



*Installation, Operation, and
Maintenance Manual*

***Welker[®] Filter / Instrument Regulator
Model
FIR-1***

***Drawing No.: AD034B0
Manual No.: IOM-048***

The information in this manual has been carefully checked for accuracy and is intended to be used as a guide for the installation, operation, and maintenance of the Welker[®] equipment described above. Correct operating and/or installation techniques, however, are the responsibility of the end user. Welker[®] reserves the right to make changes to this and all products in order to improve performance and reliability.

This manual is intended to be used as a basic installation and operation guide for the Welker[®] Filter / Instrument Regulator, *FIR-1*. For comprehensive instructions, please refer to the IOM Manuals for each individual component. A list of relevant component IOM Manuals is given in the Appendix section of this manual.

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Section 1: SPECIFICATIONS

1.1 INTRODUCTION

We appreciate your business and your choice of Welker[®] products. The installation, operation, and maintenance liability for this product becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance (IOM) Manual* prior to installation and operation of this equipment is required for a full understanding of its application and performance prior to use.*

If you have any questions, please call 1-800-776-7267 (USA) or 1-281-491-2331.

Notes, Cautions, and Warnings



Notes emphasize information and / or provide additional information to assist the user.



Caution messages appear before procedures that, if not observed, could result in damage to equipment.



Warning messages appear before procedures that, if not observed, could result in personal injury.

*The following procedures have been written for use with standard Welker[®] parts and equipment. Assemblies that have been modified may have additional requirements and specifications that are not listed in this manual.

1.2 PRODUCT DESCRIPTION

The Welker[®] *FIR-1* Filter / Instrument Regulator is designed to filter and provide regulation of an instrument pneumatic supply. It is intended for use as part of instrument packages.

The regulator of the FIR-1 is non-relieving. Welker[®] recommends that a relief valve, such as the Welker[®] RV-1 or RV-3 series relief valves, be installed downstream of the FIR-1.

Welker[®] may custom design the FIR-1 to suit the particular application and specifications of each customer.

