous for people.

HFC227ea is clean and leaves no residues. No costly cleaning operations are needed after a fire and 'down-time' is kept to a minimum. Most materials, including steel, alloy steels, aluminum, brass and other metals, as well as plastics, rubber and electrical components, are not affected by exposure to HFC227ea.

HFC227ea designed to alleviate concerns for human safety, performance, and the environment. HFC227ea has key features which define sustainable clean extinguishing agent protection:

- Zero ozone depletion potential
- A global warming potential of 3500 related to CO<sub>2</sub>, 100 years
- 33 years atmospheric lifetime
- A large margin of safety for occupied spaces

HFC227ea has been tested and verified to be safe for use in occupied spaces. Tests have proven that exposure to HFC227ea is safe and effective in suppressing fires at low concentrations; all of which are well below the EPA's maximum exposure levels. HFC227ea is approved for use in occupied areas up to 10,5 % concentration by volume with a mandated egress time of 5 minutes or less.

### Physical properties of HFC227ea

All properties tested at a room temperature of +25 °C unless otherwise noted.

Chemical name	: 2H-Heptafluoropropan
Chemical formula	: CF <sub>3</sub> CHFCF <sub>3</sub>
Molecular weight (g/mol)	: 170 g/mol
Boiling point at 1.013 bar (abs.)	: -16,4 °C
Freezing point	: -131,1 °C
Critical temperature	: 101,7 °C
Critical pressure	: 29,12 bar abs
Critical volume	: 274 cm <sup>3</sup> /mol
Critical density	: 621 kg/m <sup>3</sup>
Vapour pressure at 20 °C	: 3,91 bar abs
Liquid density at 20 °C	: 1,407 kg/dm <sup>3</sup>
Saturated vapour density at 20 °C	: 31,176 kg/m <sup>3</sup>
Specific volume of superheated vapour at 1,013 bar and 20 °C	: 0,1373 m <sup>3</sup> /kg
Density of superheated vapour At 1,013 bar and 20 °C	: 7,2833 kg/m <sup>3</sup>
Heat of vaporization (kJ/kg °C) at boiling point	: 132,6
NOAEL (VOL %)	: 9,0
LOAEL (VOL %)	: 10,5
Ozone depletion potential	: 0
US EPA SNAP approval	: Acceptes
GWP (related to CO <sub>2</sub> , 100 years)	: 3500

### Extinguishing mechanism

In order to understand how HFC227ea suppresses a fire, it is important to review the principal aspects of fire chemistry. Four components (fuel, oxygen, heat, and the combustion chain reaction) are often referred to as the "fire tetrahedron".

All four of these factors are required in the correct combination for a fire to ignite and sustain burning. The fire tetrahedron shows that a fire can be extinguished by breaking one or more links between these components or by changing the balance between them.



1. By interrupting the combustion chain reaction.
2. By containing or eliminating the source of fuel.
3. By cutting off or diluting the source of oxygen.
4. By removing sufficient heat from the fire.

The fire-extinguishing effects of HFC227ea are based on a combination of chemical and physical mechanisms without directly affecting the available oxygen. This HFC227ea enables persons present in the area to breathe and to leave the fire area safely.

### Exposure to HFC227ea

HFC227ea has been evaluated for cardiac sensitization through test protocols approved by the US Environment Protection Agency (EPA). The EPA's Significant New Alternatives Program (SNAP) classifies HFC227ea as acceptable for use as a total flooding agent in occupied spaces with specific limitations.

Extinguishing agent	HFC-227ea	FK-5-1-12	HFC-125	Inert Gas	CO <sub>2</sub>
Design concentration	6,25 – 8,7 %	6,1 %	8,7 – 12,1 %	34,2 – 40,6 %	30 – 75 %
NOAEL	9 %	10 %	7,5 %	43 %	< 5 %
Safety margin	3 – 44 %	64 %	nil	6 – 26 %	Lethal at desing concentration

### Chilling and visibility

HFC227ea discharging from the nozzles will have a chilling effect on objects and can cause frostbite burns to the skin. The liquid phase vaporizes rapidly when mixed with air. Discharging the extinguishing agent into an area with a humid atmosphere may cause a reduction in visibility due to condensation of water vapor normally present in the hazard area.

### Pressure

The normal working pressure of a SAFE227 System - depending on the system - 42 bar or 50 bar at +20 °C. This is accomplished by super pressurizing the SAFE227 System with a charge of nitrogen added to the HFC227ea. All agent containers are pressurized vessels. Care must be observed when handling, filling and transporting storage agent containers. The sealing cap must be in place whenever the charged agent container is removed from the pipework.

### Agent cylinder selection, filling capacity and empty weights

Agent container article	Size [liter]	System valve series	Agent filling quantity		Cylinder/valve empty weight [kg]
			min.fill qty. [kg]	max.fill qty. [kg]	
SFC 0101416	14	SFC 4000201	6	16	21.3
SFC 0102722	27	SFC 4000201	11	32	35.5
SFC 0102723	27	SFC 4000210	11	32	44.3
SFC 0103027	30	SFC 4000210	12	36	43.3
SFC 0105023	50	SFC 4000210	20	60	68.4
SFC 0105027	50	SFC 4000210	20	60	63.9
SFC 0107527	75	SFC 4000210	30	90	75.5
SFC 0108027	80	SFC 4000210	32	96	105.4
SFC 0112035	120	SFC 4000210	48	144	138.2
SFC 0112033	120	SFC 4000210	48	144	116.7
SFC 0112036	120	SFC 4000220	48	144	144.8
SFC 0112034	120	SFC 4000220	48	144	123.0
SFC 0114036	140	SFC 4000220	56	168	161.1
SFC 0114034	140	SFC 4000220	56	168	127.8
SFC 0118040	180	SFC 4000220	72	216	147.0
SFC 0118039	180	SFC 4000220	72	216	164.6

## SAFE227 SYSTEM AGENT CONTAINERS (pressure cylinders)

The agent container for vertical installation only is a red-coated steel construction. The agent containers are constructed, tested and marked in accordance with TPED regulations. Each agent container is delivered with a safety/ shipping valve protection cap.

