



INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
WELKER SIGHT GLASS

MODEL
SG-4

DRAWING NUMBERS
AD037AG
AD037AI

MANUAL NUMBER
IOM-094

REVISION
Rev. A, 2/14/2017

TABLE OF CONTENTS

	SAFETY	3
1.	PRODUCT INFORMATION	4
1.1	Introduction	4
1.2	Product Description	4
1.3	Specifications	4
1.4	Equipment Diagrams	5
2.	INSTALLATION & OPERATION	7
2.1	Before You Begin	7
2.2	Installation and Operation	7
3.	MAINTENANCE	8
3.1	Before You Begin	8
3.2	Maintenance	9
	APPENDIX	11
	A: Referenced or Attached Documents	11

IMPORTANT SAFETY INFORMATION

READ ALL INSTRUCTIONS



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



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



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

This manual is intended to be used as a basic installation and operation guide for the Welker Sight Glass, SG-4. For comprehensive instructions, please refer to the IOM Manuals for each individual component. A list of relevant component IOM Manuals is provided in Appendix A of this manual.

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 in this manual. Correct installation and operation, however, are the responsibility of the end user. Welker reserves the right to make changes to this manual and all products in order to improve performance and reliability.

BEFORE YOU BEGIN

Read these instructions completely and carefully.

IMPORTANT - Save these instructions for local inspector's use.

IMPORTANT - Observe all governing codes and ordinances.

Note to Installer - Leave these instructions with the end user.

Note to End User - Keep these instructions for future reference.

Installation of this Sight Glass is of a mechanical nature.

Proper installation is the responsibility of the installer. Product failure due to improper installation is not covered under the warranty.

If you received a damaged Sight Glass, please contact a Welker representative immediately.

Phone: 281.491.2331

Address: 13839 West Belfort Street
Sugar Land, TX 77498

SECTION 1: PRODUCT INFORMATION

1.1 Introduction

We appreciate your business and your choice of Welker products. The installation, operation, and maintenance liability for this equipment becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance (IOM) Manuals* 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 Welker at 1-281-491-2331.

**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 SG-4 Sight Glass is designed to allow for visual verification of product flow. The standard SG-4 is intended for on-site verification of chemical injection. When equipped with the optional visual flow indicator, the SG-4 can be used to visually verify the flow of liquid or gas products.

Welker may custom design the SG-4 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. **Please note that the specifications may vary depending on the customizations of your equipment.**

Table 1: SG-4 Specifications

Application	Standard: Visual Verification of Liquid Chemical Injection With Visual Flow Indicator: Visual Verification of Liquid or Gas Product Flow
Products	Gases and Liquids Compatible With the Materials of Construction
Materials of Construction	316/316L Stainless Steel, Glass, Plexiglas®, and Viton® Others Available
Maximum Allowable Operating Pressure	2000 psig @ -20 °F to 100 °F (137 barg @ -28 °C to 37 °C)
Connections	¼" FNPT (Standard) ⅜" FNPT ½" FNPT
Options	High Flow Visual Flow Indicator CE Compliance

