Model 9900 Analyzer

Model 9900^{WM} (Wall Mount) Version

Manual Supplement

AMETEK® Canada LP
A DIVISION OF AMETEK PROCESS & ANALYTICAL INSTRUMENTS
Western Research

PN 903-8729, Rev. A

Model 9900 Wall Mount (WM) Supplement

The information in this document is intended to supplement and/or replace information about the Model 9900RM (Rack Mount) Analyzer that is discussed throughout the Model 9900RM Analyzer *User Manual*. Only the major differences between the Wall Mount and Rack Mount versions of the Model 9900RM Analyzer are discussed in this document (i.e., locations of components, preventive maintenance procedures, etc.).

While working on the analyzer, use the main analyzer *User Manual* as your primary source of information for operations and maintenance, and use this Supplement for information that describes physical differences to the layout of the analyzer.

While the physical makeup of the Wall Mount analyzer is slightly different from the standard Rack Mount version, the general operations are the same.

NOTE

This supplement contains drawings that are intended to replace Figures in the analyzer "User Manual" that illustrate the layout of the analyzer components.

In cases where this supplement references a drawing that is in the analyzer "User Manual," the Figure number will include a Chapter number (e.g., 3-2 or 3-4). All other Figures in this Supplement are labeled sequentially (e.g., 1, 2, 3, etc.).

General Changes

The Wall Mount and Rack Mount versions of the Model 9900 Analyzer operate in much the same manner. The most notable differences with the Wall Mount version is the Electronics Enclosure size and shape and the Human-Machine Interface (HMI) on the front of the enclosure. The entry port locations for the Sample and Vent Lines, and the AC power and signal connections, are also different.

The regular preventive maintenance is basically the same, with only minor differences in the actual procedures that are listed in the analyzer manual. The main differences are discussed in this Supplement.

The major differences in the locations of components in the Wall Mount analyzer are listed below. Refer to Figure 1 and Figure 2 in this Supplement for locations of these components. The locations are referenced when viewing the interior of the Wall Mount Electronics Enclosure from the front, except where noted.

- The **Sample Inlet/Outlet Connections ports** are located on the exterior left side of the enclosure (typical).
- The **Cable Entry ports** are located on the bottom of the enclosure (access via the Gland Plate).
- The analyzer **Customer Connections** are available on the left side of the **Customer I/O PCB**, located directly above the **AC Power Distribution PCB** (see Figure 1 in this Supplement for location of the **Customer I/O PCB**, and see the “Customer Connections” drawing in the analyzer *User Manual* for termination points). This panel provides the RS-485 connection port, and analog/digital I/O and relay contact termination points.
- The **Ethernet Connector** is located inside the Electronics Enclosure on the **Gateway Ethernet Module**, adjacent to the **Customer I/O PCB**.

The following descriptions from the main analyzer *User Manual* (Rack Mount version) do not apply to the Wall Mount version.

- Analyzer cover, or top cover, secured with screws.
  The Wall Mount version has a hinged door that is secured with two latches, opened with a flat screwdriver. In all cases where the analyzer *User Manual* mentions "the Enclosure's cover is off," replace the text with "the analyzer's door is open."]

NOTE

For systems with Fibreglass cabinets, there are four latches.

- Rear Panel.
  [On the Wall Mount version all sample in/out connections, electrical connections, communication connections, and Power Entry Module components are located within the Electronics Enclosure, and accessed via the side or bottom panels.]

Other specific changes are included in the following pages.

