



INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
ESSENTIALS™ GAS SAMPLER

MODEL

MPS-2

DRAWING NUMBER

AD681BK

AD681BV

MANUAL NUMBER

IOM-222

REVISION

Rev. 0, 07/30/2018

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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 Essentials™ Gas Sampler, MPS-2. 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 Essentials™ Gas Sampler is of a mechanical and electrical 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 Essentials™ Gas Sampler, please contact a Welker representative immediately.

Phone: 281.491.2331

Address: 13839 West Bellfort 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 Essentials™ Gas Sampler is the most cost-effective, compact, and accurate gas sampling solution on the market. Its high durability and low maintenance requirements make the Essentials™ Gas Sampler ideal for remote field locations. No pressure reduction is necessary, the Welker Essentials™ Gas Sampler will pump product directly into your collection cylinder regardless of pipeline pressure. Once a cylinder is filled, it can be easily removed and transported to the lab for analysis.

Welker may custom design the Essentials™ Gas Sampler 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 customization of your equipment.**

Table 1: Essentials™ Gas Sampler Specifications	
Products Sampled	Products Compatible With the Materials of Construction
Materials of Construction	316/316L Stainless Steel, Fiberglass, and Polycarbonate
Maximum Allowable Operating Pressure	1440 psig @ -20 °F to 200 °F (99 barg @ -28 °C to 93 °C)
Connections	Pipeline: ¾" MNPT Sample Outlet: ¼" MNPT
Insertion Length	Probe Length Standard: 8"
Sample Grab Rate	0.25 cc
Dimensions	10" x 8" x 4" (Height x Length x Width)
Features	6TC Timer Composite Enclosure With Clear Cover Purge Manifold

