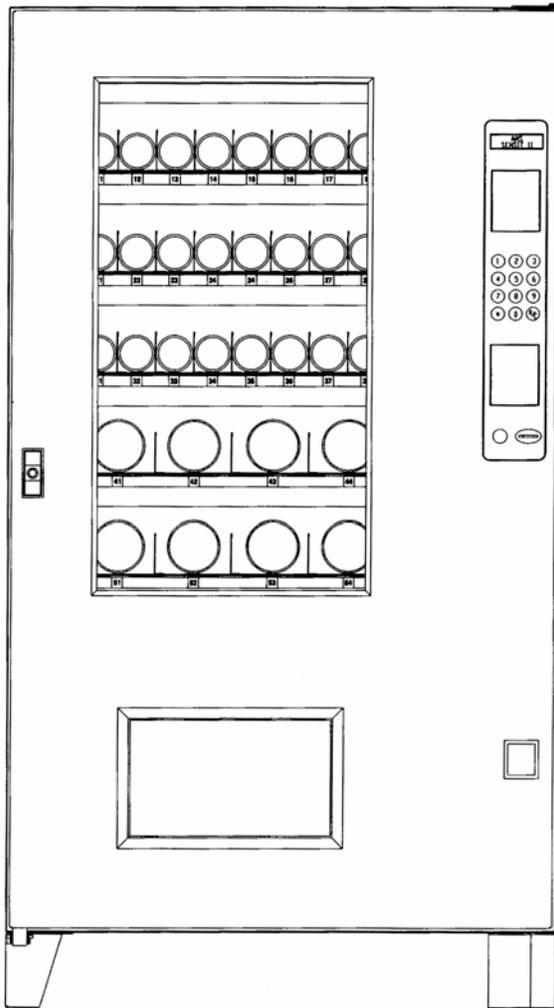




SENSIT 3 OPERATION AND SERVICE MANUAL



**Glass Front Vendor,
Model 39-FV**

**FROZEN FOOD
VENDOR**

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AMS SENSIT 3 FROZEN FOOD VENDOR

L0134A

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PUBLICATION NOTICE
L0134, Revision A, ECN 2305

It is our intent to assist our customers with up-to-date documentation: however, this manual may not contain all updates and is subject to revision without notice. Please contact our Service Department with your requests or comments.

1.0 INTRODUCTION

Congratulations on the purchase of your new AMS Sensit 3 vendor. All Sensit 3 models are versatile, high-capacity vending machines. AMS machines are designed, tested, and built to provide years of reliable, low-maintenance service in an indoor environment. A fully insulated cabinet, DEX data capability, and flexible product configuration are just some of the many features built into every AMS merchandiser. The following table shows the temperature ranges available with your new vendor.

FFV (FROZEN FOOD VENDOR)		
CAPABILITY	TEMPERATURE	PROTECTION
SNACK	75°F TO 42°F (24°C TO 5°C)	NONE
REFRIGERATED FOOD	41°F OR COLDER (5°C)	H&S
SLACKED FOOD	25°F OR COLDER (-4°C)	H&S
FROZEN FOOD	0°F OR COLDER (-18°C)	H&S

1.1 SENSIT 3 SYSTEM

Your vendor is equipped with the Sensit 3 control system. The Sensit 3 system is a patented vend-sensing system that detects when products fall into the delivery bin. Basically, a plane of infra-red light is created across the top of the delivery bin, and the Sensit 3 system can detect when the light has been blocked by a falling product. Using this technology, the vendor “knows” when your customer gets the product. The Sensit 3 system has several important benefits:

Guaranteed Delivery

If, during the vend, the product hangs up or an opening was missed in loading, the helix can rotate several additional partial revolutions to attempt to deliver the product. No more hitting or shaking the vendor to get products that did not fall!

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!

Adjustable Helix Motion

With the Sensit 3 system, the helix can stop as soon as the product falls, or when the helix returns to the home position. See section 6.8 for more information.

Additional Benefits:

1. Opening the delivery bin door will not affect the Sensit 3 system. The sensors are located above the delivery bin and will not be blocked by the bin door. Product that falls while the door is open will still pass through the beam.
2. Shining a light at a sensor 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 3 system can over-ride blocked or malfunctioning sensors and still vend.
4. Opening the door of a cold vendor will cause some condensation to form on the sensor lenses. The Sensit 3 system will not allow vending until this fogging clears, normally within a minute of closing the door.

1.2 HEALTH AND SAFETY

H&S Specifications

AMS vendors intended for vending perishable food products meet NAMA requirements for vending machines. The NAMA specifications for frozen food product vendors require that the temperature in the vendor must cool to 0°F for frozen and to 25°F for slack within 75 minutes of closing the vendor door or a **HS2** error will be generated and the vendor will not allow sales of protected items. (note that Delayed Sales has no effect on this cool-down period). This is to allow a recovery period following loading; however, all products should be frozen prior to loading.

After the cool-down requirement has been met, if the temperature in the vendor exceeds the NAMA setpoint for more than 15 minutes a **HS1** error will be generated and the vendor will not allow sales of protected items. Selections that are ‘exempt’ from Health & Safety protection will still be available. See section 6.6.

H&S Software

To meet these requirements, all AMS refrigerated food vendors have control software with a built-in Health & Safety (H&S) function. The H&S function is activated automatically in food vendors when the temperature is set at or below 41°F for food, 25°F for slacked, or 0°F for frozen products. See section 8.9 to test.

H&S Protection

In the event the temperature exceeds the NAMA specifications following the recovery period or during normal operation, an error will be generated and the vendor will not allow sales. This protects the

consumer from purchasing spoiled food. H&S error codes are detailed in Section 7.3.

Mixing Potentially Hazardous Food

From the NAMA Construction Standard:

700.1B *In single compartment machines vending both potentially hazardous and non-potentially hazardous food, areas not provided with an automatic shutoff control shall be clearly marked with labels, lights or other means that will alert the route person not to stock potentially hazardous food in those areas.*

All Sensit 3 Frozen Food vendors can be configured for Health & Safety protection by selection. All vendors shipped from the factory will be configured for Health & Safety protection of all selections.

If any selections are exempted, *it is the operator's responsibility* to mark those unprotected selections with the included yellow labels (or other means), and to instruct route persons on loading restrictions.

FAILURE TO DO SO COULD RESULT IN AN UNACCEPTABLE HEALTH RISK TO THE CUSTOMER.

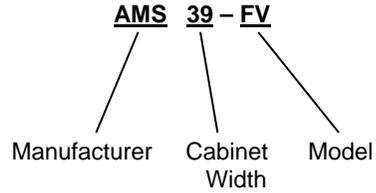
1.3 MODEL IDENTIFICATION

When requesting service, replacement parts or technical assistance, please copy the information found on the vendor Serial Plate (Refer to Figure 1.1). It is attached inside the door near the upper right corner of the window and is visible from the outside. The information contained on this plate is necessary to determine what parts, kits, or maintenance should be applied to your specific model.



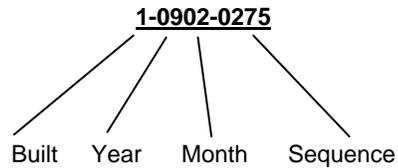
Figure 1.1 Typical Serial Plate

Model Number Breakdown (Refer to Figure 1.1)



AMS39-FV means it is an Automated Merchandising Systems Frozen Food vendor, 39" wide.

Serial Numbering System (Refer to Figure 1.1)



On all AMS serial numbers, the first digit identifies where a merchandiser was manufactured. Those merchandisers built in the U.S. start with the number 1. Those merchandisers built in Mexico start with the number 2.

The next two digits identify the year of manufacture. These numbers are 09 (for 2009) and so forth.

The next two digits identify the month. The first month of the year is 01 and the last month is 12.

The last four digits identify the number assigned to each merchandiser during assembly. Numbering starts with 0000 and continues through 9999, whereupon these four digits start over.

An example of the numbering system in use is as follows:

1-0902-1156

This merchandiser was manufactured at the Kearneysville, W.V. plant in 2009, in February, and was the 1156th merchandiser manufactured.

1.4 GENERAL SPECIFICATIONS

Operating Environment

AMS vendors are designed for indoor use only. Indoor temperatures must be between 35°F (1°C) and 110°F (43°C). Maximum temperature for vendors with perishable food is 100°F (38°C). The vendor should not be located in an area where it may be subjected to direct sunlight, a water jet, or rain.

Cabinet Physical Dimensions: Model 39-FV (Refer to Figure 1.2)

39"W x 72"H x 36"D
(99 cm x 183 cm x 91 cm)

Cabinet Weight:

Approx. 738 lbs. (335 kg)

Vendor Capacity:

Capacity depends on configuration of each tray. See Section 1.5 on the following pages.

Power Requirements

United States,

Canada and Mexico:

120 VAC, 60 Hz, 11 Amps

International:

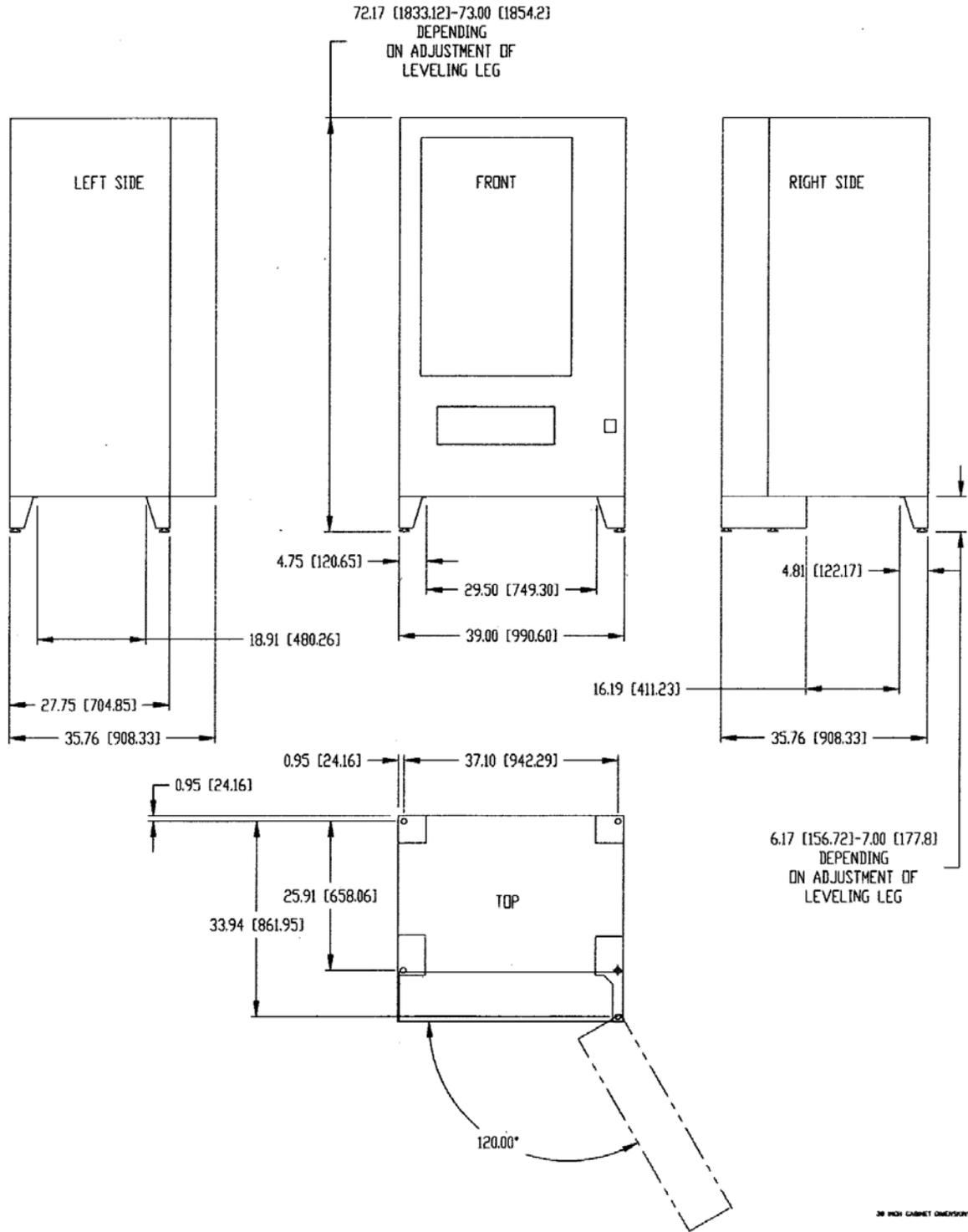
230 VAC, 50/60 Hz, 5.5 Amps

Refrigerant Specifications:

¾ HP, R-404A, 19.5 oz. (.55 kg)

Coin Mechanisms and Bill Validators

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



39- FV CABINET DIMENSIONS

1.5 Merchandiser Configurations

10		12		15		15	
12		12		15		15	
15	15	15	15	24	24	24	24
18	18	18	18	18	18	18	18
7 cw7		7 cw7		7 cw7		7 cw7	

Figure 1.3 Example Configuration

The above drawing shows a typical configuration used in an **AMS 39-FV** model vendor.

The top tray in the above example contains four columns, formed by the placement of dividers, with motors and large diameter helices in place.

The pitch of the helices (the number of slots for loading product) is given by the number. The size of the square indicates the size of the helix (small or large).

All of the top tray helices shown above are of large diameter, and are of 10, 12 and 15 pitch. The configuration on this tray can hold $10+12+15+15 = 52$ products.

All trays can be configured in this or another configuration, depending on the products being vended.

Products which fit in the 10 pitch helix may be too large to fit in the 15 pitch helix. The product must be freely pushed out of the column by the helix to fall into the hopper.

The fourth tray down as shown in the above example contains eight columns with small diameter helices. The pitch is 18 for all columns, so the configuration on this tray can hold $18 \times 8 = 144$ products.

A working configuration is one column with a given helix (or two columns coupled,) to vend a given product. A record of working product configurations, as shown in the example diagram, will greatly speed up new set-ups and duplicate vendors.

With Sensit 3, extra wide product can be vended by 'coupling' two motors.

1. Form a column between dividers, wide enough for the product. When viewed from

the front of the tray, install a clockwise (CW) motor and helix on the right side of the column, and a counter-clockwise (CCW) motor and helix on the left side of the column. Note that all normal or standard motors and helices turn CCW to vend product. The motors can be any distance apart. The helices must be of the same pitch.

2. Using the configuration menu, couple the two motors together. See Section 6.8.
3. Install the product into the two helices. Change the selection and price on the tray.

When this product is selected, the two helices will turn at the same rate to vend the product.

The bottom tray shown in the above example contains four columns with small diameter, *coupled* helices. The pitch is 7 for all columns, so the configuration on this tray can hold $7 \times 4 = 28$ products.

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.	
6,041,962	6,145,699
6,202,888	6,384,402
6,520,373	6,708,079
6,794,634	7,191,915
7,246,719	7,343,220 B2
7,446,302	
Canada	2,329,314
Mexico	230,714

2.0 SAFETY

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, some 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. 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 cannot possibly cover all hazards, therefore please remember to

++ THINK SAFETY FIRST! ++

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 1.3 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.

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 may appear to 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.
3. Test the ground fault circuit interrupter (GFCI) periodically to insure proper operation. See section 8.11

Fan Contact

These vendors are equipped with electric fans, which can start automatically. The 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 wear hand and eye protection when servicing the vendor.
3. Always keep hands, hair, loose clothing and tools away from fan blades.
4. Never insert hands or tools into concealed areas.
5. Always replace protective covers after service.

Helix Motion and Jamming

Energized vend motors can turn a helix with considerable torque, creating a possible entrapment hazard. Also, turning helices 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 gloves and 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 helices 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.

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 recovery equipment. Unauthorized service to the sealed refrigerant system will 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.

Vendor Tipping

The weight of an empty vendor is over 550 pounds, and can be more than 700 pounds!. 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, or a vendor still containing product.
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.

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.

Ground Fault Circuit Interrupter

This merchandiser is equipped with a Ground Fault Circuit Interrupter (GFCI), in compliance with UL 943, as required by ANSI/UL 751 and 541.

2.3 TEST STANDARDS

AMS vending machines bearing the ETL mark have been tested and comply with one or more of the following standards:

Standard for Refrigerated Vending Machines ANSI/UL 541, and the Standard for Refrigeration Equipment, CAN/CSA C22.2 No. 120

European Union
European Economic Area
CE (European Conformity)

Americans with Disabilities Act
See Section 4.3

3.0 VENDOR SYSTEMS AND COMPONENTS

3.1 SENSIT 3 SYSTEM OPERATION

1. The Sensit 3 system is comprised of the primary sensor, the secondary sensor, and the control logic. The primary and secondary sensors are attached to opposite ends of the hopper, and infrared light is passed between them.
2. When a selection is made, the vend motor will begin to run. After several seconds, if no product falls in the hopper (or motor returns to home position), 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 (or returns to home position) and removes the credit.
4. When the vendor is serviced with the door open, the protective lens on the sensors 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.

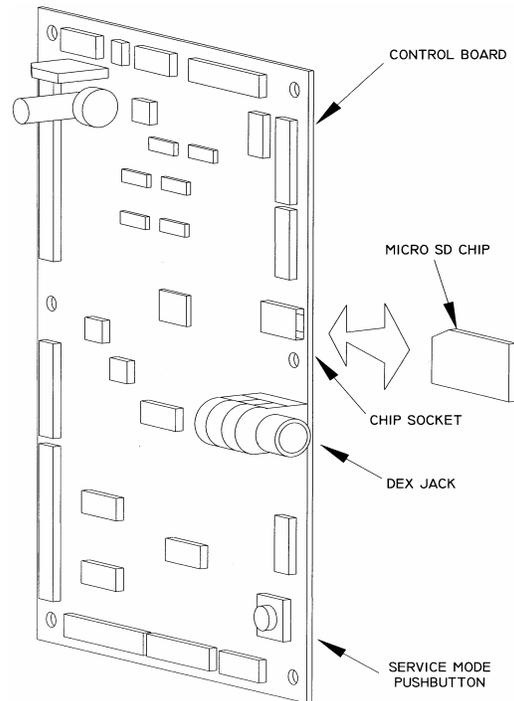


Figure 3.1 Control Board Components

3.2 CONTROL BOARD

The control board controls and monitors the vendor, DEX, and MDB systems. The control board is located in the upper left hand corner of the open vendor door, behind an access door.

Upgrading Software

The software can be upgraded by using a micro SD card. The card, and card readers, are available at Office supply chains or on the internet. Minimum capacity of 512Mb is adequate. See Section 8.1.

Mode Switch

Pressing the mode button (Refer to Figure 3.1) allows the user to get in to the controller'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, closing the door, or waiting approximately 3 minutes will automatically switch the computer back to vend mode.

DEX Jack

The DEX jack (Refer to Figure 3.1) is provided for use with external features, such as Speech (Refer to Section 6.10). Data collection with third party devices can also be made here.

3.3 VEND SENSOR

Primary Sensor

The primary sensor is located to the left of the hopper when viewing the back of the door. The sensor, inside a protective housing, sends light to and receives light from the secondary sensor (both sensors operate the same way in this regard). It contains circuitry to send a signal to the control board. When a product drops through the beam, it causes a change which is interpreted by the control as a successful vend. The primary sensor board also contains circuitry to connect to the secondary sensor, and to connect the temperature sensor to the control board. When servicing the primary board, be mindful of the emitters and detectors These can be damaged by rough handling.

Secondary Sensor

The secondary sensor, inside a protective housing, is located on the right side of the hopper when viewing the back of the door. The sensor also sends light to and receives light from the primary sensor. When servicing the secondary board, be mindful of the emitters and detectors, which can be damaged by rough handling.

3.4 INTERFACE BOARD

The Frozen Food Interface Board is a separate PC board, mounted inside the right rail mount, behind a steel panel.

The interface board is an input/output device under the control of the control board, and controls the sliding door, the defrost functions and the evaporator fan motor.

3.5 DOOR

Validator & Debit Card Reader Locations

There are two locations that will accept bill validators and/or 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).

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).

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 lifting out.

Door Switch

The door switch is mounted on the back of the vendor 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. Pressing the asterisk key (*) when the door is open, will display a minus (-) sign after the number.

Display

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

When the asterisk key (*) is pressed, the display other machine details. One of the highlighted

characters listed below will be shown in the lower right corner of the display.

- = Chiller off due to open door
- V = Chiller off due to low voltage
- D = Chiller off due to defrost timer
- P = Chiller off due to pressure timer
- % = Chiller can run, subject to temperature, set-point and EnergySENSIT

The number displayed before the % sign indicates the % of time the compressor has been running in the previous 4 hours. This is a moving average, and changes throughout the day.

If there are multiple reasons for a chiller to *not* be running, the display will show the foremost reason listed (i.e., door open takes precedence over low voltage).

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.

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.

Lighting Options

The Frozen Food vendor uses two T-5 fluorescent bulbs for maximum visual impact. LEDs are currently not available.

3.6 REFRIGERATION SYSTEM

Refrigeration Operation

The compressor compresses refrigerant gas, which increases the pressure and temperature of the gas. As the hot, compressed gas passes through the fan-cooled condenser, it is cooled and condenses to a liquid. This fan draws outside air through a vent in the door bottom, through the condenser coil where it removes the heat and is blown out through a vent in the back of the cabinet. This part of the refrigeration system is insulated from the refrigerated part of the cabinet.

Driven by the pressurized gas entering the condenser, the liquid passes through a desiccant dryer and a thermal expansion valve. The thermal expansion valve controls the rate at which the liquid refrigerant enters the evaporator.

Lower pressure in the evaporator allows the liquid to evaporate, which lowers its temperature. An evaporator fan forces air from the refrigerated part of the cabinet across the evaporator, where the air is cooled by transferring heat to the refrigerant. The cooled air is returned to the refrigerated part of the cabinet.

The warmed gaseous refrigerant is then sucked from the evaporator 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.

Temperature Control

The evaporator fan runs continuously to circulate air within the cabinet, except during vends, and when the vendor door is open. A temperature sensor located near the evaporator coil measures the temperature of air entering the evaporator. When this temperature is above the temperature setpoint, the compressor and condenser fan are turned on.

When the temperature falls to 5°F below the temperature setting, the compressor and condenser fan are turned off (refer to Section 6.6).

