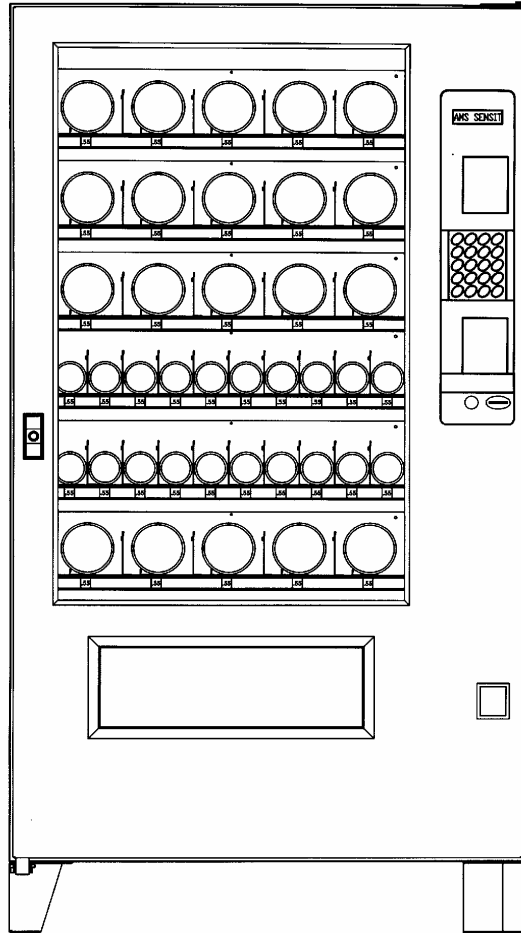




# Sensit I Glass Front Vendor



## Operation and Service Manual

**Models 35 (Snack), 39 (Snack),  
VCB (Visi-Combo), VCF (Visi-Diner and Milk)**

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# Sensit I Glass Front Vendor

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# 1. GENERAL INFORMATION

## 1.1 Introduction

The Automated Merchandising Systems Sensit I Snack, Visi-Combo, Visi-Diner and Milk are vending machines with high capacity and versatility. These various models provide for a wide range of product vending. **Note: All food products are to be pre-packaged.** AMS machines are designed, tested, and built to provide years of reliable, low-maintenance service in an indoor environment. They have full electronic control with Dex data capabilities. They each feature an electronic vend sensing system coupled with an electronically controlled vend mechanism to assure reliable product delivery. The refrigeration unit (optional) is designed for consistent cooling and reliability. Many other features and components of the AMS line of vending machines are described in detail in the following sections of this manual.

Please note; It is our intent to assist our customers with up-to-date documentation, however, this manual may not reflect all changes and may be subject to change without notice.

## 1.2 Model Identification

When requesting service, replacement parts or technical assistance, reference the Vendor Serial Plate (Figure 1). It is located on the inside of the upper left or right of the window, or on the outside of the main door on the lock side. The information contained on this plate is necessary to determine what parts, kits, or maintenance should be applied to your specific model.

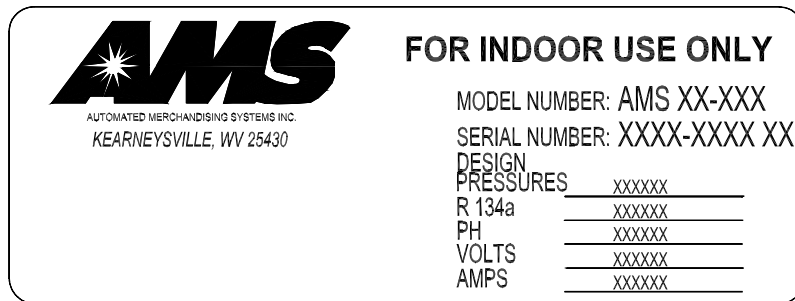
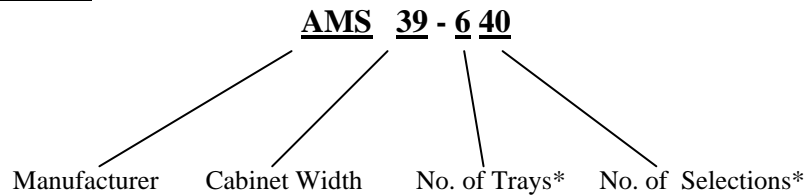


Figure 1. Vendor Serial Plate

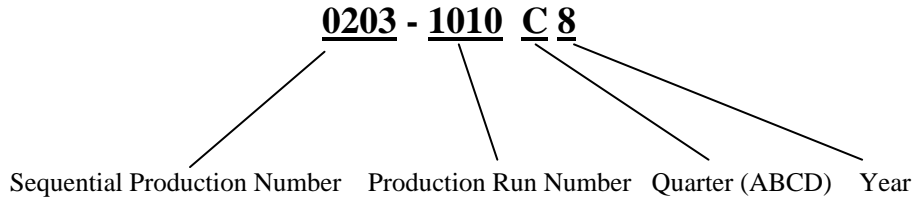
### Model Number



**Example: AMS39-640** means it is an Automated Merchandising Systems snack vendor, 39" wide, with six (6) trays and forty (40) positions for different products.

\*The dash number is dropped for Food, Bottle and Milk vendors and is replaced with 'VCF' or 'VCB'.

**Serial Number and Date Code**



**Example:** 0203-1010-C8 would be translated as machine number 203 on production run number 1010 manufactured in the third quarter of 1998.

### 1.3 Specifications

**Operating Environment**

AMS vendors are designed for indoor use between 33°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 a water jet or rain.