1.4 Equipment Diagrams

Figure 1: Essentials™ Gas Sampler General Arrangement

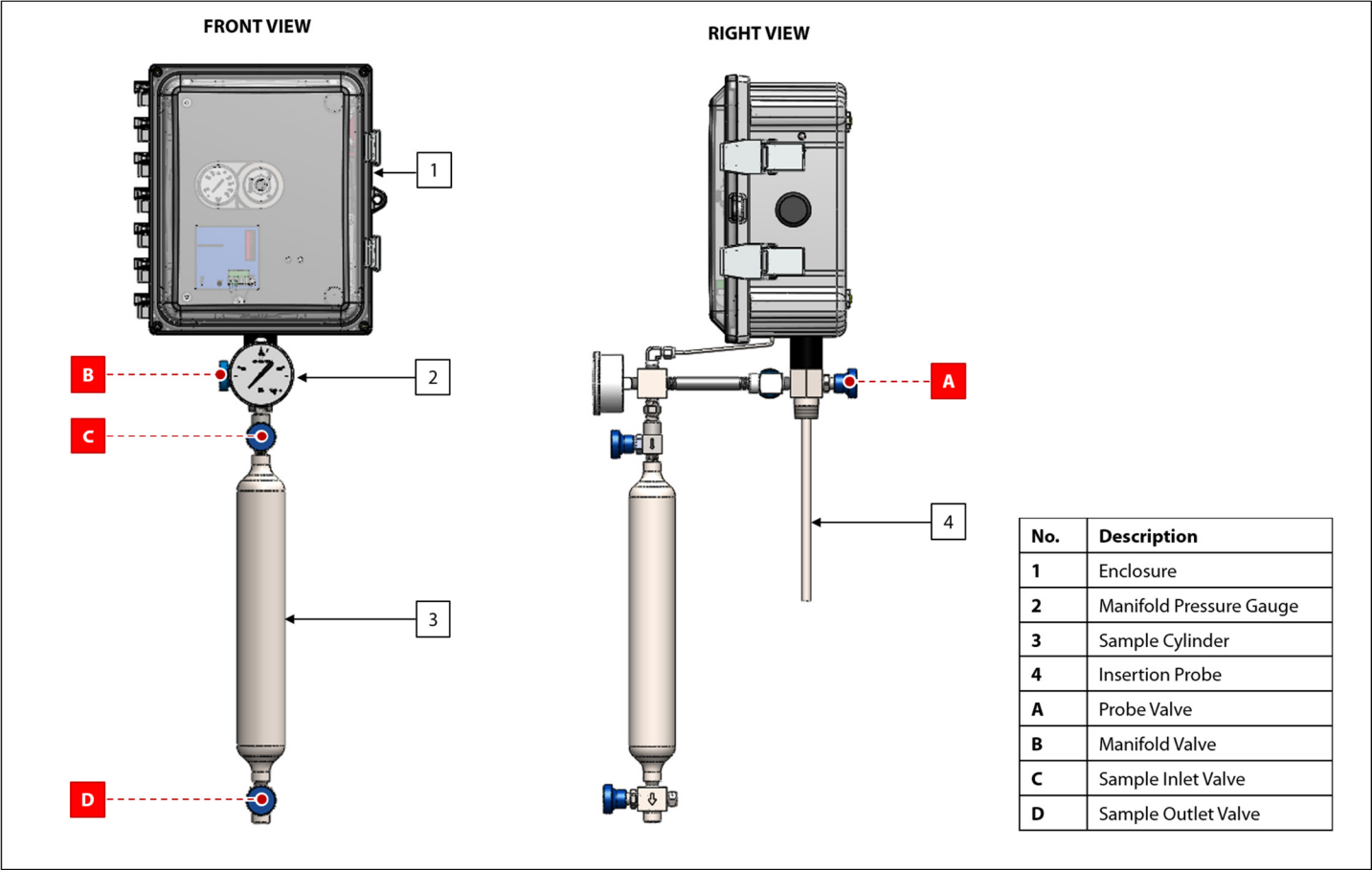
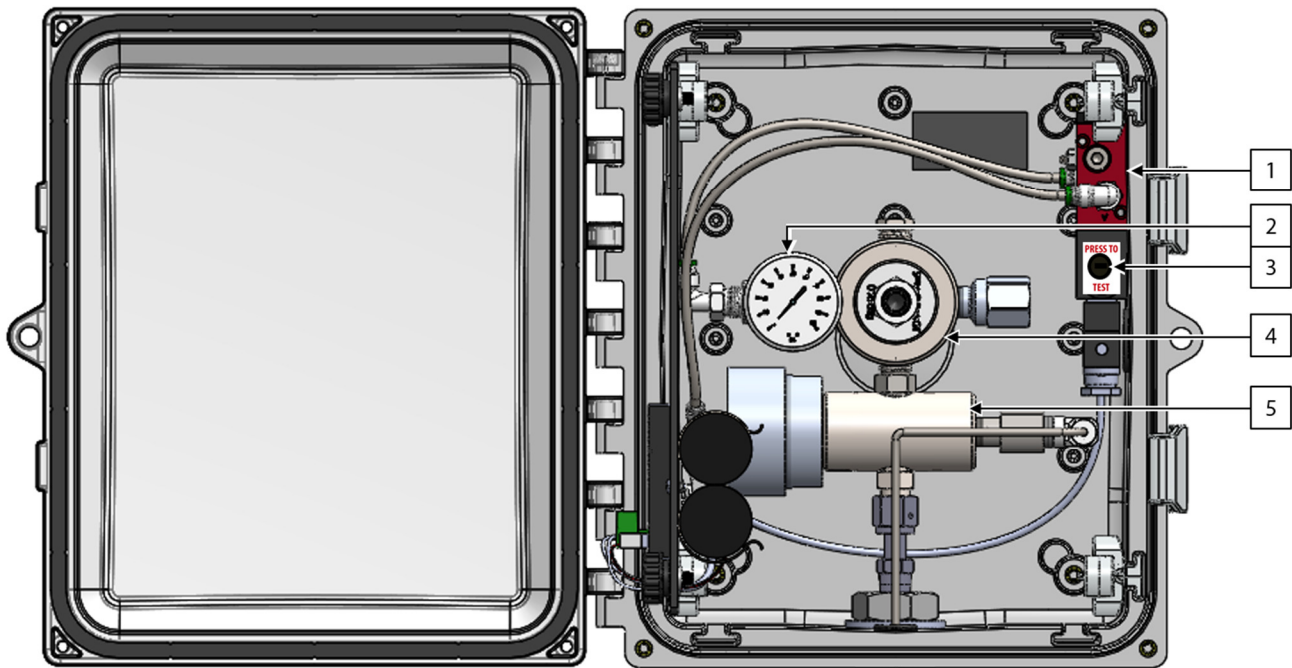


Figure 2: Essentials™ Gas Sampler Diagram



No.	Description
1	Sample Solenoid
2	Enclosure Pressure Gauge
3	Test Button
4	IR-7 Instrument Regulator
5	MPS Sample Pump

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 Essentials™ Gas Sampler Assembly Instructions

Scan the QR code or refer to the link on instructions for installing the manifold pressure gauge and tubing.



