HFC-227ea FIRE SUPPRESSION SYSTEM

COMPONENTS MANUAL FOR PYRO-200 SYSTEM

Rev 0	**First Listing Draft**	**02-20-2022**

FOREWORD

PHILOSOPHY STATEMENT

The philosophy at Adkinns Inc. (ADK) is to save our clients and customers valuable time and money by providing them with reliable and unparalleled "one-stop" fire protection solutions at reasonable prices. Our mission is to provide a fire safe environment for everyone, our vision is to become a leader in world-class fire-fighting products and our corporate culture of "Nothing is constant ... the only constant is continuous improvement" attitude will ensure that ADK will continue to "Lead the fight against fire".

PROPRIETARY NOTICE

The PYRO-200 gas system manual is a proprietary data of ADK. Reproduction of the whole or any part of this manual other than the support of the equipment for which is published is not allowed without the permission in writing by ADK.

DISTRIBUTION OF MANUAL

This manual is distributed only to persons/companies listed on ADK distributor list. The content of this manual is CONFIDENTIAL and is not to be distributed to any third parties without the written consent from ADK. The manual shall always be returned to ADK in the event that the persons/companies distribution rights is terminated and/or cancelled by either party. This manual does not cover the detection and control system and must be designed according to local requirements.

WARRANTY POLICIES

The components of the Halocarbon gas suppression system supplied by ADK are warranted to the original purchaser for 1 (one) year from the date of delivery against defects in workmanship and material. ADK will replace or repair any ADK supplied components which, in its opinion are defective and have not been tampered with or subjected to misuse, abuse or exposed to highly corrosive conditions provided that written notice of the alleged defect shall be given to ADK within 7 days after discovery thereof, and prior to the expiration of one year after order, and further provided that is ADK so instructs, such article or part thereof is promptly returned to ADK with shipping charges pre-paid.

Any question regarding the information presented in this manual, please contact:

5063 Commercial Circle,
Concord, 94520 CA,
USA
Tel: +1 (650) 457 4580

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

COMPONENT DESCRIPTION

The PYRO-200 gas system consists of field pipe work connected to a cylinder(s) through a manifold (if required), distribution pipe network and nozzles. At a reference temperature of 21°C, the PYRO-200 is stored at 25 bar, 42 bar and 50 bar within each cylinder. The proprietary system components, from cylinders to nozzles, are delivered in loose kit form and the items are bolted to a wall or solid framework. Each system is designed specifically for the area which it is protecting. Gas discharge times and gas distribution is achieved by the correct sizing of the orifice holes at the nozzle with the size engraved on the body.

The PYRO-200 system is operated by an electrical signal to a solenoid actuating device on the master or pilot cylinder. Operation of the said cylinder will pressurize the pneumatic actuating line which will operate the pneumatic release pistons on the slave cylinders causing these cylinders to discharge. The General Arrangement Drawings of piping runs can affect the final diameter of the orifices, therefore "as built" drawings must be done to enable all orifices to be calculated and drilled to suite.

1.1 PYRO-200 CYLINDER ASSEMBLY (WELDED)

HFC-227ea fluid is stored in the cylinder as a liquid, super pressurized with nitrogen. In addition, all cylinders and valves are provided with a safety cap and a protection cap. This is a safety feature to prevent uncontrolled, accidental discharge. The cylinder is designed to operate at a temperature range of -10 °C to 60 °C. Cylinders sharing the same manifold must be in equal size with the same fill density. A label is pasted onto the cylinder to display the filling pressure, agent weight, tare weight, gross weight and charge date.

WARNING:

THE VALVE OUTLET CAP MUST ALWAYS BE FITTED ONTO THE CYLINDER, IRRESPECTIVE OF WHETHER THE CYLINDER IS FULL OR EMPTY, WHEN IT IS NOT CONNECTED TO THE PIPE NETWORK OR MANIFOLD.

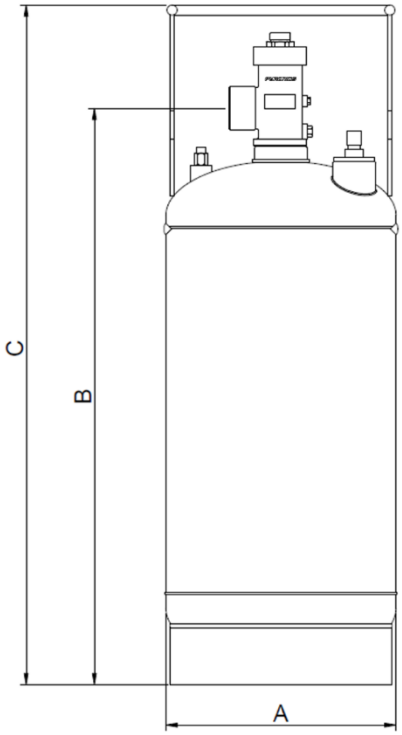


Figure 1-1: PYRO-200 Cylinders (Welded)

Specifications	
Materials	P355M, HP345
Filling – General Cylinder	0.5kg/L up to maximum of 1 kg/L
Filling – Cylinder with Liquid Level Indicator	0.5kg/L up to maximum of 0.8kg/L
Filling Pressure	25 bar or 42 bar @ 21°C
Test Pressure	63 bar or 101 bar
Standard of Compliance	TPED Directive 2010/35/EU DOT-4BW
Color	Red

1.1.1 TPED Cylinders

Table 1-1: Cylinder and Valve Assembly Dimensions for TPED Cylinders

Part Number	Capacity (L)	Valve Outlet Size (in.)	A (mm)	B (mm)	C (mm)	Burst Disc's Burst Pressure
PYR-INT-FS-WCYL-16L	16.6	1″	228.6	578	761	55Bar
PYR-INT-FS-WCYL-32L	32	1-1/2″	324	584	730	55Bar
PYR-INT-FS-WCYL-52L	52	1-1/2″	324	844	990	55Bar
PYR-INT-FS-WCYL-100L	100	1-1/2″	406	1019	1187	55Bar
PYR-INT-FS-WCYL-120L	120	2″	406	1192	1350	55Bar
PYR-INT-FS-WCYL-150L	150	2″	406	1437	1596	55Bar
PYR-INT-FS-WCYL-180L	180	2″	462	1317	1493	55Bar
PYR-INT-FS-WCYL-200L	200	2″	462	1447	1623	55Bar
PYR-INT-FS-WCYL-240L-2V	240	2″	508	1468	1656	55Bar
PYR-INT-FS-WCYL-240L-3V	240	3″	508	1523	1656	55Bar
PYR-INT-FS-WCYL-300L	300	3″	610	1363	1506	55Bar
PYR-INT-FS-WCYL-369L	369	3″	610	1608	1751	55Bar

Table 1-2: TPED Cylinders with Liquid Level Indicator

Part Number	Capacity (L)	Valve Outlet Size (in.)	A (mm)	B (mm)	C (mm)	Liquid Level Inlet Size
PYR-INT-FS-WCYL-240L-LLI	240	2″	508	1468	1656	2″ -11.5 NPSC
PYR-INT-FS-WCYL-240L-3V-LLI	240	3″	508	1523	1656	2″ -11.5 NPSC
PYR-INT-FS-WCYL-300L-LLI	300	3″	610	1363	1506	2″ -11.5 NPSC
PYR-INT-FS-WCYL-369L-LLI	369	3″	610	1608	1751	2″ -11.5 NPSC

**Cylinder dimensions shown on all tables above have a tolerance of ± 15mm.*

1.1.2 DOT Cylinders

Table 1-3: Cylinder and Valve Assembly Dimensions for DOT Cylinders

Part Number	Capacity (L)	Valve Outlet Size (in.)	A (mm)	B (mm)	C (mm)	Burst Disc's Burst Pressure
PYR-INT-FS-WCYL-D29L	29	1-1/2″	254	753	877	55Bar
PYR-INT-FS-WCYL-D52L	52	1-1/2″	406	600	-	55Bar
PYR-INT-FS-WCYL-D106L	106	1-1/2″	406	1035	-	55Bar
PYR-INT-FS-WCYL-D147L	147	2″	406	1377	-	55Bar
PYR-INT-FS-WCYL-D227L	227	2″	508	1408	-	55Bar
PYR-INT-FS-WCYL-D275L	275	3″	508	1666	-	55Bar
PYR-INT-FS-WCYL-D369L	369	3″	610	1572	-	55Bar

Table 1-4: DOT Cylinders with Liquid Level Indicator

Part Number	Capacity (L)	Valve Outlet Size (in.)	A (mm)	B (mm)	C (mm)	Liquid Level Inlet Size
PYR-INT-FS-WCYL-D227L-LLI	227	2″	508	1408	-	2″ -11.5 NPSC
PYR-INT-FS-WCYL-D275L-LLI	275	3″	508	1666	-	2″ -11.5 NPSC
PYR-INT-FS-WCYL-D369L-LLI	369	3″	610	1572	-	2″ -11.5 NPSC

**Cylinder dimensions shown on all tables above have a tolerance of ± 15mm.*

1.2 PYRO-200 CYLINDER ASSEMBLY (SEAMLESS)

HFC-227ea fluid is stored in the cylinder as a liquid, super pressurized with nitrogen. In addition, all cylinder and valve are provided with a safety cap and a protection cap. This is a safety feature to prevent uncontrolled, accidental discharge. The cylinder is designed to operate at a temperature range of -10 ºC to 60 ºC. Cylinders sharing the same manifold must be in equal size with the same fill density. A label is pasted onto the cylinder to display the filling pressure, agent weight, tare weight, gross weight and charge date.

WARNING:

THE VALVE OUTLET CAP MUST ALWAYS BE FITTED ONTO THE CYLINDER, IRRESPECTIVE OF WHETHER THE CYLINDER IS FULL OR EMPTY, WHEN IT IS NOT CONNECTED TO THE PIPE NETWORK OR MANIFOLD.

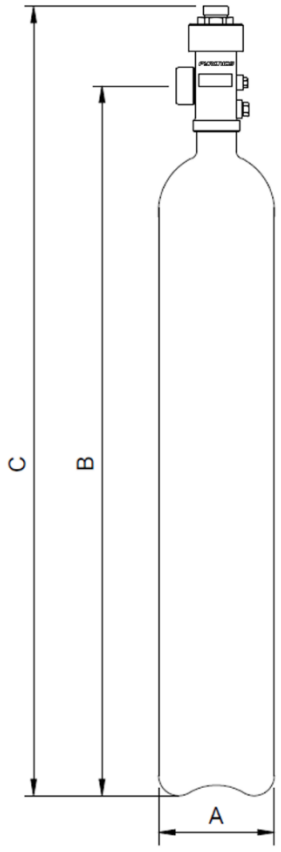


Figure 1-2: PYRO-200 Cylinder (Seamless)

Specifications	
Materials	Chromium Molybdenum Alloy Steel
Filling	0.5kg /L up to maximum of 1 kg/L
Filling Pressure	42bar and 50 bar @ 21°C
Test Pressure	300 bar
Standard of Compliance	ISO 9809 – 1

Color	Red

1.2.1 TPED Seamless Cylinders

Table 1-5: TPED Seamless Cylinders and Valve Dimensions for Vertical Installation

Part Number	Capacity (L)	Valve Outlet Size	A (mm)	B (mm)	C (mm)	Burst Disc's Burst Pressure
PYR-INT-FS-SCYL-50L	50	1-1/2″	229	1496	1609	90Bar
PYR-INT-FS-SCYL-80L	80	1-1/2″	360	1081	1194	90Bar
PYR-INT-FS-SCYL-100L	100	1-1/2″	360	1296	1409	90Bar
PYR-INT-FS-SCYL-140L	140	2″	406	1385	1515	90Bar
PYR-INT-FS-SCYL-180L	180	2″	406	1715	1845	90Bar

**Cylinder dimensions shown on all tables above have a tolerance of ± 15mm.*

1.3 DISCHARGE VALVE ASSEMBLY SERIES 1", 1-1/2" and 2" TYPE

The discharge valve assembly is of a pressure differential type and is used for fixed installations, gas suppression system up to 50 Bar. The discharge valve can be actuated electrically, pneumatically and / or manually with approved valve actuation components. A plastic protection cap is mounted onto the top of the valve to prevent dirt or particles from entering the control valve bore, which may cause a malfunction of the valve. It also prevents an accidental discharge of the cylinder.