A dip tube is used for liquefied HFC227ea withdrawal from a agent container. A dip tube is screwed into the dip tube thread of the valve and extends down almost to the bottom of the agent container.

### Agent containers for SFC 4000201 valve

Article number	SFC 0101416	SFC 0102722
Water volume (L)	14	27
Height (mm)	865	860
Valve series	SFC 4000201	SFC 4000201
External diameter (mm)	165	229
Hydraulic test pressure	250 bar	300 bar
Valve connection thread	25E (W28,8x1"/14)	25E (W28,8x1"/14)
Conformity	2010/35/EU TPED	2010/35/EU TPED

### Agent containers for SFC 4000210 series valve

Article number	SFC 0102723	SFC 0105023	SFC 0108027	SFC 0112035
Water volume (L)	27	50	80	120
Height (mm)	860	1485	1735	1500
Valve series	SFC 4000210	SFC 4000210	SFC 4000210	SFC 4000210
External diameter (mm)	229	229	267	356
Hydraulic test pressure	300 bar	300 bar	250 bar	300 bar
Valve connection thread	2 ½"-12UN-2B	2 ½"-12UN-2B	2 ½"-12UN-2B	2 ½"-12UN-2B
Conformity	2010/35/EU TPED	2010/35/EU TPED	2010/35/EU TPED	2010/35/EU TPED

Article number	SFC 0103027	SFC 0105027	SFC 0107527	SFC 0112033
Water volume (L)	30	50	75	120
Height (mm)	760	1100	1575	1530
Valve series	SFC 4000210	SFC 4000210	SFC 4000210	SFC 4000210
External diameter (mm)	267	267	267	348
Hydraulic test pressure	250 bar	250 bar	250 bar	250 bar
Valve connection thread	2 ½"-12UN-2B	2 ½"-12UN-2B	2 ½"-12UN-2B	2 ½"-12UN-2B
Conformity	2010/35/EU TPED	2010/35/EU TPED	2010/35/EU TPED	2010/35/EU TPED

### Agent containers for SFC 4000220 series valve

Article number	SFC 0112036	SFC 0114036	SFC 0118040
Water volume (L)	120	140	180
Height (mm)	1505	1715	1660
Valve series	SFC 4000220	SFC 4000220	SFC 4000220
External diameter (mm)	356	356	406
Hydraulic test pressure	300 bar	300 bar	150 bar
Valve connection thread	3"-12UN-2B	3"-12UN-2B	3"-12UN-2B
Conformity	2010/35/EU TPED	2010/35/EU TPED	2010/35/EU TPED

Article number	SFC 0112034	SFC 0114034	SFC 0118039
Water volume (L)	120	140	180
Height (mm)	1530	1745	1775
Valve series	SFC 4000220	SFC 4000220	SFC 4000220
External diameter (mm)	348	348	390
Hydraulic test pressure	250 bar	250 bar	250 bar
Valve connection thread	3"-12UN-2B	3"-12UN-2B	3"-12UN-2B
Conformity	2010/35/EU TPED	2010/35/EU TPED	2010/35/EU TPED

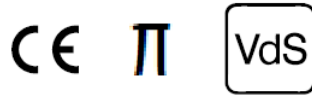
## SAFE227 SYSTEM VALVES

SAFE227 System valves are high-performance cylinder valves for fixed extinguishing systems as well as Ultra High Prutiy. System valves control the release of the HFC227ea agent from the agent container.

### System valve SFC 4000201 valve

SFC 4000201 valve used for only SAFE227 14L and 27L agent containers.

Article number	SFC 4000201
Inlet connection	W28.8 x 1/14" - 25E
Outlet connection	W21.8 x 1/14"
Burst disk	78 bar
Pressure gauge port	M10 x 1 mm
Deep Tube connection	M16 x 1 mm
Material	Brass
Conformity	PED & TPED



### System Valves SFC 4000210 and SFC 4000220 series

There are 2 sizes available for the SAFE227 System: 1,5" (33 mm) for the SFC 4000210 valve series and 2" (49 mm) for the SFC 4000220 valve series.

Valves are available without integrated electromagnetic actuator and with an integrated electromagnetic actuator. If a valve is equipped with an integrated electromagnetic actuator an additional electromagnetic release device is not required.



