

**Cryo Blau
Carbon Dioxide
Fire Suppression Systems**



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Cryo Blau System components are approved and certified in compliance with recognized international norms. Certificates related with each individual product are clearly indicated on each respective product page.

Cryo Blau systems are certified with system approval by UL.

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



Components for a complete Cryo Blau System

Cryo Blau System by SAFE Technology Ltd. is a complete UL Listed carbon dioxide fire suppression system 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 UL Listed & VdS approved components.

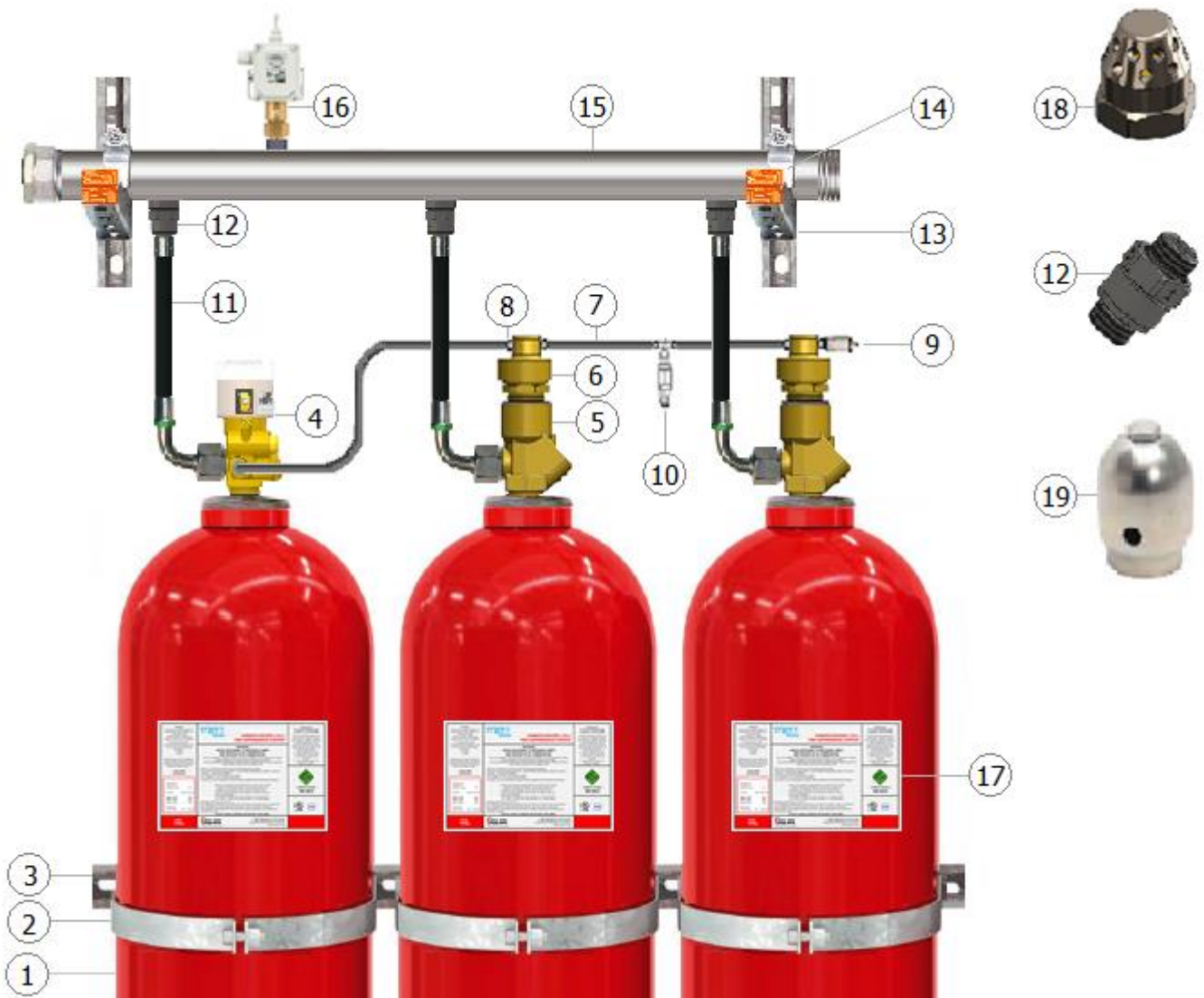
SAFE offers all the components needed to configure a complete system for 60 bar carbon dioxide extinguishing agent.

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 configure fixed suppression systems – choosing only selected components – or using the entire system.

For maximum ease and certainty of performance, specify Cryo Blau components to configure the entire system using carbon dioxide gas with seamless steel high pressure cylinders.



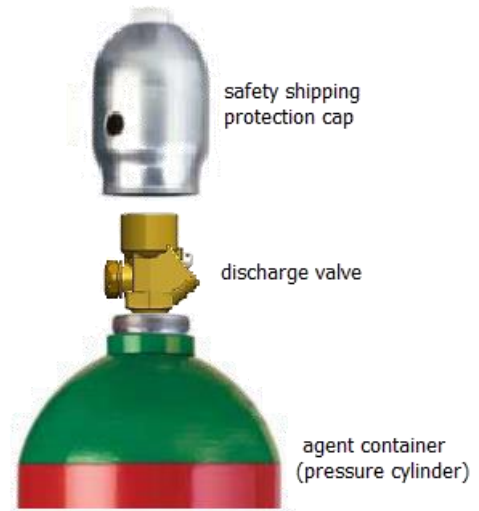
Legent			
1	Agent container	10	Pilot line test conection
2	Clamp for agent container	11	Discharge hose
3	Agent container wall mounting rail	12	Check valve
4	Master discharge valve with solenoid actuator and manual release device	13	Manifold mounting rail
5	Slave discharge valve	14	Clamp for manifold
6	Pneumatic release device	15	Manifold
7	Pilot hose	16	Pressure and flow detector switch
8	Adapter for pilot hose	17	Cylinder name plate
9	Bleed valve	18	Nozzle
		19	Valve protection (safety/shipping) cap

The **Cryo Blau** System helps you to reduce the footprint, installation and service cost by offering you a choice from 14L, 27L, 40L, 67L, 80L and 100L cylinders configurations.

The **Cryo Blau** 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 SAFE UL Listed Carbon Dioxide Fire Suppression System has been installed in thousands of instalations worldwide.

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



Cryo Blau System agent container variants

Agent containers with valve assembly	Master container (Empty) article number	Master container (Filled CO ₂) article number	Slave container (Empty) article number	Slave container (Filled CO ₂) article number	Filling ratio 0,67 kg/L Filling weight of CO ₂	Filling ratio 0,75 kg/L Filling weight of CO ₂
14 L. Agent container	SCO 2201400	SCO 2201409	SCO 2301400	SCO 2301409	9 kg.	10 kg.
27 L. Agent container	SCO 2202700	SCO 2202718	SCO 2302700	SCO 2302718	18 kg.	20 kg.
40 L. Agent container	SCO 2204000	SCO 2204026	SCO 2304000	SCO 2304026	26 kg.	30 kg.
67 L. Agent container	SCO 2206700	SCO 2206745	SCO 2306700	SCO 2306745	45 kg.	50 kg.
80 L. Agent container	SCO 2208000	SCO 2208053	SCO 2308000	SCO 2308053	53 kg.	60 kg.
100 L. Agent container	SCO 2210000	SCO 2210066	SCO 2310000	SCO 2310066	66 kg.	75 kg.

