Flame Arrestor Blowouts Installation Guide

Safety

These instructions pertain only to the Selas Flame Arrestor Blowouts and should only be used for its intended purpose. Only qualified personnel should work on the Flame Arrestors to ensure proper installation, especially when installing gas piping or electrical wiring. All installations MUST follow/meet region requirements. If unsure about this information, contact your local gas or electric company. This product can cause serious injury/harm if misused; any person working with the Flame Arrestors should be equipped with proper protective equipment, such as safety glasses, close-toed shoes, and adequate clothing attire. Contact the factory if you have any questions or concerns regarding the Flame Arrestor Blowouts.

Warning: *This guide* ***does not*** *provide every eventuality; the information provided should be considered when working with the Flame Arrestor Blowouts.*

Description: How it works

The Selas Flame Arrestors are essential devices that automatically protect combustion controllers or mixers. These flame arrestors feature a directed flow release device combined with a check valve, known as the Selas blowout. Typically used in pre-mixed combustion systems operating with fuel gases such as natural gas, propane, butane, or commonly manufactured gases, these blowouts include a check valve, rupture disc, switch, and flame-arresting screen to safeguard combustion controller piping. They protect the combustion controller or blower from excessive overpressure in combustion piping caused by a fire inside the pipe and retard backward flame propagation. Installed close to the controller or blower outlet, they ensure the safety and efficiency of the combustion system.

Applications

The ideal application for the Flame Arrestor Blowout provides overpressure protection for gas ombustion controllers and blowers.

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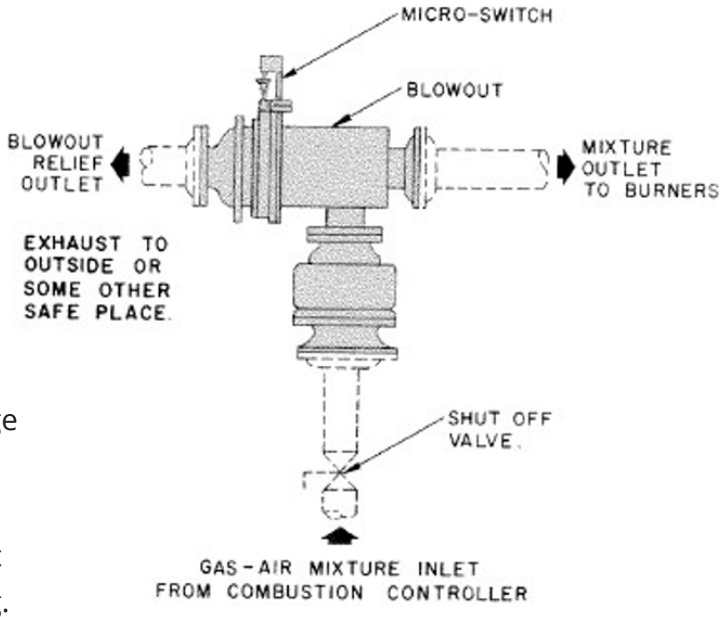
Installation

1. Install the Selas Flame Arrestor Blowout close to the combustion controller on the vertical leg of the premix fuel discharge piping. Ensure the vertical inlet and horizontal outlet orientation are maintained for effective operation of the check valve and trip baffle assembly (see Fig. 1).



2. Place throttling control valves downstream of the blowout.

3. Direct the blowout relief vent to a safe discharge area, preferably outdoors. Avoid locating the exhaust vent near workstations, traffic routes, or vulnerable equipment. Prohibit access to the vent zone while the combustion controller is operating.

4. Assemble vent piping with the fewest elbows possible, avoiding long piping runs or obstructions. Excessive restrictions may not provide sufficient pressure relief to protect the combustion controller.

5. Install the blowout in a location that allows maintenance of the flame screen, check valve, or rupture disc replacement. If side removal of the flame screen is restrictive (except for SBC-3A, which has top access), remove the flange bolts and rotate the housing to a more convenient position.

6. Support the blowout independently of the combustion controller to avoid unnecessary weight on the combustion controller connection. Also, support the vent piping independently of the blowout, especially for the SBC-3A, to allow removal of the vent flange for access to the rupture disc and trip baffle assembly.

