

PFS AGENT CYLINDER ASSEMBLY

P/N: MFC-P50/P75/P100/P150

DESCRIPTION

The PFS agent cylinder assembly stores liquid FM-200™ (HFC-227ea) superpressurized with Nitrogen to 24.8 bars at 21°C. These cylinders are fitted with discharge valves identical to those in EFS with additional 20-mm valve serving as inlet for the pressurized nitrogen agent propellant. The discharge valves are equipped with either a standard or a 2n1 pressure gauge depending on system requirement. In addition to providing a means to determine agent pressure in the cylinder, the optional 2n1 pressure gauge provides for automatic supervision of significant drop in agent pressure. The discharge valves and nitrogen inlet valve are also equipped with rupture disc-fitted safety plug that protects the cylinder assembly from possible excessive build-up of agent pressure when exposed to high temperature. As means for protection from potential hazard, safety caps are provided for covering the valve outlet and actuator connection port when the cylinder assembly is being moved or not connected to the system. A label that indicates FM-200 as the stored agent, agent fill weight, working temperature range, and other relevant information is permanently attached to the cylinder.

TECHNICAL INFORMATION

Approvals for system..... UL, FM
Approvals for cylinder..... DOT-4BW500
Agent fill pressure..... 24.8 bar (360 psi)
Cylinder rated working pressure 34.5 bar (500 psi)
Cylinder hydrostatically tested at 137.9 bar (1,000 psi)
Cylinder material Carbon Steel
Paint specification Red polyester powder coated
Installation position Vertical

See corresponding datasheets for more technical information on the discharge valves and pressure gauges.



ORDERING INFORMATION

Specify the model number, fill weight, and pressure gauge option when ordering.

SI Units

Model No.	Partner Nitrogen Cylinder	Internal Volume* (L)	Fill Range (kg)	Valve Size (mm)	Dimension (mm)			Empty Weight (kg)	Pressure Gauge Option
					D	H	A		
MFC-P50	N68-60	63.0	31.2 – 60.6	40	350	1,005	905	52.9	Standard or 2n1 ^b
MFC-P75	N68-70	89.0	44.1 – 85.6	40	350	1,290	1,190	66.3	
MFC-P100	N68-80	115.4	57.2 – 111.0	50	350	1,610	1,495	83.6	
MFC-P150 ^a	N68-80	175.0	86.7 – 168.3	50	450	1512	1397	122.2	

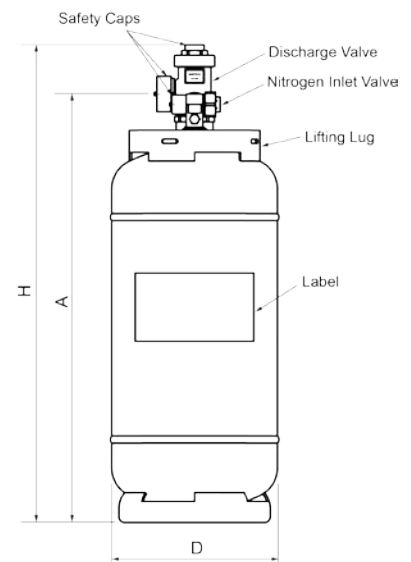
US Units

Model No.	Partner Nitrogen Cylinder	Internal Volume* (lb)	Fill Range (lb)	Valve Size (in)	Dimension (in)			Empty Weight (lb)	Pressure Gauge Option
					D	H	A		
MFC-P50	N68-60	138.9	68.8 – 133.6	1 1/2	13.8	39.6	35.6	116.6	Standard or 2n1 ^b
MFC-P75	N68-70	196.2	97.2 – 188.7	1 1/2	13.8	50.8	46.8	146.2	
MFC-P100	N68-80	254.4	126.1 – 244.7	2	13.8	63.4	58.9	184.3	
MFC-P150 ^a	N68-80	385.9	191.2 – 371.1	2	17.7	59.5	55.0	269.4	

^aNot FM Approved: See image for the lifting lug configuration

^bRefer to pressure gauge datasheet for scope of approvals

*Internal volume is based on water capacity of the cylinder



Actual product may differ from the images shown.

NITROGEN CYLINDER ASSEMBLY

P/N: N68-60/70/80

DESCRIPTION

The nitrogen cylinder assembly stores nitrogen pressurized to 60/70/80 bar at 21°C that is used as propellant for FM-200™ (HFC-227ea) extinguishing agent contained in a separate PFS agent cylinder assemblies. When released, the pressurized nitrogen provides extra pressure that drives the extinguishing agent through complex or longer pipe runs within acceptable system discharge time. In addition to providing a means to determine cylinder pressure, the optional 2n1 pressure gauge provides for automatic supervision of significant drop in nitrogen pressure. The PFS nitrogen cylinder assembly is fitted with 20-mm valve that enables interconnection with and delivery of pressurized nitrogen to PFS agent cylinder assembly. The valve is equipped with rupture disc-fitted safety plug that protects the cylinder assembly from possible excessive build-up of nitrogen pressure when exposed to high temperature. A safety cap covering the valve outlet port is also provided as a means for protection from potential hazard when the cylinder assembly is being moved or not connected to the system. A label indicating relevant information is permanently attached to the cylinder.

TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Approvals for cylinderDOT-3AA
Fill pressure60/70/80 bar (870/1015/1160 psi)
Cylinder rated working pressure147 bar (2133 psi)
Cylinder hydrostatically tested at245 bar (3555 psi)
Cylinder materialSeamless Mn Steel
Paint specificationGray polyester powder coated
Installation positionVertical
See corresponding datasheets for more technical information on the cylinder valve and pressure gauges.

ORDERING INFORMATION

Specify the model number, partner agent cylinder model number and pressure gauge option when ordering.

SI Units

Model No.	Partner PFS Agent Cylinder	Internal Volume* (L)	Fill Pressure (bar)	Valve Size (mm)	Empty Weight (kg)	Pressure Gauge Option
N68-60	MFC-P50	68	60	20	74.5	Standard or 2n1 ^b
M68-70	MFC-P75	68	70	20	74.5	
N68-80	MFC-P100, MFC-P150 ^a	68	80	20	74.5	

US Units

Model No.	Partner PFS Agent Cylinder	Internal Volume* (lb)	Fill Pressure (psi)	Valve Size (in)	Empty Weight (lb)	Pressure Gauge Option
N68-60	MFC-P50	150	60	3/4	164	Standard or 2n1 ^b
M68-70	MFC-P75	68	70	3/4	164	
N68-80	MFC-P100, MFC-P150 ^a	68	80	3/4	164	

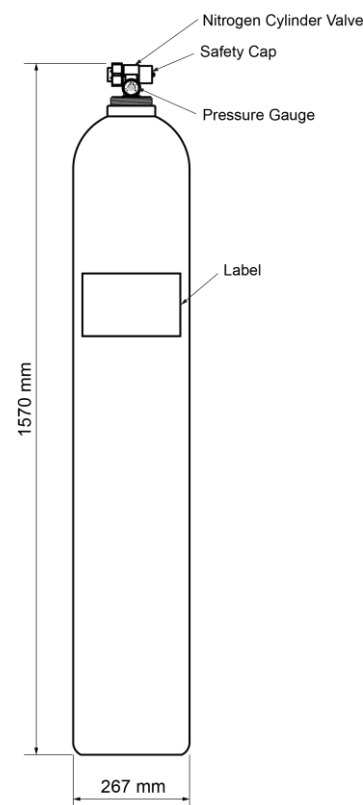
^aNot FM Approved

^bRefer to pressure gauge datasheet for scope of approvals

*Internal volume is based on water capacity of the cylinder



Nitrogen Cylinder Assembly
P/N: N68-60/70/80



Actual product may differ from the image shown.

NITROGEN NEEDLE CYLINDER

P/N: MNN-06

DESCRIPTION

The nitrogen needle cylinder is used for the pneumatic operation of the nitrogen cylinder assembly during PFS discharge. It is installed on the actuation port of the nitrogen cylinder valve via M18x1.5 nipple joint. The nitrogen needle cylinder is fitted with a steel needle attached to a needle head that acts as a piston. As the FM-200™ (HFC-227ea) agent is discharged through the agent cylinder valve, some amount of the agent flows into the nitrogen needle cylinder via the interconnect copper tube. The pressure from discharged agent then actuates the needle head causing the needle to penetrate and open the nitrogen cylinder valve. Once operated, the needle cylinder automatically resets when the actuating pressure decreases to below 6 bar (87 psi).

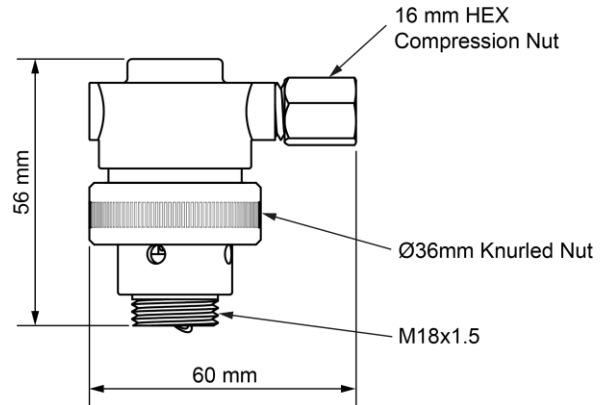
⚠ WARNING

Sharp needle hazard.



TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Minimum actuation pressure 6 bar (87 psi)
Hydrostatically tested at 197.5 bar (2866 psi)
Materials
Body Brass
Needle Stainless Steel
Reset spring Stainless Steel
Copper tubing nominal size 6 mm (1/4 in)
Copper tubing connection Compression joint
Weight 0.25 kg (0.55 lb)



ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MNN-06	Nitrogen needle cylinder

Actual product may differ from the images shown.

EFS AGENT CYLINDER ASSEMBLY

P/N: MFC-23/34/50/75/100/150

DESCRIPTION

The EFS agent cylinder assembly stores liquid FM-200™ (HFC-227ea) superpressurized with Nitrogen to 24.8 bars at 21°C. The 26.8 L, 40.2 L, 63 L, and 89 L cylinders are fitted with 40-mm discharge valve while the 115 L and 175 L cylinders with a 50-mm discharge valve. The discharge valves are equipped with either a standard or a 2n1 pressure gauge depending on system requirement. In addition to providing a means to determine agent pressure in the cylinder, the optional 2n1 pressure gauge provides for automatic supervision of significant drop in agent pressure. The discharge valves are also equipped with rupture disc-fitted safety plug that protects the cylinder assembly from possible excessive build-up of agent pressure when exposed to high temperature. As means for protection from potential hazard, safety caps are provided for covering the valve outlet and actuator connection port when the cylinder assembly is being moved or not connected to the system. A label that indicates FM-200 as the stored agent, agent fill weight, working temperature range, and other relevant information is permanently attached to the cylinder.

TECHNICAL INFORMATION

Approvals for system..... UL, FM
Approvals for cylinder..... DOT-4BW500
Agent fill pressure..... 24.8 bar (360 psi)
Cylinder rated working pressure 34.5 bar (500 psi)
Cylinder hydrostatically tested at 137.9 bar (1,000 psi)
Cylinder material Carbon Steel
Paint specification Red polyester powder coated
Installation position..... Vertical
See corresponding datasheets for more technical information on the discharge valves and pressure gauges.

ORDERING INFORMATION

Specify the model number, fill weight, and pressure gauge option when ordering.