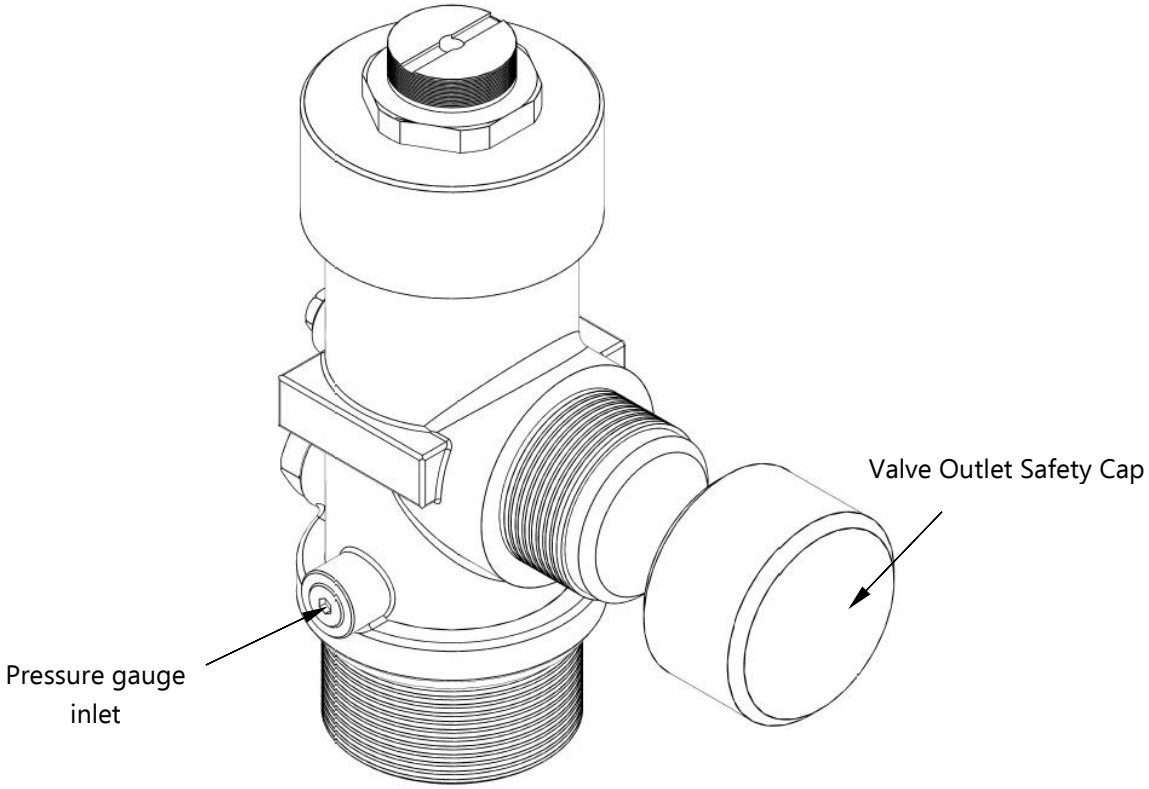


Figure 1-3: Discharge Valve

Specifications			
Part No.	PYR-INT-FS-DV-1	PYR-INT-FS-DV-1.5	PYR-INT-FS-DV-2
Valve Size	1"	1-1/2"	2"
Valve Body Material	Brass	Brass	Brass
Temperature Range	−10°C to 60°C	−10°C to 60°C	−10°C to 60°C
Actuator Connection	1-1/4" X 18UNEF	1-1/4" X 18UNEF	1-1/4" X 18UNEF
Pilot Hose Connection	1/8" NPT	1/8" NPT	1/8" NPT
Pressure Gauge Connection	1/8" NPT	1/8" NPT	1/8" NPT
Valve Outlet Connection	1-7/16" - 12 UN	1-7/8" - 12 UN	2-1/2" - 12 UN
Equivalent Length (m)	9	12.5	13

Note: All equivalent lengths given in Schedule 40, black pipe.

1.4 PYRO-200 VALVE ASSEMBLY SERIES 3" TYPE

The PYRO-200 3" valve assembly is of a pressure differential type and is used for fixed installations, gas suppression system up to 25 Bar only. There are two different types of 3" valve available; Screw Type Valve and Flange Type Valve. The PYRO-200 valve can be actuated electrically, pneumatically and / or manually with approved valve actuation components. A plastic protection cap is mounted onto the top of the valve to prevent dirt or particles from entering the control valve bore, which may cause a malfunction of the valve. It also prevents an accidental discharge of the cylinder.

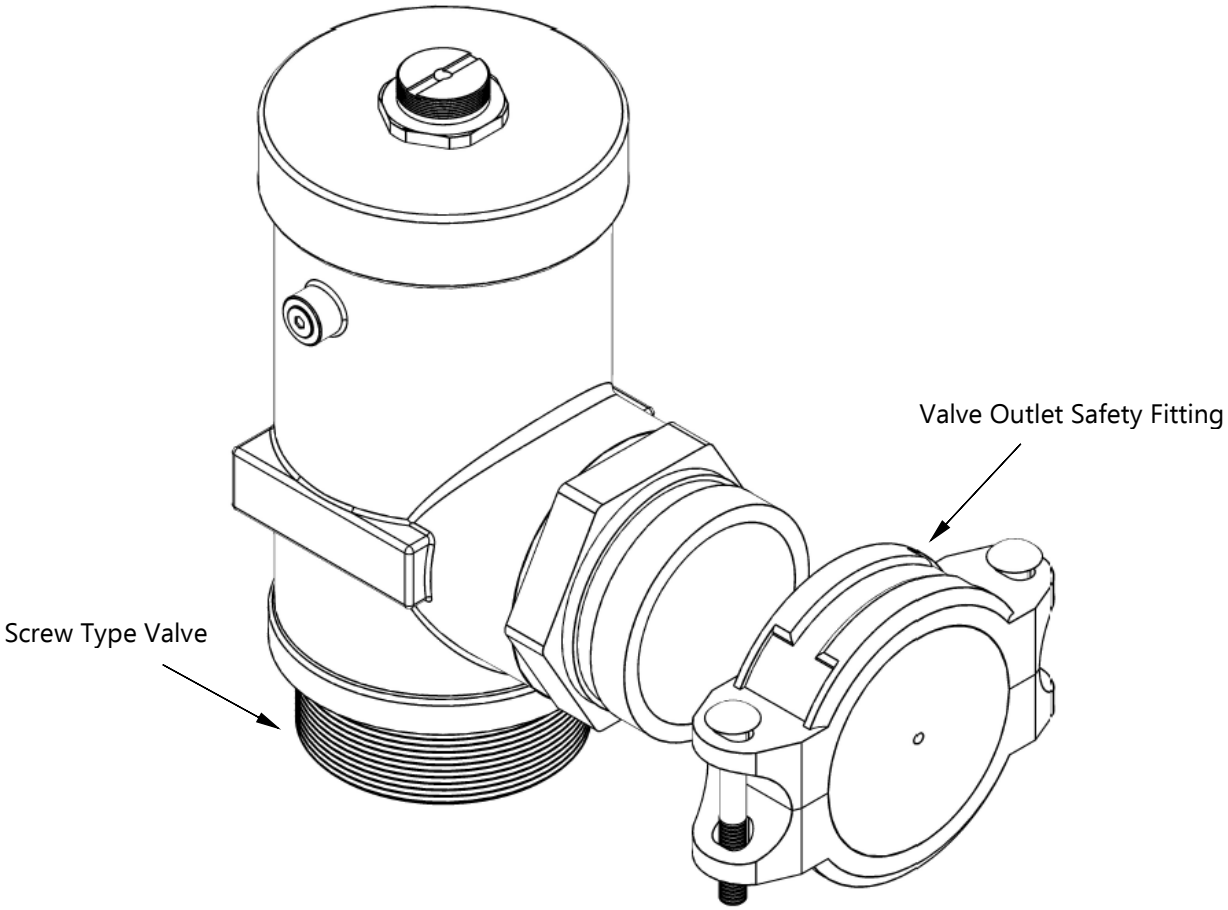


Figure 1-4: 3" Screw Type PYRO-200 Valve

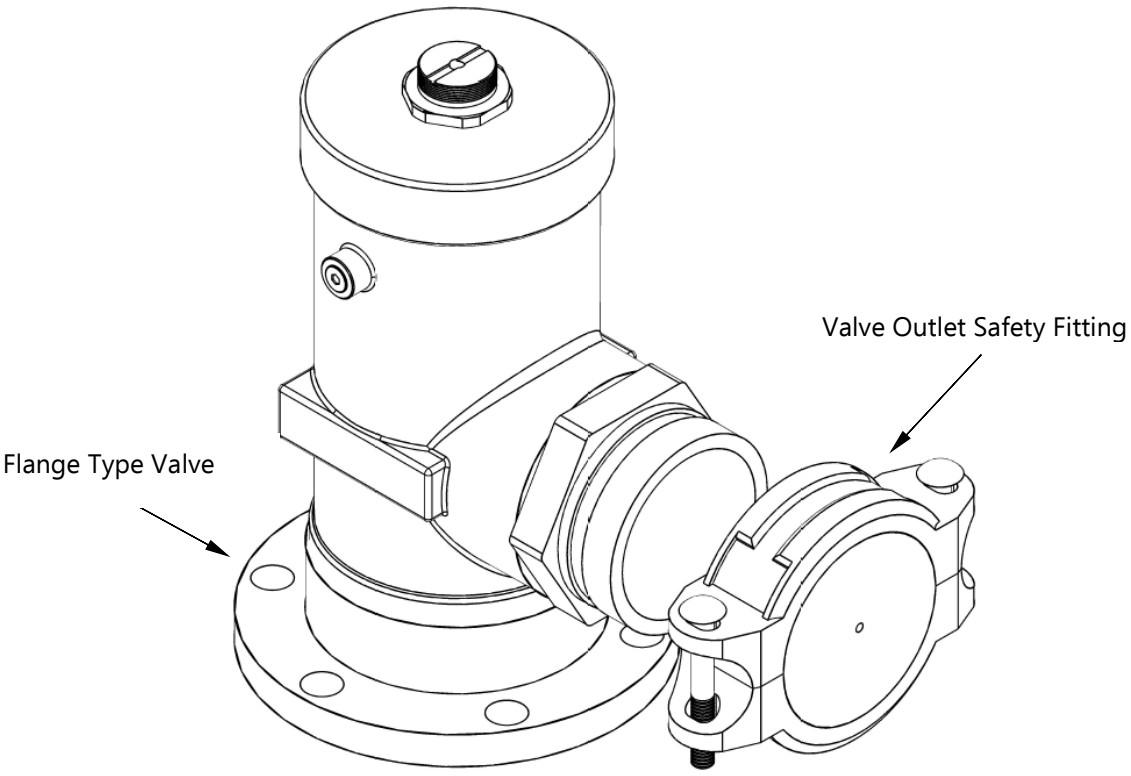


Figure 1-5: 3" Flange Type PYRO-200 Valve

PYRO-200 Valve Assembly	
Part No.	PYR-INT-FS-DV-3
Valve Size and Type	3" Screw Type
Valve Body Material	Brass
Temperature Range	−10 °C to 60 °C
Actuation Connection	1-1/4" X 18UNEF
Pilot Hose Connection	1/8" NPT
Pressure Gauge Connection	1/8" NPT
Valve Outlet Connection	3" Groove
Equivalent Length (m)	14

Note: All equivalent lengths given in Schedule 40, black pipe.

Flange	
Part No.	PYR-INT-FS-DVF-3
Flange Material	Brass
Temperature Range	−10 °C to 60 °C
Connection to Valve	4" x 12 UN
Connection to Cylinder	SS304 Cap Screw 5/8" x 1-1/2"

1.5 VALVE OUTLET ADAPTOR

The valve outlet adaptor connects the cylinder valve outlet to the discharge piping when a flexible discharge hose is not used, for example, a single cylinder system.

