

CO2 FIRE EXTINGUISHING SYSTEM

INTRODUCTION

CARBON DIOXIDE GAS

Under normal atmospheric temperature and pressures, carbon dioxide exists as a colorless, odorless gas which is about 1.5 times heavier than air. Carbon dioxide will not burn or support combustion and will not sustain life. When confined within a suitable pressure vessel and depending on temperature and pressure conditions, carbon dioxide can exist in any of three stages of matter; solid, liquid and gas.

HIGH PRESSURE CARBON DIOXIDE SYSTEM

High pressure CO₂ system is a specialized fire extinguishing system designed to maintain the carbon dioxide supply at 21° C and 850 psig in strength alloy steel cylinders. The cylinders contain the CO₂ required to protect the largest single hazard. On large hazards where several cylinders are required, a manifold is used to connect each cylinder by means of flexible hoses and check valves. Cylinder valves control the CO₂ flow to the hazard through properly sized pipe, terminating in nozzles that apply the CO₂. Flow rate is controlled by nozzle orifices as well as pipe sizes. The cylinder master valves are electronically operated and the slave valves are pressure actuated. The master valves can be automatically and/or manually operated.

CO₂ EXTINGUISHING SYSTEM APPLICATION:

- Paint and varnish manufacturing and processing areas.
- Powder coating and Painting booths.
- Transformers and substations.
- Rolling mills and Turbines.
- False Floors and cable shafts.
- Engine test benches and SHIP Engine Room / compartments.
- Printing machines.

CO2 Agent Specification

Chemical Name	: Carbon Dioxide
Chemical Formula	: CO2
Molecular Weight	: 44.01
Critical Temperature	: 31.00C
Boiling Point	: -109.30F
Vapor Pressure @ 68OF	: 832 PSIG
Vapor Density @ 68OF	: 1.53
Solubility in Water @ 68OF	: 87.8% by Volume
Appearance and Odor	: Colorless Gas, Slight Pungent Odor

HIGH PRESSURE CO2 CYLINDERS

Carbon dioxide cylinders must be floor mounted, with the discharge valve in the vertical (up) position. Horizontal mounting of cylinders is not allowed. The cylinders may be used in single or multiple cylinder applications as needed.

Cylinders are shipped from the factory with a protective shipping cap in place. Filled cylinders shall be secured during transport and while in storage in accordance with DOT and OSHA requirements. Upon installation, all cylinders shall be secured by cylinder straps or in a suitable racking arrangement. Once secured by a strap or cylinder rack, the safety/shipping cap is removed. The caps should then be stored in a suitable and nearby area for future use. The high-pressure seamless steel CO2 cylinders has concave base and manufactured in accordance with 84/525 EEC.

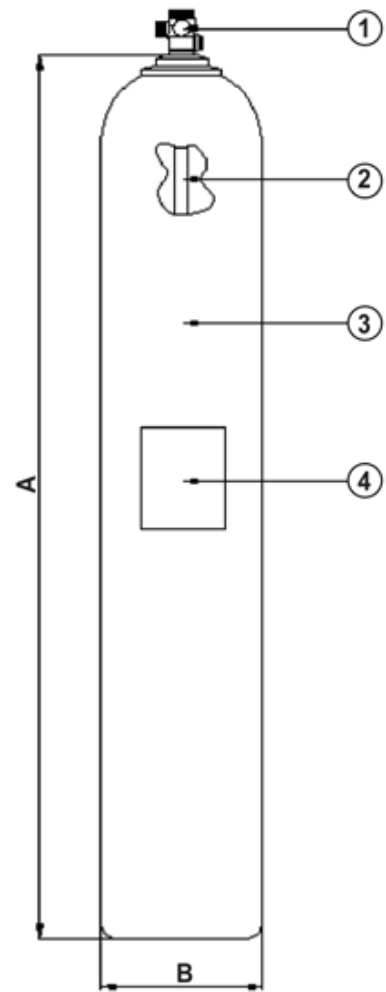
MATERIAL

Cylinder: Chrome Molybdenum Steel
Head Valve: Brass HYDRAULIC TEST PRESSURE
Test Pressure 250 Bar

