



# LPCO<sub>2</sub> SYSTEM

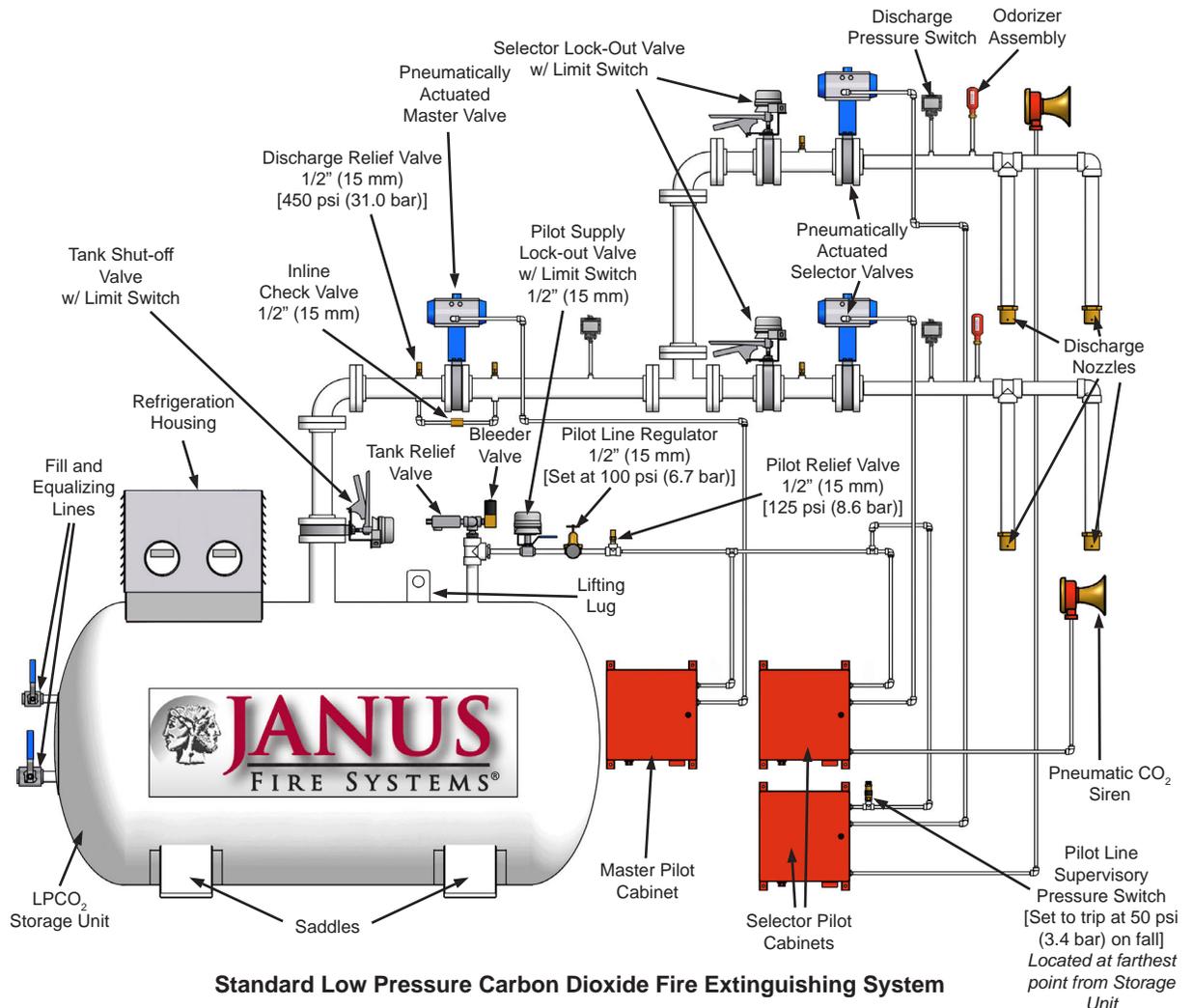
## MASTER & SELECTOR PILOT CABINETS

*W/ PNEUMATIC TIME DELAY AND NDE MASTER CABINET*

Janus Fire Systems® Master & Selector Pilot Cabinets are essential pieces of the Janus Fire Systems® Low Pressure Carbon Dioxide Fire Extinguishing System. They function to pneumatically open and close the master valve and appropriate selector valve(s) upon receipt of a signal from the fire suppression control panel, allowing the CO<sub>2</sub> agent to enter the protected volume and begin suppression. They may also be manually operated using the manual actuation valve located within the cabinets.

NFPA 12 mandates a pneumatic pre-discharge alarm sound prior to agent release into normally occupied and occupiable enclosures for total flood applications. Janus Fire Systems® Master & Selector Pilot Cabinets are designed with a pneumatic timer in each selector cabinet to allow for a variably set pre-discharge period during which time a siren is pneumatically sounded.

A pilot supply lock-out valve is fitted just downstream of the CO<sub>2</sub> storage unit as required by NFPA 12. The master and selector pilot cabinets are fitted with manual bypass valves to manually actuate the system. The selector cabinet also contains a timer bypass valves to forgo the pre-discharge period.





## SEQUENCE OF OPERATION (Master Pilot Cabinet)

When the system is in standby condition, pilot pressure enters the master cabinet and is stopped at the closed master solenoid valve and inlet port of the pneumatic pilot valve.

In standby condition, the master solenoid valve is de-energized and closed. The solenoid is energized when the selector actuation pressure switch contacts in the selector pilot cabinet open. This causes the solenoid valve to open and send pilot pressure to the pilot port of the pneumatic pilot valve. Alternately, the master pilot cabinet may be actuated manually by moving the lever of the manual actuation valve located within the master pilot cabinet to the "open" position.

Upon receiving pressure in its pilot port, the pneumatic pilot valve opens and sends pressure received at its inlet to the pneumatic actuator of the master valve. The Stages of Operation section illustrates each of the above described conditions.

Once the master valve is pneumatically actuated, it opens and carbon dioxide passes through the master valve to any and all selector valves.

### Enclosure

NEMA 4 & 12 (IP66)