**Dimensions: AMS35**

Size                    33 3/4"W x 72"H x 36"D (89 cm x 183 cm x 91 cm)  
Weight                Approx. 567 lbs. (257 kg), 674 lbs. (306 kg.) w/chiller  
Capacity              1152 units max./120 units min. (depending on helix configuration)

**Dimensions: AMS39**

Size                    39"W x 72"H x 36"D (99 cm x 183 cm x 91 cm)  
Weight                Approx. 644 lbs. (292 kg), 726 lbs. (329 kg.) w/chiller  
Capacity              1440 units max./ 150 units min. (depending on helix configuration)

**Dimensions: VCB**

Size                    39"W x 72"H x 36"D (99 cm x 183 cm x 91 cm)  
Weight                Approx. 692 lbs. (314 kg)

**Dimensions: VCF**

Size                    39"W x 72"H x 36"D (99 cm x 183 cm x 91 cm)  
Weight                Approx. 738 lbs. (335 kg)

**Power Requirements**

United States and Canada:        115 VAC, 60 Hz  
International:                        230 VAC, 50/60 Hz

Basic Unit:                            3 amps @ 115 VAC (345 watts)  
Refrigerated Snack:                7 amps @ 115 VAC (805 watts)  
Visi-Combo:                         10.8 amps @ 115 VAC (1242 watts)  
Visi-Diner/Milk:                     10.8 amps @ 115 VAC (1242 watts)

**Refrigeration Specification**

Refrigerant - Snack:                1/4 HP, R-134a, 7.2 oz. (.20 kg)  
Refrigerant - Visi-Combo:         1/2 HP, R-134a, 8.5 oz. (.24 kg)  
Refrigerant - Visi-Diner/Milk:     1/2 HP, R-134a, 8.5 oz. (.24 kg)

**Coin Mechanisms and Bill Validators Supported**

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

# 1.4 STANDARD HELIX CONFIGURATIONS AVAILABLE

## 1.4.1 AMS39 MODELS

10	10	10	10	10
10	10	12	12	12
12	12	12	12	12
12	12	12	12	12
12	12	15	15	15
15	15	15	15	15

AMS 39-630  
370 UNITS

10	10	10	10	10
10	10	12	12	12
12	12	12	12	12
12	12	15	15	15
15	15	18	18	18
15	15	18	18	18
18	18	24	24	24
15	15	15	15	15

AMS 39-635  
502 UNITS

10	10	10	10	10
12	12	12	12	12
15	15	15	15	15
18	18	18	18	18
18	18	18	18	18
15	15	15	15	15
18	18	24	24	24
12	12	12	12	12

AMS 39-640  
617 UNITS

10	10	10	10	10
12	12	15	15	15
18	18	18	18	18
18	18	18	18	18
18	18	18	18	18
15	15	15	15	15
18	18	24	24	24
12	12	12	12	12

AMS 39-645  
731 UNITS

10	10	15	15	15
12	12	12	12	12
18	18	18	18	18
18	18	18	18	18
18	18	18	18	18
18	18	15	15	15
15	15	24	24	24

AMS 39-650  
839 UNITS

10	12	12	12	15
18	18	18	18	18
18	18	18	18	18
18	18	18	18	18
18	18	18	18	18
18	18	18	18	18
15	15	15	15	15
24	24	24	24	24

AMS 39-655  
955 UNITS

15	15	15	15	15	15	15	15	15	15
18	18	18	18	18	18	18	18	18	18
18	18	18	18	18	18	18	18	18	18
18	18	18	18	18	18	18	18	18	18
18	18	18	18	18	18	18	18	18	18
15	15	15	15	18	18	24	24	24	24

AMS 39-660  
1060 UNITS

**Available Helix Sizes:**

2 1/2 Inch (63mm)

- 20139-07     7 Pitch, 2 5/8" (66mm) Opening
- 20139-10    10 Pitch, 1 7/8" (47mm) Opening
- 20139-12    12 Pitch, 1 5/8" (41mm) Opening
- 20139-15    15 Pitch, 1 1/4" (31mm) Opening
- 20139-18    18 Pitch, 1"     (25mm) Opening
- 20139-24    24 Pitch, 3/4"   (19mm) Opening

4 Inch (102mm)

- 20173-05     5 Pitch, 3 1/4" (82mm) Opening
- 20173-07     7 Pitch, 2 1/2" (63mm) Opening
- 20173-09     9 Pitch, 2"     (50mm) Opening
- 20139-10    10 Pitch, 1 3/4" (44mm) Opening
- 20173-12     12 Pitch, 1 1/2" (38mm) Opening
- 20173-15     15 Pitch, 1 1/4" (31mm) Opening



## 1.4.2 AMS35 MODELS

10	12	12	15
12	12	12	12
12	12	12	12
12	12	12	12
15	15	15	15
15	15	15	15

AMS 35-624  
313 UNITS

10	12	12	12
12	12	12	12
12	12	12	12
15	15	15	15
18	18	18	18
18	18	18	18
24	24	24	24
15	15	15	15

AMS 35-628  
418 UNITS

10	12	12	12
12	12	15	15
15	15	15	15
15	15	18	18
18	18	18	18
18	18	18	18
24	24	24	24
12	12	12	12

AMS 35-632  
508 UNITS

10	12	15	15
12	12	15	15
15	15	15	15
24	24	24	24
18	18	18	18
18	18	18	18
18	18	18	18
18	18	18	18
12	12	12	12

AMS 35-636  
598 UNITS

10	12	12	12
12	12	15	15
18	18	18	18
18	18	18	18
18	18	18	18
18	18	18	18
24	24	24	24
15	15	15	15
15	15	15	15
24	24	24	24

AMS 35-640  
682 UNITS

10	12	12	15
18	18	18	18
18	18	18	18
18	18	18	18
18	18	18	18
18	18	18	18
24	24	24	24
15	15	15	15
24	24	24	24