welker.com/videos/EssentialsGasSampler_AssemblyInstructions.mp4

2.3 Installing the Sampler

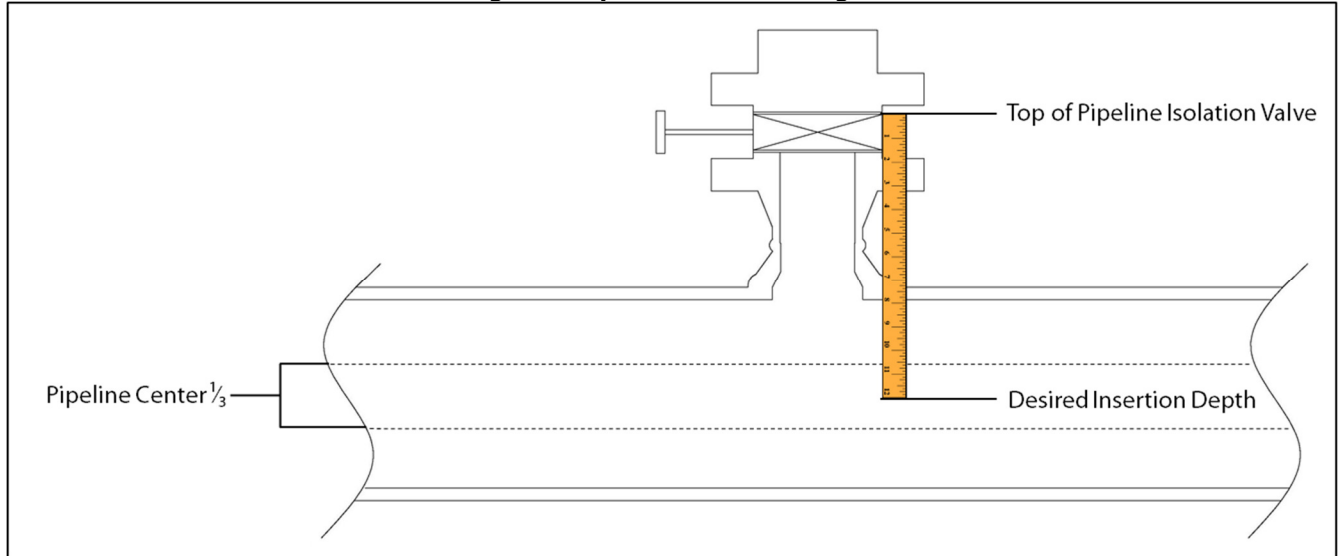
1. After unpacking the unit, check it over for compliance and any damages.



The installation instructions are written from the position that the Essentials™ Gas Sampler is part of a complete sampler system. If it is purchased as a sampler alone, the system should be constructed in a fashion compatible to the following instructions.

2. Before installing sampler onto the pipeline thread-o-let, be sure the probe is cut to a length that will reach into the center one-third of the pipeline (*Figure 3*). The sampler should be located in the least turbulent area available of the flowing stream, i.e., not in a header or blowdown stack and away from obstructions, elbows, or partially closed valves.

Figure 3: Pipeline Insertion Length



3. Once the sampler is mounted, hook-up can be completed.
4. Tube from the “sample out” port on the sampler to the sample container. The cylinder (container) should be located as close to the sampler as is possible. Use small diameter stainless steel tubing ($\frac{1}{8}$ " tubing is preferred).



All connections must be checked carefully for leaks at full line pressure. No leaks are acceptable within the complete sample system



If a constant pressure cylinder is used, refer to those instructions for complete details.



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

5. If the system is paced by an electronic signal from an outside source (i.e., turbine meter, flow computer, etc.), make the appropriate electrical hook-ups at this time.



All electrical connections must meet local and national electric codes, and excessive weight added to conduit run must be supported.

6. System is now ready for start-up.

2.4 Start-Up and Sequence of Operation

1. Open the probe valve A on the GSS10MP18 sampler (*Figure 1*).
2. Set the IR-7 instrument regulator at 65-70 psi (*Figure 2*).
3. To test the sample system, take the following steps:
 - a. Close the sample inlet valve C on the cylinder (*Figure 1*).
 - b. Actuate the sample solenoid by using a screw driver to press the Test button multiple times to actuate the pump and build pressure (*Figure 2*).
 - c. Observe the gauge on the manifold. The unit should build pressure to above line pressure. Let the unit sit for several minutes and check for a drop in pressure on the gauge. If it does drop, check for leaks. If the sampler holds pressure, the unit is ready to be placed in operation.



