

Figure 2-1. Dimensions of Cylinder and Valve Assembly, P/N B-12XXXX

Refer to Figure 5-26 for Cylinder Valve details.

Table 2-1. Cylinder and Valve Assembly Specifications

Cylinder and Valve Assembly Part Number (Old P/N)	Model	Maximum Flow Number	Dimensions		
			A	B	C
60-120001-001 (B120001)	RG-1.25G	4	15-1/4 in. (387 mm)	13-3/4 in. (349 mm)	8 in. (203 mm)
60-120002-001 (B120002)	RG-2.5G	8	21 in. (534 mm)	19-5/8 in. (498 mm)	9 in. (230 mm)
60-120003-001 (B120003)	RG-4GS	12	19 in. (483 mm)	17-1/2 in. (444 mm)	12-1/4 in. (311 mm)
60-120006-001 (B120006)	RG-4GM	12	24-3/8 in. (619 mm)	23 in. (584 mm)	10 in. (254 mm)
60-120005-001 (B120005)	RG-6G	18	35-1/8 in. (892 mm)	33-3/4 in. (857 mm)	10 in. (254 mm)

**Note:** It is permissible to use old and/or new cylinders included in this manual on a Range Guard system.

## Component Description

### 2-1.1.1 CYLINDER BRACKETS

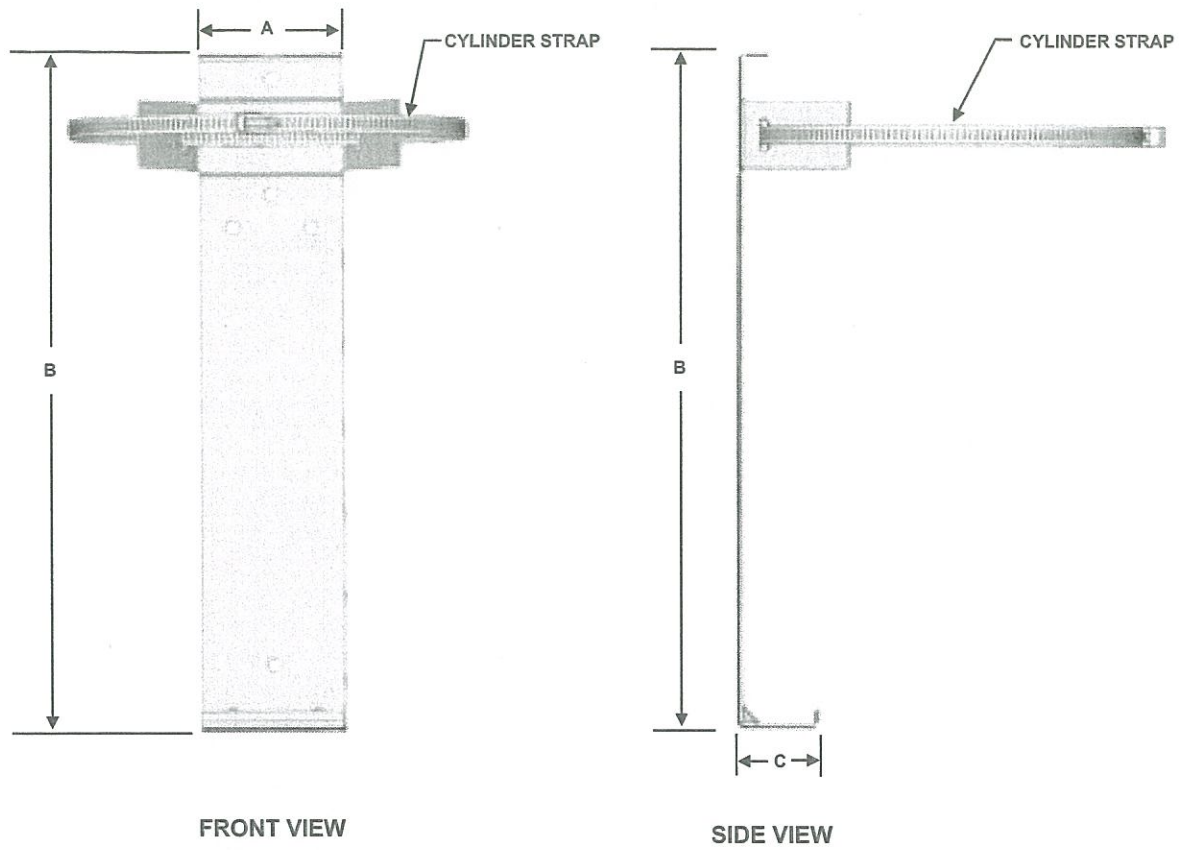


Figure 2-2. Mounting Brackets

Table 2-2. Mounting Bracket Dimensions

Part No.	Model	Dimensions		
		A	B	C
9197430	RG-1.25G	3 in. (76 mm)	9-3/8 in. (238 mm)	1-3/8 in. (35 mm)
9197263	RG-2.5G	4-1/2 in. (114 mm)	12 in. (305 mm)	2-1/2 in. (64 mm)
9197414	RG-4GM	4-1/2 in. (114 mm)	20-1/2 in. (521 mm)	2-1/2 in. (64 mm)
9197415	RG-4GS	4-1/2 in. (114 mm)	11-1/2 in. (290 mm)	2 in. (51 mm)

## Component Description

---

### 2-1.1.2 DISCHARGE ADAPTER KIT, P/N 83-844908-000

The Discharge Adapter provides a means to connect agent distribution pipe to all Range Guard Wet Chemical Cylinder and Valve Assemblies.

The Discharge Adapter Kit consists of a 3/4-inch NPT external thread and 1/2-inch NPT internal thread adapter and a steel flange plate (Figure 2-5).