AMS 35-644  
790 UNITS

15	15	15	15	15	24	24	24
18	18	18	18	18	24	24	24
18	18	18	18	18	18	18	18
18	18	18	18	18	18	18	18
18	18	18	18	18	18	18	18
18	18	18	18	18	18	18	18

AMS 35-648  
885 UNITS

### Available Helix Sizes:

#### 2 1/2 Inch (63mm)

- 20139-07 7 Pitch, 2 5/8" (66mm) Opening
- 20139-10 10 Pitch, 1 7/8" (47mm) Opening
- 20139-12 12 Pitch, 1 5/8" (41mm) Opening
- 20139-15 15 Pitch, 1 1/4" (31mm) Opening
- 20139-18 18 Pitch, 1" (25mm) Opening
- 20139-24 24 Pitch, 3/4" (19mm) Opening

#### 4 Inch (102mm)

- 20173-05 5 Pitch, 3 1/4" (82mm) Opening
- 20173-07 7 Pitch, 2 1/2" (63mm) Opening
- 20173-09 9 Pitch, 2" (50mm) Opening
- 20139-10 10 Pitch, 1 3/4" (44mm) Opening
- 20173-12 12 Pitch, 1 1/2" (38mm) Opening
- 20173-15 15 Pitch, 1 1/4" (31mm) Opening

### 1.4.3 AMS Visi-Diner

5	5	5	5	5
5	5	5	5	5
5	5	5	5	5
7	7	7	7	7
7	7	7	7	7
7	7	7	7	7

AMS 39-FOOD  
180 UNITS

Available Helix Sizes:

2 ½ Inch (63mm)

- 20139-07 7 Pitch, 2 5/8" (66mm) Opening
- 20139-10 10 Pitch, 1 7/8" (47mm) Opening
- 20139-12 12 Pitch, 1 5/8" (41mm) Opening
- 20139-15 15 Pitch, 1 1/4" (31mm) Opening
- 20139-18 18 Pitch, 1" (25mm) Opening
- 20139-24 24 Pitch, 3/4" (19mm) Opening

4 Inch (102mm)

- 20173-05 5 Pitch, 3 1/4" (82mm) Opening
- 20173-07 7 Pitch, 2 1/2" (63mm) Opening
- 20173-09 9 Pitch, 2" (50mm) Opening
- 20139-10 10 Pitch, 1 3/4" (44mm) Opening
- 20173-12 12 Pitch, 1 1/2" (38mm) Opening
- 20173-15 15 Pitch, 1 1/4" (31mm) Opening

## 1.4.4 AMS Visi-Combo

10	10	15	15	15				
12	12	12	12	12				
15	15	15	15	18	18	18	18	18
6	6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6	6

AMS 39-VISI-COMBO  
386 UNITS

### Available Helix Sizes:

#### 2 ½ Inch (63mm)

20139-07	7 Pitch, 2 5/8" (66mm) Opening
20139-10	10 Pitch, 1 7/8" (47mm) Opening
20139-12	12 Pitch, 1 5/8" (41mm) Opening
20139-15	15 Pitch, 1 1/4" (31mm) Opening
20139-18	18 Pitch, 1" (25mm) Opening
20139-24	24 Pitch, 3/4" (19mm) Opening

#### 3 Inch (76mm)

20763	6 Pitch, 3 1/2" (88mm) Opening (Bottle / Milk Trays Only)
-------	--

#### 4 Inch (102mm)

20173-05	5 Pitch, 3 1/4" (82mm) Opening
20173-07	7 Pitch, 2 1/2" (63mm) Opening
20173-09	9 Pitch, 2" (50mm) Opening
20139-10	10 Pitch, 1 3/4" (44mm) Opening
20173-12	12 Pitch, 1 1/2" (38mm) Opening
20173-15	15 Pitch, 1 1/4" (31mm) Opening

## 1.4.5 AMS Milk

6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6

AMS 39-Milk  
240 UNITS

6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6

AMS 39-Milk  
288 UNITS

Available Helix Sizes:

3 Inch (76mm)  
20763

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

## 2. 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, **potential hazards exist**. It is the intent of Automated Merchandising Systems, through this manual and service technician training, to alert individuals who will be servicing our equipment to these potential hazards, and to provide **basic safety guidelines**.

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

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

If you have questions concerning safety or service, or would like more information, please contact the Automated Merchandising Systems Service Department at 304-725-6921 or e-mail [ams@intrepid.net](mailto:ams@intrepid.net).

### 2.2 Hazards

Below are listed some specific hazards and safe practices to follow to avoid injury from those hazards. This list can not possibly cover all hazards, therefore please remember to **THINK SAFETY FIRST**.

#### 2.2.1 High Voltage Contact

All vendors are 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 (see Model Identification 1.2). High voltage areas include the electrical panel, the refrigeration unit and fans, and the fluorescent lamp. It is important to understand that contact with the high voltage wiring can result in injury or death.