(*) Agent container valves UL listed @ safety disc 190 bar

Agent containers with valve assembly	Master container (Empty) article number	Master container (Filled CO ₂) article number	Slave container (Empty) article number	Slave container (Filled CO ₂) article number	Filling ratio 0,67 kg/L Filling weight of CO ₂	Filling ratio 0,75 kg/L Filling weight of CO ₂
14 L. Agent container	SCO 2401400	SCO 2401410	SCO 2501400	SCO 2501410	9 kg.	10 kg.
27 L. Agent container	SCO 2402700	SCO 2402720	SCO 2502700	SCO 2502720	18 kg.	20 kg.
40 L. Agent container	SCO 2404000	SCO 2404030	SCO 2504000	SCO 2504026	26 kg.	30 kg.
67 L. Agent container	SCO 2406700	SCO 2406755	SCO 2506700	SCO 2506745	45 kg.	50 kg.
80 L. Agent container	SCO 2408000	SCO 2408060	SCO 2508000	SCO 2508053	53 kg.	60 kg.
100 L. Agent container	SCO 2410000	SCO 2410075	SCO 2510000	SCO 2510066	66 kg.	75 kg.

(**) Agent container valves only VdS approved @ safety disc 250 bar

A complete agent container/valve assembly

- Agent containers assembled SCO 400310 series valves
- UL listed
- Steel valve protection included.



for **UL**: Label included for filled agent containers only.

Labels needs to be ordered separately for unfilled containers.

Extinguishing agent

The Cryo Blau System is designed for the use with carbon dioxide gas.

CO₂ is an odorless, colorless, electrically non-conductive, non-corrosive and non-deteriorating gas with a slightly pungent, acidic taste. It will not burn or support combustion.

It is approximately 1,5 times heavier than air, and is normally present about 0,03% by volume at normal temperature (+15 °C) and atmospheric pressure. CO₂ has a density of 1,87 kg/m³, It is very soluble in water, forming carbonic acid. Solid carbon dioxide (dry ice) will sublime at atmospheric pressure at -78,33 °C to gaseous carbon dioxide. CO₂ is instrumental in controlling respiration and other vital responses in animals and humans, but in concentrations too high it can be lethal.

Carbon dioxide has many applications based on its varied properties. The non-flammable properties of CO₂ make it a popular gas for fire extinguishing agent.

- Colourless, odorless
- No residue to clean up after discharge
- No decomposition products
- Stored as a gas

The extinguishing effect of the Cryo Blau System is based on distributing the CO₂ into the protected area by total flooding. Therefore it has an excellent extinguishing efficiency with fires of class A, B and C. Carbon dioxide used in the Cryo Blau System are suitable for the extinguishing of deep-seated fires and surface fires.

CO₂ is the ideal and only extinguishing agent for local application as well as total flooding. Even if the openings that will allow gas leakage outside the hazard cannot be closed, Cryo Blau Systems can be designed with the extended discharge method by calculating the amount of leaked CO₂.

As CO₂ is easily available and low cost, full-scale testing can be performed without concerns.

Whereas the cost of clean up and peripheral damage associated with water, foam and dry chemical agents can exceed the cost of the fire damage itself, clean up costs and down time associated with inert gases are negligible.

Most materials and equipment are totally unaffected by exposure to CO₂. It is stable, even at high temperatures, and does not decompose when subjected to fire; therefore, it does not cause metals to corrode.

The following table shows the physical properties of carbon dioxide agent (SI Units).

Physical properties	
Chemical formula	Carbon Dioxide (CO ₂)
Molecular weight	316,04 g/mol
Boiling point at 1 atm	+49,0 °C (+120,6 °F)
Freezing point	-108,0 °C (-162,4 °F)
Critical temperature	+168,7 °C (+335,6 °F)
Critical pressure	18,65 bar (270,44 psi)
Critical volume	494,5 cc/mol (0,0251 ft ³ lbm)
Critical density	639,1 kg/m ³ (39,91 lbm/ft ³)
Specific heat, liquid	1,103 kJ/kg °C (0,2634 BTU/lb. °F)
Specific heat, vapor at 1 atm	0,891 kJ/kg °C (0,2127 BTU/lb. °F)
Heat of vaporization (kJ/kg °C) at boiling point	37,8
Thermal conductivity (W/m °C) of liquid	0,034
Viscosity, liquid	0,39 centistokes
Global warming potential (GWP)	1
NOAEL (VOL %)	10
LOAEL (VOL %)	>10,0
Ozone depletion potential (ODP)	0
Estimated atmospheric lifetime (ALT)	0,014 years
4 hours acute inhalation	LC50 > 100,000 ppm
US EPA SNAP approval	Accepted

Article	Extinguishing agent
SCO 0020020	Carbon Dioxide (CO ₂)

Extinguishing mechanism

Carbon dioxide, as extinguishing agent, reduces the oxygen concentration to below 16 percent. This oxygen reduction suffocates most type of fires, especially surface fire or fires and flashes (caused by paint, oil, etc.) And fire is quickly suppressed. In the case of deep-seated or smoldering fires (clothing or paper), the extinguishing agent concentration must be maintained in the protected area for a longer period of time so that these fires are suffocated and re-ignition is not possible.

Carbon dioxide is effective in areas where flammable liquids and vapors are present. Fire in these hazards spread very rapidly. Deep seated hazards contain electrical equipment, bulk record storage and duct work are equally well protected with carbon dioxide. A fixed CO₂ fire suppression system engineered specifically for the hazard and operated automatically, assures early fire detection and very rapid fire suppression. By suppressing these fires before they spread and flames occur, major losses may be avoided and down time is minimized.

Carbon dioxide discharges from the agent container by the force of its own expansion, without and requirement of a pump or other pressurizing mechanisms. Carbon dioxide penetrates all permeable areas, seeps into cracks and crevices where fire may be present.

The discharge of carbon dioxide resembles a cloud since expanded carbon dioxide is cold. The temperature of carbon dioxide discharging from a nozzle is approximately -78,8 °C (-110 °F) below zero. This cloud effect, or fog, is due to the moist in the air which cools off by the extremely low temperature of the carbon dioxide and fine "snow" accompanies the discharged liquid converting to dry ice particles. This cooling effect of carbon dioxide on the surrounding atmosphere has proven to be beneficial in fire fighting.

According to NFPA 12, CO₂ fire suppression systems are intended to use in not occupied spaces and must not be installed in occupied spaces except if there are no other suitable extinguishing agents that can provide an equivalent level of fire protection to CO₂.

Exposure to carbon dioxide

Any substantial release of carbon dioxide is potentially hazardous, especially inside a poorly ventilated building. Enclosed low height areas, where CO₂ gas could accumulate in high concentration, are particularly hazardous because the gas is slow to be dispersed unless the spaces are well ventilated.

CO2	
Design concentration	30 - 75%
NOAEL	< 5%
Safety margin	Lethal at design concentration

Safety precautions

The health effects of inhaling carbon dioxide includes headache, dizziness, restlessness; inhalation difficulty; sweating, malaise (feeling of discomfort); increased heart rate, cardiac output and blood pressure coma; asphyxia; convulsions and unconsciousness.

- The high concentrations of carbon dioxide, in use as an extinguishing agent, pose a health risk to humans.
- In low concentrations the health effects of carbon dioxide are physiologically reversible but in high concentrations it can cause unconsciousness and it can be fatal.

When designing a CO₂ fire suppression system, NFPA12 also requires special safety precautions to ensure the safety of persons in areas where hazardous concentrations of CO₂ may be generated by the discharge of the fire suppression system.

