

# Spence P125 Trip Stop Pilot



## WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Emerson pilot must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies, Inc. (Emerson) instructions.

If the pilot vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Installation, operation and maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Only a qualified person shall install or service the Type P125.

## Introduction

### Scope of the Manual

This manual provides instructions for installation, operation, maintenance and parts information for the Type P125 trip stop pilot.



Figure 1. Type P125 Trip Stop Pilot

## Product Description

The Type P125 trip stop pilot is used in conjunction with a Spence main valve. This combination is known as a trip stop valve.

Type P125 is a manually resettable trip pilot that, once “tripped”, results in the closing of a Spence main valve; therefore preventing further overpressure of the downstream system. The trip pilot is set at a pressure slightly greater than the desired delivery pressure. This setting procedure is completed at the factory before the pilot is shipped.

# Type P125

## Specifications

The Specifications section gives some general specifications for the Type P125 trip stop pilot. The nameplates give detailed information for a specific pilot as built in the factory.

### Maximum Inlet Temperature<sup>(1)</sup>

**Cast Iron:** 450°F / 232°C

**Cast Steel:** 750°F / 400°C

### Maximum Inlet Pressure<sup>(1)</sup>

**Cast Iron:** 250 psig / 17.2 bar

**Cast Steel:** 600 psig / 41.4 bar

### Pressure Ranges<sup>(1)</sup>

5 to 25 psig / 0.35 to 1.72 bar

10 to 50 psig / 0.69 to 3.45 bar

40 to 150 psig / 2.76 to 10.3 bar

150 to 175 psig / 10.3 to 12.1 bar

### Construction Materials

**Body:** Cast Iron, Steel

**Stem, Disc and Seat:** Stainless steel

**Gasket:** Stainless steel

### Approximate Weights

**Cast Iron:** 26 lbs / 12 kg

**Cast Steel:** 28 lbs / 13 kg

1. The pressure/temperature limits in this Instruction Manual or any applicable standard limitation should not be exceeded.

## Principle of Operation

During normal operation, the Type P125 trip stop pilot is mechanically held open (latched). Steam supply pressure is piped to the diaphragm of the trip stop main valve (Spence Types E, E2 or E5), holding it in the open position. Reduced pressure is then controlled by the pressure reducing valve. If the reduced pressure increases to the set pressure of the Type P125 trip stop pilot, two things happen. The weighted lever is unlatched, shutting off the steam supply to the trip stop main valve diaphragm chamber and the actuating steam in the diaphragm chamber of the trip stop main valve is vented downstream. Venting of the actuating steam allows the spring in the trip stop main valve to shut the valve. The Type P125 Pilot must be manually reset after being tripped. The reduced steam pressure must be less than the Type P125 set pressure for the Type P125 to remain reset.

**Additionally, physical damage to the pilot may result in personal injury or property damage due to escaping of accumulated gas. To avoid such injury and damage, install the pilot in a safe location.**

**All pressure equipment should be installed in a non-seismic area; should not be exposed to fire; and should be protected from thunderbolt (lightning) strikes.**



## CAUTION

**The piping system must be adequately designed and supported to prevent extraordinary loads to the pressure equipment.**

## Installation (Figures 2 and 3)



## WARNING

**Personal injury or system damage may result if this pilot is installed, without appropriate overpressure protection, where service conditions could exceed the limits given in the Specifications section and/or pilot nameplate.**

## Planning

1. Locate the trip stop valve in a straight run of horizontal pipe, downstream of the reducing valve. Allow headroom above the trip stop main valve for access through the blind flange.
2. Provide clearance for stem withdrawal below. Allow headroom above the trip stop pilot for installation of 1/4 in. / 6.35 mm control pipe.