FINISH

Primed and painted in accordance with BS 4800:04 E 53

1. Discharge Valve Assembly (1" NPT)
2. Siphon Tube
3. Cylinder
4. Identification Label



Capacity : 45 Kgs

Model : SFC-45

Size : A=1515mm, B= 266mm

SINGLE CYLINDER MOUNTING STRAPS

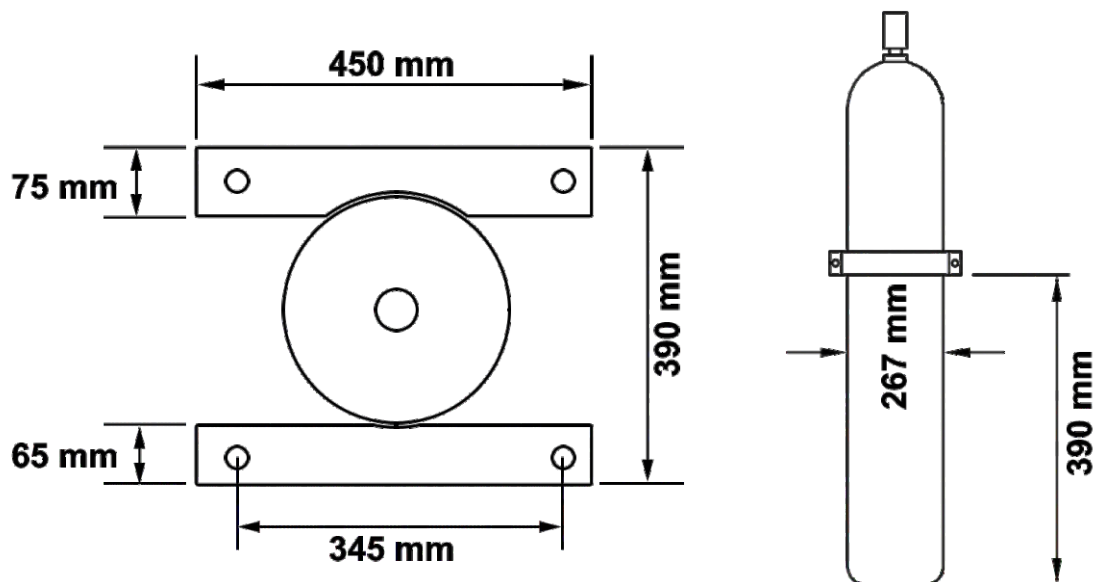
APPLICATION

Cylinder straps are used to secure the cylinder in place, on a single cylinder system, in accordance with NFPA 12 requirements. The straps may be secured to any structurally solid surface. Anchoring into plaster or any other facing material is not acceptable.

DESCRIPTION

Cylinder Straps are made of steel, primed and painted red with a baked enamel finish for corrosion resistance. All mounting hardware is supplied by the system installer.

MATERIALS: Carbon Steel
Paint - Red Gloss Enamel

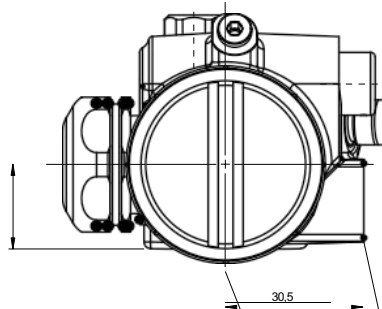
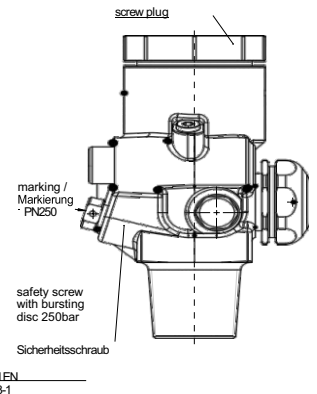
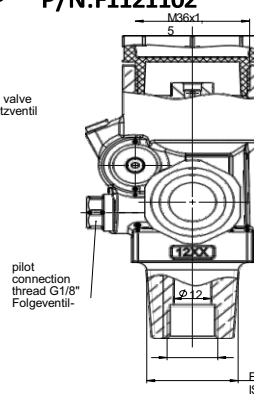
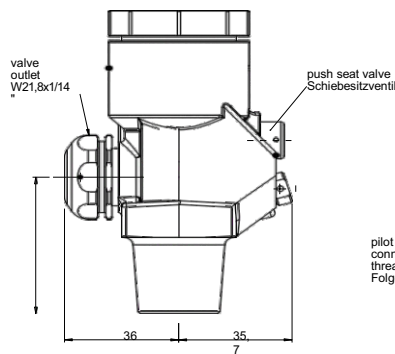
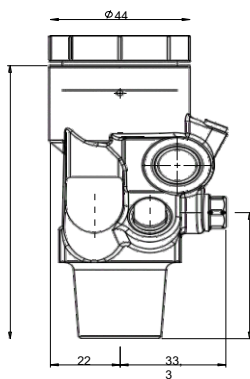


CO2 CYLINDER HEAD VALVE

VALVE FOR FIXED INSTALLATION

EST Carbon Dioxide cylinders are equipped with a cylinder valve designed to hold the Carbon Dioxide agent in the cylinder until actuated, either automatically or manually. The conversion is completed by installing an emergency manual lever actuator.