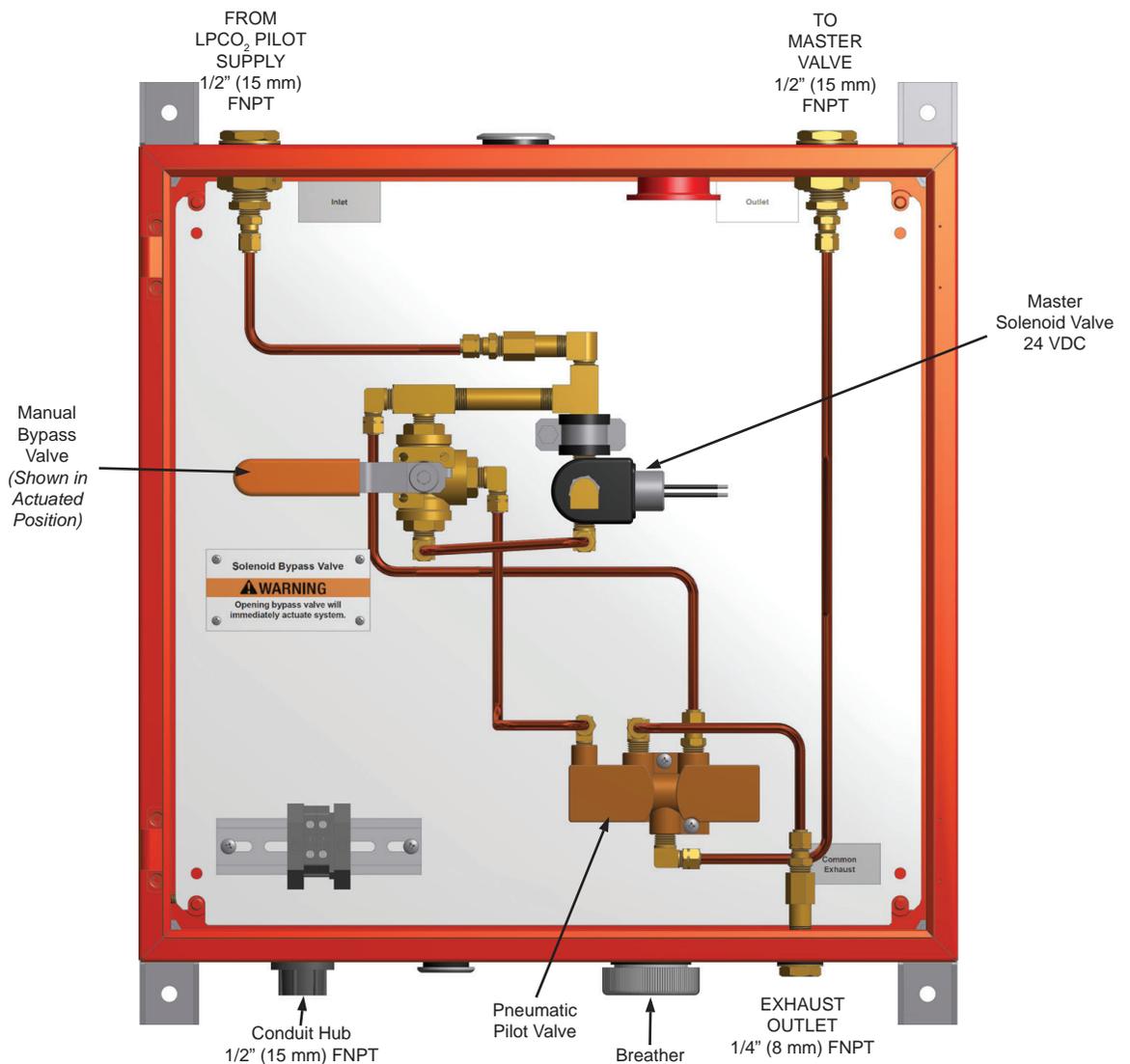
Dimensions:

20" x 20" x 6"

(508 mm x 508 mm x 152 mm)

Ambient Temp: -20° to 130°F (-29° to 54°C)

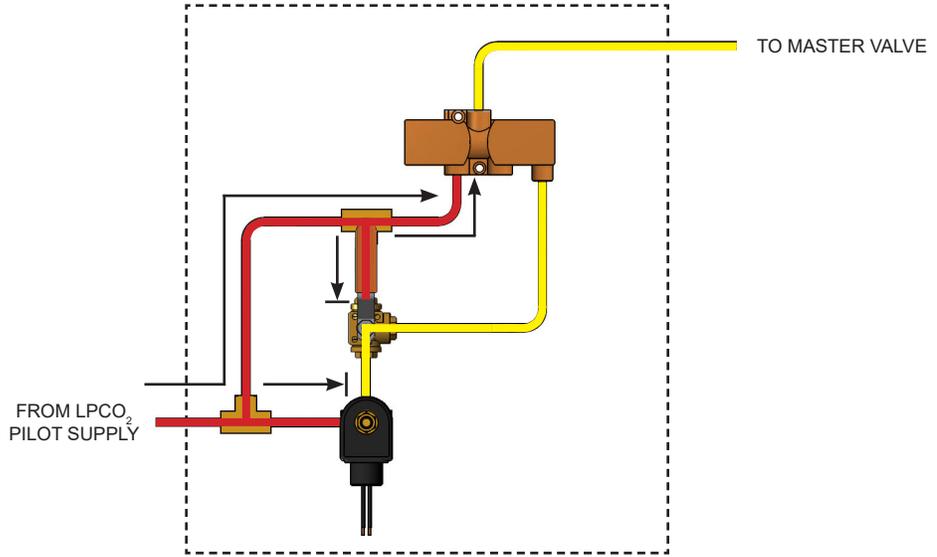
**NOTE:** NEMA 4X  
Stainless Steel Enclosure  
also available



**Standard Master Pilot Arrangement**

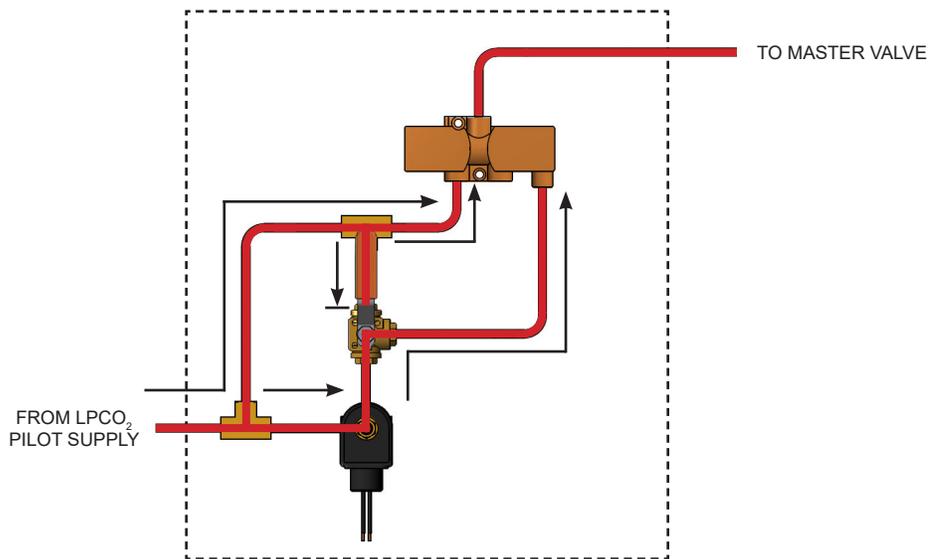
## STAGES OF OPERATION (Master Pilot Cabinet)

### MASTER CABINET IN STANDBY CONDITION



Cabinet Piping and Instrumentation Diagram

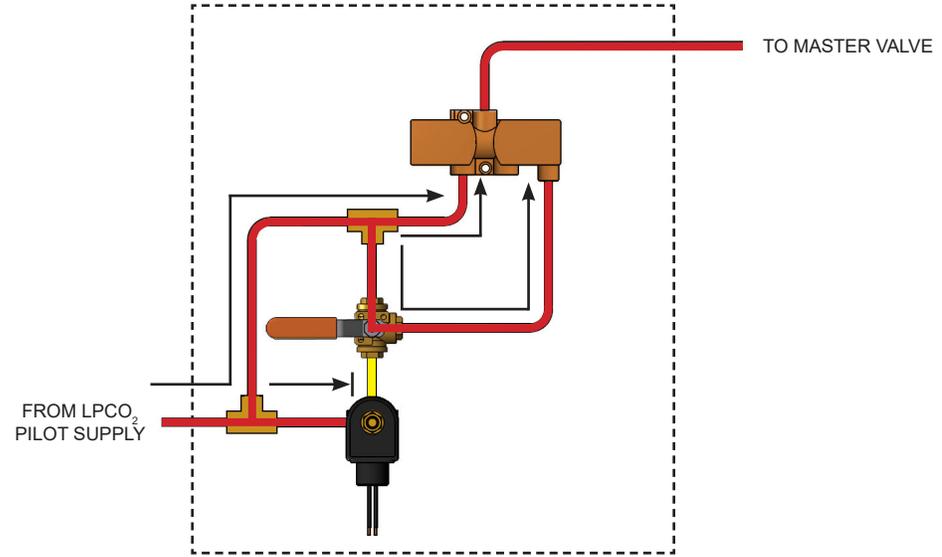
### MASTER CABINET IN DISCHARGE CONDITION



Electrically Actuated Cabinet

**MASTER CABINET IN DISCHARGE CONDITION**

LEGEND	
100 PSI	
Non-Pressurized	



**Manually Actuated Cabinet**



## SEQUENCE OF OPERATION (Selector Pilot Cabinet)

When the system is in standby condition, pilot pressure enters each selector cabinet and is stopped at the closed manual actuation valve, solenoid valve, and the inlet port of the pneumatic pilot valve.