1.3 SPECIFICATIONS

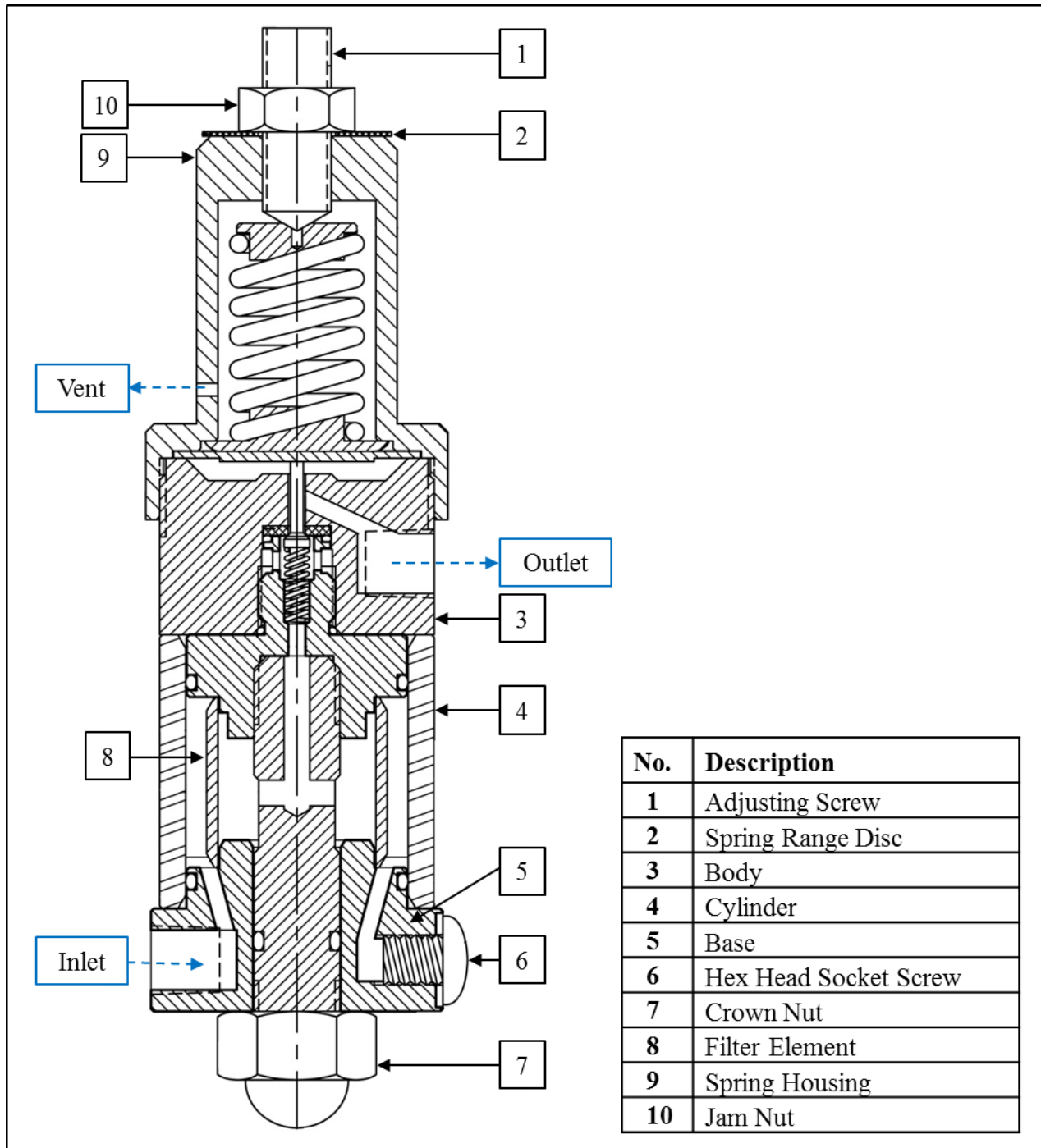


The specifications listed in this section are generalized for this equipment. Welker[®] can modify the equipment according to your company's needs. However, **please note that the specifications may vary depending on the customization of your product.**

Table 1: FIR-1 Specifications	
Products	For Use with Instrument Pneumatic Supply
Materials of Construction	316 / 316L Stainless Steel, PTFE, Teflon [®] or Kel-F [®] Seat, Viton [®] Others Available
Filter Element	10 micron or 35 micron Linear Polyethylene
Maximum Allowable Operating Pressure	3000 psig @ -20° F to 100° F (207 barg @ -28° C to 37° C)
Maximum Allowable Operating Temperature	200° F (94° C)
Inlet Pressure	0 – 3000 psig (0 – 207 barg)
Outlet Pressure	Dependent upon Spring Range. Refer to the Spring Range Disc under the Regulator Jam Nut. Yellow Tag: 0 – 25 psig (0 – 1.7 barg) Green Tag: 0 – 50 psig (0 – 3.4 barg) Red Tag: 20 – 100 psig (1.4 – 6.9 barg) Black Tag: 75 – 200 psig (5.2 – 13.8 barg)
Instrument Air Connections	1/4" NPT Others Available

1.4 SYSTEM DIAGRAM

Figure 1: System Diagram



Section 2:

INSTALLATION & OPERATION

2.1 BEFORE YOU BEGIN



After unpacking the unit, check the equipment for compliance and for any damage that may have occurred during shipment. **Claims for damage caused during shipment must be initiated by the receiver and directed to the shipping carrier.** Welker[®] is not responsible for any damage caused by mishandling by the shipping carrier.

