



INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

WELKER[®] DIFFUSING PROBE

MODEL
SP-DP

DRAWING NUMBERS
AD631BA
AD631BB
AD631ET
AD631FB
AD631FB.1

MANUAL NUMBER
IOM-203

REVISION
Rev. A, 08/14/2024

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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® Diffusing Probe, SP-DP. 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 Diffusing Probe 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 Diffusing Probe, please contact a Welker® representative immediately.

Phone: 281.491.2331
Address: 13839 West Belfort Street
Sugar Land, TX 77498

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® *SP-DP* Diffusing Probe is designed to be used in conjunction with a pulse injection pump to disperse liquid chemical across the full diameter of the pipeline.

The braided nylon wick of the SP-DP absorbs the injected liquid chemical. As pipeline product flows through the porous probe and saturated wick, the liquid chemical is released from the saturated wick and is then mixed with the pipeline product by turbulence, resulting in uniform distribution of the liquid chemical. By evenly dispersing the liquid chemical, the SP-DP prevents the liquid chemical from being wasted during pulse injection.

Welker may custom design the SP-DP 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: SP-DP Specifications

Application	Use With Injection Pump to Diffuse Liquid Chemicals, Such as Odorant or Methanol
Materials of Construction	316/316L Stainless Steel, Braided Nylon, and PTFE
Maximum Allowable Operating Pressure	½" MNPT: 7700 psig @ -20 °F to 120 °F (530 barg @ -28 °C to 48 °C) ¾" MNPT: 7300 psig @ -20 °F to 120 °F (503 barg @ -28 °C to 48 °C) 1" MNPT: 5300 psig @ -20 °F to 120 °F (365 barg @ -28 °C to 48 °C) With SG-4: 1500 psig @ -20 °F to 120 °F (103 barg @ -28 °C to 48 °C)
Connections	Pipeline: ½", ¾", or 1" MNPT Product Inlet: ¼" FNPT
Options	Extension for Customer Riser Reducing Adapter Welker® SG-4 Sight Glass With Visual Flow Indicator

