AMS

SENSIT II
GLASS FRONT VENDOR
OPERATION AND SERVICE MANUAL

Model AMS 39-VRM

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1.0 <u>INTRODUCTION</u>

Congratulations on the purchase of your new AMS Sensit II 39-VRM vendor. The VRM Snack and Visi-Combo Vendors are versatile, high-capacity vending machines. The VRM vendor is designed, tested, and built to provide years of reliable, low-maintenance service in both indoor and outdoor environments. A fully insulated cabinet, DEX data capability, and flexible product configuration are just some of the many standard features built into every AMS merchandiser.

1.1 SENSIT II SYSTEM

Your vendor is equipped with the Sensit II system. The Sensit II system is a patented vend-sensing system that detects when products fall into the delivery bin. Basically, a plane of infra-red light beams is created across the top of the delivery bin, and the Sensit II system can detect when any part of the light has been blocked by a passing product. Using this technology, the vendor "knows" when your customer gets the product. The Sensit II system has several important benefits:

1.1.1 Guaranteed Delivery

If, after one revolution, the product hangs up or an opening was missed in loading, the helix will rotate three additional half-revolutions to make sure the product is delivered. No more hitting or shaking the vendor to get products that did not fall!

1.1.2 Instant Refund

If the customer does not receive a product, he can receive a full refund by pressing the coin return, or he can select another product. No more refund requests!

1.1.3 Automatic Helix Adjustment

With the Sensit II system, the helix stops as soon as the product falls. It is no longer necessary to adjust the home position of the helix for each different package. In fact, different packages can be loaded in the same column. No more double vending!

1.1.4 Additional Benefits:

1. Opening the delivery bin door will not affect the Sensit II system. The sensors are located above the delivery bin and will not be blocked by the door. Product that falls while the door is open will still pass through the beam.
2. Shining a light at the detector will not allow vandals to receive free product. Any tampering which changes the precise amount of light normally received will be treated as a successful vend, resulting in the vandal losing his money.
3. Disabling or blocking the sensor will not allow vandals to receive free product. The Sensit II system must be receiving the normal amount of light before the vendor will dispense any product.
4. Opening the door of a cold vendor will cause some condensation to form inside. The Sensit II system will not allow vending until this fogging clears, normally within a few minutes of closing the door.

1.2 MODEL IDENTIFICATION

When requesting service, replacement parts or technical assistance, please refer to the Vendor Serial Plate (as show in Figure 1.1, Vendor Serial Plate). The plate is located on the inside of the upper left or right of the window, or on the outside of the door on the lock side. The information contained on this plate is necessary to determine what parts, kits, or maintenance should be applied to your specific model.

Figure 1.1 Vendor Serial Plate

1.2.1 Model Number Breakdown (refer to Figure 1.1)

AMS   39 - VRM

Manufacturer   Cabinet Width   Type
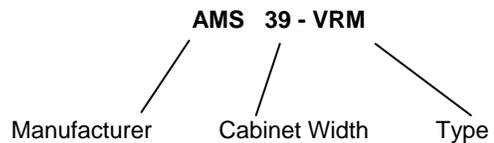
1.2.2 Serial Number and Date Code Breakdown (refer to Figure 1.1)

Sequential Production Number   Production Run Number

1203 - 1010 - B 2

Quarter (ABCD)   Year
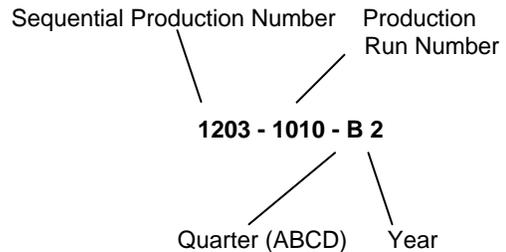
Example: 1203-1010-B 2 would be translated as sequence number 1203 of production run 1010, manufactured in the second quarter (B) of 2005.

The Production Run Number of machines built in the U.S. starts with the number 1 or any odd number. The Sequential Production Number of machines built in Mexico starts with the number 0 or any even number.

1.3 GENERAL SPECIFICATIONS

1.3.1 Operating Environment

The AMS Model 39-VRM Vendor is designed for indoor or outdoor use.

AMS SENSIT II GLASS FRONT VRM VENDOR

1.3.2 Cabinet Physical Dimensions: Model 39 (refer to Figure 1.2)
39"W x 72"H x 36"D (99 cm x 183 cm x 91 cm)

1.3.3 Cabinet Weight: Model 39
Approx. 750 lbs. (340 kg)

1.3.4 Unit Capacity: Model 39 (See Standard Helix Configuration, Section 1.5)
1440 units max. / 150 units min. (depending on helix configuration)

1.3.5 Power Requirements
United States,
Canada and Mexico: 115 VAC, 60 Hz

International: 230 VAC, 50/60 Hz

Basic Unit: 3 amps @ 115 VAC (345 watts)
1.6 amps @ 220 VAC (345 watts)

Refrigerated Snack: 7 amps @ 115 VAC (805 watts)
3.7 amps @ 220 VAC (805 watts)

Visi-Combo: 10.8 amps @ 115 VAC (1242 watts)
5.6 amps @ 220 VAC (1242 watts)

1.3.6 Refrigeration Specification
½ HP, R-134a, 8.5 oz. (.24 kg)

1.3.7 Coin Mechanisms and Bill Validators
AMS vendors will support all NAMA-approved Multi-Drop Bus (MDB) coin mechanisms, bill validators and card readers. Where applicable, it will also support the "Executive Mechanism" Coin Changer.

72.17 [1833.12]-73.00 [1854.2]
DEPENDING ON ADJUSTMENT OF
LEVELING LEG

2.50 [63.50]

0.50 [12.70]

0.90 [22.86]

0.75 [19.05]

LEFT SIDE

FRONT

RIGHT SIDE

40.75 [1035.05]

4.75 [120.65]

29.50 [749.30]

39.00 [990.60]

4.81 [122.17]

18.91 [480.26]

16.19 [411.23]

27.75 [704.85]

35.76 [908.33]

35.76 [908.33]

6.17 [156.72]-7.00 [177.8]
DEPENDING ON ADJUSTMENT OF
LEVELING LEG

40.25 [1022.35]

37.10 [942.29]

0.95 [24.16]

0.95 [24.16]

25.91 [658.06]

TOP

33.94 [861.95]

120.00°
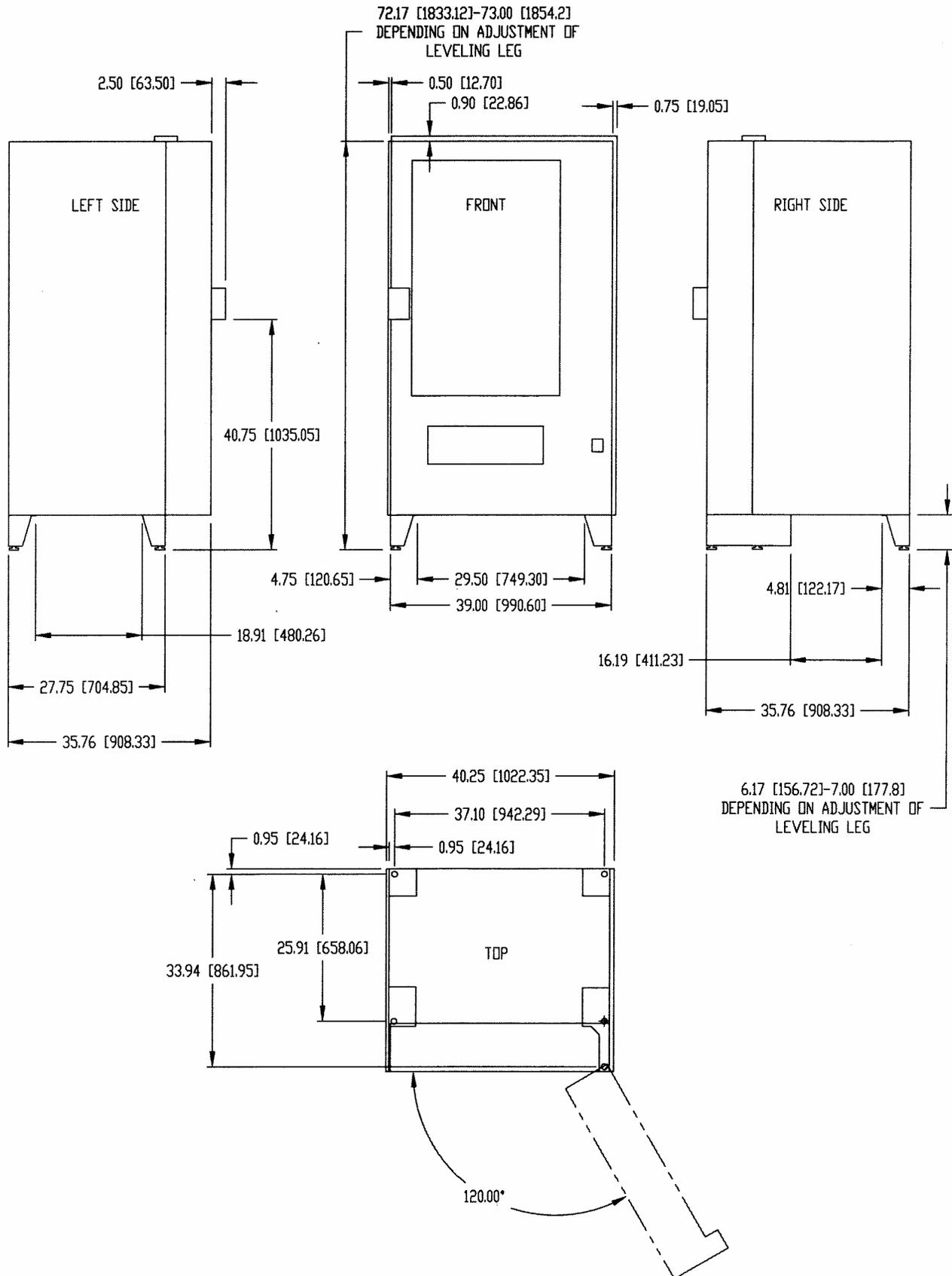
Figure 1.2 AMS 39-VRM Cabinet Dimensions (Inches[mm])

1.4 HELIX CONFIGURATIONS

10	10	15	15	15
12	12	12	12	12

15	15	15	15	15	18	18	18	18	18
6	6	6	6	6	6	6	6		
6	6	6	6	6	6	6	6		

Model 39
386 UNITS

Available Helix Sizes:
2 ½ Inch (63mm)
20120-07   7 Pitch, 2 5/8" (66mm) Opening
20120-10   10 Pitch, 1 7/8" (47mm) Opening
20120-12   12 Pitch, 1 5/8" (41mm) Opening
20120-15   15 Pitch, 1 1/4" (31mm) Opening
20120-18   18 Pitch, 1"   (25mm) Opening
20120-24   24 Pitch, 3/4"   (19mm) Opening

3 Inch (76mm)
21336   6 Pitch, 3 1/2" (88mm) Opening
                    (Bottle Trays Only)

4 Inch (102mm)
21465-05   5 Pitch, 3 1/4" (82mm) Opening
21465-07   7 Pitch, 2 1/2" (63mm) Opening
21465-09   9 Pitch, 2"   (50mm) Opening
21465-10   10 Pitch, 1 3/4" (44mm) Opening
21465-12   12 Pitch, 1 1/2" (38mm) Opening
21165-15   15 Pitch, 1 1/4" (31mm) Opening

1.5 Patent Disclosure
        This vendor and/or certain of its components are covered by one or more of the following
 U.S. and International patents:

        U.S. patents: 6,041,962; 6,145,699; 6,202,888; 6,384,402; 6,794,634

        Canadian patent 2,329,314

2.0 <u>SAFETY</u>

2.1 COMMITMENT TO SAFETY

Automated Merchandising Systems Inc. is committed to designing and producing a safe product. As with all electrical or mechanical pieces of equipment, potential hazards exist. It is the intent of Automated Merchandising Systems, through this manual and service technician training, to alert individuals who will be servicing our equipment to these potential hazards, and to provide basic safety guidelines.

To reduce the risk of serious injury or death, please read and follow all warnings in this manual. It is important that we point out that these warnings are not comprehensive. Automated Merchandising Systems can not possibly anticipate all of the ways that service may be conducted, nor all of the possible safety hazards that may result from service. Therefore at all times we urge you to beware of hazards such as electrical shock, mechanical entrapment, and tipping a vendor during movement.

Automated Merchandising Systems strongly recommends a commitment to safety on the part of all servicing personnel or organizations. Only personnel properly trained in vendor servicing should attempt any service to the internal components of the vendor. It is important to point out that Automated Merchandising Systems has no control over the vendor once it leaves our factory. **Maintaining the vendor in a safe condition is the sole responsibility of the owner**.

If you have questions concerning safety or service, or would like more information, please contact the Automated Merchandising Systems Service Department at 304-725-6921 or e-mail info@amsvendors.com.

2.2 SAFETY PRECAUTIONS

Below are listed safety precautions and safe practices to follow to avoid injury from selected hazards. This list can not possibly cover all hazards, therefore please remember to THINK SAFETY FIRST.

2.2.1 High Voltage Contact

Each vendor is designed to operate on a specific voltage, either single phase 115VAC 60Hz or 220-240VAC 50-60Hz, depending on the country. The voltage is specified on the serial plate (refer to Section 1.2 Model Identification). High voltage areas include the electrical panel, the refrigeration unit and fans, and the fluorescent lamp. It is important to understand that contact with the high voltage wiring can result in injury or death.

1. Always test the outlet for proper voltage, polarity and grounding before plugging in the vendor.
2. Always disconnect power to the vendor before servicing. Allow only fully trained service technicians to service the vendor if service must be performed with the power on.
3. Always keep electrical connections dry. Do not place the vendor in or near standing water.
4. Never use a worn or damaged power cord.

2.2.2 Improper Grounding

Some electrical components have a green or green/yellow ground wire attached to a grounding point in the vendor. If it becomes necessary to remove a ground wire during service, note how the wire is attached, including the locations of any washers. After servicing, make sure that the wires and washers are replaced exactly as they were. Note that the vendor will work normally without the ground wires, but there will be a potential shock hazard from ungrounded components.

1. Always test the outlet for proper grounding before plugging in the vendor.
2. Always reconnect ground wires after servicing.

2.2.3 Fan Contact

Vendors are equipped with electric fans which can start automatically. These fans are guarded to prevent accidental contact. However, removal of guards or other components can leave fan blades exposed and create a physical hazard.

1. Always disconnect power to the vendor before servicing.
2. Always keep protective covers in place.
3. Always wear hand and eye protection when servicing the vendor.
4. Always keep hands, hair, loose clothing and tools away from fan blades.
5. Never insert hands or tools into concealed areas.
6. Always replace protective covers after service.

2.2.4 Helix Motion and Jamming

Energized vend motors can turn a helix with considerable torque, creating a possible entrapment hazard. Also, turning helixes may eject tools or other objects left on trays. A helix that is jammed or caught can store energy as it binds, which can cause it to twist or spring outward suddenly even if power is disconnected. Use caution when freeing a jammed helix.

1. Always disconnect power to the vendor or control board before servicing the vend motors.
2. Always check for proper fit when loading products in helixes to avoid jamming.
3. Always restrain the helix before freeing a jammed or caught helix.
4. Always wear hand and eye protection when servicing the vendor.
5. Always keep hands, hair, loose clothing and tools away from moving parts.

2.2.5 Refrigerant Release

The refrigeration system is pressurized and sealed at the factory. Puncturing or cutting any component in the system will cause refrigerant gas and liquid to be propelled out of the system, creating an immediate physical hazard. Use caution to avoid accidentally opening the refrigerant system.

It should also be noted that releasing refrigerant to the atmosphere is a federal crime and is punishable by law. Any service work requiring the system to be opened must be performed by a licensed technician using certified equipment. Unauthorized service to the

sealed refrigerant system may void the warranty.