7. Do not use sheet metal ducts as vent exhaust lines.

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Electrical Wiring

The Selas blowout includes an electrical switch rated at 15 amps and capable of handling 125-, 250-, or 480-volts AC. To wire the micro switch, connect it to the manual reset shutoff valve in the gas supply line and the combustion controller motor. This setup ensures the micro switch will close the shutoff valve and stop the motor when the rupture disc shatters. The safety circuit is closed when the trip baffle assembly is in the operating (vertical) position.

Ensure all electrical connections are secure and comply with local electrical codes. Before making any electrical connections, verify that the power supply is turned off and double-check all wiring connections to prevent potential hazards. For this installation, you'll need wire strippers, screwdrivers, a multimeter, and electrical tape.

Pressure Test

When pressure testing piping for leaks, it is crucial to consider the pressure exposure limits of all installed apparatus, such as regulators, burners, firechecks, and blowouts. Selas Flame Arrestor Blowouts are typically used in premix combustion systems with pressures not exceeding 6 psi (41 kPa). Exceeding 10 psi (69 kPa) may cause the rupture disc to break, leading to potential system failure. It may be convenient to test for leaks while operating the connected combustion system blower with air only at maximum pressure. A centrifugal blower usually develops its highest pressure at about 50% of its rated capacity. Ensure the blower is operated within this range during the test to achieve accurate results. Always wear appropriate personal protective equipment (PPE) during pressure testing, and ensure all personnel are aware of the testing procedure and potential hazards. Maintain a safe distance from the equipment being tested to avoid injury in case of a rupture. By following these guidelines, you can ensure a safe and effective pressure testing process for your Selas Flame Arrestor Blowouts.

Maintenance

Selas recommends blowout valves and related devices to be inspected at least annually. Before beginning any blowout inspection or repair procedures, turning off the combustion controller fuel gas and power supply is crucial. Routine maintenance for the Selas Flame Arrestor Blowout involves two main tasks: replacing the rupture disc when it shatters and periodically inspecting the flame screen, check valve, and trip switch assembly. When a ruptured disc brakes, identifying the cause of the flashback into the combustion piping is essential. Common causes include defective burners, low line pressure at burners, or power failure resulting in a mixture in the line. Chronic flashbacks may indicate that mixture pressure settings are too low for the specific fuel gas or that there are issues in the combustion control system.

Maintenance (Continued)

Periodic preventive checks should be planned every three months with full functional and safety inspection at least annually. Inspection cycles will vary depending on the type of burner used, the type of duty, and the fuel and air quality. The flame arrestor screen, made of a wound, corrugated strip forming many small holes, can become blocked by dust or fine particles. Fouling of the screen reduces pressure delivery and mixture flow to the burners. Monitoring the pressure differential across the flame screen at a consistent flow rate can indicate the degree of fouling without shutting down for inspection. Petcocks are provided on each blowout for this purpose. Establish a reference standard by measuring and recording the pressure drop across the blowout at maximum flow rate upon installation completion. Subsequent pressure drop measurements at identical flow rates can be compared to the original pressure drop to determine the degree of fouling. Fouling can usually be minimized by improving filtration at the combustion air intake. Flame arrestor screens are best cleaned by soaking in a non-toxic, nonflammable solvent and then blowing out the dirt with compressed air from the reverse direction of normal flow. Screens should be rinsed and dried before replacement. Oily screens will become blocked sooner. When removing the flame arrestor screen, protect it from mechanical impact, as the crimped aluminum strip forming the screen is easily damaged.

Inspect the check valve and trip switch assembly periodically when a shattered rupture disc is replaced or during flame screen cleaning. The check valve should slide smoothly throughout its full stroke on its stem; use only dry-type lubricant as needed, and do not use oil or grease. Replace the check valve disc or stem when worn. The trip switch assembly should also be checked for smooth movement when pivoted away from the rupture disc. The electrical switch must have open contacts when the trip baffle assembly is in the tripped (near-horizontal) position. For servicing blowouts, follow the “General Procedures” standard for all Selas blowouts and refer to the “Specific Blowout Procedures” for the requirements of individual models.