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

## 2.2.2 Improper Grounding

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

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

## 2.2.3 Fan Contact

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

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

## 2.2.4 Helix Motion and Jamming

Energized vend motors can turn a helix with considerable torque, creating a possible entrapment hazard. Also, turning 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 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 the 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.**

## 2.2.5 Refrigerant Release

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

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

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

## 2.2.6 Vendor Tipping

The empty weight of the vendor is approximately 576 to 800 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.**
2. **Never place the vendor in an inclined position, such as on a ramp or with all the legs not on the same horizontal surface.**
3. **Never place the vendor in a moving environment such as on a ship without properly securing it in place.**
4. **Never place the vendor in a location where it may be struck by a vehicle.**
5. **Never transport an unsecured vendor.**
6. **Never attempt to lift or move the vendor by hand. Always use equipment with the proper load rating. Note that the weight listed in Specifications is empty weight.**

## 2.2.7 Other Hazards

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

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.**

## 3. THEORY OF OPERATION

### 3.1 Sensit System

- The Sensit system is comprised of three elements; the emitter, the detector, and the control logic. The emitter is a circuit board with a row of infra-red diodes located on one side of the hopper. A diffuser in front of the emitter redirects the light to create a plane of light across the top of the hopper. The detector is located on the opposite side of the hopper. It is composed of a circuit board attached to a housing. The detector circuit board has two infra-red sensors that measure the intensity of the light and relay the information to the control. The detector housing has a double parabolic mirror that focuses the light on the two sensors.
- The sensor must be calibrated so that the control recognizes the normal intensity of the light passing across the hopper. The sensor should be calibrated whenever a sensor component is changed or the vendor is placed in a new location.
- The sensor can be manually calibrated in service mode by pressing **5** while in the **OPTIONS** function (see **4.4.5 Calibrating the Sensor**).
- The sensor will automatically calibrate itself every 3 minutes in normal operation to account for changes in environmental light and other variables.
- When the vendor is serviced with the door open, the sensor can become fogged up and the temperature of the sensor can increase, particularly in hot or humid locations. After the door is closed, the sensor will calibrate every minute for 60 minutes to allow for changes in the sensor temperature and changes in light intensity as the fogging clears off. In some situations, **the vendor may not be able to vend until the fogging has cleared**. In these cases, the vendor will display “PLEASE MAKE ANOTHER SELECTION” and return the customer’s money. The money is returned in order to slow the process of making another selection, which gives the sensor more time to clear and begin operating correctly. This feature overrides the **FORCE VEND** option (see **8.6.2 FORCE VEND**) during the 10 minute period.
- When a selection is made, the control checks the operation of the sensor before vending the product. If the intensity of the light is not within 15% of the value measured during the last calibration, the control will display “PLEASE MAKE ANOTHER SELECTION” and return the customer’s money (see **5.1 Sensor Errors**).
- When a selection is made, the vend motor will begin to run. After several seconds, if no product falls in the hopper, the motor will be stopped, the credit will be maintained and the customer will be directed to “PLEASE MAKE ANOTHER SELECTION.”
- When the control 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 control stops the vend motor and removes the credit.

### 3.2 Refrigeration System

- The refrigeration system is operated through the electronic control board. A temperature sensor in the cabinet relays the current temperature to the control..
- If the temperature is above the setting that has been programmed in by the user (see **8.6.7 Temperature Setting**), 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.
- If the compressor should overheat, a thermal overload removes power to the compressor until it has cooled.
- When the temperature in the cabinet reaches 5°F cooler than the temperature setting, the control de-energizes the relay, which in turn breaks the circuit powering the compressor.
- The control will also shut off the compressor if the door is opened. This is to prevent the refrigeration unit from freezing up.

After the compressor has shut down, the control will wait until the compressor has been shut down 3 minutes and if applicable, the door has been closed 10 seconds before restarting the compressor. The delay allows pressure in the system to equalize.

## 4. SETUP AND INSTALLATION



## 4.1 Inspection

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

## 4.2 Connecting Power

Power to the vendor outlet must remain switched on for the vendor to operate.

### 4.2.1 Checking the Outlet (US and Canada)

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

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

### 4.2.2 Checking the Outlet (Outside the US 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.

### 4.2.3 Electrical Service Requirement for CE Compliance

The following requirement applies only to models 39-VCB, 39-VCF, or other models using ½ HP compressors and displaying the CE mark on the serial plate. If this requirement applies to your vendor, you will see a similarly worded decal on the back of the vendor near the power cord.

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

#### **ELECTRICAL SERVICE REQUIREMENT FOR CE COMPLIANCE:**

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

### 4.2.4 Requerimiento de Servicio Eléctrico para Certificación CE

El siguiente requerimiento se aplica solamente a los modelos 39-VCB, 39-VCF, o a otros modelos que utilicen compresores de ½ HP y que muestren la marca CE en la placa de serie. Si este requerimiento se aplica a su dispensadora, verá una calcomanía con una terminología parecida en la parte posterior de la dispensadora, cerca del cordón de corriente.

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

## **REQUERIMIENTO DE SERVICIO ELECTRICO PARA CERTIFICACION CE:**

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

### **4.2.5 Les Utilites electriques necessaire pour conformement aux regles CE**

Le suivant condition applique seulement à modèles 39-VCB, 39-VCF, ou autre modèles en utilisant ½ HP compresseur et montrer le CE sur l'en série plaque. Si cette condition s'applique à votre vendeur, vous verrez un decal de même exprimé sur le dos du vendeur près du cordon d'alimentation.

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

### **LES UTILITES ELECTRIQUES NECESSAIRE POUR CONFORMEMENT AUX REGLES CE:**

**CET EQUIPEMENT NE DOIT UTILISER QUE SUR LES LIEUX AVEC UNE CAPACITE DU COURANT AU MOINS 100A LA PHASE, FOURNIE A UN RESEAU DE DISTRIBUCION 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.**

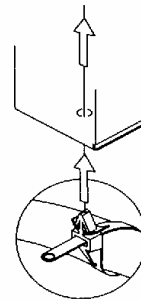
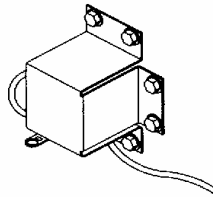
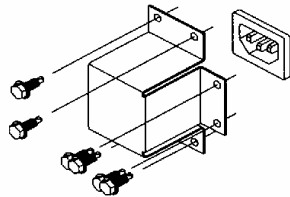
## 4.2.6 Installing the Power Cord and Cover

### TOOLS REQUIRED:

Drill with 1/4" Socket Driver (Always wear eye protection when servicing vendor.)

