



ME910P SERIES ASME – PILOT RELIEF VALVE MANIFOLD

TABLE OF CONTENTS

| | | | |
|------------------------------|---|---|-----|
| Application..... | 1 | Startup and Adjustment..... | 4 |
| Specifications..... | 2 | Shutdown..... | 4 |
| General Recommendations..... | 3 | Maintenance..... | 4 |
| Principle of Operation..... | 3 | ME910PK – Replacing A Pilot Assembly..... | 5 |
| Installation..... | 4 | Parts Ordering..... | 5-7 |

Scope of the Manual

This instruction manual provides instructions for the installation, maintenance and parts ordering information for a ME910P-ASME Relief Valve with a ME910PK-ASME Pilot. It is the responsibility of the user to ensure that installation and maintenance are in accordance with the applicable ASME codes and local requirements.

!WARNING!

MEC Industrial Pressure Relief Valves are safety devices designed to protect pressurized vessels, lines or systems during an overpressure event. Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage, personal injury or death.

MEC equipment must be installed, operated, and maintained in accordance with federal, state, and local codes as well as manufacturer's instructions. The installation in most states must also comply with NFPA No. 58, and ANSI/CGA G-2.1.

For installation in the European Union, the equipment must also comply with PED/TPED and EN ISO standards. Periodic inspections, intermediate inspections and exceptional checks of transportable pressure equipment should be carried out in accordance with the Annexes of Directive 2008/68/EC and with 2010/35/EU Directive (TPED) to ensure continued compliance with their safety requirements.

Only personnel trained in the proper procedures, codes, standards, and regulations of the LP-Gas industry should install and service this equipment.

Be sure all instructions are read and understood before installation, operation and maintenance. It is the responsibility of the end user to assure that installation and maintenance are in accordance with the applicable ASME codes and local requirements. Neither MEC Industrial nor its agents assume any liability for valves improperly installed or maintained.



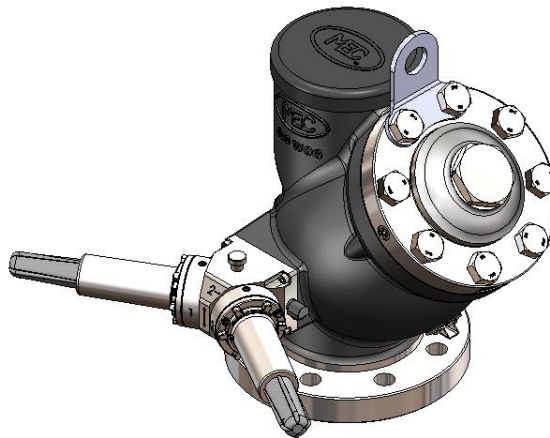
WARNING: These products contain a chemical known to the state of California to cause cancer and birth defects or reproductive harm

NOTE

Consult NFPA #58 for LP-Gas and ANSI/CGA 6.2.1 for anhydrous ammonia, and/or any applicable local and state regulations governing the application and use of pressure relief valves.

WARNING: This valve is not to be used for steam service and is not design for discharge into a closed system.

ME910P – Pilot Relief Valve Manifold



Features

- Heavy duty ductile iron body
- Corrosion resistant cad plate clear finish
- All Stainless-steel internal components
- Seal Material: Nitrile
- Discharge port with 4" FNPT Pipe-away thread
- Weather cap included
- Stainless steel weep hole deflector included
- Convenient stainless steel lifting tab included
- Tamper resistant pilot valve
- Available with 250 PSIG and 265 PSIG Pilot Valve Set Pressures (1724 and 1827 kPa)
- 100% Factory set and tested
- ASME UV and National Board Certified

Application

Designed for use with large LP-Gas and NH₃ stationary storage container applications with 4" - 300# ANSI flanged openings. The pilot valve-controlled relief mechanism allows for precision start to discharge set points in conjunction with the high flow angled seat design for high relief flow capacity in a simplified design which eliminates the need for traditional external pressure relief valves. The dual pilot valve design allows for the change of either pilot valve without taking the storage container out of service, significantly reducing cost of future service and replacement. The relief port is designed with a 4" FNPT threaded outlet, allowing convenient discharge pipe-away if necessary.