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Rupture Disc Replacement

a. Follow the “Specific Blowout Details” procedures outlined on the following pages to remove the ruptured disc assembly.
b. Carefully remove all fragments, including the ring of the shattered disc, from the blowout and vent pipe.
c. Inspect the trip baffle assembly to ensure it moves freely and smoothly about its pivot. If the baffle is damaged, replace it or restore it to its original form.
d. Verify that the electrical switch operates correctly and has not been damaged.
e. Install the replacement rupture disc and gasket.
f. Ensure the trop switch assembly’s electrical contacts are closed and open at the correct baffle positions.
g. Check the clearance between the reset knob and the electrical switch with the trip baffle assembly in the tripped (near horizontal) position. There should be a nominal gap of 3/64in (1mm) between the switch plunger and the reset knob. If necessary, adjust the reset knob and lock the adjustment with the adjacent nut.
h. Replace all covers and pipe plugs to restore the blowout to its original operating conditions.
i. Test the unit for leaks by operating the combustion controller on air only. Pay special attention to the joints that were disturbed during the replacement process.
j. Determine if the cause of the flashback has been remedied before restoring the combustion system to service.

Reassembly

After inspection or repair of the Selas Flame Arrestor Blowouts, reassemble the unit carefully, ensuring all mating parts sit squarely. Replace any worn or damaged gaskets to maintain a leak-tight seal. It is crucial that the seating faces of the check valve are clean, dry, and free of nicks. Once reassembled, test for leaks by operating the combustion controller with air only. Confirm that all sealing surfaces are leak-tight before restoring the system to combustible service. Double-check all connections and seals to ensure the system is fully operational and safe.

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Rupture Disc Replacement: SBC-3A

1. Remove or support the vent pipe independently of the blowout.
2. Remove the vent flange (2) and carefully drop the flange assembly away from the electrical switch contact.
3. Follow steps b through e in the “General Procedures” section on the following pages.
4. Place the new rupture disc, ensuring the gasket is positioned between the disc and the blowout body (1). Note that the gap between the electrical switch and the trip assembly reset knob may be affected by the play between bolts and bolt holes of the mating flanges. If the reset knob adjustment is not adequate to restore the nominal gap of 3/64 in. (1 mm), readjust the bolt-hole alignment.
5. Ensure the movement of the trip baffle corresponds with the electrical switch operation by one of the following methods: If the vent pipe does not obstruct access, reach through the vent flange (2) and trip the baffle by hand. Alternatively, remove the pivot access plug (11) at the side of the assembly and insert a screwdriver into the slot of the baffle pivot shaft (9). Rotate the screwdriver a quarter-turn to affect the entire movement of the baffle trip switch assembly. Clockwise rotation imitates the tripping action; counterclockwise rotation restores the baffle to the operating (vertical) position.
6. Continue with steps F and G in the “General Procedures” section on the following pages.
7. Reinstall the pivot access plug.
8. Proceed through the remaining steps, h, i, and j, in the “General Procedures” section on the following pages.

Flame Screen & Check Valve

Flame screen and check valve are accessible from the top of the unit.
1. Accessing the Flame Screen: Remove the top cover plate (25). Unscrew the blast-directing tube (24) by tapping lightly on the lugs welded to the tube (right-hand thread). Extract the tube through the top to expose the flame screen assembly (20).
2. Removing the Flame Screen: Unscrew the holding nut (38) and remove the flame screen.
3. Accessing the Check Valve: Remove the screen holder screws (39) and lift out the screen holder (40).
4. Removing the Check Valve Components: Remove the check valve’s cotter pin and washer. Lift off the valve disc (30) and unscrew the hex gland.