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. The defrost interval can be programmed for 3 to 12 hours, in 1 hour increments. The recommended (factory default) setting is 3 hours. The entire cycle lasts approximately 14 minutes and the cabinet temperature will rise slightly during this time.
5. When the temperature in the cabinet reaches 5°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 evaporator from freezing up after drawing in excessive moisture-laden air.
7. After the compressor has shut down, the control will wait until the compressor has been off 15 seconds before restarting the compressor. The delay allows pressure in the system to equalize.

3.7 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).

3.8 TRAYS

Refer to section 5, and 11 for optional tray accessories.

Vend Motors

Two types of motors may be used with this vendor. The configuration of the machine will be different if all of one or another is used, or if there is a mix. S3 software can be used to best advantage if all motors are designed for homing, but *must* be similar within the *same tray*.

The vend motors are snapped into mounting holes on the back of each tray. The motor is driven by 24 VDC through a harness from the control board (Refer to Section 4.2 and Section 5.10).

S3 Vend Motors

The S3 vend motors have a plastic case of which the rear half is blue. S3 coupled motors can replace dual helix motors. Where a dual helix motor is used, replace it with a 23007 motor (having a blue and ivory case for CCW rotation) and a 23007-01 motor (having a blue and gray case for CW rotation) and reinstall the helices. Use Tray Setup in Service Mode to couple the motors in each column together, causing them to turn at the same rate.

Coupled motors will always stop at the home position. If one motor runs slightly faster, the slower will correct itself. Depending on motor configuration, the motors may jog twice to try to dislodge hanging product.

Note: When *not* in Service Mode, and with door *open*, press # to reset switched motors to Home position (Not available for non switched motors. Refer to Section 6.8). Motors already at home will not move.

SII Vend Motors

A Sensit II vend motor has a plastic case which is all ivory in color. A dual helix motor allows two helices, one for CW and another for CCW rotation, to be installed. The dual helix housing only allows helices to be adjacent to each other. These motors have been discontinued, and are replaced with a set of S3 vend motors. See section 6.8 when changing motor types.

Helices

There are four sizes of helices available, approximately 1 1/2", 2 5/8", 3", and 4" in diameter. There are several pitches available in each size, and is determined by counting the number of product openings in the helix (Refer to Sections 5.6 through 5.10).

Dividers

The dividers separate 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.

Candy Pusher Bar

The candy pusher bar keeps items pushed to one side of the column. This is typically used with tall product. The candy pusher bar is removed by pulling the bar free from the plastic clips. To reinstall, it is easiest to squeeze the bar into the clip using pliers (Refer to Section 5.14).

3.9 SLIDING DOOR

The sliding door is located under the bottom-most tray and is used to seal off the space between the cabinet and door of the vendor.

When a selection is made, the sliding door will move back, allowing the selection to fall thru the sensors and into the hopper. The sliding door will then move forward against the vendor door to seal off the vendor. The sliding door will also retract when the main cabinet door is opened.

The motor which moves the sliding door is controlled by the interface board located in the right rail mount. The seals on all sides of the sliding door have been designed to preserve the temperature inside the vendor when the sliding door is closed.

3.10 ELECTRICAL PANEL

Most of the high voltage electrical components are located in the recess formed by the right rail mount on the right side of the cabinet, behind an access panel.

Power Switch

The power switch is located on the side of the right rail mount near the fuse. The power switch is used to disconnect 24VAC power to the control board.

The power should be shut off when MDB devices are being connected or disconnected, when the board is being serviced, or before any wiring harness is connected to or disconnected from the control board or sensors.

Fuse Holder

The fuse holder is located on the side 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 stored in the cover. The fuse holder is opened by pressing in and down on the indicated side of the cover and pulling out.

Transformers

The transformer reduces the input voltage to 24 volts AC for the control board. A 2nd transformer supplies power to the window heater.

RFI 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.

Relay

AMS relays use a 24 VDC signal from the control board to close the relay and supply power to the refrigeration unit or other accessories.

Ballast

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

Power Distribution Harness

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

Ground Attachment

The vendor electrical ground is made through the use of grounding studs or screws at the lower back wall of the right rail mount. Earth ground and individual ground wires from the high voltage components are attached here, *and should always be replaced after service or repair.*

4.0 VENDOR PREPARATION AND INSTALLATION

Setting up a vendor has been divided into three stages. The first step confirms power and site suitability. The second step includes preparations accomplished in the shop. Step three is accomplished on-site, where the vendor is to be located.

4.1 CONFIRMING POWER AT OUTLET

Checking the Outlet (U.S. and Canada)

AMS recommends using a dedicated outlet which can supply 15 to 20 amps per vendor.

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 110 volts and 130 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.**

The power cord for domestic vendors is 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.**

NEVER USE AN EXTENSION CORD WITH THE VENDOR.

Checking the Outlet (Outside the U.S. and 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.

Electrical Service Requirement for CE Compliance

The following requirement applies only to models using 3/4 HP compressors and displaying the CE mark on the serial plate. If this requirement applies to your vendor, you will find 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.

Requerimiento de Servicio Eléctrico para Certificación CE

El siguiente requerimiento se aplica solamente a los modelos que utilicen compresores de 3/4 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.

Les Utilites Electriques Necessaire Pour Conformement Aux Regles CE

Le suivant condition applique seulement à modèle en utilisant 3/4 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

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.

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 white plastic 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, then press out the plastic 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.

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 white plastic 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 white plastic coin chute as required to align the chute with the changer.
7. Reconnect power to the control board.

Configuring Motors

The vend motors **MUST BE CONFIGURED** after any changes in the arrangement, type, or number of motors have been made.

1. Press the service mode switch on the control board (Refer to Figure 3.1).
2. Using the # or the * key, scroll through the menu to "**TRAY SETUP**".
3. Press **6** to configure the motors. Each switched motor is moved to the home position (moving the motor only if it is not at home) in addition to detecting connected motors. If the number of motors displayed does not match the number of motors in the vendor, press **1 * 2** to jog all the motors in the vendor.

4. Watch the display for missing motors that should be connected. The vendor will not vend from a given helix when the motor is missing, jammed or has home switch problems.
5. After the motors have been configured check to make sure all the helices are in the home position. If the end of a helix is not at its lowest position in the column pull it out of the motor, turn it until it is, and reinsert the helix into the motor.

Note: When *not* in Service Mode and with door open, press # to reset switched motors to Home position (Not applicable to motors set to "Sensit". Refer to Section 6.8). Motors already at home will not move.

Test Product Loading

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. Make use of 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 1.4, and 5.5 through 5.9).
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. 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.
8. 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 5.8 Helix Ejector).

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 label until it bows enough to snap into the top groove of the extrusion.

Setting Prices

After product placement and installation of the price labels, set the prices into the vendor (Refer to Section 6.7 Price Settings).

1. To enter the service mode, press the mode switch on the control board (Refer to Figure 3.1, or the decal inside the access door, for the location of the mode switch).
2. Using the * or # keys, scroll through the menu to "PRICE SETTINGS".
3. Press 1.
4. Enter the selection for which you want to set the price (example: 12).
5. Press 9 to edit or change the price.
6. Enter the price and press * to save this price, then do one of the three things listed below:
 - a. To save the selection at this price press * again.
 - b. Press 1 to save all the tray selections at this price.
 - c. Press 2 to save all the vendor selections at this price.
7. The prices as set will be maintained by the vendor even if there is a power failure or if the machine is unplugged.
8. Exit the service mode by pressing the mode switch or closing the vendor door.

Scrolling Prices

If the Scrolling Prices option is present, prices are changed by simply rolling the price tape up or down. A pencil eraser may help. To repair or re-configure the tray, the covers simply snap on and off.

4.3 ON-SITE INSTALLATION

Remove the Shipping Boards

1. Split the shipping boards by inserting a crowbar or wedge into the slots at either end.

- 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.

Placing the Vendor in Location

- 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.
- Allow at least 4 inches between the wall and the back of the vendor for air circulation.
- Make sure the vendor does not block walkways or exits.
- Do not place the vendor in a location where it can be struck by vehicles.
- 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. The door must open wide enough to allow the trays to be pulled out.
- 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.

Leveling the Vendor

For safe operation the vendor must be level.

- 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.
- 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.
- Place a level on top of the cabinet and check for horizontal from side-to-side.
- Adjust the leveling legs on the low side one turn at a time until the cabinet is level.
- Repeat the last two steps to level the vendor front-to-back.
- After the vendor is level, adjust the support screw under the door until it contacts the floor.

False Leg Installation

WARNING

The False Leg helps to prevent the machine from tipping forward when the vendor door is open and

one or more filled trays are extended. Failure to install the false leg may result in serious injury (Refer to Figure 4.2).

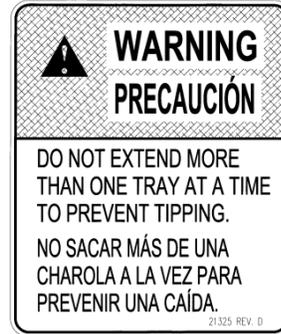


Figure 4.1 Tip-Over Warning

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

TOOLS REQUIRED:

1/4" Nut driver or socket wrench

- 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.
- Install screws through the holes and tighten until snug. Do not over tighten.



Figure 4.2 False Leg Installation

Initial Power-Up and Cool-down

When placing a Frozen Food vendor on a new location it is important to allow the machine to cool to the operating temperature **prior to placing products** in the machine. Depending upon the machine's initial temperature and ambient conditions, it will take up to 6 hours to accomplish this. Normal practice is to place a machine on location and come back the next day to load it. **All food products are to be pre-packaged and pre-chilled or frozen.**

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, from the bottom up.
6. Ensure vendor is operating properly. If the Health and Safety option is being used check vendor after 75 minutes from closing of the door to ensure NAMA requirements are being met.

5.0 TRAY ADJUSTMENT AND CONFIGURATION

The trays in AMS Sensit 3 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 helices, dividers or additional motors.

5.1 REMOVAL/INSTALLATION OF TRAYS

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.

Installation

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

5.2 TRAY VERTICAL POSITIONS

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

Removal

1. Remove the tray for access to the support rails. Note that bottle trays have a screw in each rail holder.
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. Use these same steps for the other side.

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.

5.3 TRAY COLUMN POSITIONS

Bottle tray column dividers are fastened in place and cannot be adjusted. The tray columns can be configured by the user for up to 8 columns wide for these trays. Typically the vend columns are set to single (2.66") or double (5.32") width, to be used with the standard small or large helices, 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 8 sets of motor connections. The first set of connections (at the end of the harness farthest away from the connector) is position 0,

followed by 1, 2, 3, and so on. The last set (nearest to the wire connector) is position 8. Starting at the left side of the tray, attach the harness connectors to the motors in order. For double columns, use the even numbered connection 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 0). 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 behind the bracket attached to the air plenum and lowest tray rail.
8. Reinstall the tray.
9. After changing the tray configuration, it will be necessary to reconfigure the motor matrix (Refer to Section 4.2).

5.4 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.

5.5 CHANGING HELICES

Each helix is snapped into an adapter which snaps into the vend motor.

To remove a helix from the motor, and while wearing gloves, grasp the helix about one “turn” away from the motor, and pull straight out sharply. Do not remove the helix adapter if the helix is going to be reinstalled.

To install a helix, insert the end of the adapter into the motor, and push the helix back towards the motor until the adapter snaps into place.

5.6 HELIX ADAPTER

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

5.7 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 helix by hand.
2. The ejector is typically positioned half a coil, and often much less, from the end of the helix.
3. The “fin” shaped portion is angled towards the front of the tray.