1. Never puncture or cut any component in the refrigeration system.
2. Always use licensed service technicians to service the refrigeration system.
3. Always wear hand and eye protection when servicing the vendor.

2.2.6 Vendor Tipping

The empty weight of the vendor is approximately 750 pounds (340 kg). A falling vendor can cause serious injury or death. Caution should always be taken to avoid dropping or tipping a vendor.

1. Never rock or tip the vendor. It must be kept horizontal for safe operation.
2. Never place the vendor in an inclined position, such as on a ramp or with all the legs not on the same horizontal surface.
3. Never place the vendor in a moving environment such as on a ship without properly securing it in place.
4. Never place the vendor in a location where it may be struck by a vehicle.
5. Never transport an unsecured vendor.
6. Never attempt to lift or move the vendor by hand. Always use equipment with the proper load rating. Note that the Specification weight listed is empty weight.

2.2.7 Other Improper Conditions

Hazardous conditions can be created by improper use or service of the vendor.

WARNING: Do not use electrical appliances inside the vendor unless recommended by AMS.

1. Always reinstall any parts removed during service to their original locations.
2. Never make unauthorized modifications to any part of the vendor.
3. Always replace components that are worn, broken, or otherwise unfit for use.
4. Never use unauthorized parts, or use parts for anything other than their intended application.
5.

2.3 TEST STANDARDS

AMS vending machines bearing the ETL mark have been tested for compliance with one of the following standards:

2.3.1 Standard for Refrigerated Vending Machines (ANSI/UL 541, 6th Edition, 10/30/03) and the Standard for Refrigeration Equipment (CAN/CSA C22.2 No. 120, 3rd Edition.

2.3.2 Standard for Safety for Vending Machines (ANSI/UL 751 6th Edition, 10/3/03 and the Standard for Vending Machines, Consumer and Commercial Products (CAN/CSA C22.2 No. 128-95

3.0 <u>VENDOR SYSTEMS AND COMPONENTS</u>

3.1 SENSIT II SYSTEM THEORY OF OPERATION

1. The Sensit II system is comprised of three elements; the emitter, the detector, and the control logic. The emitter is a circuit board with infra-red emitting LED's located on one side of the hopper. On the opposite side of the hopper is a circuit board with infra-red detectors that measure the intensity of the light. The emitter, the detector and the control board controls the performance of the vending operation.
2. When a selection is made, the vend motor will begin to run. After several seconds, if no product falls in the hopper, the motor will be stopped, the credit will be maintained and the customer will be directed to "PLEASE MAKE ANOTHER SELECTION."
3. When the controller measures a variation in the light intensity during the vend cycle, it recognizes that a product has fallen through the light into the hopper. The controller stops the vend motor and removes the credit.
4. When the vendor is serviced with the door open, the protective lens on the detector can become fogged up, particularly in hot or humid locations. In these cases, the vendor will display "SENSIT BLOCKED – UNABLE TO VEND" until the fogging has cleared, usually within a minute after closing the door.

3.2 CONTROL BOARD

The control board contains a program chip which controls and monitors the vendor, DEX, and the mode switch used to enter service mode. The control board is located in the upper left hand corner of the open vendor door, behind an access door.

3.2.1 Program Chip
The program chip contains the software that controls vending and refrigeration (refer to Figure 3.1). The software can be upgraded by replacing the chip, but please note that all settings such as pricing and motor configuration will have to be reprogrammed. Refer to Section 8.1 for replacing the control chip.

3.2.2 Mode Switch
Pressing the mode switch (refer to Figure 3.1) allows the user to get in to the computer's service mode to change settings, access vend data, and check error codes for troubleshooting. Data is displayed on the front display panel, and entered at the front selection panel. Pressing the switch again or closing the door will automatically switch the computer back to vend mode.

3.2.3 DEX Jack
The DEX jack (refer to Figure 3.1) is provided for downloading detailed vend data, and uploading control chip software.
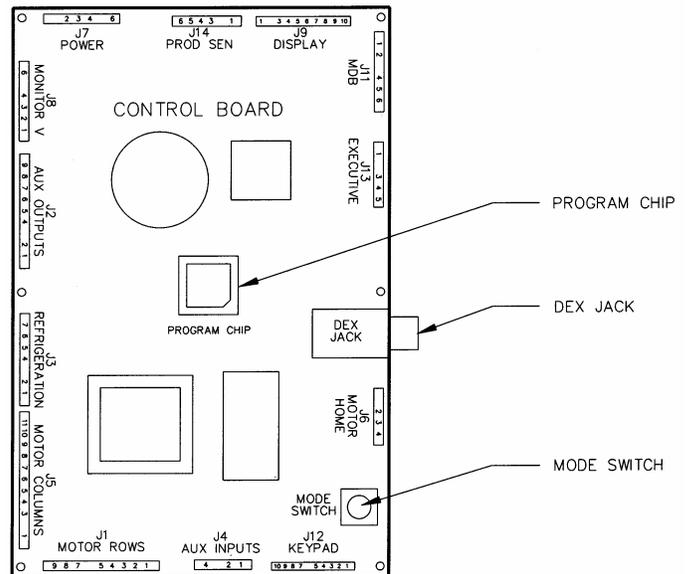
Figure 3.1 Control Board Components

3.3 VEND SENSOR

3.3.1 Emitter
The emitter, inside a protective housing, is located on the right side of the hopper when viewing the back of the door. The emitter sends a beam of infra-red light across the top of the hopper to the detector.

3.3.2 Detector
The detector is located on the left of the hopper when viewing the back of the door. The detector, inside a protective housing, receives the beam of light from the emitter and sends a signal to the control board based on the intensity of the beam. When a product drops through the beam, it causes a change in intensity which is interpreted by the control as a successful vend. When servicing the detector board, be mindful of the seven black detector cells along the top of the board. These can be knocked out of alignment or damaged by rough handling.

3.4 DOOR

3.4.1 Changer Location
Three screws are installed in the door below the coin chute. These screws mate to the keyhole slots on the back of the changer. Refer to Section 4.2.2 Mounting And Connecting Coin Mechanism.

3.4.2 Validator & Debit Card Reader Locations
There are two locations that will accept bill validators and debit card readers The lower position meets the guidelines of the Americans with Disabilities Act (ADA) for access by handicapped persons. Refer to Section 4.2.3 Mounting and Connecting Bill Validators and Card Readers

3.4.3 Coin Box

The coin box is located below the changer, behind a separate door, and is used to hold overflow coins when the changer is full. It is removed by tilting slightly and pulling.

3.4.4 Door Switch
The door switch is mounted on the back of the door. The control uses the door switch to turn off the refrigeration unit when the door is open, and to switch from service mode to vend mode when the door is closed.

3.4.5 Display
The display is located on the front of the door. It serves as the interface for using and programming the machine. It will display the price of a selected item and the credit accumulated. When the machine is idle, it can display the time and a scrolling message. In service mode, it displays the active function and parameter values.

3.4.6 Keypad
The keypad is located below the display on the front of the door. A vending selection is made by keying in the number combination that corresponds to the location of an item in the machine. The keypad is also used to enter data in operation and servicing of the vendor.

3.4.7 Coin Return Button
The coin return button is located next to the coin slot. Pressing the coin return button will release bent or irregular coins that are not accepted by the changer. If the machine fails to vend a selection that has been made, pressing the coin return will return the full credit. If the Force Vend option is disabled, it can also return the full credit before a selection is made. If the Bill Changer option is enabled, the coin return will return change for bills inserted in the bill validator.

3.5 REFRIGERATION (CHILLER) SYSTEM

3.5.1 Refrigeration Cycle Theory of Operation
The compressor compresses refrigerant gas, which increases the pressure and temperature of the gas. As the hot, compressed gas passes through the condenser, it is cooled by the condenser fan and condenses to a liquid. The fan draws outside air in through a hole in the bottom of the cabinet, across the condenser where it picks up heat, and exhausts through the back of the cabinet. This part of the refrigeration system is isolated from the refrigerated part of the cabinet by the chiller housing. Driven by the pressurized gas entering the condenser, the liquid passes through a desiccant dryer and a capillary tube, then travels into the refrigerated part of the cabinet. The restriction created by the long, narrow capillary tube controls the rate at which the liquid refrigerant enters the evaporator. Lower pressures in the evaporator allow the liquid to evaporate, which lowers its temperature. The evaporator fan forces air across the evaporator, where it is cooled by transferring heat to the refrigerant.   The warmed gaseous refrigerant is then sucked through an accumulator, which traps any liquid refrigerant and allows it to evaporate before entering the compressor. The refrigerant is then sucked into the compressor to be compressed, completing the cycle.

3.5.2 Temperature Control

The evaporator fan runs continuously to circulate air within the cabinet. A temperature sensor located near the evaporator measures the temperature of air entering the evaporator. When this temperature is above the temperature setting in the control, the compressor and condenser fan are turned on.
 When the temperature falls to 3°F below the temperature setting, the compressor and condenser fan are turned off. Refer to Section 6.5 for setting the temperature.

3.5.3 Refrigeration Controls
1.   The refrigeration system is operated through the control board. A temperature sensor in the cabinet relays the current temperature to the control.
2.   If the temperature is above the setting that has been programmed in by the user, the control sends a 24VDC signal to the refrigeration relay. The energized relay closes to complete the high voltage circuit that powers the compressor and the condenser fan.
3.   If the compressor should overheat, a thermal overload removes power to the compressor until it has cooled.
4.   To protect against evaporator freeze-up, after one hour of continuous running the compressor will be shut off for 7.5 minutes to allow for defrosting
5.   When the temperature in the cabinet reaches 3°F cooler than the temperature setting, the control de-energizes the relay breaking the circuit powering the compressor.
6.   The control will also shut off the compressor if the door is opened. This is to prevent the refrigeration unit from freezing up.
7.   After the compressor has shut down, the control will wait until the compressor has been shut down 3 minutes and if applicable, the door has been closed 10 seconds before restarting the compressor. The delay allows pressure in the system to equalize.

3.6 TRAY RAILS
The rails are located inside the cabinet and are used to support the trays. The rails are adjustable up and down in 1" increments. Refer to Section 5.3 Tray Vertical Positions.

3.7 TRAYS

3.7.1 Vend Motors
The vend motors are snapped into mounting holes on the back of each tray. Each column has one vend motor which is driven by 24 VDC from the control board. Motors do not have a conventional home position switch which would normally stop the motor after a 360° rotation. Instead, they will stop when the sensor has detected a vend, whether the rotation has been more or less than 360°. Refer to Section 4.2.5 and Section 5.11.

3.7.2 Helixes
There are typically three sizes of helixes in a vendor, approximately 2 5/8", 3", and 4" in diameter. There are several pitches available in each size. The pitch is determined by counting the number of product openings in the helix. Refer to Section 1.4 Helix Configurations and also in Section 5.0.

3.7.3 Divider

The divider separates product columns on the tray. Two horizontal slots in the divider allow for the installation of a candy pusher. To remove the divider, push rearward and lift. To install, insert the rear tab in the desired slot, push rearward and then down. Make sure the locking tabs on the bottom have engaged their respective slots and pull forward.

3.7.4 Candy Pusher Bar

The candy pusher bar keeps candies pushed to one side of the column. This is typically used with tall candy bars. The candy pusher bar is removed by pulling the bar free from the plastic clips. To reinstall, it is easiest to press the bar into the clip using pliers. Refer to Section 5.16 Pusher Bar Installation.

3.8 ELECTRICAL PANEL

The electrical panel is located in the recess formed by the right rail mount on the right side of the cabinet, behind an access panel.

3.8.1 Fuse Holder

The fuse holder is located on the outside of the right rail mount near the refrigeration unit power outlet. It contains a 3 amp fast-blow fuse to protect the 24 VAC power supply to the control board. A spare fuse is located in the front of the fuse holder. The fuse holder is opened by pressing on the indicated side and pulling.

The fuse holder can be used to disconnect power to the control board when MDB devices are being connected or disconnected, when the board is being serviced, or before any wiring harness is connected or disconnected.

3.8.2 Transformer

The transformer reduces the input voltage to 24 volts AC for the control board.

3.8.3 RF Filter

The filter removes electrical noise from the power supplied to the 24VAC transformer to prevent interference with operation of the control board and software.

3.8.4 Relay

The relay uses a 24 VDC signal from the control board to close the relay and supply power to the refrigeration unit.

3.8.5 Ballast

The ballast provides the necessary power to the fluorescent lamp in the door.

3.8.6 Power Distribution Harness

The power distribution harness splits the incoming power into individual leads for the high voltage components.

3.8.7 Ground

Two grounding studs are located inside the right rail mount column, behind the electrical panel cover. The left stud is used to attach the earth ground from the outlet. The right stud is the attachment point for the individual ground wires from the high voltage components.

3.9 1.5" HELIX TRAY (OPTIONAL)

The 1.5" Helix Tray is mounted below the bottom snack tray. To load the tray with small products such as gum and mints, grasp the tray and pull forward to unsnap the catches. After loading, push the tray to the rear until the catches snap in place.

The motors in the 1.5" Helix Tray operate in the same way as snack or bottle tray motors and do not have a home position switch. Refer to Section 3.7.1. Vend Motors.

4.0 <u>VENDOR PREPARATION AND INSTALLATION</u>

Setting up a vendor has been divided into three stages. Step 4.1 confirms power availability. Step 4.2 is accomplished in the customer's shop. Step 4.3 is accomplished on-site, where the vendor is to be located.

4.1 CONFIRMING POWER AT OUTLET

4.1.1 Checking the Outlet (US and Canada)
Using a volt meter set to AC VOLTS, check the voltage between the positive (smaller) lug entry and the ground lug entry (or center screw on two-lug outlets). The reading should be **between 103 volts and 126 volts**. Next, check the voltage between the negative (larger) lug entry and the ground. The reading should be **0 volts**. If your results vary, contact a qualified electrician to correct the outlet wiring before plugging in the vendor. **Abnormal voltage, reversed polarity or improper grounding may cause the vendor to malfunction or create hazardous conditions in the vendor, resulting in possible injury, damage to the vendor, or fire.** Never use an extension cord with the vendor.

The power cord is shipped in the hopper on the inside of the door. The cord is supplied with a standard NEMA 3-wire plug. If there are no 3-wire outlets available for powering the vendor, a grounding adapter may be used to convert a 2-wire outlet to accept the 3-wire plug. **The adapter must have a ground tab or wire which must be fastened to the center screw of the outlet**.

4.1.2 Checking the Outlet (Outside the US / Canada)
Consult a qualified electrician to check the outlet for proper polarity, voltage, and grounding. Check the serial plate on the side of the door to confirm the vendor is rated for the outlet voltage.

4.1.3 Electrical Service Requirement for CE Compliance

The following requirement applies only to models using ½ HP compressors and displaying the CE mark on the serial plate. If this requirement applies to your vendor, you will see a similarly worded decal on the back of the vendor near the power cord.

This requirement does not apply to any vendor using 120V service.

ELECTRICAL SERVICE REQUIREMENT FOR CE COMPLIANCE:

THIS EQUIPMENT IS INTENDED FOR USE ONLY IN PREMISES HAVING A SERVICE CURRENT CAPACITY OF AT LEAST 100A PER PHASE, SUPPLIED FROM A DISTRIBUTION NETWORK HAVING A NOMINAL VOLTAGE OF 400/230V. THE USER SHOULD DETERMINE IN CONSULTATION WITH THE SUPPLY AUTHORITY, IF NECESSARY, THAT THE SERVICE CURRENT CAPACITY AT THE INTERFACE POINT IS SUFFICIENT FOR THIS EQUIPMENT.

4.1.4 Requerimiento de Servicio Eléctrico para Certificación CE

El siguiente requerimiento se aplica solamente a los modelo utilicen compresores de ½ HP y que muestren la marca CE en la placa de serie. Si este requerimiento se aplica a su dispensadora, verá una calcomanía con una terminología parecida en la parte posterior de la dispensadora, cerca del cordón de corriente.