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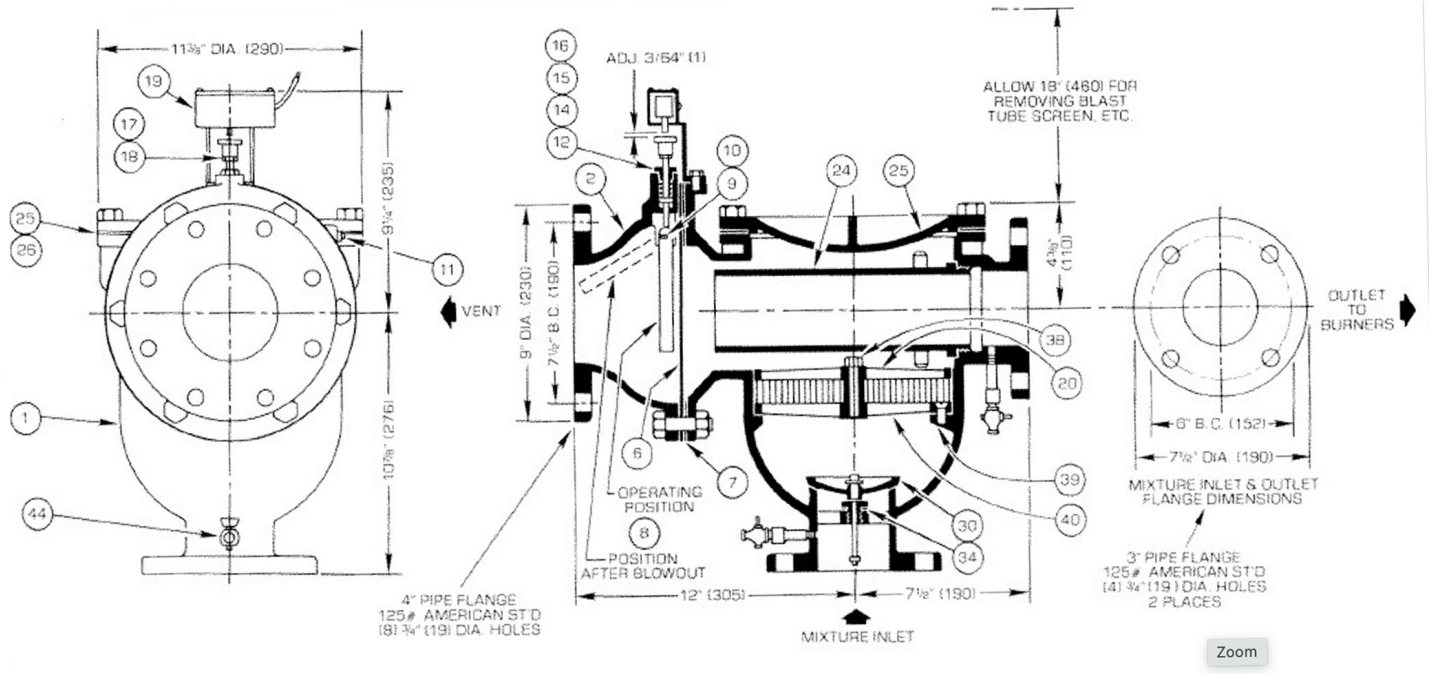
SBC-3A Dimensions & Parts List



Number	Part	Number	Part	Number	Part	Number	Part
1	Body	10	Pivot Set Screw	18	Adjustment Lock Nut	30	Check Valve Disc Ass'Y
2	Vent Flange	11	Pivot Access Plug	19	Microswitch	34	Lock Wash-er
6	Rupture Disc	12	Trip Stem	20	Flame Screen Ass'Y	38	Flame screen Holding Nut
7	Rupture Disc Gasket	14	Trip Spring	24	Blast Direc-tion Tube	39	Screen Holder Screws
8	Trip Baffle	15	Spring Gland	25	Top Cover Plate	40	Screen Holder
9	Baffle Pivot	16	Spring Retainer	26	Top Cover Plate Gas-ket	44	Pressure Test Cocks (2)
		17	Adjustment Knob				

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Rupture Disc Replacement: SBC-4A & SBC-6A

1. Remove the pivot access plug (11) on the side of the vent flange (2). Insert a screwdriver into the slot of the baffle pivot shaft (9) and rotate it a quarter-turn clockwise. This will move the baffle (8) to the operating (vertical) position, allowing for unobstructed withdrawal.
2. Remove the nuts from both slip ring bolts (41), leaving the bolts in place. Pry the slip ring (4) rearward. Loosen the 6 screws holding the baffle mount ring (5) several turns, then tap the screw heads lightly to separate the gasket surface. Altogether remove the 6 screws. Remove the two bolts (41) to allow the baffle mount ring (5) to drop through the aperture.
3. Refer to steps b through e in the “General Procedures” section on the following pages.
4. Place the gasket between the new rupture disc and the blowout body (1). Ensure that two bolt holes are reserved for through bolts to engage the slip ring (4). Note that the gap between the electrical switch and the trip assembly reset knob can be affected by normal play between bolts and bolt holes of mating flanges. If the reset knob adjustment is not adequate to restore the nominal gap of 3/64 in. (1 mm), readjust the bolt holes alignment. Install the two slip ring bolts (41) and pull the slip ring (4) against the trip assembly flange. Tighten all 6 screws and 2 bolts uniformly.
5. Verify the relationship of the electrical switch contacts for the trip baffle position by inserting a screwdriver into the pivot access plug hole to engage the slot of the baffle pivot (9). Rotate the screwdriver a quarter-turn to move the trip switch baffle. Clockwise rotation imitates the tripping action; counterclockwise rotation restores the baffle to the operating (vertical) position.
6. Follow steps f and g in the “General Procedures” section on the following pages.
7. Replace the pivot access plug (11).
8. Proceed through the remaining steps, h, i, and j, in the “General Procedures” section on the following pages.