Specifications

| Pilot Relief Valve Manifolds | | | | | | | | |
|------------------------------|-------------|---------------------|-------------|---|-------------------------------|---------------------------------|-----------------------------------|-------------------------------------|
| Part No. | Flange Size | No. of Pilot Valves | Application | Flow Capacity SCFM/Air * @120% Set Pressure | Factory Installed Pilot Valve | | Required Installation Accessories | |
| | | | | | Seal Material | Start-to-Discharge Setting PSIG | Spiral wound flange gasket | 8 Stud / Nut Universal Mounting Kit |
| ME910P/250-ASME | 4"-300# | 2 | LPG | 44,278 | Nitrile | 250 | ME901S-4F-027 | ME904SK |
| ME910P/265-ASME | 4"-300# | 2 | NH3 | 46,811 | Nitrile | 265 | ME901S-4F-027 | ME904SK |

| Replacement Pilot Valves | | | | |
|--------------------------|-----------------------|-------------|---------------|---------------------------------|
| Part No. | Installation Location | Application | Seal Material | Start-to-Discharge Setting PSIG |
| ME910PK/250-1-ASME | #1 (Left) | LPG | Nitrile | 250 |
| ME910PK/250-2-ASME | #2 (Right) | LPG | Nitrile | 250 |
| ME910PK/265-1-ASME | #1 (Left) | NH3 | Nitrile | 265 |
| ME910PK/265-2-ASME | #2 (Right) | NH3 | Nitrile | 265 |

| Accessories | |
|------------------|--|
| Part No. | Description |
| MEP910C | Replacement Weather Cap |
| MEP990-4DFM/3DFM | 4"-300 LB X 3"-300 LB Flanged ACF/ESV/ISC Adapting Spool Kit |
| ME904SK | Mounting Hardware Kit |
| ME990S-4F-172 | Flange Gasket Kit |

