

VdS

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.



TABLE OF COMPONENTS

COMPONENTS FOR A COMPLETE SAFE227 SYSTEM	Page 04
SAFE227 SYSTEM VARIANTS	Page 06
SAFE227 42 Bar system variants	Page 06
SAFE227 50 Bar system variants	Page 07
EXTINGUISHING AGENT	Page 08
SAFE227 SYSTEM AGENT CONTAINERS	Page 10
SAFE227 SYSTEM VALVES	Page 11
SAFE227 SYSTEM RELEASE DEVICES	Page 13
Electromagnetic release devices	Page 14
Reset tool for electromagnetic release device	Page 15
Manual release devices	Page 15
Manual/Pneumatic release device	Page 16
Pneumatic release device	Page 16
PILOT HOSES & ACCESSORIES	Page 16
Pilot hoses	Page 16
Adapter for pilot hose	Page 17
Non-Return valve & Vent valve	Page 17
Bleed valve	Page 17
PRESSURE GAUGES	Page 18
DISCHARGE HOSE & MANIFOLDS	Page 19
Discharge hoses	Page 19
Check valves	Page 19
Manifolds	Page 20
Manifold mounting rails	Page 20
Agent container mounting rails	Page 21
NOZZELS FOR SAFE227 SYSTEM	Page 22
OPTIONAL ACCESSORIES	Page 23
Monitoring switch & Pressure flow detector switch	Page 23
LABELS	Page 24

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.

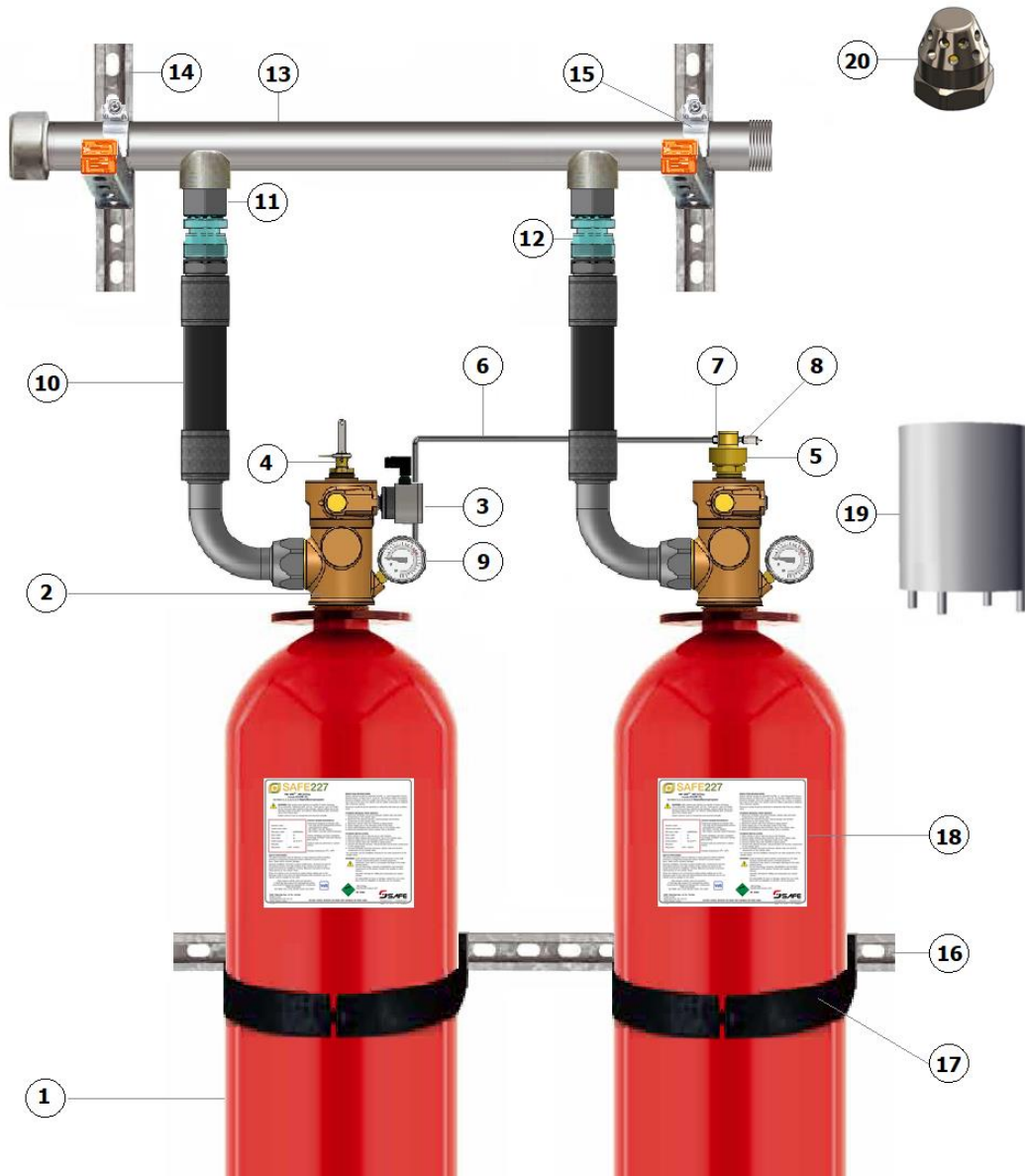
SAFE, has done the compatibility, performance testing and certification work for you. The system is ready to configure and requires less space to protect high-value assets in areas difficult to Access. **Safe, effective and VdS-Certified.**

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.