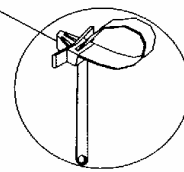
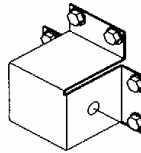
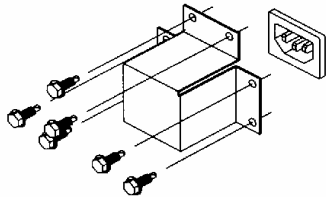
1. Plug the power cord into the IEC receptacle but do not plug into a wall outlet at this time.
2. Place the Power Cord Cover over the power cord and the IEC receptacle (see Figure 2), with the open side to the left or down as shown (according to what direction the power cord exits the cover).
3. Align the holes in the Power Cord Cover with the holes on the back of the machine, install self-drilling screws through the 6 holes in the cover. Do not over-tighten the screws.
4. Install the wire tie that is attached to the power cord, by inserting the locking tab into the hole in the cover.
5. Plug the power cord into the wall outlet or grounding adapter.

### CORDS EXITING LEFT



### EXPLODED VIEW

### CORDS EXITING DOWN



### EXPLODED VIEW

Figure 2. Power Cord Cover

## 4.3 Setup

### 4.3.1 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 vendor 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 vendor.

### 4.3.2 Mounting and Connecting Coin Mechanism (Changer)

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

1. **Always disconnect power to the vendor 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 the each slot over a screw head. Be careful to hold the wiring harnesses in this area out of the way. Once the screw head is inserted in the slot, the changer should drop slightly as the shank of the screw engages the narrow portion of the slot.
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 vendor.

### 4.3.3 Test 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/or wire ties securing the trays.
2. 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.
3. 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.
4. Place tall, narrow products in a column with a candy pusher, which is an adjustable bar to push the product to one side of the column. Typically these are installed in columns 9 and 0 on the candy trays.
5. Make sure there is adequate clearance between the tops of the packages and the trays above when sliding the trays in and out.

This is also a good time to set the end position of the helix to make sure the first product is held securely in the helix. To do this, vend a product from each column. The end position of the helix will automatically be set to the correct position when a product is vended. The control stops the helix the instant the sensor detects a product falling in the hopper.

If desired, the end position can be set manually by pulling the helix out of the motor, rotating it, and reinserting it in the motor. Note that this position will not be maintained after the first vend.

Test vend the product and adjust the position of the helix ejector if necessary. The helix ejector is a plastic device located on the front end of the helix to kick out the product.

### 4.3.4 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 down on the top of the label until it bows enough to snap into the top groove of the extrusion.

### 4.3.5 Setting Prices (also see 8.4 Price for more details)

1. To enter the service mode, open the top access door on the inside of the main door and press the mode switch on the control board (see the decal inside the access door for the location of the mode switch).
2. Using the # key, scroll through the menu to “**PRICE**”.
3. Press the selection for which you want to set the price (example: **A 2**).
4. Enter the price and press \* \* to save the new price. Tip: press \* **1** to set the whole tray to that price, or \* **2** to set that price for the entire vendor.
5. Close the door to exit service mode.

## 4.4 On-Site Installation

### 4.4.1 Remove the Shipping Boards

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

### 4.4.2 Choosing a Location

1. Select a site that is within 5 feet of an outlet. Check the outlet as described in **4.2 Connecting Power** before plugging in the power cord.
2. For refrigerated models, allow at least 4 inches between the wall and the back of the vendor for air circulation.
3. Make sure the vendor does not block walkways or exits.
4. Do not place the vendor in a location where it can be struck by vehicles.
5. Leave at least 18 inches between a wall and the hinge side of the vendor to prevent the door hitting the wall when opened, or use a protective bumper on the wall. At a minimum, the door should be able to open at least 95°.
6. The vendor is designed to meet ADA guidelines for persons in wheelchairs using a parallel approach (side of wheelchair adjacent to front of vendor). Make sure there is adequate room to maneuver a wheelchair into this position in front of the vendor.

### 4.4.3 Leveling the Vendor

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.

1. With the door closed and tightened, 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.
2. Place a level on top of the cabinet and check the level side-to-side.
3. Adjust the leveling legs on the low side one turn at a time until the cabinet is level.
4. Repeat the last two steps to level the vendor front-to-back.
5. After the vendor is level, adjust the support screw under the door until it contacts the floor.

## 4.4.4 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 bottle trays are extended. Failure to install the false leg on vendors with bottle trays may result in serious injury (see Figure 3).

### CAUTION:

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



Figure 3. Tip-Over Warning

Installing False Leg.

### TOOLS REQUIRED:

1/4" Nut driver or socket wrench

1. Align the holes in the top of the false leg with the 1/8" holes on the left side of the bottom of the door (see Figure 4). The closed end of the false leg should be facing forward.
2. Install screws through the holes and tighten until snug. Do not over tighten.