The cylinder valve assembly has a forged brass body. The pressure necessary to open the valve is 100-110 psig (689-758kPa) at 70°F.(21.1 °C.).All cylinder valves are equipped with a Safety Relief Disc that will rupture to relieve excess pressure should it reach a level in excess of 2,650 psi (18,248 kPa) in accordance with NFPA 12,



P/N: F2021100

Material : Brass

Thread : 25E - W21,8x1/14"

Test Pressure : 360 Bar

Can be used in Combination with any one of the

- **P/N: XF11280**
- **P/N:F1121101**
- **P/N:F1121102**

CONTROL HEAD VALVE HEAD VALVE

ELECTRICAL AND PRESSURE OPERATED CONTROL HEAD VALVE

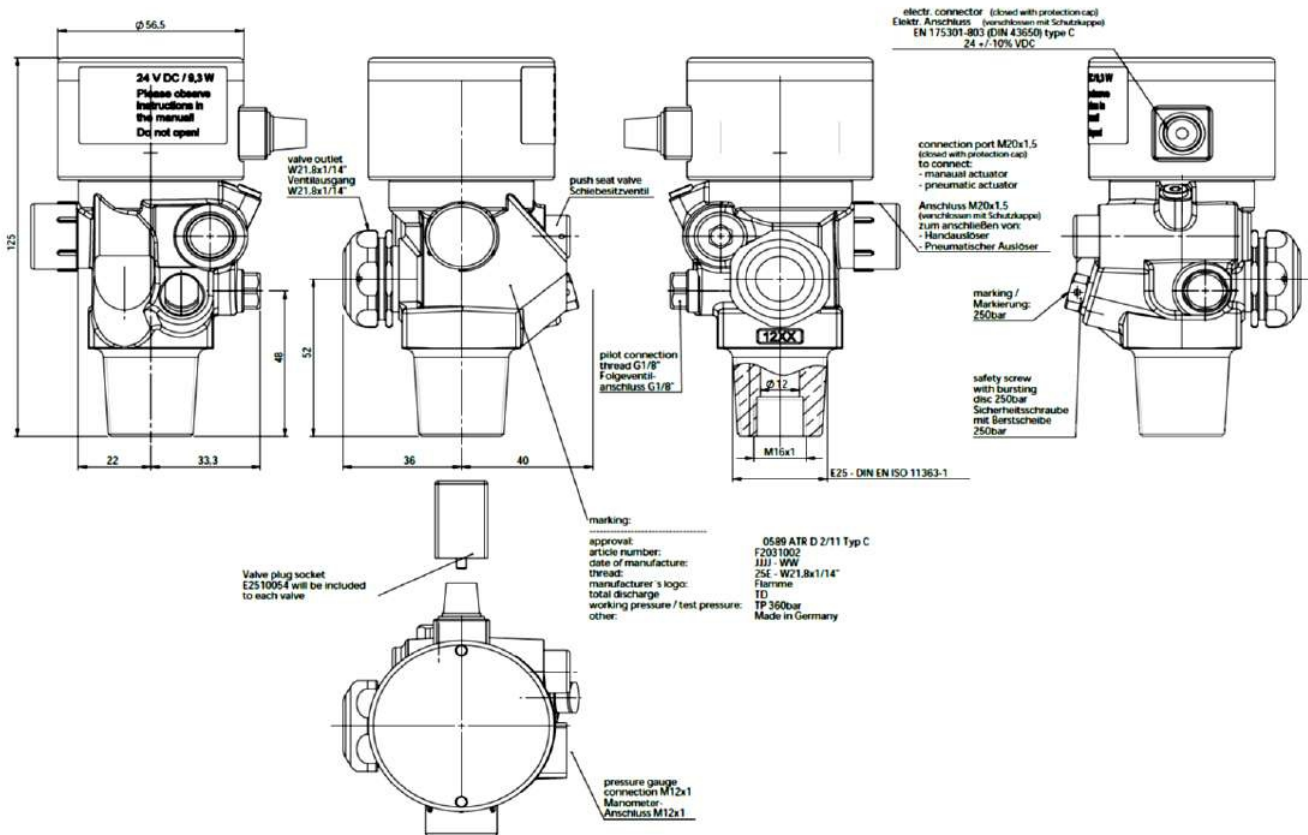
This type of control head valve operates the system cylinder electrically through electrical solenoid actuator after receiving an electronic initiating signal from the control panel. Also this type of control head valve operates the system cylinder through electrical principle, which allows the CO2 pressure to open the valve piston in order to discharge the gas in the protected area.

- Material : Brass
- Thread : 25E - W21, 8x 1/14"
- Test Pressure : 360 Bar



P/N: F2031103

Can be used in Combination with P/N: F1121104

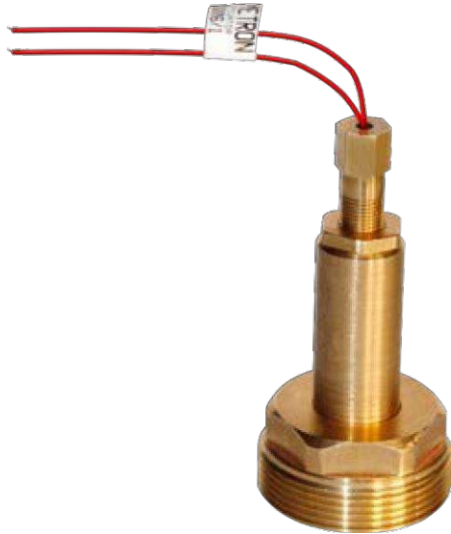


CONTROL HEAD VALVE HEAD VALVE

ELECTRIC ACTUATED CONTROL HEAD VALVE

This type of control head valve operates the system cylinder electrically through electrical pin type pyrotechnic actuators.