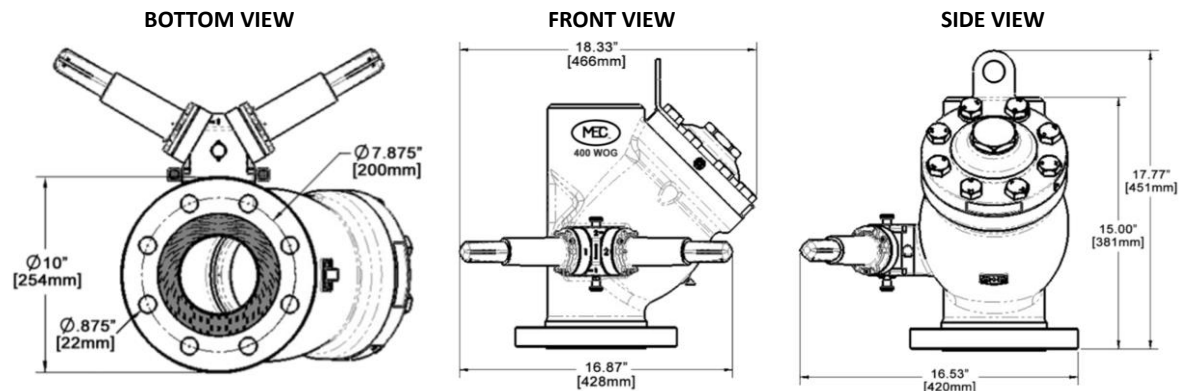


FIGURE 1: ME910P Measurements

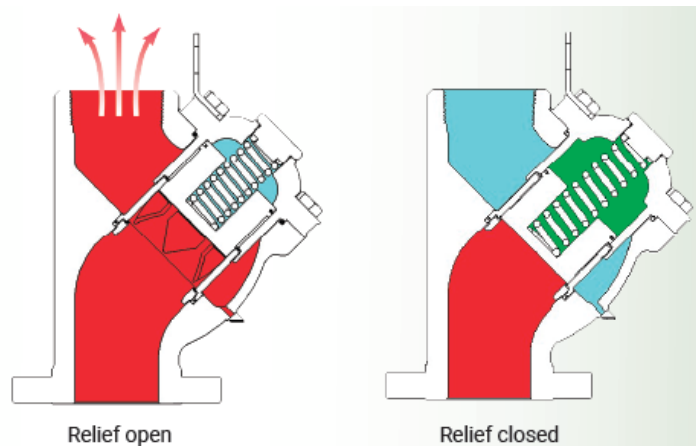


FIGURE 2: ME910P Flow Path

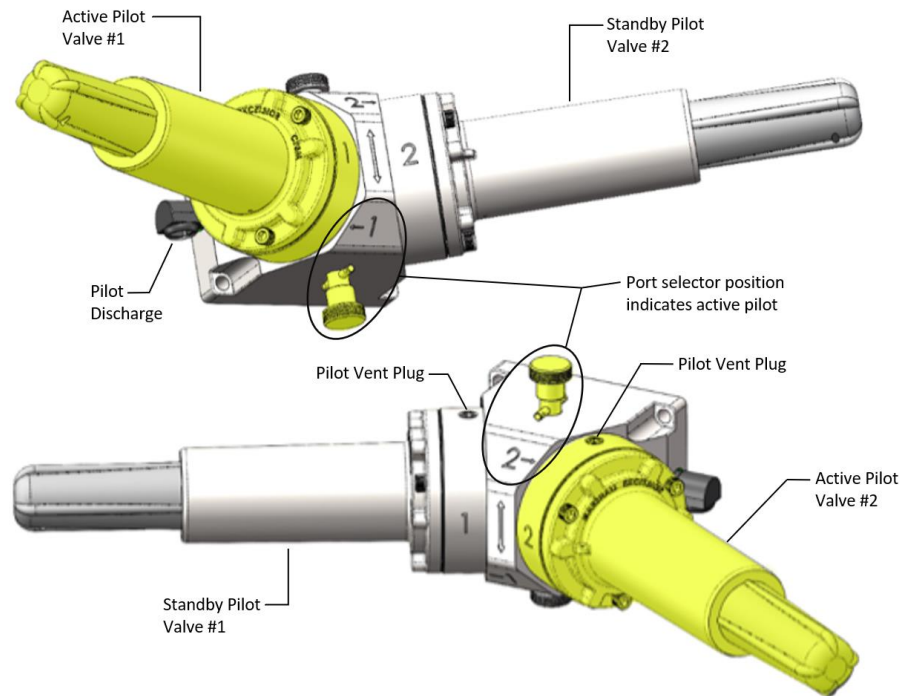


FIGURE 3: ME910PK Pilot Kit

REQUIREMENTS FOR PRESSURE RELIEF VALVES

Every container used for storing or hauling LP-Gas and anhydrous ammonia must be protected by a pressure relief valve. These valves are designed to protect the container against the development of hazardous conditions which might be created by any of the following:

- Hydrostatic pressures due to overfilling or the trapping of liquid between two points.
- High pressures resulting from exposure of the container to excessive external heat.
- High pressures due to the use of incorrect fuel.
- High pressures due to improper purging of the container.

General Recommendation

GENERAL WARNING!

Marshall Excelsior products are mechanical devices that are subject to wear, contaminants, corrosion, and aging of components made of materials such as elastomers and metal. Over time these devices will eventually become inoperative. The safe service life of these products will reflect the environment and conditions of use that they are subjected to. **REGULAR INSPECTION AND MAINTENANCE IS ESSENTIAL.** Marshall Excelsior products have a long record of quality and service; thus, end users of the equipment may overlook the hazards that can arise from using aging devices that have outlived their safe service life.