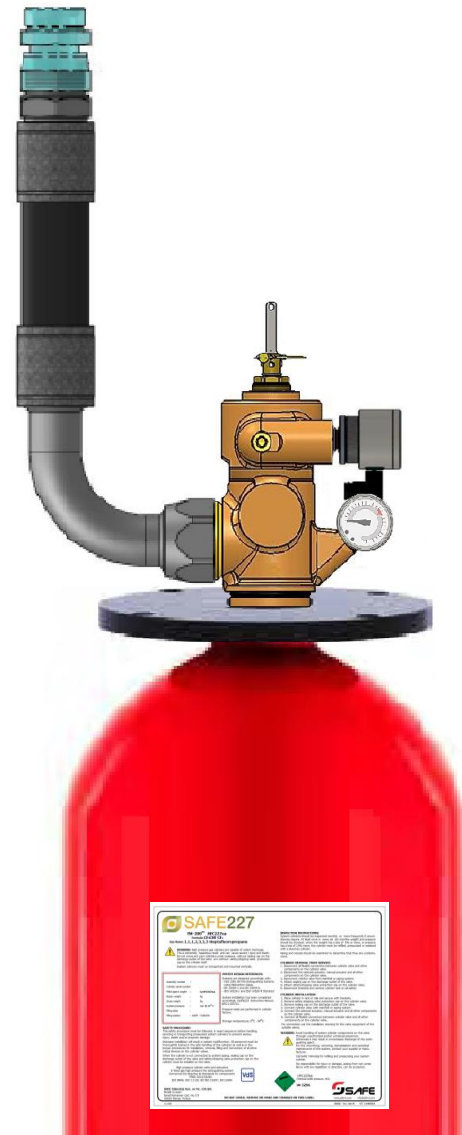


Legent			
1	Agent container (pressure cylinder)	11	Check valve
2	System valve	12	Adapter for discharge hose
3	Electromagnetic actuator	13	Manifold
4	Manual/pneumatic actuator	14	Manifold mounting rail
5	Pneumatic actuator	15	Clamp for manifold
6	Pilot hose	16	Agent container wall mounthing rails
7	Adapter for pilot hose	17	Clamp for wall mounthing rails
8	Bleed valve	18	Agent container name plate
9	Pressure gauge	19	Safety/shipping valve protection cap
10	Discharge hose	20	Nozzle

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 configurations.

- Less cylinders are needed for your installation due to high filling ratio that can be up to 1,2 kg/L
- The 50 bar pressure option allows the cylinders to be placed further away from the protection zone.
- Extremely fast discharge of agent within 10 seconds. The fire is out before it has a chance 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 Fire Suppression System has been installed in thousands of installations 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 3001442	SFC 0101416	42	14	950	165	•	W21.8 x 1/14"
SFC 3002742	SFC 0102722	42	27	945	229	•	W21.8 x 1/14"
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 3302742	SFC 0102723	42	27	1010	229	---	1 7/8" – 12 UN
SFC 3303042	SFC 0103027	42	30	910	267	---	1 7/8" – 12 UN
SFC 3305042	SFC 0105023	42	50	1635	229	---	1 7/8" – 12 UN
SFC 3305142	SFC 0105027	42	50	1250	267	---	1 7/8" – 12 UN
SFC 3307542	SFC 0107527	42	75	1725	267	---	1 7/8" – 12 UN
SFC 3308042	SFC 0108027	42	80	1885	267	---	1 7/8" – 12 UN
SFC 3312042	SFC 0112035	42	120	1650	356	---	1 7/8" – 12 UN
SFC 3312142	SFC 0112033	42	120	1680	348	---	1 7/8" – 12 UN
SFC 3412042	SFC 0112036	42	120	1705	356	---	2 1/2" – 12 UNJ
SFC 3412142	SFC 0112034	42	120	1730	348	---	2 1/2" – 12 UNJ
SFC 3414042	SFC 0114036	42	140	1915	356	---	2 1/2" – 12 UNJ
SFC 3414142	SFC 0114034	42	140	1945	348	---	2 1/2" – 12 UNJ
SFC 3418042	SFC 0118040	42	180	1860	406	---	2 1/2" – 12 UNJ
SFC 3418142	SFC 0118039	42	180	1975	390	---	2 1/2" – 12 UNJ

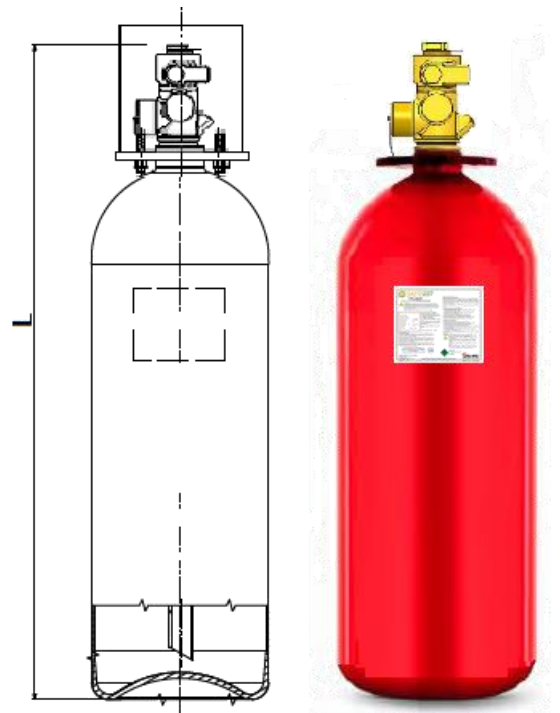
A COMPLETE CYLINDER/VALVE ASSEMBLY
 - 14L to 180L cylinder for 42 bar working pressure
 - 4000210 or 4000220 valves
 - steel valve protection cap included acc. ISO 11117

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 3001450	SFC 0101416	50	14	950	165	•	W21.8 x 1/14"
SFC 3002750	SFC 0102722	50	27	945	229	•	W21.8 x 1/14"
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 3702750	SFC 0102723	50	27	1010	229	---	1 7/8" – 12 UN
SFC 3703050	SFC 0103027	50	30	910	267	---	1 7/8" – 12 UN
SFC 3705050	SFC 0105023	50	50	1635	229	---	1 7/8" – 12 UN
SFC 3705150	SFC 0105027	50	50	1250	267	---	1 7/8" – 12 UN
SFC 3707550	SFC 0107527	50	75	1725	267	---	1 7/8" – 12 UN
SFC 3708050	SFC 0108027	50	80	1885	267	---	1 7/8" – 12 UN
SFC 3712050	SFC 0112035	50	120	1650	356	---	1 7/8" – 12 UN
SFC 3712150	SFC 0112033	50	120	1680	348	---	1 7/8" – 12 UN
SFC 3912050	SFC 0112036	50	120	1705	356	---	2 1/2" – 12 UNJ
SFC 3912150	SFC 0112034	50	120	1730	348	---	2 1/2" – 12 UNJ
SFC 3914050	SFC 0114036	50	140	1915	356	---	2 1/2" – 12 UNJ
SFC 3914150	SFC 0114034	50	140	1945	348	---	2 1/2" – 12 UNJ
SFC 3918050	SFC 0118040	50	180	1860	406	---	2 1/2" – 12 UNJ
SFC 3918150	SFC 0118039	50	180	1975	390	---	2 1/2" – 12 UNJ