Upon receipt of an actuation signal from the fire suppression control panel, the solenoid valve opens sending pilot pressure to the pneumatic siren, pneumatic timer, and timer bypass valve. Alternately, the manual actuation valve may be opened by hand. This pilot pressure also trips the selector actuation pressure switch, which opens causing the master solenoid valve located in the master pilot cabinet to energize and open.

During this pre-discharge period, the pilot pressure is stopped at the closed timer bypass valve and closed pneumatic pre-discharge timer. Once the predetermined time period has passed, the pneumatic timer opens sending pilot pressure into the pilot port of the pneumatic pilot valve. If the timer bypass valve is open, pilot pressure circumvents the timer and is sent to the pneumatic pilot valve as soon as the solenoid or manual actuation valve is opened.

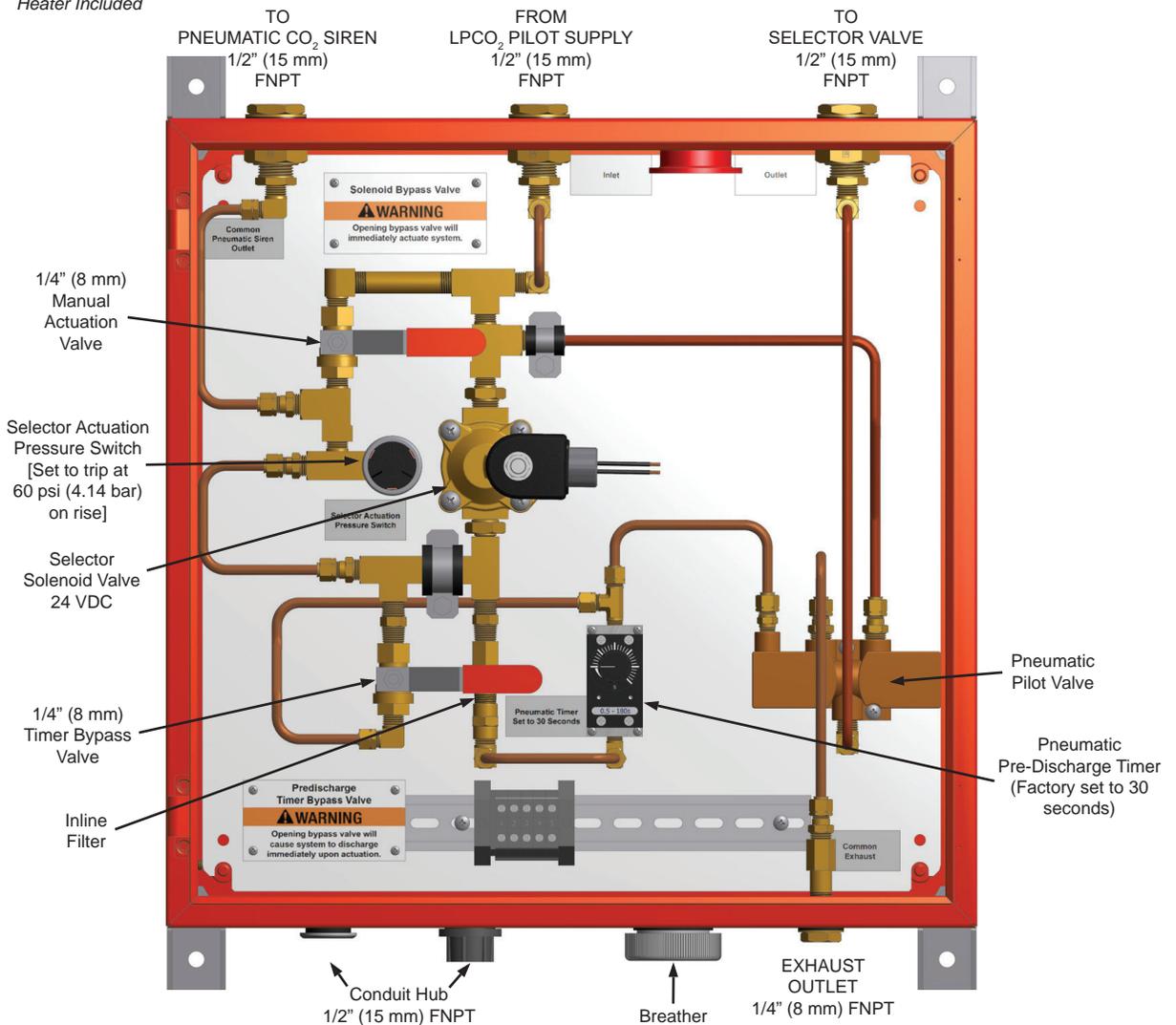
Upon receiving pressure in its pilot port, the pneumatic pilot valve opens and sends pressure received at its inlet to the pneumatic actuator of the selector valve. The Stages of Operation section illustrates each of the above described conditions.

Once a selector valve has been pneumatically actuated, it opens and allow any carbon dioxide from the open master valve to pass through to the nozzles and discharge into the protected hazard.

### Enclosure

NEMA 4 & 12 (IP66)  
 Dimensions: 20" x 20" x 6" (508 mm x 508 mm x 152 mm)  
 Ambient Temp: 40° to 130°F (4° to 54°C)  
 Heater Included

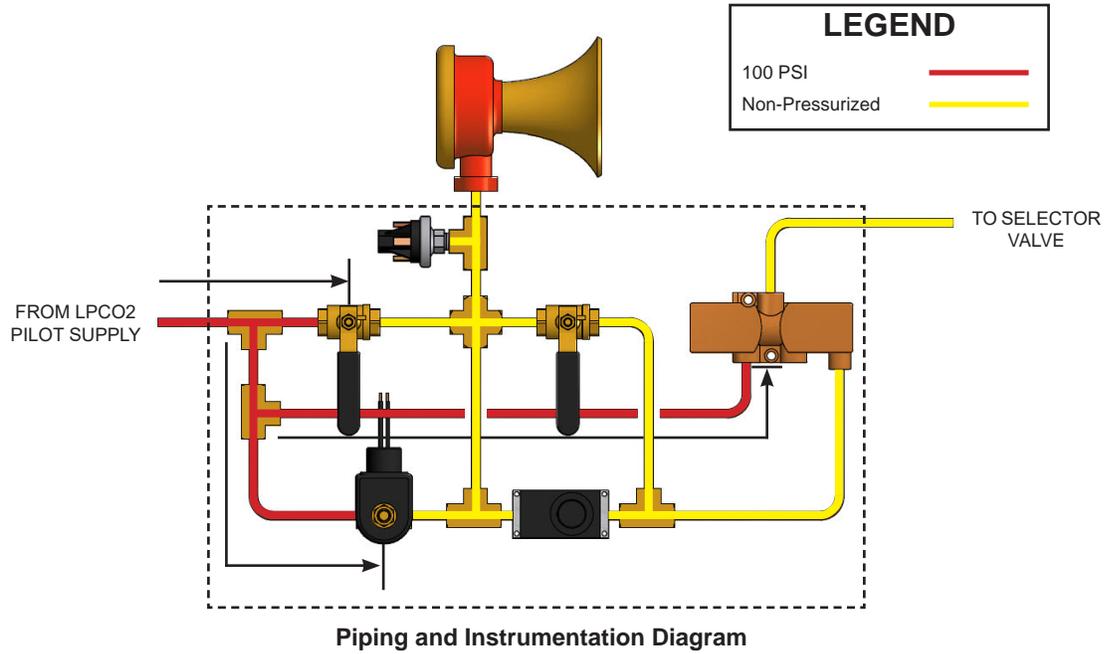
**NOTE: NEMA 4X  
 Stainless Steel Enclosure  
 also available**