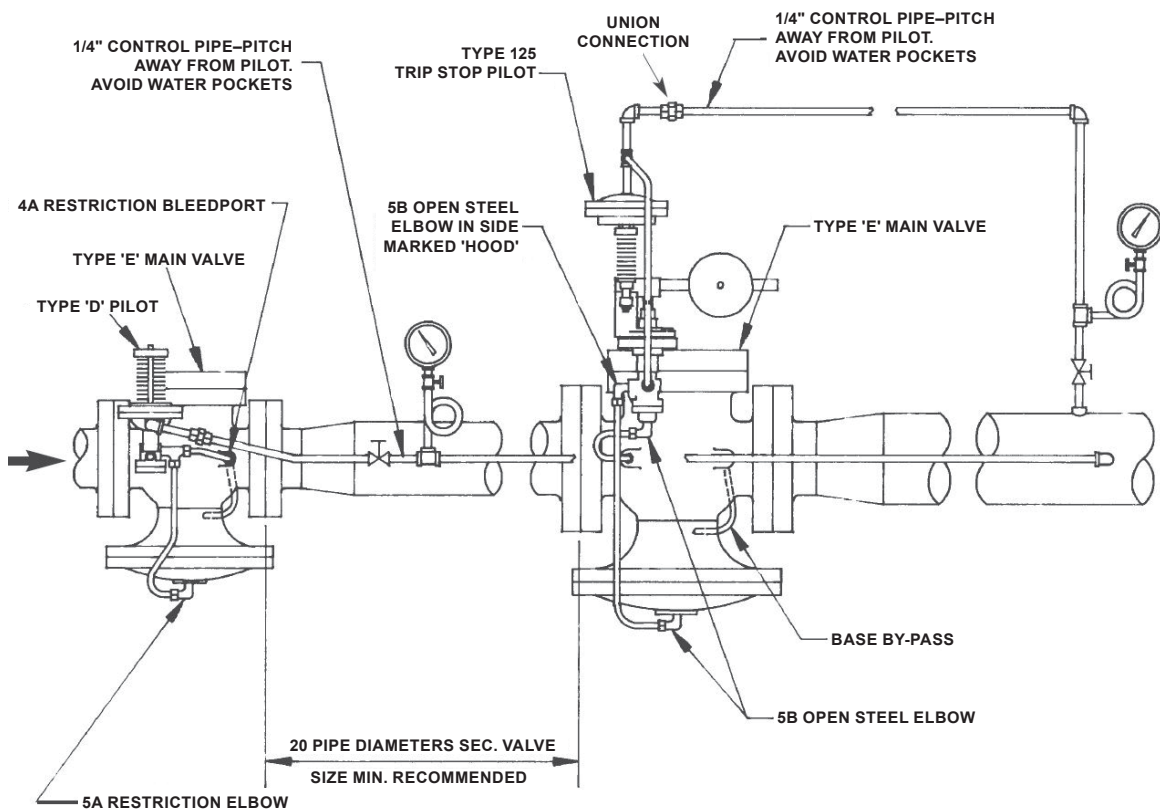


Figure 2. Type P125 Typical Installation

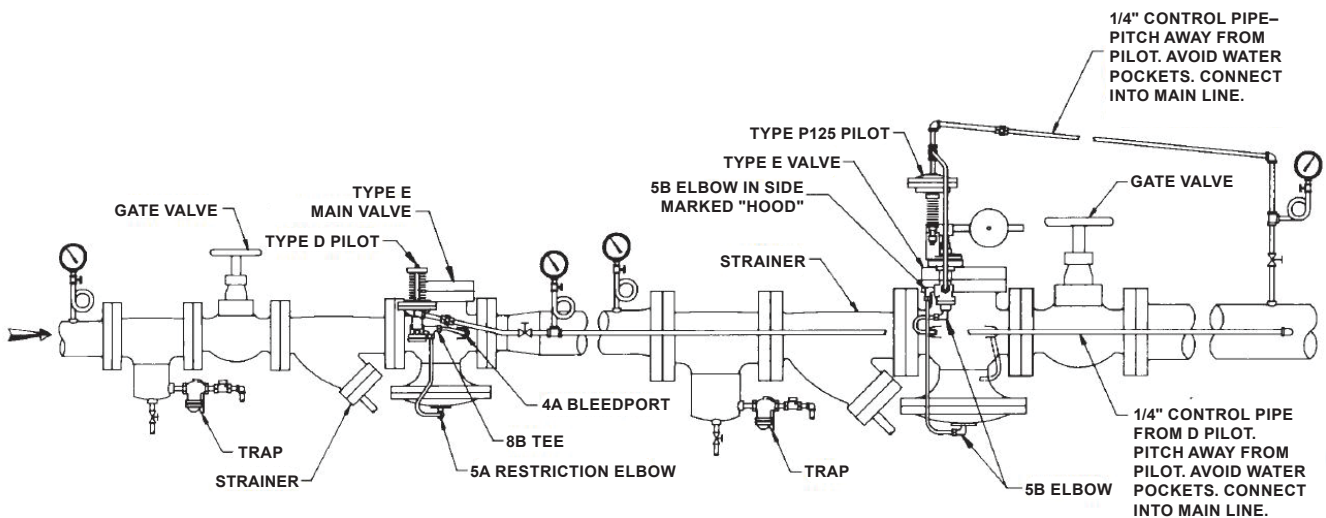


Figure 3. Type P125 Piping Installation

# Type P125

## Gauges and Trapping



### WARNING

**Steam is a potentially dangerous fluid and should be treated with caution.**



### CAUTION

**Any steam line being filled and pressurized will form condensate. This condensate can be carried by high velocity steam, causing water hammer and possible failure of system components. The steam system must be adequately trapped to remove the condensate as it forms.**

Install initial and reduced pressure gauges to indicate performance.