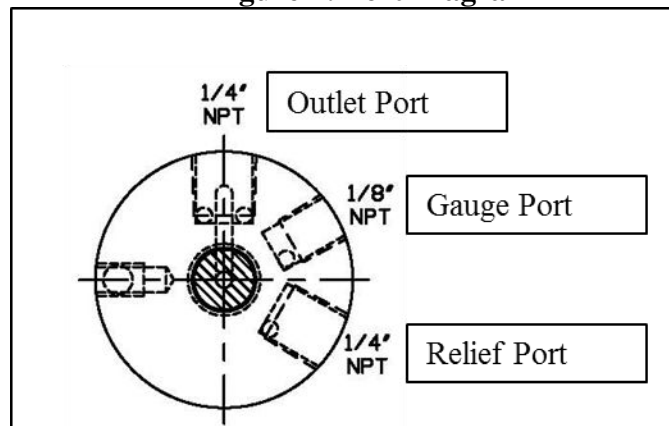


When sealing fittings with PTFE tape, refer to the proper sealing instructions for the tape used.

2.2 INSTALLATION & OPERATION

1. Install a relief valve to the relief port or connect the relief port to a downstream relief valve.

Figure 2: Port Diagram



2. Connect the outlet port to the instrument to be supplied with the filtered and regulated pneumatic supply.
3. Install a gauge into the gauge port.
4. Turn on the instrument pneumatic supply to begin supplying air to the FIR-1.
5. Loosen the jam nut at the top of the regulator.
6. Using a hex key, turn the adjusting screw until the desired outlet pressure has been reached. To increase outlet pressure, turn the adjusting screw clockwise. To decrease outlet pressure, turn the adjusting screw counterclockwise.
7. Once the desired outlet pressure has been reached, tighten the jam nut to secure the adjusting screw in place at that pressure.
8. As necessary, refer to the *Installation, Operation, and Maintenance (IOM) Manual* of the appropriate relief valve for instructions on setting the relief valve.
9. Check the system for leaks. Repair as necessary.
10. The FIR-1 is now operational.

Section 3: MAINTENANCE

3.1 BEFORE YOU BEGIN

1. **Welker® recommends that the unit have regular maintenance every six (6) months under normal operating conditions.** In cases of severe service, dirty conditions, excessive usage, or other unique applications that may lead to excess wear on the unit, a more frequent maintenance schedule may be appropriate.
2. Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit available for repairs of the system in case of unexpected wear or faulty seals.