Este requerimiento no se aplica a dispensadoras que utilizan un servicio de 120V.

REQUERIMIENTO DE SERVICIO ELECTRICO PARA CERTIFICACION CE:

ESTE EQUIPO SE PUEDE UTILIZAR SOLAMENTE EN ESTABLECIMIENTOS QUE CONTENGAN UNA CAPACIDAD DE CORRIENTE DE SERVICIO DE POR LO MENOS 100A POR FASE, Y SUMINISTRADOS POR UNA RED DE DISTRIBUCION QUE CONTENGA UN VOLTAJE NOMINAL DE 400/230V. EL USUARIO DEBERA CONSULTAR CON UNA AUTORIDAD DE SUMINISTRO, SI ES NECESARIO, PARA VERIFICAR QUE LA CAPACIDAD DE CORRIENTE DE SERVICIO EN EL PUNTO DE INTERFASE ES SUFICIENTE PARA ESTE EQUIPO.

4.1.5 Les Utilites Electriques Necessaire Pour Conformement Aux Regles CE

Le suivant condition applique seulement à modèle en utilisant ½ HP compresseur et montrer le CE sur l'en série plaque. Si cette condition s'applique à votre vendeur, vous verrez un decal de même exprimé sur le dos du vendeur près du cordon d'alimentation.

Cette condition ne s'applique pas au service de 120V d'utilisation de vendeur.

LES UTILITES ELECTRIQUES NECESSAIRE POUR CONFORMEMENT AUX REGLES CE:

CET EQUIPEMENT NE DOIT UTILISER QUE SUR LES LIEUX AVEC UNE CAPACITE DU COURANT AU MOINS 100A LA PHASE, FOURNIE A UN RESEAU DE DISTRIBUTION AVEC UN VOLTAGE NOMINAL DE 400/230V. LA PERSONNE QUI SE DETERMINER PENDANT UNE CONSULTATION AVEC L'ADMINISTRATION DU SECTEUR, S'IL FAUT, QUE LA CAPACITE DE COURANT AU POINT D'INTERFACE EST ASSEZ POUR CET EQUIPEMENT.

4.2 VENDOR PREPARATION

4.2.1 Inspection
Inspect the vendor carefully for shipping damage prior to signing the carrier's delivery receipt. Check for dents on the top or sides of the vendor, bent legs, broken glass, or other damage on the exterior of the machine. Check the interior for components that may have been knocked loose or other damage.

4.2.2 Mounting and Connecting Coin Mechanism (Changer)
The AMS vendor will support any NAMA-approved Multi-Drop Bus (MDB) Coin Mechanism. On some export models, the Mars-type Executive Mechanism is supported. Please read the coin mechanism manufacturer's literature before proceeding.

1. **Always disconnect power to the control board before servicing.**
2. On the inside of the main door, locate and open the access doors on the left side. Locate the metal coin chute which leads from the coin slot on the front of the door. Below the coin chute are (3) screws which correspond to slots on the back of the changer. Do not adjust these screws.
3. Install the changer by placing the large round opening at the bottom of each slot over a screw head. Be careful to hold the wiring harnesses in this area out of the way. Once each of the round openings are over the screw heads, the changer is lowered to engage the narrow portion of the slot with the shank of each screw.
4. Tighten the mounting screws (reference manufacturer's literature).
5. Connect the wiring harness to the bill validator (if applicable) or to the MDB connector from the control board.
6. Adjust the metal coin chute as required to align the chute with the changer.
7. Reconnect power to the control board.

4.2.3 Mounting and Connecting Bill Validators and Card Readers
The AMS vendor will support any NAMA-approved Multi-Drop Bus (MDB) bill validator or card reader. Please read the device manufacturer's literature before proceeding.

1. **Always disconnect power to the control board before servicing.**
2. On the inside of the main door, locate and open the access doors on the left side. Locate the metal coin chute which leads from the coin slot on the front of the door. Above the coin chute are (2) metal plates, each fastened to a set of (4) threaded mounting studs which correspond to the mounting holes in the bill validator. Either set of mounting studs may be used for a bill validator or card reader. The lower mounting position is ADA approved for consumers with disabilities.
3. Remove the four nuts that retain the steel cover panel. Remove the steel cover panel in the escutcheon.
4. Refer to the manufacturer's literature for instructions on accessing the mounting holes in your device. Place the mounting holes over the threaded studs and reinstall

the nuts. Some devices may require spacers, which are available from AMS (Part Number 20258).
5. Connect the wiring harness to the MDB harness from the control board. If two devices are installed, connect the second device to the validator.
6. If a coin mechanism has been previously installed, disconnect it from the control board MDB harness and connect it to the validator or second device if installed.
7. Reconnect power to the control board.

4.2.4 Test Loading and Configuration
Before putting the vendor on location, it is a good idea to determine the placement of products on the trays. Place at least one product in each helix to check for fit.

1. Remove the cardboard spacers and ties securing the trays.
2. Refer to Section 5.3 for tray vertical adjustments, and Section 5.4 for tray column configuration when configuring your vendor to suit your product.
3. Make sure the product can slide in and out of the helix easily. If the product is too snug, it may cause the helix to jam during vending. Place it in a helix with a larger opening.
4. Likewise, if the product is too loose in the helix, it may not vend properly. Use a helix with the smallest opening that will allow the product to slide in and out freely. Refer to Sections 5.6 and 5.7.
5. Place tall, narrow products in a column with a candy pusher bar, which is an adjustable bar used to push the product to one side of the column. Typically these are installed in columns 9 and 0 on the candy trays.
6. Make sure there is adequate clearance between the tops of the packages and the trays above when sliding the trays in and out, and when the product is being vended.
7. This is also a good time to set the end position of the helix to make sure the first product is held securely in the helix. To do this, vend a product from each column. The end position of the helix will automatically be set to the correct position when a product is vended. The control stops the helix the instant the sensor detects a product falling in the hopper.
8. If desired, the end position can be set manually by pulling the helix out of the motor, rotating it, and reinserting it in the motor. Note that this position is reset automatically after the first vend.
9. Test vend the product and add a helix ejector if necessary. The helix ejector is a plastic device installed on the front end of the helix to kick out the product (refer to Section 5.9 Helix Ejector).

4.2.5 Configuring Motors
If the arrangement or number of motors has been changed they will need to be configured.

1. Press the mode switch on the control board (refer to Figure 3.1, or look at the decal inside the access door for the location of the mode switch).
2. Using the **#** key, scroll through the menu to "**TRAY SETUP**".
3. Press **6** to configure the motors. If the number of motors displayed does not match the number of

motors in the vendor, press **1** * **0** to jog all the motors in the vendor.
4. Watch the display for missing motors that should be connected.

4.2.6 Installing Price Labels

After determining the product placement, install the price labels. The labels are shipped in the envelope with this manual.

1. Insert the bottom edge of the label in the lower groove of the extrusion on the front of the tray.
2. Carefully press in on the the label until it bows enough to snap into the top groove of the extrusion.

4.2.7 Setting Prices

After product placement and installation of the price labels, set the prices into the vendor (refer to Section 6.6 Price Settings).

1. To enter the service mode, press the mode switch on the control board (refer to Figure 3.1, or look at the decal inside the access door for the location of the mode switch).
2. Using the **#** key, scroll through the menu to "**PRICE SETTINGS**".
3. Press the selection for which you want to set the price (example: **12**).
4. Press 9 to edit/change price.
5. Enter the price and press * * to save the new price. Tip: press * **1** to set the whole tray to that price, or * **2** to set that price for the entire vendor.
6. Press the mode switch, or close the door, to exit service mode.
7. The prices as set will be maintained by the vendor even if there is a power failure or if the machine is unplugged: however, prices will need to be reset if the program chip is changed or if the configuration of motors or trays is changed.

4.3 ON-SITE INSTALLATION

4.3.1 Remove the Shipping Boards

1. Split the shipping boards by inserting a crowbar into the slots at either end.
2. If necessary, lift the vendor to remove the broken boards using properly rated equipment. **Do not tilt the vendor. Do not attempt to lift the vendor with a 2-wheel hand truck.**

4.3.2 Placing the Vendor in Location

1. Place the vendor within 5 feet of the designated power outlet. The power outlet should be accessible when the vendor is in position, and the ventilation opening in the back of the vendor must be clear of obstructions.
2. Allow at least 4 inches between the wall and the back of the vendor for air circulation.
3. Make sure the vendor does not block walkways or exits.
4. Do not place the vendor in a location where it can be struck by vehicles.

5. Leave at least 18 inches between a wall and the hinge side of the vendor to prevent the door hitting the wall when opened, or use a protective wall bumper. At a minimum, the door must open wide enough to allow the trays to be pulled out.
6. The vendor is designed to meet ADA guidelines for persons in wheelchairs using a parallel approach (side of wheelchair adjacent to front of vendor). Make sure there is adequate room to maneuver a wheelchair into this position in front of the vendor.

4.3.3 Leveling the Vendor

For safe operation the vendor must be level.

1. On the bottom of the vendor are four (4) threaded leveling legs located at the corners of the cabinet and a fifth support screw under the door. Before beginning, be sure that all five leveling legs are screwed in completely.
2. With the door closed and locked, check the four main legs and adjust any leg that is not contacting the floor. Make sure the support screw under the door is all the way up and is **not** contacting the floor at this time.
3. Place a level on top of the cabinet and check for horizontal from side-to-side.
4. Adjust the leveling legs on the low side one turn at a time until the cabinet is level.
5. Repeat the last two steps to level the vendor front-to-back.
6. After the vendor is level, adjust the support screw under the door until it contacts the floor.

4.3.4 False Leg Installation

Figure 4.1 Tip-Over Warning

WARNING
The False Leg helps to prevent the machine from tipping forward when the vendor door is open and one or more bottle trays are extended. Failure to install the false leg on vendors with bottle trays may result in serious injury (refer to Figure 4.1).

AMS SENSIT II GLASS FRONT VRM VENDOR

CAUTION: Wear gloves-edges may be sharp! Always wear eye protection when servicing vendor!

TOOLS REQUIRED:
1/4" Nut driver or socket wrench
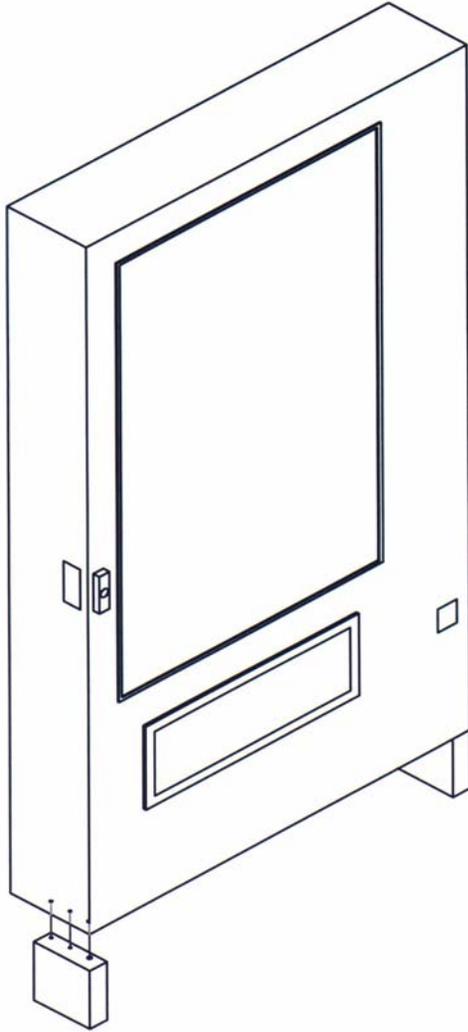
Figure 4.2 False Leg Installation

1. Align the holes in the top of the false leg with the 1/8" holes on the left side of the bottom of the door (refer to Figure 4.2). The closed end of the false leg should be facing forward.
2. Install screws through the holes and tighten until snug. Do not over tighten.

4.3.5 Initial Power-Up and Cool-down
When placing a refrigerated machine on a new location it is important to allow the machine to cool to the operating temperature **prior to loading products requiring refrigeration**. Depending upon the machine's initial temperature and ambient conditions, it will take about 4 to 5 hours to accomplish this. Normal practice is to place a machine on location and come back the next day to load it. **All products should be pre-packaged.**

1. Plug in the vendor.
2. Check that the lights inside the door come on: the chiller may or may not be running in its cycle at this time.
3. Enter the service mode and check that all settings are correct.
4. Check error codes for problems.
5. Load product after the vendor has cooled. Load one tray at a time, preferably from the bottom up.
6. Insure vendor is operating properly.

5.0 TRAY ADJUSTMENT AND CONFIGURATION

The trays in AMS Sensit II vendors are highly configurable. Practically any combination of wide and narrow columns can be set up on a tray. Before changing the configuration of your trays, make sure to order the parts you will need, such as new helixes, dividers or additional motors.

5.1 SNACK AND CANDY TRAY

5.1.1 Removal

1. To remove the tray, start with the tray pushed to its rearmost position. Lift the back of the tray up and pull the tray forward about ten inches. Reposition your hands to grasp the tray at its sides and slide the tray out. If the tray is spaced close to the tray above, it may be helpful to raise the front of the tray as you pull it free.
2. When removing a tray, it is not necessary to disconnect the tray harness. The harness is long enough that it will allow a removed tray to be placed on the floor without having to be disconnected.

5.1.2 Installation

To install the tray, place the rear on top of the rails. Slide the tray all the way to the rear. It will automatically drop into position. Make sure the harness slack is draped to the outside of the rail.

5.2 BOTTLE TRAY

5.2.1 Removal

1. Disconnect the harness inside the right column in the cabinet. The connections are labeled corresponding to the number of the tray (1-6). Push the connector out through the hole in the back of the column.
2. Pull the tray out until it stops. Carefully pull the harness up on top of the tray.
3. Locate the slide rail release levers on both sides of the tray. There should be an arrow indicating which way to push to release the levers. Note that the lever direction on the right side is opposite the direction on the left side. Push the release levers in the directions indicated and simultaneously pull on the tray.
4. Be sure to push the extended slide rails back into the cabinet before closing the door. Otherwise the slides may be damaged.

5.2.2 Installation:

CAUTION: An incorrectly installed tray can disengage from the rails and fall when extended! It is recommended that installation be performed by at least two people!

1. Fully extend the slide rails in the cabinet and hold in position.
2. Move the ball carriers out to the ends of the slide rails (refer to Figure 5.1) and hold in position.

3. Route the tray harness over the rail in the cabinet and into the right column. Connect the tray harness to the appropriate receptacle.
4. Align the rails on the sides of the tray with the extended slide rails and insert. Continue to hold the ball carriers and slide rails in place until the rails on the tray are firmly engaged in the ball carriers.
5. Push the tray in completely to lock the rails together.
6. Carefully extend the tray to check for proper installation. Support the tray to prevent falling if the rails are not properly engaged. Visually inspect the rails, and gently pull the front of the tray side to side to make sure the rails will not disengage.
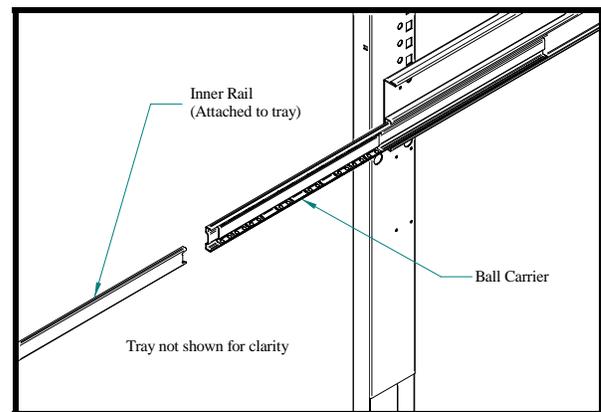
Figure 5.1 Bottle Tray Rails

5.3 TRAY VERTICAL POSITIONS

The trays can be adjusted to different vertical positions in 1 inch increments. To reposition a tray use the following steps

5.3.1 Removal

1. Remove the tray for access to the support rails.
2. Remove the screw located at the front of each rail.
3. The front of the rail can now be lifted upward and disengaged from the vertical column.
4. Pull forward to disengage the rail from the slots at the back of the cabinet.
5. Use these same steps for the other side.