Can be used in Combination with F2021105



P/N: F2031103

PNEUMATIC RELEASE DEVICE

pressure to open the valve piston in order to discharge the gas in the protected area.

Material : Brass

Pilot Pressure min : Pmin=20 bar for P1=300bar

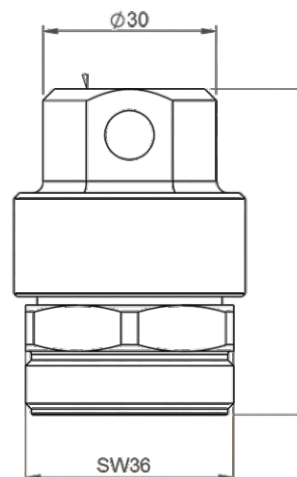
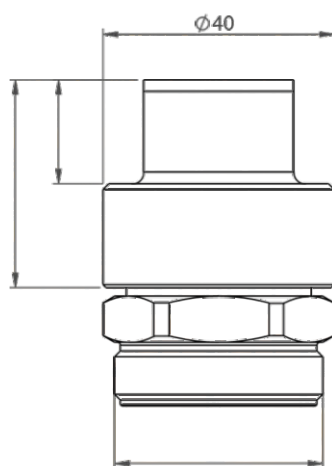
Pilot Pressure max : Pmax = 360 bar

Torque : 25Nm ±2

Can be used in Combination with F2021105



P/N:F1121102



CONTROL HEAD VALVE HEAD VALVE

PNEUMATIC - MANUAL RELEASE DEVICE

This type of control head valve operates the system cylinder through pneumatic principle, which allows the CO₂ pressure to open the valve piston in order to discharge the gas in the protected area. The provision of the lever allows the manual operation too.

P/N: F1121101

Material :Brass

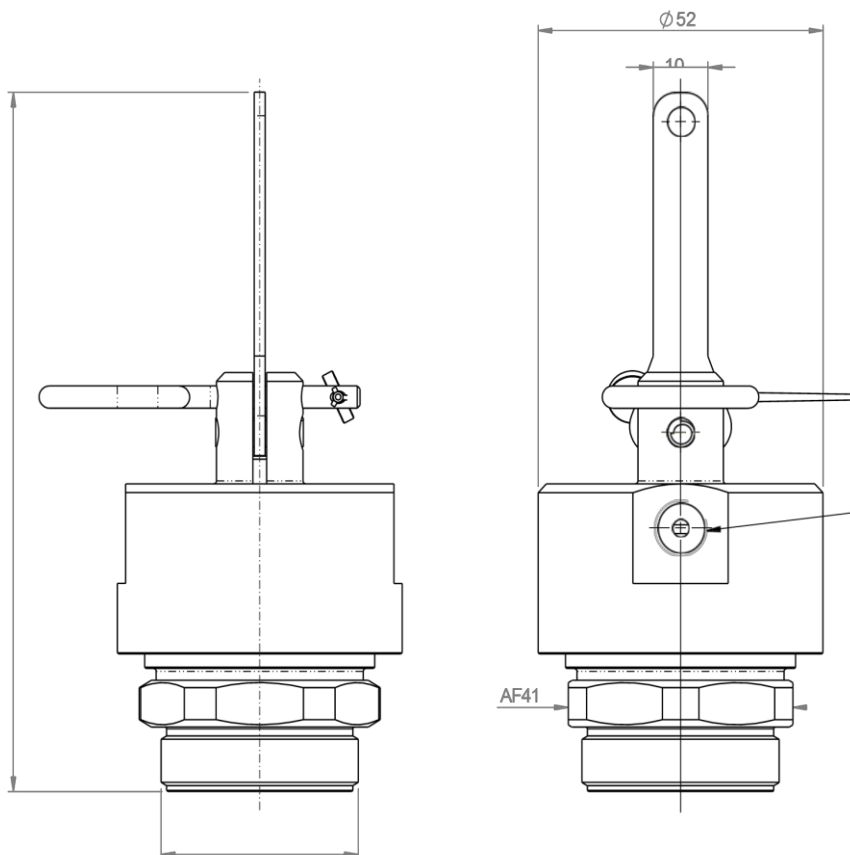
Pilot Pressuremin: Pmi=8bar for P1=300bar

Pilot Pressure max: Pmax = 300 bar

Torque: 25Nm ±2



Can be used in Combination with F2021002



CONTROL HEAD VALVE HEAD VALVE

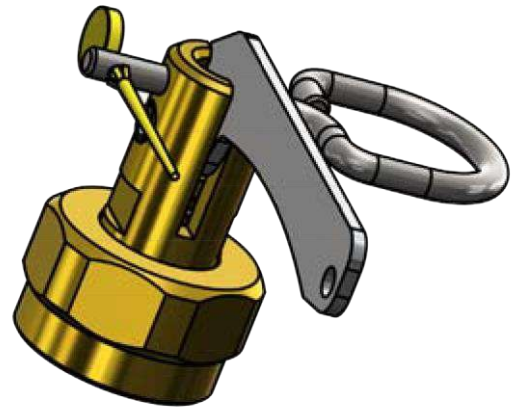
MANUAL ACTUATOR FOR F203 VALVES

This type of control head valve operates the system cylinder through pneumatic principle, which allows the CO2 pressure to open the valve piston in order to discharge the gas in the protected area.

