



# LPCO<sub>2</sub> SYSTEM

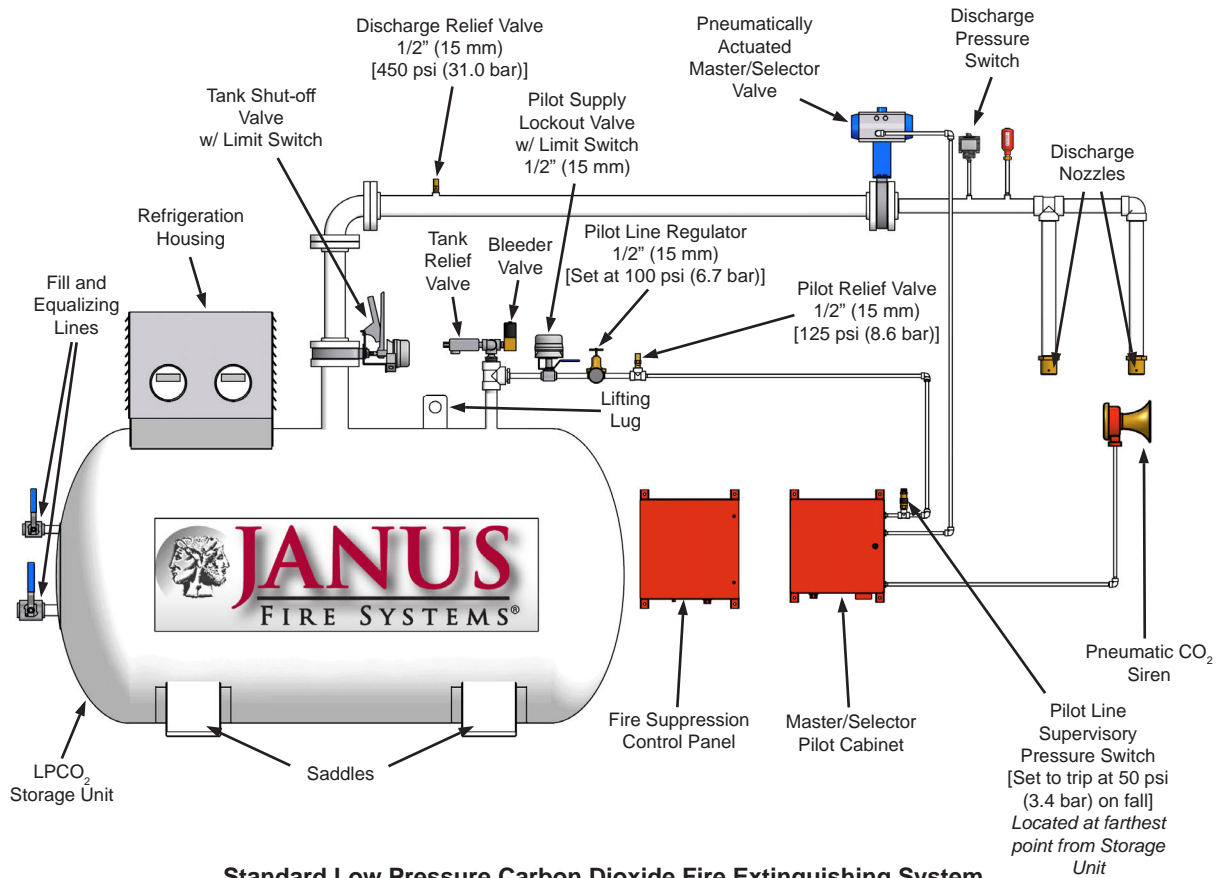
## MASTER/SELECTOR PILOT CABINET

*W/ PNEUMATIC TIME DELAY*

The Janus Fire Systems<sup>®</sup> Master/Selector Pilot Cabinet is an essential part of the Janus Fire Systems<sup>®</sup> Low Pressure Carbon Dioxide Fire Extinguishing System. It functions to pneumatically open and close the master/selector valve 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. It may also be manually operated using the manual actuation valve located within the pilot cabinet.

NFPA 12 mandates a pneumatic pre-discharge alarm sound prior to agent release into normally occupied and occupiable enclosures for total flood applications. The Janus Fire Systems<sup>®</sup> Master/Selector Pilot Cabinet is designed with a pneumatic timer 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 Janus Fire Systems<sup>®</sup> Master/Selector Pilot Cabinet also has a manual actuation valve to allow for emergency manual actuation of the pilot cabinet as well as a timer bypass valve to forgo the pre-discharge period.





## SEQUENCE OF OPERATION

When the system is in standby condition, pilot pressure enters the 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.