The best position and angle for the ejector is determined by test vending products.

5.8 HELIX ALIGNMENT DEVICE

The helix alignment device is installed under the bottom left side of the large helices to help 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 helix.

5.9 MOTOR POSITIONS / HOME

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

1. Remove the helix. Remove the harness terminals (one small and one large).
2. Press down and rearward on the top mounting tab, then pull the lower mounting legs out of the mounting slots.
3. Reverse the removal procedure to reinstall.
4. After all motor changes have been made use the Tray Setup option in Service Mode to configure the motors.
5. The vendor will not vend from a given helix when the motor is missing, jammed or has home switch problems.
6. After a motor has been configured check to make sure all the helices are in the home position. If the end of a helix is not at its lowest position in the column pull it out of the motor, turn it until it is, and reinsert the helix into its motor.

5.10 BOTTLE TIPPER BAR

The bottle tipper bar is typically used with tall bottles or packages. The tipper bar restrains the top of the item 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.

5.11 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 5.1). 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.

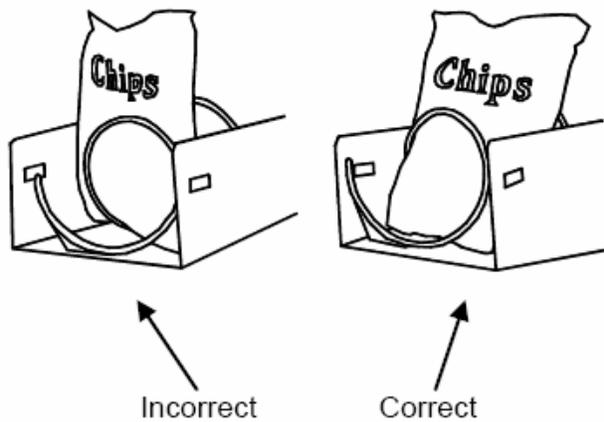


Figure 5.1 Large Bag Vending

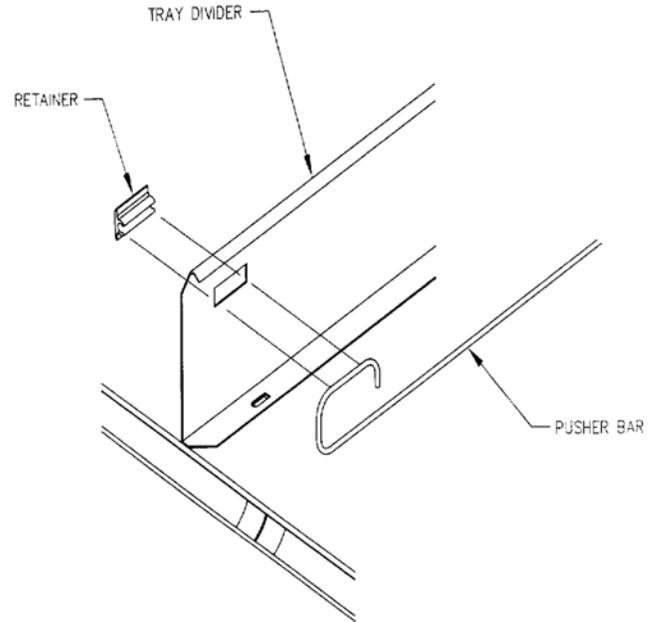


Figure 5.2 Pusher Bar Installation

5.12 TALL PRODUCT VENDING

Place tall, narrow products in a column with a candy pusher bar. Typically these are installed in columns 7 and 8 on the trays. Rotate the bar upward or downward to the desired position. It should hold the product upright, but not pinch or bind the product.

The candy pusher bar is an adjustable bar that mounts to any tray divider to keep tall items from falling sideways (Refer to Figure 5.2).

1. Snap the pusher bar into the retainer.
2. Rotate the pusher bar to accommodate the product.

6.0 SERVICE PROGRAMMING

6.1 SERVICE MODE

Access the service mode by pressing the yellow mode button on the control board (Refer to Figure 3.1). If there are no errors, ACCOUNTING DATA 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 an instruction card inside the cabinet, and inside the back cover of this manual that presents the basic information in this section in a flow-chart format.

6.2 ERROR CODES

Any errors that have been recorded will be displayed when the mode switch is pressed. Section 7.3 provides descriptions of errors and tips for troubleshooting them.

ALWAYS CORRECT THE ERROR BEFORE CLEARING THE MESSAGE!

NEXT ERROR – View the next top level error code.

1. SUBLVL ERRORS – Displays any sublevel error codes.

2. DETAILS – Displays date and time of the *last* sublevel error.

0. CLEAR ERROR – Erases the error code from memory.

6.3 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, RESET. CASH, RESET CARD, and CASHBOX COINS.
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.
8. **RESET. CARD** – Displays the total cashless sales since the last reset.
9. **CASHBOX COINS** – Displays number and value of coins in coinbox since last reset.

6.4 FILL/DISPENSE

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

1. **SELECT TUBE 1-6** - To dispense coins, press 1 through 6 (for a 6-tube changer) to dispense from tubes 1-6. Tubes are numbered starting with the lowest denomination. Each key press displays the value of the coin being dispensed and the total number of coins remaining in that tube.
2. **OR INSERT COINS** - 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 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.

6.5 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. Delayed sales do not add to or subtract from the time limits imposed by the Health and Safety rules (Refer to Section 1.2). To automatically prevent sales during specific days and

times, use SALES BLOCKING (Refer to Section 6.11).

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.

6.6 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 4°F below the setpoint. If the vendor has Health and Safety software, and is vending perishable food, the temperature must be set to 41°F or below. A set point of 40°F is recommended.
3. **START LOG** – Begin recording the cabinet temperature every minute for the first 30 minutes of cooling after the door is closed.
4. **VIEW LOG** – View the temperatures recorded in the above 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 6.15).

5. **NAMA HEALTH TEST** – Move temperature sensor bulb to the outside of machine and close the door. After 15 minutes the vendor will lock-out protected selections to prevent vending potentially hazardous product.

6. **EDIT SELECTION** – The user can choose to disable some or all selections from Health & Safety restrictions.

CAUTION: If any selections are exempted, *it is the operator’s responsibility* to mark those unprotected selections with the included yellow labels (or other means), and to instruct route persons on loading restrictions.

FAILURE TO DO SO COULD RESULT IN AN UNACCEPTABLE HEALTH RISK TO THE CUSTOMER.

Note that all vendors shipped from the factory will be configured for Health & Safety protection of all selections.

7. **DEFROST TIME** – The interval between the defrost cycles is adjustable between 3 hours and 12 hours. More frequent defrosting may be required in more humid environments.
8. **MANUAL DEFROST** – Select this option to manually start a defrost cycle. Up to 2 defrost cycles may be manually started, one after the other, in a 30 minute period.

6.7 PRICE SETTINGS

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

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.

VALUEVEND

ValueVend starts with the prices that were set using SET PRICES. Using ValueVend, two selections are grouped together and offered at a reduced price. This is possible with any possible pair of selections in the vendor, including pairing a selection with itself.

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.

In addition, a “Global” feature allows all selections (if priced the same) to get the second selection at a reduced price.

The vending machine operator should advertise the special combinations and prices.

1. **RESPOND TIME** is used to set the number of seconds (20 to 99) the customer has to make the second selection 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 and return to the ValueVend menu.
2. **CHANGE** is used to select the group to change (Group 1 through Group 10, or global). Pressing the “*” button once each time will step the display to the next group. Only one group at a time can be set.
 - 0 CLEAR** – Clears all of the settings in the *current group*. Use this key before changing ValueVend settings. Using CLEAR will not change the selection price as set using SET PRICES.
 - 1 EDIT** – Enter the first selection, enter the second selection, then enter the discounted price *for this grouping*. The discount will appear to the customer as a discount on the second selection. Selections can be any combination of tray and column.
 - Press “*” to save and return to the CHANGE display.
 - Press “#” to return to the CHANGE display without saving.
 - * **NEXT** – Press to return to the CHANGE display.
 - # **EXIT** – Returns to the ValueVend menu.

6.8 TRAY SETUP

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.

Link Motors

The user can link selections to ensure even vending of dated products, or other “space-to-sales” functions. Linked selections are vended sequentially for better product rotation. Up to 40 groups can have motors linked together *regardless of location or tray*. The linked selection with the lowest number is the master selection. All other linked selections are vended using the selection number and price of the master selection. 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. If motors are linked-but not present (or jammed), the next available motor will run.

From Tray Setup, select **2-Link Motors**.

Enter Selection: then select from the following.

9- EDIT – Use 1 & 2 to select desired link group. * saves *this* selection to *this* link group.

0- CLEAR – This will unlink the current selection. The price will revert to its original value. All other linked selections in that group will remain unchanged.

* **NEXT** – Press to increment by one selection. Any selection number may be entered directly for faster access.

EXIT – Returns to the Tray Setup menu.

Repeat for each linked selection.

Motor Type

Motor Type allows the user to change the motor-stop and credit deduction behavior. See the table below for more details on the various settings available under this function.

Enter tray – enter tray number to change motor type.

Press **1** to change motor type.

Press **#** to save and exit.

Press **2** to save entire vendor to this motor type.

All motors on a tray must be of the same design (S11 or S3), but different motor types (per tray) can be used in the same vendor.

You must press **6** (configure) after making any changes to motor type, or quantity, of vend motors.

MOTOR TYPES			
ITEM	DISPLAYED OPTION	MOTOR STOP	CREDIT DEDUCTION
1	SENSIT	Sensor*	Sensor
2	HOME/SENSOR/3	Home	Sensor
3	HOME/SENSOR +/3 (FACTORY DEFAULT)	Home + Extra**	Sensor
4	HOME_ONLY/3	Home	Home
(SII WITH HOMING) MOTOR TYPES			
5***	HOME/SENSOR/2	Sensor	Sensor
6***	HOME/SENSOR +/2	Home + Extra**	Sensor
7***	HOME_ONLY/2	Home	Home
<p>* If S3 motors are used: the switch function is ignored, and homing & coupling are not available.</p> <p>** "Extra" means that if a drop is not detected by the home position, the motor will move 2 additional increments to try to vend the product.</p> <p>*** These are settings for use only with vendors equipped with Sensit II with Homing.</p>			

HomeSensor/ will make one full turn and stop at home position. If a drop was detected, credit will be accepted. If no drop detected, "Please Make Another Selection" will scroll allowing the customer to try that or another selection- or press coin return.

HomeSensor +/ is similar to HomeSensor/, except that if no drop is detected the motor will make 2 short jogs in an effort to dislodge the product. If the motor stops off the home position, the next vend will begin the process again: stop at home- if a drop is detected deduct credit. If not, try up to two jogs. This is similar to the original Sensit sequence, and is the factory default setting for all vendors.

Home_Only/ disregards the Sensit system, and will make one complete turn and take credit- whether a drop is detected or not.

Auto Sensor Recovery is an improvement to the AMS Sensit system, that allows certain vends even when the sensor system is blocked or malfunctioning. If Motor Type is set to Home/Sensor/3 or Home

Sensor+/3, and the sensor system is inoperable, the control will automatically switch to Home_Only/3 and allow a vend. Simply put, the sensors will be ignored, the helix will make a full turn and the credit value will be deducted. Once the error is cleared, the vendor will return to its original sensor setting. **Note** that this will only work with the 23007 and 23007-01 motors, and during this temporary mode, selecting an item with the older style motor will read "selection unavailable".