- Do not re-enter the flooded area if a dangerous CO₂ concentration could still be present.
- Do not re-enter the flooded area until only fresh air is available and entry has been permitted by the fire department or responsible authorities.

Cryo Blau System agent containers

Carbon dioxide is stored under pressure in a vaporized phase in agent containers (high pressure cylinders) at a pressure of 45 to 65 bar.

CO₂ agent containers internal pressure 58,6 bar at ambient temperature of +21 °C. The pressure inside the agent container varies as the ambient temperature changes. In general, the ambient storage temperature for agent containers used in local applications is 0 °C to +49 °C and for agent containers used in total flooding applications -20 °C to +55 °C.

The agent containers must be transported, stored and installed vertical in a well ventilated, dry, cool, secure area that is protected from weather conditions and preferably fire-resistant.

Our agent containers are manufactured according to transportation DOT and/or TPED regulations, which specify the material of construction, method of manufacturing, marking, testing, and which agents they are permitted to be filled with, as well as other details. Each agent container is delivered with a safety/shipping valve protection cap.

Valve protection caps installed on the valves should not be removed until the agent containers are fixed to the wall.

Cryo Blau agent containers for SCO 4000310 series valves

Article number	SCO 0101416	SCO 0102722	SCO 0104026	SCO 0106726	SCO 0108026	SCO 0110031
Water volume	14 liters	27 liters	40 liters	67 liters	80 liters	100 liters
External diameter	165 mm	229 mm	267 mm	267 mm	267 mm	348 mm
Height	865 mm	860 mm	895 mm	1440 mm	1675 mm	1290 mm
Working pressure	167 bar	167 bar	167 bar	167 bar	167 bar	167 bar
Test pressure	250 bar	250 bar	250 bar	250 bar	250 bar	250 bar
Valve connection	25E	25E	25E	25E	25E	25E
Colour body	Red, RAL3000	Red, RAL3000	Red, RAL3000	Red, RAL3000	Red, RAL3000	Red, RAL3000
Colour shoulder	Grey, RAL7037	Grey, RAL7037	Grey, RAL7037	Grey, RAL7037	Grey, RAL7037	Grey, RAL7037
Material	34CrMo4 steel	34CrMo4 steel	34CrMo4 steel	34CrMo4 steel	34CrMo4 steel	34CrMo4 steel
Valve protection cap	W80 x 11F/1"	W80 x 11F/1"	W80 x 11F/1"	W80 x 11F/1"	W80 x 11F/1"	W80 x 11F/1"
Conformity	TPED	TPED	TPED	TPED	TPED	TPED

Agent container mounting brackets for single row containers

Galvanized steel wall mounting rails and clamps are used to mount the agent containers in a vertical position to the wall.

Part	1 Container	14 l. Agent containers		27 l. Agent containers	
		Article	Lenght	Article	Lenght
Agent container mounting rail		SCO 1216501	290 mm	SCO 1222901	380 mm
Clamp for agent container		SCO 1416501	Ø165 mm	SCO 1422901	Ø229 mm
End cap		SCO 1290001			

Part	Container qty.	40 l. – 67 lt. – 80 l. Agent containers		100 l. Agent containers	
		Article	Lenght	Article	Lenght
Agent container wall mounting rail	1	SCO 1227301	420 mm	SCO 1235001	500 mm
	2	SCO 1227302	720 mm	SCO 1235002	900 mm
	3	SCO 1227303	1020 mm	SCO 1235003	1300 mm
	4	SCO 1227304	1320 mm	SCO 1235004	1700 mm
	5	SCO 1227305	1620 mm	SCO 1235005	2100 mm
	6	SCO 1227306	1920 mm	SCO 1235006	2500 mm

Clamp for agent container	SCO 1426701	Ø267 mm	SCO 1435001	Ø348 mm
End cap	SCO 1290001			



(*) The cylinder wall mounting rails are available for 1 to 6 agent containers for 67 l. – 80 l. and 100 l. Containers.

Agent container mounting brackets for double row containers

Galvanized steel wall mounting rails, bolts and nuts are used to mount the agent containers in a vertical position to the wall. The container mounting brackets are available in two sizes for 4 or 6 agent containers.

Part	Container qty.	67 lt. – 80 l. Agent containers		100 l. Agent containers	
		Article	Lenght	Article	Lenght
Mounting rail	2 X 2 container	SCO 1227322	720 mm	SCO 1236022	910 mm
	3 X 2 container	SCO 1227323	1020 mm	SCO 1236023	1310 mm
Bolts and nuts kit		SCO 1426807	645 mm	SCO 1436007	825 mm
End cap		SCO 1290001			



Cryo Blau System discharge valves

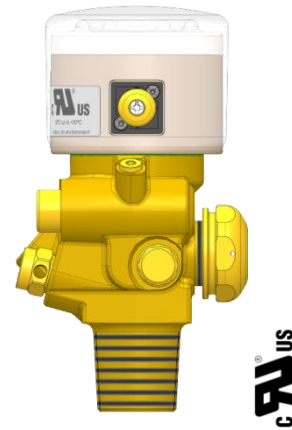
Master container discharge valve

This valve is used on agent containers and it is operated on the master agent container by an electromagnetic release device in combination with a manual/pneumatic release device or manual release device.

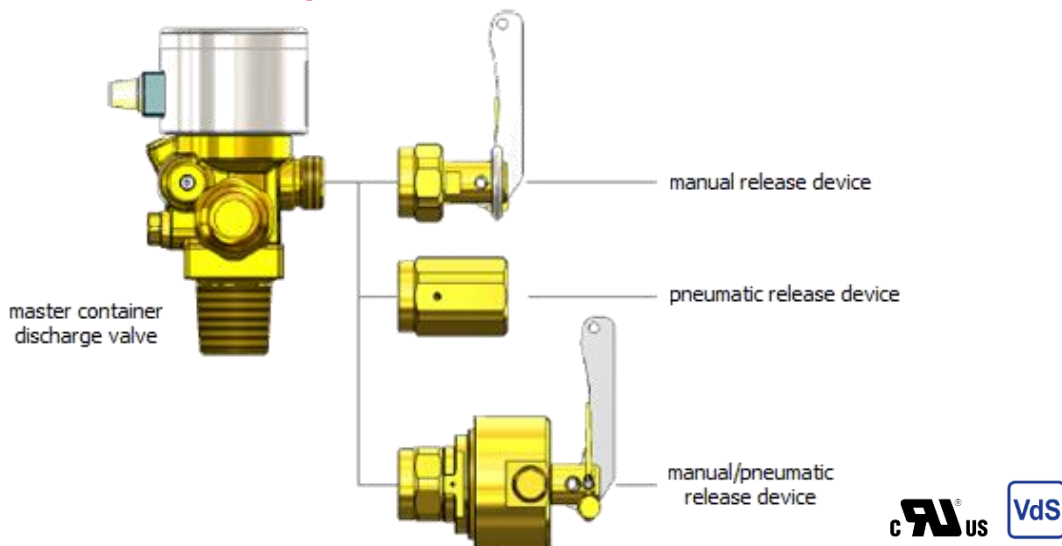
On the slave agent containers the valve is operated by the pneumatic release device, which is mounted on the M36 x 1,5 actuator connector of the valve.

The pneumatic release device is connected to the master valve by a pilot hose.