Valve Series SFC 4000210



Valve Series SFC 4000210  
with integrated electromagnetic actuator



Valve Series SFC 4000220



Valve Series SFC 4000220  
with integrated electromagnetic actuator

Articel number	Working pressure at +21°C (pw)	Inlet connection (C)	Outlet connection (A)	Dip tube thread (G)	Integrated electromagnetic actuator	Burst disc
SFC 4000211	42 bar	2 1/2" – 12 UN	1 7/8" – 12 UN	1 1/2" – 16 UN	•	78 bar
SFC 4000212	42 bar	2 1/2" – 12 UN	1 7/8" – 12 UN	1 1/2" – 16 UN	---	78 bar
SFC 4000216	50 bar	2 1/2" – 12 UN	1 7/8" – 12 UN	1 1/2" – 16 UN	•	89 bar
SFC 4000217	50 bar	2 1/2" – 12 UN	1 7/8" – 12 UN	1 1/2" – 16 UN	---	89 bar
SFC 4000221	42 bar	3" – 12 UN	2 1/2" 12 UNJ	2 1/8" – 16 UN	•	78 bar
SFC 4000222	42 bar	3" – 12 UN	2 1/2" 12 UNJ	2 1/8" – 16 UN	---	78 bar
SFC 4000226	50 bar	3" – 12 UN	2 1/2" 12 UNJ	2 1/8" – 16 UN	•	89 bar
SFC 4000227	50 bar	3" – 12 UN	2 1/2" 12 UNJ	2 1/8" – 16 UN	---	89 bar
Conformity	VdS-G312003					

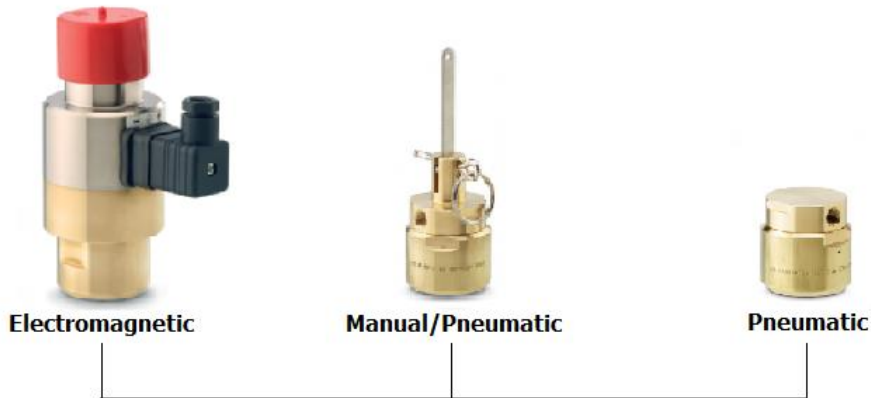
Valve series	SFC 4000210	SFC 4000220
Valve type according yo EN 12094-4	TYPE 2	TYPE 2
Pressure gauge connector	M10 x 1	M10 x 1
Pilot port	G1/8"	G1/8"
Orifice diameter	Ø 33 mm	Ø 49 mm
Maximum operating temperature range	-20 °C + 50 °C	-20 °C + 50 °C

#### Integrated electromagnetic actuator

Voltage (volt)	24 V DC ± 10 %
Current (Ampere)	0,25 A
Wattage (Watt)	6 W ± 10 %
Protection class	IP 65
Effective duty cycle (ED)	100 % ED
Minimum actuation time	>= 5 Seconds
Maximum operating temperature range	-20 °C to + 50 °C



## RELEASE DEVICES



can be used with a range of different actuators



**SFC 4000201 VALVE**

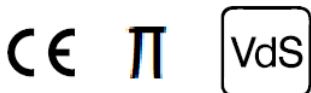


**SFC 4000210 SERIES VALVE  
with or without electromagnetic actuator**



**SFC 4000220 SERIES VALVE  
with or without electromagnetic actuator**

Large-orifice clean agent valves with flexibility of actuation methods.  
For all clean agent installations.  
Integrated solenoid option available



## ELECTROMAGNETIC RELEASE DEVICE

Device to electrically actuate the release of extinguishing agent.

for use with  
**SFC 4000201**  
**SFC 4000210 series and**  
**SFC 4000220 series valves.**

### KEY FEATURES

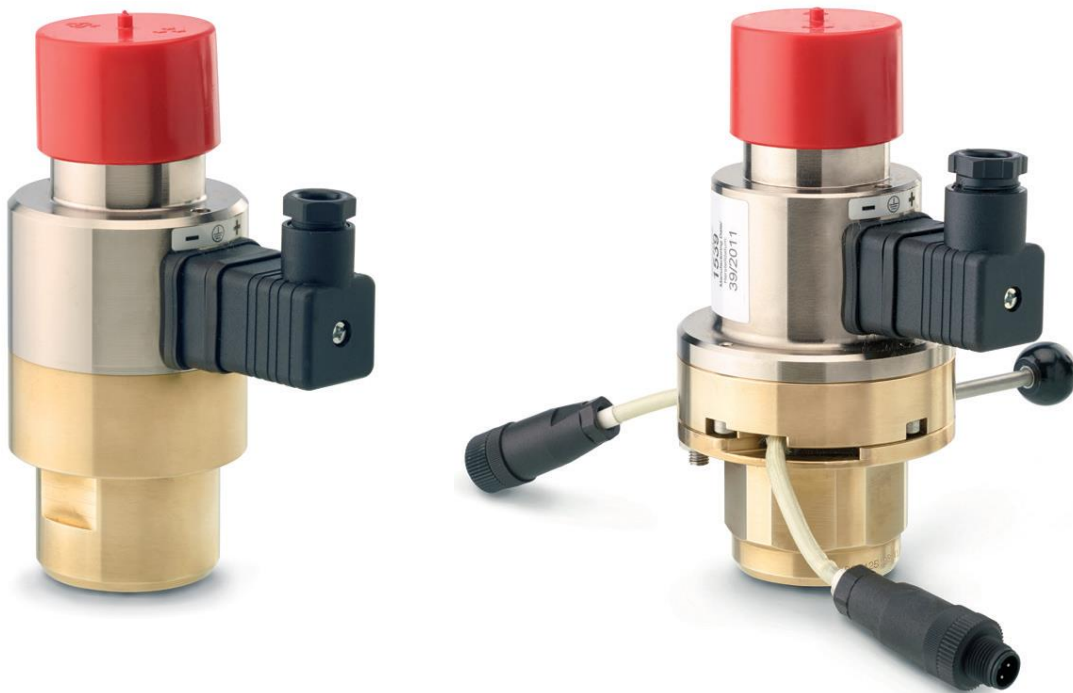
- Most commonly used as a master valve to actuate the system electronically, such as with connection to a smoke or heat detection device
- Electronically actuates the release of extinguishing agent