Flame Screen and Check Valve

For the Selas Flame Arrestor Blowout, the flame screen (20) and check valve (30) can be accessed for inspection or repair by removing the screen cover plate (22). The flame screen is held by a safety nut (36) and locked with a cotter pin (37). Given that the flame screen can weigh up to 9 lbs. (4 kg), it is advisable to use a protective pad or board underneath to remove it. To remove the check valve from the blowout housing, unscrew the nut above the lock washer (34). This setup ensures that both the flame screen and check valve are easily accessible for maintenance, promoting safety and efficiency in the Selas Flame Arrestor Blowout operation.

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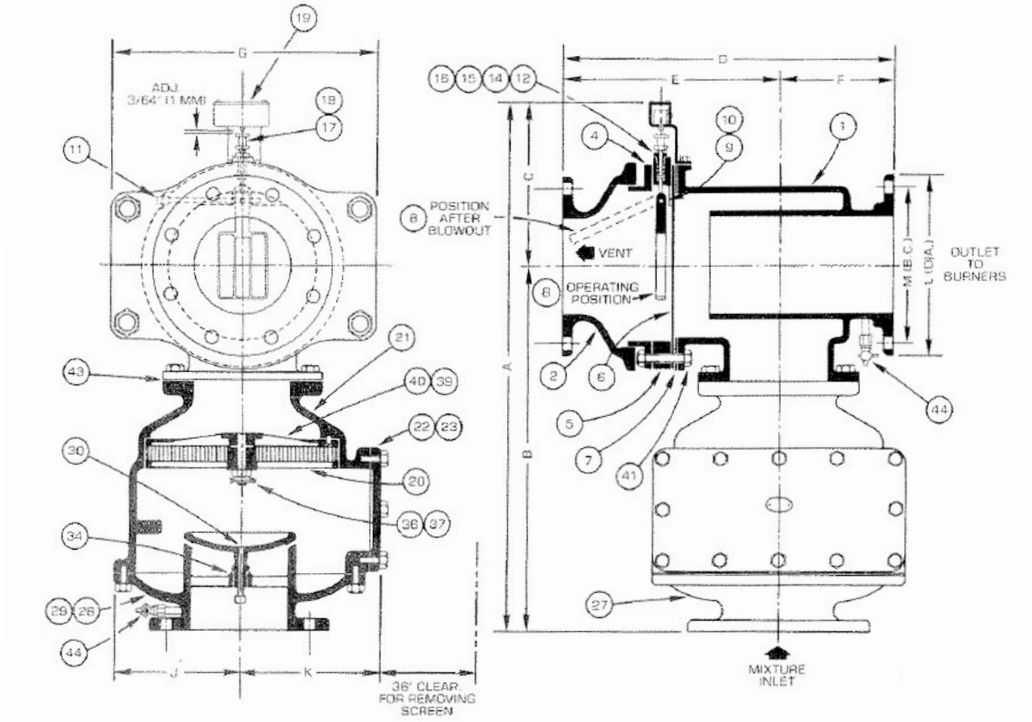
SBC-4A & 6A Dimensions & Parts List