## Trip Stop Main Valve

1. Flush the piping system thoroughly to clear it of dirt and debris.
2. Mount the trip stop main valve with the diaphragm chamber down and the arrow on the body pointing in the direction of flow.
3. Screwed end valves should be mounted between unions.

## Type P125 Pilot



### CAUTION

**Type P125 is a bracket mounted pilot. Never mount the Type P125 by the pipe nipple. Cracking of the nipple and/or pilot body can occur causing steam to blow out.**

1. Mount the bracket on the long stud extending above the trip stop main valve top flange. Bracket should be perpendicular to pipe run. Tubing is supplied pre-bent when the Type P125 pilot and the trip stop main valve are ordered together. No further bending is needed.
2. Connect the 1/4 NPT pipe tee installed on top of the trip stop pilot to the reduced pressure control point using 1/4 in. / 6.35 mm pipe. This is the Type P125 sensing line.

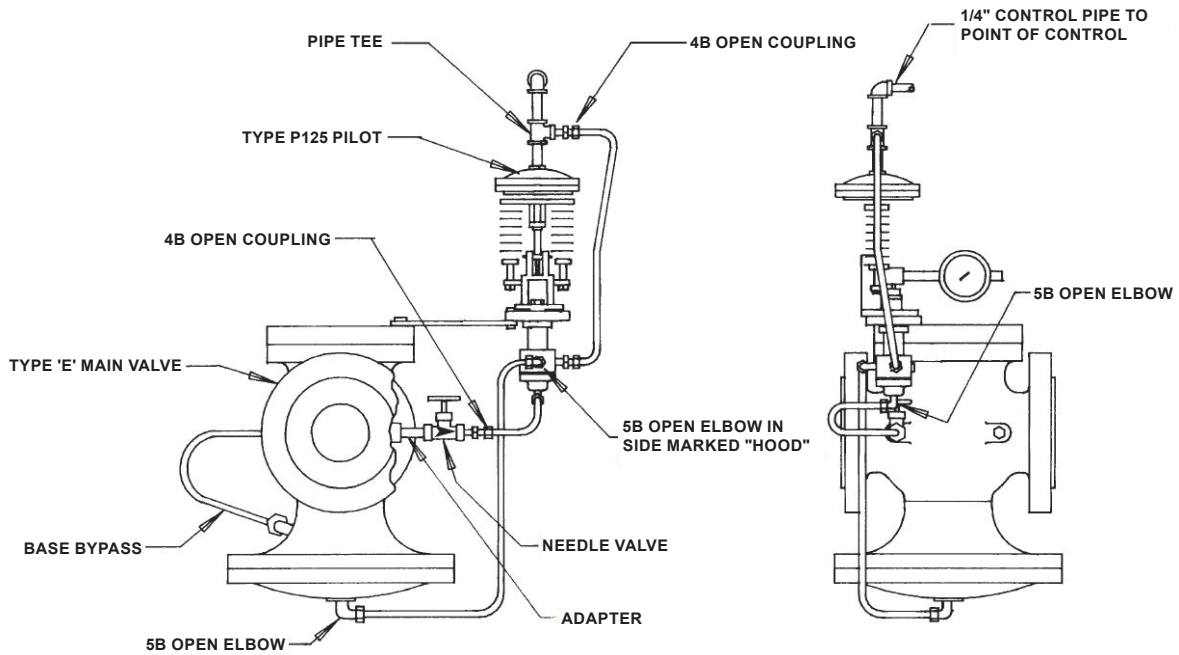
3. Pitch sensing line to avoid water pockets. Connect it to a dedicated connection on the top of the steam pipe.
4. Connect the vent line from the tee installed on top of the pilot to the pilot body. 5B open elbow is used at the body and 4B open straight coupling is used at the tee.
5. Connect the steam supply line from the upstream connection on the trip stop valve to the inlet connection on the bottom flange of the Type P125 trip stop pilot. This line must have the needle valve installed with flow direction arrow away from the main valve. A 4B open straight coupling is used at the trip stop main valve and a 5B open elbow is used at the pilot.
6. Connect the pilot outlet to the trip stop main valve hood.

For Type E main valves without condensation chamber only (Figure 4):