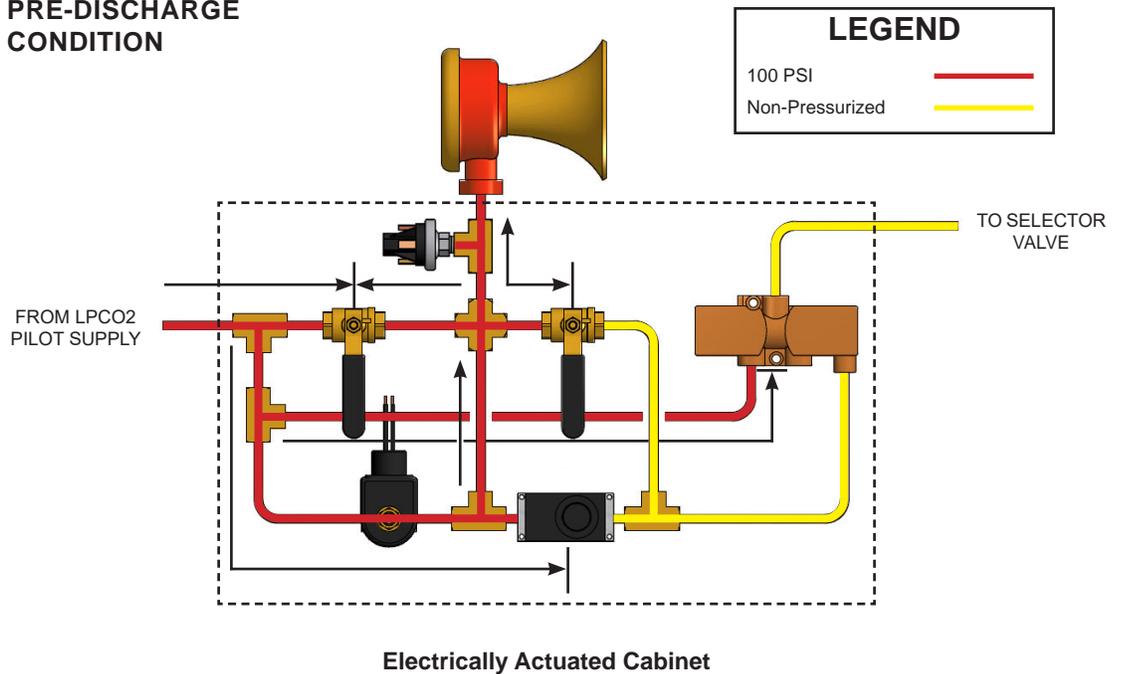
**Standard Selector Pilot Arrangement**

## STAGES OF OPERATION (Selector Pilot Cabinet)

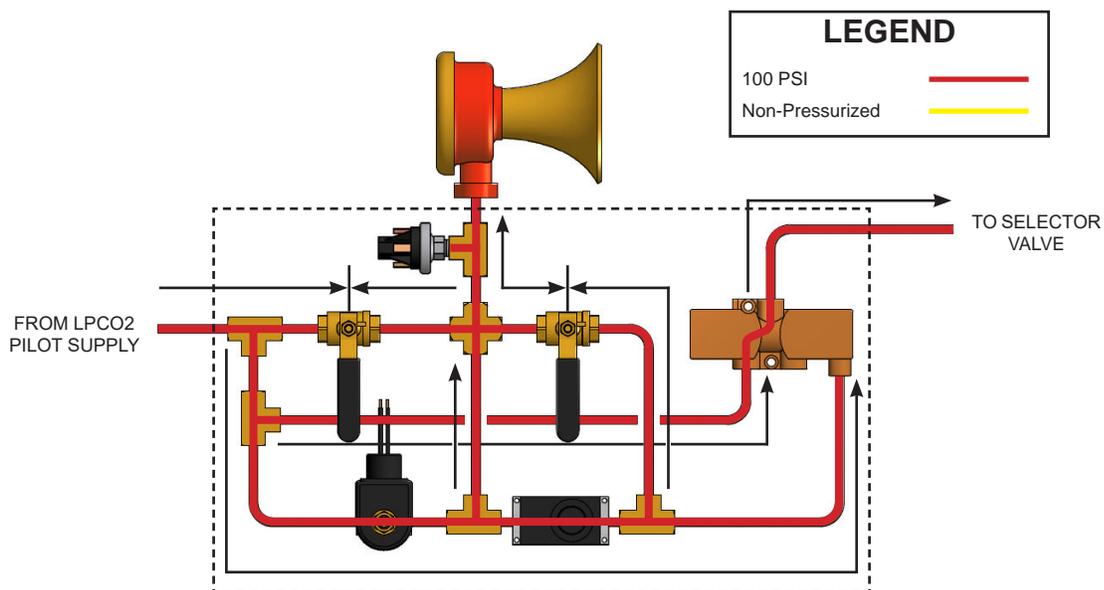
### SELECTOR CABINET IN STANDBY CONDITION