- 1 Compliant with the Construction Products Regulation (CPR) V3 Oct. 2014
- 2 VdS –approved components
- 4 Components part of VdS – approved system



The electromagnetic release device is used to actuate the SAFE227 System electrically. It is mounted on top of the master valve (only if the master valve is without integrated electromagnetic actuator) and is operated by an electrical signal from a fire detection system. In order to actuate the electromagnetic release device a constant DC voltage of 24 V is required.

The electromagnetic release device can be combined with the manual/pneumatic release device or the pneumatic release device.



with **BLOCKING DEVICE**  
to temporarily unarm the system during maintenance

Article number	SFC 4001001 (with diode) SFC 4001002 (without diode) SFC 4001011 (with diode and with blocking device) SFC 4001012 (without diode but with blocking device)
Valve connection	M42 x 1,5
Nominal voltage	24 V DC ± 10 %
Nominal current (I)	0,5 A ± 10 %
Electrical connection	DIN 175301-803 A electrical connector
Protection class	IP65
Height	131 mm / 135 mm with blocking device
Conformity	VdS-G312003

## RESET TOOL FOR ELECTROMAGNETIC ACTUATOR

The reset tool is used to reset the electromagnetic release device pin after a discharge. The reset tool is screwed into the inlet connection of the electromagnetic release device.

**Used to reset the electromagnetic actuator piston when putting the system back in active service after system discharge**



Article number	SFC 4001091
Outlet connection	M42 x 1,5
Material	Brass



## MANUAL/PNEUMATIC RELEASE DEVICE

The manual/pneumatic release device allows manual or pneumatic actuation of several SAFE227 System components. This release device is used for pneumatic actuation of multiple agent containers in series, which are connected to the master agent container by a pilot hose.

Manual actuation is accomplished by pulling the hand lever on the manual/pneumatic release device. In the closed position the manual/pneumatic release device is secured with a safety pin. By removing the safety pin, the hand lever can be manually pressed down to actuate the discharge of the extinguishing agent.

Article number	SFC 4001111
Maximum working pressure	300 bar
Inlet connection (C)	M42 x 1,5
Pilot port	G1/8"
Actuation force / pressure	< 150N / 20 Bar
Torque moment	50 + 0/-15 Nm
Body material	Brass
Height	136.5 mm
Conformity	VdS-G312003



## PNEUMATIC RELEASE DEVICE

This release device is used for pneumatic actuation of multiple agent containers in series, which are connected to the master valve on the master agent container by a pilot hose. Agent container equipped with the pneumatic release device serve as slave agent containers.

Article number	SFC 4001114
Maximum working pressure	300 bar
Inlet connection (C)	M42 x 1,5
Pilot port	G1/8"
Actuation pressure	20 bar
Body material	Brass
Height	50 mm
Conformity	VdS-G312003



## PILOT HOSES

Pilot hoses are used to connect several agent container, that are equipped with a valve and the corresponding release device.

The pilot hose is used to set up the pilot line, e.g. to connect several release devices and/or the valve and release device. The pilot hose must only be used in accordance with component approval in SAFE227 Systems.

Article number	SFC 4002105	SFC 4002107	SFC 4002110
Lenght	500 mm	700 mm	1000 mm
Connection (A / C)	2 x M12 x 1,5	2 x M12 x 1,5	2 x M12 x 1,5
Bending radius	75 mm	75 mm	75 mm
Nominal diameter	DN6	DN6	DN6
Working pressure	400 bar	400 bar	400 bar
Burst pressure	1600 bar	1600 bar	1600 bar
Maximum operating temperature range	-40 °C to +100 °C	-40 °C to +100 °C	-40 °C to +100 °C
Standard	EN 857 2 SC		
Conformity	VdS-G314018		



## ADAPTER FOR PILOT HOSE

The adapter is used for the connection of pilot hoses to the manual/pneumatic release device or to the pneumatic release device.

Article number	SFC 4002121
connections	G1/8" / M12 x 1,5
Material	Brass



Each hose requires 2 adapters.  
Must be ordered separately.

## BLEED VALVE

The bleed valve is a part of the pilot line. The bleed valve must be mounted at the end of each pilot line on the last pneumatic release device. The bleed valve is a safety device, which protects the SAFE227 System against unwanted discharge if a agent container has a leak and the pressure thereby increases in the pilot line. The bleed valve vents the pressure in the pilot line under 0,7 bar and thus prevents an accidental discharge.

Article number	SFC 4002131
Closing pressure	0,7 – 1,5 bar
Inlet connection	G1/8"
Flow @ p=0.6 bar	6 liters/min
Material	Brass



1 Compliant with the Construction Products Regulation (CPR) V3 Oct.2014  
2 VdS – approved components  
4 Components part of VdS – approved system

Mounts on all pneumatic release devices



## PRESSURE GAUGES

The pressure gauge measures and displays the pressure in the agent container. Each valve must be equipped with a pressure gauge. The pressure gauge is connected to the port for optional parts of the valve.