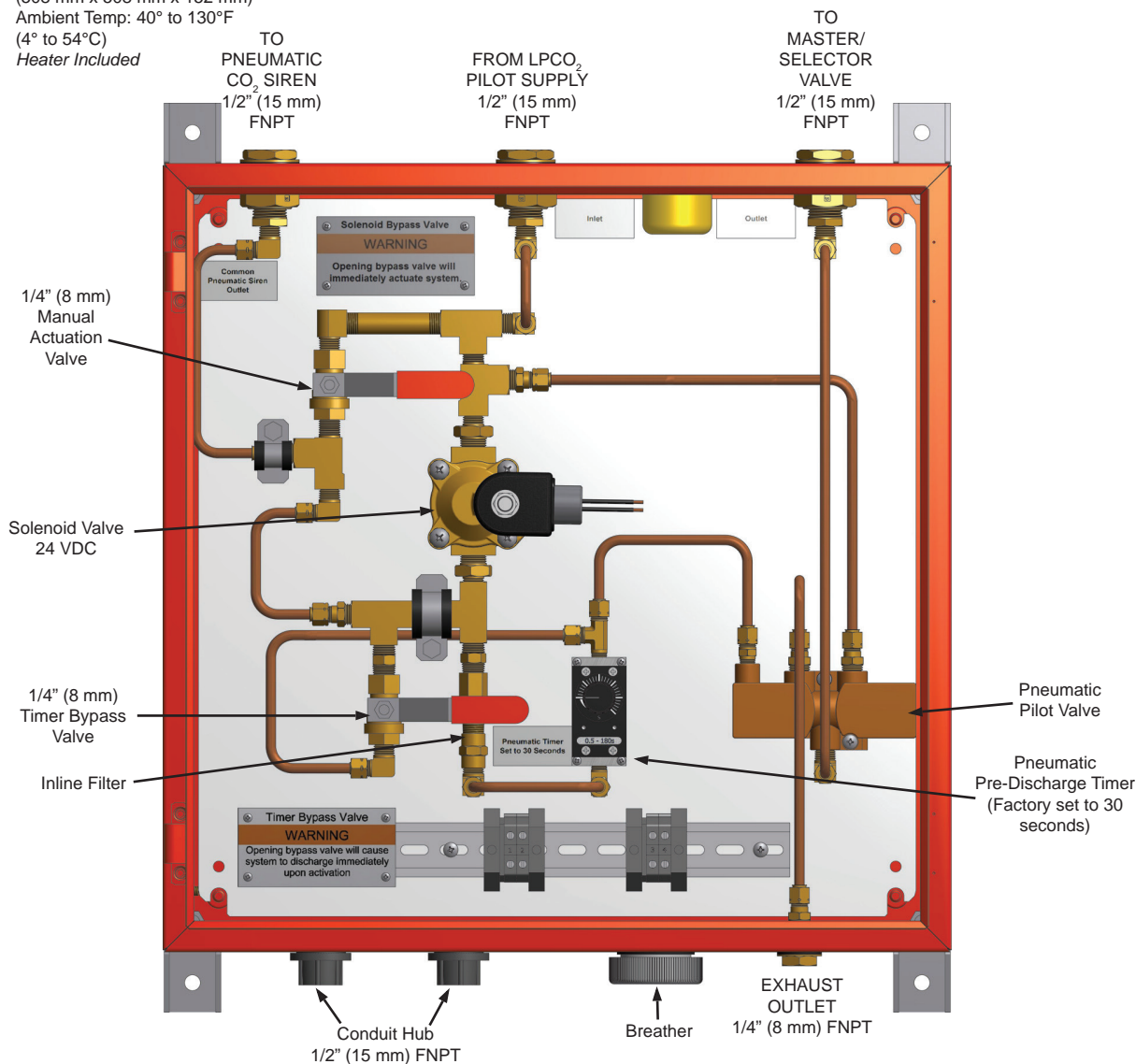
During this pre-discharge period, the pilot pressure is stopped at the closed timer bypass valve and closed pneumatic pre-discharge timer. Once the predetermined time period has passed, the pneumatic timer opens sending pilot pressure into the pilot port of the pneumatic pilot valve. If the timer bypass 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 pilot pressure to the pneumatic actuator of the master/selector valve. The Stages of Operation section illustrates each of these conditions.

### 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

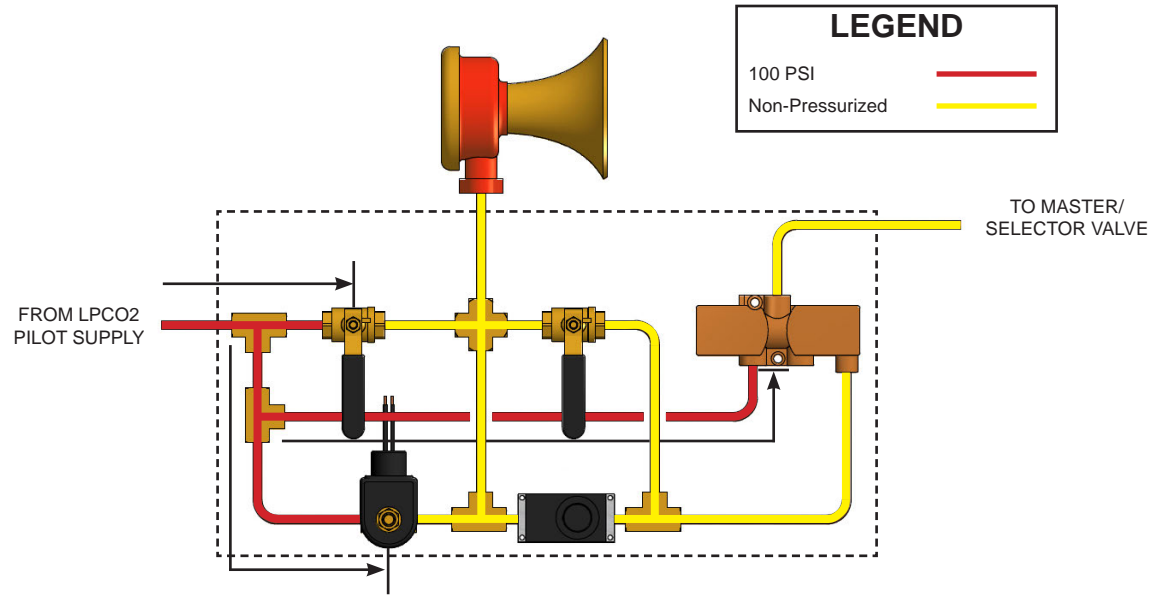
**NOTE:** NEMA 4X  
 Stainless Steel Enclosure  
 also available