### SELECTOR CABINET IN PRE-DISCHARGE CONDITION

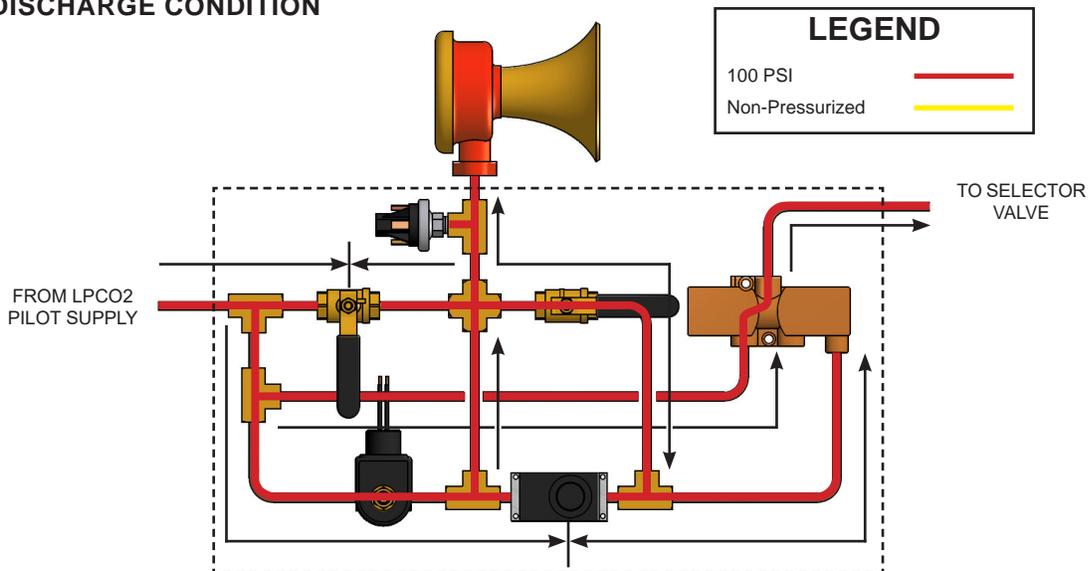


**SELECTOR CABINET IN DISCHARGE CONDITION**



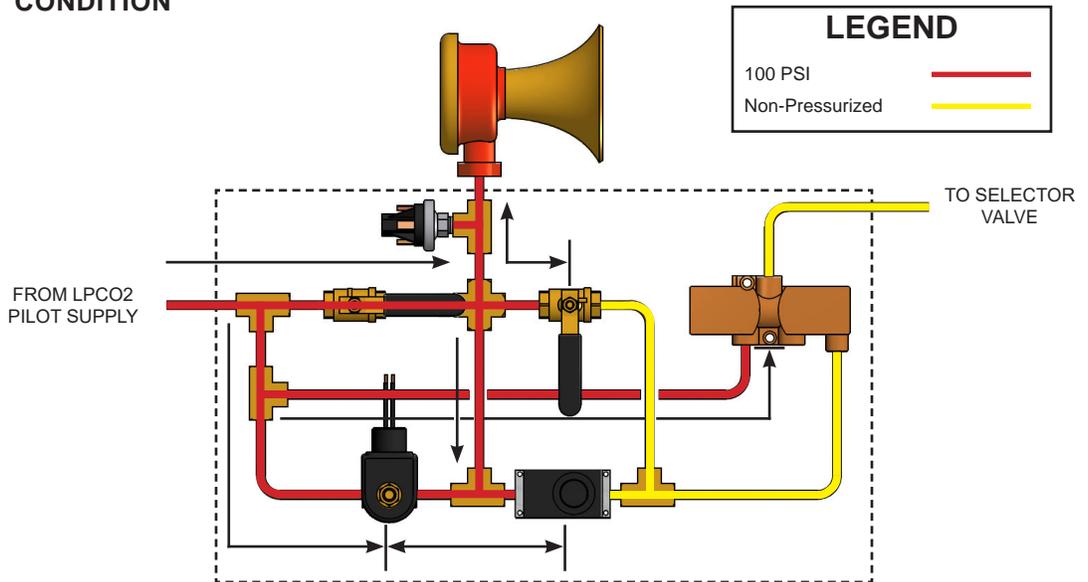
**Electrically Actuated Cabinet**

**SELECTOR CABINET IN TIMER BYPASS DISCHARGE CONDITION**



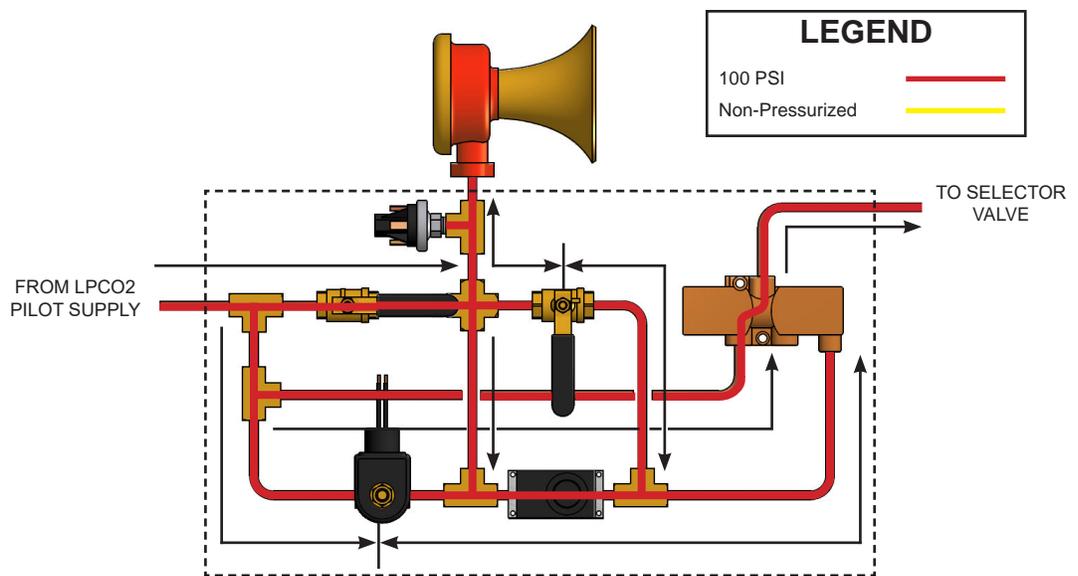
**Electrically Actuated Cabinet**

**SELECTOR CABINET IN  
PRE-DISCHARGE  
CONDITION**



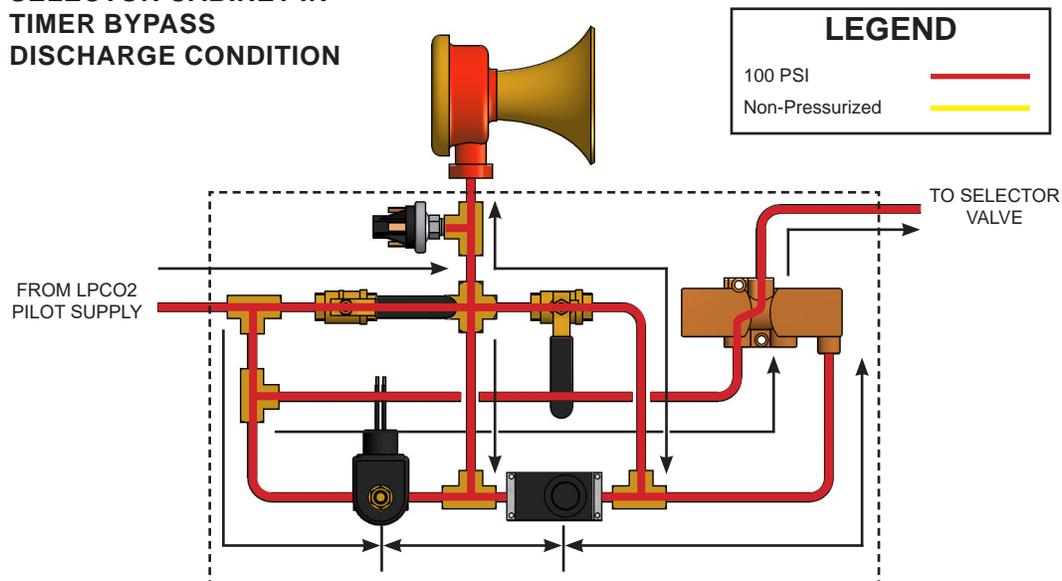
**Manually Actuated Cabinet**

**SELECTOR CABINET IN  
DISCHARGE CONDITION**



**Manually Actuated Cabinet**

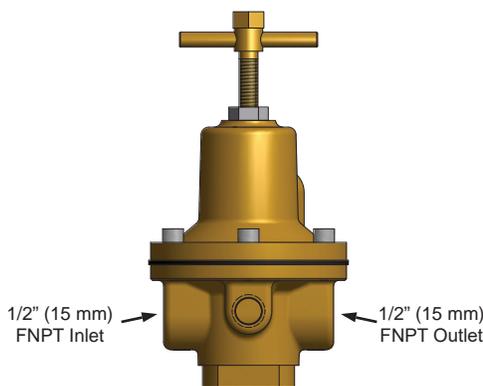
**SELECTOR CABINET IN  
TIMER BYPASS  
DISCHARGE CONDITION**



**Manually Actuated Cabinet**

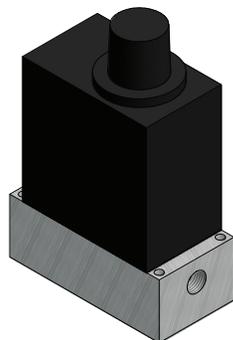
**EQUIPMENT DESCRIPTION**

**Pilot Line Regulator (P/N 19170)**

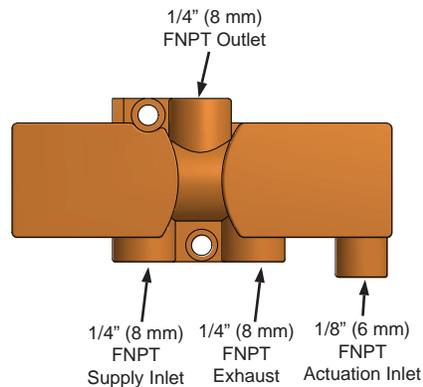
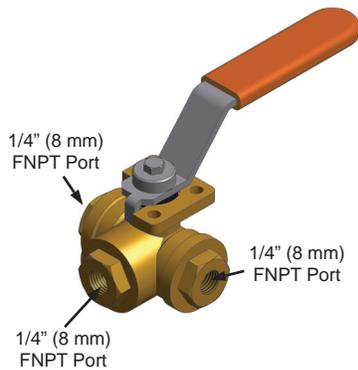
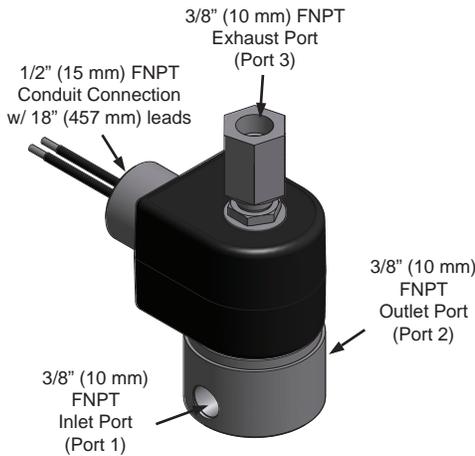
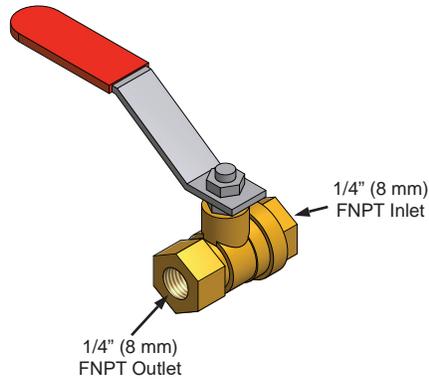