1.4 Equipment Diagrams

Figure 1: Standard SG-4 Diagram

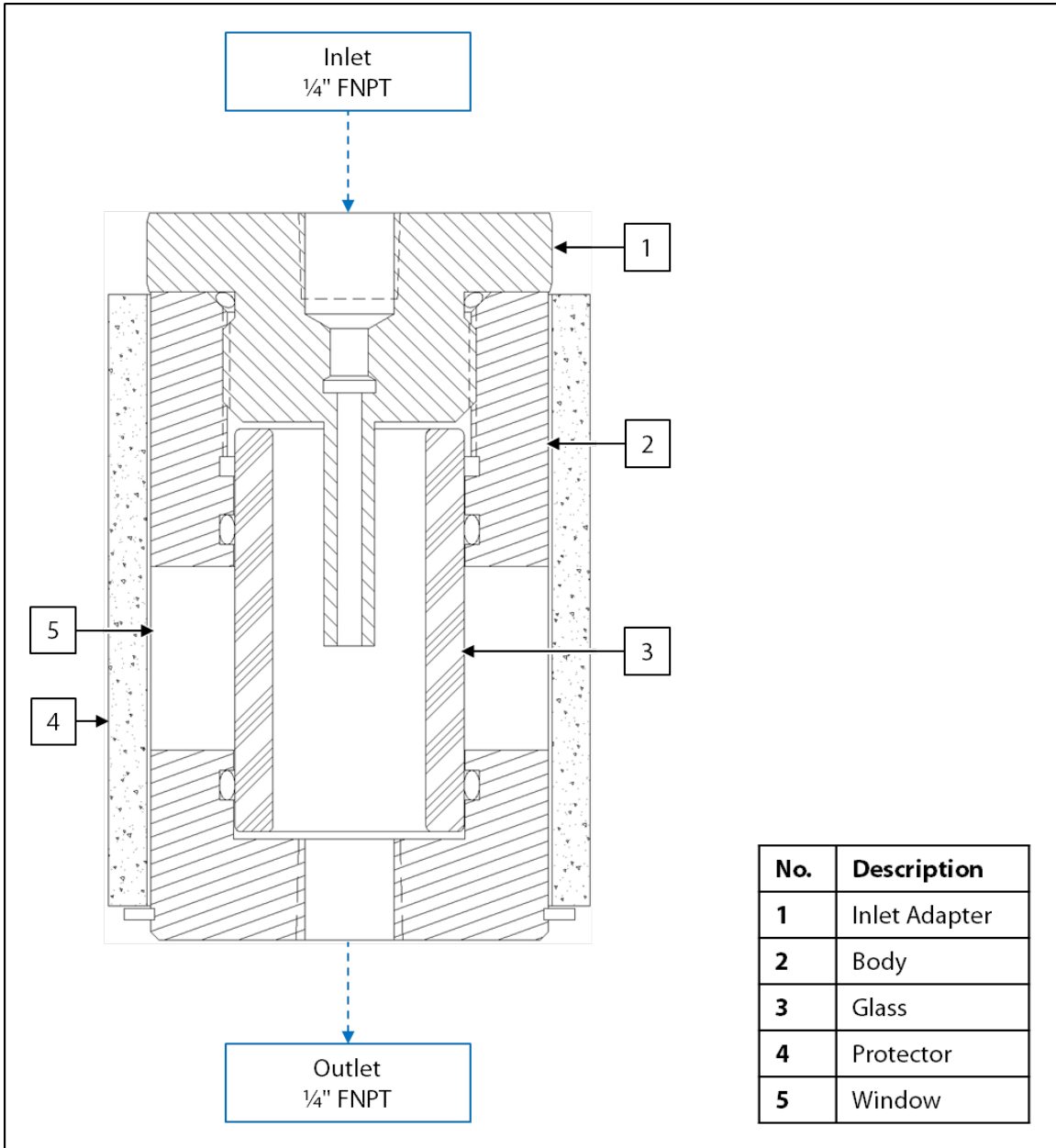
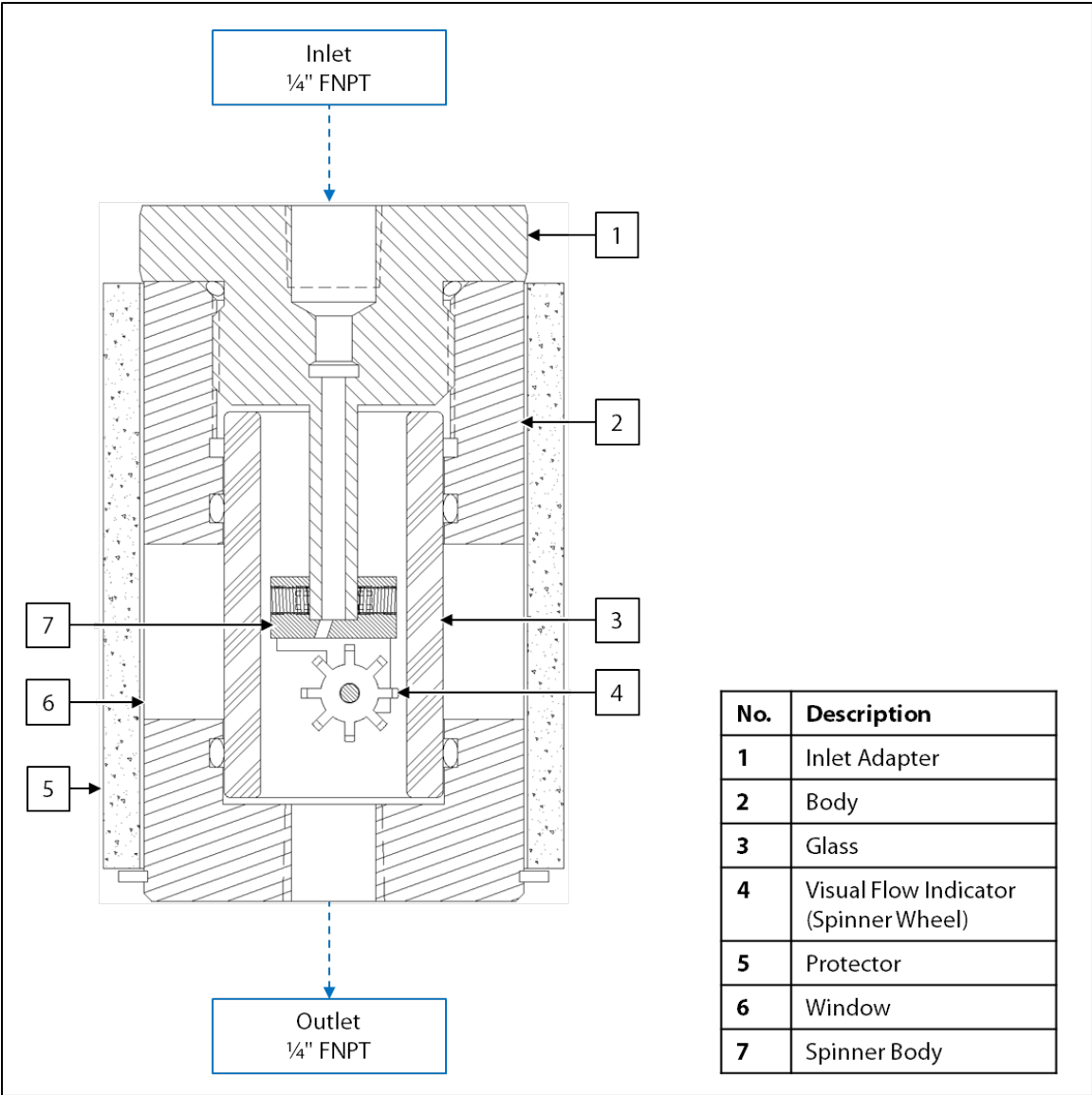