**Standard Master/Selector Pilot Arrangement**

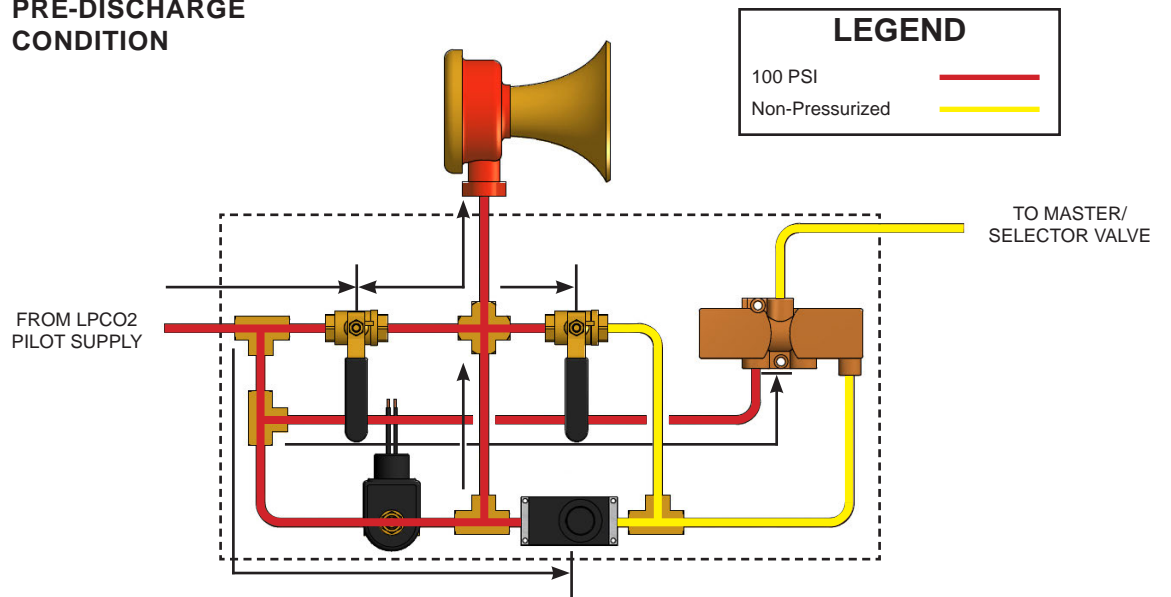
## STAGES OF OPERATION

### CABINET IN STANDBY CONDITION



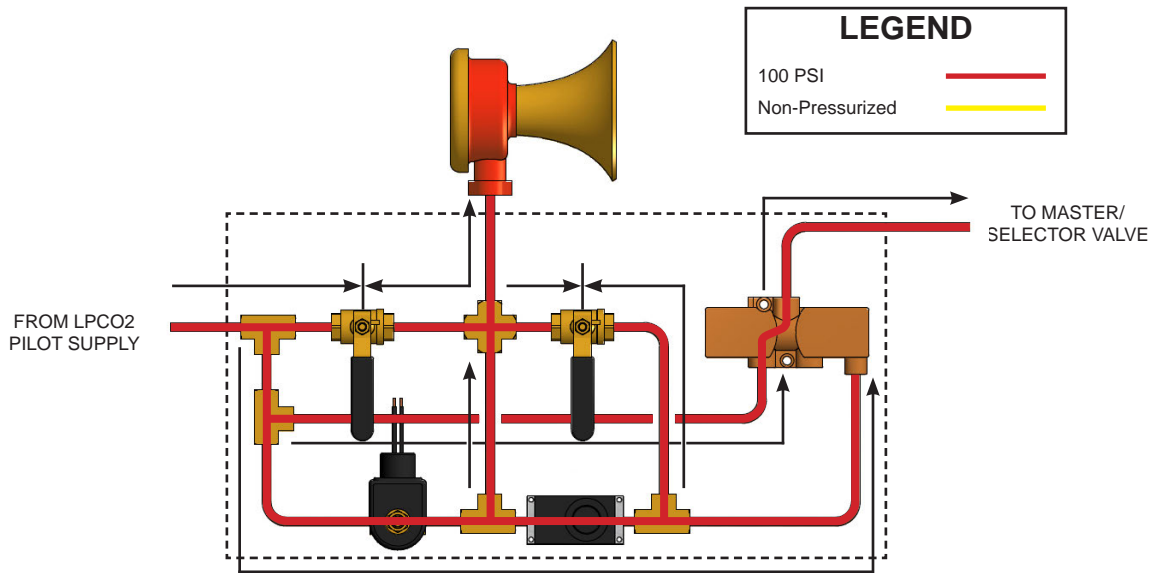
Piping and Instrumentation Diagram

### CABINET IN PRE-DISCHARGE CONDITION



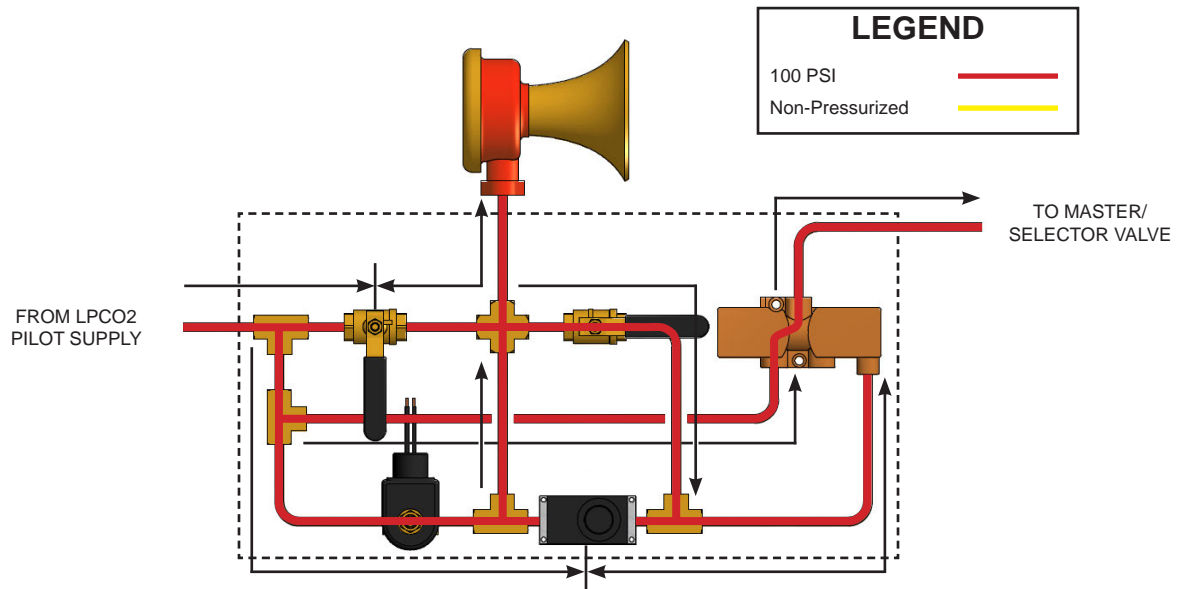
Electrically Actuated Cabinet

**CABINET IN  
DISCHARGE CONDITION**



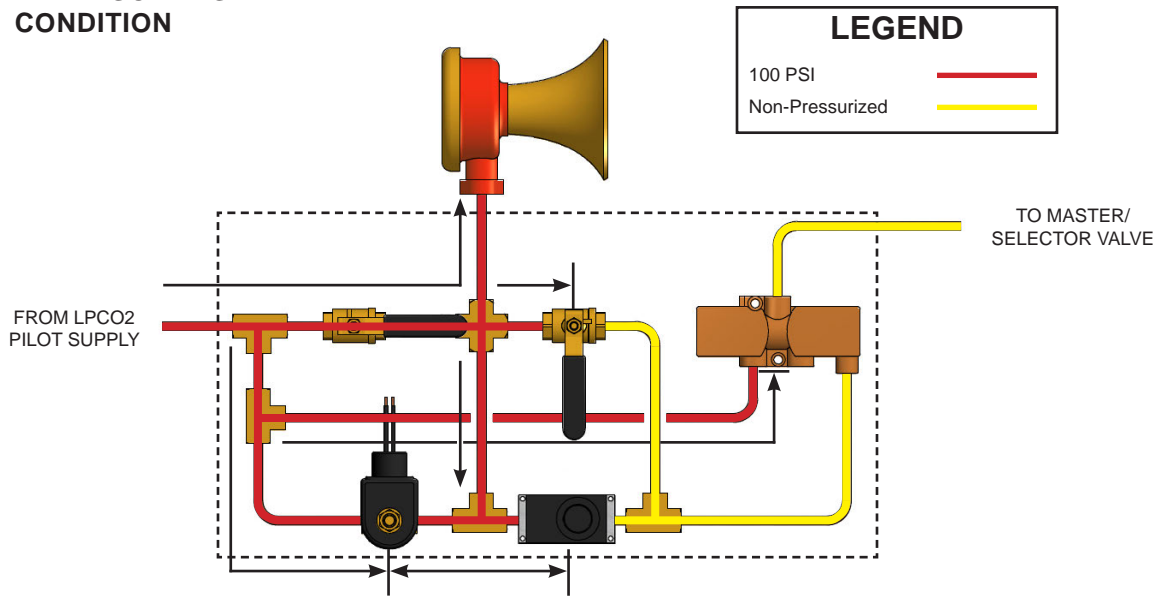
**Electrically Actuated Cabinet**

**CABINET IN  
TIMER BYPASS  
DISCHARGE CONDITION**



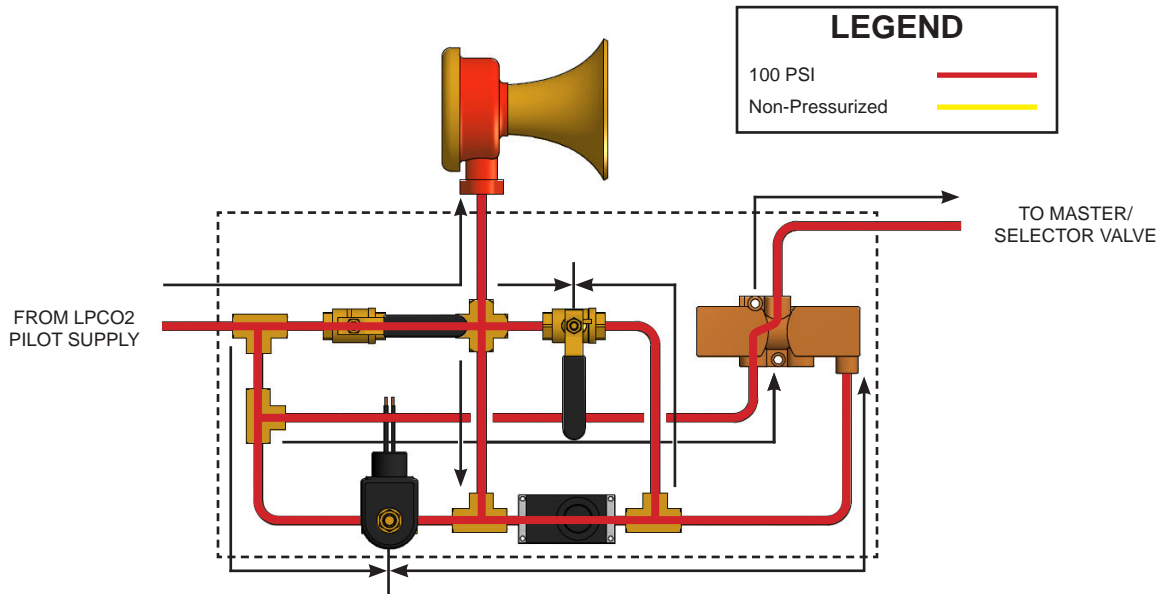