A polyamide and aluminum gas regulator is placed at the LPCO<sub>2</sub> tank vapor supply outlet to regulate the pressure into the master and selector pilot cabinets. It has a 1/2 in (15 mm) FNPT inlet and outlet with a maximum inlet pressure of 450 psig (31 bar) and an outlet range of 50 to 135 psig (3.4 to 9.3 bar). It is normally set to 100 psi (6.89 bar). The regulator has a standalone ambient temperature range of -20° to 130°F (-29° to 54°C) and a C<sub>v</sub> of 3.6. A pressure gauge (0-160 psig P/N 19171) is attached to the regulator to allow visual monitoring of outlet pressure.

**Pneumatic Timer (P/N 19172)**



The pneumatic timer is placed in the selector pilot cabinet downstream of the solenoid and manual actuation valves. It acts to create a pre-discharge delay between system actuation and system discharge to allow for notification of personnel via the pneumatic siren as mandated by NFPA 12. The timer can be set for a 1 to 180 second delay. It has a 1/8 in (6 mm) NPT inlet and outlet port and a 3-way internal exhaust. The standalone ambient temperature range for the timer is 40° to 130°F (4° to 54°C).



## Manual Actuation/Timer Bypass Valve (P/N 19173)

The manual actuation valve is placed in the selector pilot cabinet upstream of the pneumatic timer and acts as a means to manually begin the pre-discharge process in the selector pilot cabinet by sending actuation pressure to the pneumatic siren and pneumatic timer. The timer bypass valve is placed in the selector pilot cabinet downstream of the solenoid and manual actuation valves. When open, it bypasses the pneumatic timer and immediately begins the discharge process upon electric or manual actuation of the cabinet by sending pilot pressure to the pneumatic pilot valve. Both the manual actuation and timer bypass valves are manually actuated full port ball valves made of forged brass with reinforced PTFE seats and seals and have 1/4 in (8 mm) FNPT connections. The standalone ambient temperature range for both valves is -20° to 130°F (-29° to 54°C).

## Master Solenoid Valve (P/N 99446)

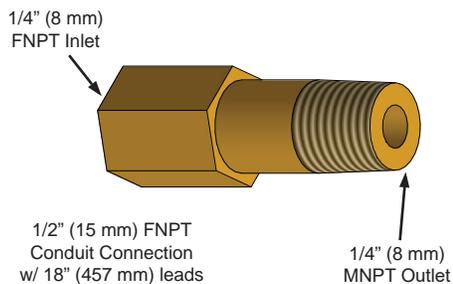
A three-way solenoid valve is installed inside the master pilot cabinet so that it is normally de-energized. This valve operates at 24 VDC, 10 Watts and has a NEMA 4X enclosure with an ambient temperature range of -20° to 150°F (-29° to 66°C). Upon being energized through the actuation of the selector actuation pressure switch, the solenoid valve opens sending pilot pressure to the inlet port of the master pilot cabinet pneumatic pilot valve.

## Master Manual Actuation Valve (P/N 99410)

A three-way manual actuator valve is utilized as a means to manually actuate the master cabinet. When placed in the actuated position, it sends actuation pressure to the actuation port of the master pneumatic pilot valve, bypassing the master solenoid valve. This will cause the master valve to open. The selector cabinet(s) must be actuated separately to begin the discharge process. The master cabinet manual actuation valve is a manually actuated full port three-way valves made of brass with reinforced PTFE seats and seals and has 1/4 in (8 mm) FNPT connections. The standalone ambient temperature range for the valve is -20° to 130°F (-29° to 54°C).

## Pneumatic Pilot Valve (P/N 19174)

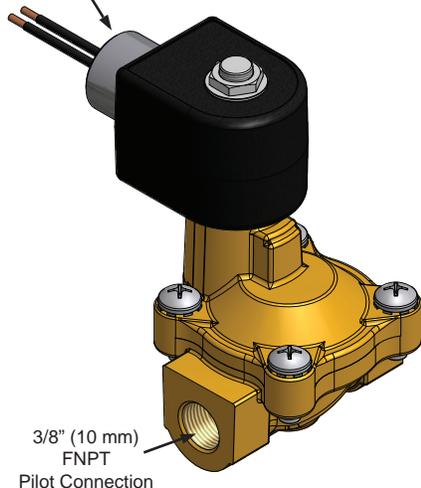
A pneumatic pilot valve is placed in both the master pilot cabinet and each selector pilot cabinet upstream of the cabinet outlet port. It has a brass body with buna seal and has four ports: a supply inlet, an actuation inlet, an outlet, and an exhaust. Upon receiving pressure to its actuation inlet, the valve opens sending pilot pressure from its supply inlet to the pneumatic actuator of the master or selector valve, which causes the valve to open. It has a standalone ambient temperature range of -20° to 150°F (-29° to 66°C).



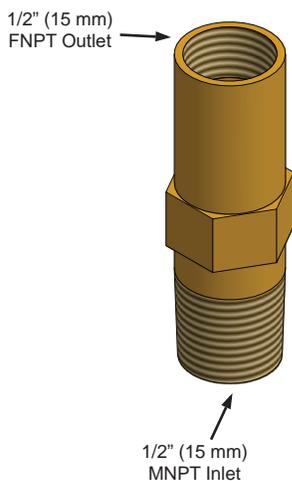
1/4" (8 mm) FNPT Inlet

1/2" (15 mm) FNPT Conduit Connection w/ 18" (457 mm) leads

1/4" (8 mm) MNPT Outlet

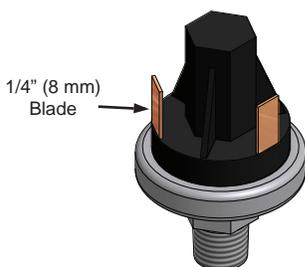


3/8" (10 mm) FNPT Pilot Connection



1/2" (15 mm) FNPT Outlet

1/2" (15 mm) MNPT Inlet



1/4" (8 mm) Blade

## Inline Filter (P/N 99109)

A 20 micron inline filter is installed in the selector cabinet immediately upstream of the pneumatic timer to protect the timer from debris. It has a brass body with a sintered bronze filter element. The filter has a 1/4 in (8 mm) FNPT inlet and a 1/4 in (8 mm) MNPT outlet.

## Selector Solenoid Valve (P/N 19309)

A normally closed solenoid valve is installed inside the selector pilot cabinet upstream of the pneumatic siren, timer bypass valve, and pneumatic timer. It operates at 24 VDC, 10 Watts and has a NEMA 4X enclosure with a standalone ambient temperature range of -20° to 150°F (-29° to 66°C). Upon receiving a signal from the releasing panel, the solenoid valve opens sending pilot pressure to the pneumatic siren and pneumatic timer in the selector pilot cabinet.