EFS Agent Cylinder Assembly
P/N: MFC-23/34/50/75/100/150

SI Units

Model No.	Internal Volume* (L)	Fill Range (kg)	Valve Size (mm)	Dimension (mm)			Empty Weight (kg)	Pressure Gauge Option
				D	H	A		
MFC-23 ^{a,b}	26.8	13.3 – 25.6	40	350	608	508	20.3	Standard or 2n1 ^d
MFC-34 ^{a,b}	40.2	19.9 – 38.4	40	350	755	655	31.6	
MFC-50	63.0	31.2 – 60.6	40	350	1,005	905	52.9	
MFC-75	89.0	44.1 – 85.6	40	350	1,290	1,190	66.3	
MFC-100	115.4	57.2 – 111.0	50	350	1,610	1,495	83.6	
MFC-150 ^{a,c}	175.0	86.7 – 168.3	50	450	1512	1397	122.2	

US Units

Model No.	Internal Volume* (lb)	Fill Range (lb)	Valve Size (in)	Dimension (in)			Empty Weight (lb)	Pressure Gauge Option
				D	H	A		
MFC-23 ^{a,b}	59.1	29.3 – 56.4	1 1/2	13.8	23.9	20.0	44.8	Standard or 2n1 ^d
MFC-34 ^{a,b}	88.6	43.9 – 84.7	1 1/2	13.8	29.7	25.8	69.7	
MFC-50	138.9	68.8 – 133.6	1 1/2	13.8	39.6	35.6	116.6	
MFC-75	196.2	97.2 – 188.7	1 1/2	13.8	50.8	46.8	146.2	
MFC-100	254.4	126.1 – 244.7	2	13.8	63.4	58.9	184.3	
MFC-150 ^{a,c}	385.9	191.2 – 371.10	2	17.7	59.5	55.0	269.4	

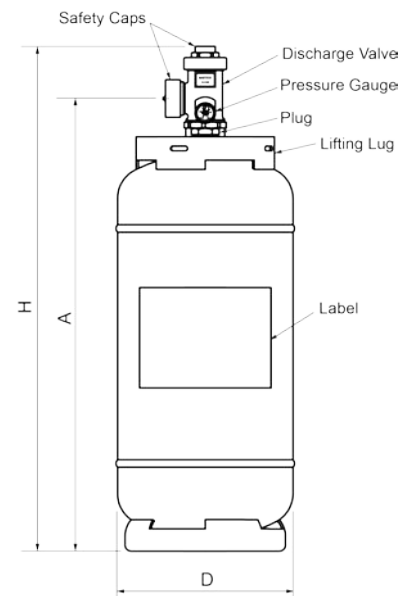
^aNot FM Approved

^bCylinder not DOT approved; Fitted with only one centrally-located necking (no Plug)

^cSee image for the lifting lug configuration

^dRefer to pressure gauge datasheet for scope of approvals

^eInternal volume is based on water capacity of the cylinder



Actual product may differ from the images shown.

AGENT NEEDLE CYLINDER

P/N: MNC-06

DESCRIPTION

The agent needle cylinder is used for the pneumatic operation of the agent cylinder assembly during system discharge. It is installed on the actuation port at the top of the discharge valve of EFS or PFS. The agent needle cylinder is fitted with a steel needle attached to a needle head that acts as a piston. Pressure from the actuating fluid in the master or pilot cylinder entering the needle cylinder through the copper tubing connected to one of the two copper tube ports is used to actuate the needle head. The other copper tube ports can be plugged or used as an interconnection port for the pneumatic actuation line when two or more agent cylinders are installed protecting the same hazard area. Once operated, the needle cylinder automatically resets when the actuation pressure in the pneumatic actuation line is relieved to below 6 bar (87 psi). The agent needle cylinder is equipped with a push button that can be used for manual operation. The push button is properly secured by a safety clip.

CAUTION

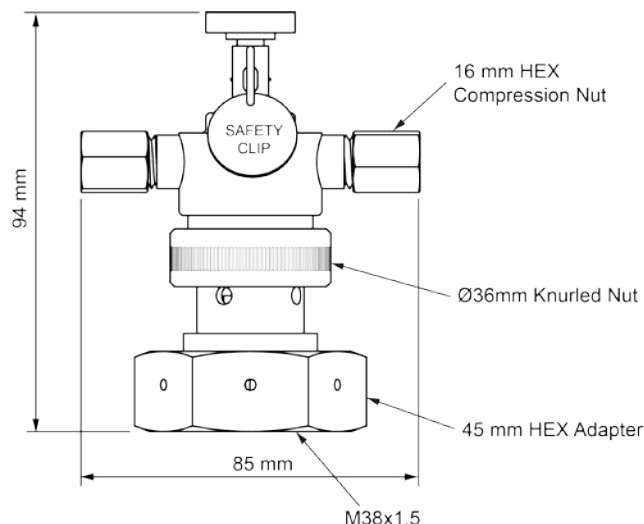
Manually actuating the agent needle cylinder will activate the extinguishing system and may compromise proper operation of a multi-cylinder system. Manual actuation should ONLY be performed in case of emergency as the last course of action.

WARNING

Sharp needle hazard.

TECHNICAL INFORMATION

Approvals for use with EFS/PFS	UL, FM
Minimum actuation pressure	6 bar (87 psi)
Hydrostatically tested at	344.7 bar (5000 psi)
Material	
Body	Brass
Needle	Stainless Steel
Push button	Brass
Safety clip	Stainless Steel
Reset spring	Stainless Steel
Copper tubing nominal size	6 mm (1/4 in)
Copper tubing connection	Compression joint
Weight	0.5 kg (1.1 lb)



ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MNC-06	Needle cylinder for agent discharge valve

Actual product may differ from the images shown.

CHECK VALVE 50A

P/N: MCV-50

DESCRIPTION

The check valve 50A is used when two or more agent cylinder assemblies are connected to the distribution piping through a manifold. It prevents backflow and loss of extinguishing agent and possible injury of personnel if the system is operated and discharged when an agent cylinder is disconnected or removed for maintenance. The inlet side of check valve 50A has internal taper threads and is connected to the flexible hose 50A while the outlet side is connected to the manifold via the manifold welding socket. The check valve 50A comes with a rubber packing seal that must be properly inserted into the manifold welding socket during installation to ensure air-tight connection.



Check Valve with Packing Seal

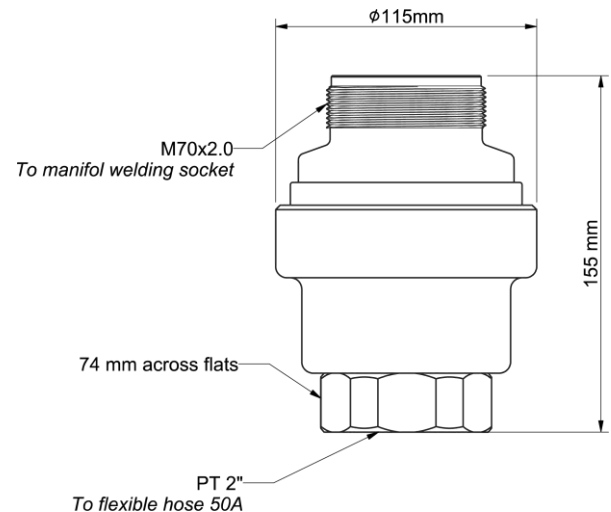
TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Materials
Body Brass (C3771)
Spring Stainless Steel (STS304)
Seat and O-ring SealsNBR
Packing SealNBR
Hydrostatically tested at 137.8 bar (2000 psi)
Weight..... 4.5 kg (10 lb)

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MCV-50	Check valve 50A with packing seal
TBD	Rubber packing seal



Actual product may differ from the images shown.

COPPER TUBING and FITTINGS

P/N: See Table

DESCRIPTION

Copper tube is used to direct the flow of the actuating fluid to the pneumatically-actuated devices. In EFS/PFS, these devices include the selector valve actuator, needle cylinders (discharge valve actuators), and pressure switches. The copper tube that will be used for connecting the pilot cylinder, selector valve actuator, and the first agent cylinder's discharge valve actuator is shipped from the factory in rolls of prescribed length and must be cut accordingly during field installation. Optionally, the copper tube can be factory pre-cut and bent to shape into one or more of the following: agent interconnect actuation tube, interlock tube (nitrogen actuation tube), selector valve actuation tube and pressure switch actuation tube.

The brass compression and flare fittings provide for the connection of copper tube between the source and pneumatic actuators or pressure switch.

TECHNICAL INFORMATION

Approval for use with EFS/PFS..... UL, FM
Copper tube
Nominal size 6A (1/4")
Min. wall thickness 0.70 mm
Fittings
Material Brass
Joint type Compression, Flare
Copper tube and fittings hydrostatically tested at 344.7 bar (5000 psi)

ORDERING INFORMATION

Specify part number and description when ordering

Part/Model No.	Description
MCT-001/002	Copper tubing [length in meter]
MTU-061	PT 3/8 flare fitting
SVU-01	PT 1/4 compression fitting
MFT-320	Agent interconnect actuation tube
MTN-500	500 mm interlock tube with PT 3/8 compression fitting
MTN-530	530 mm interlock tube with PT 3/8 compression fitting
MTN-600	600 mm interlock tube with PT 3/8 compression fitting



Copper Tube



PT 3/8 x 1/4 Compression Fitting



PT 1/4 x 1/4 Flare Fitting



Agent Interconnect Actuation Tube - Loop



Agent Interconnect Actuation Tube - Bend 90°



Interlock Tube with PT 3/8 Compression Fitting

Actual product may differ from the images shown.

COPPER TUBING and FITTINGS

P/N: See Table

DESCRIPTION

Copper tube is used to direct the flow of the actuating fluid to the pneumatically-actuated devices. In EFS/PFS, these devices include the selector valve actuator, needle cylinders (discharge valve actuators), and pressure switches. The copper tube that will be used for connecting the pilot cylinder, selector valve actuator, and the first agent cylinder's discharge valve actuator is shipped from the factory in rolls of prescribed length and must be cut accordingly during field installation. Optionally, the copper tube can be factory pre-cut and bent to shape into one or more of the following: agent interconnect actuation tube, interlock tube (nitrogen actuation tube), selector valve actuation tube and pressure switch actuation tube.

The brass compression and flare fittings provide for the connection of copper tube between the source and pneumatic actuators or pressure switch.

TECHNICAL INFORMATION

Approval for use with EFS/PFS.....	UL, FM
Copper tube	
Nominal size	6A (1/4")
Min. wall thickness	0.70 mm
Fittings	
Material.....	Brass
Joint type	Compression, Flare
Copper tube and fittings hydrostatically tested at	344.7 bar (5000 psi)

ORDERING INFORMATION

Specify part number and description when ordering

Part/Model No.	Description
MCT-001/002	Copper tubing [<i>length in meter</i>]
MTU-061	PT 3/8 flare fitting
SVU-01	PT 1/4 compression fitting
MFT-320	320mm Agent interconnect actuation tube
MFT-420	420mm Agent interconnect actuation tube
MTN-500	500 mm interlock tube with PT 3/8 compression fitting
MTN-530	530 mm interlock tube with PT 3/8 compression fitting
MTN-600	600 mm interlock tube with PT 3/8 compression fitting



Copper Tube



PT 3/8 x 1/4 Compression Fitting



PT 1/4 x 1/4 Flare Fitting



Agent Interconnect Actuation Tube - Loop



Agent Interconnect Actuation Tube – Bend 90°



Interlock Tube with PT 3/8 Compression Fitting

Actual product may differ from the images shown.

CYLINDER STRAP

P/N: MES and MPS Series

DESCRIPTION

The EFS cylinder strap is used to fasten and secure the agent cylinders in place. The cylinder strap is provided as a set which includes the steel straps, channel struts, bolts, nuts, washers, and end caps. The channel strut can be readily bolted or welded to rigid walls or fabricated steel frames.

ORDERING INFORMATION

Specify part number when ordering.