Do not use any of the ME910P Series if they leak, fail to work properly or have been damaged or have missing parts. Prompt repairs should be made by a properly trained serviceman. Continued use without repair can create a hazardous situation which could result in serious or fatal personal injury or property damage.

It is solely the responsibility of the system designer and the user to select products and materials suitable for their specific application requirements (including but not limited to set pressure/temperature and fluid service) and to ensure proper installation, operation and maintenance of these products. See Product Guide for applicable pressure/temperature limits. Assistance shall be afforded with the selection of the materials based on the technical information supplied to MEC Industrial. Applicable codes, material compatibility, product ratings and applicable details should be considered in the selection and application. Improper selection, application or use of the pressure relief valve can cause personal injury or property damage. If the product is intended for an application or use other than originally specified, the system designer and/or user must reconfirm that the selection is suitable for the new operating conditions.

Principle of Operation

A pressure relief valve is a throttling pressure control device that opens and closes to ensure the upstream pressure does not rise above a predetermined pressure. ME910P Pressure Relief Valve with dual-pilot assembly has an active pilot and a standby pilot. Only the active pilot senses the changes in the inlet pressure. The pilot selector position always indicates the active pilot.

As long as the inlet pressure is below the set pressure, the pilot control spring keeps the pilot valve plug closed. Inlet pressure passes through the pilot restriction and through the hollow passage of the valve plug then registers as loading pressure on top of the main valve plug. Force from the main spring, in addition to pilot loading pressure, provides downward loading pressure to keep the main valve plug tightly closed.

When the inlet pressure rises above the set pressure, the pressure on the pilot diaphragm overcomes the control spring and opens the valve plug. The pilot then exhausts the loading pressure from the top of the main valve plug. The pilot continuously exhausts gas while inlet pressure is above the set pressure. The inlet pressure unbalance overcomes the main spring force and opens the plug.

As the inlet pressure drops below the set pressure, the pilot control spring closes the pilot valve plug and the pilot exhaust to atmosphere stops. Force from the main spring, along with pilot loading pressure, pushes the plug onto the seat, producing tight shutoff.

Installation

!WARNING!

The piping system must be adequately designed and supported to prevent extraordinary loads to the pressure equipment. Design and install exhaust piping to guard against excessive flow restriction. Protect the pilot vent and exhaust piping from condensation or debris that can clog it.

The use of a reducer coupling between the vessel and the ME910P relief valve will negatively affect the flow capacities of this valve and will negate the flow capacity stated within the Pilot Relief Valve Manifolds table (see Specifications on sheet 2). Furthermore, the use of a reducer coupling between the vessel and the ME910P relief valve will invalidate the ASME listing of the ME910P valve.

ME910P relief valves vent gas from the main valve outlet and from the pilot exhaust. Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH₃ and LP-gas must be released outdoors in air currents that will ensure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and will not disperse or evaporate rapidly if released in still air.

To avoid injury or damage, install the ME910P relief valve where:

- Service conditions are within unit capabilities (including those given in the Specifications section)
- Service conditions comply with applicable codes, regulations or standards

Additionally, physical damage to the relief valve could break a pilot off the main valve, causing personal injury and property damage due to escaping gas. To avoid such injury or damage, install the unit in a safe location.

1. Use only qualified personnel and proper equipment when installing, operating and maintaining relief valves. Before installing, inspect the main valve and pilots for any shipment damage or foreign material that may collect during packaging and shipment. Make certain the body interior is clean and free of foreign material. To install a flanged body, use suitable line gaskets and good bolting practices. **Main body gasket and studs and nuts are not included. To order, see parts list.**

2. Ensure that the valve is in the vertical-up orientation with flow through it matching the direction of the main valve body.