Number	Part	Number	Part	Number	Part	Number	Part
1	Body	10	Pivot Set Screw	20	Flame Screen Ass'y	36	Safety Nut
2	Vent Flange	11	Pivot Access Plug	21	Flame Screen Housing	37	Cotter Pin
4	Slip Ring	12	Trip Stem	22	Screen Cover Plate	39	Screen Holder Screws
5	Baffle Mount Ring	14	Trip Spring	23	Cover PL Gasket	40	Screen Holder
6	Rupture Disc	15	Spring Gland	27	Check Valve Housing Ass'y	41	Slip Ring Screws (6)
7	Rupture Disc Gasket	16	Spring Retainer	28	Check Valve Housing	43	Pipe Flange Gasket (2)
8	Trip Baffle	17	Adjustment Knob	29	Check Valve Housing Gasket	44	Pressure Test Cocks (2)
9	Baffle Pivot	18	Adjustment Lock Nut	30	Check Valve Disc Ass'y		
		19	Microswitch	34	Lockwasher		

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Letter	SBC-4A	SBC-6A
A	28-3/16 (716)	33-11/16 (856)
B	19-11/16 (500)	23-9/16 (600)
C	8-1/2 (216)	10-1/8 (257)
D	16-3/4 (425)	21-1/4 (540)
E	11 (280)	13-1/4 (337)
F	5-3/4 (146)	8 (203)
G	12-5/8 (320)	16-1/4 (413)
J	6-1/8 (156)	7-3/4 (200)
K	6-7/8 (175)	8-1/2 (216)
L	9 (230)	11 (280)
M	7-1/2 (190)	9-1/2 (241)
N	4	6
P	¾ (19)	7/8 (22)

Rupture Disc Replacement SBC-8B

1. Remove the 4 screws securing the disc access plate (3) located at the bottom of the vent flange (2). The access plate is attached with a chain.
2. Loosen the 6 jam nuts and back of the clamp screws (46) approximately 5/8 inch (16mm). Slide the baffle mount ring (5) rearward to clear the 2 locating dowel pins (42) at the bottom. Remove the ring assembly through the aperture.
3. Follow steps b through e in the “General Procedures” section of the manual.
4. Place a gasket on each side of the new rupture disc. Position the components on the locating dowel pins (42). Install the baffle mount ring (5) and tighten the clamp screws (46) until they are in firm contact with the ring.
5. Verify the electrical switch contacts’ relationship to the trip baffle position by reaching through the access aperture and manually actuating the baffle between the tripped and operating (vertical) positions. Follow steps f and g in the “General Procedures” section.
6. Replace the disc access plate (3). Back off the 2 jam nuts and clamp screws (46) by 2 turns before fastening to the body. Tighten all 8 clamp screws (46) that secure the baffle mount ring (5). Snug the jam nuts firmly to lock the screws in place.
7. Continue with steps h, i, and j in the “General Information” section of the manual.

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Flame Screen and Check Valve

The flame screen is an essential component of the Selas Flame Arrestor Blowouts. It is in a separate housing (21) below the blowout body (1) and can be accessed by removing the flame screen cover (22). The flame screen assembly (20) can be easily removed by its handle for service or replacement, as it is not secured with fasteners. Instead, it is locked in place by close confinement within the chamber space. When removing the flame screen, handle it carefully to avoid damaging the crimped aluminum strip. A gasket is not necessary between the flame screen housing (21) and the flame screen cover (22); however, a seal is required. Use a heavy-duty automotive grease or another non-hardening substance to ensure a proper seal.

The check valve (31) is a self-contained, integral unit mounted in its own housing (27). Repair or parts replacement typically requires the removal of the complete check valve housing from the pipeline. However, in some cases, it may be possible to test for free check valve movement without removing it from the line. This can be done by reaching in and down through the side aperture of the flame screen housing (21) after the flame screen cover (22) and flame screen (20) have been removed.

SBC-8B Parts List

Number	Part	Number	Part
1	Body	21	Flame Screen Housing
2	Vent Flange	22	Flame Screen Cover
3	Disc Access Plate	27	Check Valve Housing Ass'Y
5	Baffle Mount Ring	28	Check Valve Housing
6	Rupture Disc	31	Check Valve Disc
7	Rupture Disc Gaskets (2)	32	Check Valve Stem
8	Trip Baffle	33	Check Valve Spring
9	Baffle Pivot	35	Check Valve Washers (3)
12	Trip Stem	36	Slotted Nut
13	Stem Holder	37	Cotter Pins (2)
14	Trip Spring	42	Locating Dowel Pins
15	Spring Gland	43	Pipe Flange Gaskets
16	Spring Retainer	44	Pressure Test Cocks (2)
17	Adjustment Knob	45	Access Plate Screws
18	Adjustment Lock Nut	46	Clamp Screws & Jame Nuts
19	Microswitch		
20	Flame Screen Ass'Y		