1.4 Equipment Diagrams

Figure 1: SP-DP With Ball Valve

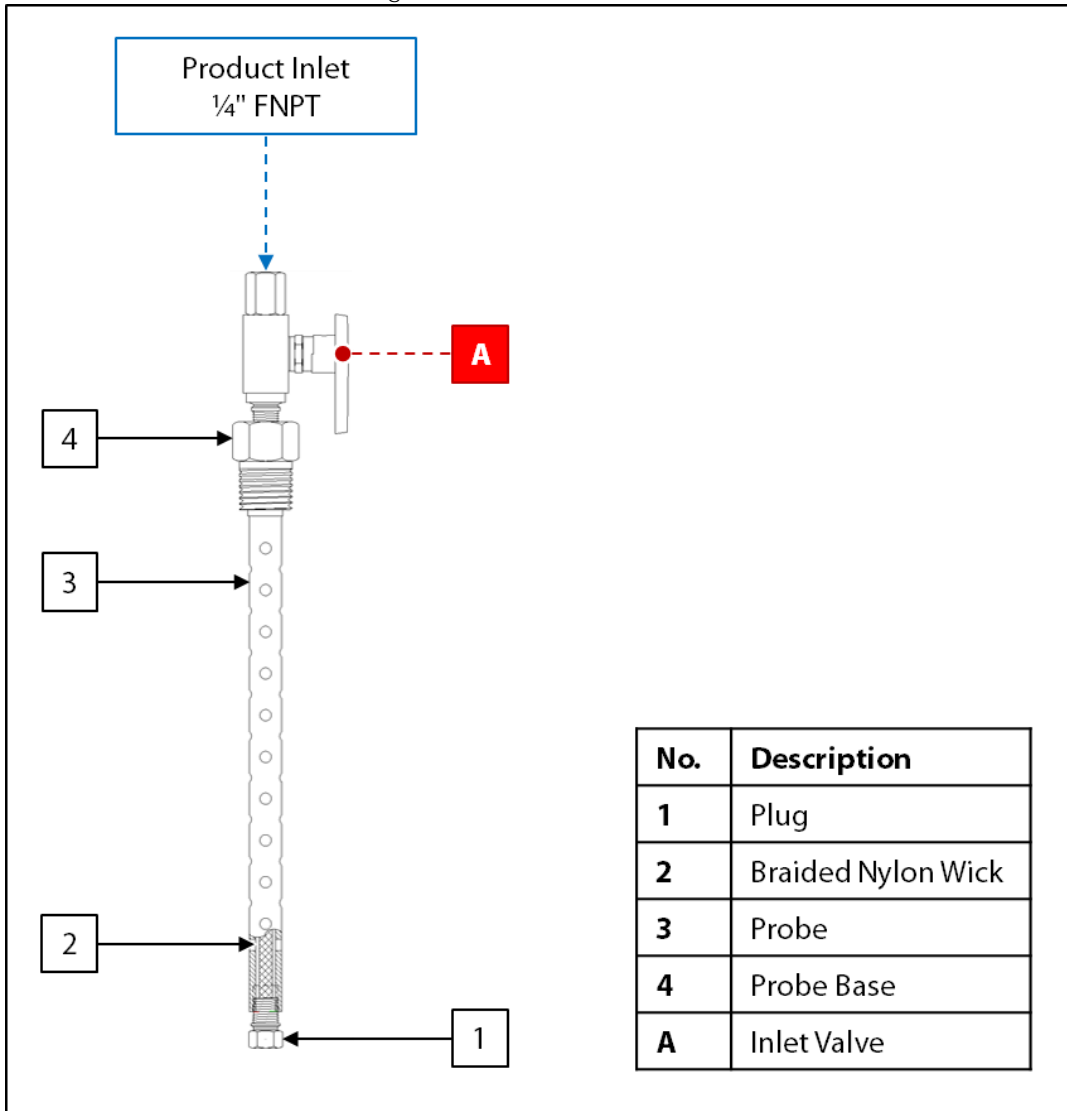