Part/Model No.	Cylinder Partner
MES-35	EFS agent cylinder MFC-23, -34, -50, -75, -100
MES-45	EFS agent cylinder MFC-150
MPS-35	PFS agent cylinder MFC-P50, -P75, -P100
MPS-45	PFS agent cylinder MFC-P150

TECHNICAL INFORMATION

Approval for use with EFS/PFS UL, FM
Material

Cylinder strap Cold rolled SPCC steel
Channel strut Structural steel (SS400)
Bolts, nuts, and washers Structural steel (SS400)
Channel end cap Plastic

Finish

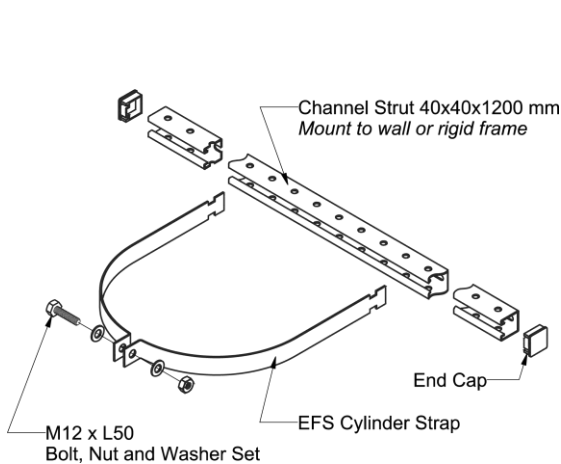
Cylinder strap Black powder coating
Channel strut Hot dip galvanizing



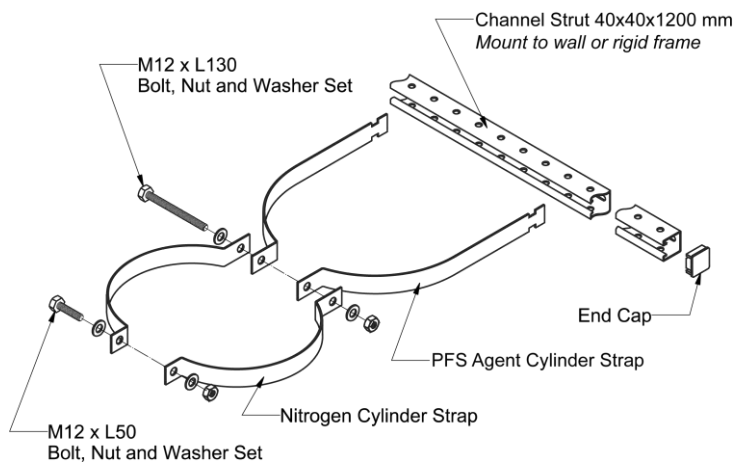
Cylinder Strap for EFS Agent Cylinders (P/N: MES-35, -45)



Cylinder Strap for PFS Agent Cylinders (P/N: MPS-35, -45)



EFS cylinder strap components



PFS cylinder strap components

Actual product may differ from the images shown.

DISCHARGE NOZZLE

P/N: See table

DESCRIPTION

Discharge nozzle is used to facilitate the uniform distribution of FM-200™ (HFC-227ea) agent throughout the protected hazard space during system discharge. The discharge nozzle is available in 180° and 360° types. The 180° nozzle is intended for sidewall installations, while the 360° nozzle is installed at the center of coverage area in an upright or pendant position.

The discharge nozzle is fitted with an orifice plate having drill size specifically designed to enable the flow of the required amount of agent at prescribed pressure and discharge time as determined using the flow calculation program. Orifice drill sizes are available in 0.2 or 0.5 mm increments.

TECHNICAL INFORMATION

Approvals for use with EFS/PFS UL, FM
Material

Body Brass
Orifice plate Brass
Snap ring Stainless steel

Body finish Ni-Cr Plating

Connection thread type PT (Pipe Thread)

Thread size 15A, 20A, 25A, 32A, 40A, 50A
(1/2", 3/4", 1", 1-1/4", 1-1/2", 2")

Nozzle coverage 12.6 x 12.6 m (360°)
12.6 x 12.6 m (180°)

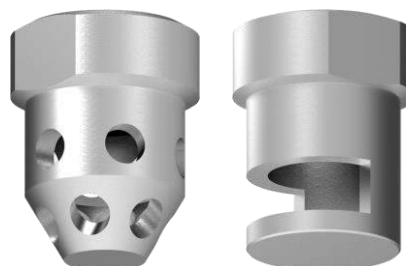
Protection height 0.5 m – 4.5 m

Max. distance from ceiling 0.3 m

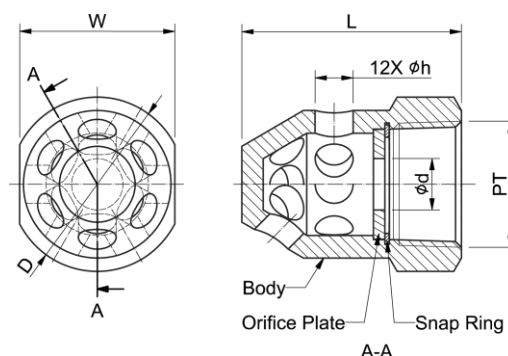
Installation position Pendant/Upright

ORDERING INFORMATION

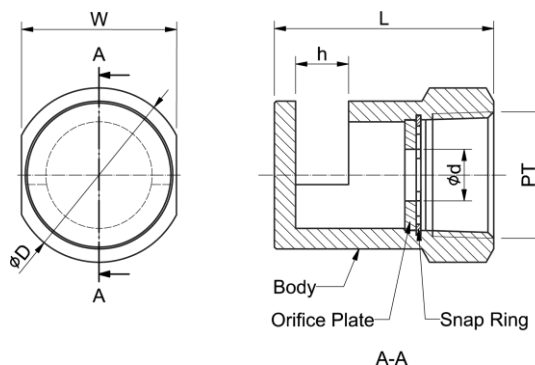
Specify nozzle part number based on flow calculation results when ordering.



EFs/PFS 360° and 180° Discharge Nozzles



360° discharge nozzles dimension



180° discharge nozzles dimension

Nozzle sizes and part number convention.

Part No. Series	Nominal Size		D	W	L	h		Orifice Plate	
	JIS	PT				360°	180°	Drill Size, d	Size Interval, mm
MFN-15-10d	15A	1/2	32	28	45	5	10	8.2 – 13.4	0.2
MFN-20-10d	20A	3/4	38	34	50	8	12	10.8 – 17.8	0.2
MFN-25-10d	25A	1	46	41	58	10	14	13.6 – 22.6	0.2
MFN-32-10d	32A	1 1/4	58	50	68	12	16	18.0 – 29.5	0.5
MFN-40-10d	40A	1 1/2	63	57	74	14	18	21.0 – 34.0	0.5
MFN-50-10d	50A	2	75	68	84	16	20	26.5 – 44.0	0.5

10d is a number obtained by multiplying the orifice plate drill size by 10. For example, the part number for a 25A (PT 1) nozzle with orifice plate drill size of 13.8 mm would be MFN-25-138.

Actual product may differ from the images shown.

ACTUATION (PILOT) CYLINDER

P/N: MAC-01

DESCRIPTION

The actuation (pilot) cylinder is used to provide for the storage of liquid CO₂. When the actuation (pilot) cylinder is operated, the CO₂ is released and directed to the actuator of selector valve (if installed) and needle cylinder through 6-mm copper tubing connected to the elbow assembly at the valve outlet. The pressure of the CO₂ is used to operate the selector valve actuator and a series of up to 25 actuation (pilot) cylinder actuators in a multi-zone system within 1 second. The actuation (pilot) cylinder is fitted with a discharge valve that uses a burst disc to hold the CO₂ pressure on one side of a plunger inside the valve – keeping the valve closed. The valve is opened by puncturing the burst disc using the solenoid cutter and subsequently venting the pressure acting on the plunger, enabling the flow of CO₂. The discharge valve is also fitted with burst-disc type safety plug as part of the safety feature of the actuation (pilot) cylinder.

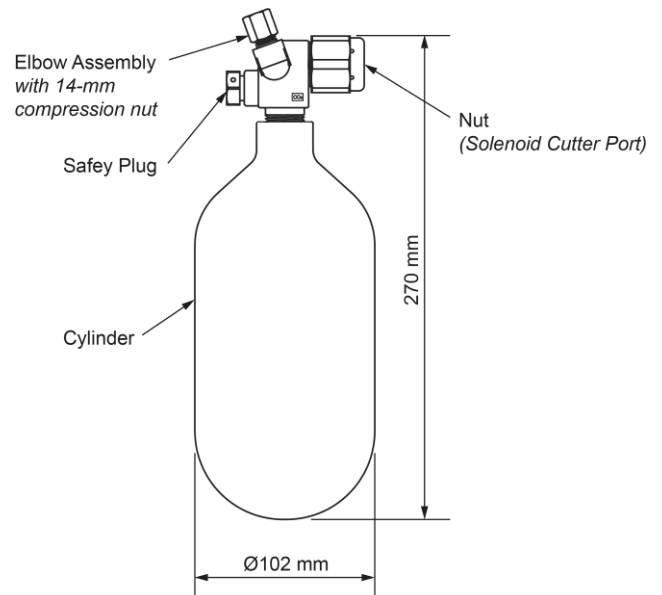
TECHNICAL INFORMATION

Approval for use with EFS/PFSUL, FM
Cylinder nominal water capacity 1.1 L
CO₂ fill weight0.65 kg
CO₂ pressure at fill55 bar at 21 °C
Nominal gross weight3.3 kg
Cylinder material Manganese steel
Cylinder hydrostatically tested at 297.8 bar (4320 psi)
Valve body material Brass
Valve hydrostatically tested at 413.6 bar (6000 psi)
Cylinder finish Powder coating

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MAC-01	Actuation (Pilot) Cylinder



Actual product may differ from the image shown.

PLUG PIN

P/N: CPP-01

DESCRIPTION

The plug pin is used to shut off or plug the end of the pneumatic actuation line at the needle cylinder (discharge valve actuator). Instead of the ferrule (compression ring), the plug pin can be inserted into the inlet/outlet port of the last needle cylinder in the agent cylinder bank and forced-in further by tightening the compression nut, creating an air-tight metal-to-metal seal.

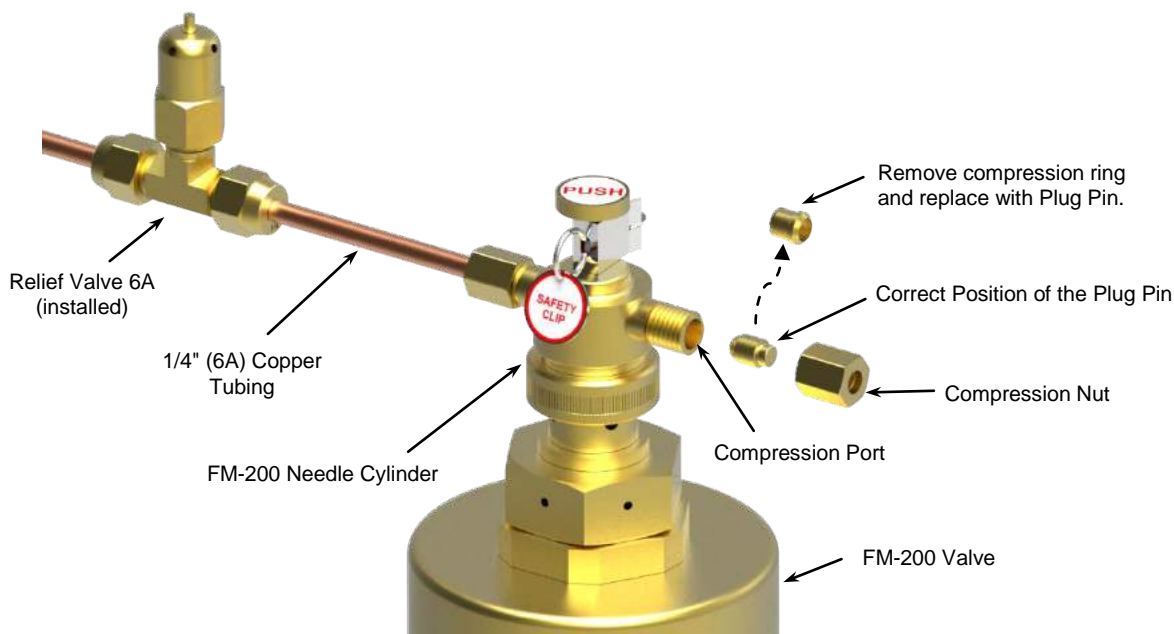
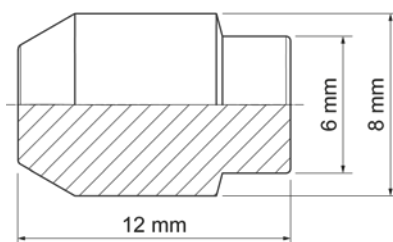
TECHNICAL INFORMATION

Approval for use with EFS/PFS..... UL, FM
Nominal size..... 6A (1/4")
Material..... Brass

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
CPP-01	Plug pin for pneumatic actuation line



Actual product may differ from the images shown.