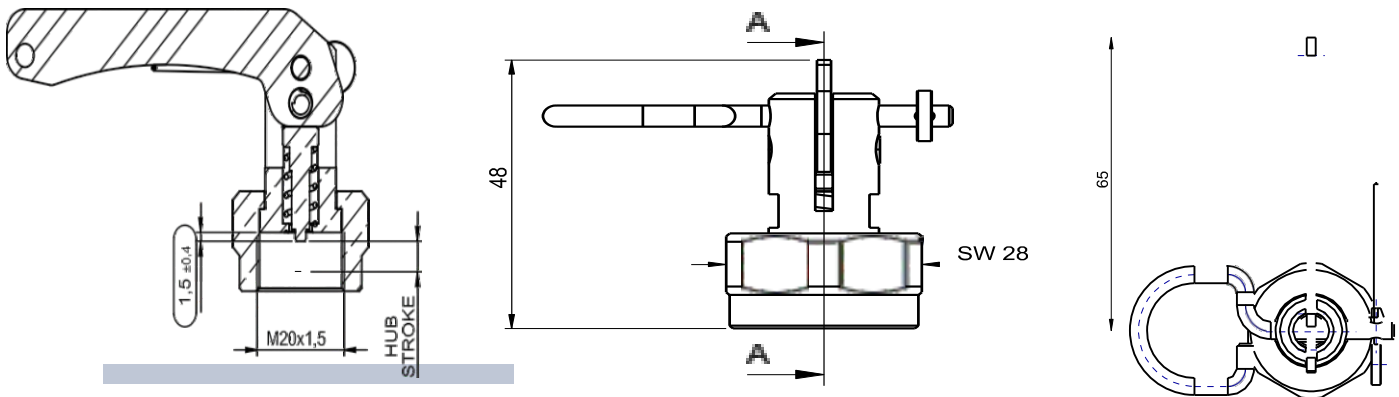
Can be used in Combination with F2031103

Assembly Instruction:

Assemble the manual actuator only in inactivated state! (Retracted pin, lever secured with safety pin!). Screw the manual actuator on the corresponding connection port of valve F203 (Torque: 15 +_1Nm), the alignment of the lever can be orientated in any position.



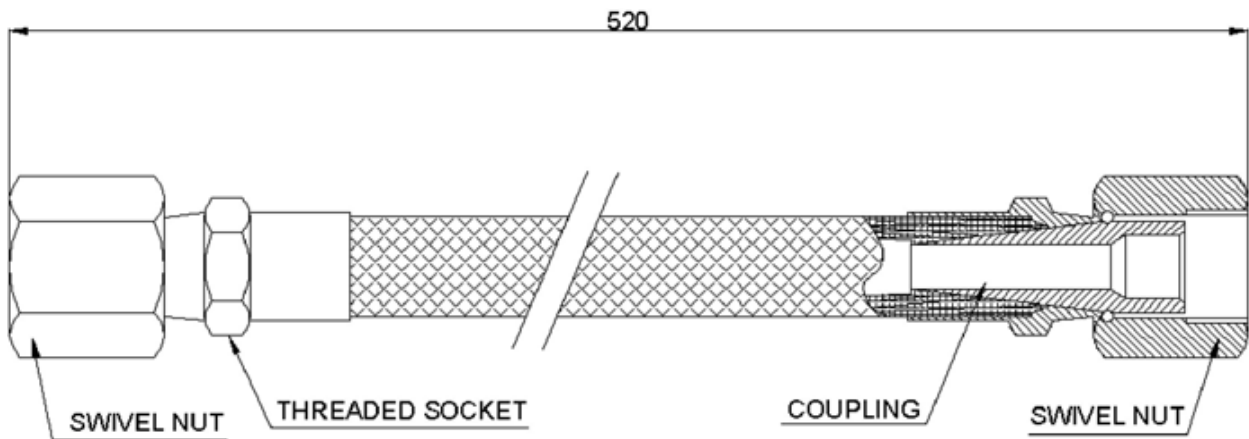
P/N: F1121104



DISCHARGE FLEXIBLE HOSE HEAD VALVE

DESCRIPTION

CO2 discharge flexible hose is used to convey the CO2 gas from the outlet of the cylinder to the discharge manifold. This made of reinforced flexible rubber tested at 480 bar to withstand high pressure with stainless steel or brass coupling and swivel joint.



P/N: FOT-001

DIMENSION

Connection : 21.7 x 1.814
Nominal Diameter : 10 mm.