The pressure gauges SFC 4001221 and SFC 4001231 are equipped with an integrated pressure switch to supervise the loss of pressure in the agent container. Therefore, the agent container leakage monitoring can take place on a weekly basis instead of a daily basis.

The left picture below shows the pressure gauge with integrated pressure switch and the right picture the standard version of a pressure gauge.

**Measures and displays the cylinder pressure to verify that cylinders are properly filled and charged.**

**for HFC227ea**

**Rear mounting for use with  
SFC 4000201  
SFC 4000210 series  
SFC 4000220 series valves**

- Integrated pressure switch.
- Choice of 0-60 bar or 0-100 bar.



Article number	SFC 4001221	SFC 4001231	SFC 4001211	SFC 4001212
Most suitable for pressure scale	42 bar	50 bar	42 bar	50 bar
Scale	0 - 60 bar	0 - 60 bar	0 - 60 bar	0 - 100 bar
Inlet connection (C)	M10 x 1	M10 x 1	M10 x 1	M10 x 1
Pressure switch	Yes	Yes	No	No
Switch contact	38 bar	45 bar	---	---
Switching mode	NC	NC	---	---
Switching voltage	4.5 to 24 VDC / AC	4.5 to 24 VDC / AC	---	---
Switching current	5 mA - 100 mA	5 mA - 100 mA	---	---
Contact load	max. 2.4 W	max. 2.4 W	---	---
Protection class	IP65	IP65	IP65	IP65
Conformity	VdS-G309005	VdS-G309005	VdS-G308005	VdS-G308005

## DISCHARGE HOSES

The discharge hose is used to set up the pipework, e.g. to connect a valve to a check valve. The connections of the discharge hose are protected with plastic caps.

**Hose to connect the cylinder valve to the manifold or pipe network in fixed fire suppression systems.**



for SFC 4000201 valve  
for 14L to 27L cylinders

for SFC 4000210 valves  
for 27L to 120L cylinders

for SFC 4000220 valves  
for 120L to 180L cylinders

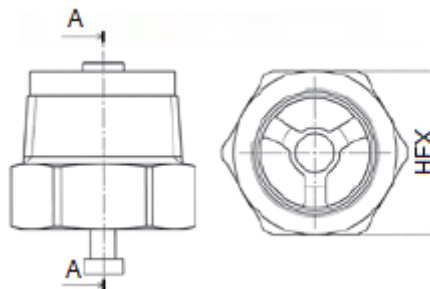


Article number	SFC 4002266	SFC 4002240	SFC 4002250
Valve series	for SFC 4000201 valves	for SFC 4000210 valves	for SFC 4000220 valves
Length	250 mm	500 mm	550 mm
Bending Radius	90 mm min	min. 500 mm	min. 630 mm
Valve connection	W21.8 x 1/14" - 90°	1 7/8" - 12UN	2 1/2" - 12UN
Outlet connection	G3/4"	R 1 1/2"	R 2"
Nominal diameter	DN12	DN40	DN50
Working pressure	360 bar	53 bar	53 bar
Maximum operating temperature range	-40 °C to +100 °C	-40 °C to +100 °C	-40 °C to +100 °C
Standard	EN 853 2 SN		
Materials	Synthetic rubber oil resistant		
Conformity	VdS-G314019	VdS-G316003	VdS-G316003

## CHECK VALVES

The check valve prevents a back-flow of the extinguishing agent into the agent container. The check valve is provided with an outlet connection (A) for the connection to the manifold and an inlet connection (C) for the connection to the discharge hose.

**Prevents backflow into the cylinder.**  
**Required for each hose attachment to the discharge manifold.**



DN33 Check valve  
for SFC 4000210 valves  
for 27L to 120L cylinders

DN50 Check valve  
for SFC 4000220 valves  
for 120L to 180L cylinders



Article number	SFC 4002333	SFC 4002350
Valve series	for SFC 4000210 valves	for SFC 4000220 valves
Nominal diameter	DN33	DN50
Inlet connection (c)	Rc 1 1/2"	Rc 2"
Outlet connection (A)	R 2"	R 2 1/2"
Working pressure	60 bar	60 bar
Material	Brass HEX 65 mm	Brass HEX 80 mm
Conformity	VdS-G318001	

## NOZZELS FOR SAFE227 SYSTEM

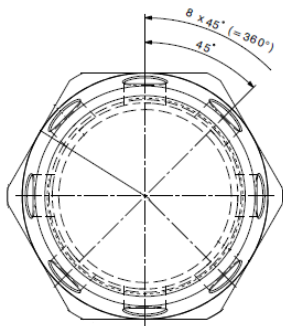
The 180 and 360 degree range of discharge nozzles are designed to provide the required flow rate and distribution of HFC227ea for total flooding of hazard areas. The 180° nozzle is engineered to provide a 180° discharge pattern for sidewall applications. The 360° nozzle offers a full 360° discharge pattern for installations where nozzles may be located in the centre of the hazard. The nozzle diameters should be dimensioned in accordance with the specifications of the VdS component approvals even when the system is not intended to be a VdS system.

The nozzles are made of brass and available with the inlet connections R1/2", R3/4", R1", R1 1/4", R1 1/2" and R2".