5.3.2 Installation

1. To reinstall the rail in the new position, locate the rear "T" slots that will be used.
2. Then push the two tabs at the back of the rail into the appropriate slots.
3. Engage the hooked tabs at the front of the rail into the appropriate rectangular holes and pull down.

4. Make sure the rail is level.
5. Align the round hole in the rail with the hole in the column and replace the screw.
6. Use these same steps for the other side.
7. Reinstall the tray, making sure the harness is routed over the top of the rail and all slack is draped to the outside of the rail.

5.4 TRAY COLUMN POSITIONS

Bottle tray column dividers are fastened in place and cannot be adjusted. The tray columns used for snacks and candy can be configured by the user from 5 to 10 columns wide. Typically the vend columns are set to single (2.66") or double (5.32") width, to be used with the standard small or large helixes, respectively. Single and double width columns can be configured in any arrangement on the tray by following the procedure below.

Plan your tray arrangement before beginning to determine which extra parts may be required. Contact your distributor to order the necessary parts.

1. Disconnect the harness and remove the tray. Place the tray on a flat, stable work surface.
2. Reposition, remove, or add tray dividers in the desired locations. To remove the divider, push rearward then lift. Reverse the procedure to reinstall.
3. It may be necessary to remove a motor and helix in order to install some dividers. Pull forward on the helix to remove it from the motor. Press down and rearward on the top motor tab to remove the motor from the tray.
4. Reposition the motors to the center of each vend column, using the upper mounting position for the large helix and the lower position for the small helix. It may be easiest to disconnect the motors from the harness first.
5. The harness has 10 sets of motor connections. The first set of connections (at the end of the harness farthest away from the connector) is position 1, followed by 2, 3, and so on. The last set (nearest to the wire connector) is position 0. Facing the rear of the tray and starting at the right end, attach the harness connectors to the motors in order. For double columns, use the even numbered connections and disregard the odd numbered connection. (Example: If the first column on the left is double width, disregard position 1 and attach the connectors for position 2). Each set of connectors has a wide and a narrow connector, corresponding to a wide and a narrow tab on the back of the motor.
6. Place the correct label in front of each column, according to the motor connections used.
7. Reconnect the harness, routing it over the rail and through the back of the column.
8. Reinstall the tray.
9. After changing the tray configuration, it will be necessary to reconfigure the motor matrix. Section 4.2.5 Configuring Motors.

5.5 CHANGING DIVIDERS

1. To remove, push rearward on the divider as far as it will go, then lift it up and out of the tray.
2. Reverse the removal procedure to reinstall.

5.6 SNACK AND CANDY HELIX

To remove, pull straight out on the helix to disengage the adapter from the motor.
Reverse the removal procedure to reinstall.

5.7 HELIX ADAPTER

1. To remove, twist the adapter to free the mounting leg from the locking tab.
2. Reverse the removal procedure to reinstall.

5.8 HELIX EJECTOR

The ejector's function is to cause the product to fall sooner, and therefore stop the helix sooner. This will help retain the next product in the helix coil, especially if they are 'difficult' products

1. The helix ejector is pulled off and pressed on the spiral by hand.
2. The ejector is typically positioned half a coil or less from the end of the spiral.
3. The "fin" shaped portion is angled towards the front of the tray.
4. The best position and angle for the ejector is determined by test vending products.

5.9 HELIX ALIGNMENT DEVICE

The helix alignment device is installed against the left side of the large helixes to keep them centered in their columns.

1. To remove, grasp the front of the helix alignment device with pliers and pull or pry upward. Take care not to lose the plastic mounting clips.
2. Reinstall by pressing the plastic mounting clips back into the mounting holes. Note that the mounting flange goes toward the spiral.

5.10 MOTOR POSITIONS

Motor position can be changed sideways for different columns, and there are two mounting positions on the snack tray. The lower and upper positions are used for the small and large spirals, respectively.

1. To remove, press down and rearward on the top mounting tab, then pull the lower mounting legs out of the mounting slots.
2. Reverse the removal procedure to reinstall.

5.11 BOTTLE ALIGNMENT DEVICE

The bottle alignment device will, in some cases, inhibit the rotation of bottles as they are vended. It has two uneven-length legs. It can be installed with either leg on top, depending on which works best.

1. To remove the bottle alignment device, remove the screws from the underside of the tray that hold it in place.
2. To reinstall, reverse the removal procedure.

5.12 BOTTLE TIPPER BAR

The bottle tipper bar is typically used with carbonated beverage bottles. The bottles have a dimpled bottom which permits them to straddle the spiral and stand upright. The tipper bar restrains the top of the bottle so that it falls bottom first, rather than tumbling off the tray.

1. To remove, bow the bar until one end can be pulled free from the support bracket. Take care not to lose the plastic bushings in the supports.
2. To reinstall, reverse the removal procedure.

5.13 AVOIDING PRODUCT HANG-UPS

Avoid large products, such as chips, from 'hanging-up' between the tray and the glass by loading them 'left corner first' into the helix. The bottom left corner of the bag should be in front of the helix to let the helix push the bottom out first (refer to Figure 5.2). An incorrect loading may cause the bag to fall top first, which could lead to a hang-up. Loading 'left corner first' prevents the product from falling top first.
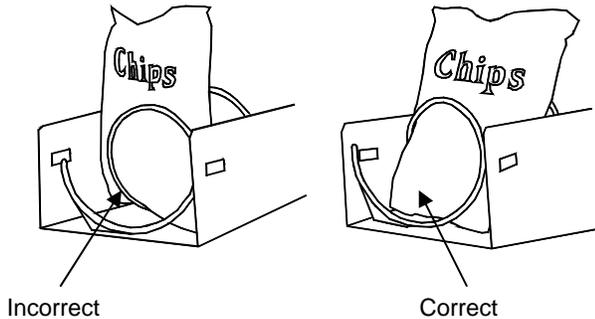
Incorrect   Correct
Figure 5.2 Large Bag Vending

5.14 TALL PRODUCT VENDING

Place tall, narrow products in a column with a candy pusher bar. Typically these are installed in columns 9 and 0 on the candy trays. Rotate the bar upward or downward to the desired position. It should hold the product upright, but not pinch or bind the product.

5.15 CANDY PUSHER BAR INSTALLATION

The candy pusher bar is an adjustable bar that mounts to any tray divider to keep tall candies from falling sideways (refer to Figure 5.3). Four pusher bars are provided with the standard glass front vendor.

1. Snap the pusher bar into the retainer.
2. Rotate the pusher bar to accommodate the product.
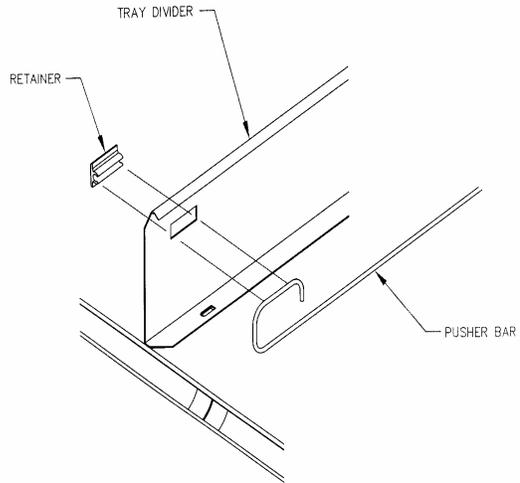
Figure 5.3 Pusher Bar Installation

5.16 1.5" HELIX TRAY ADJUSTMENT AND LOADING

5.16.1 General Information

Some vendors are equipped with a 1.5" Helix Tray designed to vend small candy, gum and mint packs. The 1.5" Helix Tray can also be ordered separately for new installations (refer to Section 11 for installation kits).

5.16.2 TRAY ADJUSTMENT AND LOADING

As delivered from the factory there are two wide columns for products such as Life Savers, and two narrow columns for products such as gum or Certs. However, the tray may be reconfigured to fit the product being vended by adjusting the position of the column dividers (refer to Figure 5.4). The dividers, being adjustable, change the column width. Adjust the divider position by removing the screw at the rear of the divider. Pull on the divider towards the front of the tray to loosen it. Reposition the divider by inserting the mounting tabs into the appropriate slots. Push the divider down and to the rear to tighten it into place. Reinstall the screw at the rear of the divider. Test the column for proper vending.
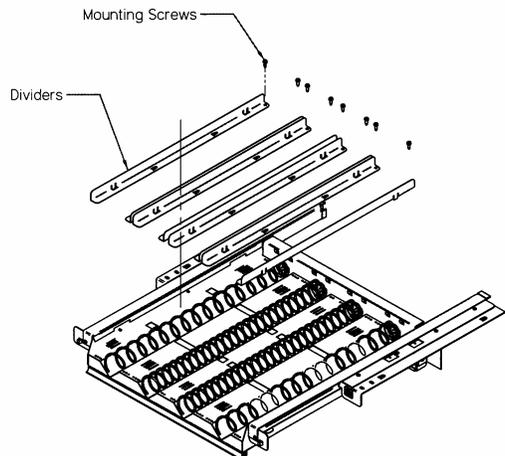
Figure 5.4 1.5" Helix Tray

6.0 <u>SERVICE PROGRAMMING</u>

SERVICE MODE

Access the service mode by pressing the mode switch on the control board (refer to Figure 3.1). After displaying any errors, the first function is displayed. Press # or * to scroll through the errors and functions. Return to vend mode by closing the door, pressing the mode switch or allowing the 2 minute time-out to occur.

For convenience, there is a decal on the right-hand side inside the cabinet that presents all the information in this section in a flow-chart format.

6.1 ERROR CODES

Any errors that have been recorded will be displayed when the mode switch is pressed. Refer to Section 7.2 for a description, along with troubleshooting tips for correcting the errors. ALWAYS CORRECT THE ERROR BEFORE CLEARING THE MESSAGE.

1. **# NEXT ERROR** – View the next top level error code.
2. **1. SUBLVL ERRORS** – Displays any sublevel error codes for MDB devices.
3. **0. CLEAR ERROR** – Erases the error code from memory.

6.2 ACCOUNTING DATA

Limited sales information can be displayed directly on the vendor display. More detailed sales information is contained in the DEX data. This data can be collected with any DEX data collection system.

1. **HIST. VENDS –** Displays number of vends since initialization of the control board.
2. **HIST. CASH –** Displays the total sales since initialization of the control board.
3. **RESET. VENDS –** Displays the number of vends since the last reset.
4. **RESET. CASH –** Displays the total sales since the last reset.
5. **HIST. SELECTIONS** – Displays sequential number of paid vends for each individual selection since initialization of the control board. Depending on the configuration, up to 80 selections may be audited.
   Enter a selection by entering its characters. The display will show the total paid count for the selection for 2 seconds. At this time another selection may be entered. All selections can be accessed this way. Press **#** to exit to the Accounting Menu.
6. **CLEAR VALUES –** Clears RESET. VENDS and RESET. CASH.
7. **SERIAL NUMBER** – Allows programming of the serial number that will appear in field ID101 in the DEX data. The user may also choose to have this programmed serial number used in place of the changer serial number in field CA101.

6.3 FILL/DISPENSE

The FILL/DISPENSE function allows the user to add coins to the changer or dispense coins from the changer.

1. **SELECT TUBE 1-5** - To dispense coins, press 1 through 5 (for a 5-tube changer) to dispense from tubes 1-5. Tubes are numbered starting with the lowest denomination. The control will display the value of the coin being dispensed and the total number of coins in that tube.
2. **OR INSERT COIN -** To fill the changer, simply drop coins in the coin slot. The display will show the value of the coin and the total number of coins in that tube. Note that coins can also be added through the back of the changer. However, the control will not be have an accurate count of the coins in the tube unless the tube is filled completely. When the high-level sensor in the tube detects coins, the control will set the correct coin count for that tube.

6.4 DELAYED SALES

The user can delay sales of specified selections to give the product time to settle or cool. The delay must be manually started each time sales are to be delayed. To automatically prevent sales during specific days and times, use SALES BLOCKING (refer to Section 6.10).

1. START DELAY – Begins the sales delay timer. Before starting the timer, choose menu item "5. EDIT SEL'NS" to specify which selections will be delayed. Customers will not be able to purchase those selections until the delay period ends.
2. CANCEL DELAY – Stops the delay timer and allows vending of all selections.
3. SET DELAY – Adjust the time of the delay timer in 15 minute increments.
4. CLEAR ALL – Clears all selections that were chosen to be delayed.
5. EDIT SEL'NS – View and change the delay status of all selections. The user can choose to apply the delay to a single selection, a tray, or all selections in the vendor.

6.5 TEMPERATURE

The user can set the refrigeration temperature and review the cooling performance of the vendor.

1. CURRENT TEMP – Displays the actual temperature in the cabinet.
2. SETPOINT – The user can adjust the refrigeration setpoint in 1°F increments. This is the temperature at which the refrigeration system will turn on. The refrigeration unit will turn off when the actual temperature is 3°F below the setpoint.
3. START LOG – Begin recording the actual temperature every minute for the first 30 minutes of cooling after the door is closed.

4. VIEW LOG – View the temperatures recorded in the cooling log. The reading number, temperature, date and time are displayed. Press 1 or 2 to scroll up or down through the readings. This log will not display until 30 minutes after the log is started.

TIP: To view a temperature history of the previous 2 days, use DATA LOGS (refer to Section 6.14).

6.6 PRICE SETTINGS

Before setting prices, install a changer so that the control will recognize the proper scaling factor for your currency.

6.6.1 SET PRICES

Enter the tray then the column for the first selection to be priced. The current price for the selection will be displayed. Press **9** to edit, then enter the new price, making sure to enter all digits after the decimal point. The decimal is placed automatically based on the scaling factor from the changer.

Example: For a price of $1.50, enter **1 5 0**.

The user can choose to apply the new price to that selection (**), all selections on the tray (*1), or all selections in the vendor (*2). It is usually faster to set all selections to the most common price in the vendor (*2), then change individual trays or items that have a different price.

6.6.2 VALUEVEND

ValueVend starts with the prices that were set using SET PRICES. Using ValueVend, any two selections are grouped together (a matching product or a different product) and offered at a reduced price. Up to 10 such groups are available. For example, in one group, soup and crackers are offered individually at full price, but if one is purchased along with the other the (total) price is reduced.

The vending machine operator should advertise the special combination prices.

1. **RESPOND TIME** is used to set the number of seconds (20 to 99) the customer has to respond before any remaining credit is returned. Set the time to at least 30 if dual languages are scrolled in the display.
   1 – Press to increase the seconds.
   2 – Press to decrease the seconds.
   * - Press to save the new setting.
2. **CHANGE** is used to change the settings of each group in turn, starting with Group 1.
   GROUP – Groups 1 through 10 may be displayed in turn by using the " * " key.
   0 CLEAR – Clears all of the settings in the current group. Use this key before changing settings. Using CLEAR will not change prices set using SET PRICES.
   1 EDIT – Enter the first selection, enter the second selection, then enter the discounted price for this grouping. Selections can be any combination of tray and column.

* **SAVE** – Press to save the new settings and return to the GROUP display.
# **EXIT** – Returns to the GROUP display without saving any changes.
1 EDIT – Press to move to the price setting display. Enter a new discounted price for this group (the group selections are kept intact).
* **SAVE** – Press to save the new price and return to the GROUP display.
# **EXIT** – Press to return to the GROUP display without saving any changes.
* **NEXT** – Display the next group.
# **EXIT** – Return to the ValueVend menu.