A COMPLETE

CYLINDER/VALVE ASSEMBLY

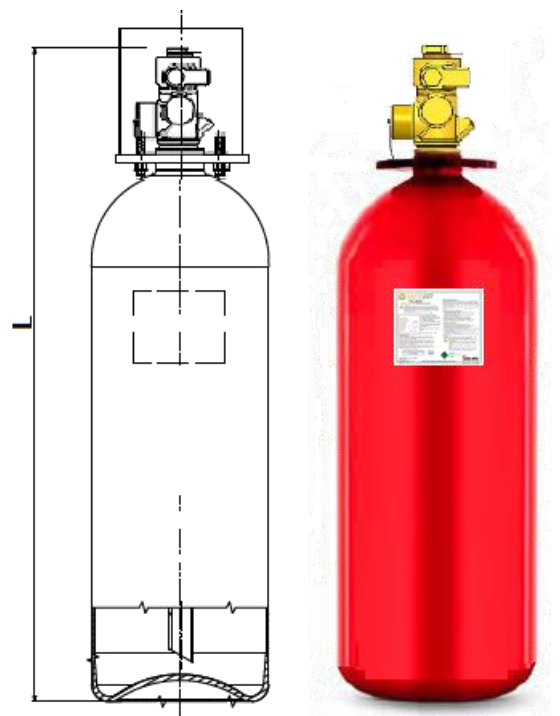
- 14L to 180L cylinder for 50 bar working pressure
- 4000210 or 40002220 valves
- steel valve protection cap included acc. ISO 11117

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 (CF₃CHFCF₃ - 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 CO₂, 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 ₃ CHFCF ₃
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 ³ /mol
Critical density	: 621 kg/m ³
Vapour pressure at 20 °C	: 3,91 bar abs
Liquid density at 20 °C	: 1,407 kg/dm ³
Saturated vapour density at 20 °C	: 31,176 kg/m ³
Specific volume of superheated vapour at 1,013 bar and 20 °C	: 0,1373 m ³ /kg
Density of superheated vapour At 1,013 bar and 20 °C	: 7,2833 kg/m ³
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 ₂ , 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 ₂
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 4000204 valve

Article number	SFC 0101416	SFC 0102722
Water volume (L)	14	27
Height (mm)	865	860
Valve series	SFC 4000204	SFC 4000204
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 4000214 & SFC 4000219 valves

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 4000214 / 219	SFC 4000214 / 219	SFC 4000214 / 219	SFC 4000214 / 219
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 4000214 / 219	SFC 4000214 / 219	SFC 4000214 / 219	SFC 4000214 / 219
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 4000224 and SFC 4000229 valves

Article number	SFC 0112036	SFC 0114036	SFC 0118040
Water volume (L)	120	140	180
Height (mm)	1505	1715	1660
Valve series	SFC 4000224 / 229	SFC 4000224 / 229	SFC 4000224 / 229
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 4000224 / 229	SFC 4000224 / 229	SFC 4000224 / 229
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

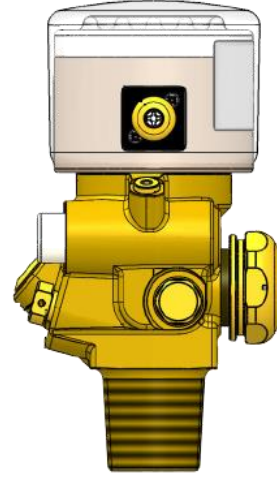
SAFE227 SYSTEM VALVES

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

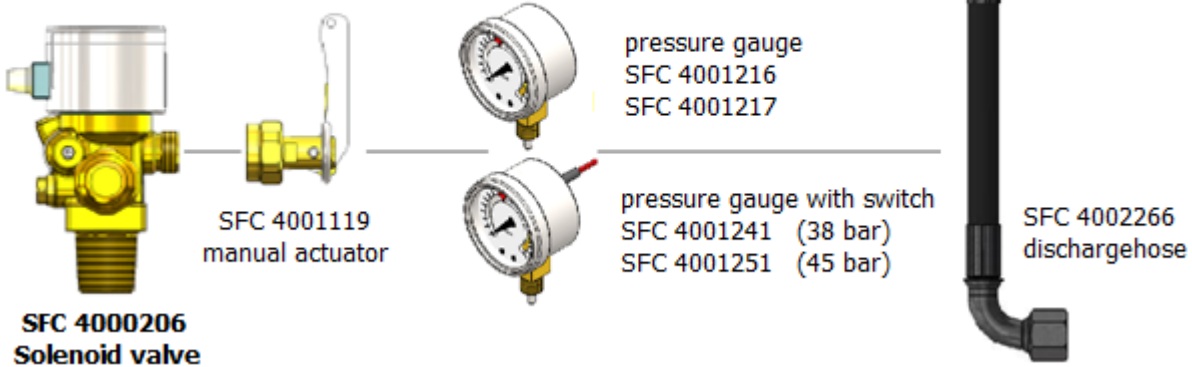
SFC 4000206 pilot valve with solenoid actuator

SFC 4000206 pilot valve with solenoid actuator used for only SAFE227 System 14L and 27L agent containers.

Article number	SFC 4000206
Inlet connection	W28.8 x 1/14" - 25E
Outlet connection	W21.8 x 1/14"
Burst disk	90 bar
Pressure gauge port	M12 x 1 mm
Deep Tube connection	M16 x 1 mm
Voltag.	24 VDC
max. current	0.4 A
Power consumption	9.3W
Material	Brass
Conformity	PED & TPED



CE Π



SFC 4000204 system valve

SFC 4000204 valve used for only SAFE227 14L and 27L agent containers.