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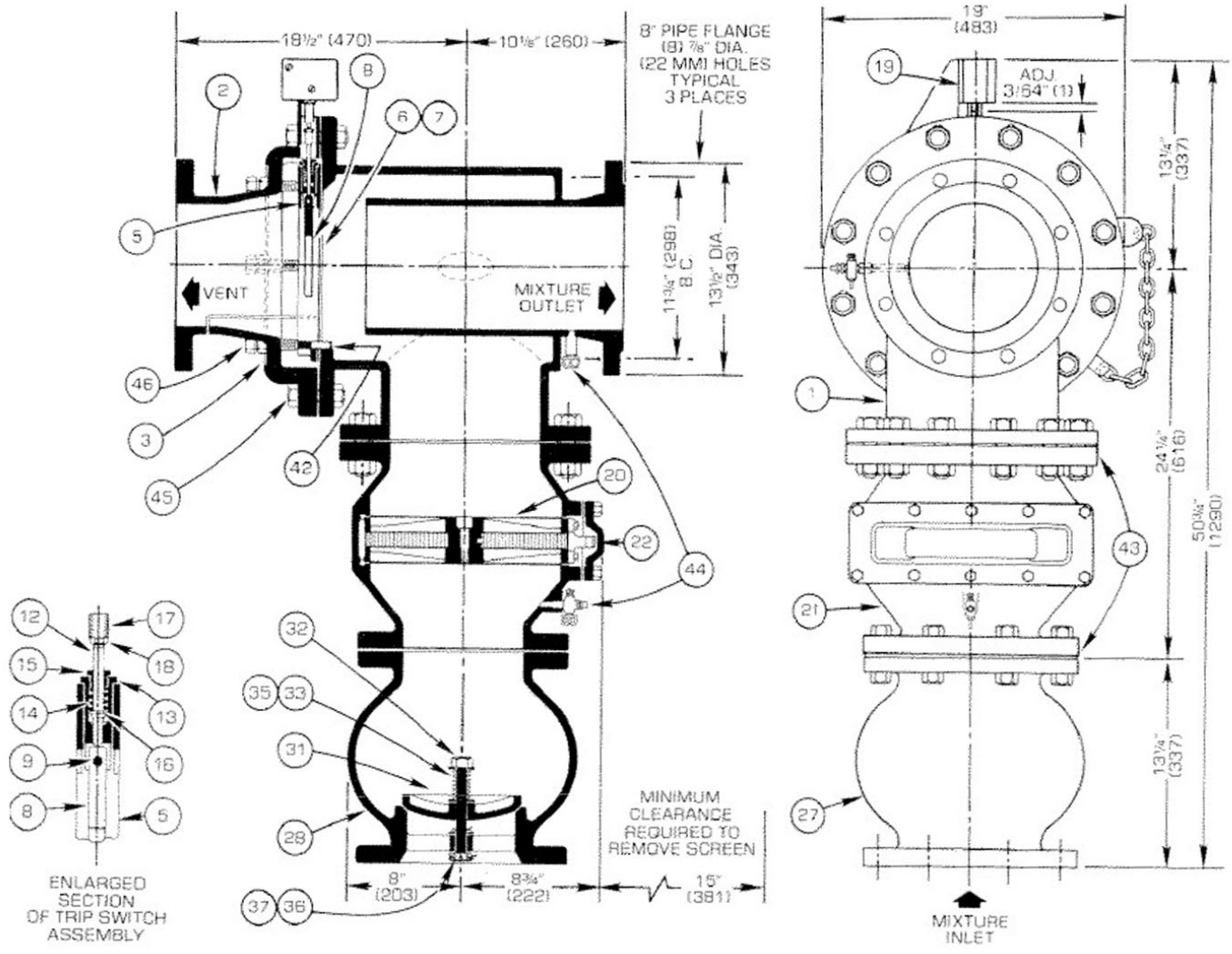
SBC-8B Dimensions