## Pilot Relief Valve (P/N 19316)

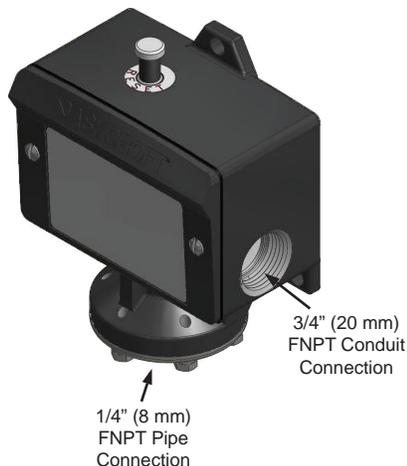
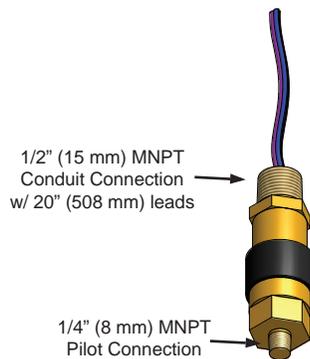
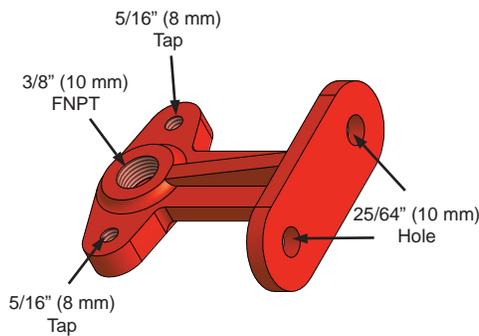
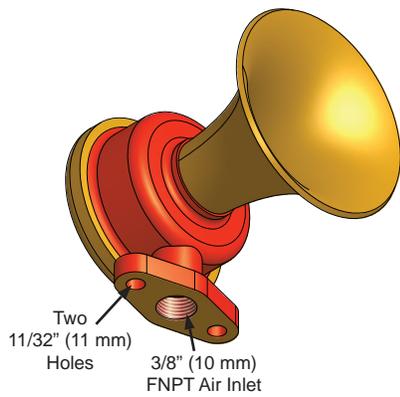
The pilot relief valve must be installed just downstream of the pilot line regulator. It has a 0.062 in<sup>2</sup> (40 mm<sup>2</sup>) orifice area and is set to open should line pressure exceed 125 psi (8.6 bar). The relief valve has a brass body with a stainless steel spring and a standalone ambient temperature range of -320°F to 165°F (-196°C to 74°C). A pipe-away adapter (P/N 19318) is available to convert the outlet to a 1/2" (15 mm) FNPT connection.

## Discharge Relief Valve (P/N 19317)

A discharge relief valve must be installed in the discharge piping at any point where pipe may be closed off between a lock-out/shut-off valve and a master or selector valve. Each relief valve has a 0.062 in<sup>2</sup> (40 mm<sup>2</sup>) orifice area and is set to open should line pressure exceed 450 psi (31.0 bar). Each relief valve has a brass body with a stainless steel spring and a standalone ambient temperature range of -320°F to 165°F (-196°C to 74°C). A pipe-away adapter (P/N 19318) is available to convert the outlet to a 1/2" (15 mm) FNPT connection.

## Selector Actuation Pressure Switch (P/N 99877)

A selector actuation pressure switch is placed in each selector cabinet immediately downstream of the manual actuation and solenoid valves. Once pressure to the switch reaches 60 psi (4.14 bar) on the rise, the switch contacts open causing the master solenoid valve located in the master pilot cabinet to be energized, actuating the master pilot cabinet. The switch is single pole double throw with contacts rated at 4 Amps resistive at 24 VDC/120 VAC or 1 Amp inductive at 24 VDC and 0.5 Amp inductive at 240 VAC. It has a standalone ambient temperature range of -20° to 130°F (-29° to 54°C).



## Pneumatic Siren (P/N 19224)

A pneumatic siren is installed outside of each selector pilot cabinet immediately downstream of both the solenoid valve and manual actuation valves but upstream of the pneumatic timer so that it is sounded during the pre-discharge period as required by NFPA 12. Each siren has a solid cast bronze bell with a stainless steel diaphragm and reaches a sound level of  $119 \pm 1$  DBA @ 100 psi at 10 ft (3.05 m). Each siren uses 1.3 lbs/minute (0.49 kg/minute) and has a  $C_v$  of .25. The sirens have an operating pressure of 50 to 150 psi (3 to 10 bar) and a standalone ambient temperature range of  $-4^\circ$  to  $400^\circ\text{F}$  ( $-20^\circ$  to  $204^\circ\text{C}$ ).

## Pneumatic Siren Bracket (P/N 19225)

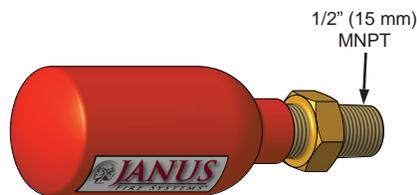
A pneumatic siren bracket affixes to the base of each pneumatic siren to allow the siren to be fastened to an outside surface.

## Pilot Line Supervisory Pressure Switch (P/N 19307)

The pilot line supervisory pressure switch is installed downstream of the pilot line regulator immediately outside of the master or selector pilot cabinet furthest from the regulator. It has a NEMA 4 enclosure for outdoor use and a standalone ambient temperature range of  $-20^\circ$  to  $180^\circ\text{F}$  ( $-29^\circ$  to  $82^\circ\text{C}$ ). When pressure drops below 50 psi (3.4 bar), the switch sends an abnormal signal to the fire suppression control panel. The switch is single pole double throw with contacts rated 5 Amps resistive at 24 VDC or 125/250 VAC and 5 Amps inductive at 125/250 VAC or 3 Amps inductive at 30 VDC.

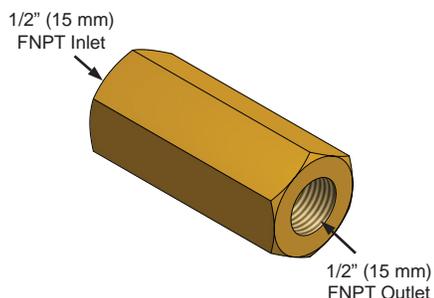
## Discharge Pressure Switch (P/N 97428)

The discharge pressure switch is used in the system to provide positive indication of agent discharge and to initiate the shut down of equipment that may deplete agent concentration. The pressure switch is a single pole, double throw (SPDT) switch with contacts rated 15 Amps at 125/250/480 VAC and 0.5 Amps at 125 VDC. It has a NEMA 4X enclosure.



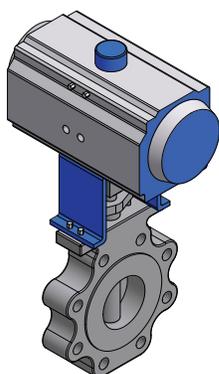
## Odorizer Assembly (P/N 99703)

The odorizer assembly is installed into system piping to provide an olfactory indication of system actuation. During system discharge, a frangible disc inside the odorizer assembly ruptures, allowing wintergreen contained in the odorizer body to mix with the discharging agent. This causes the normally odorless carbon dioxide agent released into the protected hazard to possess a distinct wintergreen smell. The odorizer assembly is non-refillable.



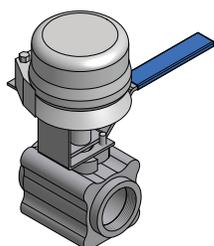
## Inline Check Valve (P/N 19501 Brass/19507 SST)

A 1/2 in (15 mm) inline check valve is installed in the discharge piping with direction-of-flow away from the selector valve(s) so that any agent that becomes trapped between the master valve and selector valve(s) when an open master valve closes has a path of flow to return to the storage unit.