Solenoid must not be pressed and locked during sampling to enable communication with the EFM and to prevent damage to the equipment.

4. To resume normal sampler operation, turn ON power to the system.
5. Open valves B, C, and D to purge the cylinder of previous sample and to remove air trapped in the tubing (*Figure 2*).
6. Once the system has been purged, close the sample purge valve D and begin sample collection.
7. Once sample has been collected, close valves B and C, then disconnect the sample cylinder.
8. Tag the sample cylinder and prepare it for transportation to the testing laboratory in accordance with company policy.

SECTION 3: MAINTENANCE

3.1 Before You Begin

1. **Welker recommends that the unit have standard maintenance under normal operating conditions: for *gas sampling*** every six (6) 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.

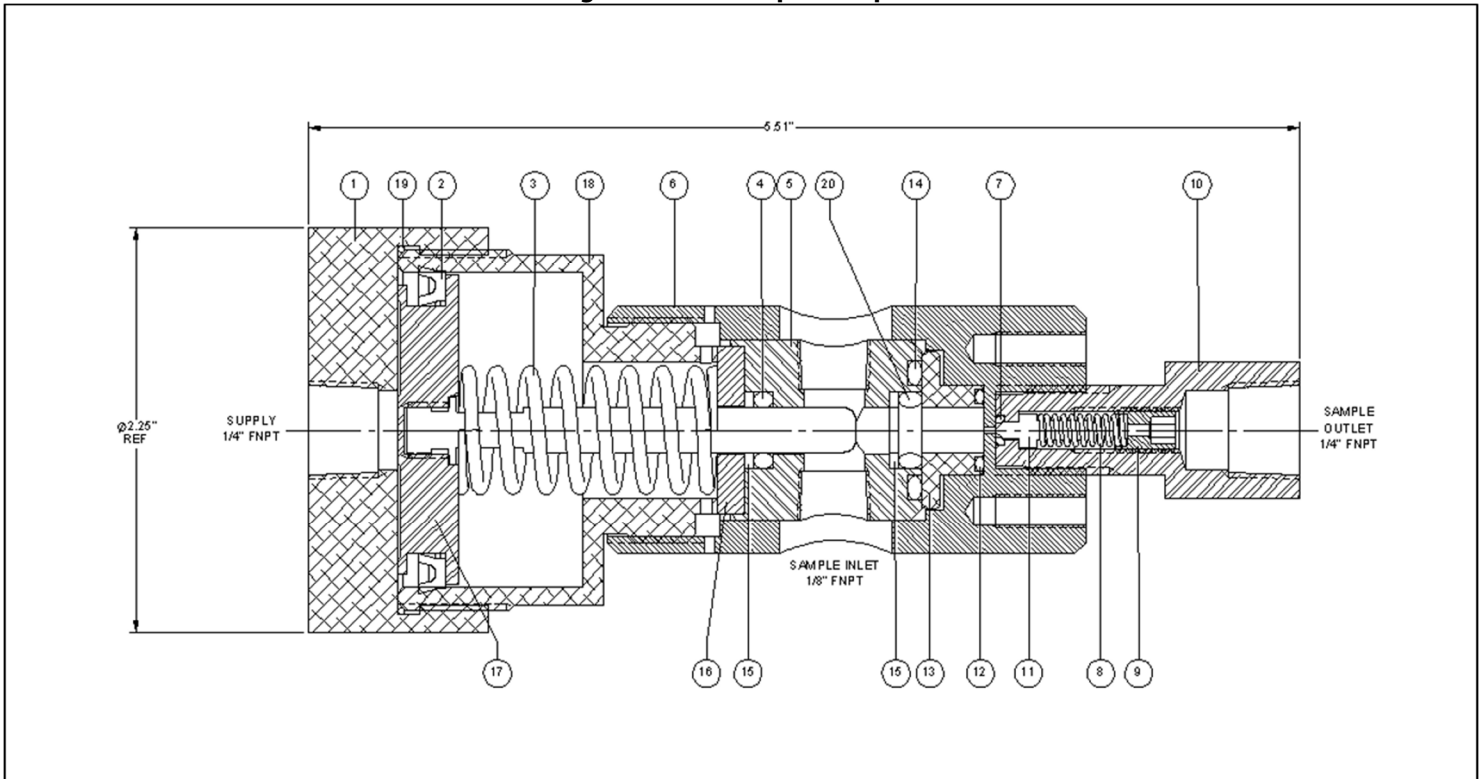


After the seals are installed, the outer diameter of shafts and inner diameter of cylinders may be lubricated to allow smooth transition of parts.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface. Welker recommends having the following tools available for maintenance. Please note that the exact tools required may vary by model.
 - a. Adjustable Wrench Sizes: 6" and 12"
 - b. 8" Channel Lock Pliers
 - c. Hex Wrench Sizes: $\frac{5}{32}$ ", $\frac{3}{16}$ ", $\frac{1}{4}$ ", and $\frac{3}{8}$ "
 - d. Lubricant to apply to all O-ring seals when reassembling.