3. For connection to the system, the size of all piping and fittings must be at least the same size as the valve inlet to ensure full flow during a relief event.

4. If system operation is necessary during maintenance or inspection, one pilot can be isolated while the other pilot actively loads the main valve to continuously protect the systems. If service to the main valve is required, remove system pressure.

5. Install a relief valve so that the pilot will exhaust properly and into a safe place. The pilot spring case vent must be kept open to atmospheric pressure. Protect this vent from icing, moisture and any other blockage as required. If the vent assembly remains in pilot exhaust port, it must be pointed down if possible or otherwise protected.

6. If the exhaust is to be piped to the main valve outlet or remotely vented, remove the vent assembly and install obstruction-free tubing or piping with a minimum number of bends into the 1/4 NPT pilot exhaust connection. Provide protection on a remote vent by installing a screened vent cap into the remote end of the vent pipe.

7. The pilot valve is factory-set for the pressure set-point specified on the order. These units are not adjustable and come with a factory-installed tamper-evident wire seal.

Startup

Pilots are set and sealed to prevent tampering. If the wire seal is broken, the pilot is unsafe and should not be used. Warranty is void if any seal is broken. With proper installation completed, slowly increase pressure while using gauges to monitor pressure.

Shutdown

1. Remove all pressure from the upstream system or tank.
2. Release all pressure from the main valve and pilot by opening the two upstream vent plugs until the trapped pressure starts bleeding out, see Figure 3.
3. Once all pressure is released, reinstall vent plugs

Maintenance

Relief valve parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement of parts depends upon the severity of service conditions or the requirements of local, state and federal regulations.

Visually inspect the physical condition of the relief valve at least once a year to check if there are leaks or damage to the relief valve. If the relief valve or pilots show any visible damage, corrosion, evidence of tampering or if water, dirt or debris is found in the discharge side of the relief valve, the valve must be cleaned, repaired and retested or replaced immediately. Observe the weather cap (MEP910C) periodically. If the cap is no longer on valve outlet, inspect the unit.

It is recommended to switch the pilot selector yearly to activate alternate pilot, see Figure 3. It is also recommended to replace both pilots every 10 years. Since the elastomer seals in relief valve are subject to normal deterioration, MEC™ recommends that a relief valve not be used for longer than 15 years without repair, retest or replacement. Earlier repair or replacement may be required due to service conditions or code requirements. If leakage observed from the relief valve during inspection, the main seals should be replaced, and the relief valve retested or the relief valve replaced immediately.

NOTE

Confirm the pilot selector position is pulled all the way towards active pilot. Do not have selector position in between the two pilots.

Lubricate all O-rings, gaskets and seals with a good grade of general-purpose grease and install gently rather than force into position. Update nameplates to accurately indicate any field change in equipment, materials, service conditions or pressure settings.

A simple preventative maintenance program for the valve and its controls will eliminate many potential problems.

ME910PK – Replacing A Pilot Assembly

This section only applies to replacing an ME910PK assembly on the ME910P. Replacing one of the two pilots requires the following tools:

- Allen Wrench Size 5/32"

!WARNING!

To avoid personal injury and equipment damage, isolate the pilot assembly from all pressure. Cautiously release pressure from the valve before attempting disassembly.

A small amount of vapor release may occur when removing a pilot. If the main valve or alternate pilot continuously vents while conducting steps, return the pilot selector to the previous position and contact your local LP-Gas distributor.

Note

The ME910PK pilot valve is factory-set for the pressure set-point specified on the order. The pilot comes with a wire seal that is factory installed to discourage and provide evidence of tampering from untrained professionals.