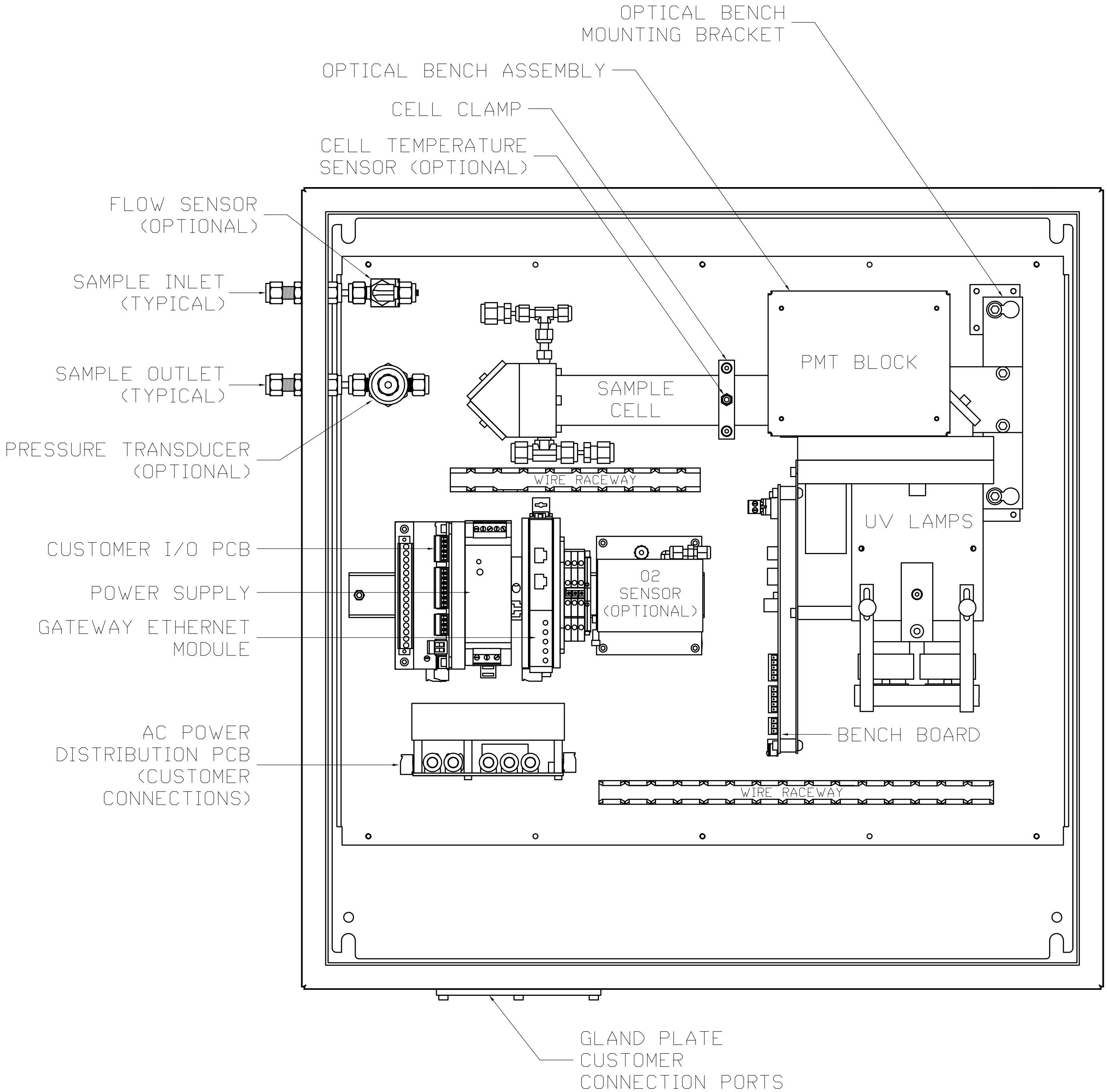

Figure 1.
Analyzer Enclosure component layout.

NOTE

For other parts and equipment not shown in Figure 1, refer to the "Analyzer internal component layout, all options" drawing in Chapter 3 of the analyzer User Manual.