Article number	SFC 4000204
Inlet connection	W28.8 x 1/14" - 25E
Outlet connection	W21.8 x 1/14"
Burst disk	90 bar
Pressure gauge port	M12 x 1 mm
Deep Tube connection	M16 x 1 mm
Material	Brass
Conformity	VdS-G314002

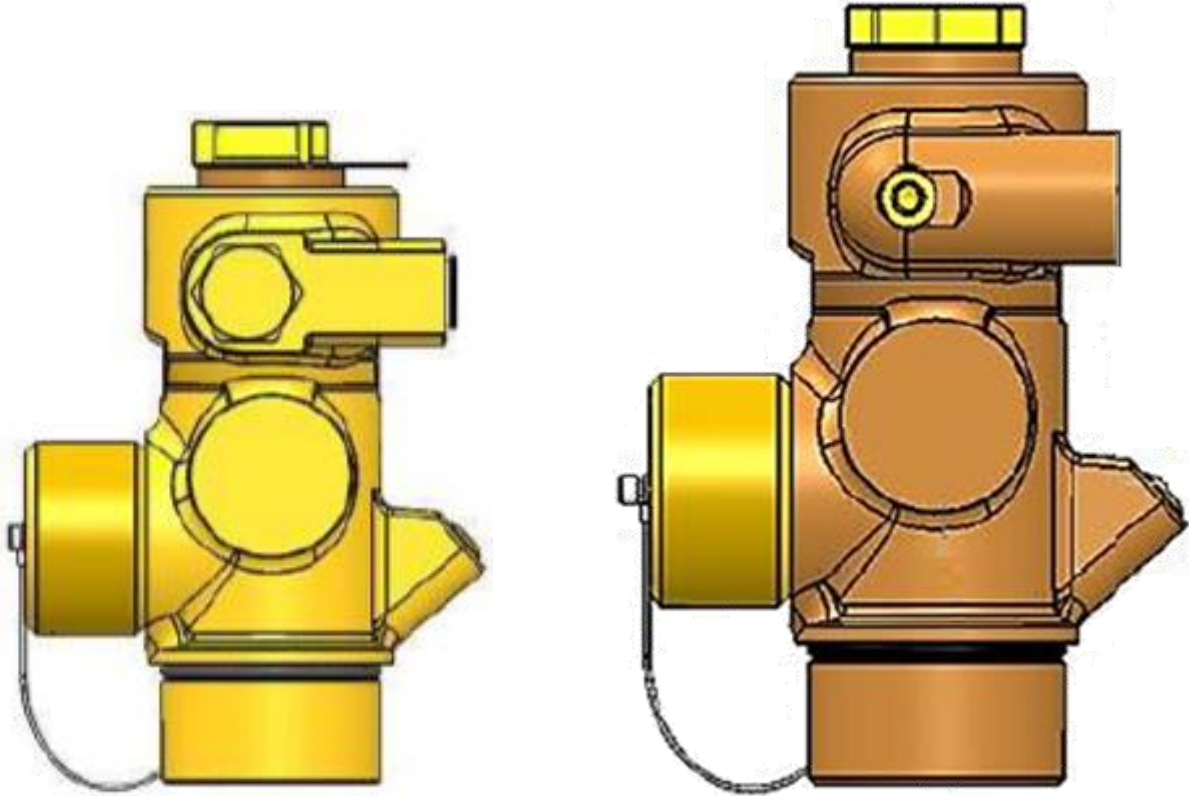


CE Π



SFC 4000210 and SFC 4000220 series system valves

There are 2 sizes available for the SAFE227 System:
 1,5" (33 mm) for the SFC 4000214 and SFC 4000219 valves
 2" (50 mm) for the SFC 4000224 and SFC 4000229 valves.

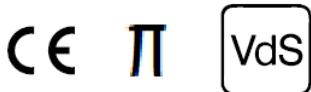


*SFC 4000214 Valve for 42 Bar Systems
 SFC 4000219 Valve for 50 Bar Systems*

*SFC 4000224 Valve for 42 Bar Systems
 SFC 4000229 Valve for 50 Bar Systems*

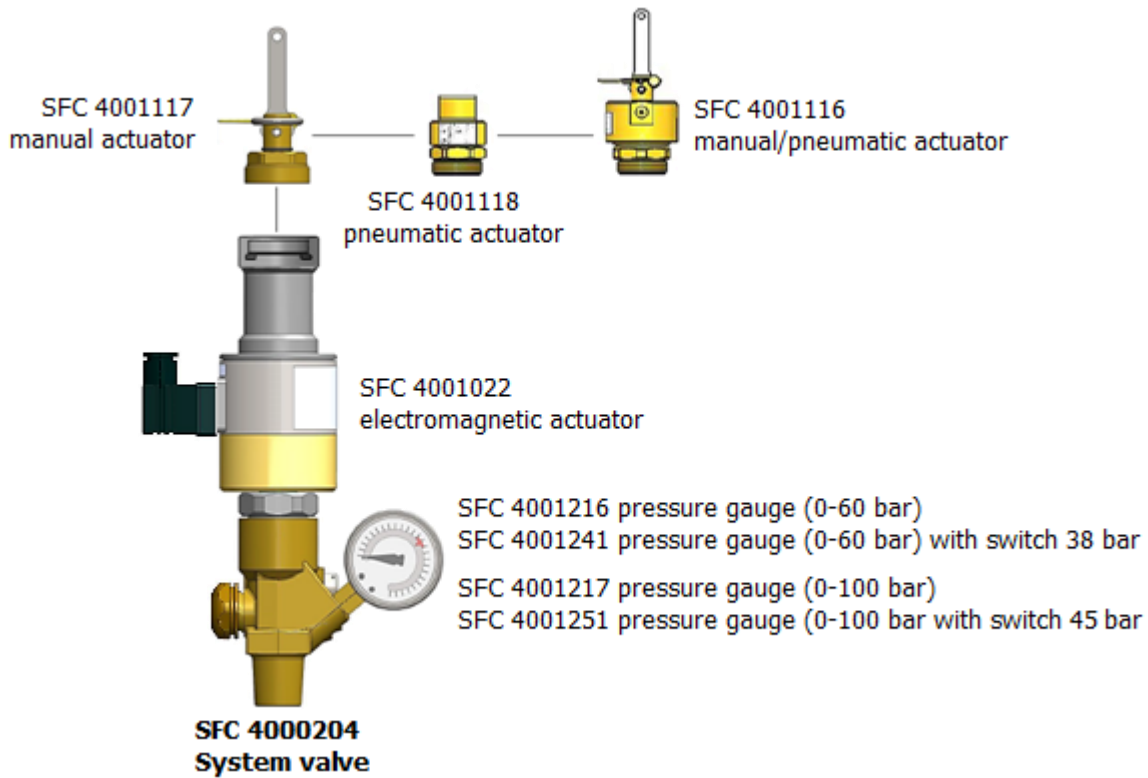
Articel number	Working pressure at +21°C (pw)	Inlet connection (C)	Outlet connection (A)	Dip tube thread (G)	Integrated electromagnetic actuator	Burst disc
SFC 4000214	42 bar	2 1/2" – 12 UN	1 7/8" – 12 UN	1 1/2" – 16 UN	---	60 bar
SFC 4000219	50 bar	2 1/2" – 12 UN	1 7/8" – 12 UN	1 1/2" – 16 UN	---	95 bar
SFC 4000224	42 bar	3" – 12 UN	2 1/2" 12 UNJ	2 1/8" – 16 UN	---	60 bar
SFC 4000229	50 bar	3" – 12 UN	2 1/2" 12 UNJ	2 1/8" – 16 UN	---	95 bar
Conformity	VdS-G317001					

Large-orifice celan agent valves with flexibiliy of actuation methods.
 For all clean agent installations.