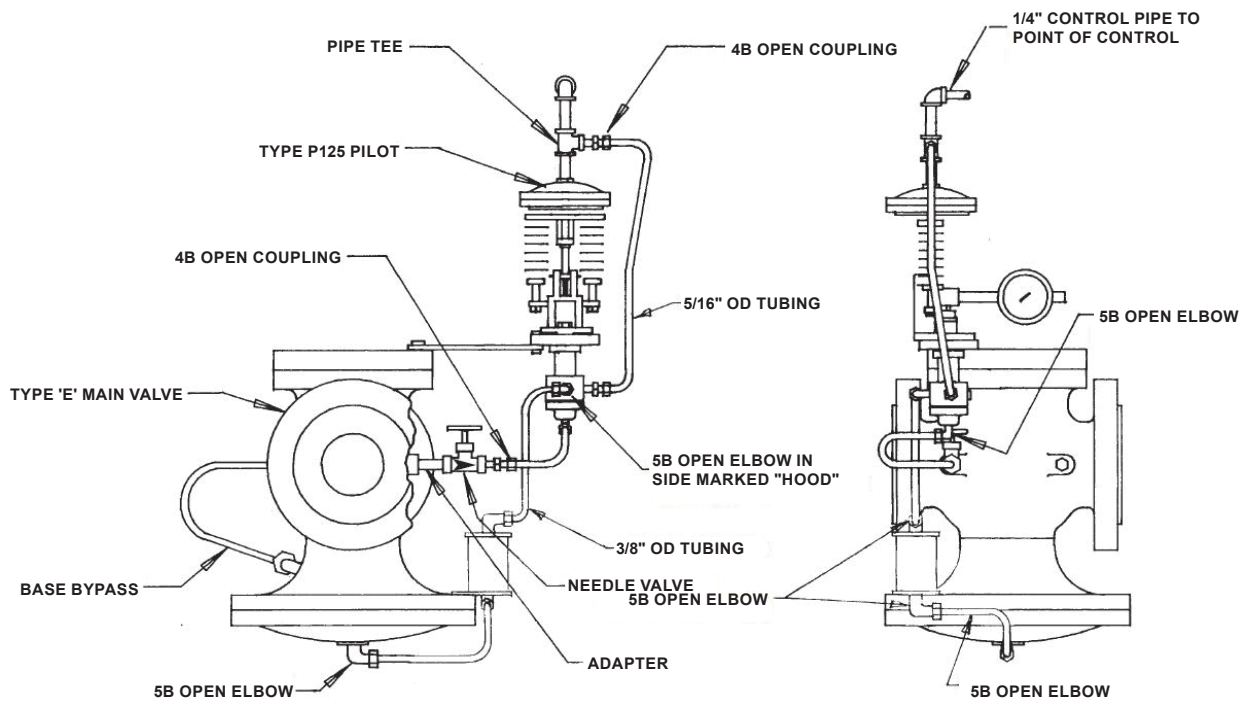
- a. Screw 5B open elbow into tapped hole in bottom of diaphragm chamber. Connect this fitting with provided tubing to the 5B open elbow stamped "HOOD" in the Type P125 Pilot.
- b. Install base bypass by screwing 5B open elbow into tapped hole in upper diaphragm chamber and 5B open elbow into tapped hole on outlet side of trip stop main valve.

For Type E2, E5, NPS 10 / DN 250 E or NPS 12 / DN 300 E main valves only (Figure 5)

- a. Install the condensation chamber using the long bolt provided.
- b. Install 5B open elbows in bottoms of condensation chamber and diaphragm chamber. Connect these fittings together with tubing provided.
- c. Fill condensation chamber with water.
- d. Install 5B open elbow in top of condensation chamber and connect to the 5B elbow stamped "HOOD" in the Type P125 trip stop pilot with tubing provided.
- e. Install base bypass by screwing 5B open elbow into tapped hole in upper diaphragm chamber and 5B open elbow into tapped hole on outlet side of trip stop main valve.



**Figure 4. Type E Main Valve Without Condensation Chamber**



**Figure 5. Types E, E5 or E Main Valves**

# Type P125

## Insulation

Insulation may only be applied to the globe and flanges of the trip stop main valve.

## Adjusting Pilot Trip Point

The Type P125 trip stop pilot is factory set to trip at the specified pressure. Field adjustment of the trip set pressure should not be necessary and is not recommended. If the Type P125 trip stop pilot fails to trip at the desired pressure, refer to Troubleshooting section or consult your Local Sales Office.

## Start-up (Figure 3)



### WARNING

**The pilot may be handling hazardous fluids. Only qualified personnel, who are familiar with the installation, should be permitted to install, readjust, inspect or maintain the pilot.**



### CAUTION

**For a non-pressurized system, there must be no load.**

## The Trip Stop Station

1. Close all stop valves and the needle valve.
2. Remove any compression on the Type D Pilot spring and latch the Type P125 Pilot in the open position.
3. Crack open the stop valve and blow down the strainer upstream of the pressure reducing main valve.
4. Open the 1/4 in. / 6.35 mm stop valve on the Type D Pilot sensing line. If the system is pressurized downstream, allow time for the pressure to feed back to the Type D Pilot and normalize between the pressure reducing main valve and the trip stop main valve.
5. Open blowdown on the strainer between the pressure reducing main valve and the trip stop main valve. If the system is pressurized downstream, note flow through the blowdown.
6. Apply compression to Type D Pilot spring only until pressure reducing valve opens (audible flow) or an increase in flow is noticed through the strainer blowdown. Allow time to blowdown strainer.
7. Open 1/4 in. / 6.35 mm stop valve on Type P125 Pilot sensing line.
8. Open needle valve on Type P125 Pilot.
9. Crack open stop valve downstream of trip stop main valve.