**Note:** The nuts and bolts used to secure the Anti-Recoil Plate to the discharge valve should be retained and used for mounting the Discharge Adapter to the valve outlet.

The Discharge Adapter can also be used as a recharge adapter to pressurize the cylinder with nitrogen after filling with wet chemical.

**Note:** This part must be ordered separately. It is not included with the Cylinder and Valve Assembly.

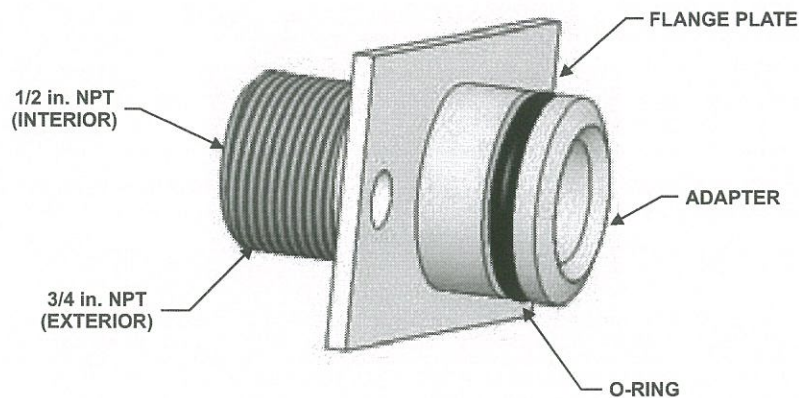


Figure 2-5. Discharge Adapter Kit, P/N 83-844908-000

**Component Description**

Table 2-5. Range Guard Nozzles

Nozzle Type	Part Number (Old Part Number)	Flow Number	Grooves	
ADP Nozzle	87-120011-001 (B120011)	1	1	
F Nozzle	87-120012-001 (B120012)	2	2	
GRW Nozzle	87-120013-001 (B120013)	1	3	
R Nozzle	87-120014-001 (B120014)	1	4	
DM Nozzle	87-120015-001 (B120015)	3	0	
LPF Nozzle	87-120022-001 (B120022)	2	1 & 4	
LPR Nozzle	87-120024-001 (B120024)	1	Disc & Core	
<p><b>Note:</b> It is permissible to use old and/or new nozzles included in this manual in a Range Guard system.</p>				

**2-2 CONTROLS****2-2.1 UNIVERSAL CONTROL HEAD (UCH) Control System, P/N B120099**

The UCH Control System, P/N B120099, is used for actuating the Range Guard Cylinder and Valve Assembly. The UCH Control System can be attached to the System Valve Actuator, P/N B120042 for direct cylinder mounting, or to a wall for remote mounting. Knockouts are provided to accommodate either type of mounting. The controller can be operated with:

- Automatic mechanical detection (fusible-links and thermo-bulb links),
- Automatic electrical operation, and
- Remote and local manual operation.