**Electrically Actuated Cabinet**

## CABINET IN PRE-DISCHARGE CONDITION



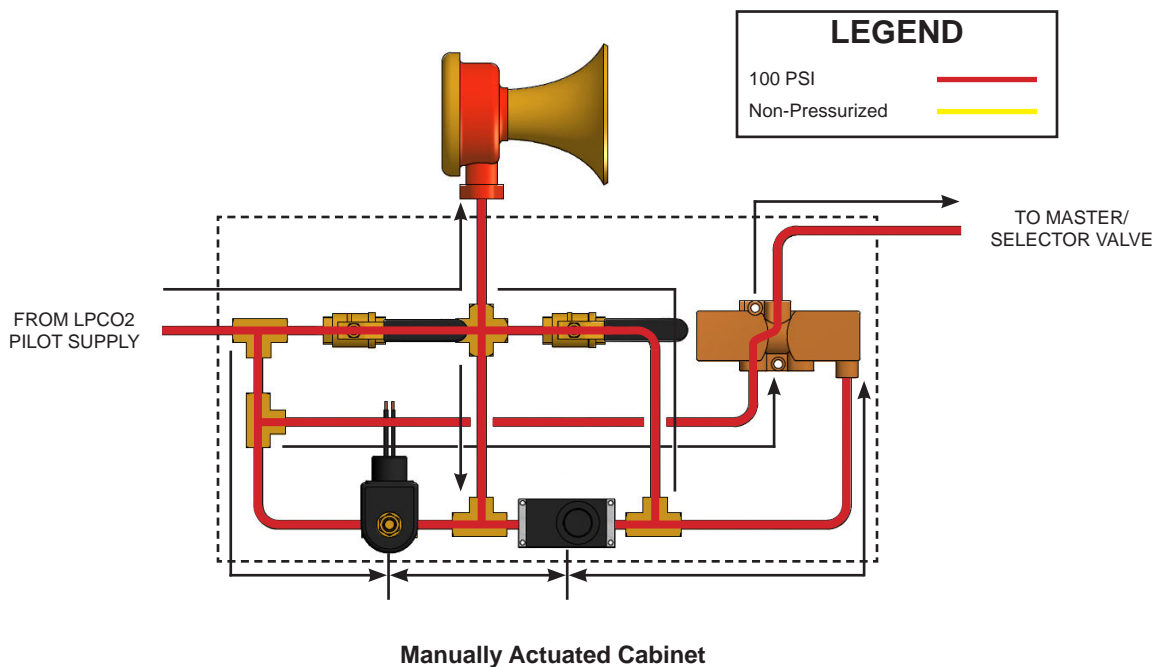
Manually Actuated Cabinet

## CABINET IN DISCHARGE CONDITION

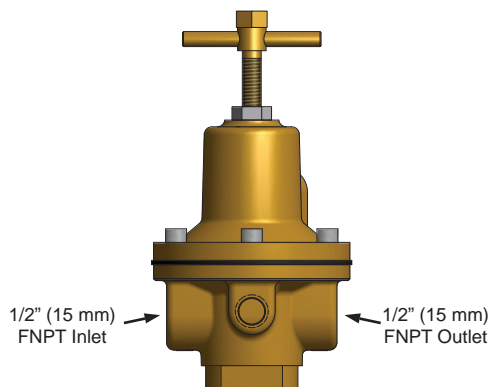


Manually Actuated Cabinet

**CABINET IN  
TIMER BYPASS  
DISCHARGE CONDITION**

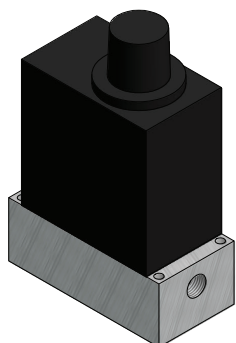


**EQUIPMENT DESCRIPTION**



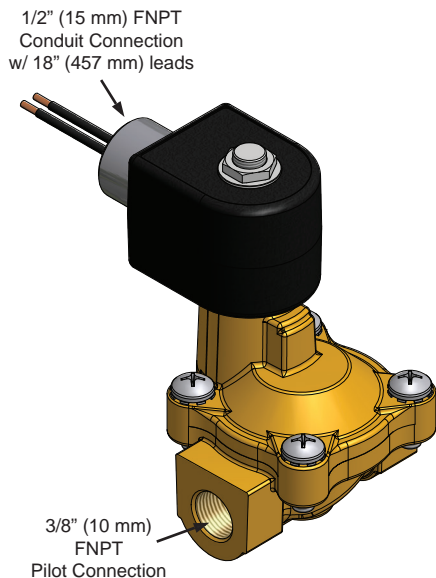
**Pilot Line Regulator (P/N 19170)**

A polyamide and aluminum gas regulator is placed at the LPCO<sub>2</sub> tank vapor supply outlet to regulate the pressure into the pilot cabinet. 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.