### *For a Non-Pressurized System*

With no load on the system, incrementally compress the Type D Pilot spring until desired downstream pressure is obtained. Alternately and incrementally open the upstream and downstream stop valves. The system is now ready for a load.

### *For a Pressurized System*

Alternately and incrementally open the upstream and downstream stop valves. Make final adjustments on Type D Pilot spring to obtain desired set pressure.

## Restarting Type P125 After Pilot has Tripped

After having determined and corrected the cause of the overpressure, if any setting has been changed, repeat Startup procedure. Otherwise:

1. Close Type P125 needle valve.
2. Close shut off valve downstream of the trip stop main valve.
3. Re-latch the Type P125.
4. Open Type P125 needle valve.
5. Incrementally open downstream shutoff valve.

## Maintenance



### WARNING

**To avoid personal injury, property damage or equipment damage caused by sudden release of pressure or explosion of accumulated gas, do not attempt any maintenance or**

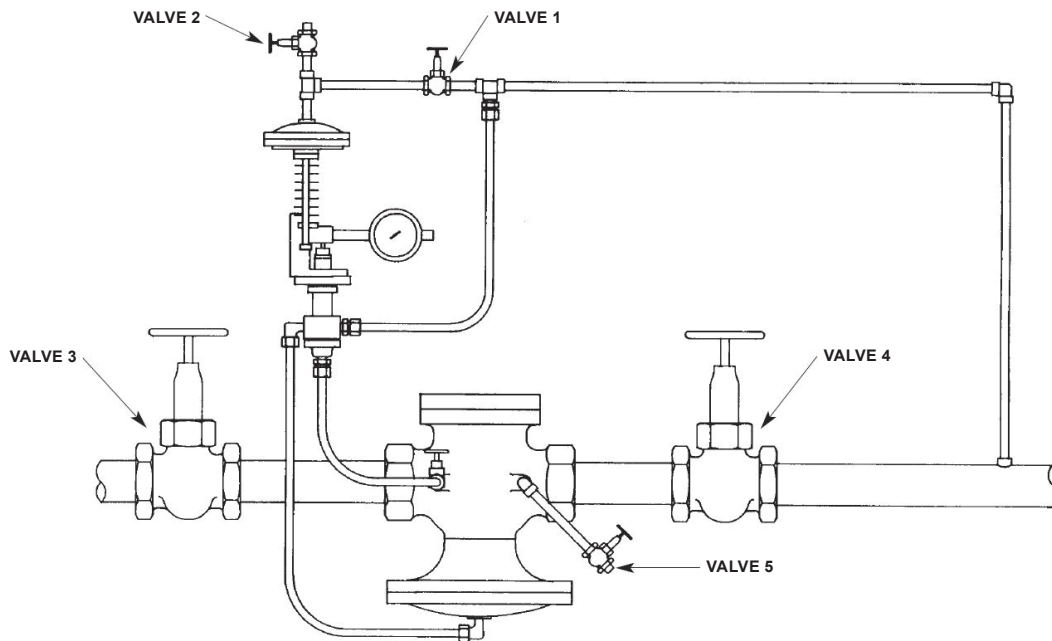


Figure 6. Type P125 Testing Procedure Installation

disassembly without first isolating the pilot from system pressure and relieving all internal pressure from the pilot.

Pilots that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Emerson should be used for repairing this pilot.

Due to normal wear or damage that may occur from external sources, this pilot should be inspected and maintained periodically. The frequency of inspection and replacement of parts depends upon the severity of service conditions or the requirement of local, state and federal rules and regulations.

Under normal conditions, complete dismantling of trip stop valves is not recommended. If it must be dismantled, contact your Local Sales Office.

- Periodically inspect Type P125 pilot for trip arc clearance in the lever area.
- Inspect the latch pin, lever pin and associated guides for accumulated dirt or corrosion.
- Lubricate guide/pin surfaces with a light grade machine oil.

## Troubleshooting



### WARNING

To avoid personal injury, property damage or equipment damage caused by sudden release of pressure or explosion of accumulated gas, do not attempt any troubleshooting or disassembly without first isolating the pilot from system pressure and relieving all internal pressure from the pilot.

Pilots that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Emerson should be used for repairing this pilot.

# Type P125

---

## Failure To Open

Check for positive inlet pressure. Check to see if Pressure Reducing Valve is open by opening blow down valve upstream of the trip stop main valve.

- If Type P125 Pilot is not in lever latched position, close needle valve, latch lever and repeat Startup procedure.
- If the Type P125 Needle Valve is closed, check the needle valve and repeat Startup procedure.
- Loosen 5B open elbow at outlet of Type P125. If steam comes out, you have assured that steam is going through the pilot.