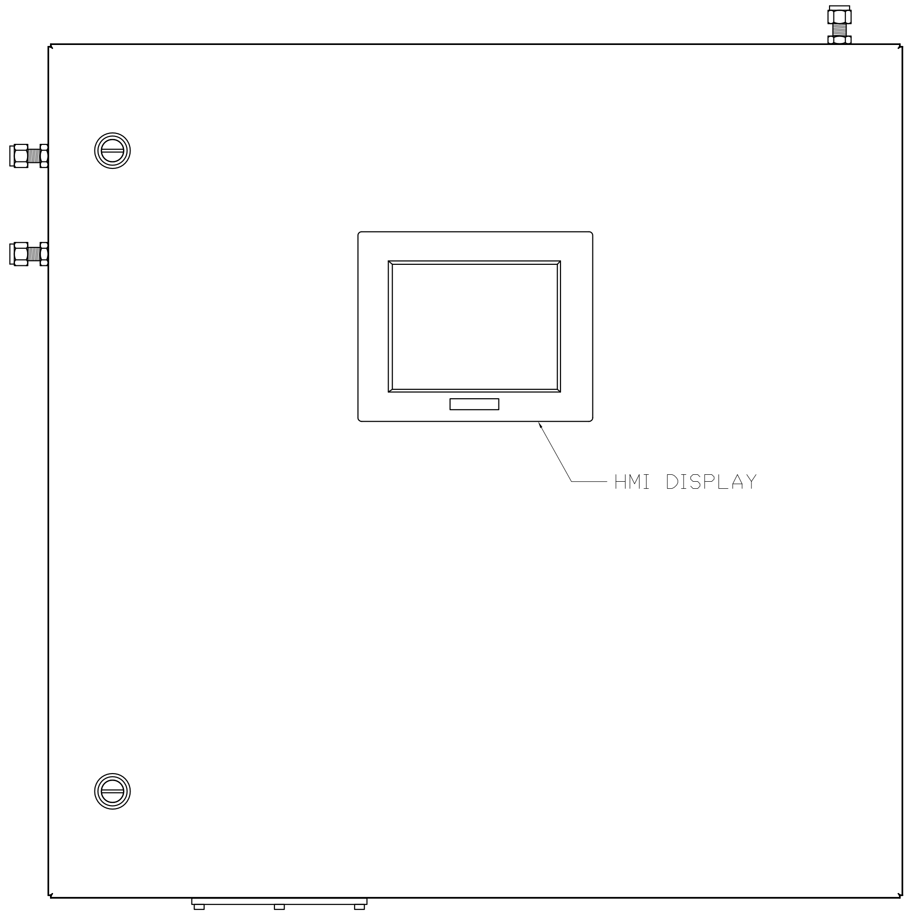

Figure 2.
User Interface Panel,
Electronics Enclosure.

Section/Chapter	**Page(s)**	**Instructions**
Uncrating and Inspecting the Analyzer (Chapter 3)	3-3	Disregard the Caution. The Wall Mount version does not have handles on the front of the analyzer. Replace the paragraphs that begin “Upon receiving the analyzer ...” with the information below.

Upon receiving the analyzer, remove it from its crate (if not in a shelter). Check the exterior of the analyzer for any physical damage. Open the Electronics Enclosure and check to ensure that all of the components and wiring within the interior of the analyzer are secure and that there is no physical damage.

Section/Chapter	**Page(s)**	**Instructions**
Installing the Analyzer (Chapter 3)	3-5	Replace this section with the information below.

The complete analyzer system is contained within one enclosure. The Wall Mount version can be mounted on a backpan, directly on a wall in a plant, or in a shelter.

All external connections to the analyzer are made through the left side (typical) and bottom of the analyzer. When mounting the analyzer, allow sufficient room around all sides of the analyzer for the Sample Line and Vent Line connections, electrical/wiring connections (cable or conduit carrying wiring to the input/output signal terminal strips and AC Power), and in front of the analyzer for door swing clearance.

The AC Power cable is routed into the analyzer enclosure through the Gland Plate on the bottom of the enclosure and terminated at the **AC Power Distribution PCB**.

The valve configuration and the flow control associated with the sample, Zero, and Calibration gases are to be supplied by the customer.

Section/Chapter	Page(s)	Instructions
Location and Environment (Chapter 3)	3-5	Replace the first paragraph beginning "The entire analyzer system..." with the information below.

The entire analyzer system can be mounted directly on a wall or in a custom-built shelter. In all cases, the analyzer system must be installed indoors to ensure it is protected from harsh environmental elements.

Section/Chapter	Page(s)	Instructions
Installing the Analyzer (Chapter 3)	3-6	Disregard Figure 3-1.

Section/Chapter	Page(s)	Instructions
Installing the Analyzer (Chapter 3)	3-7..3-8	Use Figure 3-2 in the analyzer *User Manual* only for components not included in Figure 1 in this Supplement, and disregard Figure 3-3. Refer to Figure 1 in this Supplement and Figure 3-6 (Customer Connections) in the analyzer *User Manual*.

Section/Chapter	Page(s)	Instructions
Installing and Connecting the Sample and Vent Lines (Chapter 3)	3-10	In the paragraph that begins “The analyzer is supplied with ...” note that the Sample Line Inlet and Vent Line Outlet connection fittings are located on the exterior left side (typical) on the Wall Mount version of this analyzer, not on the analyzer Rear Panel.