MATERIAL

Hose : Rubber
Couplings : Steel S 300 Cadmied

PRESSURE RATING

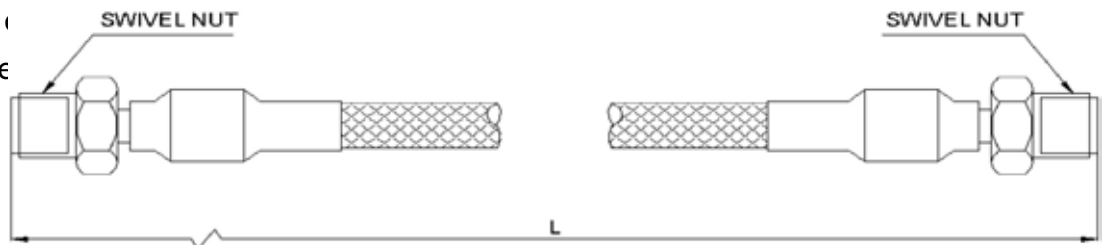
Service Pressure : 240 Bar
Test Pressure : 400 Bar
Bursting Pressure : 960 Bar

PNEUMATIC FLEXIBLE HOSE HEAD VALVE

DESCRIPTION

The pneumatic flexible hose is used when two or more cylinders are in use for one system. The first cylinder is actuated through electric actuator while the rest of cylinders will be pneumatically operated through the pneumatic hose.

Hose are in
actuators.
actuators (or
simultane



P/N: FOT-002

MATERIAL

Hose : Rubber
Couplings : Steel S 300 Cadmied

PRESSURE RATING

Service Pressure : 240 Bar
Test Pressure : 400 Bar
Bursting Pressure : 960 Bar

DIMENSION

Connection : 1/8" BSP

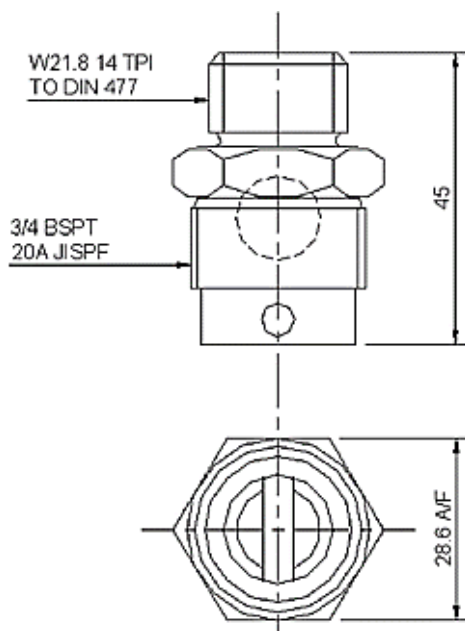
NON-RETURN VALVE HEAD VALVE

DESCRIPTION

The Check Valve is used to isolate the “Main and Reserve” supplies in FOT Carbon Dioxide system. The Check Valve prevents pressurization of the “Reserve Bank” of Carbon Dioxide cylinders by blocking the flow of agent from the “Main” system discharge piping. This allows a common discharge manifold and nozzle piping network to be used on “Main and Reserve” system installations.

P/N: FOT-003

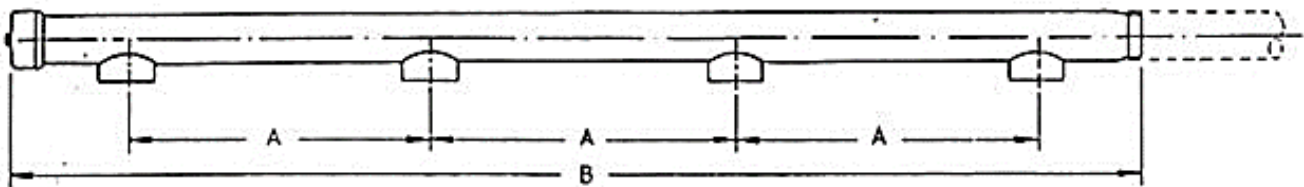
Valve Body : Brass
Ball : Carbon Steel
Maximum Pressure : 250 Bar



DISCHARGE MANIFOLD HEAD VALVE

DESCRIPTION

The Check Valve is used to isolate the “Main and Reserve” supplies in a FOT Carbon Dioxide system. The Check Valve prevents pressurization of the “Reserve Bank” of Carbon Dioxide cylinders by blocking the flow of agent from the “Main” system discharge piping. This allows a common discharge manifold and nozzle piping network to be used on “Main and Reserve” system installations.