## Master and Selector Valves

Master and selector valves allow the protection of multiple hazards or hazard zones by the LPCO<sub>2</sub> system. Janus Fire Systems® LPCO<sub>2</sub> master and selector valves are available as 1/2 in (15 mm), 3/4 in (20 mm), 1 in (25 mm), 1-1/2 in (40 mm), and 2 in (50 mm) pneumatically actuated ball valves or 3 in (80 mm), 4 in (100 mm), 6 in (150 mm), and 8 in (200 mm) pneumatically actuated wafer valves. Optional solenoid is available. Refer to DS1093 for part numbers, specifications, and ordering information.

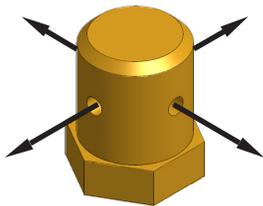


## Lockout/Bypass Valve

Lockout valves are installed where manual isolation of pipe is required. Janus Fire Systems® LPCO<sub>2</sub> lockout valves are available as 1/2 in (15 mm), 3/4 in (20 mm), 1 in (25 mm), 1-1/2 in (40 mm), and 2 in (50 mm) manually actuated ball valves or 3 in (80 mm), 4 in (100 mm), 6 in (150 mm), and 8 in (200 mm) manually actuated wafer valve. Optional stem extension and explosion-proof limit switch are available. Refer to DS1092 for part numbers, specifications, and ordering information.

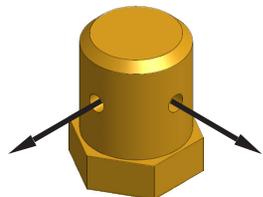
## DISCHARGE NOZZLES

Various nozzle options are available depending on the application and hazard requirements.



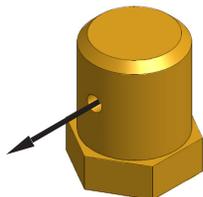
### 360° Radial Nozzle (4 Port)

360° radial nozzles are used for total flooding application. These nozzles are placed in the middle of a hazard space and discharge CO<sub>2</sub> agent in four directions allowing for a 360° coverage area. Nozzles are available in brass or stainless steel with seven different pipe sizes.



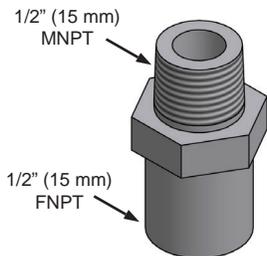
### 180° Sidewall Nozzle (2 Port)

180° sidewall nozzles are used for total flooding application. These nozzles are placed against the wall or edge of a hazard space and oriented to discharge CO<sub>2</sub> agent in two directions allowing for a 180° coverage area. Nozzles are available in brass or stainless steel with seven different pipe sizes.



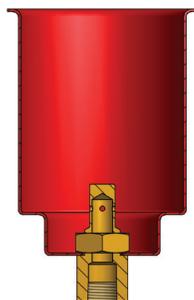
### 90° Corner Nozzle (1 Port)

90° corner nozzles are used for total flooding application. These nozzles are placed in the corner of a hazard space and oriented to discharge CO<sub>2</sub> agent in one direction allowing for a 90° coverage area. Nozzles are available in brass or stainless steel with seven different pipe sizes.



### Orifice Nozzles

Orifice nozzles are used for total flooding application. These nozzles are used for smaller hazard areas where a small flow rate is required. Nozzles are stainless steel and 1/2 in (15 mm) NPT.



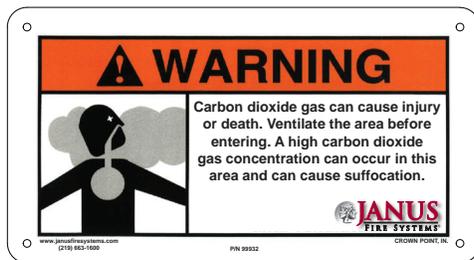
### JLA Nozzles

Janus Local Application (JLA) nozzles may be used for total flooding application, but are the only nozzle suited for local application. For local application, JLA nozzles are placed a specific distance from the protected hazard to discharge directly onto that hazard. Nozzles are available with painted cones and brass jet tip nozzles or with stainless steel cones and stainless steel jet tips. 1/2" (15 mm) or 3/4" (20 mm) pipe sizes are available.



## WARNING SIGNS

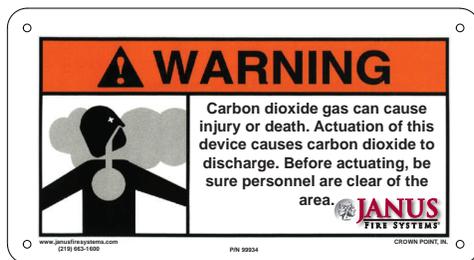
NFPA 12 mandates the placement of specifically designed warning signs in and around areas protected by CO<sub>2</sub> fire extinguishing systems. Each sign is 6-1/2 in x 12 in (165 mm x 305 mm).



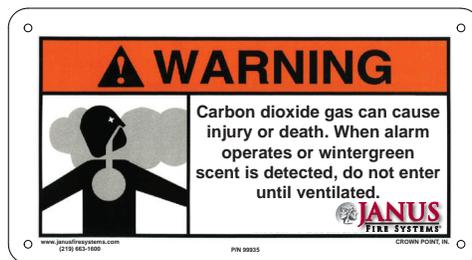
**Caution – Storage – P/N 99932**  
Post sign outside each entrance to carbon dioxide storage rooms.



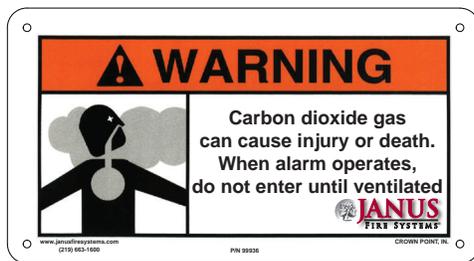
**Caution – Nearby – P/N 99933**  
Post sign in every nearby space where carbon dioxide can accumulate to hazardous levels.



**Warning – Manual Actuation – P/N 99934**  
Post sign at each manual actuation station.



**Warning – Wintergreen – P/N 99935**  
Post sign at every entrance to protected space for systems provided with wintergreen odorizer.



**Warning – Entrance – P/N 99936**  
Post sign in every protected space.



**Warning – Exit – P/N 99937**  
Post sign at every entrance to protected space.



Ordering Information	
P/N	Description
98344	Cabinet, Pilot, Master, NEMA-4, 24 VDC, NDE, w/o Supervision
98413	Cabinet, Pilot, Selector, NEMA-4, 24 VDC, w/ Timer, w/o Supervision
98348	Cabinet, Pilot, Master, NEMA-4X, 24 VDC, NDE, w/o Supervision, SST Enclosure
98338	Cabinet, Pilot, Selector, NEMA-4X, 24 VDC, w/ Timer, w/o Supervision, SST Enclosure

Master Pilot Cabinet Spare Part List	
P/N	Description
99410	Three-Way Ball Valve – <i>Manual Actuation Valve</i>
99446	Master Solenoid Valve
19174	Pneumatic Pilot Valve

Selector Pilot Cabinet Spare Part List	
P/N	Description
19172	Pneumatic Timer
19174	Pneumatic Pilot Valve
19173	Manually Actuated Ball Valve – <i>Manual Actuation / Timer Bypass Valve</i>
19224	Pneumatic Siren
19225	Pneumatic Siren Bracket
19309	Selector Solenoid Valve
99109	Inline Filter
99877	Selector Actuation Pressure Switch

Common Component Spare Part List	
P/N	Description
19170	Pilot Line Regulator
19307	Pilot Line Supervisory Pressure Switch
19316	Pilot Relief Valve
19317	Discharge Relief Valve
19318	Pipe-Away Adapter
97428	Discharge Pressure Switch
99703	Odorizer Assembly

*Note: Refer to DS1092 and DS1093 for master, selector, and lockout valve ordering information.*

The seller makes no warranties, express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, except as expressly stated in the seller's sales contract or sales acknowledgment form. Every attempt is made to keep our product information up-to-date and accurate. All specific applications cannot be covered, nor can all requirements be anticipated. All specifications are subject to change without notice.



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