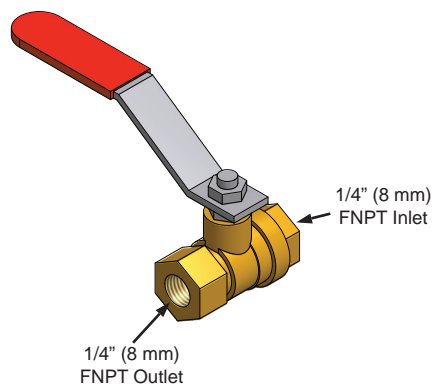
**Pneumatic Timer (P/N 19172)**

The pneumatic timer is placed downstream of the solenoid and manual actuation valve. 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).



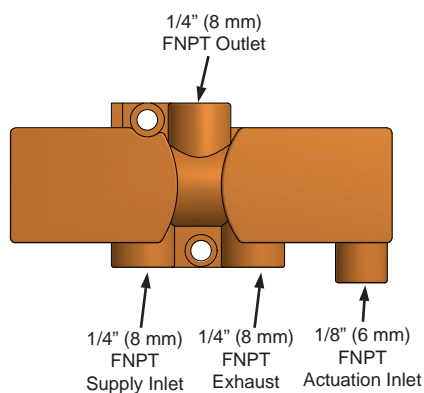
### Solenoid Valve (P/N 19309)

A solenoid valve is installed inside the 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 an ambient temperature range of -20° to 150°F (-29° to 66°C). Upon receiving a signal from the releasing