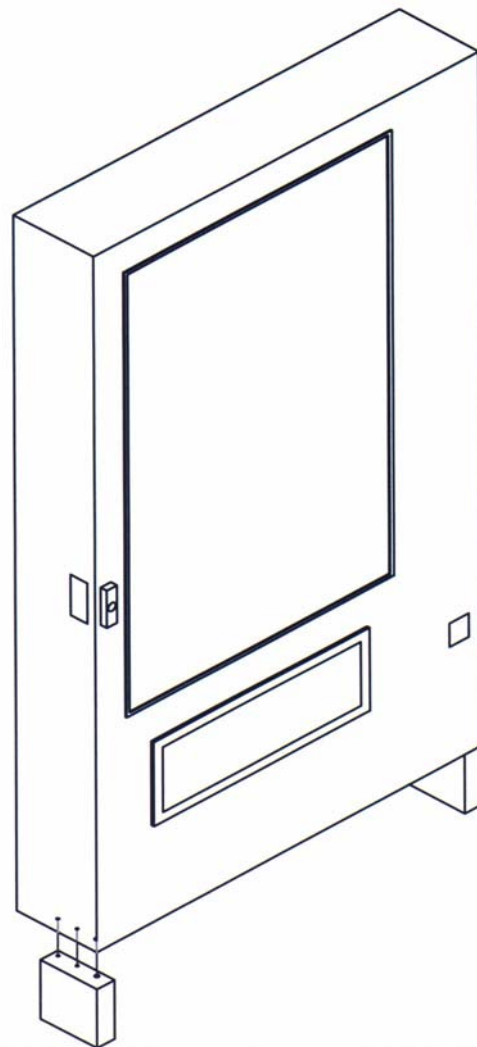


Figure 4. False Leg Installation.

#### 4.4.5 Calibrating the Sensor

The sensor should be calibrated and tested whenever the vendor is placed in a new location, or when the control board or any component of the sensor system is replaced.

1. To enter the service mode, open the top access door on the inside of the main door and press the mode switch on the control board (see the decal inside the access door for the location of the mode switch, and see **8. Service Mode** for more details on Service Mode).
2. Using the # key, scroll through the menu to “**OPTIONS**”.
3. Press 5 to start the calibration. Note that it can take up to a minute to calibrate. When finished, the display will read “**OPTIONS**” once again.
4. Press the mode switch again to exit service mode.

#### 4.4.6 Initial Cool-down

When placing a refrigerated machine on a new location it is **important** to allow the machine to cool to the operating temperature **prior to placing product** in the machine. Depending upon the machine’s initial temperature and ambient conditions, it will take about 4 to 5 hours to accomplish this. Normal practice is to place a machine on location and come back the next day to load it. **Do not load warm bottle/milk products into vendor. All bottle/milk products are to be pre-chilled.**



## 5. TROUBLESHOOTING

### 5.1 Sensor Errors

A vendor that accepts credit then returns money when a selection is made instead of vending the product indicates a sensor error. The display message typically states “**PLEASE MAKE ANOTHER SELECTION.**” Access the sensor error codes by pressing \* with the door open. The display will first show the most recent error code #, followed by a set of calibration numbers and finally the time and date in military format. These readings will alternate on the display. Press \* to advance to the next error code. Record this information, which may be useful when calling for assistance. The sensor error codes can be cleared by calibrating the sensor ( OPTION 5 ). Refer to section 5 for trouble shooting information.

### 5.2 Health and Safety Errors

Machines vending perishable products must be equipped with control software that contains the Health & Safety (H&S) function. The H&S function is activated automatically by setting the temperature to 41°F or lower (see Section 8 for programming instructions). Upon pressing the \* key to save the temperature setting, the control will beep and display the state of the H&S function. **The most important feature of the H&S function is an error flag that, if triggered by unsafe conditions, will disable all MDB devices and prevent the machine from vending any product.** This protects the consumer from purchasing spoiled product.

As of this writing, the NAMA specifications for perishable food product vendors require that the temperature in the vendor must cool to 41°F within 30 minutes of closing the door. This is to allow a recovery period following loading. After this requirement has been met, the temperature in the vendor must not get above 41°F for more than 15 minutes at any time.

The H&S software allows the refrigeration cut-in temperature to be set as low as 40°F. The refrigeration unit will cut out at a temperature 4°F below the cut-in temperature.

Unless otherwise specified by regulatory agencies, AMS recommends a cut-in temperature of 40°F when vending perishable food products.

The error messages triggered by unsafe conditions are described below. Once the error flag has been set it can only be reset by entering the service mode. This is done by pressing the mode switch on the control board. It is important for anyone servicing the vendor to **observe any message showing on the display before opening the door** and unknowingly resetting the error flag by entering the service mode to perform another service function.

**The H&S function can be tested by manually warming the temperature sensor to simulate the failure conditions** (see Section 5.3).

### **5.2.1 Out of Order – 1 (Temperature Exceeded)**

This error occurs because the temperature inside the vendor exceeded 41°F for more than 15 minutes (other than during the pull-down period following loading). At the same time the following message will be displayed; “OUT OF ORDER, 1”.

Press the yellow service mode switch, located on the lower right corner of the control board, to clear the error after correcting the cause of the error and discarding any food products that may have spoiled.

### **5.2.2 Out of Order – 2 (Time Exceeded)**

This error occurs because the temperature inside the cabinet did not reach 41°F within 30 minutes of closing the door. **If this time limit is exceeded, the H&S error flag will be triggered** and the following message will be shown in the digital display; “OUT OF ORDER, 2”.

Press the yellow service mode switch, located on the lower right corner of the control board, to clear the error after correcting the cause of the error and discarding any food products that may have spoiled.

### **5.2.3 Out of Order – 3 (Switch Error)**

This error occurs because the door switch was open for more than 30 minutes, preventing the refrigeration unit from running during that time. At this time the following message will be displayed; “OUT OF ORDER, 3”.

Press the yellow mode switch, located on the on the lower right corner of the control board, to clear the error after correcting the cause of the error and discarding any food products that may have spoiled.

## 5.3 Testing the H&S Function of the Machine

Place the unit in “Service” mode (see section 8 of manual). Press **8** to display the refrigeration cut-in temperature. The temperature will be displayed in both Celsius and Fahrenheit. Press **1** to increase the cut-in temperature. Press **2** to decrease the cut-in temperature. Press **\*** to save and return to **OPTIONS**.