CYLINDER SIZE	DIM. "A" (MM)	DIM. "B" (MM)				
		2 CYL.	3 CYL.	4 CYL.	5 CYL.	6 CYL.
100 lbs.	305	625	930	1235	1540	1845

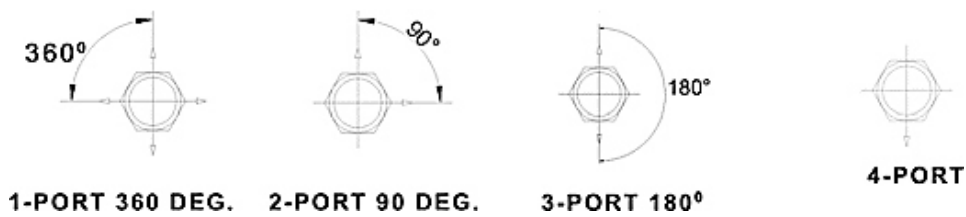
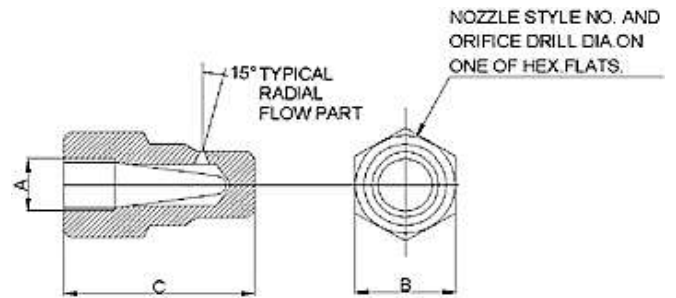
SPECIFICATION

- Manifold and discharge piping sizes are calculated by computer to comply with NFPA Standards and are dependent on the pipe work configuration.
- All manifolds are supplied with end mounted discharge outlets.
- The integral non-return valve is a fold away flap type to ensure minimum orifice restriction.
- Material to B.S. 5306 Part 5 Section 10.3.3. Proof Test 90 Bar.

RADIAL NOZZLE HEAD VALVE

DESCRIPTION

The FOT radial nozzle (P/N FOT-004) is used for Total Flooding applications to deliver the agent into the hazard area protected by Carbon Dioxide system. Nozzles are made of brass or stainless steel in different types, shapes and diameters to assure the effectiveness of extinguishing agents as per system design and quantity of gas required.



NOZZLE SIZE			PURCHASE CODE
A	B	C	
1/6"	7/8"	1 23/32"	0678
3/8"	1"	1 27/32"	0679
1/2"	1 1/8"	2 1/16"	0680
3/4"	1 3/8"	2 5/16"	0681
1"	1 5/8"	2 11/16"	0682
1 1/4"	2	3 1/16"	0683
1 1/2"	2 1/4"	3 7/16"	0684
2"	3"	3 15/16"	0685

P/N: FOT-004

'F' TYPE DISCHARGE NOZZLE

DESCRIPTION

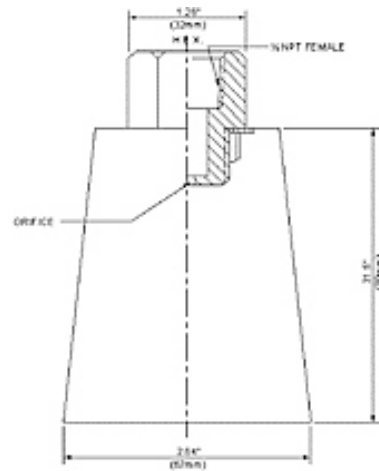
The FOT 'F' type discharge nozzle (P/N SCO-010) is used for Local and Total Flooding applications to deliver the agent into the hazard area protected by Carbon Dioxide system.

Nozzles are made of brass in different types, shapes and diameters to assure the effectiveness of extinguishing agents as per system design and quantity of gas required.

MATERIAL

Body: Brass,

Finish : Red Paint



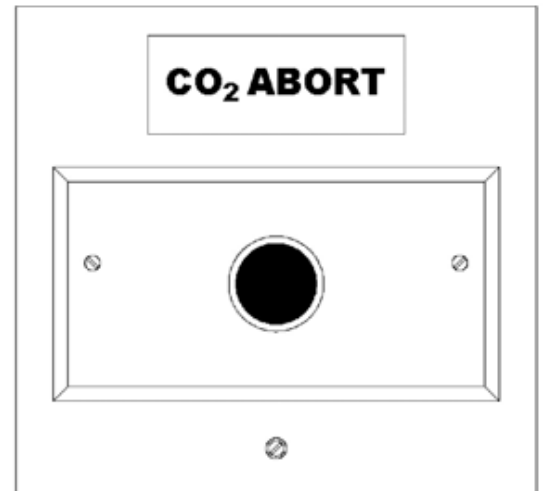
P/N: FOT-005

ABORT SWITCH (OPTIONAL)

DESCRIPTION

The System Abort Switch is designed to be in conjunction with other system equipment. It provides a temporary means, by which the system actuation circuit may be interrupted, when operated prior to the circuit actuation. The unit employs a non-latching contact push button switch. While depressed, the switch causes the agent release circuit to be manually delayed. Upon release of the Abort Switch, the release circuit will follow the specific configuration of the system control panel.

DIMENSIONS	
Width	87 mm
Height	87 mm
Depth	52 mm



P/N: FOT-005

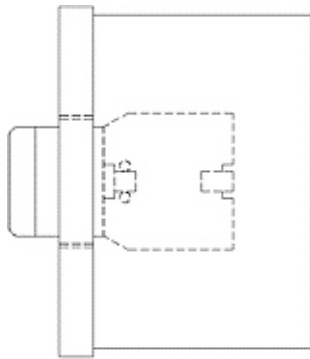
MAIN-RESERVE SWITCH (OPTIONAL)

DESCRIPTION

The “Main” to “Reserve” switch is used with systems that incorporate main and reserve (back-up) agent storage. The switch may utilize 1 or 2 Form “C” Contact blocks which will provide an electrical path to either the “Main” or “Reserve” releasing modules.