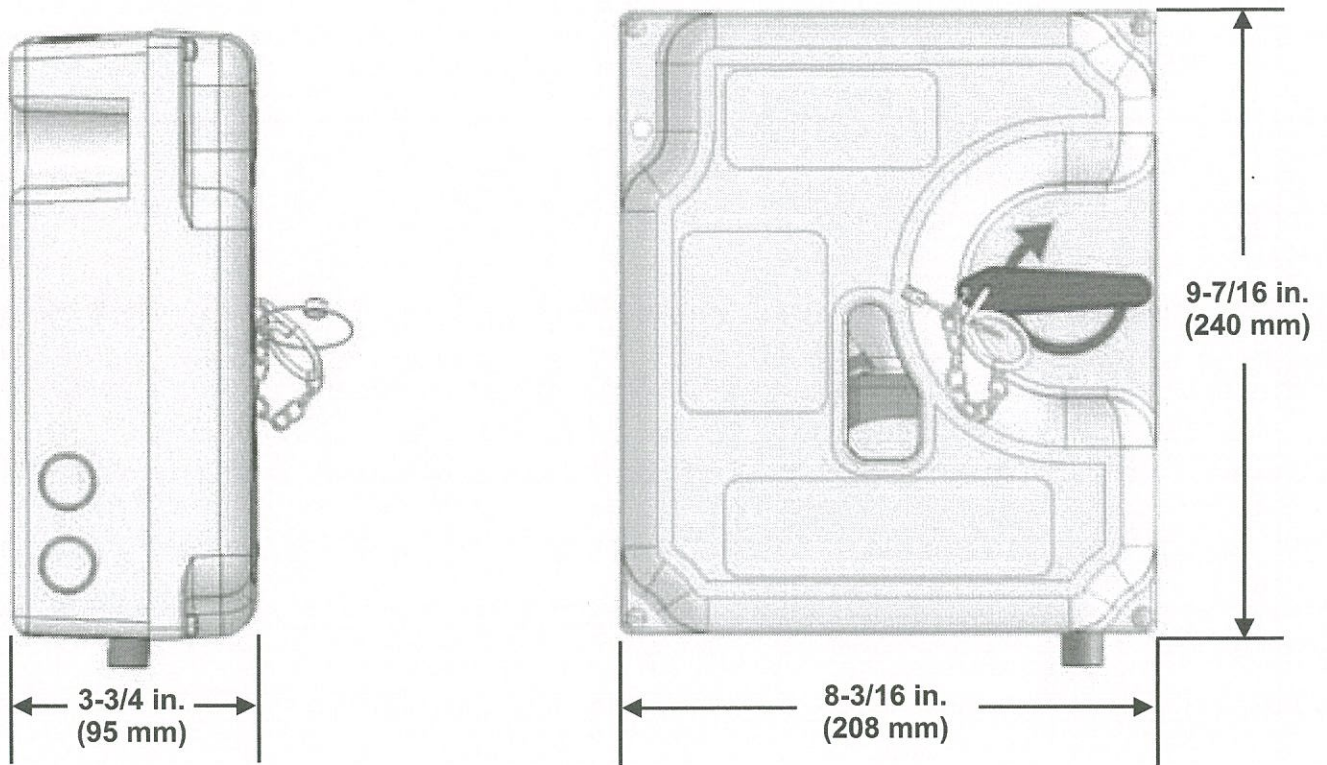


Figure 2-15. UCH Control System, P/N B120099

## Component Description

### 2-2.1.1 SYSTEM NITROGEN CARTRIDGE, P/N 87-120043-001 (OLD P/N B120043)

The UCH Control System uses a nitrogen cartridge for actuating the wet chemical cylinders and is charged with dry nitrogen (see Figure 2-16). The cartridge is mounted inside the UCH Control System to protect it from tampering and provides the date of manufacturing and space (gray band) for recording the installation date.

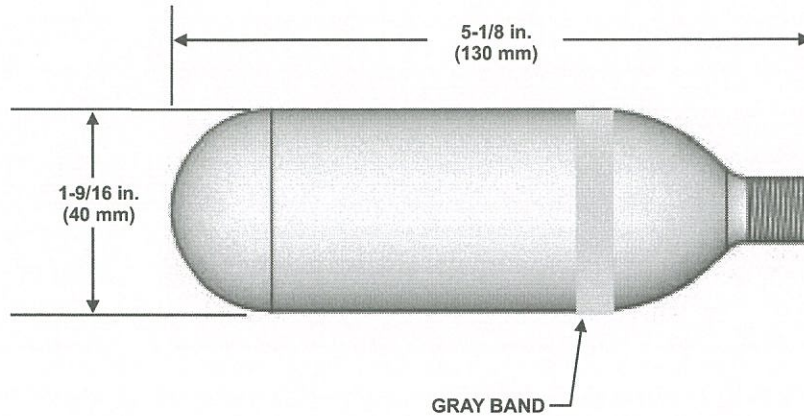


Figure 2-16. System Nitrogen Cartridge, P/N 87-120043-001

**Note:** New system cartridges (P/N 87-120043-001) are marked "P/N 87-120043-001". Old system cartridges (P/N B120043) are not marked with a part number. It is permissible to use old and/or new system cartridges included in this manual in a Range Guard system.