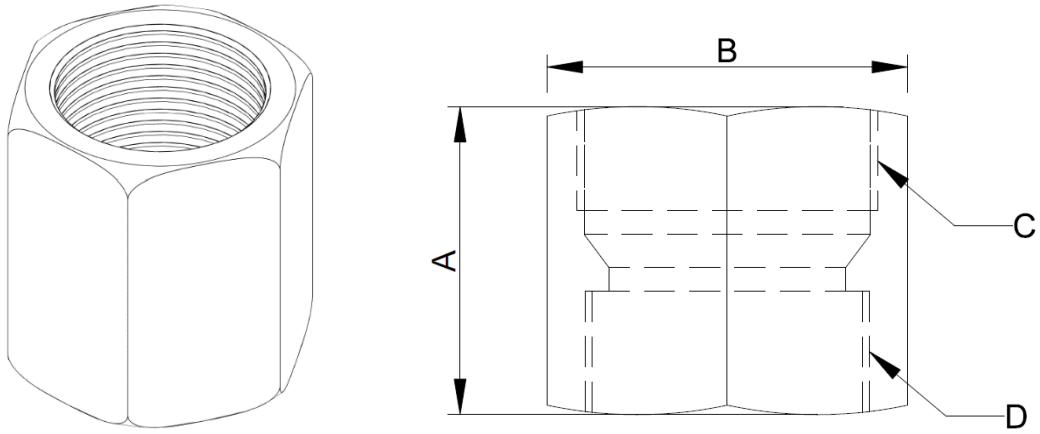


Figure 1-6: Valve Outlet Adaptor

Part No.	Valve Size	A (mm)	B (mm)	C	D
PYR-INT-FS-VOA-1V	1″	50	44.5	1-7/16″ – 12 UNJ	1″ BSP x 11 TPI
PYR-INT-FS-VOA-1.5V	1-1/2″	58	60.5	1-7/8″ – 12 UNJ	1-1/2″ BSP x 11 TPI
PYR-INT-FS-VOA-2V	2″	65	73.5	2-1/2″ – 12 UNJ	2″ BSP x 11 TPI

1.6 PYRO-200 CYLINDER LABEL

The cylinder label shows the details regarding the weight of HFC-227ea gas, tare weight, gross weight, filling pressure and charge date.

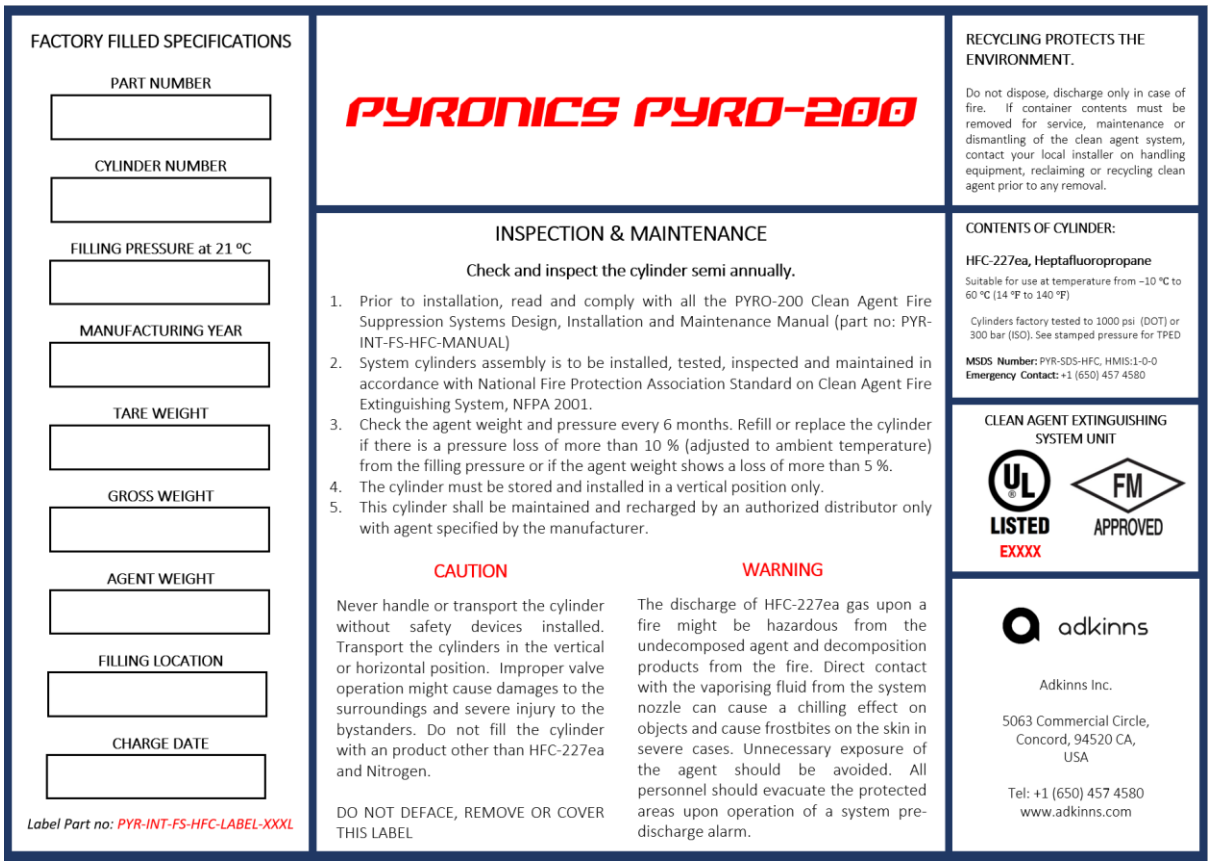


Figure 1-7: PYRO-200 Cylinder Label

Specifications	
Part Number	PYR-INT-FS-HFC-LABEL-100L
Material	Polyethylene Terephthalate (PET)
Size	297 mm x 210 mm

Specifications	
Part Number	PYR-INT-FS-HFC-LABEL-52L
Material	Polyethylene Terephthalate (PET)
Size	237 mm x 168 mm

1.7 ASSEMBLY PRESSURE GAUGE 25 BAR

The pressure gauge indicates the internal pressure of the PYRO-200 cylinders. It is installed onto the valve. 25 bar pressure gauge will be used in 25 bar PYRO-200 system cylinders.

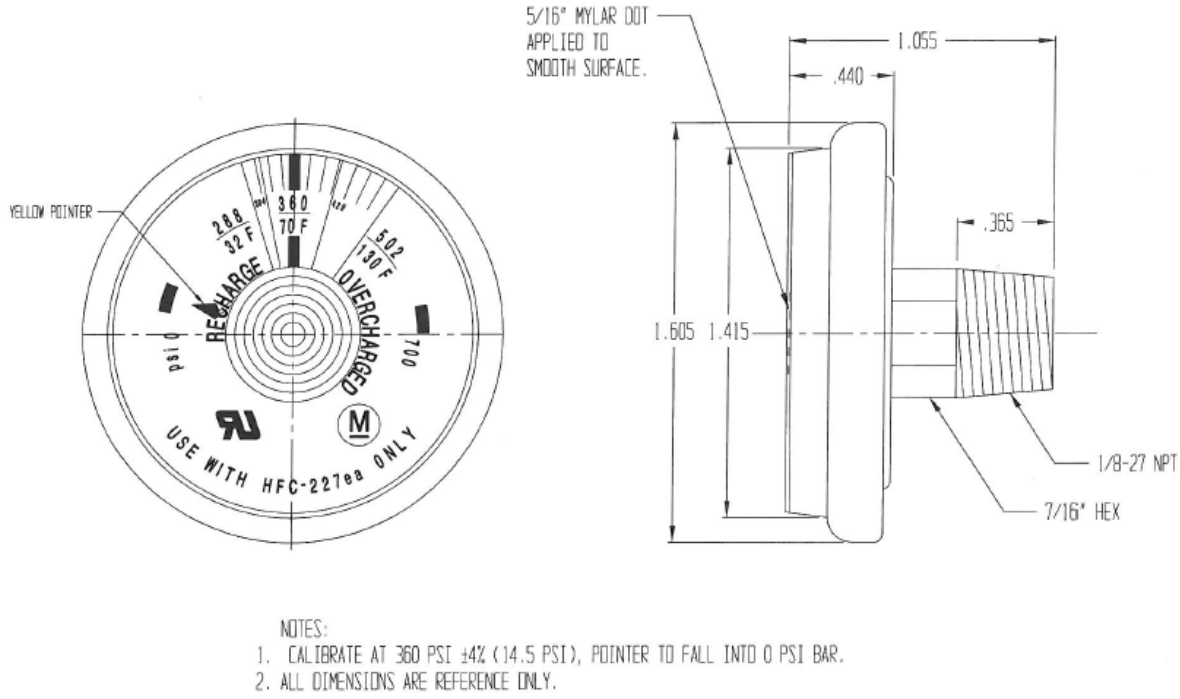


Figure 1-8: Pressure Gauge for 25 bar

Specifications	
Part Number	PYR-INT-FS-HFC-PG-25B
Type	Spring Tube Manometer
Temperature Range	−10 °C to 60 °C
Connection to Valve	1/8" NPT

1.8 ASSEMBLY PRESSURE GAUGE 42 BAR

The pressure gauge indicates the internal pressure of the PYRO-200 cylinders. It is installed onto the valve. 42 bar pressure gauge will be used in 42 bar PYRO-200 system cylinders.

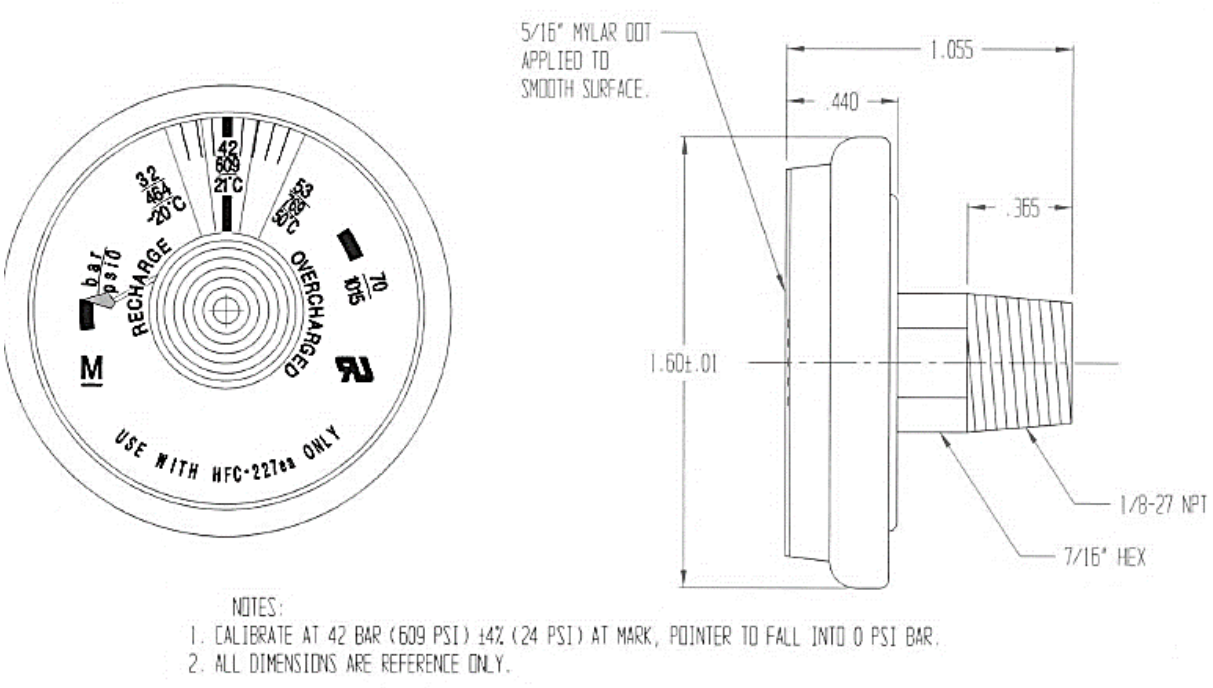


Figure 1-9: Pressure Gauge for 42 bar

Specifications	
Part Number	PYR-INT-FS-HFC-PG-42B
Type	Spring Tube Manometer
Temperature Range	−10 °C to 60 °C
Connection to Valve	1/8" NPT

1.9 ASSEMBLY PRESSURE GAUGE 50 BAR

The pressure gauge indicates the internal pressure of the PYRO-200 cylinders. It is installed onto the valve. 50 bar pressure gauge will be used in 50 bar PYRO-200 system cylinders.