Figure 2: SP-DP With Check Valve

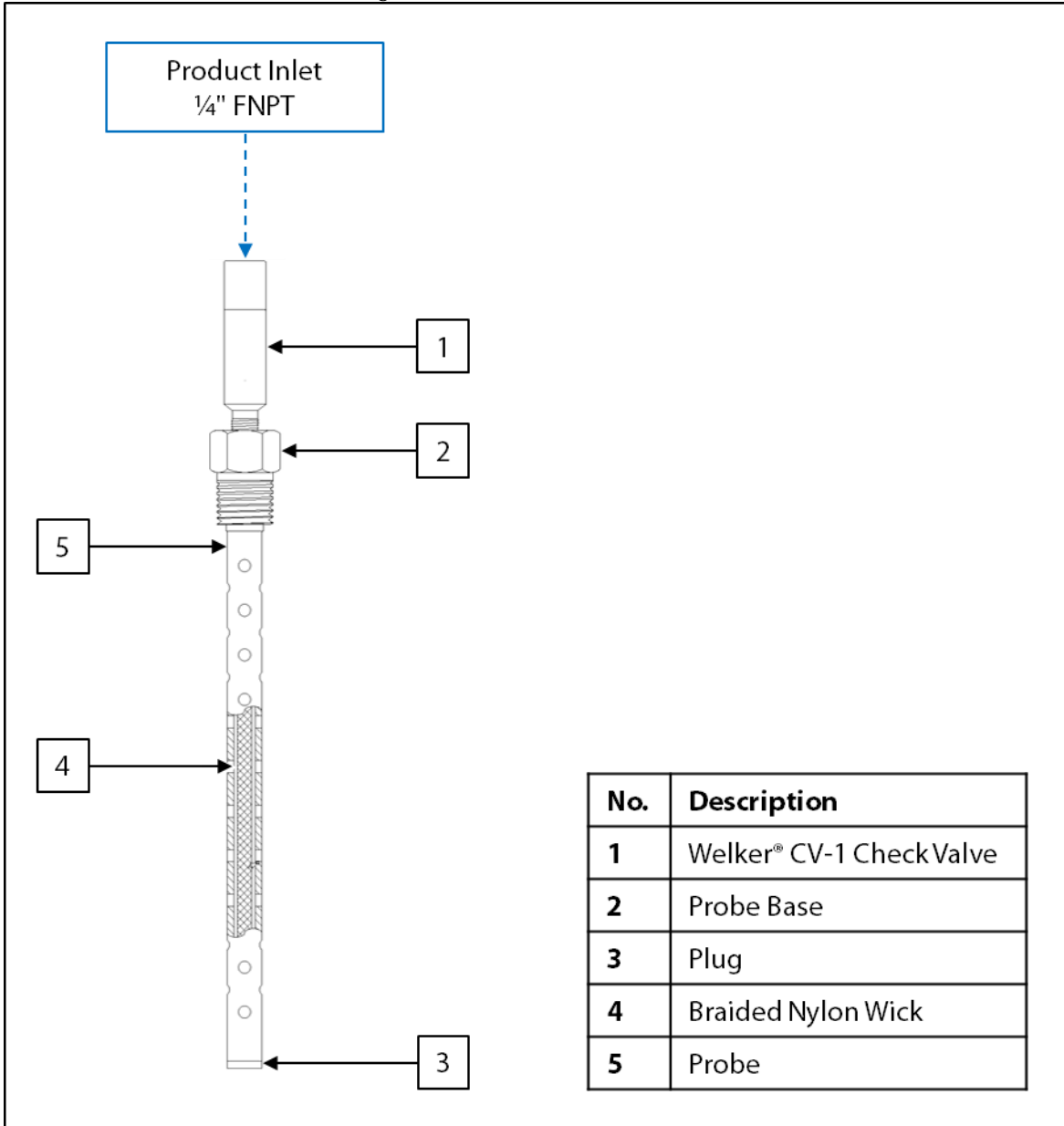
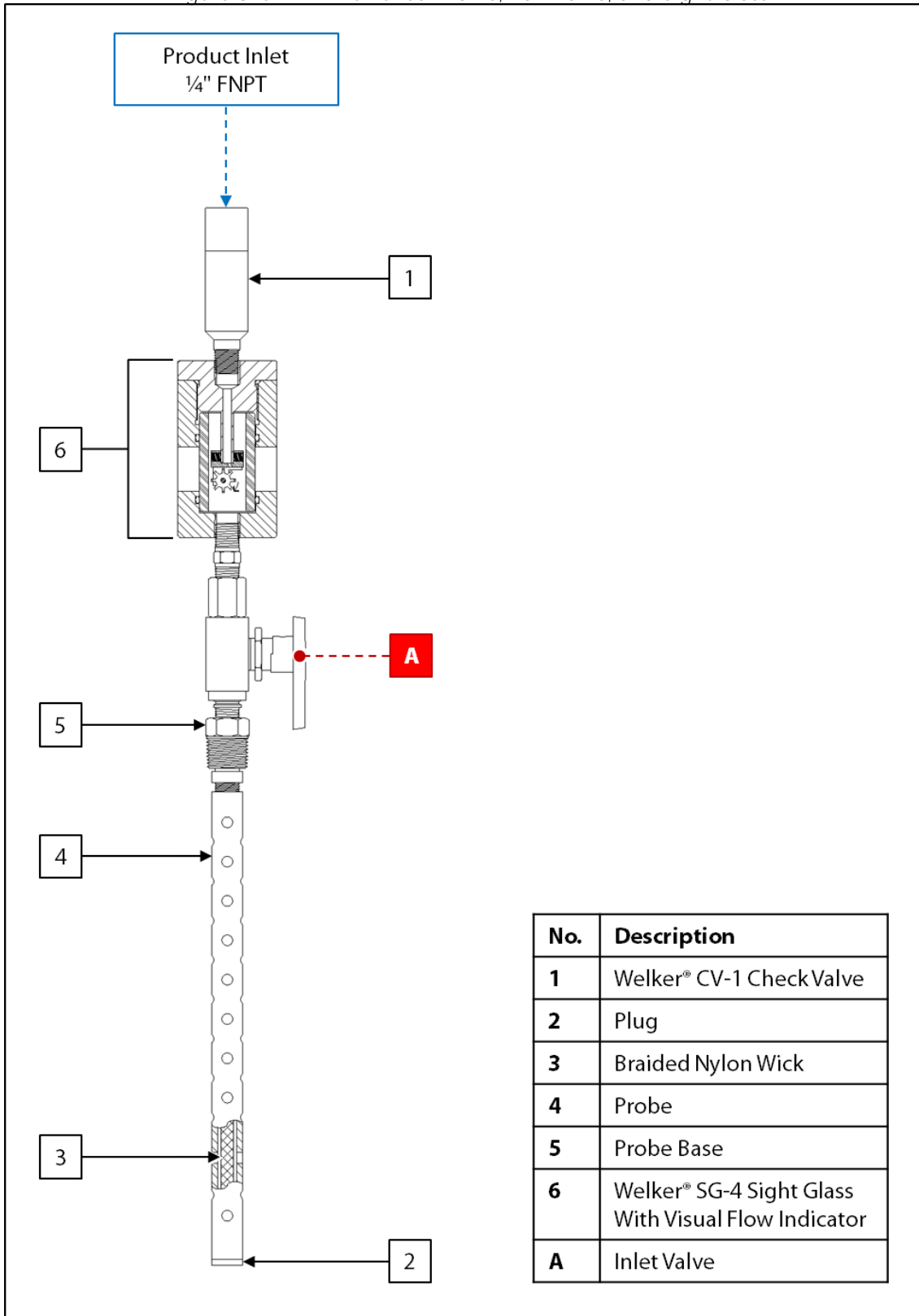