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. Note: this feature will only work with the **1-Sensit** motor setting.

- 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.

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.

Letter / Number

Allows use of either keyboard format. The control board/software default is for NUMERIC, using the 12-key keypad. Note that if the control board is changed this setting may need to be set to "Number". This setting should be changed to "Letter" if the vendor is equipped with 20 pushbutton keypads (with alphabetic characters). Depending on the setting, the top tray is designated "1" or "A", and downward with numbers (2-8) or letters (B-H).

Configure Motors

Configure Motors moves each switched motor to the home position (moving the motor only if it is not at home) in addition to detecting connected motors.

This selection MUST BE RUN after changes in the arrangement or number of motors have been made.

The vendor will not vend from a given helix when the motor is missing, jammed or has home switch problems. This requires that Configure Motors *must be run* after adding motors or otherwise changing the motor configuration.

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. (In non-switched Sensit II firmware, the control allowed new motors to be auto-configured.)

Couple Motors

With Sensit 3, configurations to vend extra wide product can be made by using the coupled-motors feature (Refer to Section 1.5). The coupled motor feature works by coupling together a set of two motors. One motor turns counter-clockwise, and the other motor must turn clockwise. Both motors turn for the same length of time. Trays may have multiple coupled motors.

From the Tray Setup menu, press "7", then enter the first selection to couple (for example 24).

Press "9" to edit, then enter the column number of the second column to couple. For this example, press 7 to couple selections 24 and 27. The second column could also be 5 or 6 for this set. In this example, the display will read COUPLE 24,27.

Press the "*" to save these selections and move to the next selection.

Note that a coupled motor set will vend using the lowest numbered column selected. In the example

given above, use 24 to select a product. A column selection of 25 will display the message "PLEASE MAKE ANOTHER SELECTION".

If the "*" button is pressed the display will move to the next selection. Entering the desired number will also take you to another selection.

Press "0" to clear coupled motor sets from the control board. The display will read "XX: COUPLE OFF".

To return to Tray Setup, press the "#" key at any time.

The tray numbers on the front of the tray should be changed to suit.

The Coupled Motor feature will not work with Sensit II motors.

6.9 MDB (MULTI-DROP BUS)

Settings

The user can select the following settings.

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. Note that using 6.8.1.3 CHANGE BILL will override force vend.

No Cheat

The factory default is "Y" for yes. If set to "Y", the control will not allow a vend to occur 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.

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.

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.

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.

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.

Instant Revaluation

Adds value to card immediately when cash is inserted.

BILL AND CASH-LESS APPLICATIONS

Sensit 3 software allows running the vendor with no coin mech.

The changes to allow bill-only and bill and cashless applications affect fundamental MDB behavior of the VMC. It was decided to make these changes without introducing new layers of option settings. The typical customer using a coin-based system should not notice any changes except under unusual conditions. This section will explain those changes and unusual conditions.

To simplify the discussion, the term "healthy" will be used to describe a peripheral (coin mech, bill validator, or a cashless device) which is present, which is communicating normally to the VMC, and which has no fatal out-of-service conditions.

MDB OUT-OF-SERVICE

Previously, the VMC would go out-of-service if what it determined a "critical" peripheral became unhealthy. In a coin-based system, the coin mech was the critical peripheral. In a cashless-only system, the card reader was the critical peripheral. Bill-only applications were not supported, so an unhealthy validator was never sufficient to take the machine out-of-service.

In this firmware, the machine will only go out-of-service if at first at least one peripheral becomes healthy, then all peripherals become unhealthy.

REMAINING IN SERVICE W/O COIN MECH

If a bill validator is present, and the coin mech becomes unhealthy, the VMC will now continue running with the validator (and cashless if present). Over the past several years, the criteria for an "unhealthy" finding have become more stringent, as various reported error conditions such as coin jams were removed from out-of-service consideration. Right now, in practical terms, the coin mech either has to burn out completely or become disconnected to be considered unhealthy by the VMC's criteria. A healthy coin mech going unhealthy should be a rather rare occurrence.

To help notify patrons and service personnel that the coin mech has become unhealthy, the EXACT CHANGE message will be activated. This should discourage patrons from inserting paper money, unless the prices happen to be in paper money increments. Also, patrons trying to feed coins into the mech will notice immediately that the coins disappear (in the case of a serious coin jam) or fall through.

"#" KEY FOR ESCROW RETURN

In bill-only applications, there is no classic coin return button to request return of the last-inserted bill. As a result, when the coin mech is considered unhealthy, the "#" key will be treated as equivalent to a coin mech escrow return.

BILL-ONLY APPLICATION NOTES:

In a bill-only system, prices must be restricted to the scaling factor of the bill validator. Usually, this scaling factor will start from the smallest paper currency unit instead of the smallest coin unit. This will limit setting selection prices that would require change-making.

Due to the absence of a coin mech, the normal No Cheat logic is disabled, regardless of the VMC option setting. The VMC's fairness is limited to not taking in more money than the maximum price in the machine. As mentioned earlier, the '#' key is equivalent to escrow return, possibly allowing the patron to retrieve the last-inserted bill.

The EXACT CHANGE message should never occur in a pure bill-only system.

BILL PLUS CASHLESS APPLICATION NOTES

Prices will be restricted to the scaling factor of the cashless device, which is usually the smallest coin unit.

Revaluation occurs in the same way it does with a coin mech, except in cases where the payment medium is at or near its maximum balance. With a coin mech, the VMC will allow credit to exceed the maximum balance as long as any excess can be paid back in coins. Without a coin mech, the VMC rejects any bills that would exceed the maximum balance (in a card-first revaluation) or rejects the payment medium entirely (in a cash-first revaluation).

Hide Card Value Use this feature to display or not display the value on the card. When enabled, this will prevent the credit amount from being displayed during a card swipe. This can avoid confusion for the customer when the maximum priced value is displayed before making a selection for a lesser cost product.

Press "8" to change the YES to a NO and again to change it back. Press "#" to save any change and exit this feature.

Card Refund should be enabled only for certain card readers that have difficulty processing refunds. Any credit displayed after a failed vend will be held for 15 minutes. Additional credit may be added to this *un-refundable* credit for other purchases.

Press "9" to change the YES to a NO and again to change it back. Press "#" to save any change and exit this feature.

currently available in the Frozen Food vendor, and should always be set to N.

6.10 OPTIONS

Message

The user can customize the scrolling message that is displayed when the vendor is idle. Write out the desired message first. The message to be displayed on the scrolling display can be up to 50 characters, including letters, numbers, punctuation and spaces. New messages erase old ones.

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

To enter a message, the user should rapidly tap a particular key to cycle through a list of characters for that key. Stop at the desired character. When the keypad is left idle, the last-displayed character is moved over to the end of the message. Continue to select the next character. The key definitions are similar to those of cell phones:

- | | |
|---|---------------------|
| KEY 0: (space)0 | KEY 5: JKL5 |
| KEY 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.

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.

Language

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.

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.

Product Sensor

If set to "Y", the vendor will use the product sensor (located in the bottom of hopper) to determine if there is product in the delivery bin. This is not

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. A utility cable (AMS 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 1/4" jack from the 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.

6.11 SALES BLOCKING

Four separate time periods in each day of the week can be set, during which selections can be blocked (prevented from vending). All or any combination of selections in the vendor can be blocked from vending, or are exempt from blocking (free to vend).

SET PERIODS 1-4

1. Enter the number (1-4) of the time period to set-up. For example, choose #1.
2. Enter the time when sales blocking period #1 is to start, then press SAVE as indicated.
3. Select a.m. or p.m. for starting.
4. Enter the time when sales blocking period #1 is to end, then press SAVE as indicated.
5. Select a.m. or p.m. for ending.

NOTE: A time period can be started, for example, at 9:00 p.m., and may be set to end at 6:00 a.m. (which would be the following day).

6. Starting with Sunday, press #1 blocking will be ON or OFF. Select 2 to continue with the next day of the week.
7. NOTE: Sales blocking as set in the vendor may be turned ON or OFF by turning one or more days of the week ON or OFF.

ALL SELECTIONS?

1. To block all selections in the vendor in time period #1 select YES for „ALL SELECTIONS?“
2. To choose different selections to block in time period #1 select NO. Choose the combination of selections to block as desired. Any combination of tray and column may be blocked (for example, trays 3, 4 and 5, and selections 61, 62 and 66).
3. In this Selection Entry display, enter the number of the first selection. For example, choose 25.
4. The display will show 25, and if it is blocked or exempt.
5. Press the number “9” on the keypad anytime to switch 25 from being blocked to being exempt, or back again.
6. Press “#” on the keypad to exit without saving, and return to the previous display.
7. Press “*” on the keypad to show the next display for selection 25.
8. Press “*” again to save selection 25 as blocked or exempt, as was displayed.
9. Press “1” to save ALL of #2 tray as blocked or exempt.
10. Press “2” to save ALL selections in the vendor as blocked or exempt.
11. Press “#” to exit and return to the previous display. After a short time without any keystrokes the control will save entries as-is and return to the Selection Entry display.
12. After saving, these selections will be blocked as set for time period #1.
13. Return to 1-4 SET PERIODS and chose time period #2. Follow the same steps as given above for time period #1. The time of day, the days of the week, and the selections can be different from time period 1. All four time periods may be different from others.
14. The settings in sales blocking may be changed at any time by selecting the time period and changing the time of day, day of the week, and selections.

6.12 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 “Y”, and the time is automatically adjusted for Daylight Savings Time to the US scheme. Other locations available are Europe, Australia, and Mexico. Selecting “N” will disable this feature completely.
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.

6.13 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.

Note that Free Vend will not time-out on its own.

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.

6.14 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.

6.15 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, and once the maximum number of entries is reached, the oldest entry will drop from the list.

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 log records power failure information. The display shows

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 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.

6.16 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 slightly, 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.

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.

CLEAR HISTORY

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

SET TEMP CHG

The factory default is 10° F. TEMP CHG (temperature change) allows the user to set the temperature change as an increase from the original temperature set point (Refer to Section 6.6). 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

$\frac{+10^\circ \text{ EnergySENSIT change}}{55^\circ \text{ vendor temperature}}$

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.

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.

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.

LIGHTING

This is an optional feature in energy efficient vendors. Note that Lighting may be used regardless of the status of the other EnergySensit features, or of Health and Safety. The factory default is "N" for No. Press the "7" key to change between No and Yes.

Lighting uses the historical activity data to turn the vendor lights off and on for the fluorescent lamps. 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 off.

Lighting does not affect the vendor 2-line display.

Note: To add this feature to a Frozen Food vendor, an additional relay and wire harness are required. Please call the factory Service Department for more information.

BRIGHTNESS

The optional fluorescent lamp is not dimmable. It is either on or off. To use the LED dimming feature the vendor must be equipped with S3 control board, have a 20158L or later MDB harness, and have single or dual LED lamps

installed.

7.0 TROUBLESHOOTING

7.1 OUT OF SERVICE MESSAGE

Certain critical errors will disable the vendor. When this happens, an "OUT OF SERVICE" message will be displayed. If the error is related to the Health and Safety function of a perishable food vendor, the "OUT OF SERVICE" message will be followed by an error code beginning with "HS." Refer to the section on Health and Safety errors below. **Please note that if a Health and Safety error occurs, any food which may have spoiled should be discarded.**

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 first*, then press "0" to clear the error code. Certain errors will have more detail available: press **1** to see more detailed (sublevel) error codes, or **2** for date/time of last occurrence.