3.2 Disassembly

Figure 4: MPS Sample Pump



The sampler must first be removed from the pipeline in order to perform maintenance.

1. Close probe valve to isolate pump system from the from process pipeline and close manifold valve to isolate sample cylinder (Figure 1).
2. Remove all instrument tubing between regulator, solenoid, and pump (Figure 2).
3. Remove sampler from probe
4. Disconnect regulator from pump.
5. Unscrew cap (part #1) from motor housing (part #18).
6. Remove piston (part #17), spring (part #3), and spring retainer (part #16).
7. Inspect piston (part #17) for scratches or pits. The piston has a polished surface and should be free from scratches or abrasions. Slightly lubricate before reassembly.
8. Remove flow ring (part #5) and replace the two O-ring seals on each end (parts #4 and #14).



Before installing new O-ring seals, be sure O-ring grooves are clean and seals have been lubricated with silicone grease or an O-ring lubricant.

9. Remove relief cap (part #10) from body.
10. Remove poppet (part #11) and spring (part #8) by unscrewing spring adjuster (part #9).
11. Inspect poppet for scratches and clean relief cap.
12. Replace O-ring (part #7).
13. Reassemble in reverse order. All seals and shafts should be lightly lubricated before installation. Do not overtighten screwed connections. They are O-ring sealed and need only be snug.
14. Reconnect instruments and cylinder.
15. Sampler is now ready to put into operation.

3.3 Reassembly

To reassemble the sampler, simply reverse the order of disassembly while paying special attention to the following procedures:



Check valves for leaks and repair as necessary during reinstallation.

- 1. O-rings and seals can be cut or destroyed during assembly. Please use caution when assembling the sampler.
- 2. Lubricate the polished surfaces on the shafts and cylinders. Silicone grease is recommended. Small amounts are sufficient.
- 3. Take extra care when reassembling the inner shaft, as it must travel through several seals. Lubricate and rotate shaft while inserting, so as not to scratch the shaft or damage the seals.
- 4. Snug the packing gland nuts after the sampler has been fully reassembled.



Never tighten the nut unless it is leaking. DO NOT OVERTIGHTEN.

- 5. When the collection head assembly is being replaced, use caution with the internal relief, making sure it is properly aligned while threading on the anvil/cylinder. The anvil/cylinder must be attached securely to the inner shaft.

3.4 Troubleshooting

Table 2: Essentials™ Gas Sampler Troubleshooting

Issues	Possible Causes	Solutions
Product is not flowing into the sample cylinder.	Any customer-supplied valves between pipeline and pump may not be open.	Ensure any necessary valves are open.
	There is a leak in the system	Follow step 3 in <i>Section 2.3 Start-Up and Sequence of Operation</i> to test the sample system for leaks. Change o-rings if necessary.
The IR-7 Instrument Regulator is leaking or flow is restricted.	The cartridge assembly may need to be replaced.	Check the cartridge assembly and replace as necessary. Refer to the <i>Installation, Operation, and Maintenance (IOM) Manual</i> for the IR-7 for instructions.

APPENDIX A: REFERENCED OR ATTACHED DOCUMENTS

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

- IOM-044: Welker IR-7 Instrument Regulator
- IOM-105 Welker NV-1 and NV-5 Instrument/Needle Valves

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

- Circle Seal Controls 500 Series Adjustable Popoff and Inline Relief Valves (Welker IOM-V178)
- McDaniel Controls Series R7, T7, and J7 Stainless Steel Case Utility Gauges (Welker IOM-V274)
- Versa® C Series Valves (Welker IOM-V041)
- WIKA Type 232.53 and 233.53 Bourdon Tube Pressure Gauges (Welker IOM-V171)

Welker drawings and schematics suggested for use with this unit:

- Assembly Drawing: AD625BC (MPS Sample Pump) and AD681BV (Essentials™ Gas Sampler)

NOTES



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