1. To easily identify the active pilot, check the direction of pilot selector assembly. The port selector position indicates active pilot. See Figure 3.
2. To switch pilot assemblies from inactive to active. Remove the lock pin wire and pull the lock pin out of the indicated side of the selector that is active. Move the pilot selector to the pilot valve intended to be activated, replace lock pin in the active side of pilot selector, and resecure pin wire.
3. Gently loosen the 1/16 in. vent plug on the inactive pilot to bleed off trapped pressure.
4. Once the inactive pilot is completely depressurized, remove the pilot loosening the 3 socket head cap screws.
5. Replace both O-rings (provided in the pilot kit) on the Pilot Block Assembly.
6. Apply Anti-seize to the new socket head cap screws before threading the new pilot onto the Pilot Block Assembly. Tighten until secure.

7. Perform a leak check on all connections. At this time you may choose to continue using the new pilot as the main control pilot and slide the pilot selector back to activate the new pilot following step 2, and utilize the alternate pilot as the standby pilot.

8. The reserve pilot should be purged of pressure to prolong service life and minimize the risk of vapor reliquefying in the pilot. Refer to step 3 to properly purge the reserve pilot. After purging the reserve pilot, tighten the vent plug.

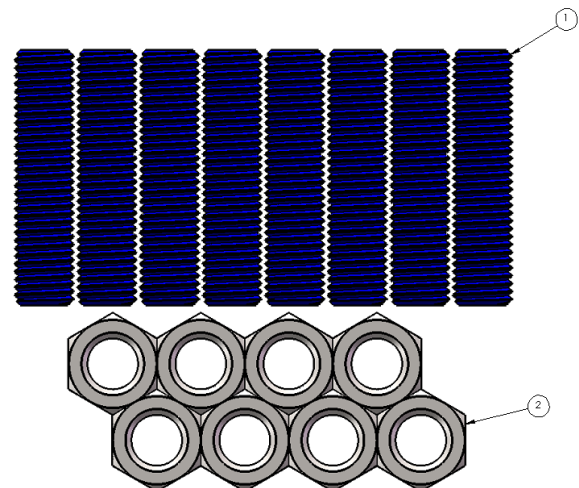
Parts Ordering

Important

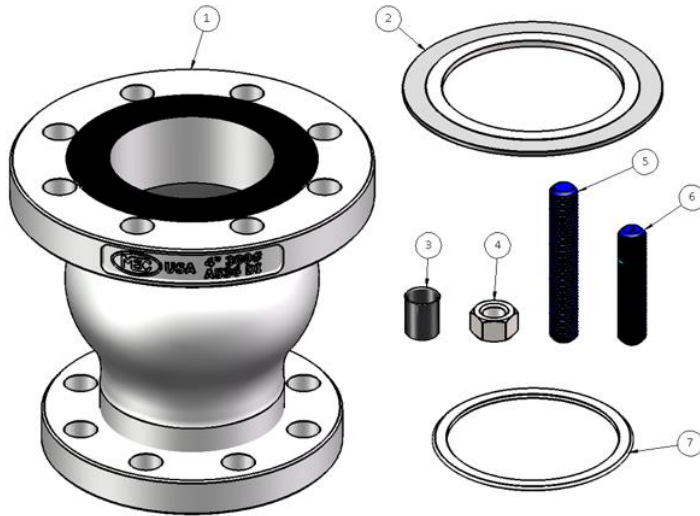
Use only Genuine MEC replacement parts. Components that are not supplied by MEC should not, under any circumstances, be used in any MEC valve, because they might adversely affect the performance of the valve and could give rise to personal injury and property damage.

When corresponding about this equipment, always reference the equipment model or series number found on the nameplate.