## Failure To Trip

- Check the set pressure to see that it is not higher than desired. If so, consult your Local Sales Office.
- Ensure that the weight is not missing from the lever and replace if necessary.
- Make sure there are no foreign objects restricting the lever's movement and remove any obstructions.
- Check the lever pin for corrosion and remove, clean and lubricate if necessary.
- Correct the cause of the corrosion.

## Pilot Trips And Main Valve Doesn't Shut

Check Type P125 Pilot sensing line shut off valve. Open it if it is closed. Carefully remove bend and 5B elbow from lower diaphragm chamber of trip stop main valve.

- If the trip stop main valve closes, check to see if the vent line is plugged or incorrectly installed.
- If the trip stop main valve does not close, it is wedged open. In this case, check for foreign object between seat and disc of trip stop main valve.
- All joints must be inspected periodically for leakage. Keep bolts and fittings tight.
- Never allow a leak to persist.

## Testing Procedure

The purpose of the testing procedure is to confirm that:

- The control pipe is obstruction free.
- The pilot delatches.
- The pilot closes and shuts off.
- The trip stop main valve closes and shuts off.

The required installation is shown in Figure 6. The tests are conducted with the system pressurized and in running mode. Observe precautions necessary for safety and personal protection.

To Check Control Pipe for Obstructions:

1. Crack valve 2. Steam should blow through. If there is no steam flow, close valve 2 and clear the obstructed control pipe.
2. Close valve 1. Steam flow through valve 2 should cease.
3. Close valve 2 and open valve 1.

To Check trip stop pilot and main valves:

1. Isolate main valve from downstream pressure by closing valve 4. Valve 3 is open.
2. Isolate pilot from downstream pressure by closing valve 1.
3. Vent pilot by opening valve 2.
4. Pressurize pilot diaphragm by connecting an air pressure source to valve 2.
5. Trip pilot valve by gradually increasing the air pressure to the pilot diaphragm. Valve should trip when air pressure reaches set pressure. Do not overpressurize.
6. Vent main valve body by cracking valve 5.
7. Observe valve 5 discharge. No steam flow should be seen. Wispy flash steam from the base cavity may be present. Blowing steam indicates main valve is not closed or downstream pressure, if present, may be leaking through shutoff valve 4.
8. Close valve 5.
9. Close valve 2.
10. Open valve 1.
11. Open needle valve and relatch lever on Type P125 Pilot.
12. Repeat startup procedure for a pressurized system.

## Parts Ordering

When ordering parts, it is essential that the pilot type, service and serial number be stated.

Select part by item number, but order by part number. Specify complete part number when ordering.

## Parts List

Key	Description	Part Number	Key	Description	Part Number
1	Cottor Pin, Steel (4 required)	WAL05-03265-00	21	Cap Screw, Steel (2 required)	WAL05-04772-00
2	Hex Nut, Steel (16 required)	WAL05-02872-00	22	Bonnet, Cast iron	WAL04-13944-00
3	Mounting Bracket, Steel	-----	23	Stem Bushing, Cast iron	WAL04-11094-00
4	Cap Screw, Steel (14 required)	WAL05-04771-00	24	Disk and Seat assembly, 203 Lead	WAL02-08586-02
5	1/4 NPT Pipe Plug, Steel	WAL04-03769-00	25	Gasket	WAL05-11718-00
6	Spring, OTS (2 required)		26	Bottom Flange, Carbon steel	WAL04-14759-00
	5 to 25 psi / 0.35 to 1.72 bar	WAL05-05032-00	27	Diaphragm, 301 Stainless steel	WAL04-01629-01
	10 to 50 psi / 0.69 to 3.45 bar	WAL00-15081-00	28	Pressure Plate, Cast iron	WAL04-03676-00
	40 to 150 psi / 2.76 to 10.3 bar	WAL05-05028-00	29	Spring Yoke, Cast iron	WAL04-06178-00
	150 to 175 psi / 10.3 to 12.1 bar	WAL05-05030-00	30	Pivot Pin, 416 Stainless steel (2 required)	WAL04-03215-00
7	Spring Button, Ledloy (2 required)	WAL04-01053-00	31	Trip Level, 17-4 PH	WAL04-13945-00
8	Hex Nut, Steel (2 required)	WAL05-02877-00	32	Weight, Cast iron	WAL04-06135-00
9	Standard, Ledfin (2 required)	WAL04-05201-00	33	Thumb Screw, Steel	WAL05-04880-00
10	Hex Nut, Steel (2 required)	WAL05-02874-00	34	Set Screw, Steel	WAL05-04874-00
11	Hood, Cast iron	WAL04-02640-00	35	Bellows Nut, Brass	WAL04-02911-00
12	Cowl, Cast iron	WAL04-01513-00	36	Bellows, Brass	WAL05-17579-00
13	Guide Pin, Ledloy	WAL04-03240-00	37	Cap Screw, Steel (8 required)	WAL05-04803-00
14	Hex Nut, Steel (2 required)	WAL05-03014-00	38	Body, Cast iron	WAL04-11095-01
15	Trip Latch Stud Assembly, Steel	WAL07-42861-00	39	1/4 NPT Pipe Plug, Steel	WAL04-03772-00
16	Trip Latch Assembly, Steel	WAL07-40549-00	40	Seat Ring, 420 FH Stainless steel	WAL04-11099-00
17	Base Bracket, Cast iron	WAL04-01001-00			
18	Stem Button, Brass	WAL04-01064-00			
19	Adjusting Stem, Ledloy	WAL04-05402-00			
20	Stop Nut, Brass	WAL04-02980-00			

