

3.5 Disassembly Instructions

3.5.1 Gas Module II, Gas Module SE, and Gas Module SE with Spirometry

Before disassembling the unit, perform the following:

1. Power down the Gas Module and remove the AC power cable.
2. Remove the interface cable from the Passport XG, Expert, Passport 2, Spectrum or Spectrum OR. These instructions do not apply to the Gas Module 3.
3. Perform work on an anti-static mat at a grounded ESD workstation.

NOTE: The numbers in parentheses () refer to the isometric drawings.

WARNING: Always Remove Power from the Gas Module BEFORE Disassembly.

The six major assemblies of the Gas Module are: The Power Supply, the Interface board, the front bezel, the main chassis, the Spirometry Module (PVX unit) and the M-GAS module. The M-GAS module's replaceable components include: the Nafion Tube, the Drive Pump, the Valve Module, and the Fan. The M-GAS anesthetic agent and O₂ analyzer, and their CPU board are not available separately or as a sub module. In cases of component failure in these assemblies, replacement M-GAS modules will be available. In addition there are three cables, a dust filter cover, and a front panel moisture trap assembly. This section will detail the most economical way to remove each assembly. Refer to the isometric drawings in section 4.7.

A. Removing the Enclosure (10):

WARNING: Remove Power from the Gas Module BEFORE removing the Enclosure.

1. Remove the four screws attaching the Monitor mounting bracket to the Gas Module.
2. Remove the four screws attaching the bottom of the Gas Module's enclosure to the chassis (11).

NOTE: In the next step, use care not to bend or distort the EMC guard fingers while sliding the enclosure.

3. Slide the enclosure back to expose the internal electronics.
4. To re-install, perform the above steps in the reverse order.

B. Replacing the Power Supply (26):

1. Remove the four screws attaching the Power Supply assembly to the chassis.
2. Slide the Power Supply assembly out the open side of the chassis.
3. Unplug the two keyed connectors on the Power Supply assembly.
4. Remove the clear plastic shield (13) and retain to install on the replacement part.
5. To install the replacement part, perform the above steps in the reverse order.

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- C.** Replacing the Line Voltage Receptacle (20):
 - 1.** Remove the two screws attaching the line voltage receptacle to the chassis.
 - 2.** Remove the spade lugs from the rear of the line voltage receptacle, noting each one's position. When installing the replacement part, reinstall the spade-lugged wires on to the terminals they were removed from.
 - 3.** To install the replacement part, perform the above steps in the reverse order.
 - D.** Replacing the Gas Module II Line Voltage Power Switch (21)
 - 1.** Remove the spade lugs from the line voltage power switch, noting each one's position. When installing the replacement part, reinstall the spade-lugged wires on to the terminals they were removed from.
 - 2.** The line voltage power switch is snapped into the rear chassis. To release the switch, pinch the plastic retainers and push the switch out.
 - 3.** To install the replacement part, perform the above steps in the reverse order.
 - E.** Replacing the Gas Module SE Line Voltage Power Switch (21)
 - 1.** Remove the spade lugs from the line voltage power entry receptacle on the rear panel, noting each one's position. When installing the replacement part, reinstall the spade-lugged wires onto the terminals they were removed from.
 - 2.** Remove the line voltage power switch connector from the power supply and remove the ground wire lug from the chassis.
 - 3.** Remove the PVX unit (see step O).
 - 4.** Remove the Front Bezel (see step J).
 - 5.** Remove the two screws holding the switch to the Front Bezel.
 - 6.** To install the replacement part, perform the above steps in reverse order.
 - F.** Replacing the Interface Board (1):
 - 1.** Remove the two jack-posts attaching the rear panel interface connector to the rear panel. This interface connector is part of the Interface Board.
 - 2.** Remove the two screws (Gas Module II) or 1 screw (Gas Module SE) attaching the Interface Board to the Interface board bracket.
 - 3.** Unplug the Power Supply Interface Board Cable from the Interface Board.
 - 4.** Unplug the 26 pin cable connector.
 - 5.** To install the replacement part, perform the above steps in the reverse order.
 - G.** Replacing the Power Supply to Interface Board Cable (2):
 - 1.** Unplug the Power Supply to Interface cable at the Power Supply assembly
 - 2.** Unplug the Cable at the Interface board.
 - 3.** Carefully pull the Cable through the M-GAS module's sub-chassis and through the cable retainer on the rear of the chassis.
 - 4.** To install the replacement part, perform the above steps in the reverse order.