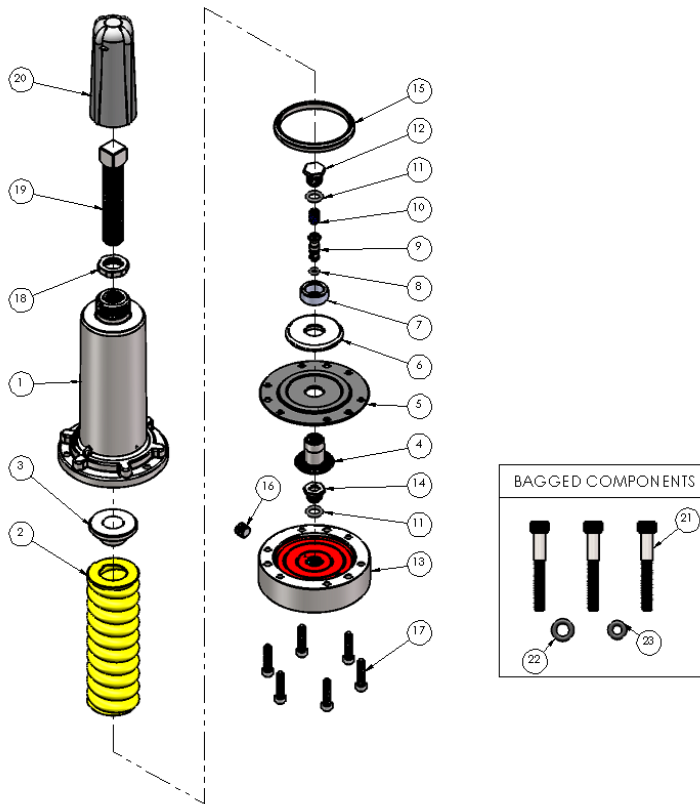
| Parts List for ME904SK | | |
|------------------------|-------------|------|
| Ref. # | Description | QTY. |
| 1 | Flange Stud | 8 |
| 2 | Flange Nut | 8 |



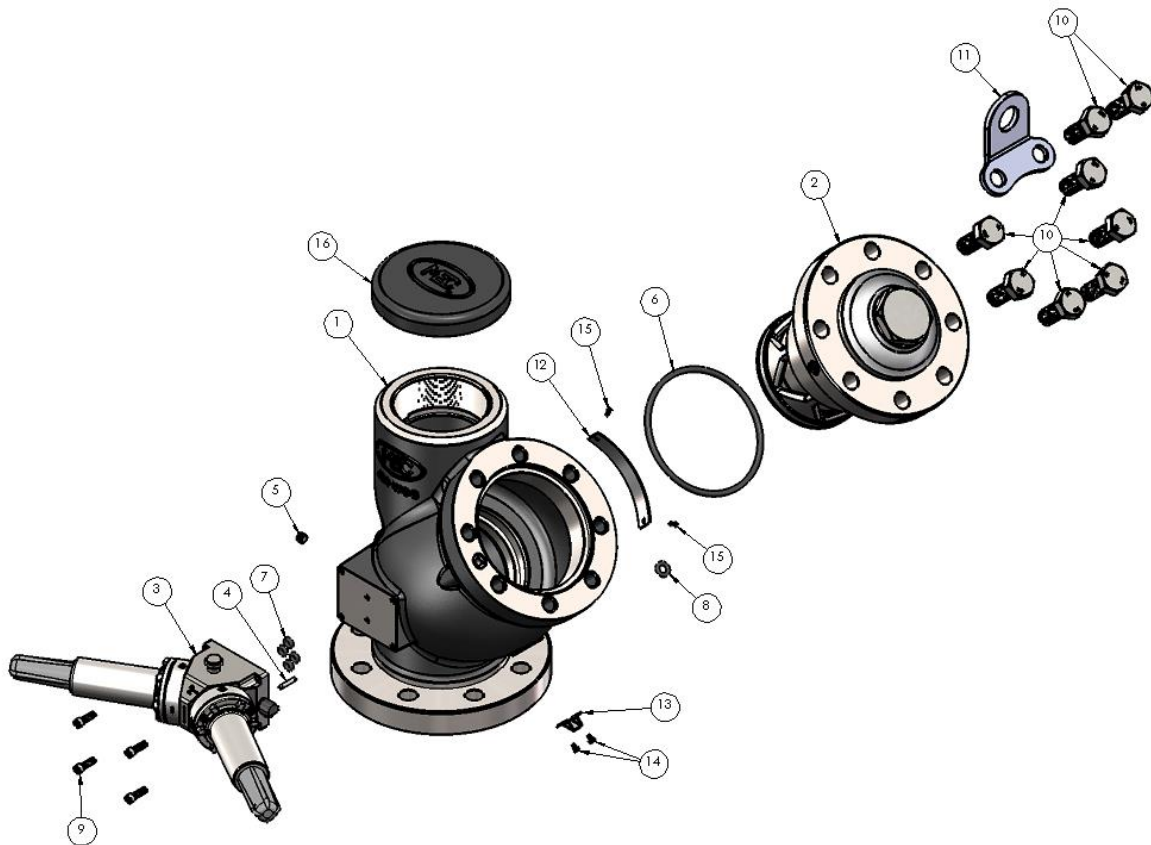
| Parts List for MEP990-4DFM/3DFM | | |
|---------------------------------|---------------|------|
| Ref. # | Description | QTY. |
| 1 | Bell Housing | 1 |
| 2 | Spiral Gasket | 1 |
| 3 | Bushing | 16 |
| 4 | Flange Nut | 24 |
| 5 | Stud | 8 |
| 6 | Stud | 8 |
| 7 | Upper Gasket | 1 |