panel, the valve opens sending pilot pressure to the pneumatic siren and pneumatic timer.



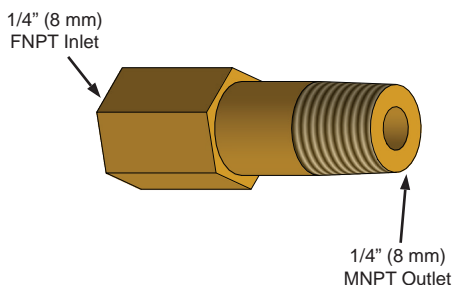
### Manual Actuation/Timer Bypass Valve (P/N 19173)

The manual actuation valve is placed upstream of the pneumatic timer and acts as means to manually begin the pre-discharge process by sending actuation pressure to the pneumatic siren and pneumatic timer. The timer bypass valve is placed 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).



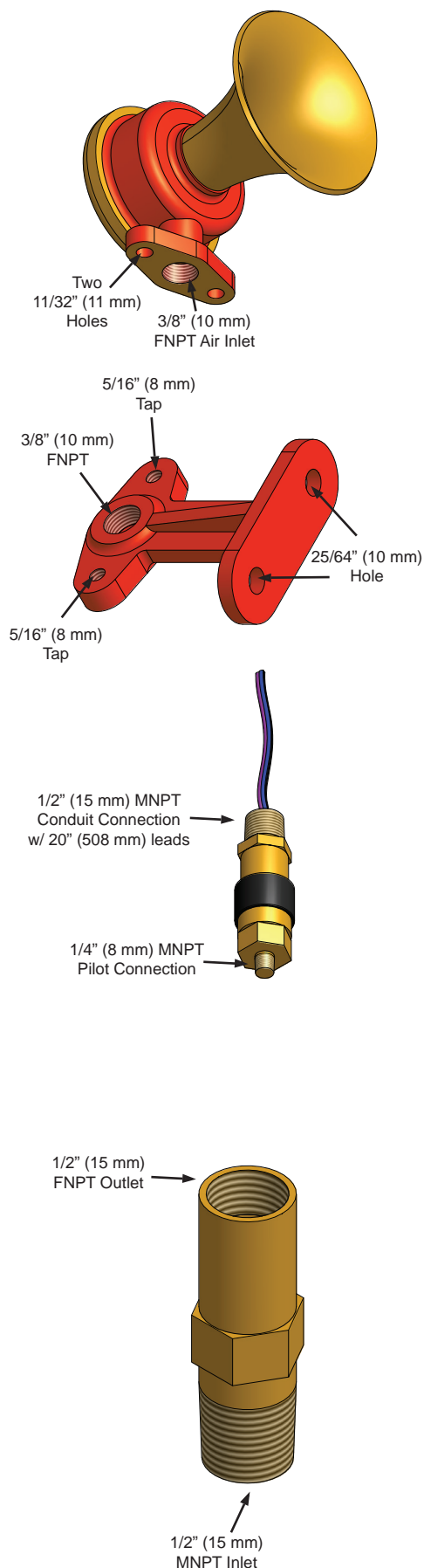
### Pneumatic Pilot Valve (P/N 19174)