### 2-2.1.2 TEST CARTRIDGE, P/N 87-120044-001 (OLD P/N B120044)

The Test Cartridge is used for testing of the Badger Wet Chemical System. The cartridge has a red band and is labeled "TEST CARTRIDGE" as shown in Figure 2-17.

**Note:** The System Nitrogen Cartridge P/N 87-120043-001 is required for actuation and full discharge or "puff" tests.



**The Test Cartridge (P/N 87-120044-001) must be removed and the System Nitrogen Cartridge (P/N 87-120043-001) must be installed at the completion of any work done on the system. Failure to do so will result in malfunction of the system.**

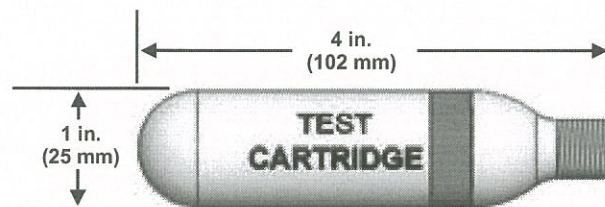


Figure 2-17. Test Cartridge, P/N 87-120044-001

**Note:** New test cartridges (P/N 87-120044-001) are marked "P/N 87-120044-001". Old test cartridges (P/N B120044) are not marked with a part number. It is permissible to use old and/or new test cartridges included in this manual in a Range Guard system.

**2-2.1.3 SYSTEM VALVE ACTUATOR (SVA), P/N B120042**

A System Valve Actuator (SVA) is mounted to every wet chemical cylinder valve assembly (see Figure 2-18). The SVA has ports for low profile tubing runs, and is also equipped with a spring loaded plunger that locks the piston in the discharged position, ensuring complete discharge of the cylinder(s) contents.

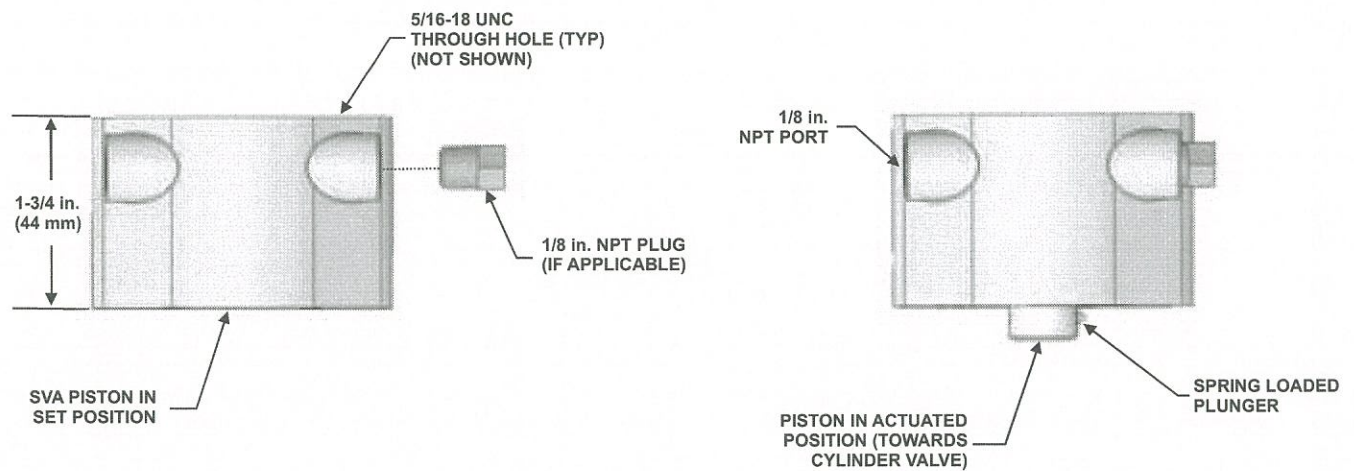


Figure 2-18. System Valve Actuator (SVA), P/N B120042

Component Description

2-2.1.4 HIGH-PRESSURE NITROGEN TUBING, P/N B120045



The braided High-Pressure Nitrogen Tubing, is required on all installations in which the UCH Control System is mounted to a wet chemical cylinder. Use of another hose in such an installation could result in death or serious personal injury and/or malfunction of the system.

The High-Pressure Nitrogen Tubing is used to connect the UCH Control System to the SVA (see Figure 2-19). A 1/8-inch NPT (male) x 3/8-24 JIC Adapter is included with the High Pressure Nitrogen Tubing.