| Parts List for ME910PK | | |
|------------------------|-----------------------|------|
| Ref. # | Description | QTY. |
| 1 | Bonnet | 1 |
| 2 | Spring | 1 |
| 3 | Spring Guide | 1 |
| 4 | Diaphragm Retainer | 1 |
| 5 | Diaphragm | 1 |
| 6 | Diaphragm Plate | 1 |
| 7 | Lower Spring Guide | 1 |
| 8 | O-Ring | 1 |
| 9 | Valve Plug | 1 |
| 10 | Spring | 1 |
| 11 | O-Ring | 2 |
| 12 | Retainer | 1 |
| 13 | Pilot Cartridge | 1 |
| 14 | Guide | 1 |
| 15 | Diaphragm Spacer | 1 |
| 16 | 1/16" NPT Plug | 1 |
| 17 | Socket Head Cap Screw | 6 |
| 18 | Nut | 1 |
| 19 | Adjusting Screw | 1 |
| 20 | Cap | 1 |
| 21 | Socket Head Cap Screw | 3 |
| 22 | O-Ring | 1 |
| 23 | O-Ring | 1 |



| Parts List for ME910P | | |
|-----------------------|-----------------------|------|
| Ref. # | Description | QTY. |
| 1 | Body | 1 |
| 2 | Bonnet | 1 |
| 3 | Pilot Block | 1 |
| 4 | Lock Pin | 1 |
| 5 | 1/8" NPT Plug | 1 |
| 6 | O-Ring | 1 |
| 7 | O-Ring | 4 |
| 8 | O-Ring | 1 |
| 9 | Socket Head Cap Screw | 4 |
| 10 | Hex Head Bolt | 8 |
| 11 | Lifting Bracket | 1 |
| 12 | Nameplate | 1 |
| 13 | Vent | 1 |
| 14 | Nameplate Screw | 2 |
| 15 | Rivet | 2 |
| 16 | Weather Cap | 1 |



It is solely the responsibility of the system designer and user to select products and materials suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Assistance shall be afforded with selection of materials based on technical information supplied to MEC Industrial; however, system designer and user retain final responsibility. The designer should consider applicable Codes, material compatibility, product ratings and application details in selection and application. Improper selection, application or use of products described herein can cause personal injury or property damage. If designer or user intends to use product for an application or use other than originally specified, he must reconfirm that the selection is suitable for new operating conditions.

Marshall Excelsior Company
1506 George Brown Drive Marshall, MI 49068
Phone (269) 789-6700 Fax (269) 781-8340

www.marshallexcelsior.com