A pneumatic pilot valve is placed in the 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/selector valve, which causes the master/selector valve to open, releasing the CO<sub>2</sub> agent. It has a standalone ambient temperature range of -20° to 150°F (-29° to 66°C).



### Inline Filter (P/N 99109)

A 20 micron inline filter is installed 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.



## Pneumatic Siren (P/N 19224)

A pneumatic siren is installed immediately downstream of both the solenoid valve and manual actuation valve but upstream of the pneumatic timer so that it is sounded during the pre-discharge period as required by NFPA 12. It 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). The siren uses 1.3 lbs/minute (0.49 kg/minute) and has a  $C_v$  of .25. It has an operating pressure of 50 to 150 psi (3 to 10 bar) and an ambient temperature range of  $-4^\circ$  to  $400^\circ\text{F}$  ( $-20^\circ$  to  $204^\circ\text{C}$ ).

## Pneumatic Siren Bracket (P/N 19225)

The pneumatic siren bracket affixes to the base of the 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 the master/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.

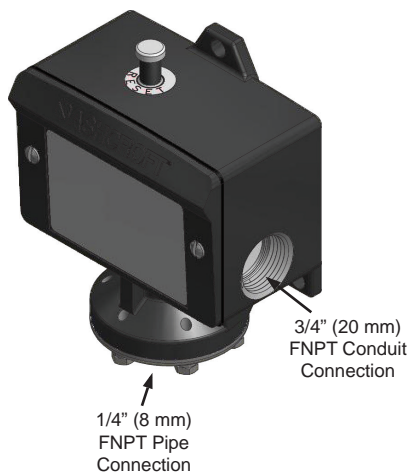
## Pilot Relief Valve (P/N 19316)

The pilot relief valve is installed just downstream of the pilot line regulator. It has a  $0.062 \text{ in}^2$  ( $40 \text{ mm}^2$ ) 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  $-320^\circ\text{F}$  to  $165^\circ\text{F}$  ( $-196^\circ\text{C}$  to  $74^\circ\text{C}$ ). 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)

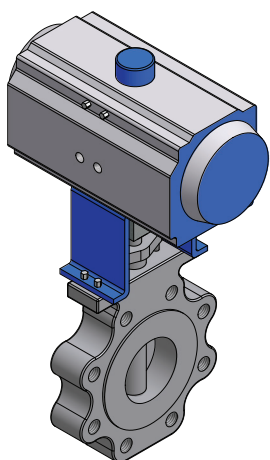
The discharge relief valve is installed upstream of the master/selector valve and downstream of the tank shut-off valve. It has a  $0.062 \text{ in}^2$  ( $40 \text{ mm}^2$ ) orifice area and is set to open should line pressure exceed 450 psi (31.0 bar). The relief valve has a brass body with a stainless steel spring and a standalone ambient temperature range of  $-320^\circ\text{F}$  to  $165^\circ\text{F}$  ( $-196^\circ\text{C}$  to  $74^\circ\text{C}$ ). A pipe-away adapter (P/N 19318) is available to convert the outlet to a  $1/2"$  (15 mm) FNPT connection.





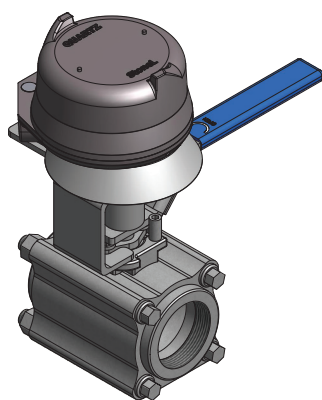
## Discharge Pressure Switch (P/N 97428)

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.



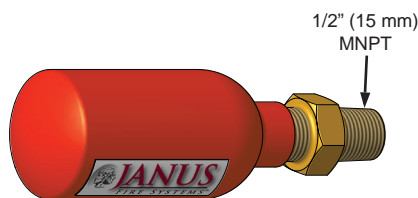
## Master/Selector Valves

The master/selector valve allows the protection of a single or multiple hazards or hazard zones by the LPCO<sub>2</sub> system. Janus Fire Systems<sup>®</sup> LPCO<sub>2</sub> master/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<sup>®</sup> 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.



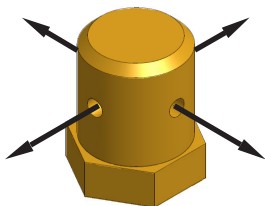
## Odorizer Assembly (P/N 99703)

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.



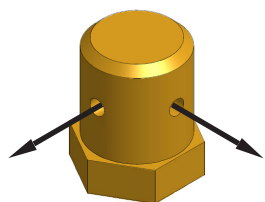
## DISCHARGE NOZZLES

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



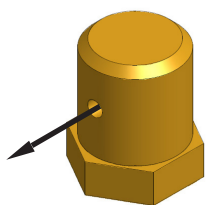
### 360° Radial Nozzle (4 Port)

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.