Testing the H&S function is performed as follows:

1. Place the unit in “Service” mode (see section 8 of manual). Scroll to “OPTIONS” and press “8” to display the set temperature of the unit. Press the “\*” button to see if the H&S option is enabled. Set point of the vendor must be 41° or lower for the H&S option to be enabled.
2. At this point, the sensor (see Figure 5) can either be disconnected, causing the controller to assume a temperature of 255°F/124°C, or temporarily relocated outside the cabinet. Relocating the sensor will allow the sensor to be tested as well.
3. The sensor is mounted to it’s bracket with two spring clamps and a retaining “bump”. To remove the sensor push it to the rear of the cabinet and out of the clamps, and up over the retaining bump.
4. If the sensor is relocated outside the door, close the door and allow the sensor temperature to exceed the 41°. The temperature of the sensor can be monitored by pressing the “\*” button on the keypad.
5. After 30 minutes, the display should read “OUT OF ORDER, 2”. The machine will not vend products until door is opened and the controller is reset.
6. Remount sensor inside the cabinet onto it’s bracket, insuring sensor wire is not caught or pulled. Push sensor all the way into the spring clamps. If the sensor was disconnected, reconnect it at this time.
7. Close vendor door. The vendor will return to normal operation.

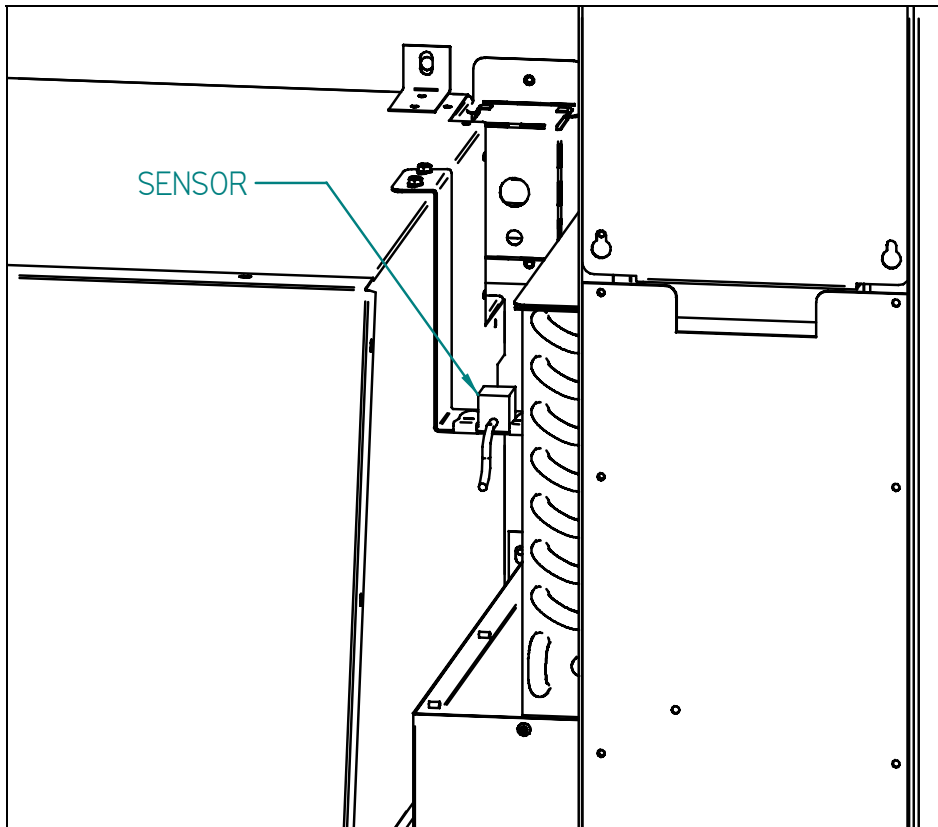


Figure 5. Temperature Sensor

## 5.4 Machine Errors

### Top Level Error Codes

To check for errors, enter the service mode by pressing the yellow mode switch located at the lower right corner of the control board, while the door is open. The controller will first scroll through the top level error codes. If there are no errors, the controller will display “**NO ERRORS**”. Otherwise each top level error will be displayed for two (2) seconds. The error messages automatically scrolls for 30 seconds or until the # key is pressed.

<b>TOP LEVEL ERROR CODES</b>	
<b>DISPLAY</b>	<b>ERROR DESCRIPTION</b>
JAM MOTOR	Motors Jammed
DOORSWITCH	Door Switch Open Greater Than 1 Hour
SEL STUCK	Keypad Character Closed Greater Than 2 Minutes
CHANGER	Coin Mechanism Error
BILL VAL	Bill Validator Error
CARDREADER	Card Reader Error
BT DT	Bottle Sensor

### Sub-Level Error Codes

To view the sub-level error codes, press the \* key while the top level error code is being displayed. Correcting the error will clear the error code and display the next error code. Once all errors are cleared, “**SERVICE**” will be displayed briefly, then the first Service Mode function is displayed.

#### 5.4.1 JAM MOTOR

The display will scroll each individually jammed motor on the display for two (2) seconds. Clear any jammed products from the indicated vend columns. **Use caution when freeing jammed product** (see 2.2.4 **Helix Motion and Jamming**). To reset the error, select the jammed motor with the keypad. The control will attempt to run that motor. If the motor runs successfully, the control will display that selection followed by “**OK**”. If the motor has been taken out of the motor matrix, it will be re-established in the matrix. When all motors have been re-established in the matrix the display will read “**ALL OK**”.