PRESSURE RELIEF DEVICE

P/N: MSF-20

DESCRIPTION

The pressure relief device is used in systems where the piping section between the manifold check valve and the selector valve(s) may be closed off. To prevent entrapment of agent in such section of closed piping and over-pressurization when exposed to high temperature, the pressure relief device must be installed in a suitable location at the manifold. The pressure relief device is fitted with a rupture disc that operates at a rated burst pressure of 60 bar.

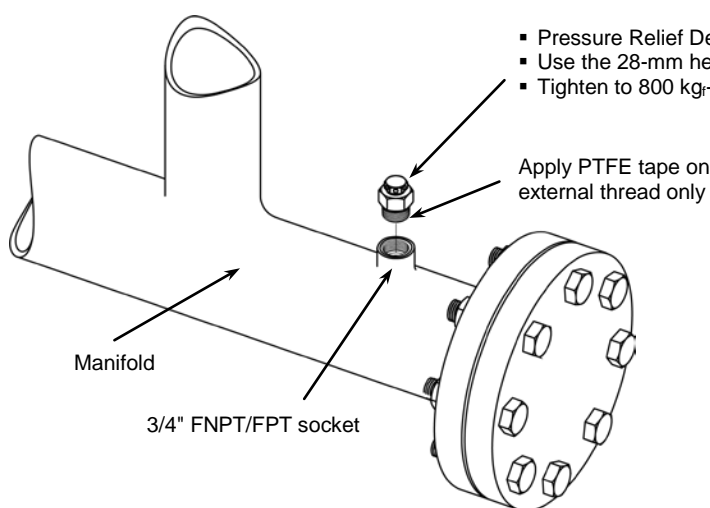
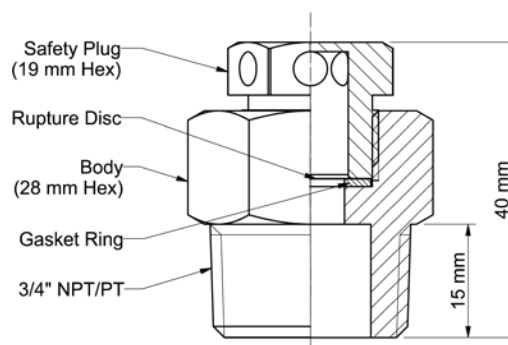
TECHNICAL INFORMATION

Approvals for use with EFS/PFS..... UL, FM
Nominal Size 20A (3/4")
Burst Pressure..... 60 bar (870 psig)
Material:
Safety Plug, Rupture Disc and Body..... Brass
Gasket Ring..... Bakelite
Connection Thread Size and Options 3/4" NPT/PT
(NPT or PT thread to be specified on order.)

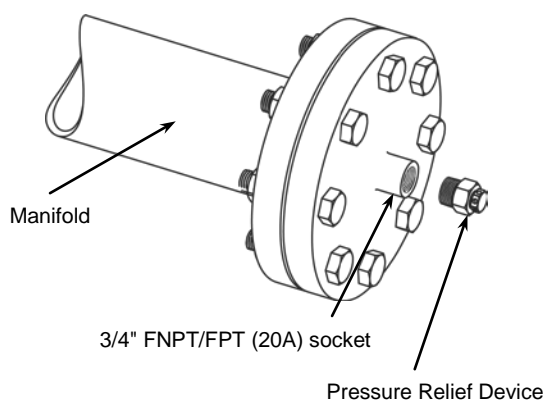
ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MSF-20	Pressure relief device full assembly
TBD	Rupture disc
TBD	Gasket ring
TBD	Safety plug
TBD	Body



Option 1: On manifold pipe



Option 2: On end-of-manifold pipe cap

Illustrative guide for installing the pressure relief device

Actual product may differ from the images shown.

DISCHARGE PRESSURE SWITCH (OPTIONAL)

P/N: MPS-01 (DY-PS-01)

DESCRIPTION

An optional discharge pressure switch is factory-assembled with the actuation box and can be used to initiate the discharge alarm when the agent is released. The pressure port of the pressure switch is connected to the selector valve or distribution piping outlet port via 6-mm copper tubing. The pressure switch is fitted with a micro limit switch that closes an electrical circuit when sufficient pressure from the discharged extinguishing agent enters the pressure port or when the push button on top is pulled manually. The operation of the pressure switch shall result to the activation of the discharge alarm system if properly connected to a compatible releasing control panel. Following its operation, the optional discharge pressure switch requires manual reset by pressing the push button inward.

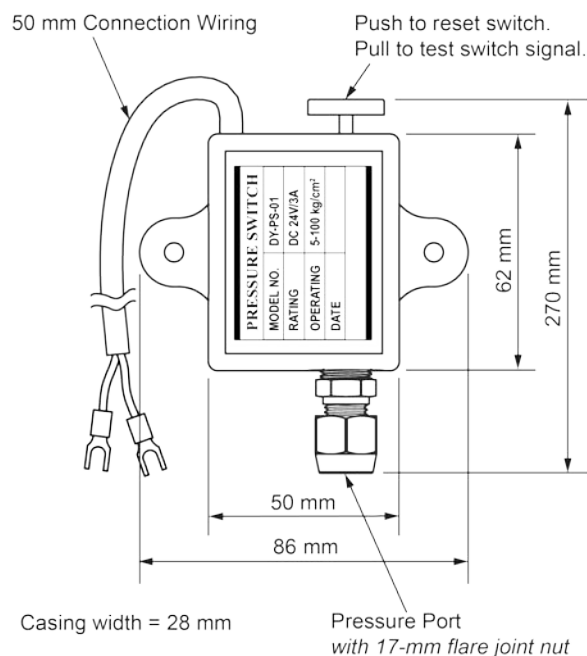
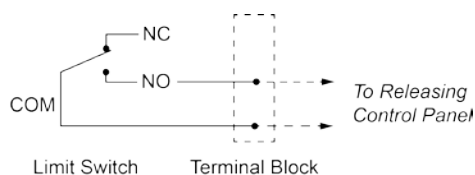
NOTE:

FM-200™ (HFC-227ea) EFS/PFS requires the use of UL Listed pressure switch that is compatible with the system operating pressure and fire alarm control panel. The system designer is strongly advised to refer to the pressure switch product manual for compatibility information.



TECHNICAL INFORMATION

Approvals for use with EFS/PFS..... Not within the scope UL or FM
Electrical rating.....24VDC, 3A
Min. operating pressure.....5 bar (72.5 psi)
Casing material..... Polyethylene
Weight.....0.2 kg (0.44 lb)
Wiring diagram



ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MPS-01(DY-PS-01)	Discharge pressure switch (optional)

Actual product may differ from the image shown.

UNION ELBOW

P/N: MEU-501/502

DESCRIPTION

The union elbow is used to provide a 90° connection between the agent cylinder valve and the flexible hose 50A. It comes with two rubber packing seals that must be properly placed inside the union nuts during installation to ensure air-tight connection. The union elbow is fitted with 85 mm octagon nut on both ends for easy installation. When the union elbow is to be connected to a 40 mm discharge valve, a union elbow adapter is needed and must be obtained separately.

TECHNICAL INFORMATION

Approval for use with EFS/PFSUL, FM
Materials

Elbow and Union Stainless Steel (STS304)

Union Nut Brass (C3771)

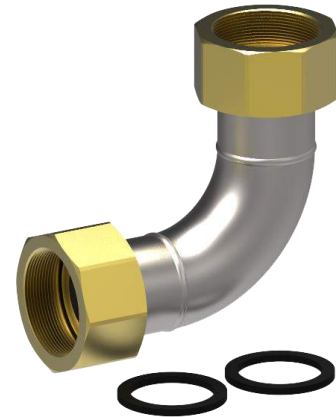
Packing Seal NBR

Length, L

MEU-501 125 mm (4.9 in)

MEU-502 225 mm (8.8 in)

Hydrostatically tested at 137.8 bar (2000 psi)

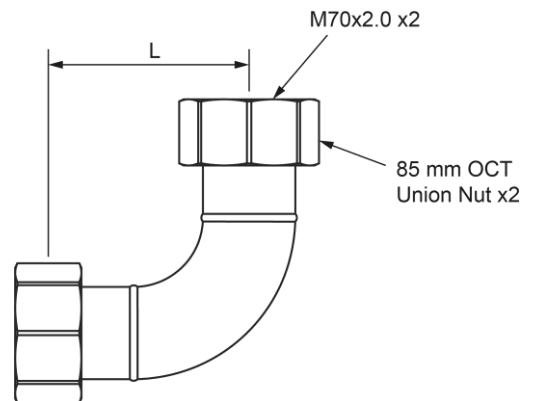


Union Elbow Set

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MEU-501	125 mm Union elbow
MEU-502	225 mm Union elbow
TBD	Rubber packing



Actual product may differ from the images shown.

UNION ELBOW ADAPTER

P/N: MVA-40

DESCRIPTION

The union elbow adapter is used when the agent cylinder assemblies having 40 mm discharge valves are to be installed in the system. It provides for the connection of the 40 mm discharge valve to the 50 mm union elbow. The externally-threaded portion of the union elbow adapter is connected to the union elbow while the internally-threaded part is connected to the outlet of the discharge valve. It comes with a factory-installed rubber O-ring that seals off the connection from possible leakage.



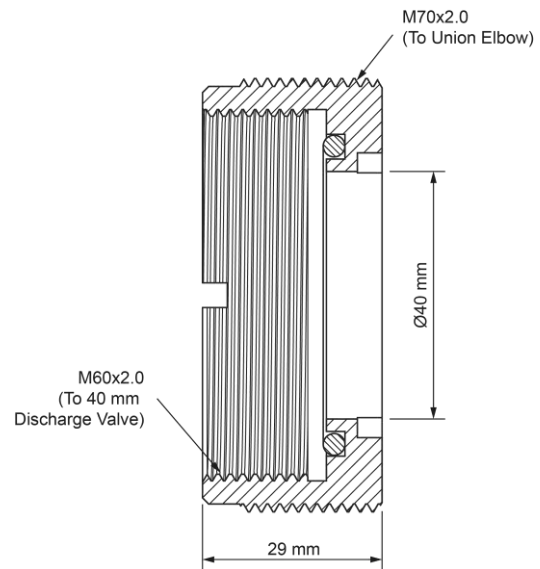
TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Materials
BodyBrass (C3604)
O-ring SealNBR
Weight..... 0.3 kg (0.7 lb)

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MVA-40	Union elbow adapter
TBD	Rubber O-ring



Actual product may differ from the images shown.

EXPLOSION-PROOF PRESSURE SWITCH

P/N: P1X-B30-S0426

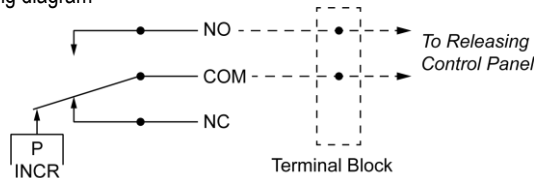
DESCRIPTION

The explosion-proof pressure switch is a type of discharge pressure switch available with EFS and PFS that is recommended for use in rugged and hazardous locations. It can be connected to the discharge pressure port of the selector valve or to a 1/4" NPT socket on the distribution piping via the supplied copper tube and fittings. The explosion-proof pressure switch is also provided with steel bracket that can be easily mounted to the piping.

As the discharged extinguishing agent reaches the selector valve or location in piping where the pressure switch is connected, the pressure from the flowing agent is used to operate the switch. The operation of the pressure switch shall result to the activation of the discharge alarm system if properly connected to a compatible releasing control panel.