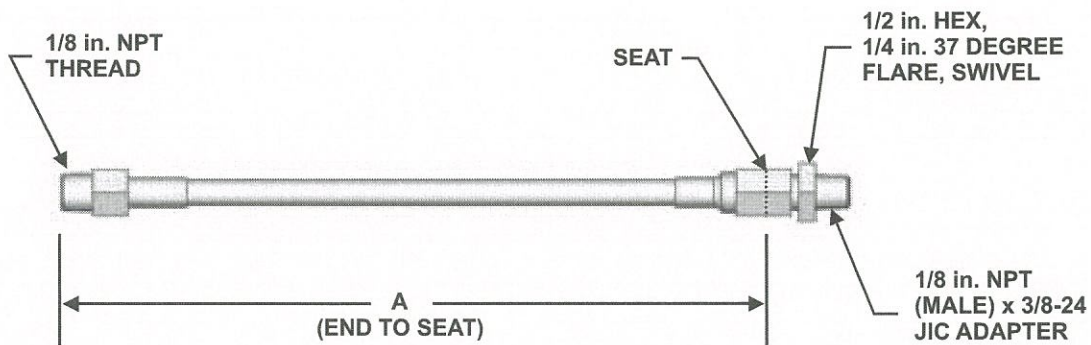


Figure 2-19. External Tubing for UCH Control System, P/N B120045

Table 2-6. External Tubing for UCH Control System

Part Number	Length "A"
B120045-001	7-1/2 in. (191 mm)
B120045-002	24 in. (610 mm)
B120045-003	60 in. (1524 mm)



## Component Description

### 2-2.1.6 MICROSWITCH KIT, P/N B120039, B120039-501 (FOR UCH)

The Microswitch Kit is a single pole, double-throw switch (see Figure 2-21 and Table 2-7). Included in the kit is the microswitch, pigtail assembly and four mounting screws (two short and two long).

**Note:** Microswitch Kit P/N B120039-501 includes pigtail assembly with white stripes.

The wire leads are 24-inches (610 mm) in length. Four Microswitch Kits can be mounted in the UCH Control System. There are two mounting locations to accommodate the four Microswitch kits (two stacked at each mounting location), with EMT ports for each mounting location. This allows for the use of two electrical junction boxes for separation of signal lines and AC lines.

These are used when it is necessary to open or close electrical circuits. The following are examples, but not limited to:

- Electric appliance shutdown
- Make up air shutdown
- Electric gas valve shutdown
- Shuntbreaker/relay

**Note:** Not for alarm initiation.

Electrical appliances usually have a higher amp rating than the switches. In this case, such appliances shall not be wired directly to the microswitch. A magnetic contactor or relay must be used.

To wire the microswitch for UCH, refer to Figure 4-30.

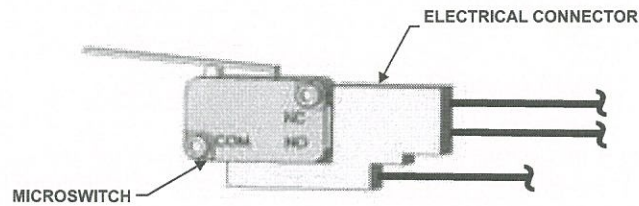


Figure 2-21. Microswitch Kit, P/N B120039

Table 2-7. Microswitch Electrical Ratings

125/250 Vac	20.5 Amps
250 Vac	1-1/2 HP
125 Vac	1/2 HP

## Component Description

### 2-2.3 Automatic Detectors and Accessories

#### 2-2.3.1 DETECTOR HOUSING KIT, P/N 804548 (UCH ONLY)

The Detector Housing Kit, shown in Figure 2-28, consists of the following:

Table 2-11. Detector Housing Kit, P/N 804548

Item	Quantity
7-9/16 in. (192 mm) Detector Housing	1
1/2-inch EMT Connectors	2
Crimp Sleeves	4
"S" Hook	1

These items are used to attach the detectors to the 1/16-inch cable leading to the UCH Control System. The Detector Housing can be configured as an End-of-Line or In-Line bracket.