H. Replacing the M-GAS Module (4):

1. Remove the shield, from the chassis, that exposes the M-GAS module Interface board.
2. Remove the four screws attaching the M-GAS module's sub-chassis to the main chassis.
3. Lift the M-GAS until the (M-GAS) rear connector comes in contact with the rear panel of the chassis.
4. Tilt the M-GAS module slightly to release it's rear panel connector.
5. Unplug the M-GAS's rear panel connector.
6. Remove the four pneumatic tubes that connect to the chassis fittings. Note the position of each tube.
7. To install the replacement part, perform the above steps in the reverse order.

I. Replacing Specific Parts of the M-GAS Module (Pump, Fan, Valve Module):

See "L. Preventive Maintenance Items:" for Nafion Tube replacement details

The agent analysis sensor and O₂ sensor and the Main CPU board are a matched set and must be replaced as an assembly. Problems in these areas will require replacing the M-GAS assembly. Specific parts may be replaced.

1. Remove the M-GAS module from the chassis. Follow the steps in section H for details.
2. Remove the five, 1/4 inch screws that attach the M-GAS sub-chassis to the inner-sub-chassis.
3. Remove the single, 1 1/4 inch long screw (that passes through two standoffs) that attaches the circuit board to the sub-chassis.
4. Carefully lift the inner-sub-chassis away from the sub-chassis enough to unplug the O₂ sensor's two cable connectors. Be sure to note the orientation of these connectors.
5. The Pump (17) is attached to the inner-sub-chassis with a tie-wrap. Cut the tie-wrap to remove it.
6. The Fan (15) is attached by four screws, accessible through access holes in the fan's four corners.
7. The Valve module snaps into a spring-steal bracket of the inner-sub-chassis.
8. When disconnecting any pneumatic component, always note the orientation of that component's pneumatic tube connections.
9. To install the replacement part, perform the above steps in the reverse order.

J. Replacing the Front Bezel (6):

1. Remove the M-GAS, Interface board, PVX unit and the Power Supply assemblies. See sections B, F, H and O for details.
2. Remove the four large screws holding the Bezel to the Main Chassis.
3. Pull the front Bezel away from the chassis.
4. To install the replacement part, perform the above steps in the reverse order.

K. Replacing the Chassis (11):

1. Replacing the main chassis requires removing each assembly. Remove each assembly in the order given in these instruction.
2. To install the replacement part, perform the above steps in the reverse order.

L. Preventive Maintenance Items:

The PM items are; The Moisture Trap (7), The Nafion Tube (25), the *CO₂ Absorber (30), and the O₂ Sensor Filter (24). Refer to the isometric drawing for details.

M. The Nafion Tube can be replaced without disassembling the inner-sub-chassis:

1. Remove the M-GAS module. See Section H for details.
2. Locate the cut-out window on the bottom of the M-GAS.
3. Using a tool, pull the Nafion tube away from its pneumatic port on the valve module.
4. Remove the other end of the Nafion tube from the Moisture Trap housing.

**CO₂ absorber will not be present in units S/N 4314008 or lower.*

N. Replacing the Cooling Fan's Dust Filter (18):

1. Remove the filter cover by pulling it straight out.
2. Replace the filter or rinse the filter with mild soap and water solution.

NOTE: **Ensure the filter material dries completely before re-installing.**

O. PVX unit

1. Disconnect the ribbon cable and power connector (4 black wires) from the PVX unit.
2. Detach the PVX unit from the front panel (1 screw).
3. To install replacement part, perform the above steps in reverse order.

3.5.2 Gas Module 3

Before disassembling the unit, perform the following:

1. Power down the Gas Module and remove the AC power cable.
2. Remove the interface cable from the Passport 2, Spectrum or Spectrum OR.
3. Perform work on an anti-static mat at a grounded ESD workstation.

WARNING: **Always Remove Power from the Gas Module BEFORE Disassembly.**

A. Removing the Enclosure

WARNING: **Remove Power from the Gas Module BEFORE removing the Enclosure.**

1. Remove the four screws attaching the Monitor mounting bracket to the Gas Module.
2. Remove the four screws attaching the bottom of the Gas Module's enclosure to the chassis.
3. Slide the enclosure back to expose the internal modules. Be careful not to damage the EMC gaskets.
4. To re-install, perform the above steps in the reverse order. Before sliding the enclosure on inspect the EMC gaskets for damages or wear. Damaged or much worn EMC gaskets must be replaced. Replacement of EMC gaskets is to be performed at factory.