6.7 TRAY SETUP

6.7.1 Test Motors

Enter the selection number to be tested, or press * to see the following options for testing multiple motors.

1-**JOG ALL** – All motor positions in the vendor will be tested. Each motor will be turned only a very small amount, so that products loaded in the vendor will not be dispensed. The display will show the number of the motor being jogged, or it will show a message that a motor is missing.
2-**JOG TRAY** – All motor positions on the selected tray will be tested. The display will show the number of the motor being jogged, or it will show a message that a motor is missing.
3-**CHECK JAMMED** – The control will attempt to run each motor that has caused a jammed motor error. The status of the motor will be displayed afterward.

6.7.2 Link Motors

The user can link adjacent selections of the same product on the same tray. The leftmost linked selection is the master selection. All other linked selections are vended using the selection number and price of the master selection. Linked selections are vended sequentially for better product rotation. Entering the selection number of any linked selection will default to the master selection number, and the control will vend the next linked selection in the sequence.
1. **NEW LINK** – Enter the tray where the motors are to be linked, then enter the first and last column numbers (left to right) to be linked.
2. **VIEW / EDIT** – The user can view, change, or delete existing links.
3. **CLEAR ALL** – This will delete all current links. The prices of the previously linked selections will remain the same as their master selections until new prices are set.

6.7.3 Home Switch

Only the seventh and eighth tray positions in the vendor can be set to use motors with home position switches. Enter the tray number (7 or 8) and press 1 to change the setting. The setting must match the type of motors used on the tray, or the motors will not work correctly.

When the setting is Y for YES, the switches on all of the motors on the selected tray are enabled. When a product selection is made the motor will only turn one full

turn then stop. If the sensors did not detect a drop then "PLEASE MAKE ANOTHER SELECTION" will be displayed. Note that if the motors are non-switched (as in the 1.5" helix trays) the helix will turn for 4 seconds - typically vending more than one item.

When the state is N for NO, the switches on all of the motors are disabled. When a product selection is made the motor will turn until the sensors detect a drop. If after several seconds no drop occurs the motor will stop and "PLEASE MAKE ANOTHER SELECTION" will be displayed.

6.7.4 Delayed Stop

The user can program a delayed stop of up to one second to allow a motor to continue running after the product has been dispensed.

1. **ENTER SELECTION** – Enter the number of the selection to be delayed, enter 9 to edit, then enter the time in tenths of a second. The decimal point is placed automatically.
   Example: Entering **8** will program a delay of 0.8 seconds.
2. The user can save the programmed delay to the selection, the entire tray, or all selections in the vendor. Linked selections will use the delay programmed for the master selection.

6.7.5 Number – This allows the user to designate the trays in the vendor (from the top tray down) with the letters (A-H) instead of numbers (1-8). This feature requires an alpha-numeric keypad which is not available on the AMS 39-VRM Outdoor Vendor and therefore should always be set to "Number". Note that when replacing the control board or program chip, the replacement will most likely be set at "Letter" and will need to be reset to "Number" using the Letter/Number function.

6.7.6 Configure – The control will find all connected motors in the vendor and display the total number. The configuration of connected motors is stored in memory. If a configured motor is later found to be missing during a vend, an error message will be generated in service mode to alert the service person that the motor is disconnected.

6.8 MDB (MULTI-DROP BUS) SETTINGS

6.8.1 Force Vend – The factory default is "**N**" for no. If set to "**Y**", the customer is forced to make a selection before the control will allow a refund. If the selected product cannot be dispensed, a full refund can be returned to the customer. This setting will be over-ridden by the CHANGE BILL setting. (refer to Section 6.8.3).

6.8.2 No Cheat – The factory default is "**Y**" for yes. If set to "**Y**", the control will not allow a vend unless correct change can be returned to the customer. If disabled, the control will allow the customer to be short-changed up to $1.00.

6.8.3 Change Bill – The factory default is "**N**" for no. If set to "**Y**", the customer can insert a bill and receive a full refund in coins by pressing the coin return button. Note that using CHANGE BILL will override force vend.

6.8.4 Hold Lost Credit – The factory default is "**Y**" for yes. If set to "**Y**", any remaining credit after a vend that can't be returned to the customer will be maintained on the display for 15 minutes. The customer can add to this credit to purchase additional items.

6.8.5 Multi-Vend – The factory default is "**N**" for no. If set to "**Y**", the vendor will hold the change following a vend. The customer can make additional purchases with the remaining credit. The customer may push the coin return button at any time to refund this credit.

6.8.6 Lev2 Coin Mech – The factory default is "**N**" for no. If set to "**Y**", the vendor will treat the coin mechanism as a level 2 device. Vendor must be powered down before change will take effect. AMS recommends that this option remain as "**N**" for no.

6.9 OPTIONS

6.9.1   Message

The user can customize the scrolling message that is displayed when the vendor is idle. Other words can be customized by using the CREATE CUSTOM option in the LANGUAGE menu (refer to Section 6.9.3).

Write out the desired scrolling message first. The message to be displayed on the scrolling display can be up to 50 characters, including letters, numbers, punctuation and spaces.

Select the message option to enter a message. The controller will prompt the user to press "1" to change the message, or press "#" to exit.

To enter message text, the user repeatedly presses a particular key to cycle through a list of characters that have been defined for that key. When the keypad is left idle for a short time, the last-displayed character is added to the end of the message. The key definitions are similar to those of telephones and cell phones:

KEY 0: (space)0	**KEY 5:** JKL5
KEY 1: !?,.$:;*&"+-/<>=#%'1	**KEY 6:** MNO6
KEY 2: ABC2	**KEY 7:** PQRS7
KEY 3: DEF3	**KEY 8:** TUV8
KEY 4: GHI4	**KEY 9:** WXYZ9

Pressing the * key will back space through the message. Pressing the # key will save the message.

The user can also customize the scrolling message by using a computer running the AMS Sensit II utility software and the cable connection on the control board. Contact your local AMS distributor for information on the AMS Sensit II utility software.

6.9.2 Prize – The factory default is "0" for none. The user can set the vendor to give away a free product after a predetermined number of successful vends. Enter the number of vends between free vends, up to 9999. Setting the number to "0" will disable the prize option.

6.9.3 Language

6.9.3.1 Primary – The user is presented with a menu of available languages. The user may choose the primary language for the display of all messages. Note that Service Mode messages are available in Primary language only.

6.9.3.2 Secondary – If desired, the user can select a secondary language for the display of all messages. Messages will be displayed first in the primary language, then in the secondary language.

6.9.3.3 Create Custom – The user can create customized versions of words or enter words in another language. For convenience, the primary language messages can be used as a starting point. The user can then select words to modify. After creating the customized messages, set the primary or secondary language to CUSTOM.

6.9.4 Product Sensor – If set to "**Y**", the vendor will use the product sensor (optional) to determine if there is product in the delivery bin. The control board will not allow vending until any product in the delivery bin is removed. A "REMOVE PRODUCT" message will be displayed. This feature is used primarily when vending glass bottles and products that can be damaged by other falling products.

6.9.5   Speech - A speech synthesizer option is available for use with RC Systems Inc. DoubleTalk LT speech synthesizer. It operates only while the vendor is in service mode. The speech synthesizer vocalizes keystrokes and what is shown on the display.

    The Options menu selection 5 enters the synthesizer on/off menu. Press 5 to toggle on/off. Press # to exit to the Options Menu.

    When turned on the synthesizer is inactive until the vendor is placed into service mode.

    The synthesizer must be plugged into the DEX plug on the control board. The Sensit II utility cable (P/N 20786, Harness, Chip Programming) may be used, but it must be plugged into a male-to-male gender adapter (Radio Shack 26-231B) followed by a null modem adapter (Radio Shack 26-264). The serial cable from the DoubleTalk LT is plugged into the null modem adapter. The ¼" jack from the Sensit II utility cable is then plugged into the DEX plug on the control board (other DEX functions cannot be used while the DoubleTalk LT is plugged in). A dedicated cable could also be constructed.

6.10 SALES BLOCKING

    The factory default is "**N**" for no. The user can define up to four time periods each day during which specified selections will be blocked. For each time period, the user can select which days of the week blocking will be active. <u>All or any combination of selections in the vendor can be blocked.</u>

1-4 SET PERIODS – Enter the number (1-4) of the time period to edit. For the selected period, enter the time when sales blocking will start, then enter the time when sales blocking will end. Select the days of the week when the blocking period will be active. If a blocking period extends from one day into the next, it will be active or inactive based on the day it starts.

ALL SELECTIONS? - If the question 'ALL SELECTIONS?' is answered YES, every selection in the vendor will be blocked for that period as defined. If the answer is NO, then enter each individual selection where blocking is desired. Any combination of tray and column may be entered. After saving, those selections will be blocked for that period.

6.11 CLOCK SETTINGS

1. **TIME AND DATE –** Enter the current time and date. This information will be used for data logs and error records.
2. **DAYLIGHT SAVINGS –** The factory default is "**N**" for no. If set to "**Y**", the time is automatically adjusted for Daylight Savings Time.
3. **DISPLAY CLOCK** – The factory default is "**Y".** The current time will appear on the display beneath the scrolling message when the vendor is not in use.
4. **12/24 FORMAT** – The user can choose to display the time in 12-hour or 24-hour (military) format. The factory default is 12-hour format.

6.12 FREE VEND

    The factory default is "**N**" for no. The vendor can be quickly set to vend all products for free. Prices are ignored while FREE VEND is enabled. The original prices will be restored when FREE VEND is turned off.

1. **VIEW / EDIT** – The current setting is displayed, and the user can change the setting. A warning will be briefly displayed if FREE VEND is turned on.

6.13 AUXILIARY OUTPUT

    The auxiliary output is a 5VDC signal lasting 100 milliseconds following a successful vend. This signal can be used to trigger user-supplied external devices. As of this writing, AMS does not supply such accessory devices and cannot offer technical assistance for such devices. This feature is provided only as a convenience to those users of advanced technical skill who wish to connect such a device to their AMS vendor and have sufficient electronic expertise to do so.

1. VIEW / EDIT – The current setting is displayed, and the user can change the setting. Enabling the auxiliary output will not harm the vendor or affect the performance of the vendor in any way.

6.14 DATA LOGS

The user can review recorded data on vendor temperature, power outages, and door openings. This data is sometimes helpful in diagnosing problems with the vendor. These logs are cleared whenever the software is changed.

1. **TEMPERATURE** – The temperature log contains temperature measurements taken at half-hour intervals over the previous two days. The display shows the recording number, the recorded temperature, and the time and date of the recording. The log holds 96 measurements, with number 1 being the most recent.
2. **POWER** – The power outage log records power failure information. The display shows the recording number, whether power went ON or OFF, the temperature in the cabinet, and the time and date of the recording. The log holds 10 recordings, with number 1 being the most recent.
3. **DOOR SWITCH** – The door switch log records door openings and closings. The display shows the recording number, whether the door was OPENED or CLOSED, the temperature in the cabinet, and the time and date of the recording. The log holds 10 recordings, with number 1 being the most recent.

6.15 EnergySENSIT

The EnergySensit feature is a way of reducing energy consumption. When enabled, EnergySensit predicts periods of inactivity and allows the internal temperature of the vendor to rise, taking advantage of these inactive times.

Essentially, by looking at past activity, the vendor learns when to expect vends and when not to and alters the internal temperature (and hence, energy consumption) accordingly. Less energy is used as the internal temperature is allowed to increase.

Because of this increase in temperature, it's not recommended for use on temperature-critical products. Note that the EnergySensit temperature change feature cannot be enabled while the Health & Safety function is enabled.

6.15.1. ENABLE

The factory default is "N" for no. When set to "Y," EnergySensit is enabled.

NOTE: If the Health and Safety feature is ON, the display will show "ENERGYSENSIT OFF" immediately after displaying "HEALTH AND SAFETY ON." To use EnergySensit the Health and Safety feature must be off.

6.15.2. CLEAR HISTORY

EnergySENSIT keeps a recorded history. The entire contents of the history can be deleted and a new record will start at that time.

6.15.3. TEMP CHG

The factory default is 10° F. TEMP CHG (temperature change) allows the user to set the difference (increase) in temperature from the original temperature set point (see section 6.5). During predicted periods of inactivity, the vendor will maintain a temperature equal to the temperature set point plus the temperature change value. This value can be set from 1°F to 30°F.

For example, 45° chiller set point
<u>+ 10°</u> EnergySENSIT change
55° vendor temperature

6.15.4. PATT TIME

The factory default is 7 days. PATT TIME (pattern time) is a repeating cycle or time period that the surrounding environment experiences. Although it can be set from 1 to 10 days, 7 days represents the typical cycle of most environments in the US and many other countries. In a swing-shift type environment where employees work 4 days and then have 4 days off, set the PATT TIME to 8.

6.15.5. HIST FACT

The factory default is 3. The HIST FACT (historical factor) is used to determine how much past data to use for predicting future periods of inactivity. If set to 3, it will use data from three pattern times. If set to 4, it will use data from 4 pattern times, and so on. It can be set from 3 to 15. The higher the number, the less likely that someone will purchase a warmer-than-ideal product but the energy savings won't be as great.

6.15.6. DEL TIME

The factory default is 3 hours. DEL TIME (delay time) is the time it takes the vendible products to warm (or cool) by the TEMP CHG amount. Typically, a machine full of beverages will require a greater delay time than one full of snacks.

6.15.7. LIGHTING

This is an optional feature in EnergySensit. The factory default is "N" for No. Press "7" to change between No and Y for Yes. Lighting uses the historical activity data to turn the lights in the vendor off and on. Note that Lighting may be enabled regardless of the status of the other EnergySensit feature, or of Health and Safety. If the lights are off and the keypad is used or credit activity is detected, the lights will come on for three minutes.

If the lights are off and the door is opened, the lights will come on and remain on until the door is closed. When the door is closed, the lights will turn back off.

7.0 <u>TROUBLESHOOTING</u>

7.1 OUT OF SERVICE MESSAGE

Certain critical errors will disable the vendor. When this happens, an "OUT OF SERVICE" message will be displayed.

To get the vendor back in service, press the mode switch on the control board. Any errors will be displayed immediately. Refer to the list of error codes and explanations below. Correct the cause of the error, and press "**0**" to clear the error code. If the error code was generated by an MDB device (CHANGER, BILL VALIDATOR, or CARD READER), press **1** to see more detailed (sublevel) error codes.

7.2 MACHINE ERROR CODES: CAUSES AND SOLUTIONS

7.2.1 Viewing Top Level Error Codes

To view top level error codes, enter the service mode by pressing the mode switch located at the lower right corner of the control board. ACCT DATA will be displayed if there are no errors or an error has been cleared (whether corrected or not). If the error message has been cleared, but the cause has not been corrected, the message can be re-displayed by briefly turning off the power. Use the keypad buttons to perform the following:

#. NEXT ERROR – to view the next top level error code in memory.

1. SUBLVL ERRORS – to display any sublevel error codes including MDB devices.

0. CLEAR ERROR – to erase the error code from memory (first correct the error).

7.2.2 Viewing Sub-Level Error Codes

To view the sub-level error codes, press the 1 key while the top level error code is being displayed. Correct the condition which caused the error first, then clear the error code by pressing "0". Once all errors are cleared, "ACCT-DATA" will be displayed. Refer to the next section for a description of error codes, their causes and solutions.