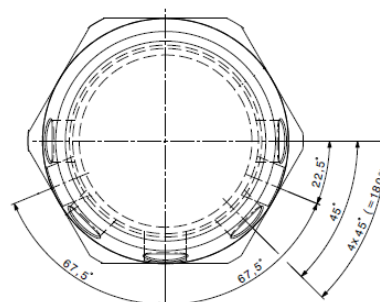
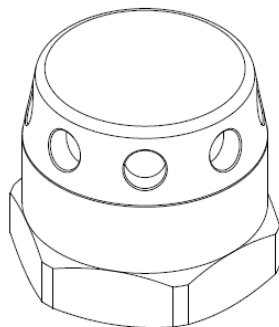
Fixed holes discharge nozzles, used with calculated drill size of orifice. The nozzles are delivered with their orifices drilled and assembled according to the results of the VdS calculation software.

Nozzles are available in two different series with different dispersal patterns. SFC 75360XXX with spray angle 360° with 8 discharge holes. SFC 75180XXX with spray angle 180° with 8 discharge holes.

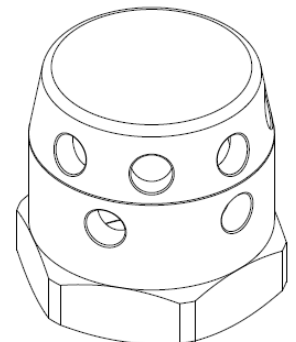
The nozzle selection depends on the hazard and location to be protected.



360° – 8 discharge holes, 1 row



180° – 8 discharge holes, 2 rows



**Pre-boed and preassembled discharge nozzles for HFC227ea extinguishing agent**

### KEY FEATURES

- Available in 360° or 180° versions
- Solid brass
- Max working pressure 100 bar

- 3 VdS – approved components
- 4 Components part of VdS – approved system



### Inlet connection (C) Rc 1/2"

Article number range	Orifice diameter range (DN) $\pm$ 0,02 [mm]	Increasig stpes	Spray angel	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7536015 – 03,0 to SFC 7536015 – 05,0	3,0 – 5,0	0,1 mm	360°	8	40	32
SFC 7518015 – 03,0 to SFC 7518015 – 05,0	3,0 – 5,0	0,1 mm	180°	8	45	32
Conformity	VdS-G316014					

### Inlet connection (C) Rc 3/4"

Article number range	Orifice diameter range (DN) $\pm$ 0,02 [mm]	Increasig stpes	Spray angel	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7536020 – 04,8 to SFC 7536020 – 06,8	4,8 – 6,8	0,1 mm	360°	8	40	38
SFC 7518020 – 04,8 to SFC 7518020 – 06,8	4,8 – 6,8	0,1 mm	180°	8	48,5	38
Conformity	VdS-G316014					

### Inlet connection (C) Rc 1"

Article number range	Orifice diameter range (DN) $\pm$ 0,02 [mm]	Increasig stpes	Spray angel	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7536025 – 06,5 to SFC 7536025 – 08,6	6,5 – 8,6	0,1 mm	360°	8	50	46
SFC 7518025 – 06,5 to SFC 7518025 – 08,6	6,5 – 8,6	0,1 mm	180°	8	57,5	46
Conformity	VdS-G316014					

### Inlet connection (C) Rc 1 1/4"

Article number range	Orifice diameter range (DN) $\pm$ 0,02 [mm]	Increasig stpes	Spray angel	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7536032 – 08,4 to SFC 7536032 – 11,3	8,4 – 11,3	0,2mm	360°	8	55	55
SFC 7518032 – 08,4 to SFC 7518032 – 11,3	8,4 – 11,3	0,2 mm	180°	8	63	55
Conformity	VdS-G316014					

### Inlet connection (C) Rc 1 1/2"

Article number range	Orifice diameter range (DN) $\pm$ 0,02 [mm]	Increasig stpes	Spray angel	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7536040 – 11,0 to SFC 7536040 – 13,0	11,0 – 13,0	0,2 mm	360°	8	65	65
SFC 7518040 – 11,0 to SFC 7518040 – 13,0	11,0 – 13,0	0,2 mm	180°	8	70	65
Conformity	VdS-G316014					

### Inlet connection (C) Rc 2"

Article number range	Orifice diameter range (DN) $\pm$ 0,02 [mm]	Increasig stpes	Spray angel	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7536050 – 12,8 to SFC 7536050 – 16,0	12,8 – 16,0	0,3 mm	360°	8	70	75
SFC 7518050 – 12,8 to SFC 7518050 – 16,0	12,8 – 16,0	0,3 mm	180°	8	77	75
Conformity	VdS-G316014					

## MANIFOLDS

Manifolds are used to connect several agent cylinders and form a cylinder battery with SFC 4000220 series valves.

It should be manufacture from galvanised seamless steel pipes of diameter and quality found as a result of VdS hydraulic calculation. There should be welded connection ports on the main line for the check valves to be connected to the manifold inlets.

Connection ports must be the same diameter as the check valve outlet connection. The end of the manifold must be closed by welding by end plug. The manifold outlet is connect to the discharge piping network.