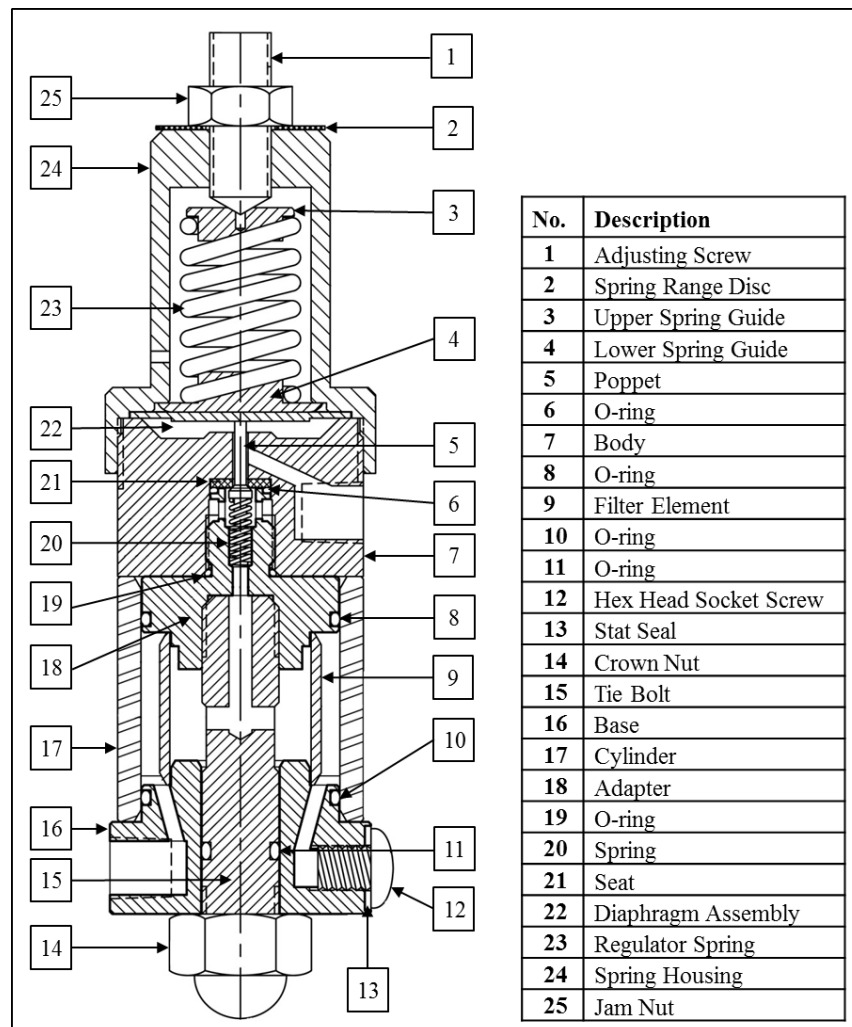


New seals supplied in spare parts kits are not lubricated. They should be lightly lubricated before installation. Welker® recommends Dow Corning® 111 (DC 111) or an equivalent lubricant for use with this unit.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.

3.2 MAINTENANCE

Figure 3: Maintenance Diagram



1. During system operation, check for leaks and repair as necessary.
2. Prior to performing maintenance, turn off the instrument pneumatic supply, and then isolate and depressurize the FIR-1.
3. Loosen the jam nut and turn the adjusting screw counterclockwise to decrease the pressure on the spring.
4. Unscrew and remove the spring housing to expose the spring, spring guides, and diaphragm.
5. Examine the diaphragm for damage. The rubber portion of the diaphragm should be free of cuts or other damage. The metal pad portion of the diaphragm should be free of scratches. Replace as necessary.
6. Align the upper spring guide, spring, and lower spring guide, and then place them back into the spring housing.
7. Set the diaphragm in the spring housing. The rubber portion of the diaphragm must face the lower spring guide and the metal pad must face outward.
8. Hand-tighten the spring housing onto the FIR-1.
9. Remove the crown nut and tie bolt from the base of the FIR-1.
10. Remove the base.
11. Replace the O-ring on the base.
12. Remove the cylinder to expose the filter element and adapter.
13. Examine the filter element. If the filter media appears saturated, or if the filter element is damaged in any way, replace the filter element.
14. Remove the adapter from the body, taking care not to lose the spring, seat, and poppet, which are small parts that may come loose when the adapter is removed.
15. Replace the O-rings on the adapter.
16. Remove the spring and poppet from the body, if not already removed.
17. Examine the poppet for scratches or other damage. Replace as necessary.
18. Carefully remove the seat. As necessary, use a small, pointed instrument to remove the seat, taking care not to damage the seat.
19. Examine the beveled edge of the hole in the center of the seat. Damage to this area will prevent positive shut-off. Examine the seat for scratches, tears, or other damage. Replace as necessary.
20. Insert the seat back into the body with the beveled side facing out toward the poppet.
21. Insert the poppet and spring back into the body.
22. Screw the adapter firmly back into the body.
23. Align the filter element with the adapter, and slide the cylinder back over the filter element and adapter.
24. Insert the base into the cylinder.
25. Insert the tie bolt into the base. Screw on the hex nut and tighten securely.
26. As necessary, replace the stat seal.
27. Maintenance is now complete. Refer to *Section 2.2, Installation & Operation*, for instructions on reinstalling the FIR-1.

APPENDIX

ATTACHED DOCUMENTS:

Welker® *Installation, Operation, and Maintenance (IOM) Manuals* suggested for use with this unit:

- IOM-033: Welker® RV-1, RV-2, RV-2CP, and RV-3 Relief Valves

Other *Installation, Operation, and Maintenance (IOM) Manuals* suggested for use with this unit:

- None

Welker® drawings and schematics suggested for use with this unit:

- Assembly Drawing (Standard): AD034BO



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