Figure 2: SG-4 With Visual Flow Indicator Diagram



SECTION 2: INSTALLATION & OPERATION

2.1 Before You Begin



After unpacking the unit, check the equipment for compliance and any damage that may have occurred during shipment. Immediately contact a Welker representative if you received damaged equipment.



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

2.2 Installation and Operation



The SG-4 can be used in conjunction with existing equipment, such as pitot probes, injection pumps, and small pumps. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the equipment and company standards for proper equipment arrangement.

1. Connect the appropriate fittings to the inlet and outlet, and then install the SG-4 on the product line.



The standard SG-4 must be installed vertically with the outlet pointing down. The SG-4 with visual flow indicator may be installed vertically or horizontally.

2. Slowly open the inlet valve on the SG-4.



If there is a temperature difference greater than 200 °F (93 °C) between the SG-4 and the liquid product, opening the inlet valve too quickly may cause thermal shock and could damage the glass.

3. After the temperature has equalized, open the inlet valve completely.
4. Visually check the SG-4 to verify product flow.



If the SG-4 is equipped with the optional visual flow indicator, product flow is indicated by spinning of the wheel.

5. If the SG-4 is foggy and product flow is not visible, the SG-4 must be cleaned. See *Section 3.2, Maintenance*, for removal and cleaning instructions.
6. If the SG-4 is equipped with the optional visual flow indicator and product flow is not visible, debris around the visual flow indicator may be preventing the wheel from spinning. See *Section 3.2, Maintenance*, for removal and cleaning instructions.

SECTION 3: MAINTENANCE

3.1 Before You Begin

1. **Welker recommends that the unit have standard maintenance under normal operating conditions:** for **gas applications** every six (6) months; and for **liquid applications** every twelve (12) months. 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 should be lightly lubricated before being installed to ease the installation of the seals and reduce the risk of damage when positioning them on parts. Wipe excess lubricant from the seals, as it may adversely affect analytical instrument results.



For sample-exposed seals, Welker recommends non-hydrocarbon-based lubricants, such as Krytox®. For non-sample-exposed seals, Welker recommends either non-hydrocarbon-based lubricants or silicone-based lubricants, such as Molykote® 111.



After the seals are installed, the outer diameter of shafts and inner diameter of cylinders may be lubricated to allow smooth transition of parts.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.
4. Welker recommends having the following tools available for maintenance. Please note that the exact tools required may vary by model.
 - a. Crescent Wrench
 - b. Seal Pick