TECHNICAL INFORMATION

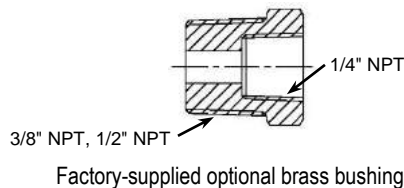
Approvals for use with EFS/PFS UL
Pressure switch independent approvals c-UL, CSA
Electrical rating 0.03 A at 250 VDC
Pressure port size 1/4" NPT
Factory set pressure 25 psi (1.7 bar)
Proof pressure 2000 psi (138 bar)
Wiring diagram



See product datasheet from Barksdale for more technical information.

Optional Parts

If 3/8" NPT or 1/2" NPT instead of 1/4" NPT pipe socket is installed in the distribution piping, a 3/8" x 1/4" NPT or 1/2" x 1/4" NPT brass bushing is provided upon order. Refer to illustration for installation guide.



ORDERING INFORMATION

Specify part number and description when ordering.

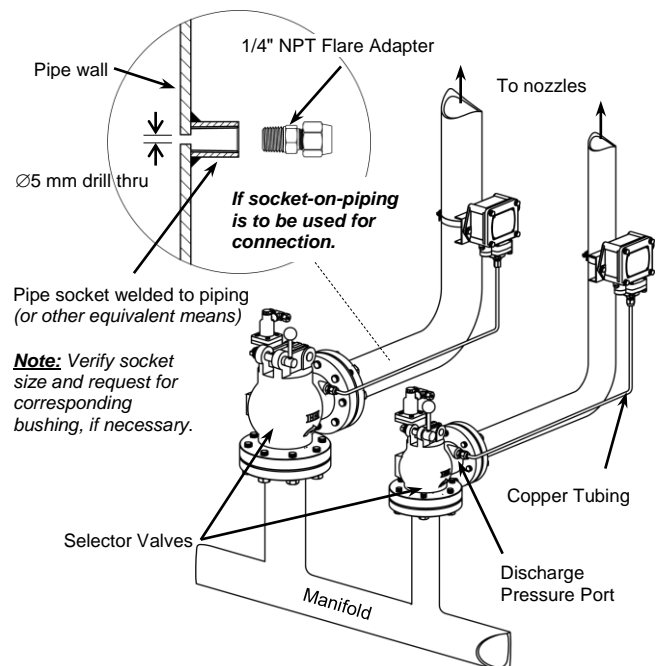
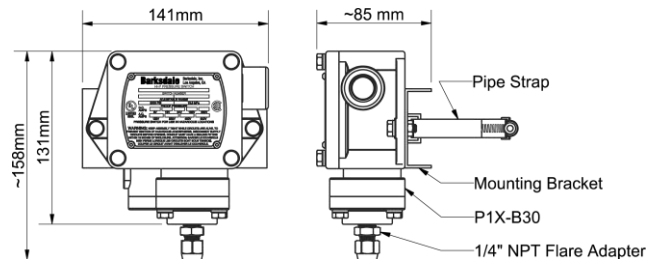
Part/Model No.	Description
PX-B30-S0426	Compact Pressure Switch
TBD	Mounting bracket set
TBD	1/4" NPT flare adapter (to pressure switch)
SVU-01	PT 1/4" flare adapter (to selector valve)
MBN-0610	3/8" x 1/4" NPT bushing (optional)
MBN-0615	1/2" x 1/4" NPT bushing (optional)

INSTALLATION

The explosion-proof pressure switch may be connected to the selector valve discharge pressure port using 6A (1/4") copper tubing and a 1/4" NPT flare adapter. If the system does not use selector valve or if preferred, connect the pressure switch to a 1/4" NPT socket or suitable socket-bushing combination welded over a 5-mm hole on one side of the distribution piping.



Explosion-Proof Pressure Switch with Mounting Bracket and 1/4" Flare Adapters



Illustrative guide for installing the explosion-proof pressure switch.

Actual product may differ from the images shown.

ACTUATION BOX ASSEMBLY

P/N: MAB-C1/C2

DESCRIPTION

The actuation box assembly consists of system components that are used for the automatic or manual release operation of the extinguishing system. The steel box provides enclosure for the actuation (pilot) cylinder, solenoid cutter with solenoid cutter supervisor or remove/tamper seal and an optional discharge pressure switch. Except for the solenoid cutter with solenoid cutter supervisor or remove/tamper seal, all components of the actuation box assembly are factory pre-installed. The solenoid cutter and solenoid cutter supervisor are shipped separately and shall be mounted onsite during system installation.

When a remove/tamper seal is to be used instead of the solenoid cutter supervisor, it should be noted that after the solenoid cutter has been installed, or when the solenoid cutter has been removed and replaced for servicing/maintenance, the remove/tamper seal, must be attached immediately. Otherwise, the solenoid cutter supervisor must be installed properly, and the use of remove/tamper seal is unnecessary.

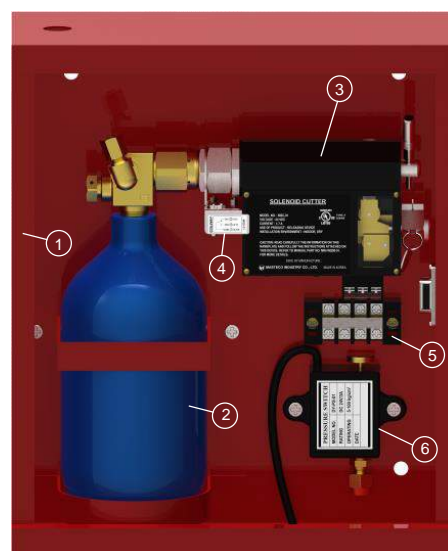
The actuation box assembly is also factory-fitted with a 4-port terminal block that provides for easy connection of the electrical devices to the agent releasing control panel. If the optional pressure switch (not covered by UL certification and FM approval) is to be used along with the solenoid cutter supervisor, a 6-port terminal block must be ordered separately.



TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Box materialCold Rolled Steel Sheet (SPCC)
Box Wall Thickness 1.2 mm
FinishPowder Coating Paint

Part/Model No.	Physical Dimension (L x W x H), mm (in)	Weight, kg (lb)
MAB-C1	310 x 135 x 360 (12.2 x 5.3 x 14.2)	4.5 (9.9)
MAB-C2	390 x 155 x 380 (12.2 x 5.3 x 14.2)	7.0 (15.4)



ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MAB-C1	Actuation box, size 310x135x360
MAB-C2	Actuation box, size 390x155x380

Assembly components

Item	Part/Model No.	Description
1	ACB-06-05	Actuation box enclosure (case)
2	MAC-01	Actuation (pilot) cylinder
3	MSC-01	Solenoid cutter
4	MSS-01	Solenoid cutter supervisor
5	MPS-01	Pressure switch (optional)
6	ACB-06-04	Terminal block
-	MWL-01	Remove/tamper seal* (not shown)

*The remove/tamper seal is not needed when the solenoid cutter supervisor is installed.

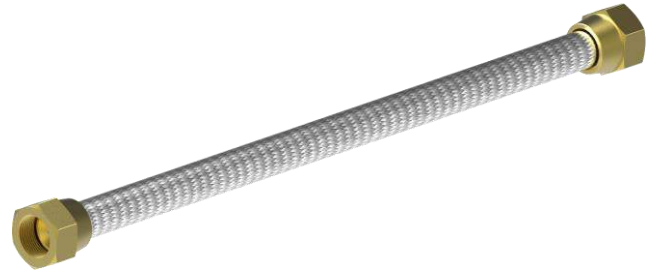
Actual product may differ from the images shown.

FLEXIBLE HOSE 20A

P/N: MFH-206/207/209

DESCRIPTION

The flexible hose 20A is used in PFS to direct the flow of pressurized nitrogen from the nitrogen cylinder to the FM-200® agent cylinder during system discharge. The 48-mm hex nuts at both ends of the flexible hose 20A provide quick threaded coupling of the agent cylinder and the agent propellant nitrogen cylinder via the 20-mm valves.



Flexible Hose 20A
P/N: MFH-206/207/209

TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Minimum bending radius75 mm (3.0 in)
Hydrostatically tested at197.6 bar (2866 psi)

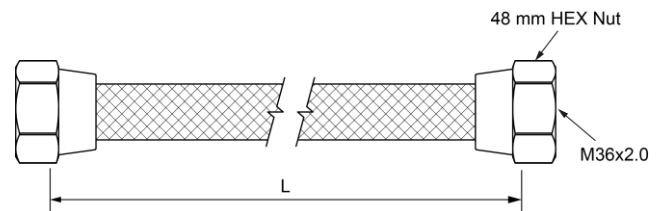
Materials

Flexible hoseStainless Steel (STS304)
Wire meshStainless Steel (STS304)
NutBrass (C3771)

ORDERING INFORMATION

Specify part number when ordering.

Model No.	Nom. Length, L mm (in)	Weight, kg (lb)	Couple/Partner	
			PFS Agent Cylinder	Nitrogen Cylinder
MFH-206	600 (23.6)	1.27 (2.8)	MFC-P100, MFC-P150	N68-80
MFH-207	700 (27.6)	1.37 (3.0)	MFC-P75	N68-70
MFH-209	900 (35.4)	1.54 (3.4)	MFC-P50	N68-60



Note: To ensure ordering of correct model, refer to the PFS cylinders coupling information.

Actual product may differ from the images shown.

FLEXIBLE HOSE 50A

P/N: MFH-50

DESCRIPTION

The flexible hose 50A is used in EFS or PFS to direct the flow of FM-200™ (HFC-227ea) from the agent cylinder to the manifold or distribution piping during system discharge. The straight-threaded (M70x2.0) end of the flexible hose 50A is connected to the union elbow while the tapered-threaded (2" PT) end is connected to the check valve 50A.

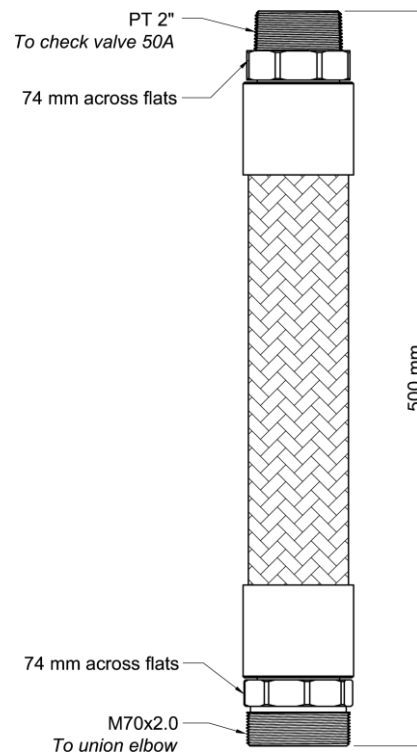
TECHNICAL INFORMATION

Approvals for systemUL, FM
 Minimum bending radius 350 mm (13.8 in)
 Hydrostatically tested at 137.5 bar (2000 psi)
 Materials
 HoseStainless Steel (STS304)/EPDM
 Wire mesh Stainless Steel (STS304)
 Nut Brass (C3771)
 Overall length..... 500 mm (19.7 in)

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MFH-50	Flexible hose 50A



Actual product may differ from the images shown.

MANIFOLD WELDING SOCKET

P/N: MWS-50

DESCRIPTION

The manifold welding socket is used as an intermediate connection device between the check valve 50A and manifold. The outlet side of the socket is welded to the manifold while the inlet side which has internal metric threads is connected to the check valve 50A.



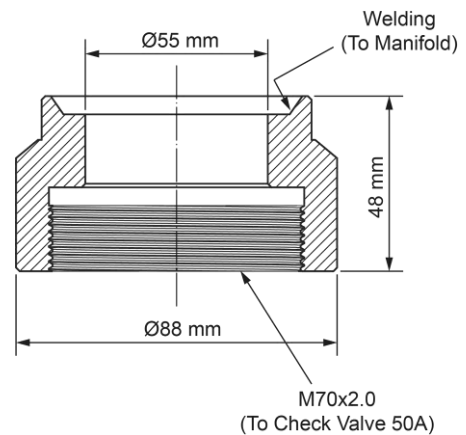
TECHNICAL INFORMATION

Approvals*UL, FM
 Body materialCarbon Steel (S20C)
 Weight 1 kg (2.2 lb)

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MWS-50	Manifold welding socket



Actual product may differ from the images shown.