Article number	nominal diameter	inlet connection	connection quantity	length [mm]	working pressure	used for agent containers
SFC 6023562	2"	2 1/2"	2 port	790	60 bar	120 lt. or 140 lt. cylinders
SFC 6023563	2"	2 1/2"	3 port	1200	60 bar	120 lt. or 140 lt. cylinders
SFC 6024062	2"	2 1/2"	2 port	840	60 bar	180 lt. cylinders
SFC 6033562	3"	2 1/2"	2 port	790	60 bar	140 lt. cylinders
SFC 6033563	3"	2 1/2"	3 port	1200	60 bar	140 lt. cylinders
SFC 6033564	3"	2 1/2"	4 port	1610	60 bar	140 lt. cylinders
SFC 6034062	3"	2 1/2"	2 port	840	60 bar	180 lt. cylinders
SFC 6034063	3"	2 1/2"	3 port	1300	60 bar	180 lt. cylinders
SFC 6034064	3"	2 1/2"	4 port	1760	60 bar	180 lt. cylinders



## MANIFOLD MOUNTING RAIL

Galvanized steel wall mounting rails and clamps are used to mount the manifold.

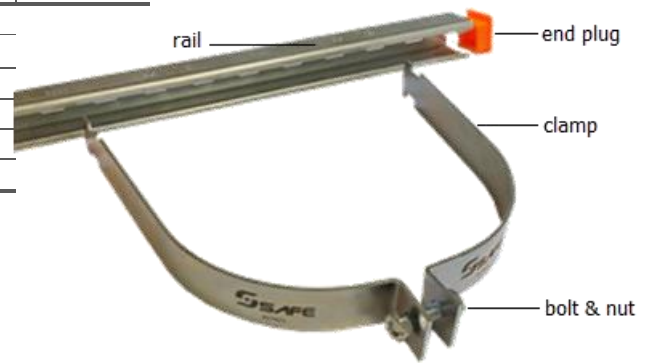
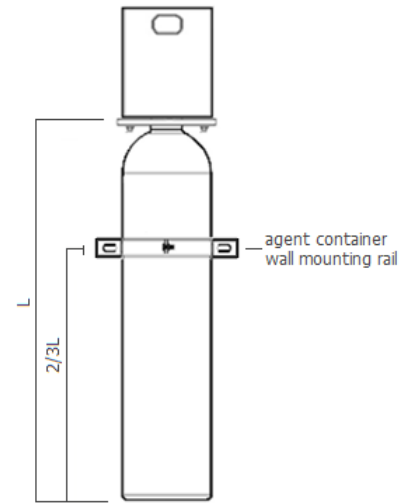
Part	Article number	Length	used for agent containers
Manifold mounthing rail	SFC 6093561	300 mm	1 row 120 lt. or 140 lt. cylinders
Manifold mounthing rail	SFC 6094061	350 mm	1 row 180 lt. cylinders
Manifold mounthing rail	SFC 6093562	700 mm	2 rows 120 lt. or 140 lt. cylinders
Manifold mounthing rail	SFC 6094062	750 mm	2 rows 180 lt. cylinders
Manifold mounthing rail	SFC 6093563	1100 mm	3 rows 120 lt. or 140 lt. cylinders
Manifold mounthing rail	SFC 6094063	1250 mm	3 rows 180 lt. cylinders
Clamp for manifold	SFC 6099002	2"	
Clamp for manifold	SFC 6099003	3"	
End plug	SFC 1290001		



## AGENT CONTAINER MOUNTING RAILS

Galvanized steel wall mounting rails and clamps are used to mount the agent containers in a vertical position to the wall. The agent container wall mounting rail is available for 1 to 4 agent containers.

Part	Article number	Agent containers		Lenght [mm]
		Diameter [mm]	Quantity	
Agent container wall mounthing rails	SFC 1216501	165	1	320
	SFC 1222901	229	1	380
	SFC 1226701	267	1	420
	SFC 1235001	348	1	500
	SFC 1236001	356	1	510
	SFC 1236002	356	2	920
	SFC 1236003	356	3	1330
	SFC 1236004	356	4	1740
	SFC 1240001	406	1	560
	SFC 1240002	406	2	1020
	SFC 1240003	406	3	1480
	SFC 1240004	406	4	1940
2 X Clamp for wall mounthing rails	SFC 1416501	165	1	
	SFC 1422901	229	1	
	SFC 1426701	267	1	
	SFC 1435001	348	1	
	SFC 1436001	356	1	
	SFC 1440001	406	1	
End plug	SFC 1290001			
Bolt M10 x 30	SFC 1290021			
Nut M10 x 30	SFC 1290045			



## MONITORING SWITCH

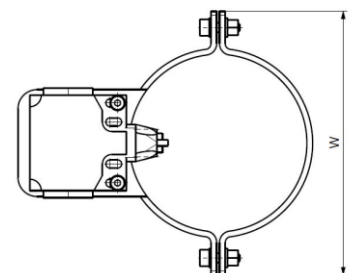
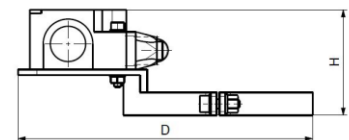
The monitoring switch (for electromagnetic release device) monitors if the electromagnetic release device is properly in place to actuate the system. It is connected to the control box.

**Mandatory according to NFPA 2001 Standard on Clean Agent Extinguishing Systems – 2015 Edition**

### KEY FEATURES

- Compact design: remains in the cylinder diameter
- Easy installation: simply clamps around the valve base
- Retrpfit of existing installation possible

Articel number	SFC 4001031	SFC 4001032
Description	Mounted on SFC 4000210 series valves	Mounted on SFC 4000220 series valves



## PRESSURE & FLOW DETECTOR SWITCH

The pressure and flow detector switch is connected to the manifold and to a power supply. It is used to send a signal that the SAFE227 System is discharging. It reacts in the earliest stage of a discharge at 2 bar pressure and energizes or de-energizes electrically operated equipment e.g. an alarm box or control panel.