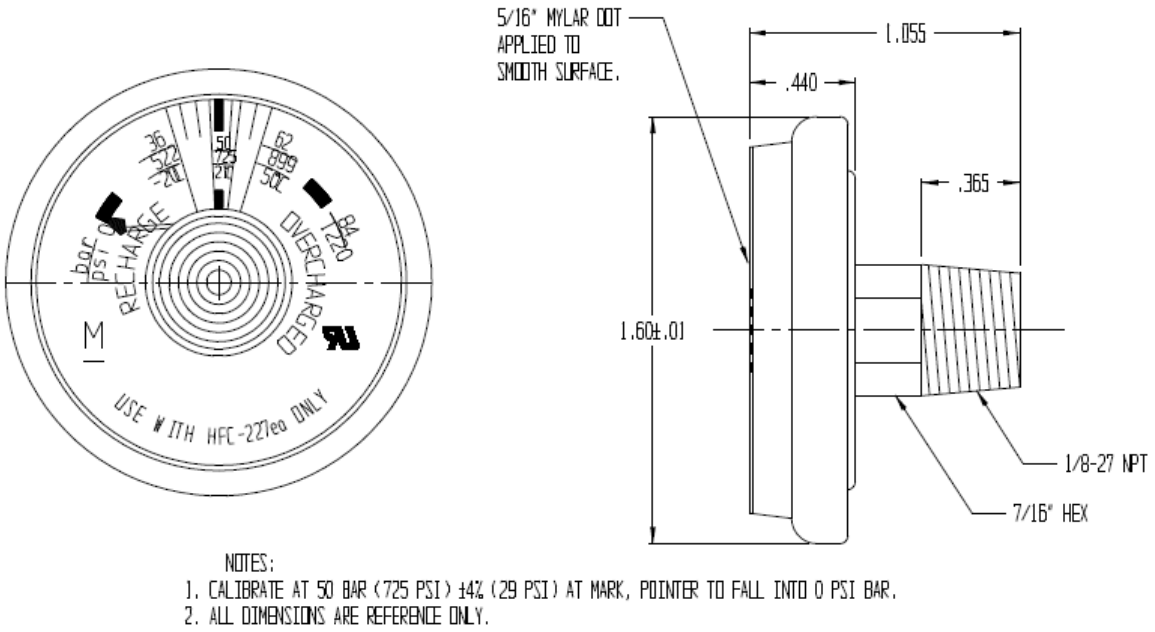


Figure 1-10: Pressure Gauge for 50 bar

Specifications	
Part Number	PYR-INT-FS-HFC-PG-50B
Type	Spring Tube Manometer
Temperature Range	−10 °C to 60 °C
Connection to Valve	1/8" NPT

1.10 ASSEMBLY PRESSURE GAUGE 25 BAR WITH LOW PRESSURE SWITCH

The pressure gauge with low pressure switch indicates and monitor the internal pressure of the PYRO-200 cylinders. It is installed onto the valve and connected electrically to the control panel. 25 bar pressure gauge with low pressure switch will be used in 25 bar PYRO-200 system cylinders.

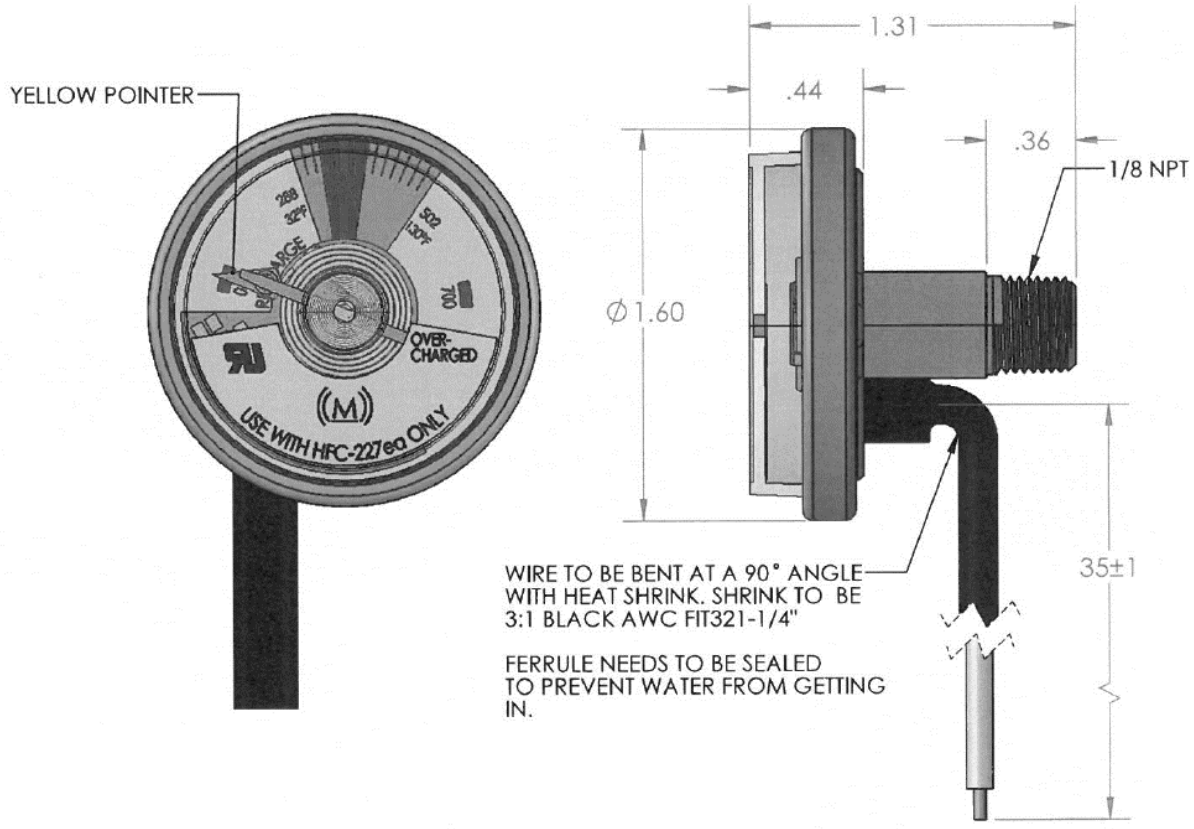


Figure 1-11: 25 bar Pressure Gauge with Low Pressure Switch

Specifications	
Part Number	PYR-INT-FS-HFC-PGS-25B
Wire	18 Gage SXL
Temperature Range	−10°C to 60°C
Connection to Valve	1/8″ NPT

1.11 ASSEMBLY PRESSURE GAUGE 42 BAR WITH LOW PRESSURE SWITCH

The pressure gauge with low pressure switch indicates and monitor the internal pressure of the PYRO-200 cylinders. It is installed onto the valve and connected electrically to the control panel. 42 bar pressure gauge with low pressure switch will be used in 42 bar PYRO-200 system cylinders.

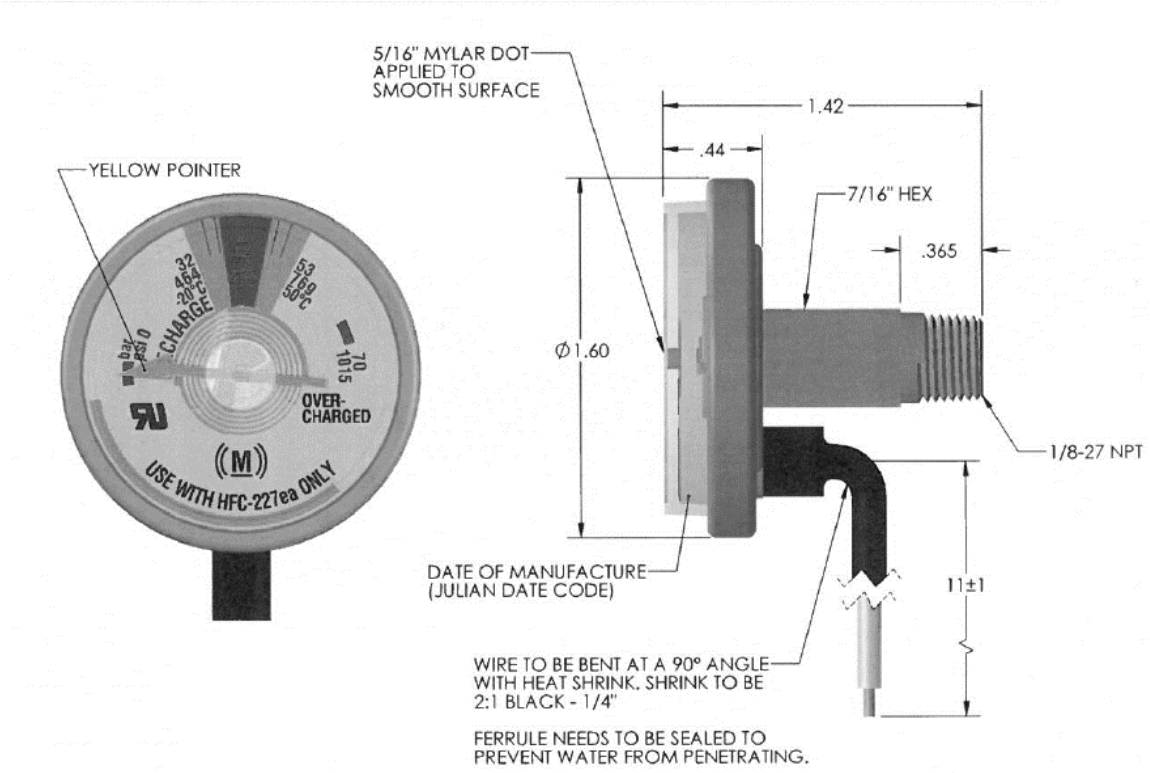


Figure 1-12: 42 bar Pressure Gauge with Low Pressure Switch

Specifications	
Part Number	PYR-INT-FS-HFC-PGS-42B
Wire	18 Gage SXL
Temperature Range	−10°C to 60°C
Connection to Valve	1/8" NPT

1.12 ASSEMBLY PRESSURE GAUGE 50 BAR WITH LOW PRESSURE SWITCH

The pressure gauge with low pressure switch indicates and monitor the internal pressure of the PYRO-200 cylinders. It is installed onto the valve and connected electrically to the control panel. 50 bar pressure gauge with low pressure switch will be used in 50 bar PYRO-200 system cylinders.

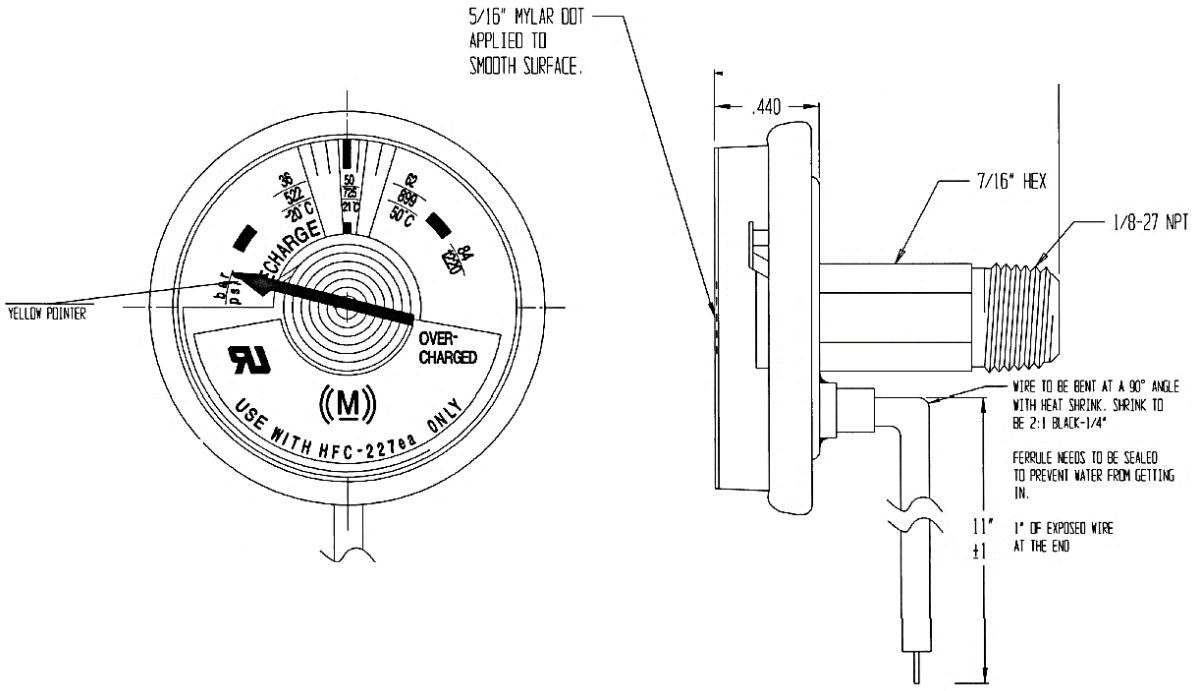


Figure 1-13: 50 bar Pressure Gauge with Low Pressure Switch

Specifications	
Part Number	PYR-INT-FS-HFC-PGS-50B
Wire	18 Gage SXL
Temperature Range	−10°C to 60°C
Connection to Valve	1/8" NPT

1.13 LIQUID LEVEL INDICATOR

The liquid level indicator is used to measure the liquid level of HFC-227ea for 100 L and 369L TPED cylinders. A measuring tape is place inside the tube. Pull the tape up to the maximum and then slowly lowering it until a magnetic interlock with the float is touched. The tape will remain above the neck ring to show the reading of the liquid level. The device is installed in an empty cylinder prior filling of HFC-227ea. It is suitable only for cylinder filling density of 0.8 kg/l and below.