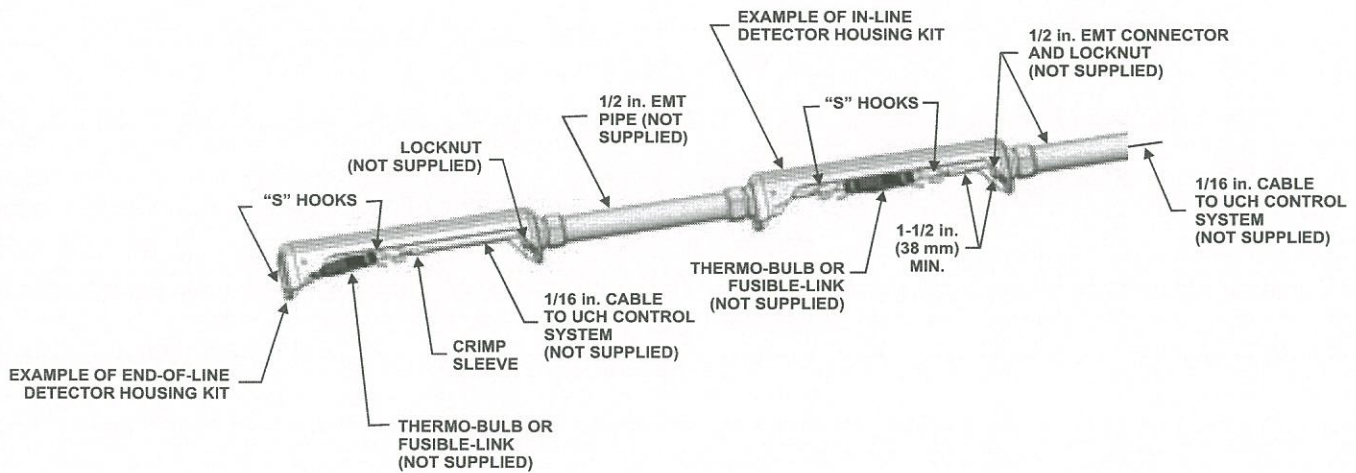


Figure 2-28. Example of End-of-line and In-line Detector Housing Kit, P/N 804548

## Component Description

### 2-2.3.3 THERMO-BULB LINKS, P/N 87-12009X-XXX (OLD P/N B12009X-XXX)

Thermo-Bulb Links, shown in Figure 2-30, are used in conjunction with Universal-Link Housing Kits (P/N 60-120064-001) and/or Detector Housing Kits (P/N WK-804548-000). The links are held together with a liquid-filled glass tube (Thermo-Bulb), which bursts at a predetermined temperature, allowing the two halves of the link to separate. The types of Thermo-Bulb links are:

- Rapid Response
- Standard Response

These Thermo-Bulb links are available in various temperature ratings with a minimum/maximum load rating of 0 lb./50 lb. (0 kg/23kg) (see Table 2-13).

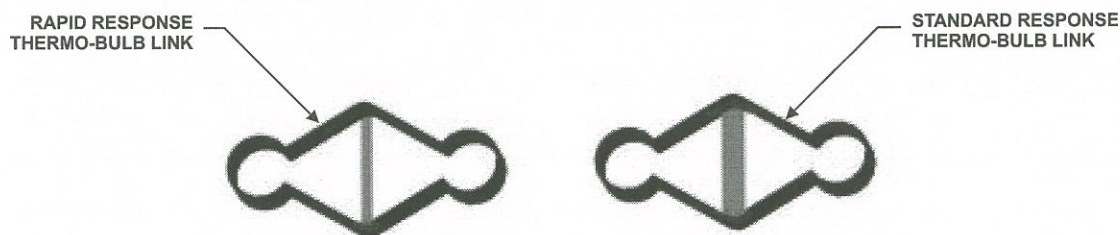


Figure 2-30. Thermo-Bulb Link, P/N 87-12009X-XXX

Table 2-13. Rapid and Standard Response Thermo-Bulb Link Temperature Ratings

Rapid Response Part Numbers (Old Part Numbers)	Standard Response Part Numbers (Old Part Numbers)	Temperature	Color	Maximum Exposure Temperature
87-120095-165 (B120095-165)	87-120090-165 (B120090-165)	165°F (74°C)	Red	100°F (38°C)
87-120095-212 (B120095-212)	87-120090-212 (B120090-212)	212°F (100°C)	Green	150°F (66°C)
87-120095-286 (B120095-286)	87-120090-286 (B120090-286)	286°F (141°C)	Blue	225°F (107°C)
87-120095-360 (B120095-360)	87-120090-360 (B120090-360)	360°F (182°C)	Mauve	300°F (149°C)
87-120095-450 (B120095-450)	87-120090-450 (B120090-450)	450°F (232°C)	Black	375°F (191°C)
87-120095-500 (B120095-500)	87-120090-500 (B120090-500)	500°F (260°C)	Black	475°F (246°C)
<p><b>Note:</b> New Thermo-Bulb Links (P/N 87-12009X-XXX) are marked "K". Old Thermo-Bulb Links (P/N B12009X-XXX) are marked "B." It is permissible to use old and/or new Thermo-Bulb Links included in this manual in a Range Guard system.</p>				

**2-2.3.7 CORNER PULLEY, P/N WK-844648-900**

The Corner Pulley is used to change the direction of the control cable runs. The cable's protective conduit (1/2-inch EMT) is attached to the Corner Pulleys with the coupling nuts provided. The Corner Pulley is equipped with a ball-bearing pulley for minimum resistance to the cable travel.