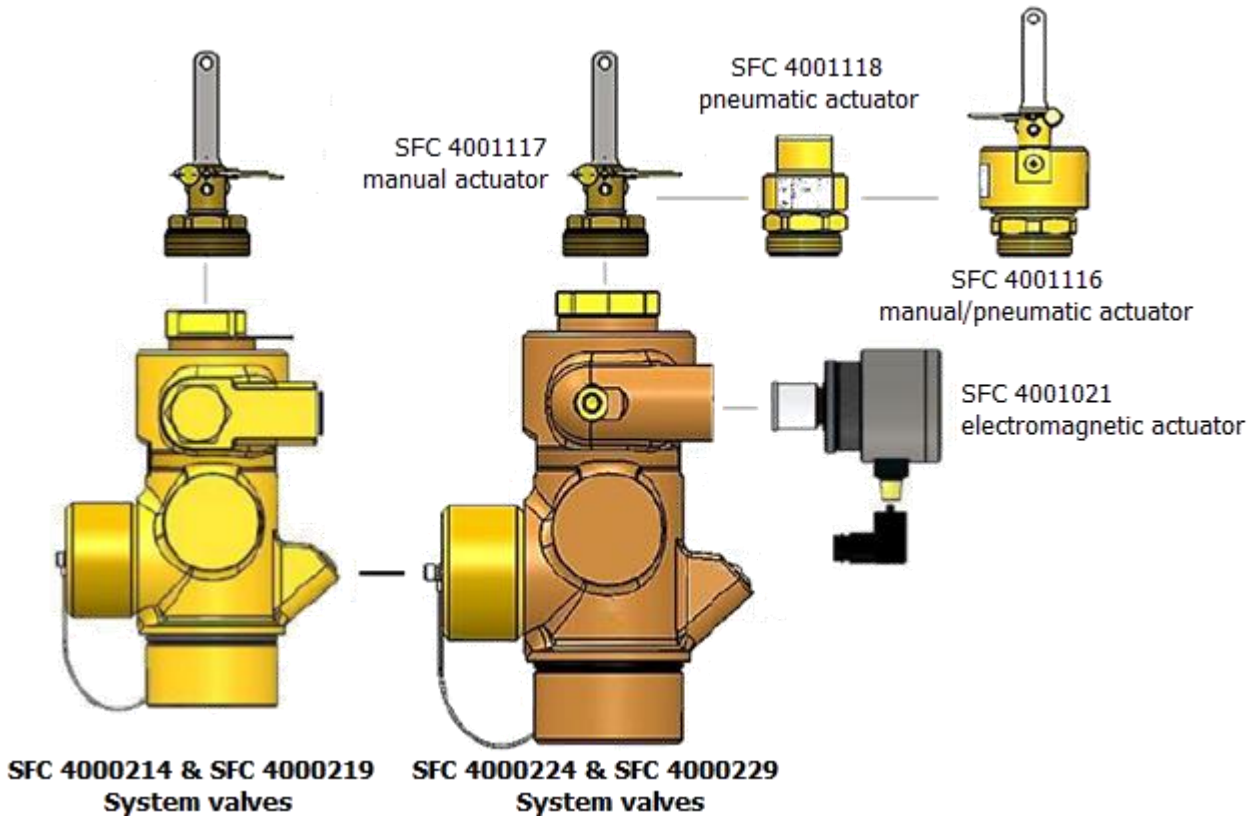


RELEASE DEVICES

SFC 4000204 valve



System Valves SFC 4000210 and SFC 4000220 series



ELECTROMAGNETIC RELEASE DEVICE

Device to electrically actuate the release of extinguishing agent.

SFC 4001022 for use with SFC 4000204 valve

SFC 4001021 for use with 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



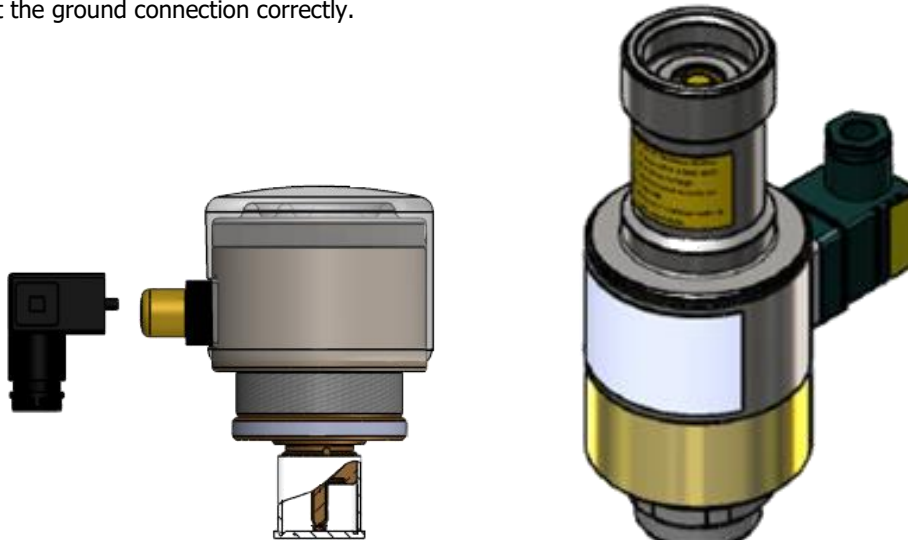
The electromagnetic release device is used to actuate the SAFE227 System electrically. It is mounted on top of the master valve and is operated by an electrical signal from a fire detection system. In order to actuate the electromagnetic release device a constant DC voltage of 24 V is required.

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

The duration of electrical impulse to actuate must be >5 seconds.

The coil itself has no protective circuit, if necessary this has to be implemented by user with the pilot wiring.

Interchanging polarity of the contacts (+) and (-) does not lead to malfunction of these device or extinguishing system, but ensure to connect the ground connection correctly.