7.2 HEALTH AND SAFETY ERRORS

NAMA specifications for frozen food require that the temperature in the vendor must cool to 0°F for frozen food, or 25°F for slacked food within 75 minutes of closing the door (note that Delayed Sales has no effect on this cool-down period). This is to allow a recovery period following loading. **ALL PRODUCTS MUST BE FROZEN PRIOR TO LOADING.**

After this requirement has been met, the temperature in the vendor must never get above 0°F (or for slacked foods 25°F) for more than 15 minutes. See the following chart for other temperature ranges available with this vendor.

In the event the internal temperature exceeds the NAMA specifications following the recovery period or during normal operation, an error will be generated and the vendor will not allow further sales of protected items. This protects the consumer from purchasing spoiled product. H&S error codes are detailed in Section 7.3.

FFV (FROZEN FOOD VENDOR)		
CAPABILITY	TEMPURATURE	PROTECTION
SNACK	75°F TO 41°F (24°C TO 5°C)	NONE
REFRIGERATED FOOD	41°F OR COLDER (5°C)	H&S
SLACKED FOOD	25°F OR COLDER (-4°C)	H&S
FROZEN FOOD	0°F OR COLDER (-18°C)	H&S

The H&S function can be tested by disconnecting the sensor. (Refer to Section 8.9).

7.3 MACHINE ERROR CODES: CAUSES AND SOLUTIONS

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.
- 2. DETAILS** – displays the time and date of last error occurrence.
- 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).

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 (Refer to 7.3.3). 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.

7.3 ERROR CODES - CAUSES AND SOLUTIONS

ERROR CODES – CAUSES AND SOLUTIONS			
TOP LEVEL ERROR CODE	SUB LEVEL CODE	CAUSES	SOLUTIONS
OUT OF SERVICE HS1	NONE	The internal temperature rose above NAMA setpoint for 15 minutes.	The power was disconnected, the door was not closed completely, or the refrigeration system needs service/cleaning. Check/clean screens. Check operation of door switch. Check DATA LOGS in service mode for more information.
OUT OF SERVICE HS2	NONE	The internal temperature did not cool to NAMA setpoint within allotted time after closing the door.	The door was open too long, warm product was loaded, the door was not closed completely, power was out, or the refrigeration system needs service/cleaning. Check/clean screens. Check DATA LOGS in service mode for more information
OUT OF SERVICE HS3	NONE	The door switch was open more than 30 minutes.	The door was not closed properly. If proper operation is not restored by closing the door, replace the door switch. Check for ‘-’ when pressing * key.
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.
SENSIT BLOCKED	NONE	The vend sensor is blocked or lens is dirty.	Remove any obstructions from the path of the sensor.
SENSIT DISCONNECTED	NONE	The vend sensor is disconnected.	Check all sensor harness connections.
HOME ERROR	NONE	Motor switch problem.	Check for correct motor type. Check for proper connections. Check for correct motor set-up (See section 6.8)
MOTOR JAMMED	Displays selection #	Excessive current draw, or helix frozen to tray.	Caution! See section 7.4 below
CLEAN SCREEN	NONE	Reminder generated by control board.	Not an error, but an aid for the service person. See section 8.3.

7.4 CLEARING JAMMED MOTOR

If one or more motors and helices 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)!

Clear any jammed products from the indicated vend columns.

To reset the error, first enter service mode, then select Tray Setup (Refer to Section 6.8). 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.

7.5 WATER/ICE FORMATION IN THE CABINET

Water formation in the cabinet indicates an air leak which allows moist air to continually enter the cabinet and condense on the evaporator.

1. Make sure the refrigeration unit is sealed properly all the way around. In particular, check the seals around the sliding door.
2. Make sure the door is properly tightened so that it makes contact with the gasket on all sides.

3. Make sure there are no foreign objects interfering with the sliding door, and the sliding door closes properly.

7.6 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 REPLACEMENT 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.
	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.	Ensure primary side of transformer is receiving power. If there is not at least 29 VAC on secondary side replace transformer.
Vendor displays "Please Make Another Selection".	Selection not configured in the motor matrix.	Reconfigure the motors. Check for motor coupling.
	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 changer
	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 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

Symptom	Possible Cause	Remedy
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.
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. Motor jammed. Sensors blocked.	Connect harness to the control board connector. Check harnesses.
Tray selection continues to turn after a successful vend.	Wrong motor or motor type: All motors will not stop at Home position.	See page 6.3 & 6.4
Health and Safety shut down.	Door switch is not working.	Adjust switch for positive contact with door.
		Close door tightly.
		Replace defective door switch.
		Replace defective door switch harness.
	Bottom Air Vent Screen Blocked.	Clean obstruction or dirt from bottom screen and clean/replace furnace filter.
	Evaporator frozen.	Check for air leaks.
		Verify evaporator fan and relay are functioning.
		Check defrost components, including relays.
Refrigeration problem.	See below.	
Door switch is not working.	Adjust switch for positive contact with cabinet.	
Refrigeration unit not running.	Waiting for defrost cycle	The compressor may not run during the 1 st 4 minutes of Manual Defrost
	Refrigeration harnesses disconnected, or faulty relay.	Check 3 relays located in chiller unit
	Temperature setting too high	Reset temperature setting
	Overheated compressor	Allow 15 minutes for thermal cutout to reset. Check/clean filter.
	Over-pressure timer.	Allow 1 minute for pressure, and 15 seconds after door closed.
	Door not closed	Display should show (-) when pressing (*) key when door closed
Sliding door not moving.	Cabinet door not closed, motor jammed, check interface board in right rail mount.	Door should retract when cabinet door opens

8.0 MAINTENANCE

8.1 UPGRADING FIRMWARE

Occasionally it may be necessary to take advantage of new software features. The software can be upgraded by using a micro SD card, available at most electronics retailers.

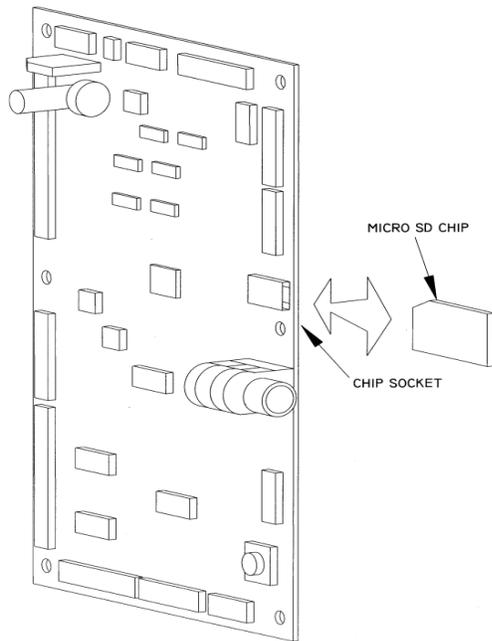


Figure 8.1 Loading Control Software

1. Locate the socket for the micro SD program card (Refer to Figure 8.1).
2. Load the program chip into the socket (it will only fit one way). Push in until it latches in place.
3. Press the yellow Mode button. Three software options will be shown on the display.
4. Press **3**, then the “*” key to scroll through the options.
5. When the desired software is shown on the display press the “#” key.
6. The selected software will be loaded and verified (this will take about 30 seconds).
7. After the software has been loaded the vendor will re-boot, and display will show the software number, version and name.
8. Remove the chip by pushing it into the socket a small amount. It will unlatch and slide out when pressure is released.
9. Check options and set prices as needed. Note that prices and settings (but not DEX

data) are saved and restored during this process.

10. Store the micro SD card in a safe place.

The small program that starts the sequence of loading the program into RAM, is known as a *boot loader*. This can be upgraded in the same manner as firmware, but prices will NOT be saved.

8.2 CLEANING THE CHILLER AIR FILTER

Frozen Food vendors are shipped with a re-useable air filter for the chiller. It is located in front of the condenser coil, and plainly visible when the door is opened. AMS recommends cleaning or replacing the air filter at least twice a year under normal conditions, more often in dusty environments. Any standard furnace filter, 12” x 12” x 1” thick may be used, and are generally available at discount stores and home improvement centers.

To access the filter, remove two screws (used to secure cover for shipping), and gently lift the filter cover up- and out. Do not allow the vendor to run without a filter!

CAUTION: Always wear eye protection and gloves when cleaning vendor! Condenser fins are sharp!

8.3 CLEANING THE BOTTOM SCREEN

Obstructions and lint blocking the air flow up into the chiller condenser can damage the chiller. Clean monthly to allow air to flow through the chiller condenser.

Two screens are used in the Frozen Food vendor to allow air into the chiller. They are located at the bottom of the main door (under the hopper). To clean the screens follow the instructions given below:

Cleaning Fixed Screen (bottom of door)

1. Open the door to the vendor to stop the chiller.
2. A vacuum attachment with a brush is preferred: however, a bristle brush may also be used.
3. Do not use water or other liquid chemicals or solvents.
4. From the underside of the vendor gently sweep lint away from the screen with the brush. Do not push the lint into the screen.
5. Clean the floor under the vendor with the brush, removing any obstructions such as cardboard and wrappers.
6. Close the vendor door.

A “Clean Screen” reminder has been added to help keep the chiller working at maximum efficiency. Approximately every 280 hours of chiller operation, a beep/display reminder will occur when the vendor door is opened. This represents approximately 1 month of use in an average indoor placement. Clear the reminder by entering Service Mode.

8.4 CLEANING THE VENDOR EXTERIOR

Clean the vendor exterior as necessary using mild household cleaners and water. Dampen a cloth or sponge with the cleaning solution and gently wipe clean the exterior.

1. Do not use chemicals or solvents. These can damage paint, plastic trim and decals.
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.
5. Clean the glass inside and out with a good window cleaner.

8.5 CLEANING THE VENDOR INTERIOR & GLASS

Clean the interior using mild household cleaners and water. Dampen a cloth or sponge with the cleaning solution and gently wipe the interior surfaces clean.

The door liner is made from ABS plastic. This liner will crack or stain if chemical solvents or harsh detergents are used.

1. Unplug the vendor from the power socket.
2. Open the vendor door.
3. Do not use chemicals or solvents. These can damage paint, extruded plastic parts and other plastic parts.
4. Do not use abrasive cleaners.
5. Do not use a water jet.
6. Do not let water or cleaning solutions contact electrical or electronic components.
7. Allow to air dry, or place a window fan on the floor in front of the open interior.
8. When dry, plug in the vendor.

The inside window is a triple-pane sealed glass window. The outer window is a single tempered glass pane. The inside window is hinged to allow easy cleaning.

1. Open the vendor door.
2. Operate the latch, mounted inside the vendor door, which secures the inside window. When released the inside

window can be swung open on it's hinges.

3. Clean both sides of both windows with any good glass cleaner.
4. Use a soft cloth, a squeegee and/or chamois. Do not use any solvents, chemical or abrasive cleaners on the glass.
5. Close and latch the inside window, then close the vendor door.

8.6 LUBRICATION WITH LITHIUM GREASE

Once a year the T-handle screw threads, and door moving parts should be lubricated with grease. Apply grease (or similar lubricant) to the door lock bolt threads and the door hinges as necessary. Wipe off excess grease. No other lubrication is required.