Following a system discharge, reset any field devices. Once all devices are in a stand-by status the Main-Reserve Switch may be moved to the “Reserve” position. The Control Panel may then be reset to a normal mode for uninterrupted FOT protection. The empty “main” containers can be removed for recharge. After the containers in the “Main” system have been recharged, the switch may be returned to the “Main” position.

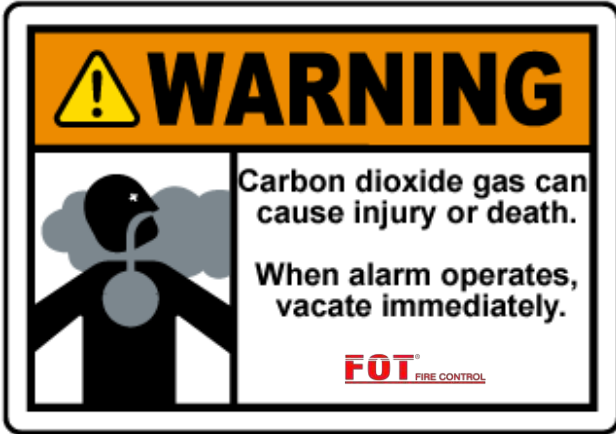
DIMENSIONS	
Width	105 mm
Height	105 mm
Depth	75 mm



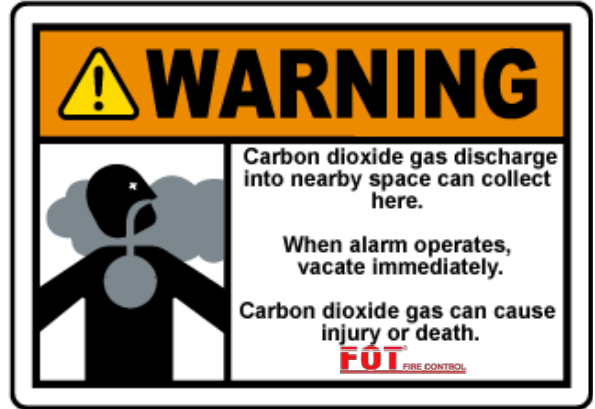
WARNING SIGNS

DESCRIPTION

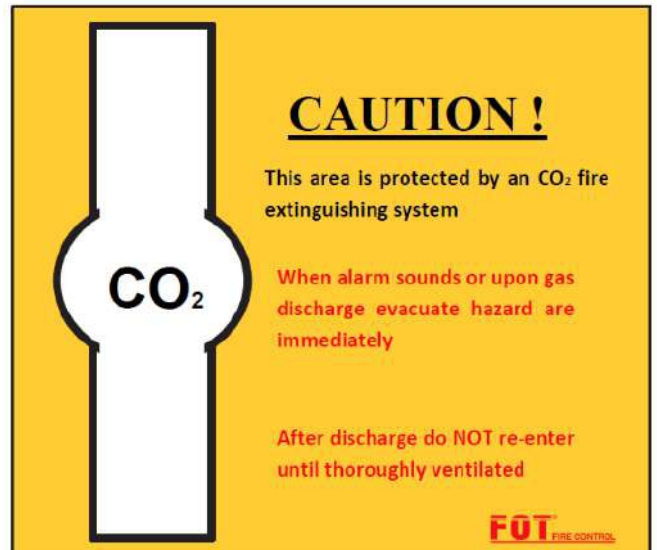
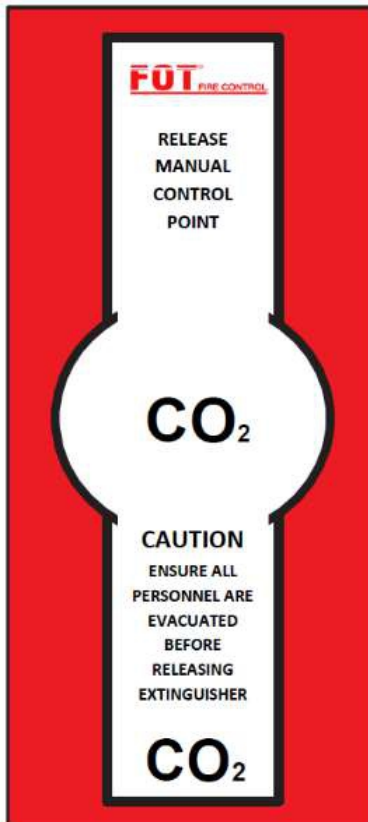
Instructional signs are provided to inform personnel of any potential hazards they face when operation certain devices or working within areas protected by CO2 systems



Sign in Every Protected space



Sign at Every Entrance to Protected Space



TYPICAL ARRANGEMENT