7.2.3 Error Code Causes and Solutions

ERROR CODES – CAUSES AND SOLUTIONS			
Top Level Error Code	**Sub Level Code**	**Causes**	**Solutions**
JAMMED	XX JAM	Jammed product in helix, broken/jammed helix adapter, helix caught on tray or divider, "frozen" motor or broken gearbox	Remove any jammed products and test the motor using TRAY SETUP in the service mode. Refer to Section 7.5
	ALL OK		
	XX OK		
X STUCK	NONE	Keypad selection button X has been depressed more than 2 minutes.	Clear any obstructions or dirt from around the selection buttons and make sure they can move freely. If proper operation is not restored, replace the keypad.
CHANGER	A message has been generated by the changer. Press **1** to see changer sub-level error codes.		
	COMMUN	COMMUNICATIONS – Communications error.	Check MDB harness connections.
	SENSOR	SENSOR – Sensor error.	Consult changer manual or manufacturer.
	JAM TUBE	JAMMED TUBE – Jammed coin tube.	Clear any obstructions from the coin tube.
	CHK SUM	CHECK SUM – Check sum error.	Consult changer manual or manufacturer.
	CHUTE	CHUTE – No coins accepted for a period of time.	Clear any obstructions from the coin chute.
BILL VALIDATOR	A message has been generated by the bill validator. Press **1** for bill validator sub-level error codes.		
	COMMUN	COMMUNICATIONS – Communications error.	Check MDB harness connections.
	STK FULL	STACKER FULL – Stacker is full.	Empty stacker.
	MOTOR	MOTOR – Bad stacker motor.	Consult acceptor manual or manufacturer for repair.
	JAM BILL	JAMMED BILL - Bill is jammed.	Clear any jammed bills from the acceptor.
	CHK SUM	CHECK SUM – Check sum error.	Consult acceptor manual or manufacturer.
	OPEN BOX	OPEN BOX – Open box.	Close the bill box.
	SENSOR	SENSOR – Sensor error.	Consult acceptor manual or manufacturer.

7.2.3 Error Code Causes and Solutions - Continued

ERROR CODES – CAUSES AND SOLUTIONS			
Top Level Error Code	**Sub Level Code**	**Causes**	**Solutions**
CARD READER	A message has been generated by the card reader. Press **1** to see sub-level error codes.		
	CARD ERROR –.	Card error	Use a different card.
	INVALID CARD –	Invalid card	Use a different card
	TAMPER	Tamper error.	Consult card reader manual or manufacture
	COMMUNICATIONS 4	Communications error.	Check MDB harness connections
	SERVICE	Unit needs service.	Consult card reader manual or manufacturer.
	READ ERROR	Reader failure.	Consult card reader manual or manufacturer.
	COMMUNICATIONS 9	Communications error	Check MDB harness connections.
	JAMMED CARD	Card is jammed.	Clear the jammed card from the card reader.
PROD. SENSOR	NONE	The product sensor is blocked or disconnected.	Remove any products or other objects in the bottom, or in sensor openings in ends, of the delivery bin. Check sensor harness connections.
SENSIT BLOCKED	NONE	The vend sensor is blocked or lens is fogged.	Remove any obstructions from the path of the sensor.
SENSIT DISCONN'D	NONE	The vend sensor is disconnected.	Check sensor harness connections.

7.3 CLEARING JAMMED MOTOR

If one or more motors and helixes become jammed, the motor(s) will be displayed as a sublevel error under "Motor Jammed".

Energized vend motors can turn a helix with considerable torque, creating a possible entrapment hazard. Disconnect power to the vendor or control board before freeing a jammed helix or motor. Always restrain or block the helix before freeing a jammed or caught product.

CAUTION: **Use caution when freeing jammed product! Refer to 2.2.4 Helix Motion and Jamming!**

Clear any jammed products from the indicated vend columns.

To reset the error, first enter service mode (refer to Section 6.0), then select Tray Setup (refer to Section 6.7.1). Press "1", then " * ", then "3". The control will attempt to run the jammed motors. If the motor had been taken out of the motor matrix, it will be re-established in the matrix.

7.4 WATER ACCUMULATION IN THE CABINET

Water accumulating in the cabinet is usually caused by one of two things: condensation of moist air or rain water leaking into the cabinet. Excessive condensation indicates an air leak which allows moist outside air to continually enter the cabinet and condense on the evaporator.

To minimize condensation on the evaporator:

1. Make sure the refrigeration unit cover gasket is sealing properly all the way around. In particular, check the openings where the refrigeration lines and drain tube pass through the cover. These openings should be sealed completely around the lines and tube with duct putty.
2. Make sure the cabinet door is properly tightened when it is closed so that it makes contact with the gasket on all sides.
3. Make sure there are no objects preventing the vend door from closing. The vend door must open and close freely and close completely.

Rain water can enter the cabinet through the rear ventilation opening. Rain entering through this opening is not considered hazardous since all components of the refrigeration unit are sealed. Water will drain out through the ventilation opening in the bottom of the cabinet. Check to make sure the refrigeration unit cover gasket is seating properly if excess water is noticed in the front of the cabinet.

Some water accumulation on the inside bottom area of the cabinet door is expected and should drain out on its own. Check to make sure the rain guards on the top of the door and cabinet are present and functioning properly to minimize water coming in around the door gasket

7.5 MACHINE TROUBLE SHOOTING CHART
   The following troubleshooting chart may be used to find quick remedies for electrical and mechanical failures in the vendor.

IF A REPLACMENT PART IS NECESSARY, PLEASE CONTACT YOUR DISTRIBUTOR

Symptom	Possible Cause	Remedy
No power at the control board. (no beeping sound during power-up or when the service mode button is pushed)	No power from power cord.	Check power cord, outlet or supply.
	3.0 amp fuse is blown.	Replace 3.0 amp fuse.
	Fuse harness is not connected to the back of the fuse holder.	Connect fuse holder harness.
	Power harness is disconnected.	Reconnect power harness.
	Short or cut in the power harness between the transformer and control board	Check continuity through the power harness. If there is no continuity replace the power harness.
	Transformer does not have power at the 24 VAC secondary side.	Insure primary side of transformer is receiving power. If there is no 24 VAC on secondary side replace transformer.
Vendor displays "Please Make Another Selection".	Selection not configured in the motor matrix.	Reconfigure the motors.
	Motor jammed	Clear jammed motor and clear error code
	Vend not sensed by sensor	Clear fault in sensor boards or harness: possible control board error
Vendor does not accept coins.	Options set for "Free Vend"	Scroll to Free Vend and change to **N**
	Changer unplugged.	Plug in changer.
	Coins jammed.	Clear jammed coins.
	Defective changer or other MDB device.	Replace changer.
	Credit amount exceeds the highest price. (Prices may be set at $0.00.)	Set prices.
	Control board is in service mode.	Exit service mode.
Vendor will not pay out coins.	Changer unplugged.	Plug in changer.
	Defective changer.	Replace changer.
	Coins jammed.	Clear jammed coins.
	No coins in changer.	Add coins to the changer.
Validator will not accept bills.	Changer unplugged.	Plug in changer.
	Not enough change in the changer.	Add coins to the changer.
	Validator unplugged.	Plug in the validator.

7.5 MACHINE TROUBLE SHOOTING CHART - Continued

IF A REPLACMENT PART IS NECESSARY, PLEASE CONTACT YOUR DISTRIBUTOR

Symptom	Possible Cause	Remedy
Bill is immediately stacked.	Change feature is enabled.	Disable change feature.
	Highest price is greater than bill value.	Change price.
	Non configured selection has a price greater than bill value.	Set and save all prices, including selection columns not in use.
Tray selections do not make a complete cycle.	Harness off at the J-1, J-5 and/or J-6 connector on the control board.	Connect harness to the control board connector. Check harnesses.
Tray selection continues to turn after a successful vend.	Home switch option (used in older style Gum and Mint trays, Assy. 20668) may be set to ON	Set Home Switch to OFF
Evaporator frozen	Moist outside air entering cabinet	Check for air leaks.
		Close door tightly.
		Check all gaskets for leaks
	Check for evaporator fan motor not working.	Replace failed evaporator fan motor.
		Check evaporator fan switch harness connection.
		Replace evaporator switch.
Refrigeration unit not running.	Door switch is not working.	Adjust switch for positive contact with door.
		Close door tightly.
		Check door switch harness connection.
		Replace defective door switch.
		Replace defective door switch harness.
	Temperature setting in the control board is set too high.	Reset temperature setting.
	Refrigeration relay harness disconnected.	Connect refrigeration relay harness.
	Inoperative Relay	Check for low voltage and high voltage.
	Defective refrigeration relay.	Replace relay.
	Over-pressure timer.	Allow 3 minutes for system pressure to equalize, then try again.

7-4

8.0 <u>MAINTENANCE</u>

8.1 REPLACING THE PROGRAM CHIP

Occasionally it may be necessary to replace the program chip to take advantage of new software features. Please note that after replacing the chip it will be necessary to reprogram prices and any other variables such as option settings and blocking times that have been changed from the factory settings. The motors will need to be reconfigured. The Letter/Number function will need to be set to "Number". The Product Sensor option, if used, will need to be set to **"Y"**, and if the 1.5" Helix Tray is installed the home switch (in tray setup) will need to be set to **"N"**.

1. Disconnect the power to the control board by using the power switch located on the right rail mount above the refrigeration unit power outlet.
2. Locate the program chip (refer to Figure 8.1).
3. Insert a chip removal tool in one of the slots located at the corners of the socket and pry the chip from the socket. Note that the chip has one chamfered corner which corresponds to a chamfer in the socket.
4. Press the new chip in place, making sure the chamfer is correctly oriented and the wires on the chip line up with the connections in the socket.
5. Reconnect the power to the board and check the software revision number. The revision number will be displayed for several seconds after connecting the power.
6. Configure the motors, program the prices and re-enter any other desired settings. Refer to Section 6.0, Service Programming.
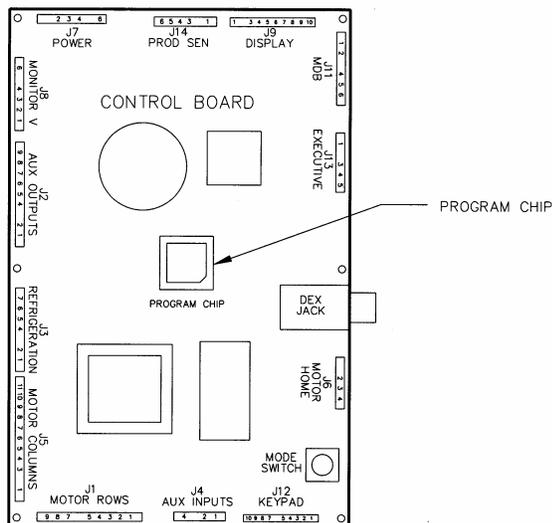
Figure 8.1 Replacing Program Chip

8.2 CLEANING THE REFRIGERATION UNIT

AMS recommends cleaning the refrigeration unit at least twice a year under normal conditions, more often in dusty environments.

CAUTION: Always wear eye protection and gloves when cleaning vendor!

1. Unplug the vendor.
2. Remove the temperature sensor from refrigeration unit housing.
3. Remove the refrigeration unit housing (refer to Figure 8.2).

CAUTION: Condenser fins are sharp!

4. Remove dust from the condenser fins and coils with a vacuum or stiff brush.
5. Remove dust from the inside of the rear screen.
6. Remove dust from the outside of the bottom screen.
7. Replace the housing. When reinstalling the refrigeration unit housing, it is important to seal the housing completely to prevent air leaks. Outside air leaking into the cabinet can cause condensation to form, which can lead to water overflowing the drain pan or ice build-up on the evaporator. Follow the procedure below to ensure proper sealing.
   a. Locate the notches on the back right corner of the housing (refer to Figure 8.2).
   b. Remove any duct putty from the notches. Do not discard the putty. It will be reinstalled later.
   c. Set the housing in place, making sure the drain line and power cord pass through the lower notch. The insulated copper tubing should pass through the upper notch.
   d. Push the housing tightly against the back of the cabinet and visually check that the foam gasket is making contact on all sides.
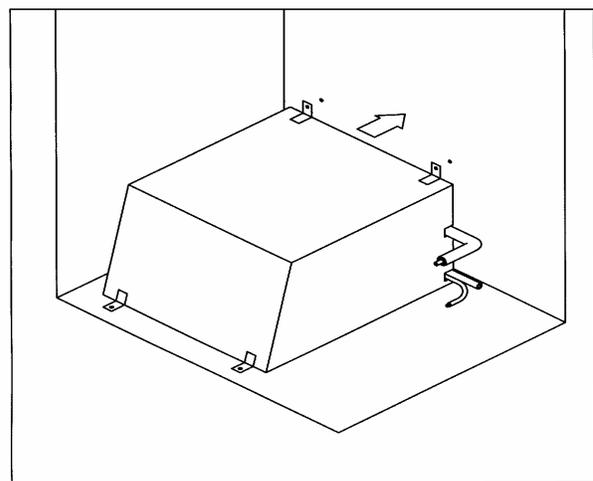
Figure 8.2 Refrigeration Unit Housing

e. Continue to push on the housing while reinstalling the screws through the mounting tabs. Be careful – do not overtighten the screws.

f. Remove the screen from the outside back of the cabinet.

g. Press the duct putty into the notches. Make sure to seal completely around the drain line, power cord, and insulated copper tubing.

h. Reinstall the screen.

i. Reinstall the temperature sensor.

j. Plug in the vendor.

8.3 CLEANING THE VENDOR CABINET

Clean the vendor cabinet as necessary using mild household cleaners and water. Apply the cleaning solution to a cloth or sponge and gently wipe the vendor surfaces to clean.

1. Do not use chemicals or solvents. These can damage the paint and plastic trim.
2. Do not use abrasive cleaners.
3. Do not use a water jet.
4. Do not let water or cleaning solutions contact electrical or electronic components.

8.4 CLEANING THE PLASTIC DOOR LINER

Some vendors use a door liner made from ABS plastic. This liner should be cleaned with a mild detergent diluted in water. Do not use chemical solvents or harsh detergents as these products could crack the liner.

8.5 CLEANING THE WINDOW PANEL AND WINDOW COVER

The glass window panel is hinged to allow easy cleaning. A spring-type latch is mounted inside the door on the lockbolt cover. Press the spring to release and open the hinged window panel.

Clean the window with any good glass cleaner. The plastic window cover can be cleaned with the same cleaner or a neutral detergent using a soft sponge, wool cloth or chamois and rinsed with water. NEVER use any solvents, chemical, or abrasive cleaners, or scrapers, squeegees or brushes on the plastic window cover.

8.6 LUBRICATION WITH LITHIUM GREASE

Once a year the bottle tray rail ball bearings and door moving parts should be lubricated with white lithium grease.

1. Pull out the tray. The tray rail is constructed of three telescoping channel sections. Apply a light coating of grease on the outside of the first two sections, along the top and bottom edges.
2. Apply grease on the inside of the last two sections along the top and bottom.
3. Apply grease (or similar lubricant) to the door lock bolt threads and the door hinges as necessary.
4. Wipe off excess grease. No other lubrication is required.

8.7 REPLACING FLOURESCENT BULBS

1.
2. Unplug the vendor from the wall.
3. Open the door.
4. Turn bulb one-quarter turn and, at both ends at the same time, slide out through the slots in bulb sockets.
5. Remove one of the two black end caps from the clear protective tube. Slowly remove defective bulb by sliding it out of the tube.
6. Dispose of bulb properly.
7. Slowly insert new bulb into clear protective tube, turning the bulb so the pins are centered in the opening in the black end cap. Install the second black end cap, centering the opening over the pins.
8. Install the bulb by inserting bulb pins at both ends at the same time through slots in bulb sockets, then turn bulb one-quarter turn.
9. Plug in the vendor to test the lamp.
10. Close the vendor door.

8.8 DEFROSTING THE EVAPORATOR COIL

Excess moisture accumulating inside the cabinet may freeze in the evaporator coil. As the coil becomes blocked all useful chilled air is also blocked.