Article number	SCO 4000317	SCO 4000316
Inlet connection	25E	25E
Outlet connection	W21.8 x 1/14"	W21.8 x 1/14"
Burst disc	190 bar	250 bar
Test pressure	360 bar	360 bar
Connection port	M20 x 1.5	M20 x 1.5
Pilot connection port	G1/8"	G1/8"
Nominal width (DN)	12 mm	12 mm
Voltage	24 VDC	24 VDC
max. current	0.4 A	0.4 A
Power consumption	9.3 W	9.3 W
Material	Brass	Brass
Conformity	UL Listed	



Components for master container discharge valve

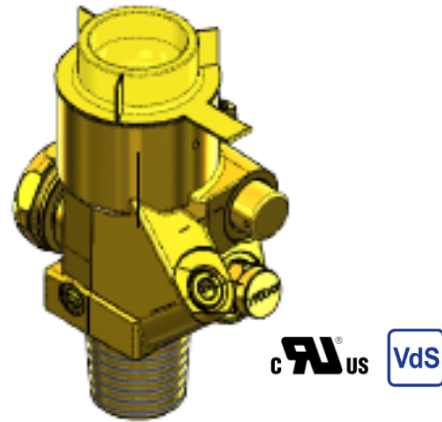


Article number	Actuation	Technical details		
SCO 4001119	Manual	actuation by pulling out the safety pin and lever movement (moving the lever by 90°)		
SCO 4001120	Manual/Pneumatic	minimum pilot pressure 8 bar	maximum pilot pressure 300 bar	connection 2 x G1/8"
SCO 4001129	Pneumatic	minimum pilot pressure 0,33 x container pressure	maximum pilot pressure 360 bar	connection 1 x G1/8"

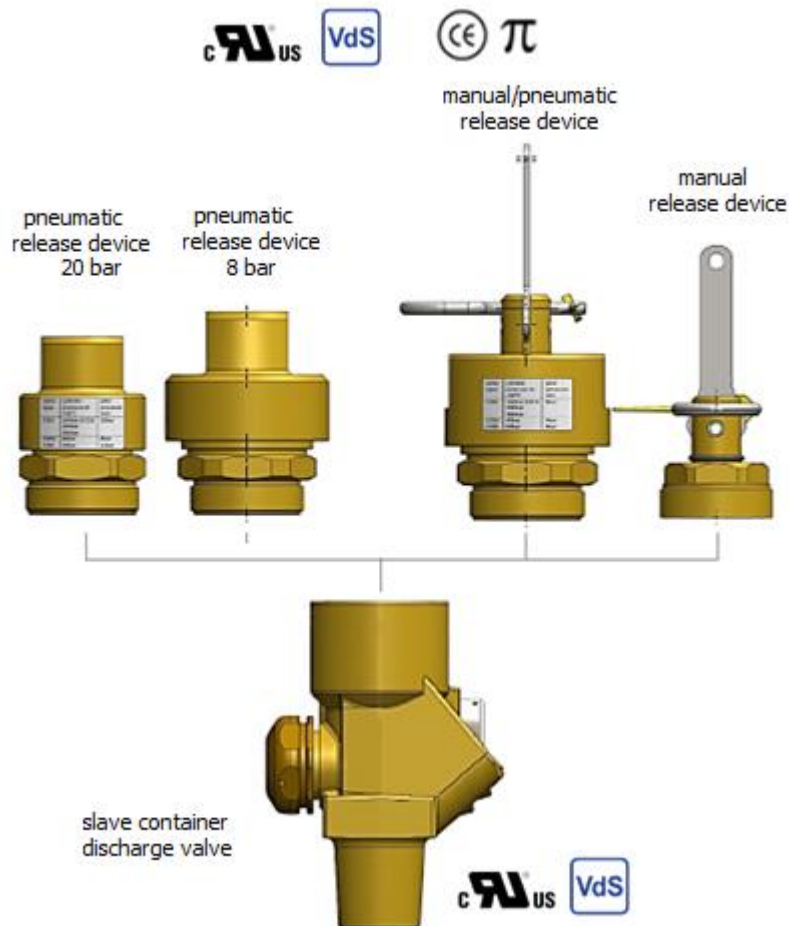
Slave container discharge valve

This valve is used on slave agent container.
It is operated by the pneumatic release device.
Possible to use in combination with a manual/pneumatic release device or manual release device.

Article number	SCO 4000314	SCO 4000312
Inlet connection	25E	25E
Outlet connection	W21.8 x 1/14"	W21.8 x 1/14"
Burst disk	190 bar	250 bar
Test pressure	360 bar	360 bar
Connection port	M36 x 1.5	M36 x 1.5
Pilot connection port	G1/8"	G1/8"
Nominal width (DN)	12 mm	12 mm
Material	Brass	Brass
Conformity	UL Listed	VdS Approved



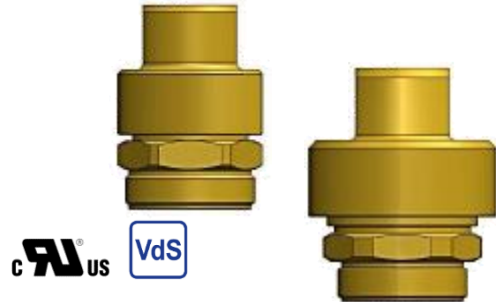
Components for slave container discharge valve



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 container.

Article number	SCO 4001118	SCO 4001128
Inlet connection	M36 x 1,5	M36 x 1,5
Nominal pilot pressure	20 bar	8 bar
Maximum working pressure	360 bar	300 bar
Torque moment	25Nm ± 2	25Nm ± 2
Protection class	IP65	IP65
Ambient temperature	-20 +50 °C	-20 +50 °C
Material	Body: brass	

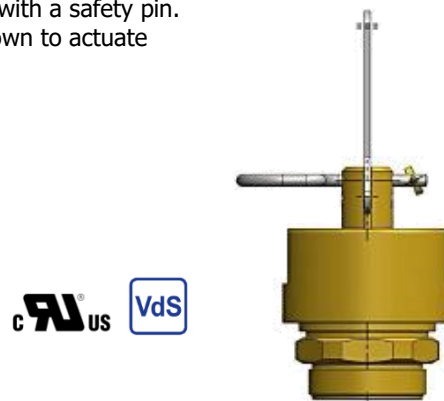


Manual/Pneumatic release device

The manual/pneumatic release device allows manual or pneumatic actuation of several Cryo Blau System agent containers. 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	SCO 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

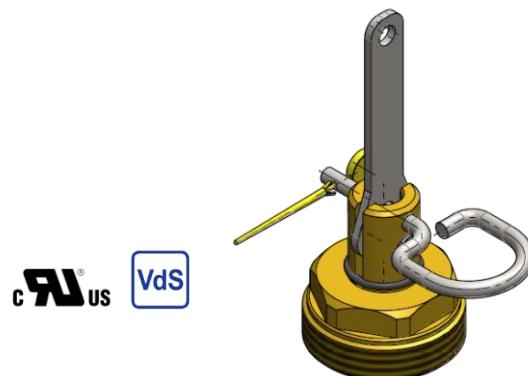


Manual release device

The manual release device allows manual actuation of Cryo Blau System. This release device is used for manual actuation, which are connected to the master agent container valve.

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.

Article number	SCO 4001117
Inlet connection	M36 x 1,5
Max. working pressure	300 bar
Torque moment	25Nm ± 2
Ambient temperature	-20 +55 °C
Material	Brass



Pilot hoses

Pilot hoses are used to connect several agent containers, 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 be used only in accordance with component approval in Cryo Blau Systems.