NOTE

For systems in a shelter the Sample and Vent Line connections may already have been made at the analyzer; in this case, the customer will only have to supply and route the Sample and Vent lines to the Sample Line Inlet and Vent Line Outlet connection fittings on the exterior of the shelter. Sample gas Inlet/Outlet port locations may vary on Wall Mount Enclosures.

Section/Chapter	Page(s)	Instructions
Connections for Modbus® TCP on Ethernet (Optional) (Chapter 3)	3-12	Replace the paragraph that begins “Connect the Ethernet cable...” with the information below.

NOTE

For systems in a shelter this connection may have been made at the factory; in this case, and the customer will only then have to supply and route the Ethernet cable to the shelter.

Route the Ethernet cable into the analyzer enclosure through the Gland Plate on the bottom of the enclosure and terminated and connect it to the **Gateway Ethernet Module** (see Figure 1)on the **MCU** board (accessed from the top of the **MCU** board). Connect the other end to the network.

Section/Chapter	Page(s)	Instructions
Input/Output Signal and Alarm Relay Contact Connections (Chapter 3)	3-14	Replace this section with the information below.

The terminal blocks for connection to the digital input and output signals, analog output signals, and the status relay contacts are located on the optional **Customer I/O** PCB. Refer to Figure 1 in this Supplement for the location of the Gland Plate and **Customer I/O** PCB, and to Figures 3-5, 3-6, 3-7.1, and 3-7.2 in the analyzer *User Manual* for the connector locations and connection points.

1. Open the Electronics Enclosure to allow access to the **Customer I/O** PCB.

2. Route cable or conduit carrying the input/output and relay contact wiring into the analyzer. Connect the conduit or cable gland to the Gland Plate.

3. Route the input/output wiring through the Gland Plate and then to the **Customer I/O** PCB. Make the connections.

[Continue to use Figure 3-6 in the analyzer *User Manual* for the various Customer Connection points.]

NOTE

For systems in a shelter these connections may have been made between the analyzer and a termination box inside the shelter; in this case, the customer will only then have to supply and route the signal and relay contact wiring to the analyzer termination box in the shelter.

For shelter systems refer to analyzer Final "As-Built" wiring drawings, which are part of the analyzer Documentation Package shipped with the analyzer.

Section/Chapter	Page(s)	Instructions
AC Power Connection (Chapter 3)	3-16	Replace the paragraph beginning "The operating voltage of the analyzer..." with the information below. The Caution still applies.

The operating voltage of the analyzer is indicated on the Product Label on the analyzer Backpan, which is mounted to the back of the analyzer Enclosure. Verify the operating voltage on the label agrees with the operating voltage indicated on the documentation supplied with the analyzer. If there is a discrepancy, contact the local distributor or the factory.

Section/Chapter	Page(s)	Instructions
General Purpose (GP) Applications (Chapter 3)	3-16	Disregard this section. The AC Power connection method described here does not apply to the Wall Mount version of this analyzer.

Section/Chapter	Page(s)	Instructions
Division 2/Zone 2 Applications (Chapter 3)	3-20	Disregard the section “Division 2/Zone 2 Applications”. The AC Power connection method described here does not apply to the Wall Mount version of this analyzer. Instead, use the information below (“Wall Mount Applications”).

Wall Mount Applications

Model 9900 Wall Mount analyzers have a Gland Plate on the bottom of the analyzer Enclosure (see Figure 1 in this Supplement) for electrical connections. These analyzers do not have the Power Entry Switch Plate (or AC Power Switch and AC Plug Connector); therefore, an external power-disconnect switch is required to turn the analyzer power On/Off.

Non-Shelter Systems
To connect AC Power to the Wall Mount analyzer (see Final “As-Built” drawings – shipped with the analyzer – for electrical connections):

1. Open the analyzer Enclosure door.
2. Remove the M20 or ½" plug from the AC Power Gland Plate.
3. Route the AC Power wiring (approved by local wiring regulations and electrical codes) from the external power-disconnect switch (supplied by customer/end user) to the analyzer. The power-disconnect switch must be installed in a safe area, within 3 metres (9.84 feet) of the analyzer.
4. At the analyzer, use a certified cable gland (supplied by customer/end user) with the AC Power Wiring and connect the cable gland to the Gland Plate. Route the AC wiring to **J100** on the **AC Power Distribution** PCB and terminate the wiring.
5. Terminate the wiring to the external power-disconnect switch.
6. Connect an earth ground to the analyzer enclosure (typical: inside rear panel). See Figure 3-7.2 in the analyzer *User Manual* for location.
7. Close and secure the analyzer Enclosure door.