# Type P125

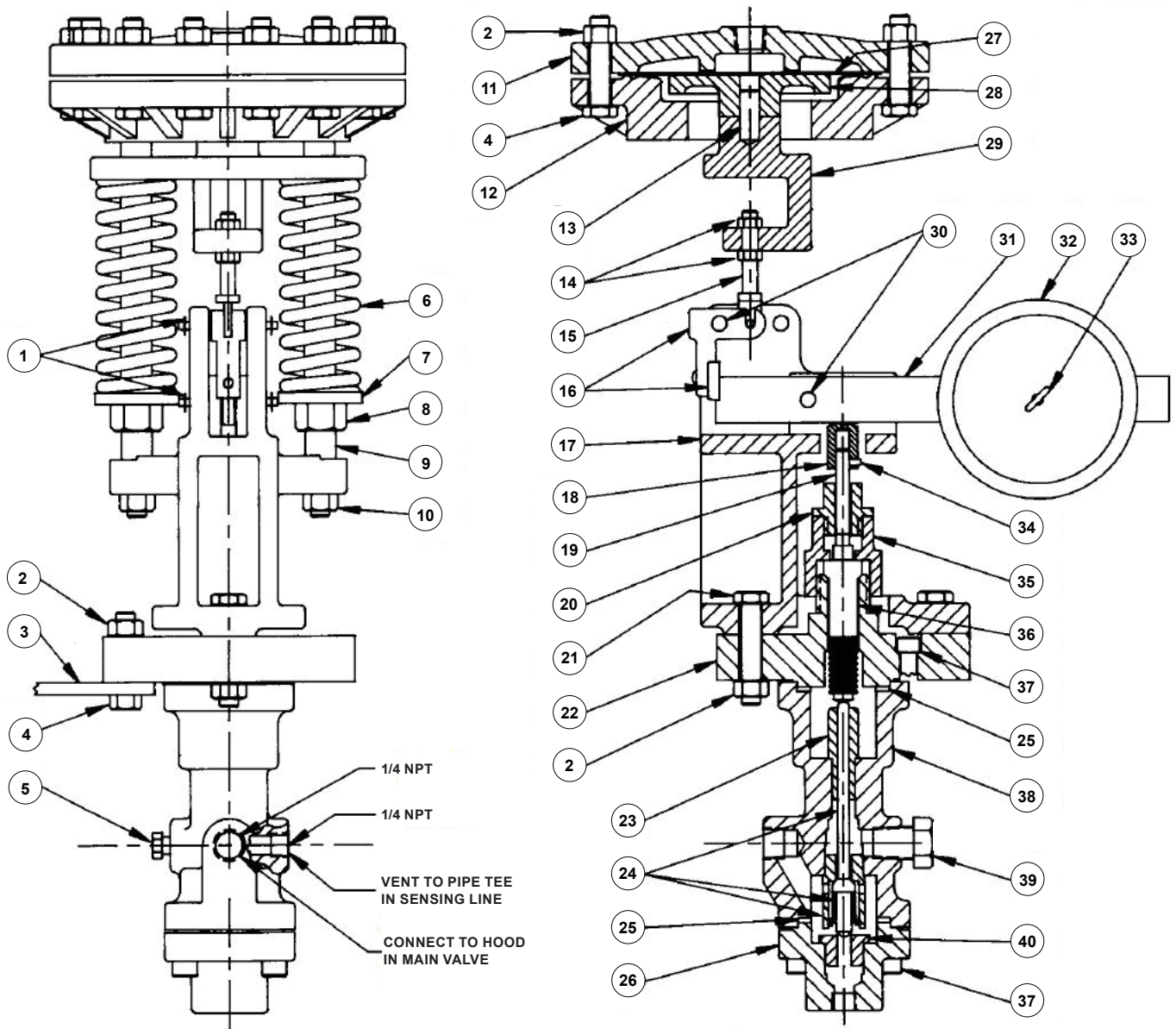


Figure 7. Type P125 Assembly, Cast Iron

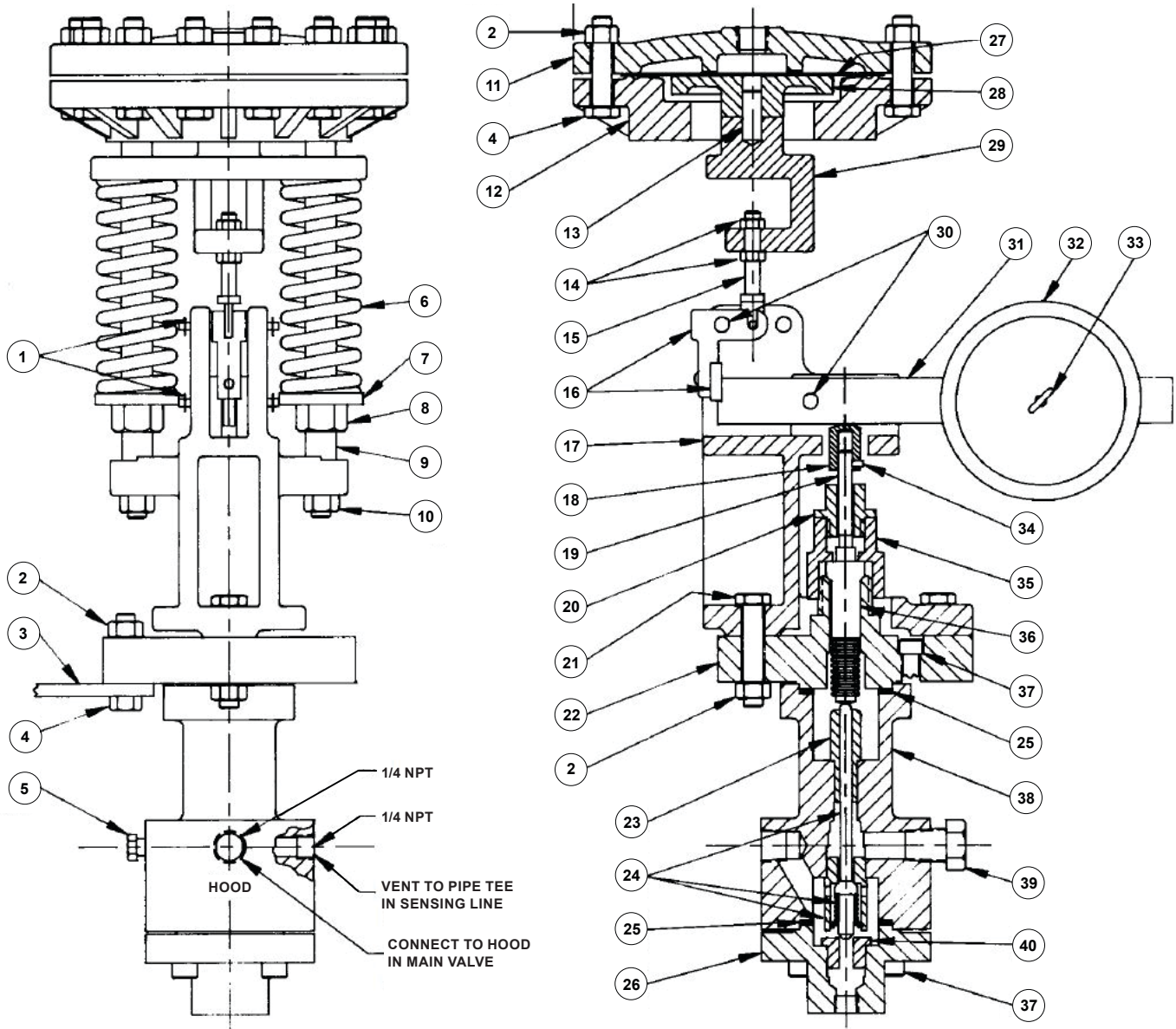


Figure 8. Type P125 Assembly, Cast Steel

# Type P125

---

 [SpenceValve.com](http://SpenceValve.com)

## Emerson Automation Solutions

### Americas

McKinney, Texas 75070 USA  
T +1 800 558 5853  
+1 972 548 3574

### Europe

Bologna 40013, Italy  
T +39 051 419 0611

### Asia Pacific

Singapore 128461, Singapore  
T +65 6777 8211

### Middle East and Africa

Dubai, United Arab Emirates  
T +971 4 811 8100

VCIMD-14952 © 2021 Emerson Electric Co. All rights reserved. 11/21  
Spence is a mark owned by one of the companies in the Emerson Automation Solutions business unit of Emerson Electric Co. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are property of their prospective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson Electric Co. does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson Electric Co. product remains solely with the purchaser.