Article number	SCO 4002114	SCO 4002115	SCO 4002117	SCO 4002119
Length	400 mm	500 mm	700 mm	1000 mm
Connection	2 x M12 x 1,5			
Bending radius	30 mm			
Nominal diameter	DN5			
Working pressure	360 bar			
Standard	EN 857 2 SC			



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	SCO 4002121
Connections	G1/8" / M12 x 1,5
Material	Brass

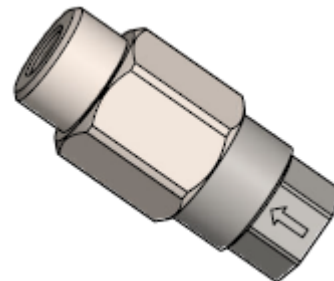


Each hose requires 2 adapters.
Must be ordered separately.

Non-return valve for pilot hose

Non-return valves allow flow in the direction of flow only and prevent the blow back in the opposite direction. For this purpose the component gets assembled, in accordance with the correct flow direction, in the pilot hose line.

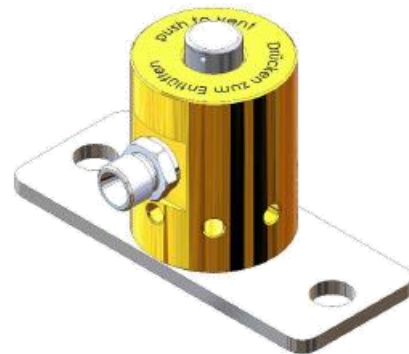
Article number	SCO 4002138
Body	Stainless steel; elastomer
Thread (inlet – outlet)	G1/8"
Operating pressure	360 bar
Temperature range	-20 °C up to +50 °C
Installation position	any



Vent valve for pilot hose

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

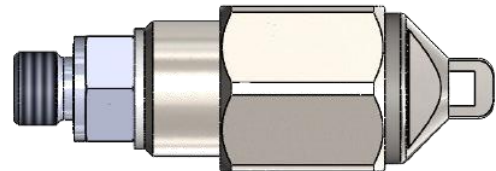
Article number	SCO 4002137
Operating pressure	360 bar
Temperature range	-20 °C up to +65 °C
Connections	1 x straight fitting M12 x 1.5 – G1/8" 24° seal cone
Vent holes	∅5mm 8 x 45°
Type of actuation	Manual actuation
Materials	Brass
Conformity	VdS-Test Report



Bleed valve

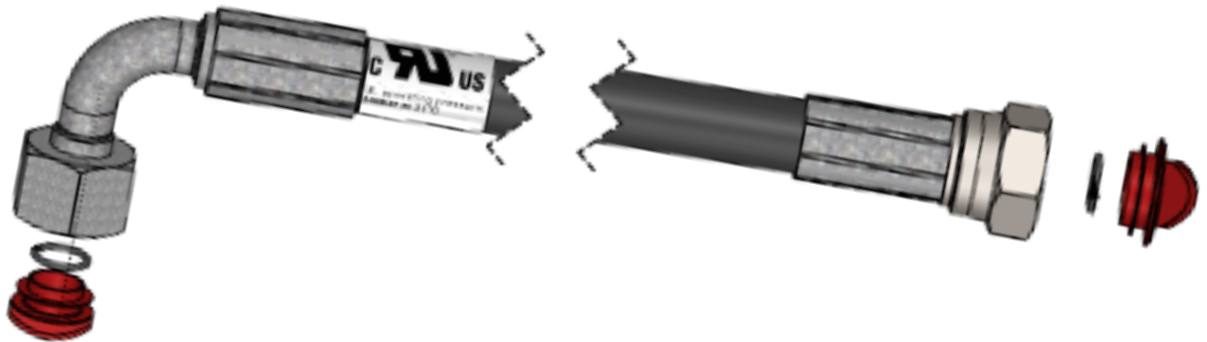
The bleed valve is a part of the pilot line. The bleed valve must be mounted at the end of each pilot line on the last pneumatic release device. The bleed valve is a safety device, which protects the Cryo Blau System against unwanted discharge if an agent container has a leak and the pressure thereby 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	SCO 4002136
Max. inlet pressure	360 bar
Closing pressure	~0,4 bar increasing pressure
Opening pressure	~0,5 bar falling pressure
Inlet connection	G1/8"
Conformity	VdS Test Report



Discharge hoses

The discharge hose is used for the connection of the valve to the check valve. The discharge hose is provided with one W21.8 x 1/14" nut and one G3/4" nut. The nuts are protected with plastic caps, which must be removed before installation. The W21.8 x 1/14" nut with the inserted gasket is installed on the valve. The G3/4" nut with the inserted gasket is connected to the check valve.



Article number	SCO 4002267	SCO 4002268
Length	300 mm	400 mm
Nominal diameter	DN12	
Connection type	Type-1 (EN 12094-8)	
Inlet connection	Connecting nut W21.8 x 1/14" O-ring sealing (included) 90° bend	
Outlet connection	Connecting nut BSP - 3/4" O-ring sealing (included) straight	
Working pressure	max. 360 bar inlet pressure	
Burst pressure	>1240 bar	
Temperature range TS	-20 °C to +50 °C	
min. bending radius R	90 mm	



Check valve

The check valve prevents a back-flow of the extinguishing agent into the agent container. The check valve is provided with an outlet connection for the connection to the pressure regulator and an inlet connection for the connection to the discharge hose.

Article number	SCO 4002315
Nominal diameter	DN12
Inlet connection	G3/4"
Outlet connection	G3/4"
Working pressure	360 bar
Temperature range TS	-20°C / +60°C
Mounting torque at the inlet/outlet thread	max. +55Nm ±5Nm
Materials: Bodies, pistons, adaptors, caps,	Stainless steel; Elastometric gasket materials, plastic
Materials: Elastometric gasket	EPDM



Manifolds

Manifolds are used to connect several agent containers at 140 bar pressure.

Manifolds are available in single row and double row versions for connecting 2 to 20 agent containers.

It should be manufactured from seamless steel pipes as a result of VdS hydraulic calculation. There should be welded connection ports on the main line for the constant and pressure discharge regulators to be connected to the manifold inlets.

Connection ports must be at the same diameter as the pressure discharge regulator's outlet connection. The end of the manifold must be closed by welded end plug. The manifold outlet is connect to the discharge piping network.

Cryo Blau System single row manifolds

Single row manifolds (inlet Rc 3/4")

Single row manifolds (Inlet Rc 3/4")			
Article number	SCO 6022672	SCO 6022673	SCO 6022675
Connection for	2 containers	3 containers	5 containers
Lenght (L)	560 mm	860 mm	1460 mm
Lenght (I)	300 mm	300 mm	300 mm
Inlet connection	Rc 3/4"	Rc 3/4"	Rc 3/4"
Outlet connection	R 2"	R 2"	R 2"
Working pressure	140 bar	140 bar	140 bar
Test pressure	210 bar	210 bar	210 bar



Single row manifolds for 100 l. agent containers (inlet Rc 3/4")

Single row manifolds for 100 l. agent containers (Inlet Rc 3/4")			
Article number	SCO 6023552	SCO 6023553	SCO 6023555
Connection for	2 containers	3 containers	5 containers
Lenght (L)	760 mm	1160 mm	1960 mm
Lenght (I)	400 mm	400 mm	400 mm
Inlet connection	Rc 3/4"	Rc 3/4"	Rc 3/4"
Outlet connection	R 2"	R 2"	R 2"
Working pressure	140 bar	140 bar	140 bar
Test pressure	210 bar	210 bar	210 bar

Cryo Blau System double row manifolds

Double row manifolds (inlet Rc 3/4")

Doble row manifolds (Inlet Rc 3/4")			
Article number	SCO 6022812	SCO 6022813	SCO 6022815
Connection for	2+2 4 containers	3+3 6 containers	5+5 10 containers
Lenght (L)	560 mm	860 mm	1460 mm
Lenght (I)	300 mm	300 mm	300 mm
Inlet connection	Rc 3/4"	RC 3/4"	Rc 3/4"
Outlet connection	R 2"	R 2"	R 2"
Working pressure	140 bar	140 bar	140 bar
Test pressure	210 bar	210 bar	210 bar



Double row manifolds for 100 l. agent containers (inlet Rc 3/4")

Doble row manifolds for 100 l. agent containers (Inlet Rc 3/4")			
Article number	SCO 6023612	SCO 6023613	SCO 6023615
Connection for	2+2 4 containers	3+3 6 containers	5+5 10 containers
Lenght (L)	760 mm	1160 mm	1960 mm
Lenght (I)	400 mm	400 mm	400 mm
Inlet connection	Rc 3/4"	Rc 3/4"	Rc 3/4"
Outlet connection	R 2"	R 2"	R 2"
Working pressure	140 bar	140 bar	140 bar
Test pressure	210 bar	210 bar	210 bar

Manifold connector

The manifold connector is used to connect several manifolds.