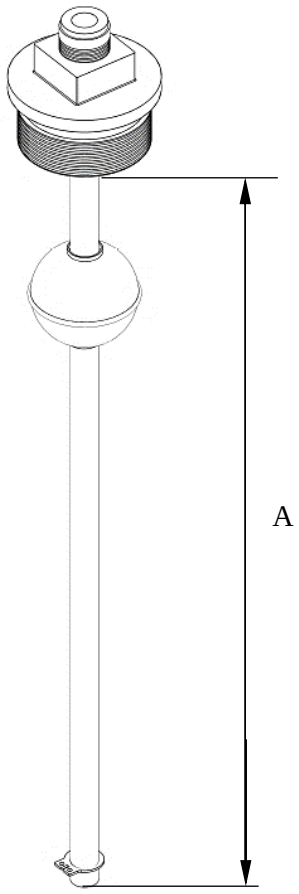


Figure 1-14: Liquid Level Indicator

Specifications	
Part Number	PYR-INT-FS-LLI
Cylinder Size	100L to 369L
Neck Ring Inlet Size	2”-11.5 NPSC
A (mm)	Varied according to cylinder

**Liquid level indicator subject to cylinder selection*

1.14 ELECTRICAL ACTUATOR WITH MANUAL CONTROL

The Electrical Actuator is used to actuate the system electrically. The actuator is installed on top of the master cylinder valve without any power supply until an event of emergency. A manual actuator can be installed as a backup or alternative solution on both the electrical actuator to discharge the HFC-227ea gas from the cylinder.

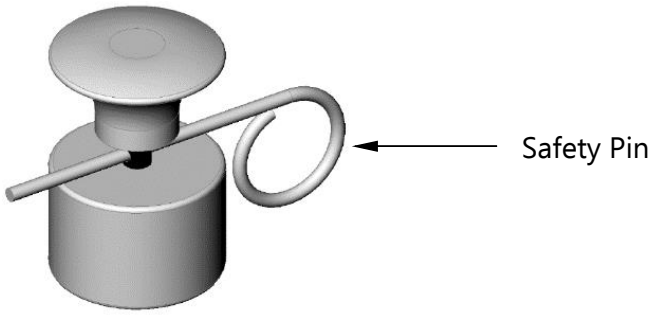


Figure 1-15: Manual Actuator

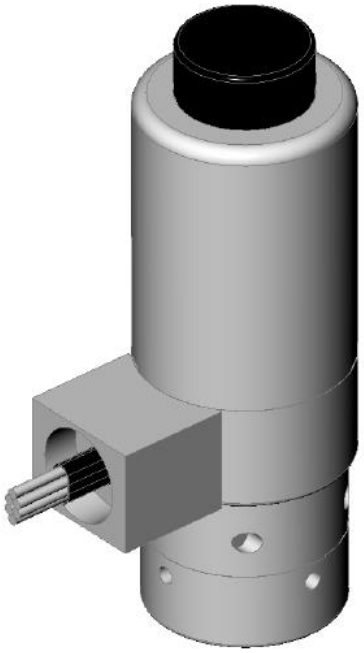


Figure 1-16: Electrical Actuators

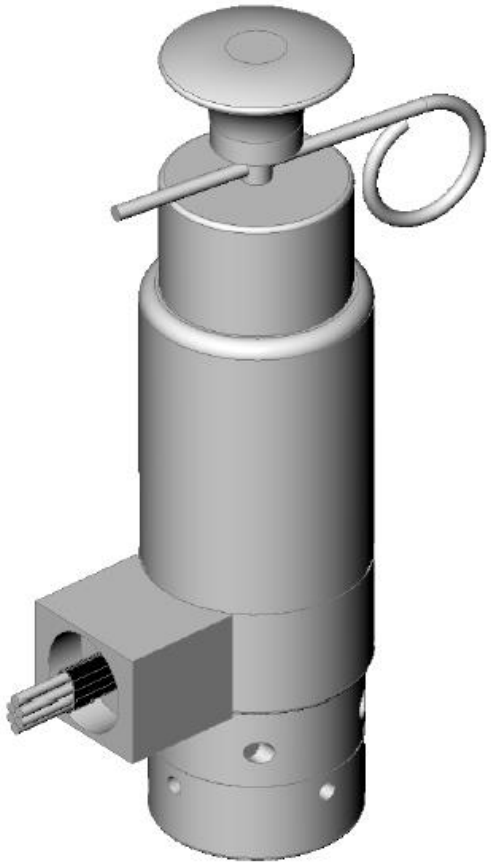


Figure 1-17: Electrical Actuator with Manual Actuator

Specifications (Manual Actuator)	
Part Number	PYR-INT-FS-MA
Material	Brass & Stainless Steel
Actuating Force	12 – 40 lbs
Connection	1-1/8" x 18 UNEF

Specifications (Electrical Actuator)	
Part Number	PYR-INT-FS-EMA
Material	Brass & Stainless Steel
Actuating Force	12 – 40 lbs
Connection	1-1/4" x 18 UNEF
Supply Voltage	24 VDC
Firing Current	0.5 Amp
Temperature Range	−10°C to 60°C

1.15 PNEUMATIC ACTUATOR

The pneumatic actuator(s) are installed in all the other slave cylinders. At first, the electical actuator will open the primary cylinder. After that, in rapid ocurring sequence, the pneumatic release device will open all the other cylinders.

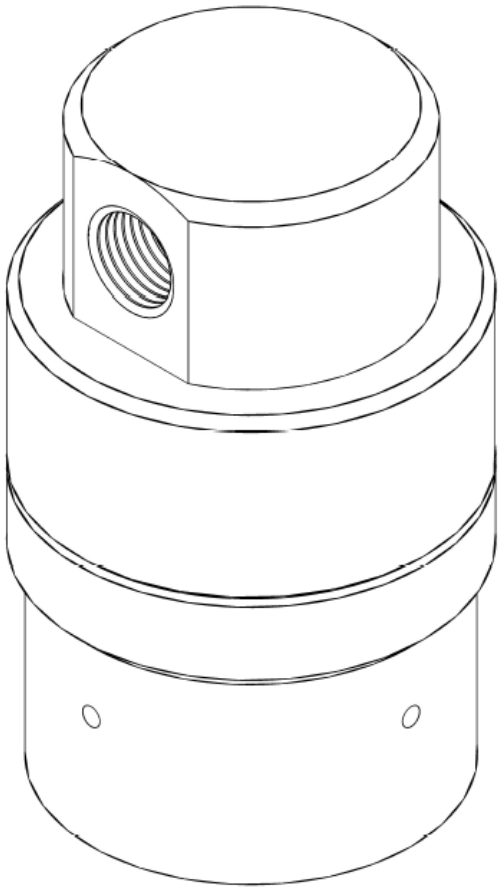


Figure 1-18: Pneumatic Actuator

Specifications	
Part Number	PYR-INT-FS-PA
Material	Brass
Connection	1-1/4" x 18 UNEF
Pilot Hose Connection	1/8" NPT

1.16 DISCHARGE HOSE

The discharge hose type DN38 is used for the valve assembly type DN38 for connection to the check valve DN50 where multiple cylinders are connected to a common manifold assembly. The discharge hose type DN50 is used for the valve assembly type DN50 for connection to the check valve DN65 where multiple cylinders are connected to a common manifold assembly.

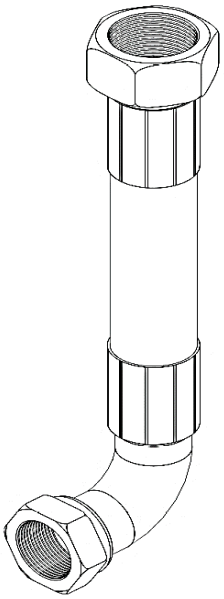


Figure 1-19: Discharge Hose

Specifications				
Part Number	PYR-INT-FS-DH-25B-1.5V	PYR-INT-FS-DH-45B-1.5V	PYR-INT-FS-DH-25B-2V	PYR-INT-FS-DH-45B-2V
Name	DN38		DN50	
Material	Synthetic Rubber Hose with high tensile steel wire single braid reinforcement	Synthetic Rubber Hose with high tensile steel wire double braids reinforcement	Synthetic Rubber Hose with high tensile steel wire single braids reinforcement	Synthetic Rubber Hose with high tensile steel wire double braids reinforcement
Max. Working Pressure	50 bar	90 bar	40 bar	80 bar
Temperature Range	−10 °C to 60 °C	−10 °C to 60 °C	−10 °C to 60 °C	−10 °C to 60 °C
Length from Elbow Inlet	465 mm	465 mm	520 mm	520 mm
Elbow Inlet	1-7/8″ – 12 UNJ	1-7/8″ – 12 UNJ	2-1/2″ – 12 UNJ	2-1/2″ – 12 UNJ
Outlet	2″ BSP	2″ BSP	2-1/2″ BSP	2-1/2″ BSP
Equivalent Length (m)	4.0	4.0	4.4	4.4

Note: All equivalent lengths given in Schedule 40, black pipe.

1.17 DISCHARGE HOSE WITH EXTENDED ELBOW

The extended elbow discharge hose is only available for DN50 valve with 25 bar system. This extended elbow enables the connection for a cylinder with a protective shroud to provide better flexibility during installation.

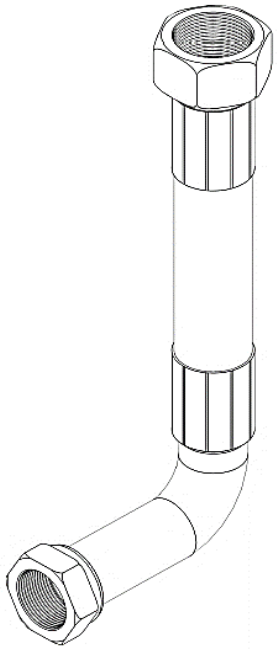


Figure 1-20: Extended Elbow Discharge Hose

Specifications	
Part Number	PYR-INT-FS-EEDH-25B-2V
Name	DN50
Material	Synthetic Rubber Hose with high tensile steel wire single braids reinforcement
Max. Working Pressure	40 bar
Temperature Range	−10 °C to 60 °C
Length from Elbow Inlet	520 mm
Elbow Inlet	2-1/2" – 12 UNJ
Outlet	2-1/2" BSP
Equivalent Length (m)	4.4

Note: All equivalent lengths given in Schedule 40, black pipe.

1.18 DISCHARGE HOSE FOR 3" VALVE

Discharge hose with configuration as figure below is only available for DN80 valve assembly. This discharge hose consists of 3" stainless steel hose, 90 degree grooved elbow and three 3" groove coupling. One side of the 90 degree grooved elbow is connected to the outlet of 3" valve by a 3" groove coupling. The other side will be connected to the stainless steel hose also by a 3" groove coupling. The other end of the stainless steel hose will then be connected to the check valve.