Shelter Systems
For systems in a shelter refer to system Final “As-Built” drawings for AC Power connections. These drawings are part of the Documentation Package shipped with the analyzer system.

Section/Chapter	Page(s)	Instructions
Powering Up the Analyzer (Chapter 3)	3-22	In Step 1 replace the first two paragraphs beginning “General Purpose (GP) Analyzers...” and “Division 2/Zone 2 Analyzers...” with the information below.

Switch the analyzer power-disconnect switch to the On position. This will also apply power to the Human-Machine Interface (HMI).

For systems not using a power-disconnect switch, apply power to the analyzer using the alternative method. This will also apply power to the Human-Machine Interface (HMI).

Section/Chapter	Page(s)	Instructions
Zero-Calibrate the Analyzer and Optional O_2 Sensor, and View the Results (Chapter 5)	5-3	In Step 1, use Figure 1 in this Supplement in place of Figure 5-6 in the analyzer *User Manual*. For Shelter Systems, refer to the Note below.

NOTE

For systems in a shelter the Zero Gas connection may be a permanent connection from the analyzer to the exterior of the shelter. In this case, the customer will only have to supply, route, and connect the Zero Gas tube to the Zero Gas Inlet on the exterior of the shelter.

Section/Chapter	Page(s)	Instructions
Span-Calibrate the Analyzer and View the Results (Chapter 5)	5-5	In Step 1, use Figure 1 in this Supplement in place of Figure 5-6 in the analyzer *User Manual*. For Shelter Systems, refer to the Note below.

NOTE

For systems in a shelter the Span Gas connection may be a permanent connection from the analyzer to the exterior of the shelter. In this case, the customer will only have to supply, route, and connect the Span Gas tube to the Span Gas Inlet on the exterior of the shelter.

Section/Chapter	Page(s)	Instructions
Measuring Cell Preventive Maintenance (Chapter 6)	6-7	Use Figure 6-1 in the analyzer *User Manual* to locate other analyzer parts and equipment that are not shown in Figure 1 in this Supplement.

Section/Chapter	Page(s)	Instructions
Measuring Cell Preventive Maintenance (Chapter 6)	6-9..6-12	Replace Steps 4 and 5 in the analyzer *User Manual* with Step 4 below.

4. Open the Electronics Enclosure door and remove the Measuring Cell from the analyzer. To do this:

WARNING

The analyzer sample system will be under positive pressure.

NOTE

Before proceeding, note the position of the sample tube fitting elbows. This will be helpful when replacing these parts later.

Various lengths of screws are encountered during disassembly. Take note of where each length is used and be sure to replace the appropriate screws in their original locations when reassembling the Measuring Cell later.

   a. Disconnect the Sample and Vent Line connection fittings from the Cell.

   b. Remove the (2) screws from the blue (Measuring) Cell Clamp and remove the clamp. The Cell Temperature Sensor (if used) can remain in the Cell Clamp, and does not have to be disconnected.

CAUTION

In the next step, take care to ensure the Cell Window does not drop out when removing the Cell from the Optical Bench Assembly.

c. While holding the Cell in place, remove the (3) screws that secure the Measuring Cell to the Optical Bench. Remove the Cell from the Optical Bench, taking care not to drop the Window when these parts are separated. Carefully remove the Cell Window from the Measuring Cell by grasping it by its outer edge. Avoid touching the Window surfaces.

Inspect the Window for any chips, cracks, or scratches. Place the Window on a soft, non-abrasive cloth – and set it aside in a safe location – to avoid damaging it.

Use an o-ring removal tool to remove the o-ring from the Cell. Take care not to scratch or damage the o-ring groove.

Section/Chapter	Page(s)	Instructions
Measuring Cell Preventive Maintenance (Chapter 6)	6-13..6-14	Replace Steps 13 and 14 in the analyzer *User Manual* with Step 13 below.

13. Replace the Measuring Cell in the analyzer. To do this:

a. Align the two larger-diameter holes in the Measuring Cell with the two larger-diameter holes in the Optical Bench Assembly. **Ensure that the Cell Window does not slide out of position when the Cell is initially placed against the Optical Bench Assembly.**

Secure the Cell to the Optical Bench assembly using the three screws removed earlier. Tighten the screws evenly.

b. Replace the blue Cell Clamp over the Measuring Cell and secure the Cell in place using the (2) clamp screws.

c. Reconnect the Sample/Vent Line tubes to the Measuring Cell fittings (or union tees).