3.2 Maintenance

Figure 3: Standard SG-4 Maintenance Diagram

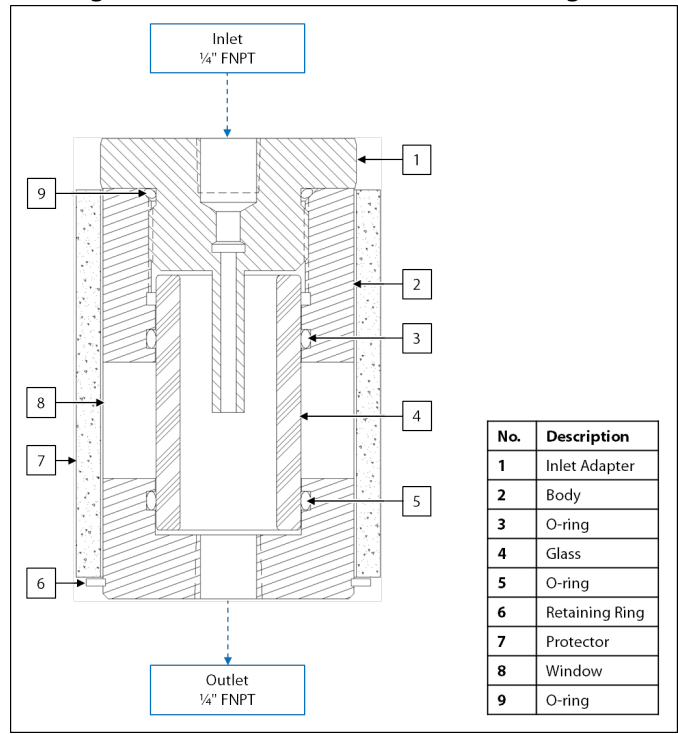
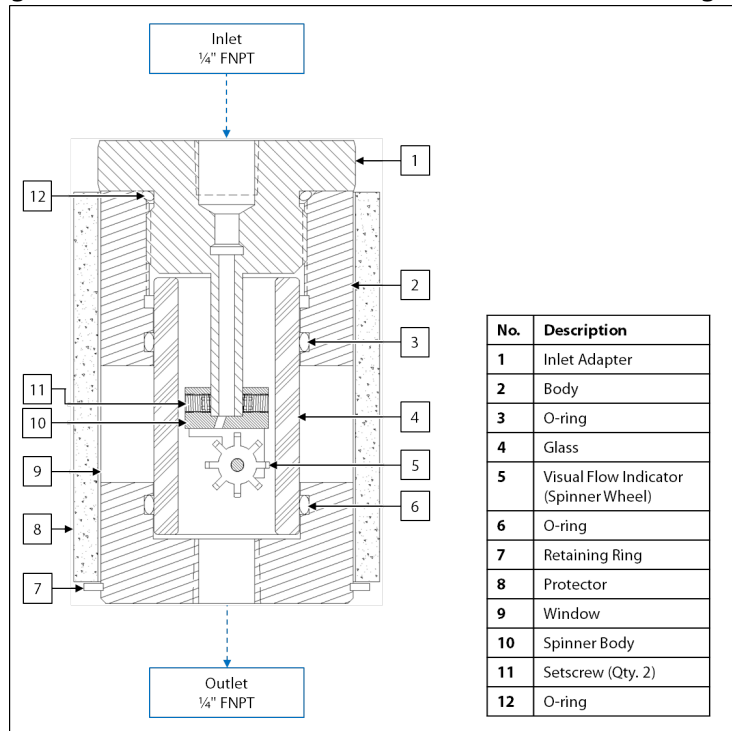


Figure 4: SG-4 With Visual Flow Indicator Maintenance Diagram



1. Halt product flow and close the inlet valve to the SG-4.
2. Allow product to run through the outlet until all pressure has been relieved and no product remains in the SG-4.
3. Disconnect attached tubing from the SG-4 and remove the SG-4 from the system.
4. Carefully slide the protector off over the inlet adapter.
5. Carefully unscrew the inlet adapter from the body, taking care not to break the glass.



Note that if the SG-4 is equipped with the optional visual flow indicator, the visual flow indicator will be removed with the inlet adapter.

6. As necessary, clean the visual flow indicator to remove any debris around the wheel. Debris has been successfully removed once the wheel spins freely.
7. Carefully remove the glass from the body.
8. Inspect the glass for any cracks that may affect the integrity of the SG-4. Replace as necessary.
9. Remove the O-rings from the inlet adapter and body.
10. Clean the inlet adapter, body, protector, and glass with a solvent or cleaning agent, and then thoroughly dry them with a clean, dry cloth.



Welker recommends cleaning the SG-4 with a quick-evaporating solvent, such as acetone. Refer to the appropriate company policy for the approved quick-evaporating solvent. Use chemical solvents safely, following all personal protective equipment (PPE) and usage directions listed on the solvent label and Material Safety Data Sheet (MSDS).

11. Replace the O-rings on the inlet adapter and body.



Ensure that the O-ring on the inlet adapter is seated properly to prevent leakage.

12. Carefully slide the glass back into the body, taking care not to scratch the glass.
13. Carefully screw the inlet adapter into the body, taking care not to break the glass.
14. Carefully slide the protector on over the inlet adapter and down to the retaining ring.
15. The SG-4 is ready for installation. See *Section 2.2, Installation and Operation*, for instructions on installing the SG-4.

APPENDIX A: REFERENCED OR ATTACHED DOCUMENTS

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

- None

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: AD037AG (Standard SG-4)
- Assembly Drawing: AD037AI (SG-4 With Visual Flow Indicator)

NOTES

Handwriting practice lines consisting of multiple horizontal dashed lines.



13839 West Bellfort Street
Sugar Land, TX 77498
Phone: 281.491.2331

welker.com