Figure 3: SP-DP With Check Valve, Ball Valve, and Sight Glass



No.	Description
1	Welker® CV-1 Check Valve
2	Plug
3	Braided Nylon Wick
4	Probe
5	Probe Base
6	Welker® SG-4 Sight Glass With Visual Flow Indicator
A	Inlet Valve

Figure 4: SP-DP With Check Valve, Ball Valve, and Pressure Gauge

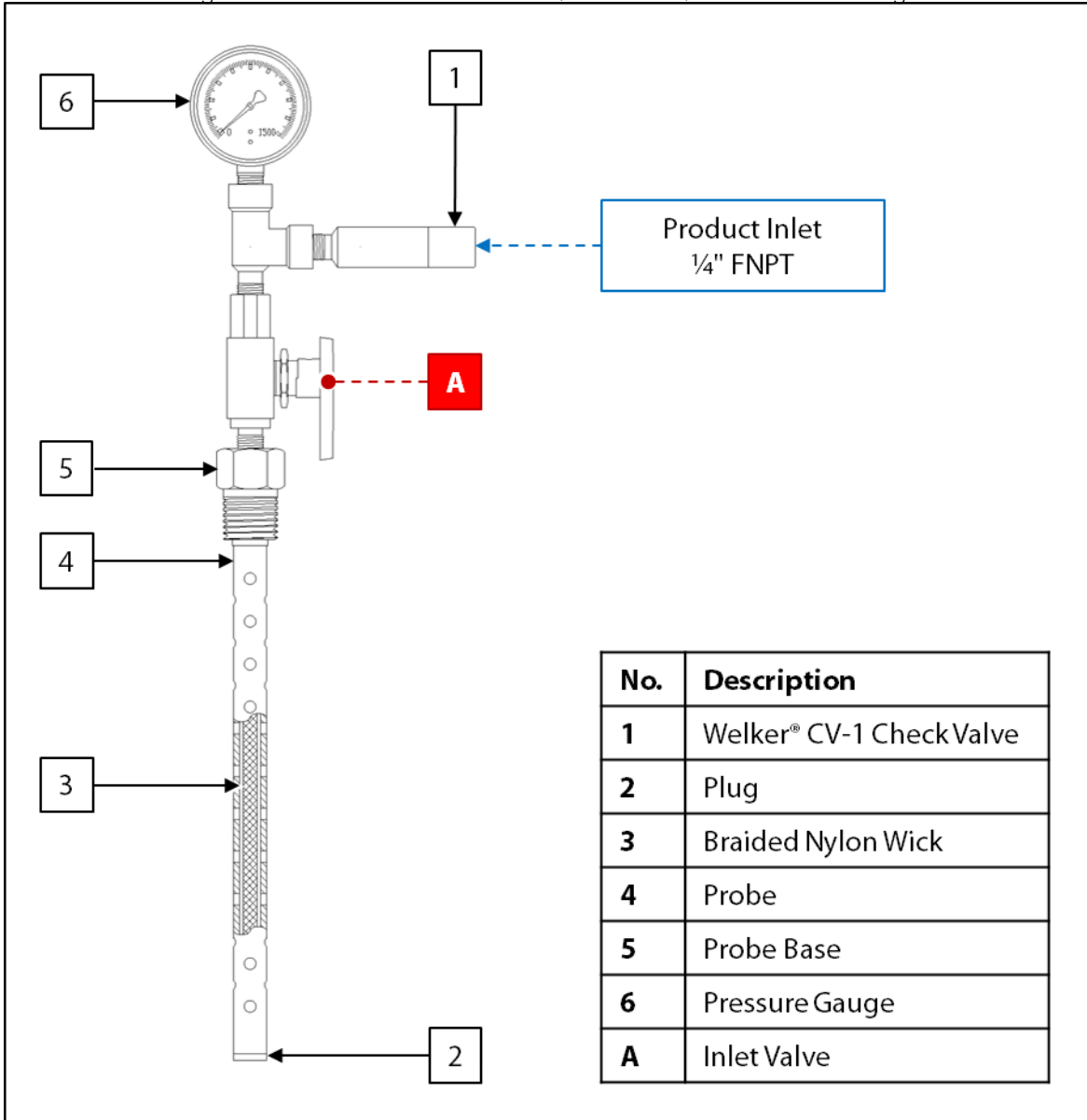
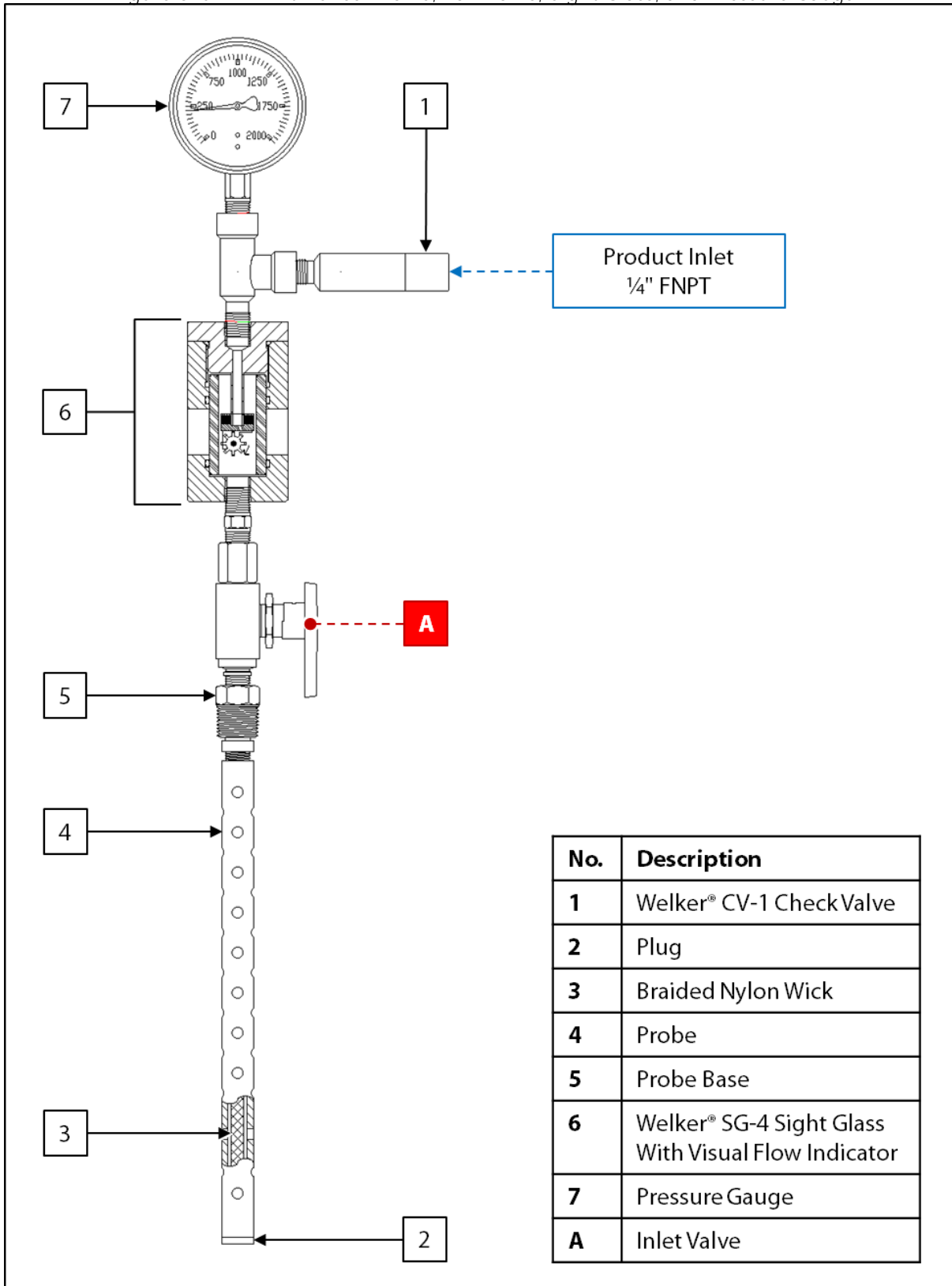


Figure 5: SP-DP With Check Valve, Ball Valve, Sight Glass, and Pressure Gauge



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

1. Depressurize the pipeline.



The pipeline must be depressurized prior to installing and removing the unit.