1. Unplug the vendor
2. Open the door.
3. Place a fan on the floor in front of the vendor to direct room temperature air into the back of the cabinet.
4. Do not use any tools or electrical appliances to chip at, heat up or otherwise 'speed up' the defrosting action around the coil. Do not puncture the coil.
5. Look for the source of excess moisture.
6. Look for broken or leaking product. Dispose of it and clean up the liquid.
7. Inspect the vend hopper and clean it of liquids and broken containers.
8. Check to make sure the vend hopper door doesn't 'hang open'.
9. Check that the gasket of the chiller housing is securely contacting the cabinet and is sealing it on all sides.
10. Check to ensure the sealing putty is firmly in place around the two openings on the rear, right hand edge of the chiller housing. Use more putty if it is missing or is not enough.
11. Check the door gasket around the cabinet opening. It should be intact.
12. Check to see if the door closes squarely on all four sides and the lock draws the door firmly against the gasket.
13. After the evaporator coil has been defrosted, clean up any water inside the cabinet.
14. Close the door.
15. Plug in the vendor and allow it to cool before loading products.

8.9 TESTING THE TEMPERATURE SENSOR
          There is no ready test of the temperature sensor. If the electrical signal between the sensor and control board is lost (by means of a broken wire or a bad connection) the control will default to an internal "temperature" of 120°F, and operate the chiller unit continuously. Otherwise, anytime the " * " is pressed on the keypad the temperature inside the vendor is displayed.
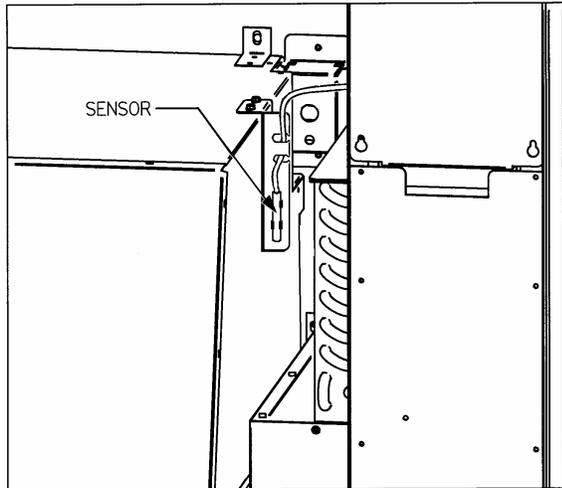

Figure 8.3 Temperature Sensor

8.10 PC UTILITY LOADING INSTRUCTIONS

          An AMS vendor designed for vending food meets or exceeds standards for Health and Safety (H&S), and H&S software must be used. A vendor not designed for H&S may have H&S software installed but it may not meet H&S requirements.

          These instructions are for loading of Sensit II software into the vendor, configuring the vendor software as required, and/or downloading of selected history files.

          The configuration settings can be saved in a file for configuring the vendor again at a later time, or for uploading the same configurations to other vendors.

8.10.1 Requirements
          The basic application requirements are:

1. An IBM compatible PC (a lap-top or similar PC) operating on Windows 98 or higher.
2. 32MB RAM (64 recommended).
3. VGA monitor or better.
4. CD-ROM drive.
5. DB9 Serial port, or USB adapter.
6. CD from AMS containing the most current version of P/N 3302, AMS Sensit II Utility and the most current vendor software for your application.
7. P/N 20786, Harness, Chip Programming (See Figure 6.1).

8.10.2 Installation
          Install software onto the PC as follows:

1. Turn on the PC.
2. Use the "Add/Remove Programs" feature in Control Panel to remove any previous versions of the Sensit II Utility.
3. Place the AMS Software CD in the CD drive.
4. If the CD-ROM does not start automatically, choose START, then RUN, then type D:\setup.exe (where D is the name of your CD-ROM drive).
5. Follow the on-screen instructions of the installation guide.
6. After installation, the AMS software may be left on the PC. Store the CD as a backup.

8.10.3 Startup
          After loading of software into the PC, start up in the following order:

1. Connect the cable connector to the PC serial port (leave the ¼" plug unplugged at this time, see Figure 6.1).
2. Turn on the PC
3. Turn on the vendor.
4. To open the program, double-click on the desktop icon placed there during installation.
5. After the program has opened (and the vendor is running), plug the ¼" plug into the jack on the side of the control board in the vendor.
6. Further choices are described below.

8.10.4 Toolbar
          The AMS Utility tool bar is located in the upper left hand of the screen

FILE: Provides typical Windows-type options such as NEW, OPEN, SAVE, PRINTER/SETUP, and EXIT.

COMM: Use to select what type of task to perform using the AMS Utility software:

RECEIVE CONFIGURATON is used to download settings from a vendor to save for future use.
SEND CONFIGURATION is used to upload new settings to a vendor.
RECEIVE DATA LOGS is used to retrieve four data logs (Power, Door, Temperature, and Cooling). Collected data will be displayed in the Data Logs block.
NOTE The cooling log must be active for 30 minutes before cooling data is available.
RECEIVE AUDIT is used to collect standard information. Collected data will be displayed in the Audit Data block.
SEND FLASH is used to update the software used by the vendor control board (electronic transfer of the software eliminates the need to replace chips)
RECEIVE FLASH is used to download the software used by the vendor control board for other uses (electronic transfer of the software eliminates handling chips).
TOOLS: Primarily used during the initial startup to determine if the serial cable is connected to the correct COMM port. You may also un-synchronize

the settings clock with the internal clock in your computer, but this is normally enabled.

8.10.5 Program Screens

The AMS Utility programs are located in a column on the left side of the screen.

PRODUCT INFO: This screen allows selections and entries to be made at an individual product level.

SELECTION ID: Identifies the tray and column.

PRODUCT NAME: This feature is not available through the vendor keypad. Up to a 16 digit entry in this field will be briefly shown on the display when this selection is made on the vendor. An example entry may be "Ice Cold" when a soda has been selected.

PRICE: The maximum price is $199.95 for US applications (or 3999 base units if referencing the scale factor). It should be a multiple of the lowest denomination coin used, but if not, the control will round up to the next highest price that can be represented exactly.

DELAY SALE is enabled here for each product. This must be turned on and in the SETTINGS screen an enable box checked and the delay time specified in order for Delay sales to occur.

DELAYED STOP can be set for up to one second, in 0.1 second intervals, allowing a vend motor to continue running after the product has been dispensed.

SETTINGS: This screen provides for turning some features on and off and for entering messages and data:

GENERAL VEND: These options are more fully explained elsewhere in the manual. Please note these features:

NO-CHEAT and HOLD LOST CREDIT are enabled by default. The PRIZE box default is zero. If your vendor is so equipped, turn on the PRODUCT SENSOR using the ENABLE box.

LANGUAGE: Service mode will be displayed in the primary language only. Customer messages will scroll the primary language first, followed by the secondary.

MISCELLANEOUS: The chiller temperature setpoint (when the chiller will run) is adjusted here.

NOTE: AMS recommends an H&S setpoint of 40° for vendors which are vending perishable food.

MACHINE S/N The customer may enter any desired serial number in 'Machine S/N'. Checking the 'Use for changer SN' box will make the coin mechanism serial number match the machine.

DELAY SALES: Must also be enabled and the time delay entered here in order to delay sales for the items selected at the Product Info screen.

CLOCK/CALENDAR: If not current, reset the time and day/month/year.

ENERGYSENSIT: Settings for the power savings program for refrigeration and lighting may be made here, and the two programs turned on and off.

NOTE: Setting the chiller setpoint to 40°F enables H&S and will disable the refrigeration power saving selection. The lighting power saving feature is not affected.

USER MESSAGE: may be up to 50 characters, including lower case and additional punctuation marks not available through the keypad.

BLOCKING: This screen displays four periods during the day when sales will be disabled (Note that Sales Blocking and Delay Sales are used for different purposes). For each period select the start time, end time and day of the week. Then select any number of tray and column combinations to block in that period. The default is all selections are blocked.

TRAY: This screen provides a way to "link" motors for space-to-sales applications.

MASTER/LINKED: Check 'Master' for the left-most selection, and 'Linked' for as many as desired directly to the right of the Master. Linked selections are vended sequentially for better product rotation. Whatever price is set for the Master will be used for any linked motors.

HOME SWITCH: Enable the Home Switch for the older Gum & Mint trays that use a switched vend motor. If the vendor is equipped with 1.5" helix trays, these should be disabled.

VALUEVEND: This screen displays response time (default of 30 seconds), two product selections in each of 10 groups, and a total price. In any group, change the price then select any product button to display the assignment chart. Select the two products to be grouped for that price. Select APPLY to enter this group into the ValuVend program and return to the first screen to allow making additional selections.

DATA LOGS: The screen is used to view and print the four logs (Power, Door, Temperature, and Cooling). In order to view the first three, select Comm|Receive Data Logs at the ToolBar. Print a log by right-clicking anywhere in the data, then select 'Print Log'.

AUDIT DATA: This screen displays the standard information stored in the controller. To access this data, select Comm|Receive Audit. Accessing this information will reset the resetable counters, and will register in the EA_ field, which is a history of reads.

8.10.6 Software Operation

To upload to the vendor:

1. Go through all the screens and configure all settings and entries as desired.
2. Save the completed configurations.
3. Select SEND FLASH.
4. A message will come up on the screen asking "Would you like to preserve current configuration?" Selecting "YES" will maintain all the pricing, messages, ect. currently on the vendor. Selecting "NO" will upload the new configuration data to the vendor. The upload will start automatically.
5. In a few minutes the upload will be complete.

8.10.7 Shutdown

After loading of software into the PC or the vendor, configuring the vendor software as required, or downloading of selected history files, shut down in the following order:

1. Save the configuration file for future use.
2. Unplug the cable from the vendor control board.

3. Unplug the vendor.
4. The AMS Sensit II Utility may be left on the PC as convenient.
5. Change to other programs or shut off the PC as desired.

NOTE: Different or special configuration files can be made up and saved for future use.

NOTE: The method of startup and shutdown can be modified to allow changing the software and configuration in multiple vendors.

8.10.8 Errors

This software has been tested on Windows platforms from 98se to XP. However, should errors occur, the lower left corner displays the current error and can help eliminate problems.

"BOOT LOAD 1.22" is displayed when the vendor is powered up while connected to the PC running this software. Disconnect power to the vendor, unplug the cable and restart the vendor.

"UNEXPECTED APPLICATION RUNTIME ERROR…DESCRIPTION: PORT ALREADY OPEN" occurs when this software is started while connected to the vendor, the cable is connected to the wrong serial port, or the PC is looking in the wrong place. Go to Tools|Preferences|Comm Settings and select a different port. Then restart.

"NO RESPONSE TO ENQ" occurs when there is no connection at one end of the cable. Usually this occurs when the plug is not pressed fully into the jack, there is a bad connection within the plug, there is a broken wire in the cable, or the cable is connected to the wrong serial port.
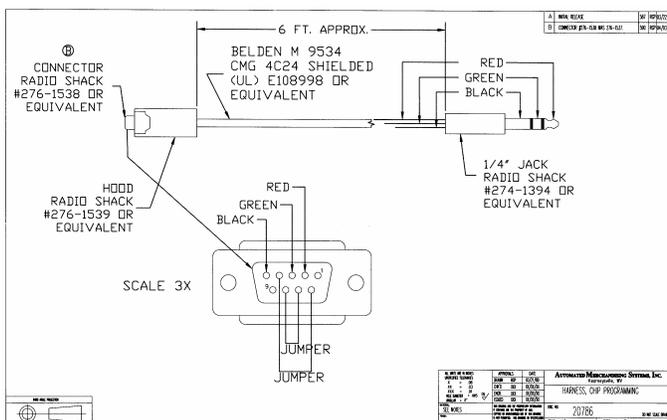
Figure 8.4 Harness, Chip Programming