8.7 LAMP REPLACEMENT

Replacing Fluorescent Bulbs

1. Unplug the vendor from the wall.
2. Open the door.
3. Unlatch the insulated window by pivoting the two latches up and over ½ turn.
4. Turn bulb one-quarter turn and, at both ends at the same time, slide out through the slots in bulb sockets.
5. Dispose of bulb properly.
6. 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.
7. Close and latch the insulated window.
8. Plug in the vendor to test the lamp.
9. 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. Leave the vendor plugged in.
2. Open the door.
3. If the vendor has entered an H&S vending hold, the products should be disposed of.
4. In Service Mode, select TEMPERATURE, then select MANUAL DEFROST – Select this option to manually start a defrost cycle. A defrost cycle will last about 14 minutes. Up to 2 defrost cycles may be manually started, one after the other, in a 30 minute period.
5. While the defrost cycle is on, check that the bulkhead around the bottom of the refrigerated section of the cabinet is securely mounted to the cabinet and is sealed on all sides.

6. Check that the gasket on all sides of the sliding door on top of the bulkhead is intact, and that the front gasket seals against the vendor door.
7. Check the door gasket around the cabinet opening. It should be intact.
8. The gaskets must seat against the flat part of the door without obstructions.
9. Check to see if the door closes squarely on all four sides and the lock draws the door firmly against the gasket.
10. Any physical problems must be corrected. If the environment is humid or has become more humid (as in a seasonal change), then shorten the defrost time.
11. In Service Mode, select TEMPERATURE, then select DEFROST TIME. The interval between the defrost cycles is adjustable between 3 hours and 12 hours. More frequent defrosting may be required in more humid environments.
12. Close the door.
13. Allow to cool down before reloading frozen products.

8.9 TESTING THE TEMPERATURE SYSTEM (Health and Safety)

1. Enter the service mode (refer to Section 6.0).
2. Press # until the Temperature section appears, then press 5 to initiate the test. This procedure overrides the NAMA pull-down requirement, in order to verify the vend lockout function when the internal temperature rises above the NAMA setpoint for more than 15 minutes.
3. At this point temporarily disconnected the sensor, causing the controller to assume a temperature of 125°F/52C. A black, 2-wire connector is located midway in the loop of wires connecting the door and cabinet for this purpose.
4. Close the door and wait 15 minutes. At this point the vendor will not vend protected products until the door is opened and the error is cleared (Refer to Section 6.2).
5. Be sure to reconnect the temperature sensor harness when finished.
6. Close vendor door. The vendor will return to normal operation (including a cool-down time if needed).

8.10 SENSIT 3 UTILITY

A basic software Utility is available for Sensit3 control boards. Currently it allows an operator to save/load vendor configurations, and upgrade firmware. Please contact your distributor or AMS for more information.

8.11 REPLACING THE POWER CORD and GFCI TEST

TOOLS REQUIRED:

Use this procedure to replace a power cord that is cut, split open or is otherwise damaged or is a hazard. A ¼" nut driver, gloves and protective eyewear are required. Refer to Figure 8.2.

REMOVAL

1. Move the vendor away from the wall and unplug the power cord from the wall outlet.
2. Remove and save the 6 screws attaching the cover. Save the cover.
3. Unplug the power cord from the vendor as the protective cover is removed.
4. Operate the small lever on the wire tie to open the wire tie loop and free the power cord.
5. Remove and dispose of the damaged power cord.

INSTALLATION

1. Plug the new power cord into the vendors IEC receptacle but do not plug the power cord into a power outlet at this time.
2. Place the cover over the IEC receptacle, with the open side to the left as shown. The cover will help prevent the power cord from being removed.

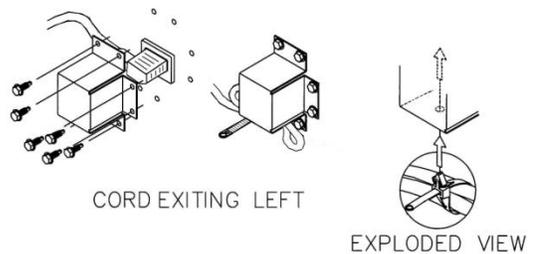


Figure 8.2 Power Cord and Protective Cover

3. Align the holes in the cover with the holes on the back of the machine. Reinstall 6 screws through the holes in the cover. Do not over-tighten the screws.
4. Loop the cord under the cover and back to the left. Install the wire tie around the fold and tighten it.
5. Install the wire tie and attached power cord by inserting the locking tab into the hole in the cover.
6. Plug the power cord into the power outlet. The power should come on in the vendor.
7. If the power is on in the vendor, test the GFCI as follows: press the TEST pushbutton on the GFCI to trip the GFCI and shut it off. The vendor power should turn off. Then press the RESET pushbutton to return the

GFCI to normal operation. The vendor should turn on.

8. If the power is not on in the vendor check the GFCI as follows: press the TEST pushbutton on the GFCI for 1 second to trip the GFCI and shut it off. Then press the RESET pushbutton for 1 second to return the GFCI to normal operation. The vendor should turn on.
9. If there is no power, check the power outlet at the wall. If there is power at the outlet check for power at the plug end of the power cord.
10. If everything is operational return the vendor to its position next to the wall.

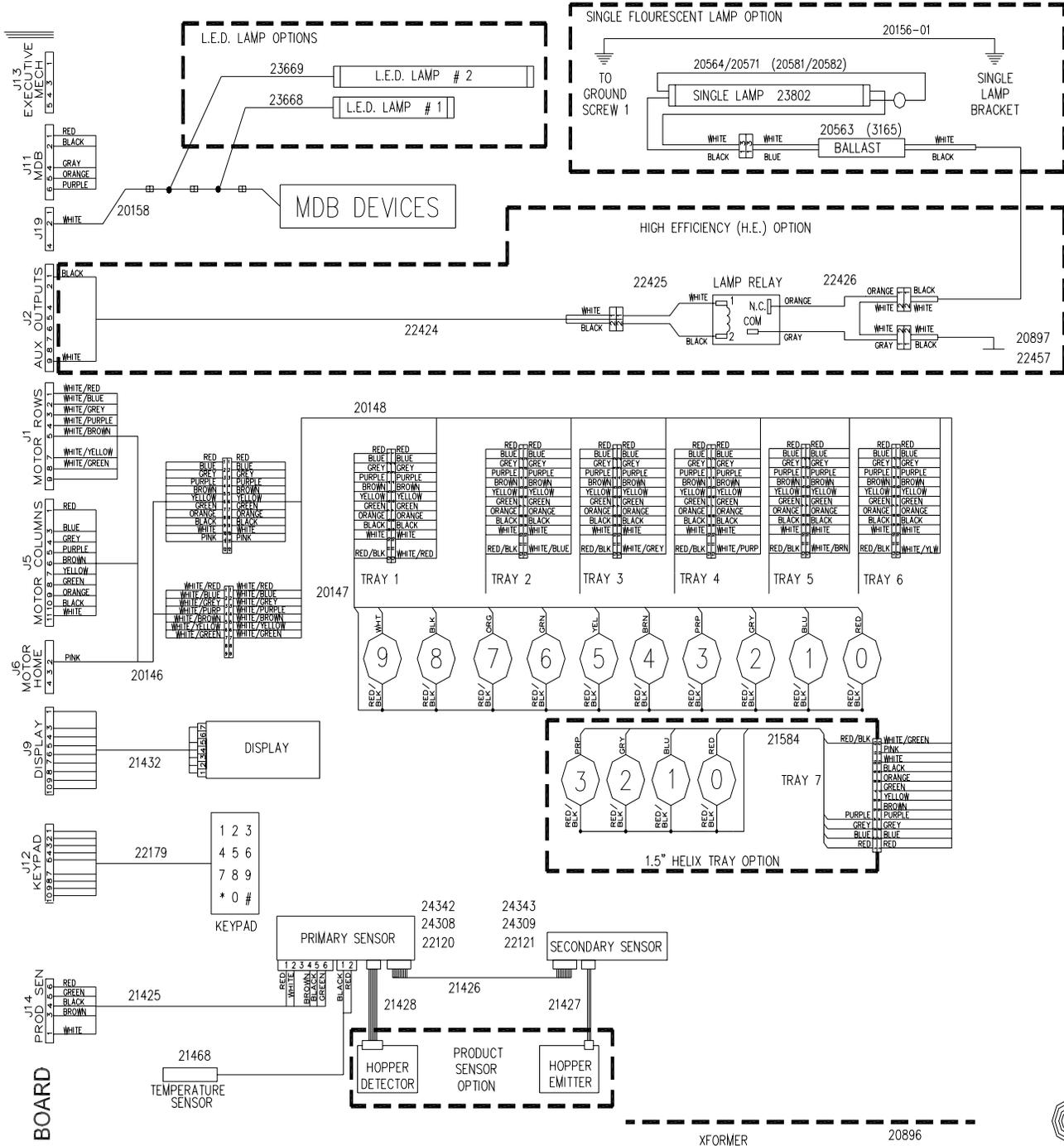
8-12. STORING THE VENDOR

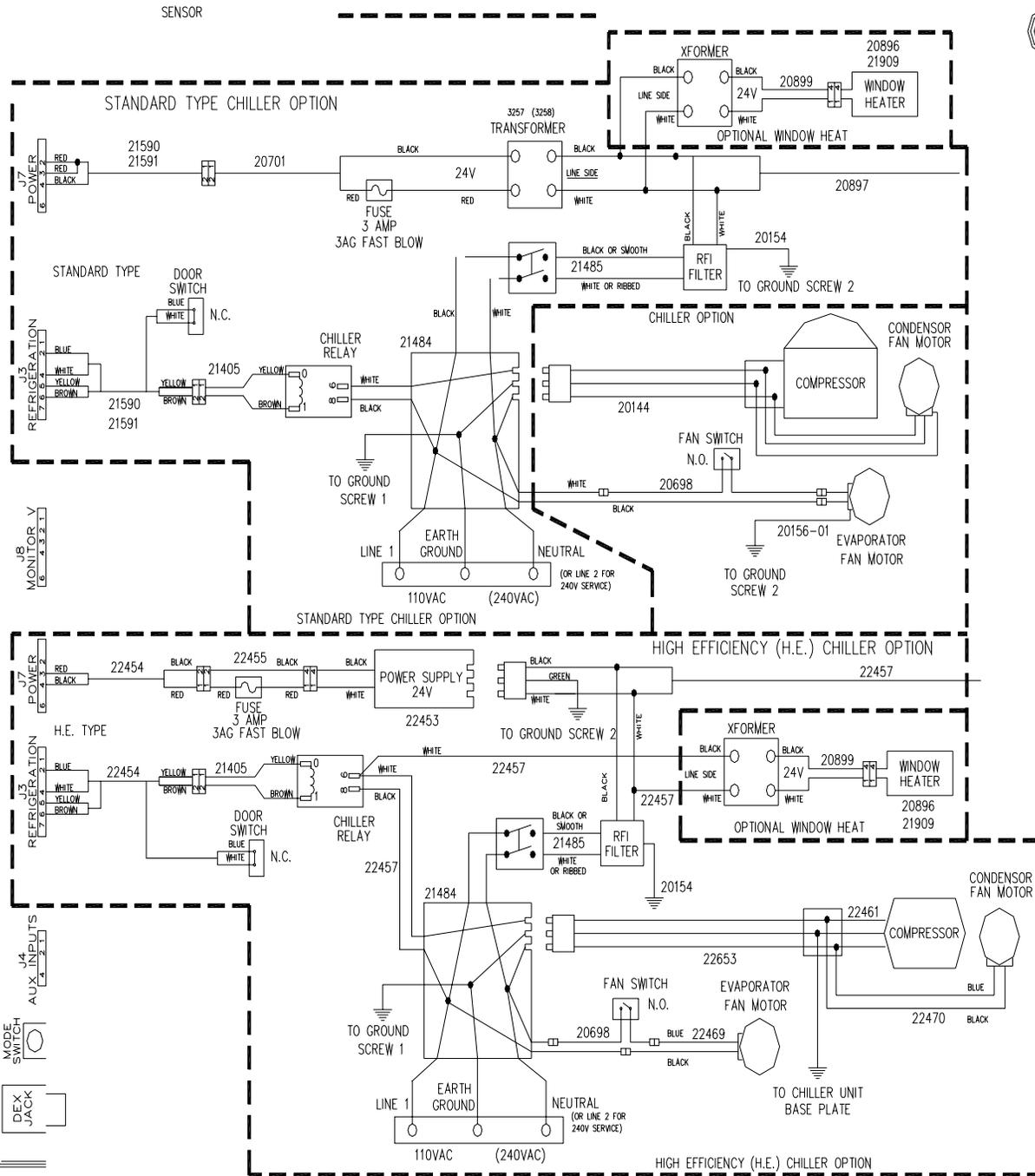
If the vendor is to be stored without power for several days or longer, use the following instructions. These instructions are similar to those used to store any refrigerator.