SFC 4001021 use for SFC 4000210 & SFC 4000220 series valves

SFC 4001022 use for only SFC 4000204 valve

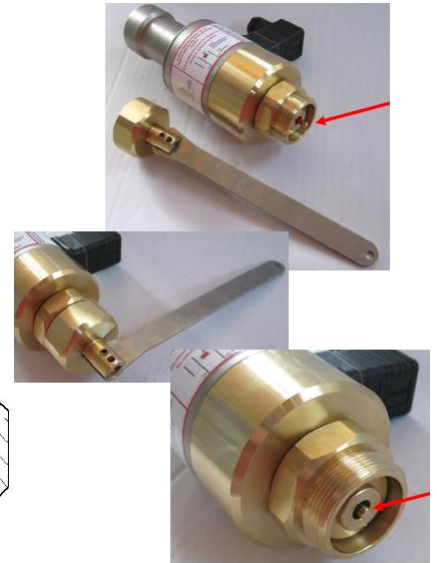
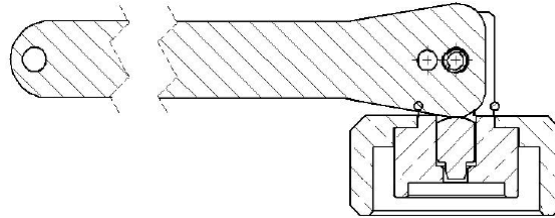
Article number	SFC 4001021	SFC 4001022
Valve series	SFC 4000210 & SFC 4000220	SFC 4000204
Inlet connection	M20 x 1,5	M36 x 1,5
Nominal voltage	24 VDC ± 10 %	24 VDC ± 10 %
Nominal current	0,4 A	0,5 A ± 10 %
Torque moment	25Nm ± 2	25Nm ± 2
Protection class	IP65	IP65
Ambient temperature	-20 +55 °C	-20 +55 °C
Material	Brass and stainless steel	Brass and stainless steel
Conformity	VdS-G317001	VdS-G314002

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

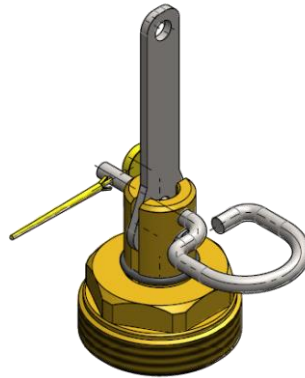
Article number	SFC 4001096
Connection	M36 x 1,5
Material	Brass



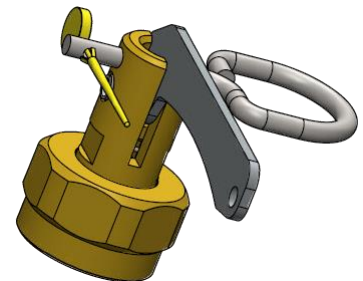
MANUAL RELEASE DEVICE

The manual release device allows manual actuation of pilot cylinder SAFE227 System components. This release device is used for manual actuation, which are connected to the pilot agent container.

Manual actuation is accomplished by pulling the hand lever on the manual release device. In the closed position the manual 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.



SFC 4001117 use for
SFC 4000204
SFC 4000210 & SFC 4000220
series valves



SFC 4001119 use for only
SFC 4000206 valve

Article number	SFC 4001117	SFC 4001119
Inlet connection	M36 x 1,5	M20 x 1,5
Maximum working pressure	300 bar	300 bar
Torque moment	25Nm ± 2	15Nm ± 1
Ambient temperature	-20 +55 °C	-20 +55 °C
Material	Brass	Brass
Conformity	VdS-G317001	

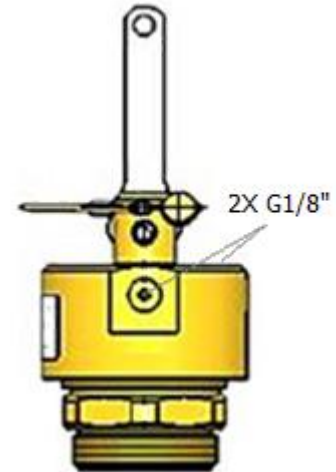


MANUAL/PNEUMATIC RELEASE DEVICE

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.

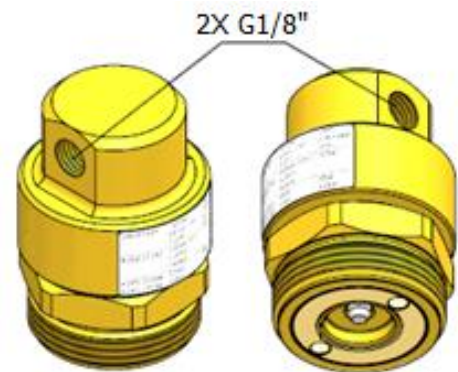
Article number	SFC 4001116
Inlet connection	M36 x 1,5
Maximum working pressure	300 bar
Torque moment	25Nm ± 2
Protection class	IP65
Ambient temperature	-20 +55 °C
Material	Brass
Conformity	VdS-G317001



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 4001118
Inlet connection	M36 x 1,5
Maximum working pressure	300 bar
Actuation pressure	6 bar
Torque moment	25Nm ± 2
Protection class	IP65
Ambient temperature	-20 +55 °C
Material	Body: brass
Conformity	VdS-G317001



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 4002115	SFC 4002117	SFC 4002119
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	30 mm	30 mm	30 mm
Nominal diameter	DN5	DN5	DN5
Working pressure	360 bar	360 bar	360 bar
Standard	EN 857 2 SC		
Conformity	VdS-G316009		



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



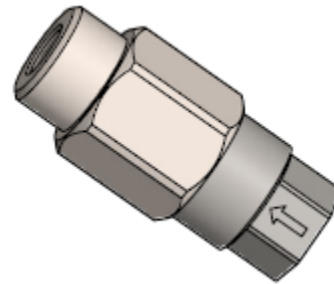
Each hose requires 2 adapters.
Must be ordered separately.

NON-RETURN VALVE FOR PILOT HOSE

Non-return valves allow flow in the direction of flow and prevent it in the opposite direction.

For this purpose the component gets assembled, in accordance with the correct flow direction, in the pilot hose line.

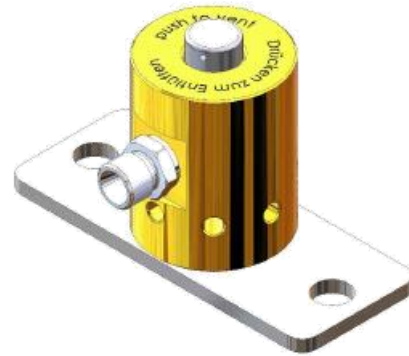
Article number	SFC 4002138
Body	Stainless steel; elastomer
Thread (inlet – outlet)	G1/8"
Operating pressure	360 bar
Temperature range	-20 °C up to +50 °C
Installation position	any
Conformity	VdS-G318002



VENT VALVE FOR PILOT HOSE

Vent valves are used in fixed installed SAFE227 System for venting pilot line.