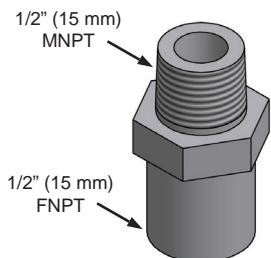
### 180° Sidewall Nozzle (2 Port)

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.



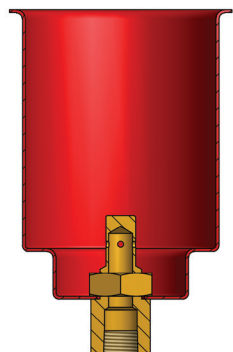
### 90° Corner Nozzle (1 Port)

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.



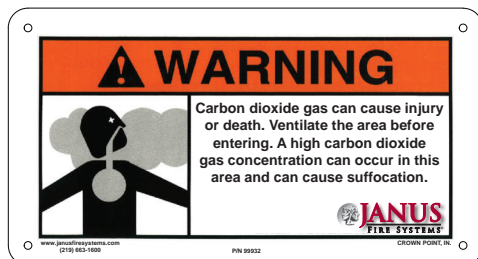
### JLA Nozzles

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.

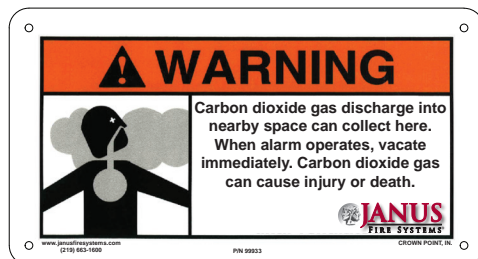


## WARNING SIGNS

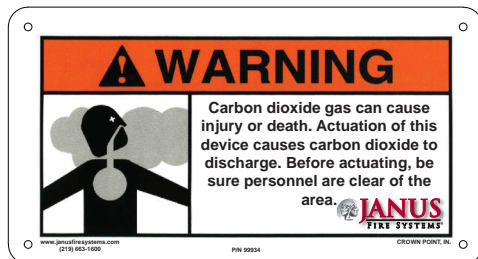
NFPA 12 mandates the placement of specifically designed warning signs in and around areas protected by CO<sub>2</sub> fire extinguishing systems. Each sign is 6-1/2 in x 12 in (165 mm x 305 mm).



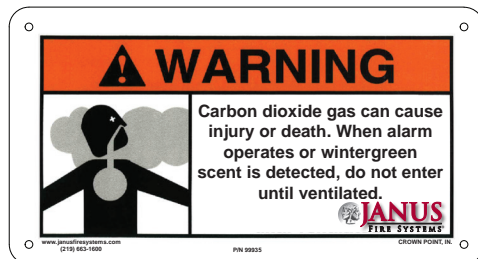
**Caution – Storage – P/N 99932**  
Post sign outside each entrance to carbon dioxide storage rooms.



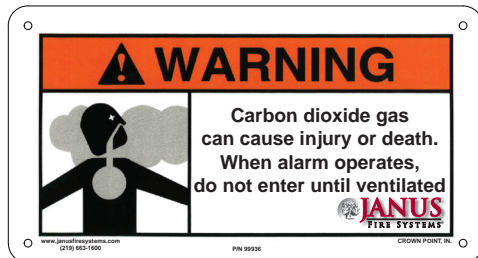
**Caution – Nearby –P/N 99933**  
Post sign in every nearby space where carbon dioxide can accumulate to hazardous levels.



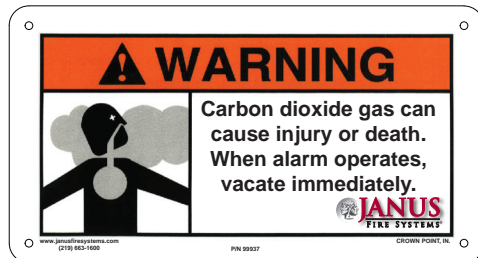
**Warning – Manual Actuation – P/N 99934**  
Post sign at each manual actuation station.



**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
99728	Cabinet, Pilot, Master/Selector, NEMA-4, 24 VDC (w/ Heater)
98334	Cabinet, Pilot, Master/Selector, NEMA-4X, 24 VDC, SST Enclosure (w/ Heater)

### Spare Part List

P/N	Description
19170	Pilot Line Regulator
19172	Pneumatic Timer
19174	Pneumatic Pilot Valve
19173	Manually Actuated Ball Valve – <i>Manual Actuation / Timer Bypass Valve</i>
19307	Pilot Line Supervisory Pressure Switch
19316	Pilot Relief Valve
19317	Discharge Relief Valve
19318	Pipe-Away Adapter
19224	Pneumatic Siren
19225	Pneumatic Siren Bracket
19309	Solenoid Valve
99109	Inline Filter
97428	Discharge Pressure Switch
99703	Odorizer Assembly
99932	Sign, Caution, CO2, Storage Areas
99933	Sign, Caution, CO2, Nearby Spaces
99934	Sign, Warning, CO2, Manual Stations
99935	Sign, Warning, CO2, Entrance w/ Odorizer
99936	Sign, Warning, CO2, Entrance
99937	Sign, Warning, CO2, Exit

*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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