After a discharge the pressure and flow detector switch must be reset manually.

**Used to send a signal that the system is discharging.**

**Pressure Activated.**

### KEY FEATURES

- Sends a signal to control panel or alarm box at the earliest phase of discharge
- Acuated at 2 bar pressure
- Flexible Voltage/Amp power source



Article number	SFC 4002521
Opening pressure	2 bar
Operating pressure	200 bar
Test pressure	300 bar
Inlet connection (C)	G1/2"
Operating temperature	-10 °C to 85 °C
Dimensions	191 x 105 x 47 mm
Voltage (Volt)	400 V AC / 3 A or 24 V DC / 10 A
Protection class	IP65



## AGENT CONTAINER LABEL

**VdS-approved cylinder labels  
For 27L to 180L cylinders**

**A mandatory  
part of a complete  
VdS-approved system.**



Not included with empty cylinder / valve assemblies.



Labels only valid for cylinders VdS approved systems.

Article number	SFC 1100621
Dimensions	235 x 175 mm

**FM-200™ HFC227ea**  
Formula: **CF<sub>3</sub>CHF CF<sub>3</sub>**  
Gas Name: **1,1,1,1,2,3,3,3-Heptafluoropropane**

**WARNING:** High pressure gas cylinders are capable of violent discharge. This is extremely hazardous result and can cause severe injury and death. Do not move and carry cylinders under pressure, without sealing cap on the discharge outlet of the valve and without safety/shipping valve protection cap on the cylinder itself. System cylinders must be transported and mounted vertically.

**SYSTEM DESIGN REFERENCES:**  
Systems are designed accordingly with:  
- VdS 2381 EN Fire Extinguishing Systems using Halocarbon Gases,  
- EN 15004-1 and EN 15004-5,  
- ISO 14520-1 and ISO 14520-9 Standard

System installation has been completed accordingly. SAFE227 Instruction Manual. SFC1100721.  
Pressure tests are performed in cylinder factory.  
Storage temperature: 0°C - 54°C

**SAFETY PROCEDURE:**  
This safety procedure must be followed, in exact sequence before handling, servicing or transporting pressurized system cylinders to prevent serious injury, death and/or property damage.  
Improper installation will result in system malfunction. All personnel must be thoroughly trained in the safe handling of the cylinders as well as in the proper procedures for installation, removal, filling and connection of all other critical devices on the cylinder valves.  
When the cylinder is not connected to system piping, sealing cap on the discharge outlet of the valve and safety/shipping valve protection cap on the cylinder must be installed on the valve.  
High pressure cylinder valve and actuators in fixed gas high pressure fire extinguishing system  
Conforms EU Directive & Standards for components  
TPED 2010/35/EU  
ISO 9809, ISO 11120, EN ISO 10297, EN 12094

**INSPECTION INSTRUCTIONS:**  
System cylinders should be inspected monthly or more frequently if circum- stances require. At least once in every six (6) months the weight and pressure should be checked, when the weight has a loss of 5% or more, or pressure has a loss of 10% more, the cylinder must be refilled, pressurized or replaced with a stand-by cylinder.  
Piping and nozzles should be examined to determine that they are unobstruc- tured.

**CYLINDER REMOVAL FROM SERVICE:**  
1. Disconnect all flexible connectors between cylinder valve and other components on the cylinder valve.  
2. Disconnect the solenoid actuator, manual actuator and all other components on the cylinder valve.  
3. Disconnect cylinder valve from manifold or piping system.  
4. Attach sealing cap on the discharge outlet of the valve.  
5. Attach safety/shipping valve protection cap on the cylinder valve.  
6. Disconnect brackets and remove cylinder rack or rail safety.

**CYLINDER INSTALLATION:**  
1. Place cylinder in rack or rails and secure with brackets.  
2. Remove safety shipping valve protection cap on the cylinder valve.  
3. Remove sealing cap on the discharge outlet of the valve.  
4. Connect cylinder valve with manifold or piping system.  
5. Connect the solenoid actuator, manual actuator and all other components on the cylinder valve.  
6. Connect all flexible connectors between cylinder valve and all other components on the cylinder valve.  
For connection use the installation drawing for the valve equipment of the suitable valves.

**WARNING:** Avoid handling of system cylinder components on the valve through unanchored and/or untrained personnel. Otherwise it may result in unnecessary discharge of the exting- uishing agent.  
For the mounting, removing, dismantation and periodical maintenance of the system, contact your supplier or manu- facturer.  
Call SAFE Teknoloji for refilling and pressurizing your system cylinder.  
No responsibility for injury or damage, arising from non-com- pliance with any legislation or directive, can be accepted.

**VdS** **HFC227ea**  
Chemical under pressure, NOC  
**UN 3296**

**SAFE**

**DO NOT COVER, REMOVE OR MAKE ANY CHANGES ON THIS LABEL.**

SAFE Teknoloji San. ve Tic. Ltd.Şti.  
NO58 3V.Xam  
İzmit Kahrarman Cad. No:3-5  
43030 Manisa Türkiye

www.safe-tr.com info@safe-tr.com  
2022 - Nov. rev-A SFC 1100621

## DANGER AND WARNING SIGNS



Article number	SFC 1100626	SFC 1100629	SFC 1100627	SFC 1100628
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Article nr. SFC 1100763 - Revision A\_R  
Effective March 10<sup>th</sup> 2023

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