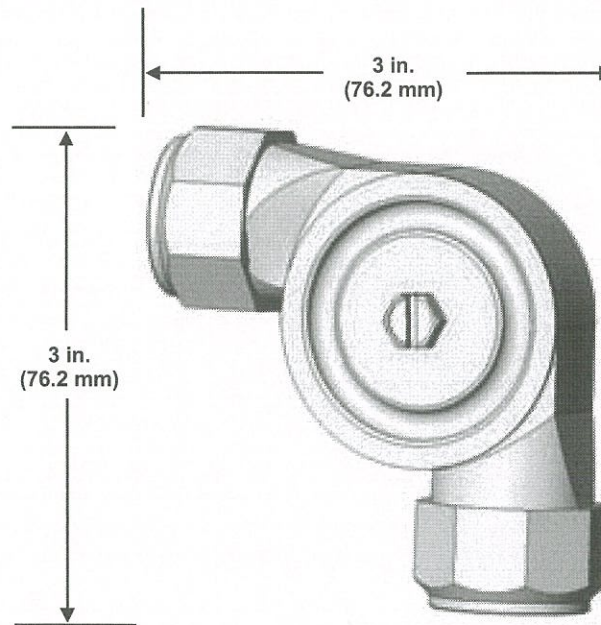


Figure 2-33. Corner Pulley, P/N WK-844648-900

**2-2.4 Remote Manual Releases****2-2.4.1 REMOTE MANUAL RELEASE, P/N B875572 (UCH ONLY)**

The Remote Manual Release, shown in Figure 2-35, is provided as a means of manually actuating the system from a remote location. The Remote Manual Release is attached to the UCH Control System with 1/16-inch control cable. To actuate the system at the Remote Manual Release, pull out the safety pin and pull hard on the handle.

Each Remote Manual Release is supplied with a separate nameplate. This nameplate must be attached to the mounting surface 1-inch above or below the Remote Manual Release.

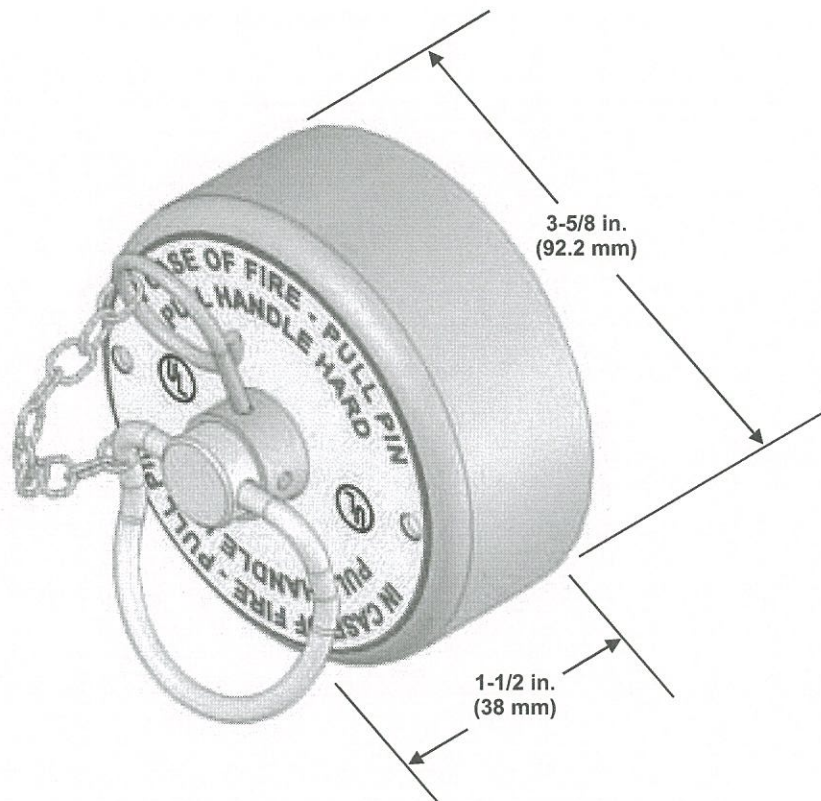


Figure 2-35. Remote Manual Release, P/N B875572

## Component Description

### 2-3.3 Mechanical Gas Valve, P/N B12007X

A Mechanical Gas Valve is required on systems used to protect gas-fueled appliance(s). Upon system actuation, the control stem closes, stopping the gas flow to the appliance(s).