9.0 <u>WIRING DIAGRAM</u>

Figure 9.1 Typical Wiring Diagram, Sheet 1 of 4

AMS SENSIT II GLASS FRONT VRM VENDOR
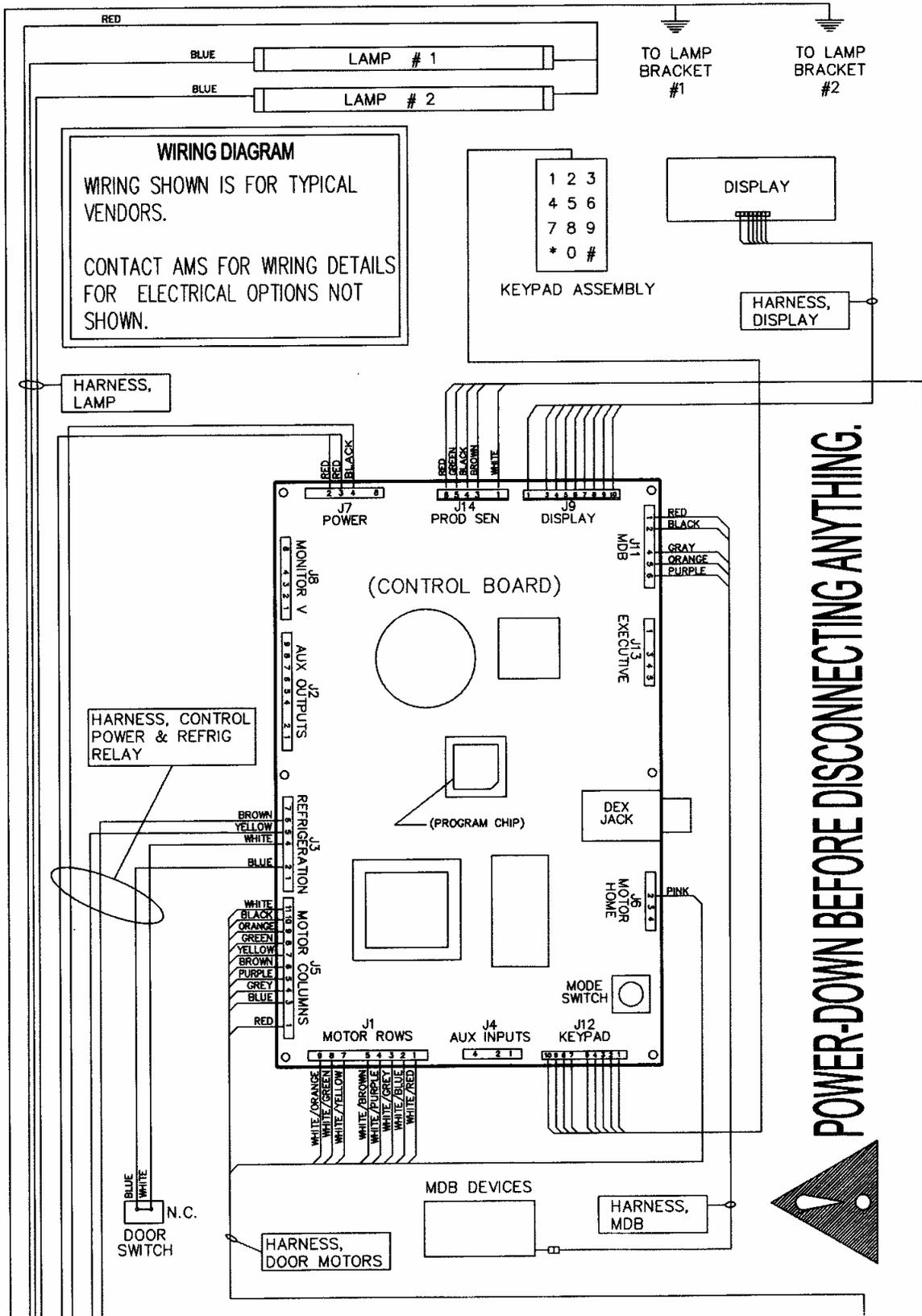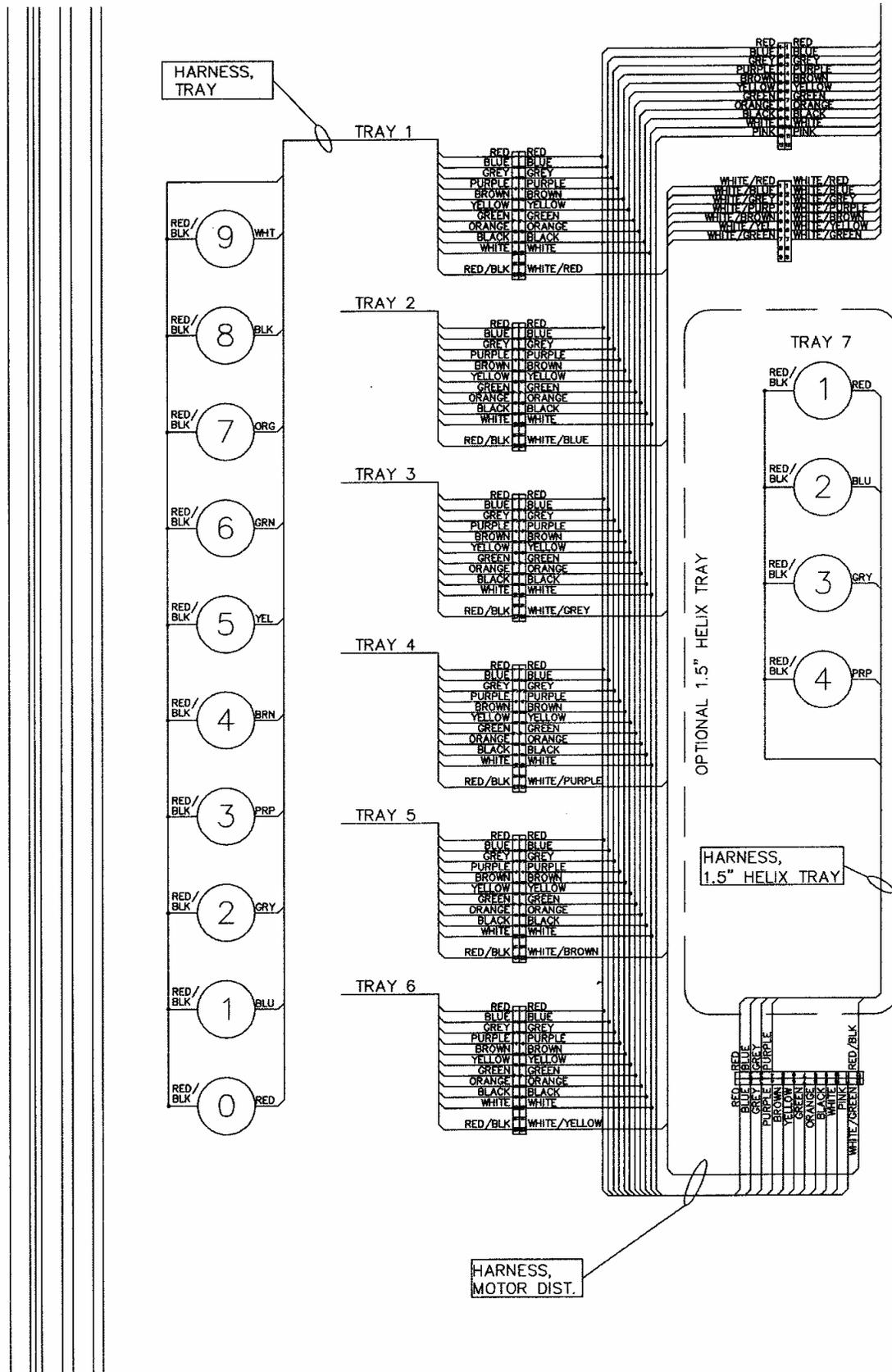
**Figure 9.1 Typical Wiring Diagram, Sheet 2 of 4**
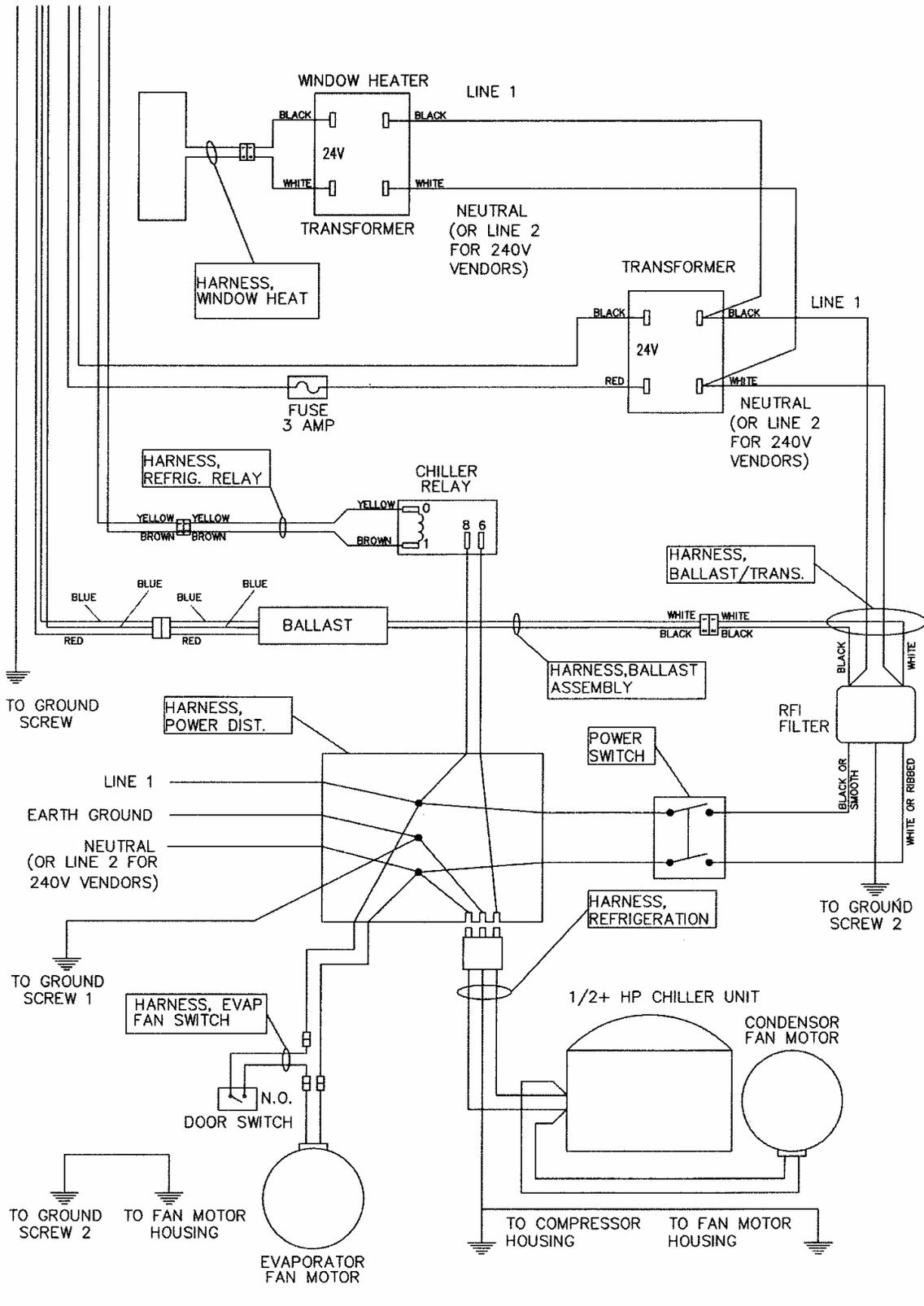
Figure 9.1 Typical Wiring Diagram, Sheet 3 of 4
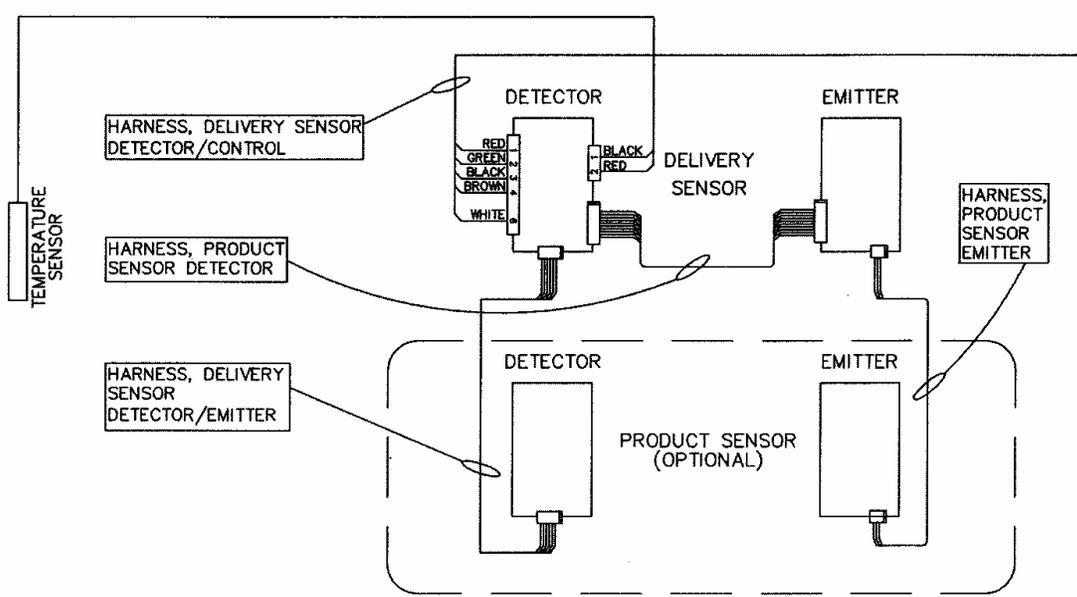
FUSE REPLACEMENT — 3AG (3 AMP FAST BLOW)

Figure 9.1 Typical Wiring Diagram, Sheet 4 of 4

10.0 <u>SUPPORTED DEX FIELDS</u>

CA101   Coin mechanism serial number
CA102   Coin mechanism model number
CA103   Coin mechanism software revision
CA201   Value of cash sales since initialization
CA202   Number of cash vends since initialization
CA203   Value of cash sales since last reset
CA204   Number of cash vends since last reset
CA301   Value of cash in since last reset
CA302   Value of cash to the cash box since last reset
CA303   Value of cash to tubes since last reset
CA304   Value of bills in since last reset
CA305   Value of cash in since initialization
CA306   Value of cash to the cash box since initialization
CA307   Value of cash to the tubes since initialization
CA308   Value of bills in since initialization
CA401   Value of cash dispensed since last reset
CA402   Value of cash manually dispensed since last reset
CA403   Value of cash dispensed since initialization
CA404   Value of cash manually dispensed since initialization
CA601   Number of DEX reads performed since initialization
CA602   Number of door openings since initialization
CA701   Value of cash discounts since last reset
CA702   Value of cash discounts since init
CA703   Number of cash discounts since last reset
CA704   Number of cash discounts since init
CA801   Value of cash overpay since last reset
CA1001   Value of cash filled since last reset
CA1002   Value of cash filled since initialization
CB101   Control board serial number
CB102   Control board model number
CB103   Control board software revision

DA201   Value of card sales since initialization
DA202   Number of card vends since initialization
DA203   Value of card sales since last reset
DA204   Number of card vends since last reset
DA401   Value credited to card since initialization
DA402   Value credited to card since last reset
DA501   Value of card discounts since last reset
DA502   Number of cashless discounts since last reset
DA503   Value of card discounts since initialization
DA504   Number of cashless discounts since init

EA401   Date of installation
EA402   Time of installation
EA403   Installation terminal/interrogator identification
EA701   Number of power outages since last reset
EA702   Number of power outages since initialization
EA301   Number of reads since initialization
EA302   Date of the current read out
EA303   Time of current read out
EA304   This terminal/interrogator identification
EA305   Date of the last read out
EA306   Time of the last read out
EA307   Last terminal/interrogator identification

ID101   Machine serial number
ID102   Machine model number
ID103   Machine build standard
ID107   VIDTS stage
ID108   VIDTS revision
ID401   Decimal point position
ID402   International telephone country code
ID403   Currency description

PA101   Product number
PA102   Product price
PA201   Number of products vended since initialization
PA202   Value of paid products since initialization
PA203   Number of products vended since last reset
PA204   Value of paid product sales since last reset
PA205   Number of discounts since init
PA206   Value of discounts since init
PA207   Number of discounts since last reset
PA208   Value of discounts since last reset
PA401   Number of free vends since initialization

TA201   Value of vend token sales since initialization
TA202   Number of token vends since initialization
TA203   Value of vend token sales since last reset
TA204   Number of vend token vends since last reset
TA205   Value of value token sales since initialization
TA207   Value of value token sales since last reset
TA208   Number of value token vends since last reset

VA101   Value of all paid sales since initialization
VA102   Number of all paid vends since initialization
VA103   Value of all paid sales since last reset
VA104   Number of all paid sales since last reset
VA105   Value of discounted paid vends since init
VA106   Number of discounted paid vends since init
VA107   Value of discounted paid vends since last reset
VA108   Number of discounted paid vends since last reset
VA301   Value of all free vends since initialization
VA302   Number of all free vends since initialization
VA303   Value of all free vends since last reset
VA304   Number of all free vends since last reset

11.0 <u>OPTIONAL EQUIPMENT</u>

Part No. 21565 – Kit, 1.5" Helix Tray, Reduced Depth (39")
        A four-selection helix tray that mounts below the bottom tray.

Part No. 20449 - Kit, Candy Pusher
        The candy pusher is an adjustable bar that mounts to any tray divider to keep tall candies from falling sideways.

Part No. 20450 - Kit, Helix Splitter
        The helix splitter is a plastic divider that can be inserted into a small helix to divide each coil into two product openings, thereby doubling product capacity. The helix splitter works best with narrow products such as Life Savers.

Part No. 20535 - Kit, Cup Rail, Small Helix
Part No. 20536 - Kit, Cup Rail, 4" Helix
Part No. 20723 - Kit, Cup Rail, 3" Helix
        The cup rail is a flat plastic bar that can be placed inside the helix to provide a flat surface for rigid flat-bottomed packages that otherwise do not stay upright when placed in a helix. Examples would be drink boxes or bottles, or individual serving cups of soup, pudding, etc.

Part No. 20664 - Kit, Banking Spacer

Part No. 21166 - Kit, False Leg
        False leg to be installed on all machines having 2 or more bottle trays to prevent machine tipping during loading.
Failure to install the false leg could result in serious injury.

P/N 3302, AMS Sensit II Utility CD
P/N 20786, Harness, Chip Programming
        Load Sensit II software into the vendor, configure the vendor software, and/or download files using the AMS Utility software, the cable and the vendor software

12.0 <u>LIMITED WARRANTY</u>

Automated Merchandising Systems Inc. (AMS) warrants this equipment to the Original Purchaser only, for a period of one (1) year from the date of shipment, to be free under normal use and service from defects in material or workmanship, and for three (3) years on the refrigeration unit, electronic control board, and the two sensor boards. The refrigeration unit consists of the compressor, fan motors, relay, and the sealed components of the system. Light bulbs, glass, and painted surfaces are not covered by this warranty.

Should any part prove defective within the warranty period, AMS will repair or replace (at its option) the defective component. AMS will provide normal ground shipment for parts replaced under warranty. This warranty does not cover the labor or other costs associated with removal and reinstallation of a defective component. All defective components, at the option of AMS, are to be returned, properly packaged, freight prepaid, to AMS or to the authorized dealer or distributor from whom the equipment was purchased for verification of the defect. Prior to returning any parts for replacement the customer is to contact the AMS Service Department at (304) 725-6921 for return authorization. AMS reserves the right to refuse any collect shipment.

This warranty applies only if the equipment has been serviced and maintained in strict accordance with the instructions presented in this service manual and no unauthorized repair, alteration, or disassembly has been done. Any defects caused by improper power source, abuse of the product, accident, alteration, vandalism, improper service techniques, or damage incurred during return shipment due to improper packaging will not be covered by this warranty. Likewise, any equipment that has had the serial number removed, defaced or otherwise altered will not be covered by this warranty.

AMS reserves the right to make changes or improvements in its products without notice and without obligation, and without being required to make corresponding changes or improvements in equipment already manufactured or sold.