COMPACT PRESSURE SWITCH

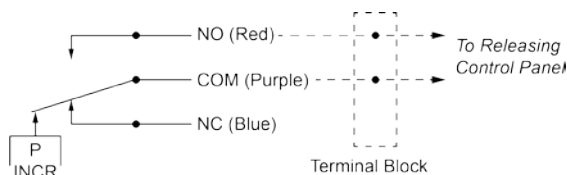
P/N: 96211-BB2-S1637

DESCRIPTION

The compact pressure switch is a compact-size pressure switch that is used to initiate the discharge alarm in EFS or PFS when the agent is released. It is connected directly to the distribution piping via a 1/4" NPT female adapter or pipe socket. As the discharged extinguishing agent reaches the selector valve or location in piping where the pressure switch is installed, the pressure from the flowing agent is used to operate the switch. The operation of the pressure switch shall result to the activation of the discharge alarm system if properly connected to a compatible releasing control panel.

TECHNICAL INFORMATION

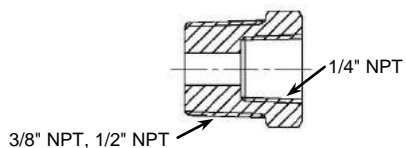
Approvals for use with EFS/PFS UL
Pressure switch approvals c-UL, CSA
Electrical rating 30VDC 5A
Pressure port size 1/4" NPT
Factory set pressure 25 psi (1.7 bar)
Proof pressure 1000 psi (68 bar)
Wiring diagram



See product datasheet from Barsdale for more technical information.

Optional Parts

If 3/8" NPT or 1/2" NPT instead of 1/4" NPT pipe socket is installed in the distribution piping, a 3/8" x 1/4" NPT or 1/2" x 1/4" NPT brass bushing is provided upon request. Refer to illustration for installation guide.



Factory-supplied optional brass bushing

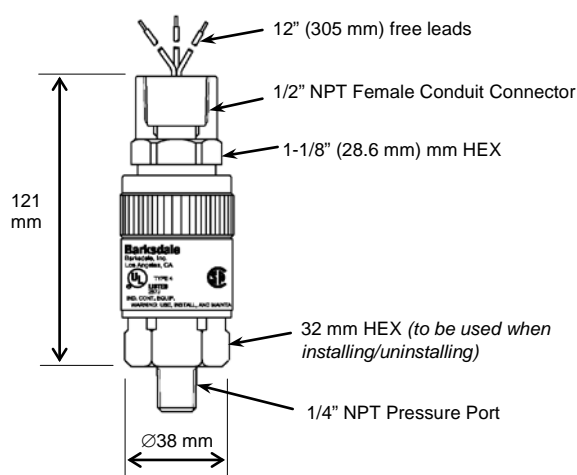
ORDERING INFORMATION

Specify part number and description when ordering.

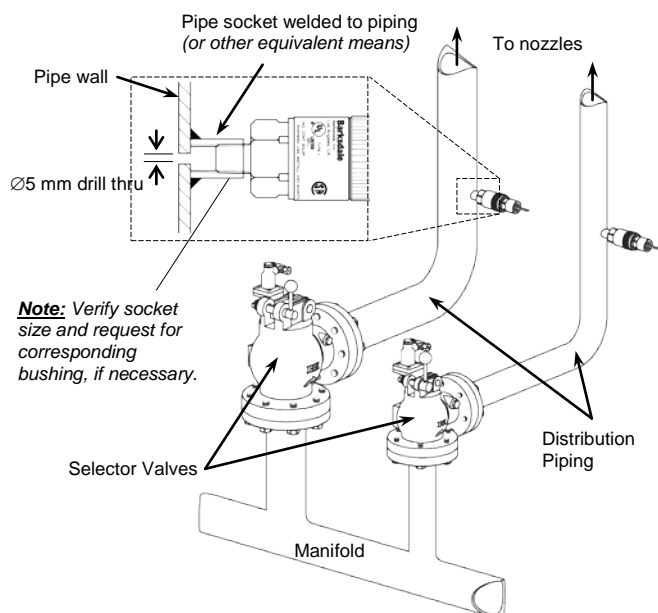
Part/Model No.	Description
96211-BB2-S1637	Compact Pressure Switch
MBN-0610	3/8" x 1/4" NPT Bushing (optional)
MBN-0615	1/2" x 1/4" NPT Bushing (optional)

INSTALLATION

With a 1/4" NPT socket or suitable socket-bushing combination, install the pressure switch over a 5-mm hole drilled thru one side of the distribution piping downstream of selector valve, if any. Wrap the pressure port (external thread) with sufficient amount of PTFE tape, then mount the compact pressure switch to the pipe socket or bushing and tighten by hand plus one full turn using a 32 mm hex wrench.



Physical Dimension



Illustrative guide for installing the compact pressure switch

Actual product may differ from the image shown.

CHECK VALVE 6A

P/N: MCV-06

DESCRIPTION

The check valve 6A restricts the flow of actuation gas in the actuation line to one direction only. It is installed in the pneumatic actuation tubing in a multi-zone system to ensure that the actuation pressure is delivered only to the intended needle cylinders (pneumatic valve actuators) on the agent cylinder valves. In main/reserve systems, the check valve is used to prevent the actuation of the reserve system when the main system is discharged.

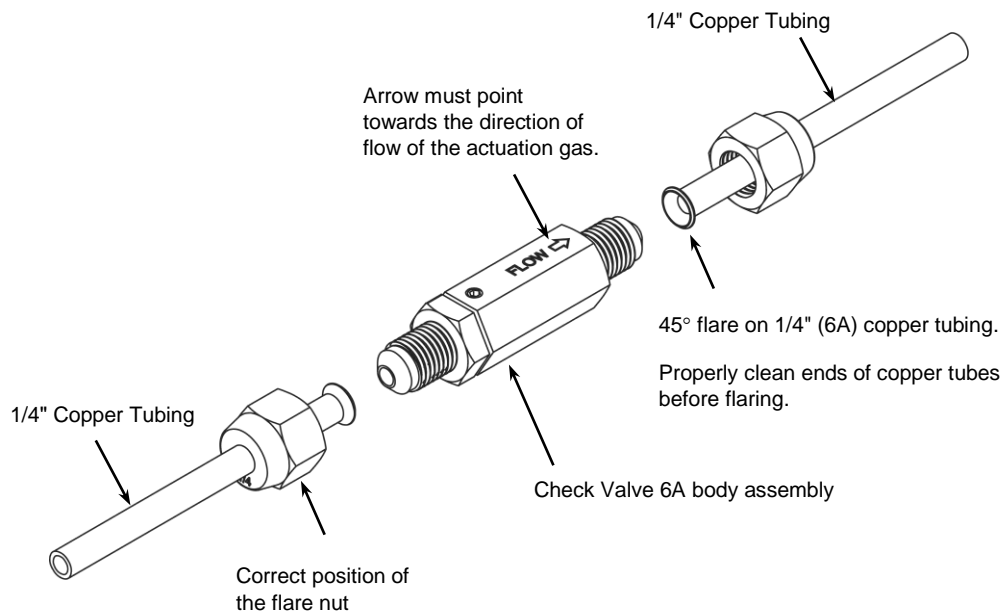
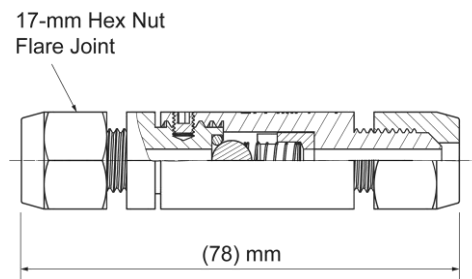
TECHNICAL INFORMATION

Approval for use with EFS/PFS.....	UL, FM
Nominal size.....	1/4" (6A)
Fitting thread	7/16" UNF
Minimum operating pressure.....	1 bar
Hydrostatically tested at	344.7 bar (5000 psi)
Material	
Body, Nipple and Flare Nuts	Brass
O-Ring Seal	NBR
Locking Screw	Alloy steel
Tubing connection	Flared joint
Installation position	In line with tubing (arrow points to flow)

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MCV-06	Check valve 6A



Illustrative guide for installing the pressure relief device

Actual product may differ from the images shown.

RELIEF VALVE 6A

P/N: MRV-06

DESCRIPTION

The relief valve 6A is used for bleeding off pressure in the pneumatic actuation line. The relief valve 6A is normally open and automatically closes when the pressure reaches 1.5 bar. After the system has discharged, the relief valve must be manually operated to vent the pressure in the actuation line prior to performing any related post-discharge maintenance.

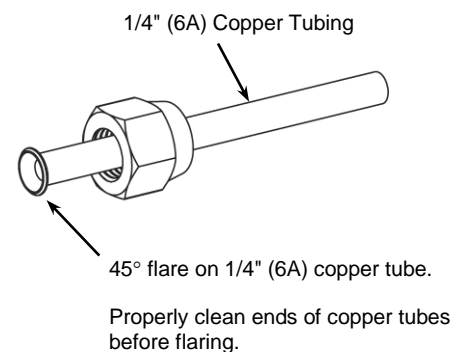
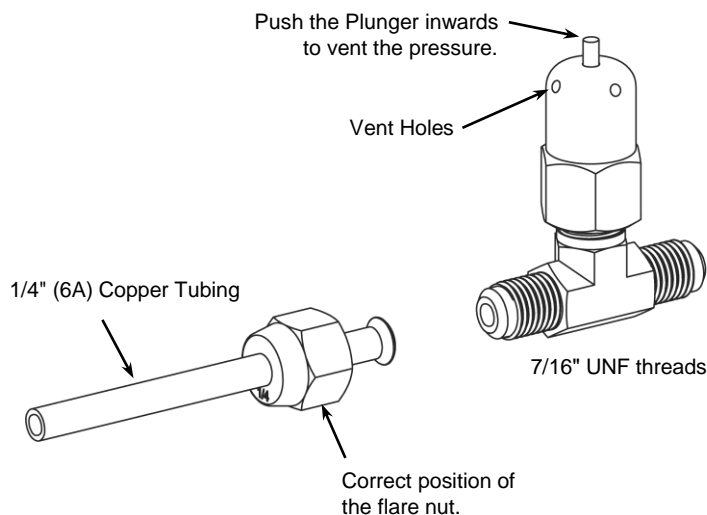
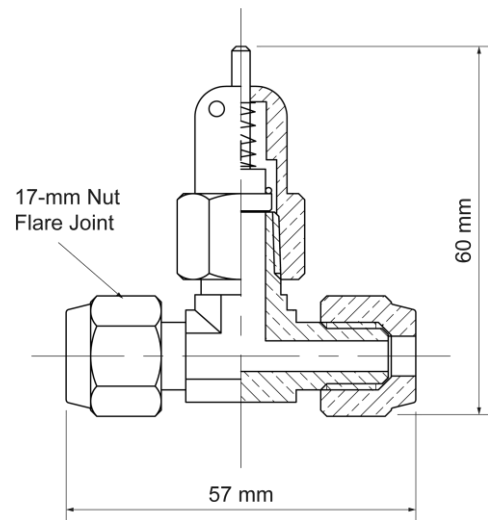
TECHNICAL INFORMATION

Approvals for use with EFS/PFS UL, FM
Nominal size 1/4" (6A)
Minimum operating pressure 1.5 bar
Hydrostatically-tested at 344.7 bar (5000 psi)
Material
Tee, Flare Nuts, Socket and Plunger Brass
O-Ring Seal NBR
Spring Steel
Copper tubing connection Flare Joint
Connection thread 7/16" UNF
Installation position Plunger vertically up or down

ORDERING INFORMATION

Specify part number and description when ordering

Part/Model No.	Description
MRV-06	Relief valve 6A



Illustrative guide for installing the relief valve 6A

Actual product may differ from the images shown.