**Note:** Only Mechanical Gas Valves that are specifically UL listed and identified by part number in this manual may be used with the Range Guard system.

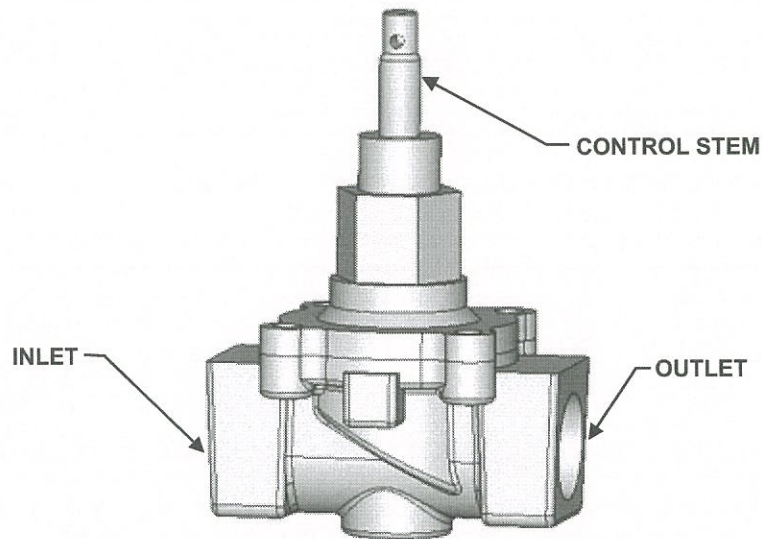


Figure 2-42. Mechanical Gas Valve, P/N B12007X

Table 2-17. Mechanical Gas Valve Sizes

Pipe Size	Part Number
3/4 in. (19 mm)	B120071
1 in. (25.4 mm)	B120072
1-1/4 in. (32 mm)	B120073
1-1/2 in. (38 mm)	B120074
2 in. (51 mm)	B120075
2-1/2 in. (64 mm)	B120076
3 in. (76 mm)	B120077

**2-3.11 1/2-inch Vent Plug, P/N 9196984**

A 1/2-inch Vent Plug is used in the discharge piping near a Range Guard cylinder to prevent pressure build-up in the discharge pipe system, caused by heat, from rupturing the foil seals on each nozzle. The 1/2-inch Vent Plug is to be installed in the discharge piping so that it faces the ceiling or the wall.



**NEVER INSTALL IT FACING DOWN OR AT THE FLOOR.**

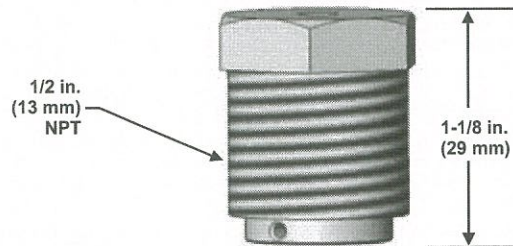


Figure 2-50. 1/2-inch Vent Plug, P/N 9196984

**2-3.12 Keeper Pin, P/N 9197108**

The Keeper Pin (P/N 9197108) is used to prevent actuation while installing the system.

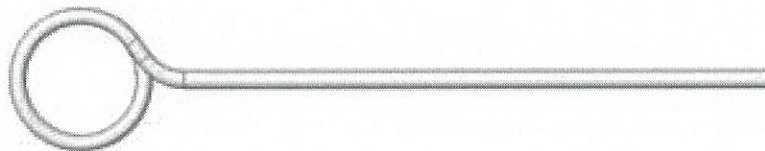


Figure 2-51. Keeper Pin, P/N 9197108

**2-3.13 System Recharge**

For recharge purposes, select the size of the Karbaloy agent recharge container (see Table 2-22) that fits the cylinder.

Table 2-22. Wet Chemical Agent

Part Number	Old Part Number	Wet Chemical
87-120030-001	9197428	RG-1.25G Wet Chemical Recharge Container
87-120031-001	9197257	RG-2.5G Wet Chemical Recharge Container
87-120032-001	9196991	RG-4GS/RG-4GM Wet Chemical Recharge Container
87-120033-001	9196783	RG-6G Wet Chemical Recharge Container

**Note:** It is permissible to use old and/or new recharge containers included in this manual in a Range Guard system.