SCAN FOR MORE INFORMATION

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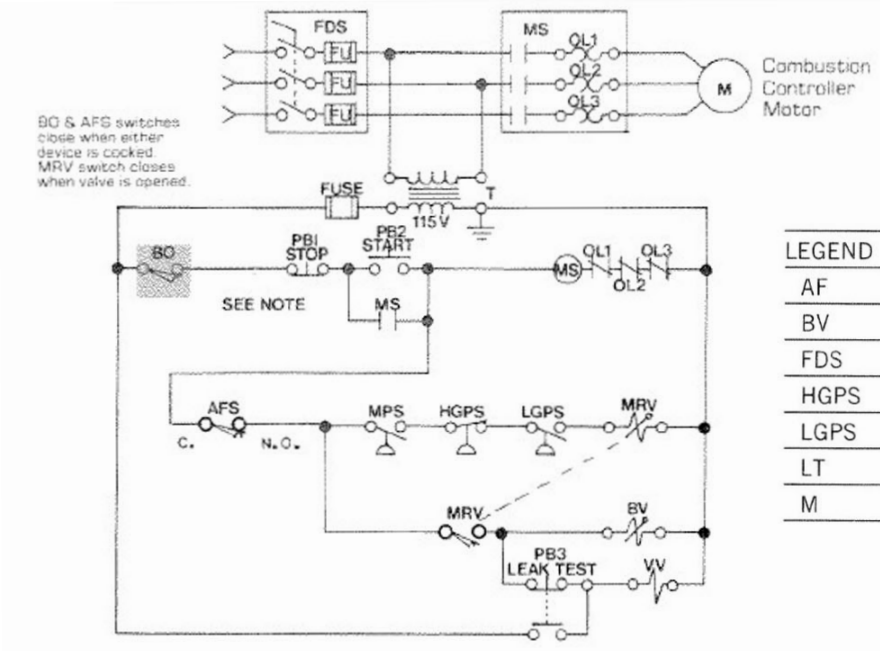
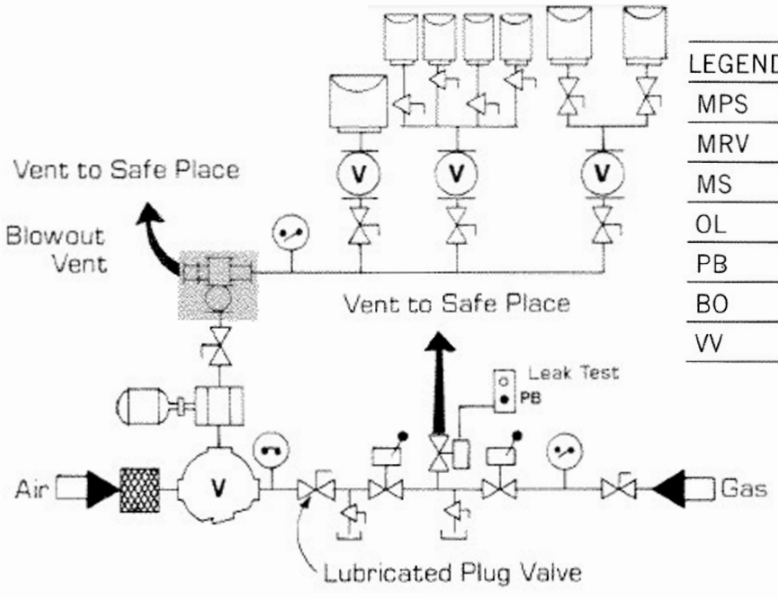
Wiring Diagram



LEGEND	DESCRIPTION
AF	AUTOMATIC FIRECHECK
BV	BLOCKING VALVE
FDS	FUSIBLE DISCONNECT SWITCH
HGPS	HIGH GAS PRESSURE SWITCH
LGPS	LOW GAS PRESSURE SWITCH
LT	LEAK TEST ASSEMBLY
M	MOTOR (COMB. CONT.)

Piping Diagram



LEGEND	DESCRIPTION
MPS	MIXTURE PRESSURE SWITCH
MRV	MANUAL RESET VALVE
MS	MOTOR STARTER
OL	OVERLOAD
PB	PUSH BUTTON
BO	BLOWOUT
VV	VENT VALVE

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