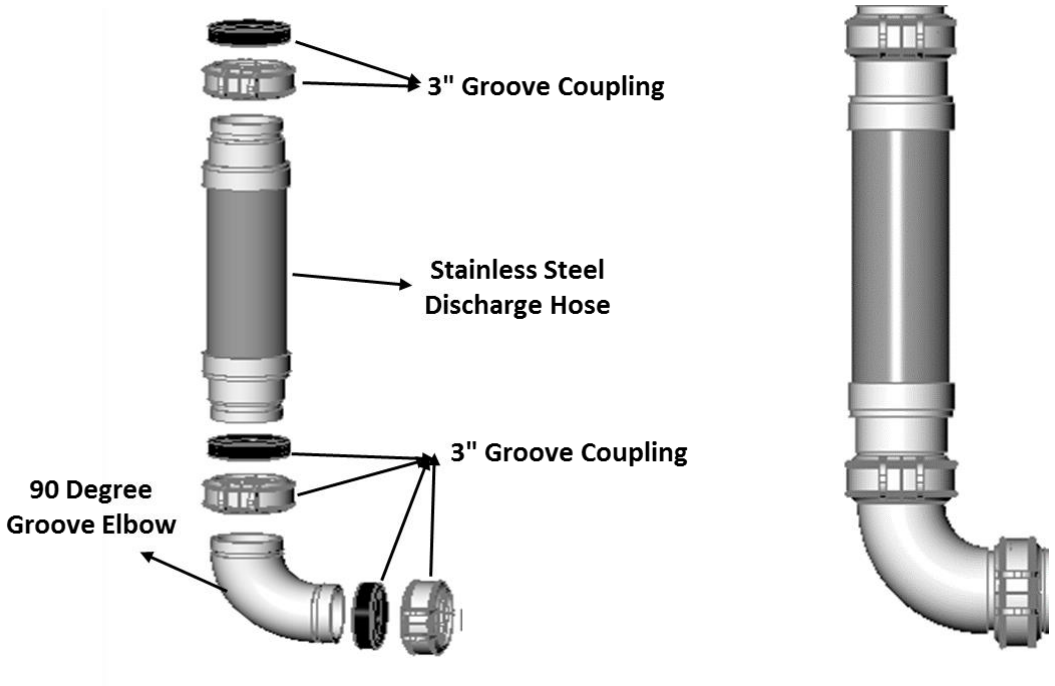


Figure 1-21: Arrangement for 3" Discharge Hose

1.18.1 3'' STAINLESS STEEL HOSE

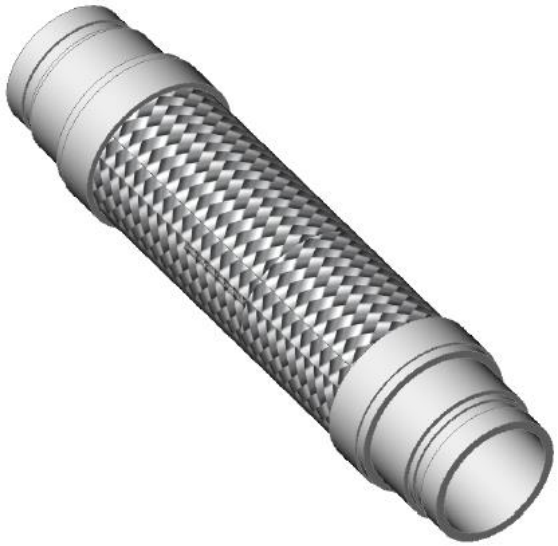


Figure 1-22: 3" Stainless Steel Hose

Specifications	
Part Number	PYR-INT-FS-DH-25B-3V
Material	Stainless Steel
Operating Pressure	28 bar
Temperature Range	−10 °C to 60 °C
Length	475 mm
Connection	3″ Groove Connection
Equivalent Length (m)	4.7
Bend Limit	10°

Note: All equivalent lengths given in Schedule 40, black pipe.

1.18.2 3'' GROOVE COUPLING

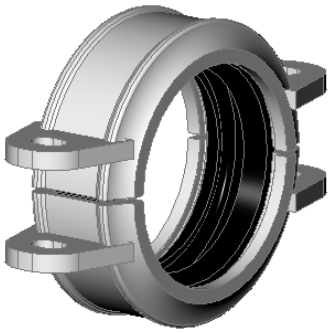


Figure 1-23: 3" 3″ Groove Coupling

Specifications	
Part Number	PYR-INT-FS-GC-3
Material	Ductile Iron

1.18.3 3'' 90 DEGREE GROOVED ELBOW

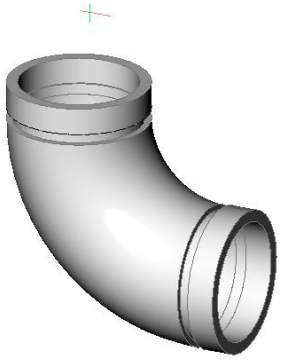


Figure 1-24: 3" 90 Degree Grooved Elbow

Specifications	
Part Number	PYR-INT-FS-90GE-3
Material	Ductile Iron
Connection	3″ Groove Connection

1.19 PILOT LINE HOSE

The PYRO-200 pilot line hose is used to connect the pneumatic actuators from the master cylinder to slave cylinder(s). Each hose is fitted with a galvanized steel male connection fitting. A 1/8" nipple is used for connection to the master cylinder.

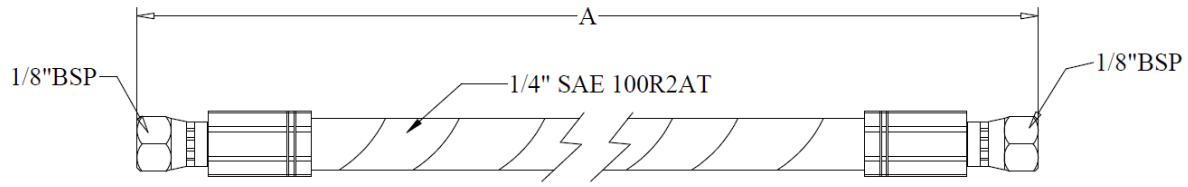


Figure 1-25: Pilot Line Hose

Specifications		
Part Number	PYR-INT-FS-PH-560	PYR-INT-FS-PH-760
Overall Length, A (mm)	560	760
Material	Synthetic Rubber Hose with 2 high tensile steel wire braids reinforcement	Synthetic Rubber Hose with 2 high tensile steel wire braids reinforcement
Max. Working Pressure	275 bar	275 bar
Temperature Range	−10 °C to 60 °C	−10 °C to 60 °C
Hose Connections	1/8" BSP	1/8" BSP
Fitting Connections	1/8" BSP	1/8" BSP

1.20 CHECK VALVE

The manifold check valve is fitted on the manifold and is used to prevent loss of agent should the system discharge while any cylinder is removed for maintenance.

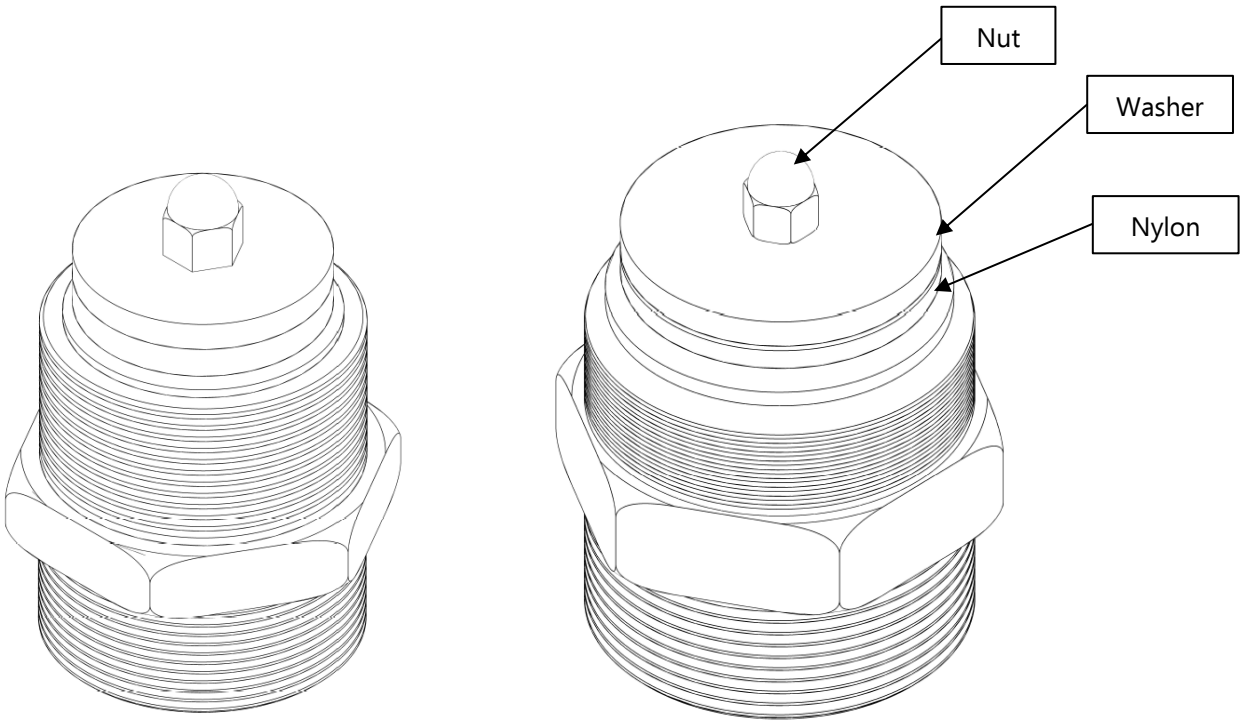


Figure 1-26: Check Valve

Specifications		
Part Number	PYR-INT-FS-CV-1.5	PYR-INT-FS-CV-2
Name	DN50	DN65
Overall Length (mm)	100	100
Material	Gun Metal	Gun Metal
Seat	Nylon	Nylon
Washer	Zinc Plated Mild Steel	Zinc Plated Mild Steel
Nut	Stainless Steel	Stainless Steel
Spline	Stainless Steel	Stainless Steel
Temperature Range	−10 °C to 60 °C	−10 °C to 60 °C
Inlet and Outlet Connections	2″ BSP	2-1/2″ BSP
Equivalent Length (m)	36.3	17.1

Note: All equivalent lengths given in Schedule 40, black pipe.

1.21 3" CHECK VALVE

The 3" check valve is only available for DN80 valve assembly. It is also used to prevent the loss of agent should the system discharge while any cylinder is removed for maintenance. The 3" check valve consists of a few components; check valve body, grooved reducer and two 6" groove coupling. The bottom part of the check valve body is connected to the grooved reducer by a 6" groove coupling and the top part of the check valve is connected to the manifold also by a 6" groove coupling. The arrangement can be seen in the figure below:

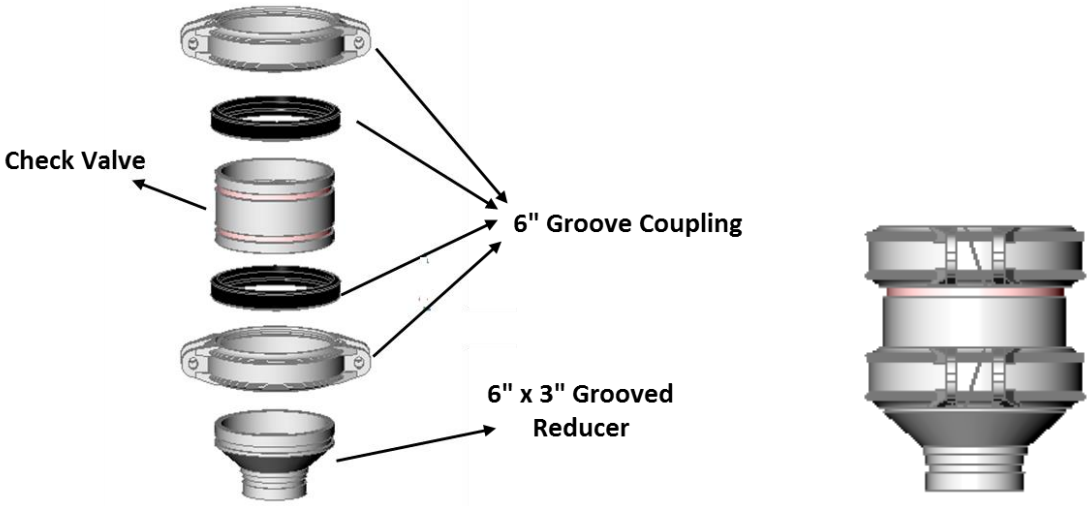


Figure 1-27: Arrangement of 3" Check Valve

1.21.1 3'' CHECK VALVE BODY

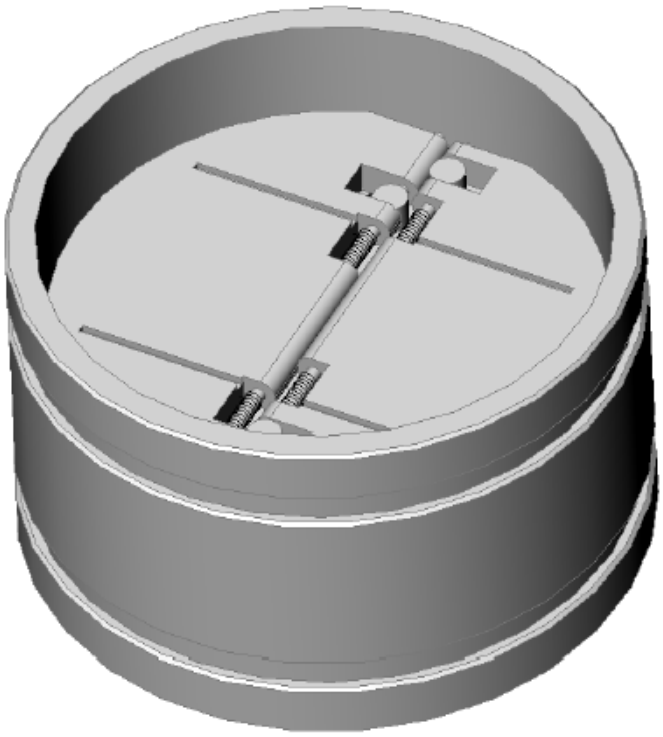


Figure 1-28: 3" Check Valve

Specifications	
Part Number	PYR-INT-FS-CV-3
Body Material	Steel, Zinc-Nickel Plated
Clapper Material	Brass
Temperature Range	−10 °C to 60 °C
Height	100 mm
Diameter	165mm
Connection	6" Groove Connection
Equivalent Length (m)	14

Note: All equivalent lengths given in Schedule 40, black pipe.