SELECTOR VALVE

P/N: MSV-32/40/50/65/80/100/125/150

DESCRIPTION

When the system protects multiple hazard zones, the selector valve is used to direct the flow of extinguishing agent from the designated agent cylinder(s) to the corresponding protected enclosure during system discharge. The selector valve is normally locked at closed position. Pressure of the actuating gas that is released from the pilot cylinder and enters the pneumatic actuator via the selector valve tee is used to unlock the spindle. Discharged extinguishing agent entering the inlet side lifts the spindle leaving the selector valve open. After system discharge, the spindle rubber seals must be inspected, and the selector valve manually reset to normal position prior to putting to service. The selector valve is fitted with a release lever that enables manual unlocking of the spindle. Selector valve size 32 mm and 40 mm are fixed to the manifold/piping via the hex union nuts while size 50/65/80/100/125/150 mm are fixed to the manifold/piping via the flanges hex bolts

TECHNICAL INFORMATION

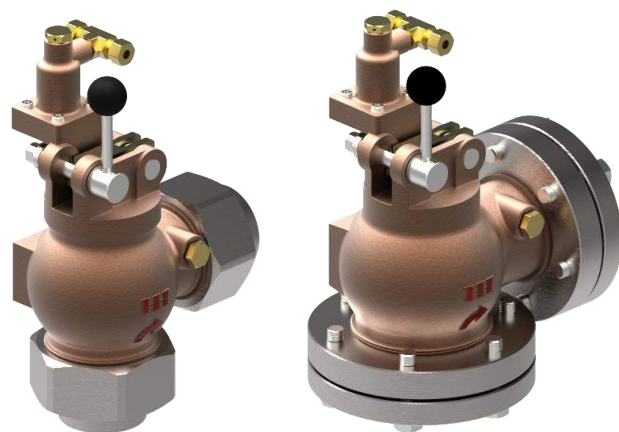
Approvals UL, FM
Material

Body Bronze Casting (BC6)
Spindle Brass (C3604)
Release Lever Stainless Steel (STS304)
Rubber Seals NBR
Union Nut (In/Out) Carbon Steel (SM45C)
Pipe Union (In/Out) Carbon Steel (SS400)
Valve Flange (In/Out) Carbon Steel (SM45C)
Pipe Counter Flange (In/Out) Carbon Steel (SM45C)
Hydrostatically tested at 137.8 bar (2000 psi)

ORDERING INFORMATION

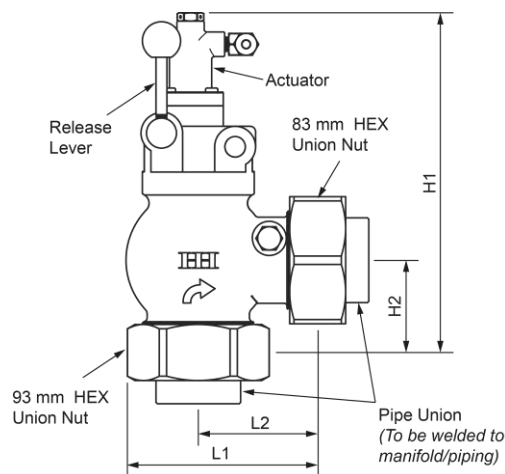
Specify part number and description when ordering.

Model No. (P/N)	ID In/Out, mm (in)	Weight, kg (lb)	L1, mm (in)	L2, mm (in)	H1, mm (in)	H2, mm (in)	HEX Bolt Size, mm (in)
MSV-32	32 (1-1/4)	10.9 (24.0)	142 (5.6)	90 (3.5)	249 (9.8)	70 (2.8)	N.A.
MSV-40	40 (1-1/2)	10.2 (22.5)	142 (5.6)	90 (3.5)	249 (9.8)	70 (2.8)	N.A.
MSV-50	50 (2)	18.1 (40.0)	190 (7.5)	110 (4.3)	247 (9.7)	68 (2.7)	19 (3/4)
MSV-65	65 (2-1/2)	25.3 (55.8)	215 (8.5)	125 (5)	286 (11.3)	85 (3.3)	19 (3/4)
MSV-80	80 (3)	38.2 (84.2)	240 (9.4)	140 (5.5)	328 (12.9)	110 (4.3)	24 (15/16)
MSV-100	100 (4)	67.3 (148.4)	288 (11.3)	175 (6.9)	396 (15.6)	135 (5.3)	30 (1 3/16)
MSV-125	125 (5)	98.7 (217.6)	350 (13.8)	200 (7.9)	438 (17.2)	158 (6.2)	30 (1 3/16)
MSV-150	150 (6)	136.7 (301.4)	395 (15.6)	230 (9.0)	461 (18.1)	168 (6.6)	36 (1 7/16)

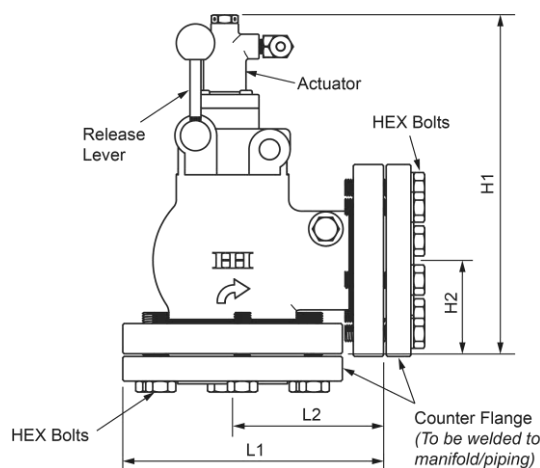


P/N: MSV-32/40

P/N: MSV-50/65/80/100/125/150



P/N: MSV-32/40



P/N: MSV-50/65/80/100/125/150

Actual product may differ from the images shown.

SOLENOID CUTTER with ADAPTER

P/N: MSC-01

DESCRIPTION

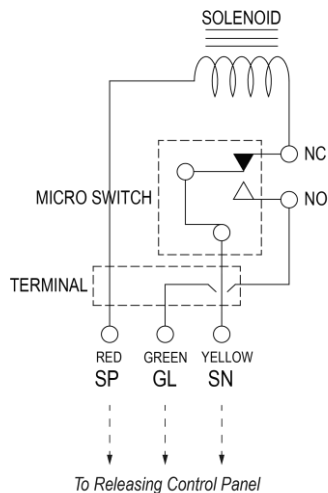
The solenoid cutter is used as a releasing device for the FM-200™ (HFC-227ea) EFS and PFS. It actuates the pilot or master cylinder when system discharge operation is initiated. In normal system discharge operation, the solenoid cutter is activated via electric signal from the system releasing control panel. When energized, the spring-loaded needle assembly is released. Should the electrical fail, the solenoid cutter is fitted with push button that can be used for manual operation of the device. The solenoid cutter requires to be reset manually after it has been operated.

The solenoid cutter is shipped with suitable adapter depending on whether the device is to be used in conjunction with master agent cylinder or actuation (pilot) cylinder valve. Ensure that this specific information is provided upon order.

TECHNICAL INFORMATION

Approvals for use with EFS/PFSUL, FM
Device approvalsc-UL-us
Use of deviceReleasing device
Electrical rating24VDC, 1.7A
Material
NeedleStainless steel
Enclosure/FrameZinc alloy
Gross weight2 kg (4.4 lb)
Listed compatible releasing panelPotter PFC-4110RC
Wiring Diagram

RED-YELLOW : INPUT POWER
GREEN-YELLOW : NEEDLE RELEASE DISPLAY



Note: The needle release display connection maybe skipped depending on system requirement.

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MSC-01	Solenoid Cutter
SCA-01	Adapter for pilot cylinder valve
SCA-02	Adapter for master cylinder valve



⚠ WARNING Sharp needle hazard.

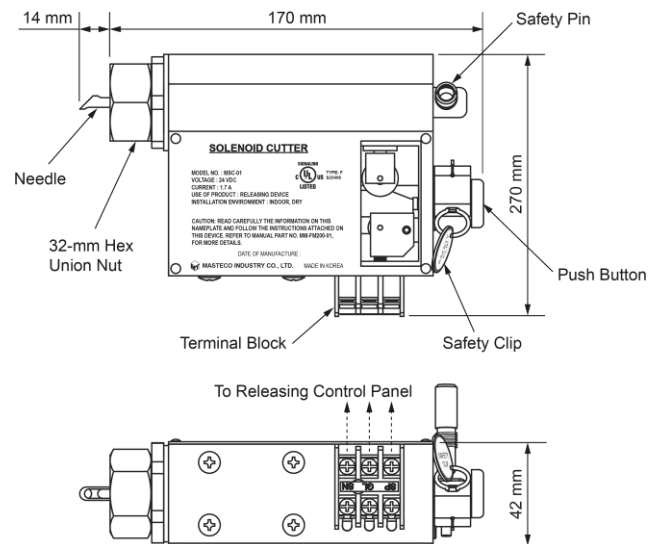


For Pilot Cylinder Valve
(P/N: SCA-01)



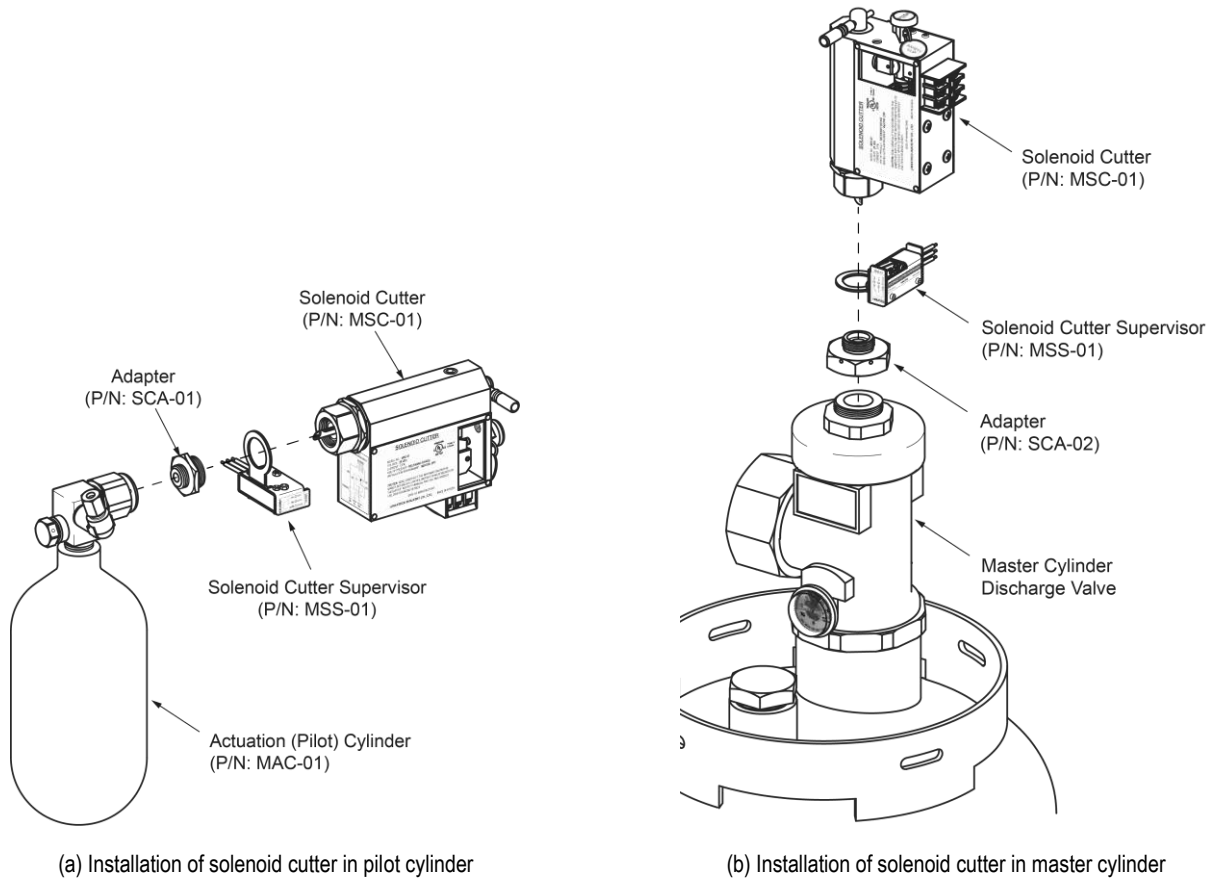
For Master Cylinder Valve (P/N:
SCA-02)

Solenoid Cutter Adapters



Physical Dimension

Actual products may differ from the images shown.