Article number	SCO 6095001
Working pressure	140 bar
Test pressure	300 bar
Connection	2"
Material	Galvanised steel



Manifold end cap

The manifold end cap is used to close the end of the manifold. The red dot confirms testing up to 300 bar.

Article number	SCO 6095003
Working pressure	140 bar
Test pressure	300 bar
Connection	2"
Material	Galvanised steel



Manifold mounting rails

Part	Article number	Horizontal (L)	Vertical (L)	used for agent containers	
Manifold mounthing rail	SCO 6092731	200 mm	300 mm	single row	Ø267 mm containers
Manifold mounthing rail	SCO 6092732	520 mm	600 mm	double row	Ø267 mm containers
Manifold mounthing rail	SCO 6093561	275 mm	400 mm	single row	Ø348 mm containers
Manifold mounthing rail	SCO 6093562	680 mm	700 mm	double row	Ø348 mm containers
Clamp for manifold	SCO 6099002	2"			
End plug	SCO 1290003				



Accessories for manifolds

Pressure gauge for manifold

The pressure gauge for manifold is used to indicate the discharge pressure. It is mandatory when using directional valves (for multi-zone systems).

Article number	SCO 4002531
Inlet connection	G1/2"
Nominal diameter	80 mm
Scale	0-400 bar
Accuracy class	1,6
Liquid filling	Glycerin



Pneumatic alarm device (for multi-zone systems)

The pneumatic alarm device is provided for system actuation warning.

Article number	SCO 4002541	SCO 4002542
Inlet connection	G1/4"	G1/4"
Sound pressure	100 ±5 db(A)	115 ±5 db(A)



Non-electric blocking device (for multi-zone systems)

The non-electric blocking device has to be installed for each flooding zone.

Article number	SCO 4002536
Pipe connection	G1/4"
Nominal diameter	DN6
Max. operating pressure	10 bar
Operating temperature	-20 °C to +50 °C



Optional components

Pressure relief device for manifold

The pressure relief device for manifold is a safety device to prevent overpressure in manifolds in fire fighting systems using inert gases which are equipped with a pressure regulator operating under 60 bar.

It is mandatory when using directional valves (for multi-zone systems).

Article number	SCO 4002532
Set pressure	66 bar at 20° C
Outlet connection (A)	G1/2"
Inlet connection (C)	G1/2"



Pressure and flow detector switch

The pressure and flow detector switch is used to monitor the pressure either in the pipework or in the pilot line and to trigger an alarm in case of actuation. An increase in pressure causes axial movement of the internal parts, which leads to switching of the electrical contacts inside the pressure and flow detector switch.

Furthermore, the pressure and flow detector switch can be actuated manually. After an actuation the pressure and flow detector switch must be reset manually.

Article number	SCO 4002521
Operating pressure	2 bar
Design pressure	200bar
Test pressure	300 bar
Inlet connection (C)	G1/2"
Operating temperature	Max. 85° C
Power source	400 V AC / 3 A or 24 V DC / 10 A
Dimensions (L x W x H)	109.9 x 105 x 47 mm
Protection class	IP65



Tamper device

Article number	SCO 1100695
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The tamper device is a red sticker with an imprint **SAFE WARRANTY**.
It is used as a seal to avoid manipulation of the electromagnetic release device after installation.
It is also used to seal the control box in a multi-zone systems.

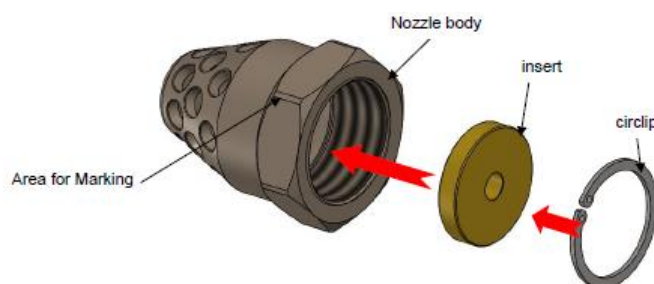
Nozzles for Cryo Blau System

The 180 and 360 degree range of discharge nozzles are designed to provide the required flow rate and distribution of Carbon Dioxide Gas for 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 determined in accordance with VdS calculation software.

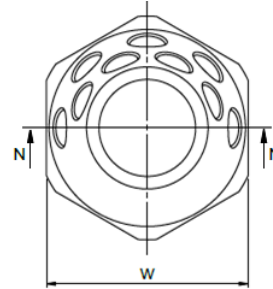
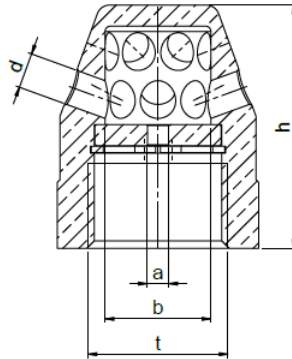
The nozzles are made of brass and available with the inlet connections (C) R3/8", R1/2", R3/4", R1", R1 1/4", R1 1/2" and R2".

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

The machined insert has to be put inside the nozzle body and fixed with the enclosed circlip.



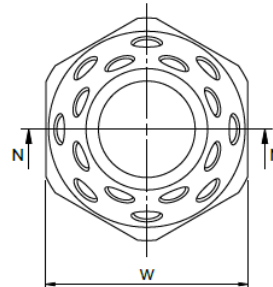
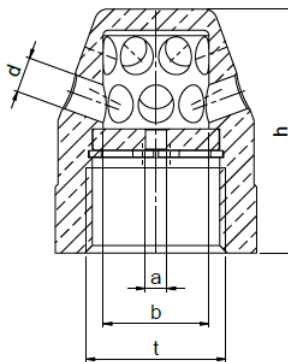
180° Sidewall nozzles