Article number	SFC 4002137
Operating pressure	360 bar
Temperature range	-20 °C up to +65 °C
Connections	1 x straight fitting M12 x 1.5 – G1/8" 24° seal cone
Vent holes	∅5mm 8 x 45°
Type of actuation	Manual actuation
Materials	Brass
Conformity	VdS-Test Report



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 4002136
Closing pressure	0,4 bar
Inlet connection	G1/8"
Flow @ p=0.6 bar	6 liters/min
Material	Brass
Conformity	VdS-Test Report



Mounts on all pneumatic release devices

1 Compliant with the Construction Products Regulation (CPR) V3 Oct.2014

2 VdS – approved components

4 Components part of VdS – approved system

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 parts of the valve.

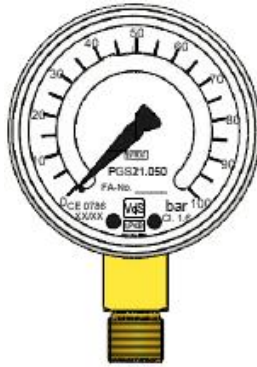
The pressure gauges SFC 4001241 and SFC 4001251 are equipped with an integrated pressure switch to supervise the loss of pressure in the agent container.

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

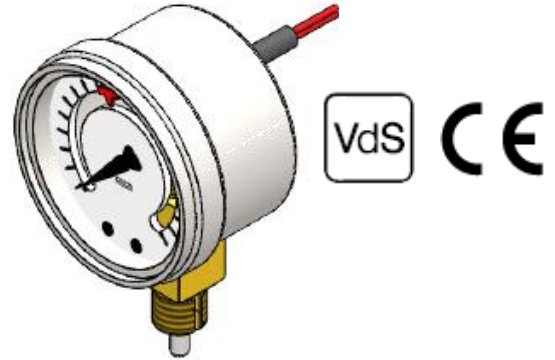
for HFC227ea

**Rear mounting for use with
SFC 4000204 & SFC 4000206
SFC 4000210 series
SFC 4000220 series valves**

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



Pressure gauge



Pressure gauge with switch

Article number	SFC 4001216	SFC 4001217	SFC 4001241	SFC 4001251
Pressure scale	42 bar	42 bar / 50 bar	42 bar	50 bar
Scale	0 – 60 bar	0 – 100 bar	0 – 100 bar	0 – 100 bar
Inlet connection	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Pressure switch	No	No	Yes	Yes
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-G309005	VdS-G309005

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 4000204 valve
for 14L to 27L cylinders

for SFC 4000210 valves
for 27L to 120L cylinders

for SFC 4000220 valves
for 120L to 180L cylinders



SFC 4002266
discharge hose



SFC 4002247
discharge hose



SFC 4002257
discharge hose

Article number	SFC 4002266	SFC 4002247	SFC 4002257
Valve series	for SFC 4000204 valves	for SFC 4000210 valves	for SFC 4000220 valves
Length	250 mm	400 mm	400 mm
Bending Radius	min. 90 mm	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	DN33	DN50
Working pressure	360 bar	70 bar	70 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-G316010	VdS-G316012	VdS-G316012

Discharge hose adapters (OPTIONAL)

Screw connection with connection nut
Type: female /connection nut / male

Discharge hose adapter G1 1/2"

Article SFC 4002296

Discharge hose adapter G2"

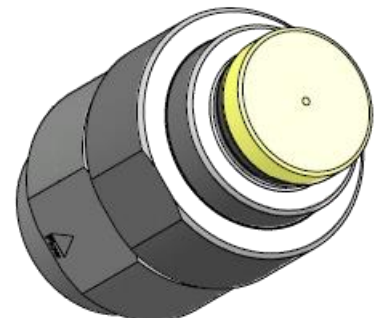
Article SFC 4002297



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.

Article number	SFC 4002335	SFC 4002355
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"
Working pressure	70 bar	70 bar
Conformity	VdS-G317009	



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 6023572	2"	2"	2 port	790	60 bar	120 lt. or 140 lt. cylinders
SFC 6023573	2"	2"	3 port	1200	60 bar	120 lt. or 140 lt. cylinders
SFC 6024072	2"	2"	2 port	840	60 bar	180 lt. cylinders
SFC 6033572	3"	2"	2 port	790	60 bar	140 lt. cylinders
SFC 6033573	3"	2"	3 port	1200	60 bar	140 lt. cylinders
SFC 6033574	3"	2"	4 port	1610	60 bar	140 lt. cylinders
SFC 6034072	3"	2"	2 port	840	60 bar	180 lt. cylinders
SFC 6034073	3"	2"	3 port	1300	60 bar	180 lt. cylinders
SFC 6034074	3"	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.

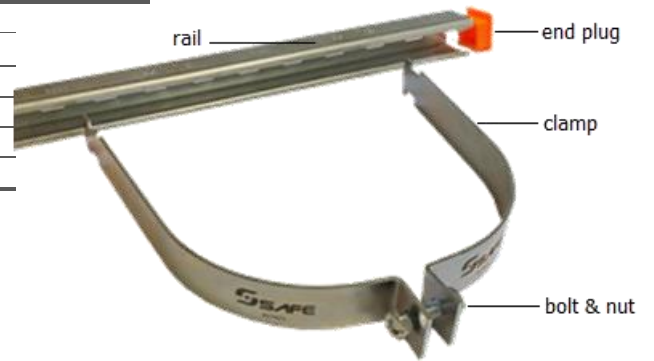
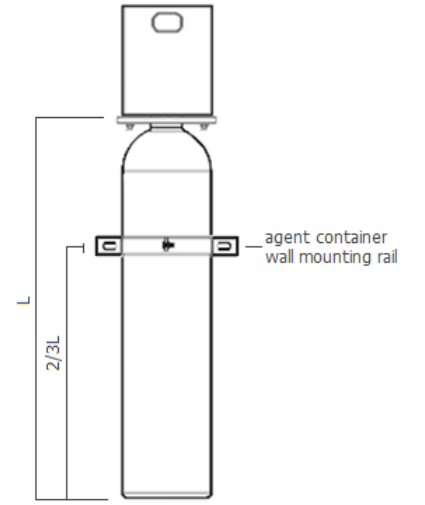
Part	Article number	Length	used for agent containers
Manifold mounting rail	SFC 6093561	300 mm	1 row 120 lt. or 140 lt. cylinders
Manifold mounting rail	SFC 6094061	350 mm	1 row 180 lt. cylinders
Manifold mounting rail	SFC 6093562	700 mm	2 rows 120 lt. or 140 lt. cylinders
Manifold mounting rail	SFC 6094062	750 mm	2 rows 180 lt. cylinders
Manifold mounting rail	SFC 6093563	1100 mm	3 rows 120 lt. or 140 lt. cylinders
Manifold mounting 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			



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 R3/8", R1/2", R3/4", R1", R1 1/4", R1 1/2" and R2".