1.21.2 GROOVED REDUCER

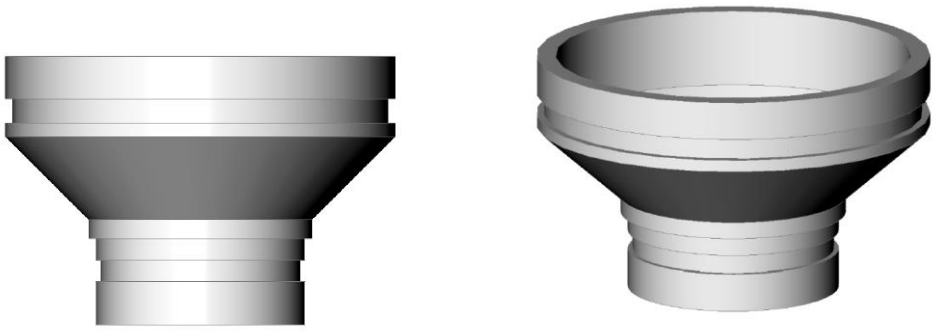


Figure 1-29: 6'' x 3'' Grooved Reducer

Specifications	
Part Number	PYR-INT-FS-GR-63
Material	Ductile Iron
Top Connection	6" Groove Connection
Bottom Connection	3" Groove Connection

1.21.3 6'' GROOVE COUPLING

Figure 1-30: 6'' Groove Coupling

Specifications	
Part Number	PYR-INT-FS-GC-6
Material	Ductile Iron

1.22 NOZZLE

There is one type of nozzle available in the PYRO-200 system, which is 360° discharge nozzle with 8 holes respectively. The orifice sizes of the nozzle are based on calculation done in the Jensen-Hughes software. The ports are drilled in 0.1 mm increments to the specified system design. The connection is BSP thread for all the nozzle.

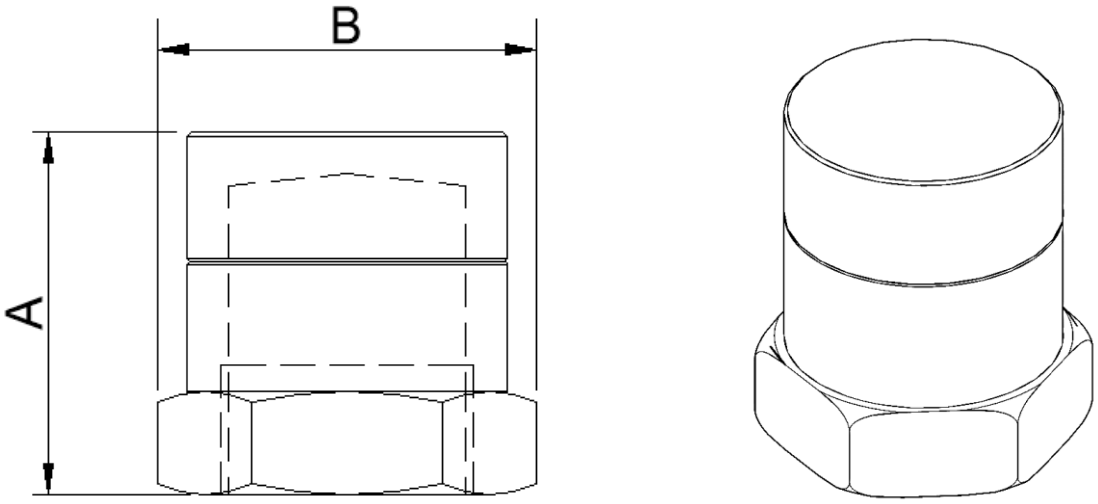


Figure 1-31: Nozzle

Table 1-6: Dimensions for 360° discharge nozzles

Part No.	Material	Sizes (inches)	A (mm)	B (mm)	Allowable Orifice Size, mm
PYR-INT-FS-HFC-DN-1.2	Brass	1/2″	45	31.75	2.2 – 4.9
PYR-INT-FS-HFC-DN-3.4		3/4″	45	38.10	3.4 – 6.6
PYR-INT-FS-HFC-DN-1		1″	56	44.45	4.3 – 8.4
PYR-INT-FS-HFC-DN-1-1.4		1-1/4″	65	50.80	5.6 – 11.0
PYR-INT-FS-HFC-DN-1-1.2		1-1/2″	70	63.50	6.5 – 12.9
PYR-INT-FS-HFC-DN-2		2″	88	76.20	8.4 – 16.6

**Allowable orifice size subject to design calculation*

1.23 CYLINDER MOUNTING EQUIPMENT

The steel bracket and strap are used to mount the cylinder in vertical position.

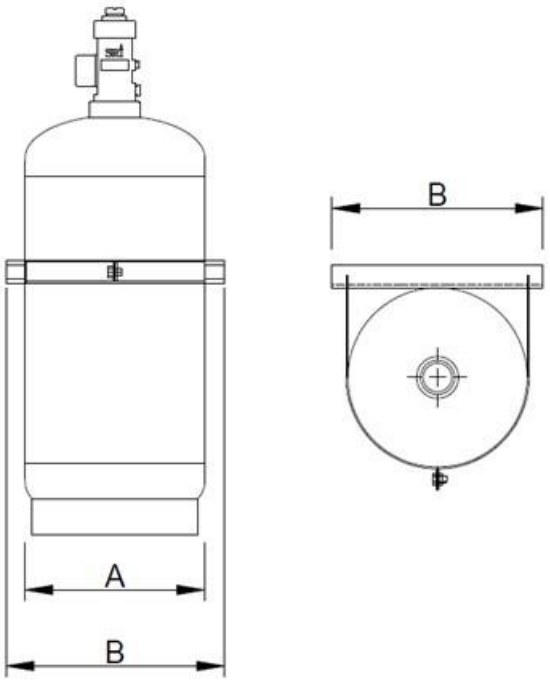


Figure 1-32: Cylinder mounting equipment

Table 1-7: Dimensions for cylinder mounting part

Part No.	Cylinder Outer Diameter, mm	A (mm)	B (mm)
PYR-INT-FS-SCMS-10L	140mm	140	300
PYR-INT-FS-SCMS-20.30L	204mm	204	300
PYR-INT-FS-SCMS-50L	228.6mm, 229mm, 232mm	229	300
PYR-INT-FS-WCMS-29L	254mm	254	300
PYR-INT-FS-WCMS-9.16L	267mm, 273mm	273	350
PYR-INT-FS-WCMS-32.52L	325mm	325	400
PYR-INT-FS-SCMS-80.140L	356mm, 350mm, 360mm	360	450
PYR-INT-FS-WCMS-52.150L	400mm, 406mm	406	500
PYR-INT-FS-WCMS-180.200L	462mm	462	550
PYR-INT-FS-WCMS-300L	508mm	508	600
PYR-INT-FS-WCMS-369L	610mm	610	700

**Dimension for bracket has a tolerance of ± 15mm*

1.24 SLAVE ARRANGEMENT COMPONENTS

For slave containers, the pneumatic connection is made using flexible pilot hose. To install the pilot hose, remove the pilot pressure port plug from the master container valve assembly and connect the male adaptor. After that, connect one end of the pilot hose to the pneumatic actuator. The maximum number of slave actuated cylinders is 5 containers (6 containers in total). After every 6 containers, another master container must be installed with an electrical actuator. All the electrical actuators must operate at the same time to ensure simultaneous discharge from all the cylinders used. Refer to Figure 1-35 and Figure 1-36 for more details regarding the arrangement for master-slave cylinders for welded cylinders and seamless cylinders respectively.

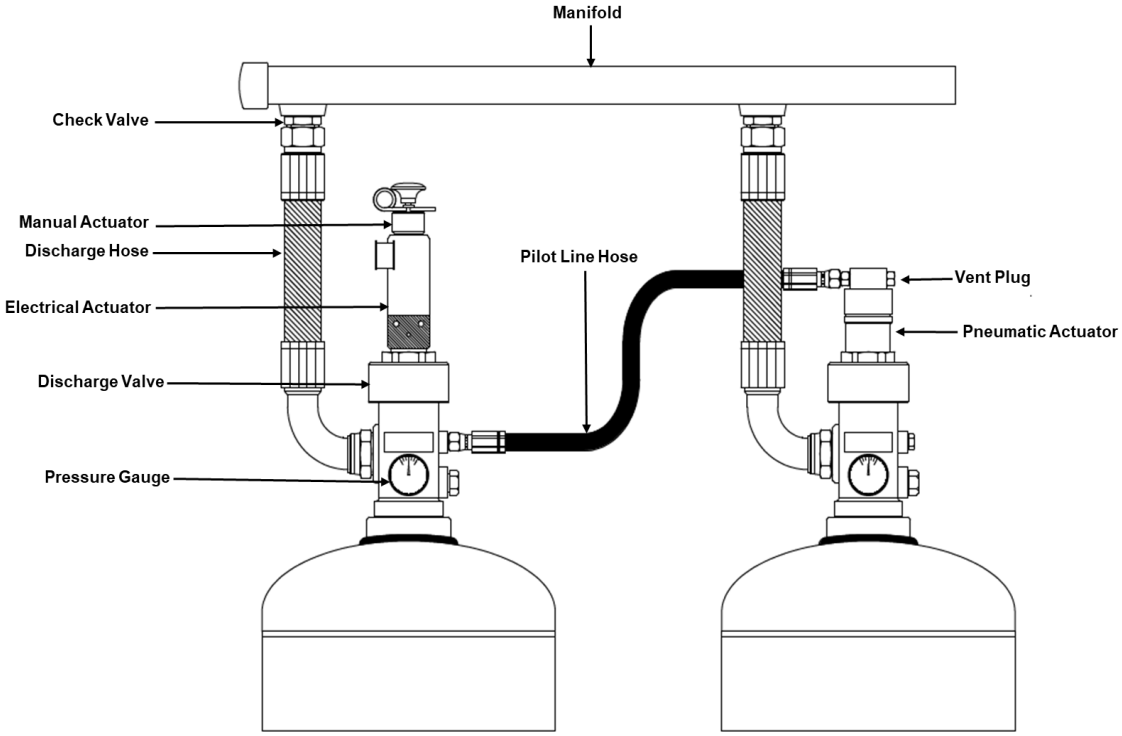


Figure 1-33: Master and Slave(s) Cylinder Arrangement

1.25 ARRANGEMENT FOR 3" VALVE SYSTEM

The master and slave arrangement for a 3" valve system is generally the same as the other system (Refer to Figure 1-33). The only difference is the type of discharge hose and check valve used in the 3" valve system compares to the other system. The assembled discharge hose is connected to the check valve by a 3" groove coupling. The check valve will then be connected to the manifold by a 6" groove coupling.