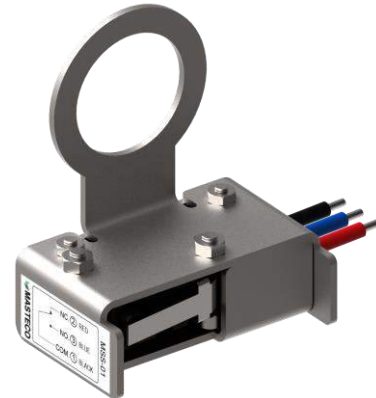
Illustrative guide for the installation of solenoid cutter in pilot and master cylinders

SOLENOID CUTTER SUPERVISOR

P/N: MSS-01

DESCRIPTION

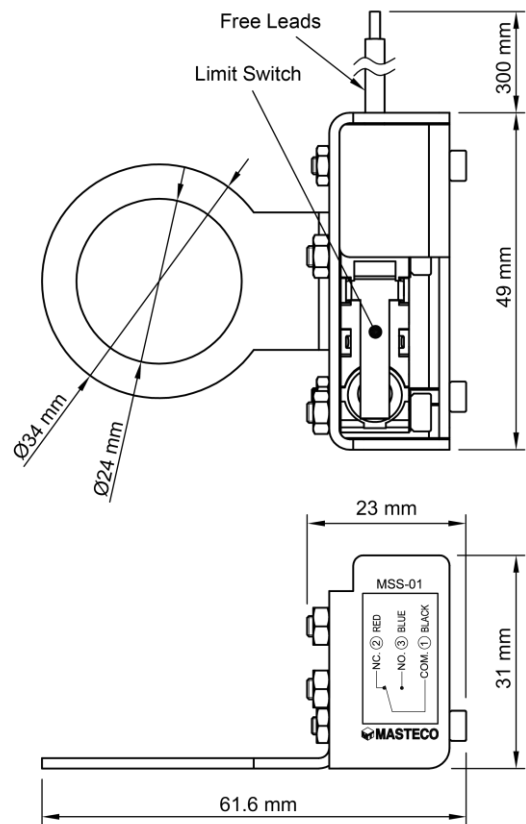
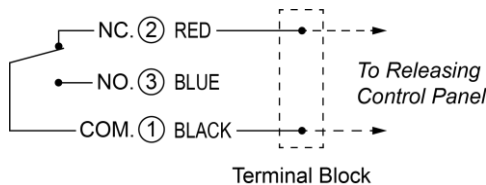
The solenoid cutter supervisor is used to monitor the position of the solenoid cutter (electric actuator) in the agent actuation (pilot) cylinder valve or master cylinder discharge valve. It is fitted with a normally closed water-resistant micro limit switch such that when the device is properly installed and connected to a releasing control panel, complete removal or significant disengagement due to improper installation or loosening of the solenoid cutter from the valve it actuates causes the switch to activate, transmit electrical signal and triggers the audible and visual supervisory notification at the control panel. The solenoid cutter supervisor can be quickly installed in existing solenoid cutter and valve assemblies or new installations.



TECHNICAL INFORMATION

Approvals for use with EFS/PFS	UL
Micro limit switch approvals	UL, cUL, ENEC15
Electrical rating	30VDC, 5A
Connection wiring	300 mm free leads, #18 AWG
Washer bracket, cover, bolts, and nuts material	Stainless steel
Gross weight	80 g
Compatibility	40A/50A agent cylinder valve, Actuation (pilot) cylinder valve

Wiring diagram

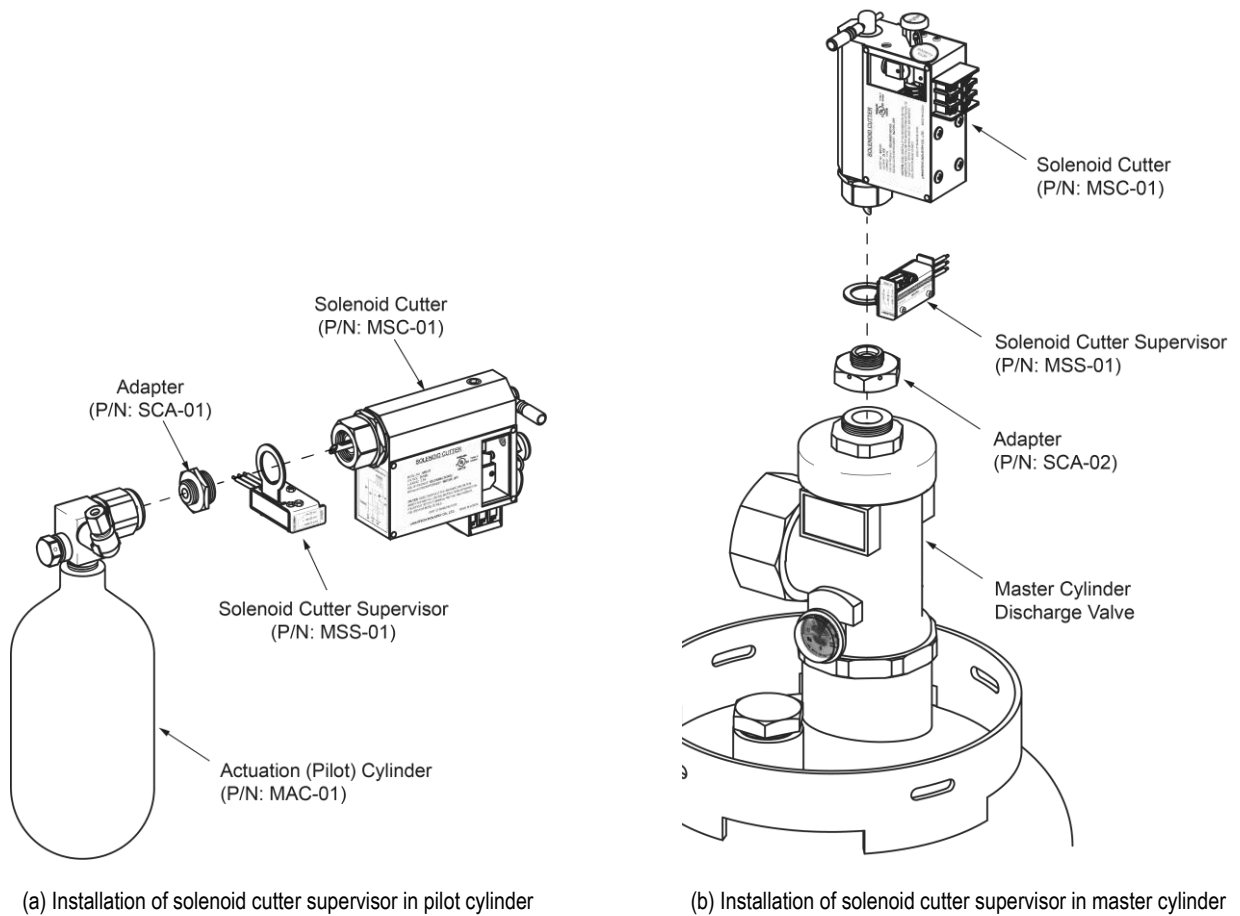


ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MSS-01	Solenoid cutter supervisor

Actual product may differ from the image shown.



Illustrative guide for the installation of solenoid cutter supervisor in pilot and master cylinders

TEE 6A

P/N: MTF-06

DESCRIPTION

The relief valve 6A is used for bleeding off pressure in the pneumatic actuation line. The relief valve 6A is normally open and automatically closes when the pressure reaches 1.5 bar. After the system has discharged, the relief valve must be manually operated to vent the pressure in the actuation line prior to performing any related post-discharge maintenance.

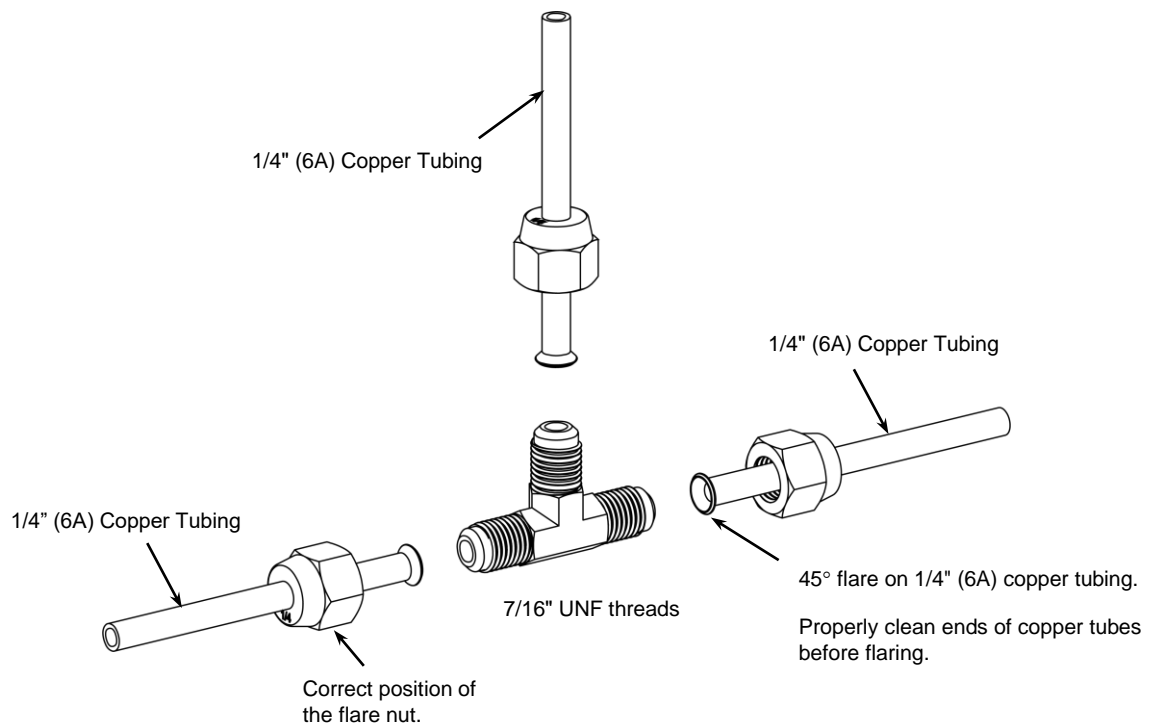
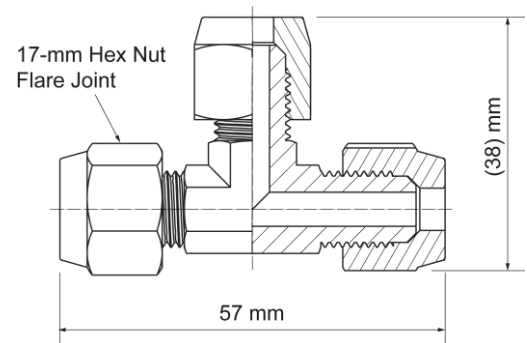
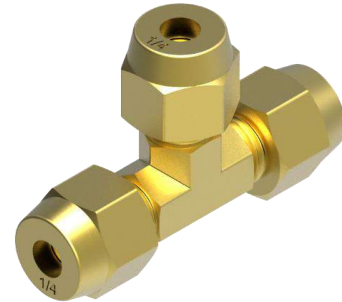
TECHNICAL INFORMATION

Approvals for use with EFS/PFS UL, FM
Nominal size 1/4" (6A)
Hydrostatically-tested at 344.7 bar (5000 psi)
Material Brass
Copper tubing connection Flared Joint
Connection thread 7/16" UNF

ORDERING INFORMATION

Specify part number and description when ordering.

Part/Model No.	Description
MTF-06	Tee 6A



Illustrative guide for installing the tee 6A

Actual product may differ from the images shown.