Nozzles are available in two different variants with different dispersal patterns. SFC 77360XXX with spray angle 360° with fixed discharge holes. SFC 77180XXX with spray angle 180° with fixed discharge holes.

The range of available orifice diameter (min. – max.) is written in the table of variants. The required orifice diameter has to be determined by VdS calculation software.

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



180° discharge nozzle



360° discharge nozzle

180° Sidewall nozzles

Article number range	Inlet connection (C)	Orifice diameter range [mm]	Spray angle	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7718010 – XX,X	G 3/8"	3,0 – 9,5	180°	5	29	24
SFC 7718015 – XX,X	G 1/2"	3,0 – 12,0	180°	5	36	30
SFC 7718020 – XX,X	G 3/4"	4,0 – 16,0	180°	9	46	38
SFC 7718025 – XX,X	G 1"	6,0 – 20,0	180°	9	55	45
SFC 7718032 – XX,X	G 1 1/4"	8,0 – 25,0	180°	9	64	50
SFC 7718040 – XX,X	G 1 1/2"	10,0 – 32,0	180°	14	77	60
SFC 7718050 – XX,X	G 2"	12,0 – 40,0	180°	14	94	80
Conformity	VdS- G317005					

360° Nozzles

Article number range	Inlet connection (C)	Orifice diameter range [mm]	Spray angle	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SFC 7736010 – XX,X	G 3/8"	3,0 – 9,5	360°	8	29	24
SFC 7736015 – XX,X	G 1/2"	3,0 – 12,0	360°	8	36	30
SFC 7736020 – XX,X	G 3/4"	4,0 – 16,0	360°	16	46	38
SFC 7736025 – XX,X	G 1"	6,0 – 20,0	360°	16	55	45
SFC 7736032 – XX,X	G 1 1/4"	8,0 – 25,0	360°	16	64	50
SFC 7736040 – XX,X	G 1 1/2"	10,0 – 32,0	360°	24	77	60
SFC 7736050 – XX,X	G 2"	12,0 – 40,0	360°	24	94	80
Conformity	VdS- G317005					

MONITORING SWITCH

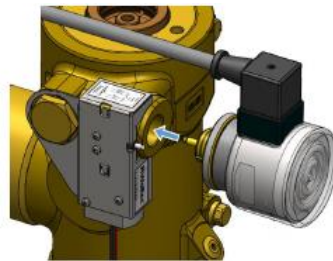
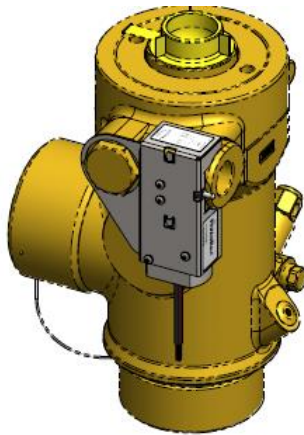
The monitoring switch (for electromagnetic release device) monitors if the electromagnetic release device is properly in place to actuate the system. It is connected to the control box.

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

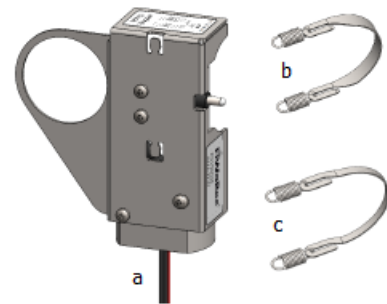
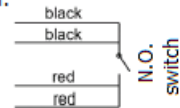
KEY FEATURES

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

Articel number	SFC 4001041	SFC 4001042
Description	Mounted on SFC 4000210 series valves	Mounted on SFC 4000220 series valves



Switching type - NO
 Rating - max. 30VDC, 3A
 Protection class - IP65
 Wiring diagram:



a. monitoring device
 b. mounting clamp for use with valve SFC 4000210
 c. mounting clamp for use with valve SFC 4000220

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 14L to 180L cylinders**

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

Article number	SFC 1100621
Dimensions	235 x 175 mm



Not included with
empty cylinder / valve assemblies.



Labels only valid for cylinders
VdS approved systems.

FM-200™ HFC227ea
Formula: CF₃CHF₂
Gas Name: 1,1,1,2,2,3,3,3-Heptafluoropropane

WARNING: High pressure gas cylinders are capable of violent discharge. This is extremely hazardous liquid, 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 head.
System cylinders must be transported and mounted vertically.

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
Concerned EU Directive & Standards for components
TRED 2010/35/EU
ISO 9809, ISO 11120, EN ISO 10297, EN 12094

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

INSPECTION INSTRUCTIONS:
System cylinders should be inspected monthly or more frequently if circumstances require. At least once in every six (6) months 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 reloaded with a stand-by cylinder.
Piping and nozzles should be examined to determine that they are unobstructed.

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 unauthorized and/or untrained personnel. Otherwise it may result in unnecessary discharge of the extinguishing agent.
For the mounting, removing, deinstallation and periodical maintenance of the system, contact your supplier or manufacturer.
Call SAFE Teknoloji for refilling and pressurizing your system cylinder.
No responsibility for injury or damage, arising from non compliance with any legislation or directive, can be accepted.

SAFE Teknoloji San. ve Tic. Ltd.Şti.
N0208 D1 Akam
Sıralı Kahraman Cad. No.3-5
45030 Manisa Türkiye

VdS

HFC227ea
Chemical Under pressure, NDC
UN 3296

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

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

DANGER AND WARNING SIGNS



Article number	SFC 1100626	SFC 1100629	SFC 1100627	SFC 1100628
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SAFE TEKNOLOJİ SAN. VE TİC. LTD. ŞTİ.
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Article nr. SFC 1100764 - Revision A_F
Effective March 10th 2023

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