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



360° Nozzles



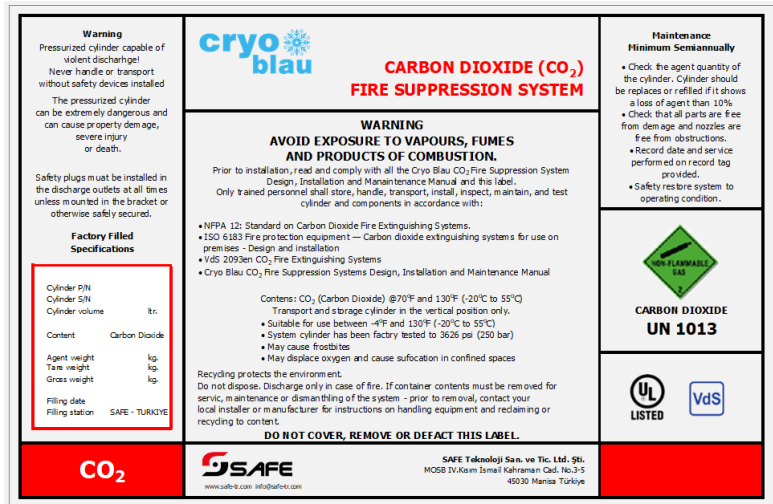
Article number range	Inlet connection (C)	Orifice diameter range [mm]	Spray angle	Number of discharge holes	Lenght nozzle (L1) [mm]	Wrench size (HEX) [mm]
SCO 7736010 – XX,X	G 3/8"	3,0 – 9,5	360°	8	29	24
SCO 7736015 – XX,X	G 1/2"	3,0 – 12,0	360°	8	36	30
SCO 7736020 – XX,X	G 3/4"	4,0 – 16,0	360°	16	46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



Agent container label

Agent containers are filled with the extinguishing agent at SAFE Teknoloji San. ve Tic. Ltd. Şti. manufacturing facility and labelled with filling, safety, transport, maintenance and warning information.

Article number	SCO 1100621
Key features	Self-advise
Dimensions	235 x 175 mm



Danger and warning signs

Danger and warning signs are provided to alert personnel that the storage room, the room or the building is protected with a Cryo Blau System and that they must not enter the area during or after discharge. The danger and warning signs must be placed in a conspicuous location at the entrance to the protected space and or on the enclosure that is being protected.

Key features	Self-advise
Dimensions	200 x 150 mm



Article number: SCO 1100626



Article number: SCO 1100629

Key features	Self-advise
Dimensions	240 x 150 mm



Article number: SCO 1100627



Article number: SCO 1100628

Software availability

Design Software is available to calculate fire suppression systems for

- NFPA 12 Standard on Carbon dioxide Extinguishing Systems
- ISO 6183 Fire protection equipment — Carbon dioxide extinguishing systems for use on premises - Design and installation
- VdS 2093en CO₂ Fire Extinguishing Systems

The software is easy to use and only by entering the overall project data (protected area space, type of gas, application...), the software enables users to have a precise overview of the given project thanks to:

- Calculation of the extinguishing agent's amount,
- Calculation of the equipment and components,
- Outline of the optimal installation design.

Extinguishing agent	Article number for VdS calculation software	Article number for VdS calculation software manual
Carbon Dioxide	SCO 1100787	SCO 1100797



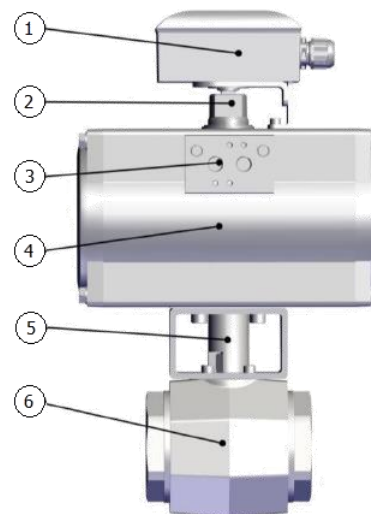
Pneumatic directional valves for multi-zone systems

Directional valves are used in multi-zone systems. A directional valve is used when multiple extinguishing zones are protected by the same set of agent containers. The directional valve directs the extinguishing agent to the appropriate extinguishing zone. The directional valves are controlled pneumatically for opening. In addition, a manual switching operation (manual override) is possible with the wrench attached at the directional valve.

Each directional valve is equipped with a monitoring device which shows position (open or closed) of the directional valve and thus provides both a visual and electrical indication of the status of the directional valve.

Technical specifications	
System pressure	140 bar
Nominal control pressure	6 bar
Control pressure zone	6-10 bar
Gas type (only for control pressure)	Nitrogen
Temperature range TS	-20 °C to +50 °C
Extinguishing agents	Carbon Dioxide
Materials	Stainless steel, aluminum, plastic, elastomer materials
Joining methods	Screw joints (BSP) / Flanges (ISO, EN)
Opening angle	90°
Installation position	User-defined

pos.	Description of the product
1	Limit switch / Position switch with visual indicator
2	Manual, emergency actuation
3	Pneumatic connection
4	Actuator
5	Connecting shaft
6	Ball valve



Article number	Size	Connection	W.P. P(max)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	Weight [kg]
SCO 4006500	DN20	BSP G3/4"	140 bar	189	95	49	108	317	24,5	6,2
SCO 4006505	DN25	BSP G1"	140 bar	189	113	58	108	325	29,5	6,9
SCO 4006510	DN32	BSP G1 1/4"	140 bar	231	111	81	133	370	40	10,9
SCO 4006515	DN40	BSP G1 1/2"	140 bar	257	130	100	154	413	50	17,2
SCO 4006525	DN50	BSP G2"	140 bar	257	140	118	154	428	59	18,3
SCO 4006635	DN63	ISO 6164-2 2 1/2"	140 bar	334	150	208	161	546	104	49,9
SCO 4006645	DN80	ISO 6164-2 3"	140 bar	374	170	258	182	608	129	80,1
SCO 4006655	DN100	ISO 320*1 4"	140 bar	519	200	260	242	688	130	113,4
SCO 4006735	DN63	EN 1092-1 2 1/2"	140 bar	374	174	224	161	562	112	59,5
SCO 4006745	DN80	EN 1092-1 3"	140 bar	374	180	258	182	609	129	82,2
SCO 4006755	DN100	EN 1092-1 4"	140 bar	519	200	260	242	680	130	105,1

Pneumatic control panel

The pneumatic control panel is intended for use in total flooding systems with carbon dioxide.

Product repairs must only be performed by the manufacturer or with prior written consent of the manufacturer using only original spare parts.

Extinguishing agent	IG01 – IG100 – IG55 – IG541
Maximum inlet pressure	60 bar
Outlet operating pressure	8 bar
Connection thread	G1/4"
Inlet connection for pilot hose	1/4"
Operating temperature range TS	-20 °C to +50 °C
Voltage (Volt)	24 V DC ± 10%
Protection class	IP65
Minimum actuation time	≥ 5 seconds

Article number	Number of zones	Dimensions (LxH)
SCO 4007002	2 Zones	470 x 450
SCO 4007003	3 Zones	470 x 450
SCO 4007004	4 Zones	470 x 450
SCO 4007005	5 Zones	470 x 450
SCO 4007006	6 Zones	470 x 450
SCO 4007007	7 Zones	700 x 450
SCO 4007008	8 Zones	700 x 450
SCO 4007009	9 Zones	700 x 450
SCO 4007010	10 Zones	700 x 450



- Available in multiple version from 2 to 10 zones protection.
- For UL, tamper evident seal must be used to seal the electrical control box after installation. (to be ordered separately)



Pilot cylinders for multi-zone systems

The pilot cylinder is used for pneumatic actuation of the pipework. It should be equipped with valve SRX 4000345 and filled with nitrogen.