2. If applicable, ensure that inlet valve A is closed (*Figure 1, Figure 3, Figure 4, or Figure 5*).
3. Wrap the threads of the threaded probe base with PTFE tape.
4. Install the SP-DP to the pipeline.



For optimal chemical diffusion, Welker recommends that the probe be installed in the top of the pipe and inserted into the bottom one-third ($\frac{1}{3}$) of the pipeline in a high-velocity area of the flowing stream.

5. Using customer-supplied $\frac{1}{4}$ " tubing, connect from the customer injection pump to the inlet of the SP-DP (*Figure 1, Figure 2, Figure 3, Figure 4, or Figure 5*).
6. If applicable, open inlet valve A (*Figure 1, Figure 3, Figure 4, or Figure 5*).
7. Check for leaks at the pipeline connection and repair as necessary.
8. Open the outlet valve on the customer injection pump.
9. The SP-DP is now operational.
10. If the SP-DP is equipped with the optional Welker® SG-4 Sight Glass With Visual Flow Indicator (a.k.a. spinner wheel), visually verify product is flowing from the customer injection pump into the pipeline (*Figure 3 or Figure 5*).



If the SG-4 is foggy and product flow is not visible, the SG-4 must be cleaned. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the SG-4 for cleaning instructions.



If the spinner wheel is not spinning, debris around the Visual Flow Indicator may be preventing the wheel from spinning freely. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the SG-4 for cleaning instructions.

2.3 Removing the Unit

1. Depressurize the pipeline.



The pipeline must be depressurized prior to installing and removing the unit.

2. Close the outlet valve on the customer injection pump.
3. If applicable, close inlet valve A (*Figure 1, Figure 3, Figure 4, or Figure 5*).
4. Disconnect the customer-supplied tubing from the inlet of the SP-DP.
5. Remove the SP-DP from the pipeline.

3.1 Before You Begin

1. Maintenance is necessary if a leak occurs at the valve.
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. Adjustable Wrench (Qty. 2)
 - b. Hex Key Set
 - c. Seal Pick

3.2 Maintenance



Maintenance is needed when a leak occurs at the valve.

1. Prior to performing maintenance, the SP-DP must be removed from the pipeline. See *Section 2.3, Removing the Unit*, for instructions on removing the SP-DP from the pipeline.
2. As necessary, remove optional equipment from inlet valve A (*Figure 3, Figure 4, or Figure 5*).
3. To perform maintenance on optional equipment, refer to the *Installation, Operation, and Maintenance (IOM) Manual* for each component. A list of components is available in *Appendix A, Referenced or Attached Documents*.
4. Unscrew inlet valve A from the probe base (*Figure 1, Figure 3, Figure 4, or Figure 5*).
5. To perform maintenance on inlet valve A, refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the valve.
6. Unscrew the probe from the probe base.
7. Remove the braided nylon wick from the probe.
8. Inspect the braided nylon wick for excessive wear or deterioration. Replace as necessary.
9. As necessary, clean the probe.
10. Install the braided nylon wick to the probe.
11. Install the probe to the probe base.
12. Install inlet valve A to the probe base (*Figure 1, Figure 3, Figure 4, or Figure 5*).
13. As necessary, install optional equipment to inlet valve A (*Figure 3, Figure 4, or Figure 5*).
14. Maintenance is now complete. Reinstall the SP-DP according to the instructions in *Section 2.2, Installation*.
15. Check all fittings for leaks.

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

- IOM-073: Welker® CV-1 and CV-1F Check Valves
- IOM-094: Welker® SG-4 Sight Glass

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

- Flowserve Corporation Vogt Forged Steel Gate, Globe and Check Valves (Welker® IOM-V054)
- Parker Ball and Plug Valves (Welker® IOM-V213)
- WIKA Bourdon Tube Pressure Gauges Type 232.53 and Type 233.53 (Welker® IOM-V171)

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

- Assembly Drawing: AD631BA (SP-DP With Check Valve)
- Assembly Drawing: AD631BB (SP-DP With Check Valve, Ball Valve, and Pressure Gauge)
- Assembly Drawing: AD631ET (SP-DP With Ball Valve)
- Assembly Drawing: AD631FB (SP-DP With Check Valve, Ball Valve, Pressure Gauge, and Sight Glass)
- Assembly Drawing: AD631FB.1 (SP-DP With Check Valve, Ball Valve, and Sight Glass)