1. Unplug the vendor from the power outlet.
2. Remove any products from the vendor.
3. Clean the inside of the vendor using the general directions given in Section 8-5.
4. Leave the vendor door open for a day to allow the interior to thoroughly dry.
5. Close the vendor door and lock it to protect the interior.
6. Roll up the power cord and place it in the hopper. If the vendor is being moved follow the handling and setup procedures given in Section 4.

9.0 WIRING DIAGRAM

⚠️ POWER-DOWN BEFORE DISCONNECTING ANYTHING.





<p>AUTOMATED MERCHANDISING SYSTEMS INC. 255 WEST BURR BLVD., KEARNEYSVILLE, WV, 25430 304-725-6921, FAX 304-725-6983 www.amsvendors.com - info@amsvendors.com</p>	<p>REVISION D</p>	<p>DWG. NO. 23802</p>	<p>TITLE DECAL, COMBINED WIRING DIAGRAM</p>
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10.0 SUPPORTED DEX FIELDS**NOTE: Certain fields may not be reported if the value is zero.**

BA101	Bill Validator Serial Number	DA201	Value of cashless sales since initialization
BA102	Bill Validator Model Number	DA202	Number of cashless vends since initialization
BA103	Bill Validator Software Revision	DA203	Value of cashless sales since last reset
CA101	Coin mechanism serial number	DA204	Number of cashless vends since last reset
CA102	Coin mechanism model number	DA401	Value credited to cashless device since initialization
CA103	Coin mechanism software revision	DA402	Value credited to cashless device since last reset
CA201	Value of cash sales since initialization	DA501	Value of cashless discounts since last reset
CA202	Number of cash vends since initialization	DA502	Number of cashless discounts since last reset
CA203	Value of cash sales since last reset	DA503	Value of cashless discounts since initialization
CA204	Number of cash vends since last reset	DA504	Number of cashless discounts since initialization
CA301	Value of cash in since last reset	DA901	Value of cashless overpay since last reset
CA302	Value of cash to the cash box since last reset	DA902	Value of cashless overpay since initialization
CA303	Value of cash to tubes since last reset	DXE01	Transmission Control Number:"1"
CA304	Value of bills in since last reset	DXE02	Number of Included Sets:"1"
CA305	Value of cash in since initialization	EA301	Number of reads with reset since initialization
CA306	Value of cash to the cash box since initialization	EA302	Date of the current read out
CA307	Value of cash to the tubes since initialization	EA303	Time of current read out
CA308	Value of bills in since initialization	EA304	This terminal/interrogator identification
CA401	Value of cash dispensed since last reset	EA305	Date of the last read out
CA402	Value of cash manually dispensed since last reset	EA306	Time of the last read out
CA403	Value of cash dispensed since initialization	EA307	Last terminal/interrogator identification
CA404	Value of cash manually dispensed since initialization	EA401	Date of first DEX configuration
CA601	Number of DEX reads performed since initialization	EA402	Time of first DEX configuration
CA602	Number of door openings since initialization	EA403	Installation terminal/interrogator identification during first DEX configuration
CA701	Value of cash discounts since last reset	EA701	Number of power outages since last reset
CA702	Value of cash discounts since initialization	EA702	Number of power outages since initialization
CA703	Number of cash discounts since last reset	G8501	Record Integrity Check (least significant byte first)
CA704	Number of cash discounts since initialization	IC101	Machine serial number
CA801	Value of cash overpay since last reset	IC106	Machine Asset Number
CA1001	Value of cash filled since last reset	IC501	System Date (yymmdd)
CA1002	Value of cash filled since initialization	IC502	System Time (hhmm)
CB101	Control board serial number	IC504	System Daylight Savings Mode (OFF, NA, EU, AUS)
CB102	Control board model number	ID101	Machine serial number
CB103	Control board software revision	ID102	Machine model number
DA101	Cashless 1 Serial Number		
DA102	Cashless 1 Model Number		
DA103	Cashless 1 Software Revision		

ID103	Machine Software Revision		
ID106	Machine Asset Number	SE01	Number of Included Sets
ID107	VIDTS stage: "5"	SE02	Transaction Set Control
ID108	VIDTS revision: "0"		Number: "0001"
ID401	Decimal point position		
ID402	Numeric Currency Code (ISO4217)	VA101	Value of all paid sales since initialization
ID403	Alphabetic Currency Code		
ID501	System Date (yymmdd)	VA102	Number of all paid vends since initialization
ID502	System Time (hhmm)		
ID504	System Daylight Savings Mode (OFF, NA, MEX, EU, AUS)	VA103	Value of all paid sales since last reset
		VA104	Number of all paid sales since last reset
PA101	Product number (set to the selection number(e.g. 12)	VA105	Value of all discounts since initialization
PA102	Product price		
PA103	Product Identification (Customer Facing product name)	VA106	Number of all discounted paid vends since initialization
PA201	Number of products vended since initialization	VA107	Value of all discounts since last reset
PA202	Value of paid products since initialization	VA108	Number of all discounted paid vends since initialization
PA203	Number of products vended since last reset	VA301	Value of all free vends since initialization
PA204	Value of paid product sales since last reset	VA302	Number of all free vends since initialization
PA205	Number of discounted paid vends since initialization	VA303	Value of all free vends since last reset
PA206	Value of discounts given since initialization	VA304	Number of all free vends since last reset
PA207	Number of discounted paid vends since last reset		
PA208	Value of discounts given since last reset		
PA401	Number of free vends since initialization		
PC101	Product number (one based index)		Receiving devices should not be designed to expect any particular transmission order.
PC102	Product price		If firmware or BOOT is upgraded, installation numbers are reset to zero.
PC103	Product Identification		Certain fields are omitted if all element values are zero.
TA201	Value of vend token sales since initialization		
TA202	Number of vend token vends since initialization		
TA203	Value of vend token sales since last reset		
TA204	Number of vend token vends since last reset		

11.0 OPTIONAL EQUIPMENT

Part No. 23282 - Kit, Candy Pusher, FFV

The candy pusher is an adjustable bar that mounts to any tray divider to keep tall items from falling sideways.

Part No. 23283 - Kit, Helix Splitter, FFV

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.

Part No. 23284 - Kit, Cup Rail, Small Helix, FFV

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 are too short, or otherwise do not stay upright when placed in a helix. Examples would be ice cream cups, or certain ice cream novelties.

Part No. 23285 - Kit, Cup Rail, 3.75" Helix, FFV

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 are too short, or otherwise do not stay upright when placed in a helix.

Part No. 20664 - Kit, Banking Spacer

P/N 20786, Harness, Chip Programming

Use with the speech hardware and software program.

P/N 3701, S3 Utility Programming software

Use with 20786 harness.

Part No. 24046-02 - Kit, Mini Dispenser, FFV

Replaces a snack selection with 1.5" helix and spacer.

Part No. 24012-02 - Kit, Scrolling price conversion

Convert any tray to new scrolling prices.

12.0 LIMITED WARRANTY

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.

SERVICE MODE

- Open door and press the yellow switch on the control board to enter SERVICE MODE.
- Press # or * to scroll through the functions.
- Return to vend mode by closing the door or pressing the mode switch.

ERROR CODES

- # NEXT ERROR
- 2 DETAILS
- 1 SUBLVL ERRORS
- 0 CLEAR ERROR

ACCOUNTING DATA

1. HISTORICAL VENDS
2. HISTORICAL VALUE
3. RESET VENDS
4. RESET VALUE
5. HISTORICAL SELECTIONS
6. CLEAR ALL
7. SERIAL NUMBER
8. RESET CARD
9. CASHBOX COINS

FILL/DISPENSE

- SELECT TUBE 1-6
- OR INSERT COINS

DELAYED SALES

1. START DELAY
2. CANCEL DELAY
3. SET DELAY
4. CLEAR ALL
5. EDIT SEL'NS

TEMPERATURE

1. CURRENT TEMP
2. SETPOINT
3. START LOG
4. VIEW LOG
5. NAMA HEALTH TEST
6. EDIT SELECTIONS *Mark exempt selections to alert driver!*
7. DEFROST TIME
8. MANUAL DEFROST

PRICE SETTINGS

1. SET PRICES
2. VALUEVEND

TRAY SETUP

1. TEST MOTORS
2. LINK MOTORS
3. MOTOR TYPE
4. DELAYED STOP
5. LETTER / NUMBER
6. CONFIGURE
7. COUPLE MOTORS

MDB SETTINGS

1. FORCE VEND
2. NO CHEAT
3. CHANGE BILL
4. HOLD LOST CREDIT
5. MULTI-VEND
6. LEVEL2 COIN MECH.
7. INSTANT REVALUATION
8. HIDE CARD VALUE
9. CARD REFUND

OPTIONS

1. MESSAGE
2. PRIZE
3. LANGUAGE
4. PPRODUCT SENSOR
5. SPEECH

SALES BLOCKING

- 1 - 4 SET PERIODS

CLOCK SETTINGS

1. TIME AND DATE
2. DAYLIGHT SAVINGS
3. DISPLAY CLOCK
4. 12/24 FORMAT

FREE VEND

1. VIEW / EDIT

AUXILIARY OUTPUT

1. VIEW / EDIT

DATA LOGS

1. TEMPERATURE
2. POWER
3. DOOR SWITCH

ENERGYSENSIT

1. ON/OFF
2. CLEAR HISTORY
3. SET TEMP CHANGE
4. SET PATTERN TIME
5. SET HIST FACTOR
6. SET DELAY TIME
7. LIGHTING
8. BRIGHTNESS (LED)

Note: When not in Service Mode and with door open, press # to move out-of-position switched motors to Home position (Home/Sensor +/3 only).