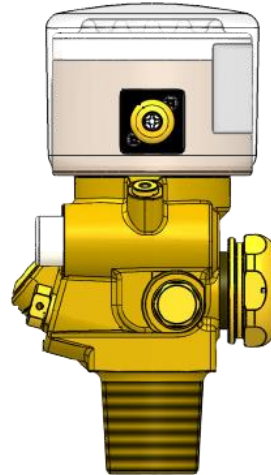
Article number of pilot cylinder	SRX 5009172	SRX 5009175	SRX 5009177
Max. number of alarm device	1	2	2
Cylinder article number	SCO 0100514	SCO 0101014	SCO 0102722
Pilot cylinder water volume	5 liters	10 liters	27 liters
External diameter	140 mm	140 mm	229 mm
Height	435 mm	810 mm	900 mm
Working pressure	200 bar	200 bar	200 bar
Test pressure	300 bar	300 bar	300 bar
Valve connection	25E	25E	25E
Colour	Red, RAL3000	Red, RAL3000	Red, RAL3000
Material	34CrMo4 steel	34CrMo4 steel	34CrMo4 steel
Valve protection cap	W80 x 11F/1"	W80 x 11F/1"	W80 x 11F/1"
Filled Nitrogen	200 bar	200 bar	200 bar



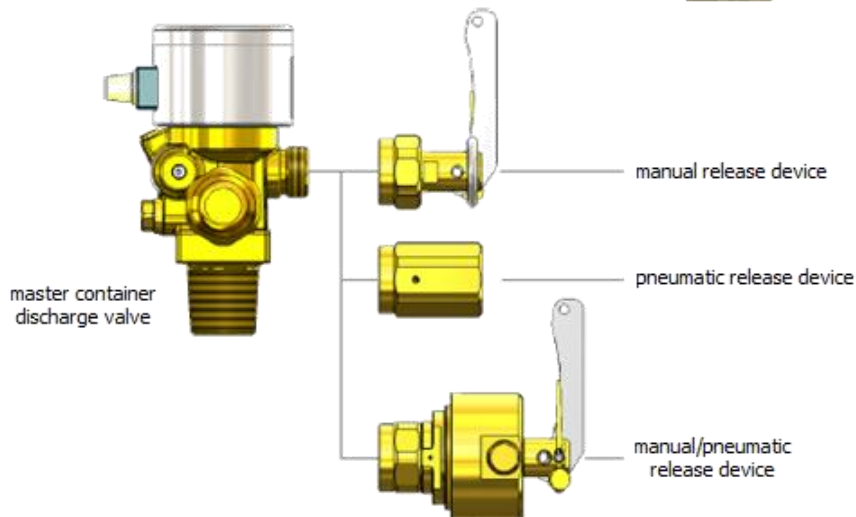
Valve with solenoid actuator for pilot cylinders

SRX 4000335 pilot valve with solenoid actuator used for only Cryo Blau System 5L, 10L and 27L pilot cylinders.

Article number	SRX 4000345
Inlet connection	25E
Outlet connection	W21.8 x 1/14"
Burst disk	270 bar
Pressure gauge port	M12 x 1 mm
Voltag.	24 VDC
max. current	0.4 A
Power consumption	9.3W
Material	Brass



Components for pilot cylinder valve with solenoid actuator



Article number	Actuation	Technical details		
SCO 4001119	Manual	actuation by pulling out the safety pin and lever movement (moving the lever by 90°)		
SCO 4001120	Manual/Pneumatic	manually actuation by pulling out the safety pin and lever movement (moving the lever by 90°)		
		minimum pilot pressure 8 bar	maximum pilot pressure 300 bar	connection 2 x G1/8"
SCO 4001129	Pneumatic	minimum pilot pressure 0,33 x container pressure	maximum pilot pressure 360 bar	connection 1 x G1/8"

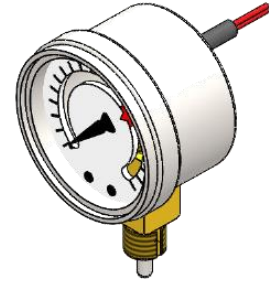
Pressure gauges for pilot cylinder valves

The pressure gauge measures the pressure in the pilot cylinder. It is equipped with an integrated pressure switch to supervise the loss of pressure in the pilot cylinder.

Each valve must be equipped with a pressure gauge.

The pressure gauge is screwed into the port for optional parts of the valve.

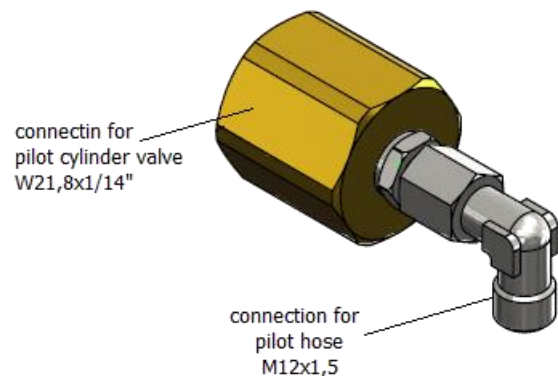
Article number	SRX 4001281	SRX 4001402	SRX 4001404
Pressure scale	200 bar	200 bar	200 bar
Scale	0 – 315 bar	0 – 300 bar	0 – 300 bar
Valve connection	M12 x 1	M12 x 1	M12 x 1
Pressure switch	---	Yes	Yes
Switch point	---	180 bar	180 bar
Type of switch	---	(NO)	(NC)
Conformity	VdS	UL	



Adapter for pilot cylinder valve

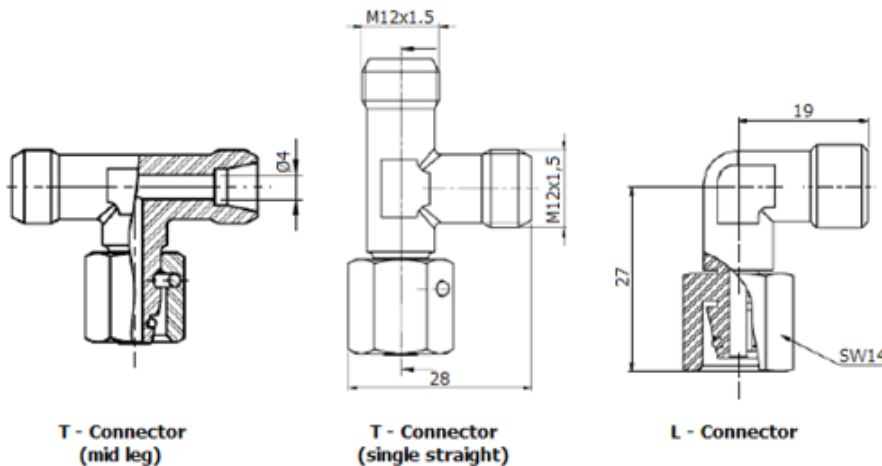
Article number	SCO 4002139
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- To adapt the pilot cylinder to the pilot line
- Connected to the Pilot Cylinder's outlet port Therad connection W21,8x1/14"
- Outlet connection M12x1,5 mm (DKLO 24°) for pilot hose Straight or with L – Connector
- Operating pressure 315 bar



Adapters for pilot hose

Article number	Description
SCO 4002126	T – Connector (mid leg)
SCO 4002127	T – Connector (single straight)
SCO 4002128	L – Connector



Pressure reducer for pilot cylinder

The pressure reducer for the pilot cylinder is mounted at the pilot hose connected to the pilot cylinder valve. By connecting a pilot hose to the outlet of the pressure reducer, the pilot cylinder pressure is reduced to the desired level (max 8 bar) and transferred to the pneumatic directional valve.

Article number	SCO 5002146
Gas type	Nitrogen
Inlet connection	Rp 1/4"
Outlet connection	Rp 1/4"
Inlet pressure	0-220 bar
Outlet pressure	1.5 – 15 bar maximum
Set pressure	8 bar
Temperature range	-20 °C up to +60 °C
Body	Brass

The setting of each pressure reducer is done directly by the manufacturer and cannot be changed.

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