	6-14	Replace Step 16 in the analyzer *User Manual* with Step 16 below.

16. Close and secure the Electronics Enclosure door.

Section/Chapter	Page(s)	Instructions
Source Lamps Replacement (Chapter 6)	6-18	Replace Step 4 in the analyzer *User Manual* with the information below.

4. Open the Electronics Enclosure door.

	6-23	Replace Step 17 in the analyzer *User Manual* with the information below.

17. Close and secure the Electronics Enclosure door.

Section/Chapter	Page(s)	Instructions
Replacing the Filter Wheel Drive Belt and Bearings in the Filter Assembly (Optical Bench) – Motorized Optical Bench Analyzers Only (Chapter 6)	6-24	In Step 4, replace the sentence "Remove the Analyzer Enclosure cover..." with the information below.

4. Open the Electronics Enclosure door and remove the Optical Bench/ Measuring Cell Assembly from the analyzer. To do this (see connector "**Item**" locators in Figure 6-3):

	6-25	In Step 4-c, replace the sentence "Loosen – but do not remove – the two outer..." with the information below.

Loosen and back out – but do not remove – the two outer screws on the blue Optical Bench Mounting Bracket (near the upper-right area of the analyzer) until they are loose enough to allow the Optical Bench/Measuring Cell to move.

	6-27	Replace Step 4-d with the information below.

d. Gently slide the assembly toward the left side of the analyzer. While holding the Optical Bench/Measuring Cell Assembly by the Lamp Block and Measuring Cell, carefully remove it from its mounting brackets and remove it from the analyzer.

Section/Chapter	Page(s)	Instructions
Replacing the Filter Wheel Drive Belt and Bearings in the Filter Assembly (Optical Bench) – Motorized Optical Bench Analyzers Only (Chapter 6)	6-28	Replace Step 10-a with the information below.

a. While holding the Optical Bench/Measuring Cell Assembly by the Lamp Block and the Measuring Cell, carefully install it in the Analyzer Enclosure, aligning the mounting bracket slots on the Optical Bench end with the screws on the Optical Bench Mounting Bracket, and resting the Cell against its Mounting Bracket.

   Gently slide the assembly to the right until it stops.

	6-28	Replace Step 10-b with the information below.

b. Starting at the Optical Bench Mounting Bracket, tighten the two screws to secure the assembly in place.

   Replace the blue Cell Clamp over the Measuring Cell and secure the Cell in place using the (2) clamp screws.

	6-29	Replace Step 12 with the information below.

12. Close and secure the Electronics Enclosure door.

Section/Chapter	Page(s)	Instructions
Status Code 1 Screens and Diagnostics (Chapter 6)	6-53..6-62	Under the ***Corrective Action*** for all of these Status Codes, replace all references to "...remove the top cover from the analyzer Enclosure..." with "...open the Electronics Enclosure door...".

Section/Chapter	Page(s)	Instructions
Status Code 2 Screens and Diagnostics (Chapter 6)	6-63..6-70	Under the ***Corrective Action*** for all of these Status Codes, replace all references to "...remove the top cover from the analyzer Enclosure..." with "...open the Electronics Enclosure door...".

Section/Chapter	Page(s)	Instructions
Status Code 3 Screens and Diagnostics (Chapter 6)	6-71..6-83	Under the ***Corrective Action*** for all of these Status Codes, replace all references to "...remove the top cover from the analyzer Enclosure..." with "...open the Electronics Enclosure door...".

Section/Chapter	Page(s)	Instructions
Spare Analyzer Fuses (Chapter 7)	7-7	In the Note following the Spare Analyzer Fuses list, change the sentence "For the location of this board..." to the information below.

For the location of this board, refer to Figure 1 in this Supplement.

Section/Chapter	Page(s)	Instructions
Replacement Printed Circuit Boards (Chapter 7)	7-8	In the Note following the Replacement Printed Circuit Boards list, refer to Figure 1 in this Supplement instead of the listed drawing.

Section/Chapter	Page(s)	Instructions
Drawings (Appendix D)	C-8	Disregard the Analyzer Rear Panel Layouts drawing in the analyzer *User Manual*.