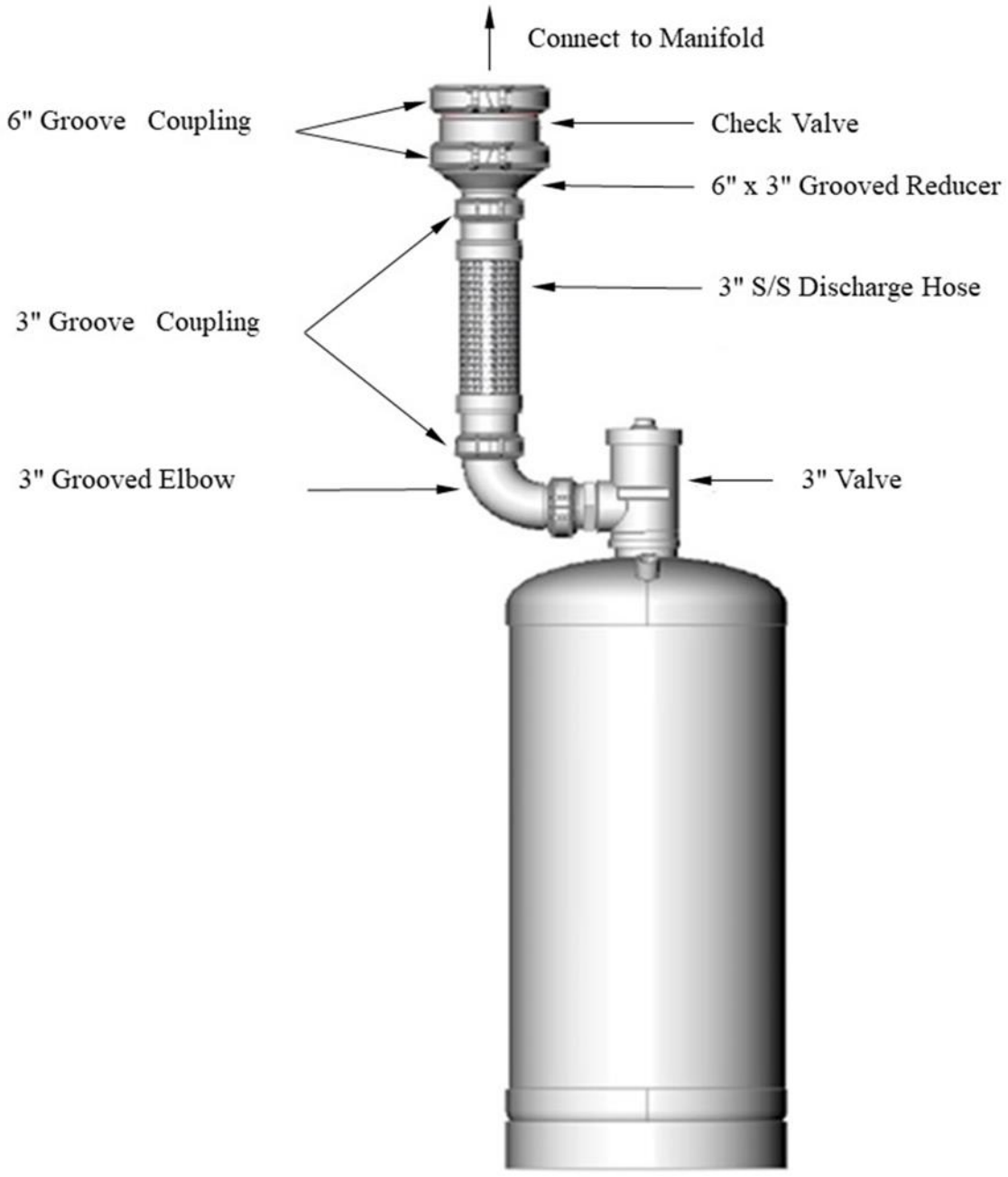
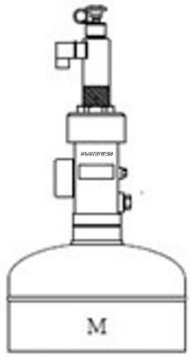
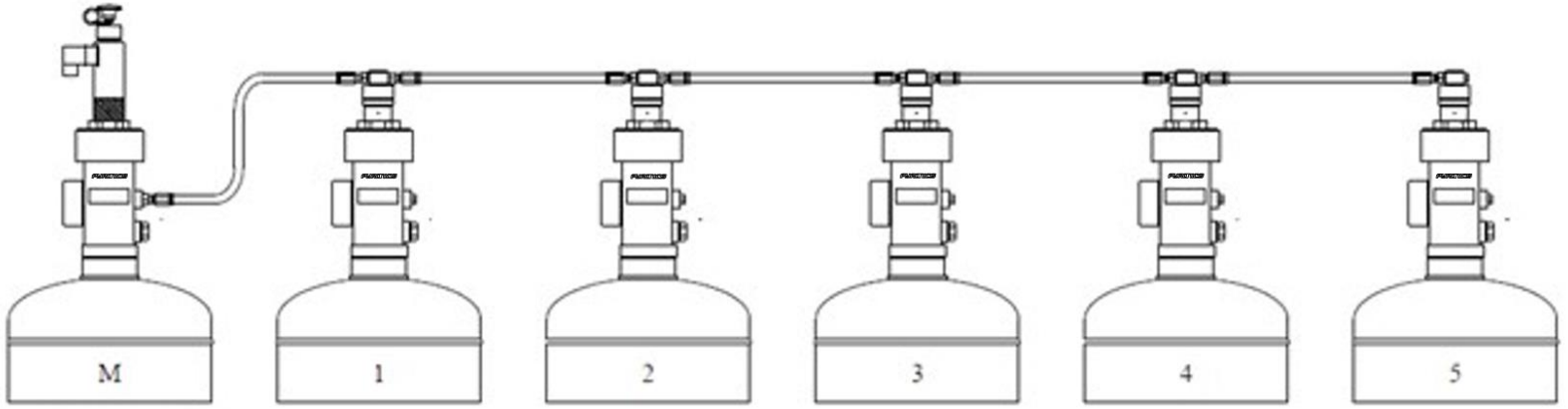


Figure 1-34: Arrangement for 3" Valve System

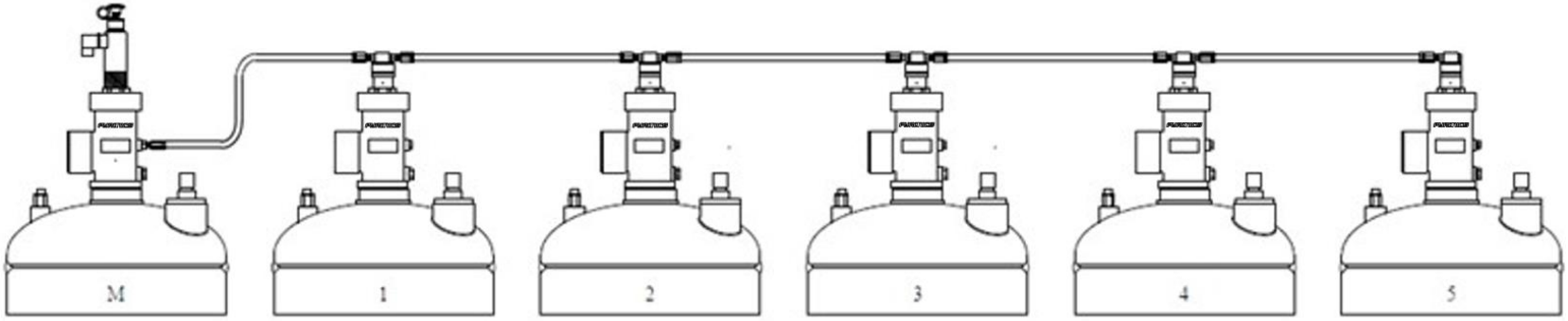
1.26 SLAVE ARRANGEMENT COMPONENTS (WELDED CYLINDERS)



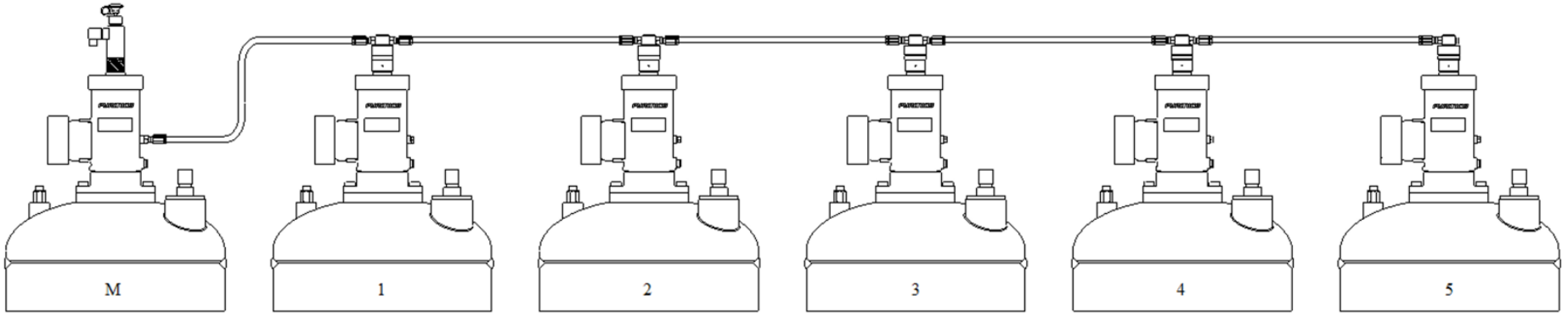
9 L to 32 L Master Cylinder – Maximum of one, 1" Valve cylinders can be used



52 L to 100 L Master Cylinder – Maximum of six, 1-1/2" Valve cylinders can be used



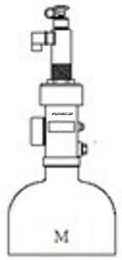
150 L to 200 L Master Cylinder – Maximum of six, 2" Valve cylinders can be used



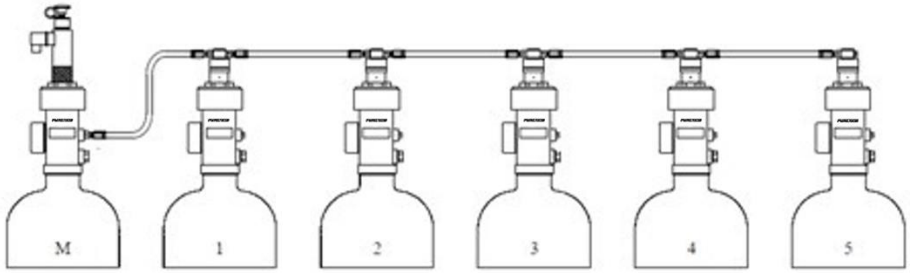
240 L to 369 L Master Cylinder – Maximum of six, 3" Valve cylinders can be used

Figure 1-35: Maximum Number of Pneumatic Actuator for Welded Cylinders

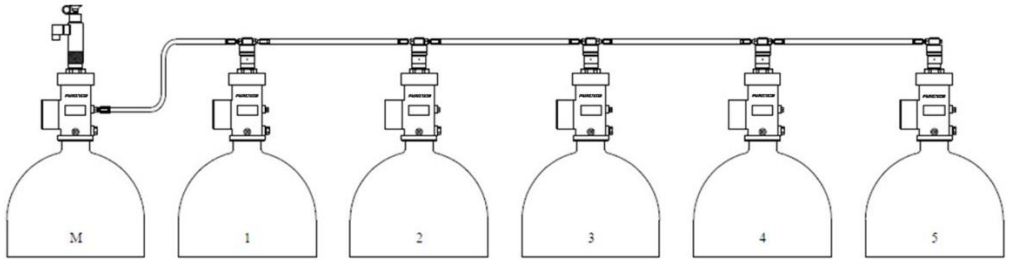
1.27 SLAVE ARRANGEMENT COMPONENTS (SEAMLESS CYLINDERS)



10 L to 30 L Master Cylinder – Maximum of one, 1" Valve cylinders can be used



50 L to 100 L Master Cylinder – Maximum of six, 1-1/2" Valve cylinders can be used



140 L Master Cylinder – Maximum of six, 2" Valve cylinders can be used

Figure 1-36: Maximum Number of Pneumatic Actuator for Seamless Cylinders