<b>JAM MOTOR ERROR CODES</b>	
<b>DISPLAY</b>	<b>ERROR DESCRIPTION</b>
XX JAM	Jammed Motor = XX
ALL OK	All configured motors are in the matrix
XX OK	The selected motor was already in the matrix

#### 5.4.2 DOORSWITCH

The DOORSWITCH error code has no sub-levels. The door switch is reset by closing the door, and the error will reset itself.

### 5.4.3 SEL STUCK

Free up the indicated selection button to clear the error. If necessary, loosen the plastic escutcheon slightly from inside the door to free any trapped foreign material that may be causing the button to stick.

<b>SELECTION STUCK ERROR CODES</b>	
<b>DISPLAY</b>	<b>ERROR DESCRIPTION</b>
X STUCK	Selection 'X' is stuck

### 5.4.4 CHANGER

Press \* to scroll through the CHANGER error codes. Reference the owner's manual for your device for information on correcting device errors.

<b>CHANGER ERROR CODES</b>	
<b>DISPLAY</b>	<b>ERROR DESCRIPTION</b>
COMMUN	Communications error
SENSOR	Sensor error
CHUTE	No coins accepted for TBD time period
JAM TUBE	Tube jam
CHK SUM	Check sum error

### 5.4.5 BILL VAL

Press \* to scroll through the BILL VALIDATOR error codes. Reference the owner's manual for your device for information on correcting device errors.

<b>BILL VALIDATOR ERROR CODES</b>	
<b>DISPLAY</b>	<b>ERROR DESCRIPTION</b>
COMMUN	Communications error
STK FULL	Stacker full
MOTOR	Bad stacker motor
JAM BILL	Bill jammed
CHK SUM	Check sum error
OPEN BOX	Open box
SENSOR	Sensor error

## 5.4.6 CARDREADER

Press \* to scroll through the CARD READER error codes. Reference the owner's manual for your device for information on correcting device errors.

<b>CARD READER ERROR CODES</b>	
<b>DISPLAY</b>	<b>ERROR DESCRIPTION</b>
CRD ERR	Card error
INVA CRD	Invalid card
TAMPER	Tamper error
TDB	Manufacture's defined error
COMMUN 4	Communications error
SERVICE	Needs service
READ ERR	Reader failure
COMMUN 9	Communications error
JAM CARD	Card jammed

## 5.4.7 BT DT (Bottle Sensor)

The BT DT error code has no sub-levels. Check/clear vend hopper, sensor and wire connections.

## 5.5 Water 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 cover gasket is sealing properly all the way around. In particular, check the opening where the refrigeration lines pass through the cover. This opening should be sealed completely around the lines with the gray putty very similar in consistency to modeling clay.
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 vend door, and the vend door closes properly.

## 5.6 Trouble Shooting Chart

**IF AT ANY TIME A REPLACEMENT PART IS NECESSARY, PLEASE CONTACT YOUR DISTRIBUTOR**

Symptom	Possible Cause	Remedy
No power at the main control board. (no beeping sound when the service mode button is pushed)	3.0 amp fuse is blown.	Replace 3.0 amp fuse.
	Fuse harness is not connected to the back of the fuse holder.	Connect fuse holder harness.
	Power harness is disconnected.	Reconnect power harness.
	Short or cut in the power harness between the transformer and control board	Check continuity through the power harness. If there is no continuity replace the power harness.
	Transformer does not have power at the 24 VAC secondary side.	Check the secondary side of the transformer for 24 VAC. If it does not have 24 VAC coming from it replace the transformer.
Vendor displays “Please Make Another Selection”.	Sensor out of calibration. Acceptable Calibration Parameters:	Recalibrate the sensor (See 8.6 OPTIONS) PULSE: 7-14 BASIS: 100's PWM: 375-675
	Selection not configured in the motor matrix.	Reconfigure the motors.
	Sensor harness is disconnected.	Reconnect the sensor harness.
	Cracked, broken or misaligned diffuser.	Replace or realign diffuser.
	Sensors blocked.	Remove obstruction.
	Defective detector assembly.	Replace detector assembly.
	Defective emitter board.	Replace emitter board.
	Main control board defective.	Replace main control board.
Vendor does not accept coins.	Defective sensor harness.	Replace sensor harness.
	Changer unplugged.	Plug in changer.
	Defective changer.	Replace changer.
	Credit amount exceeds the highest price. (Prices may be set at \$0.00.)	Set prices.
Vendor will not pay out coins.	Main control board is in service mode.	Exit service mode.
	Changer unplugged.	Plug in changer.
	Defective changer.	Replace changer.
	Coins jammed.	Clear jammed coins.
Validator will not accept bills.	No coins in changer.	Add coins to the changer.
	Changer unplugged.	Plug in changer.
	Not enough change in the changer.	Add coins to the changer.
	Validator unplugged.	Plug in the validator.

***IF AT ANY TIME A REPLACEMENT PART IS NECESSARY, PLEASE CONTACT YOUR DISTRIBUTOR***

<b>Symptom</b>	<b>Possible Cause</b>	<b>Remedy</b>
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.
Pricing decimal point is in the wrong location on the display.	There is no changer installed in the vendor.	Install changer.
Display protected when disabling clock.	Health and Safety feature is active.	
Gum and mint selections do not make a complete cycle.	Harness off at the J-11 connector on the main control board.	Connect harness to the J-11 connector on main control board.
Health and Safety shut down.	Evaporator frozen.	Check for air leaks.
		Check for a failed evaporator fan motor. If it has failed replace the evaporator fan motor.
		Check evaporator fan switch harness connection.
		Replace evaporator switch.
	Defective temperature sensor.	Replace temperature sensor.
Refrigeration problem.	See below.	
Vendor displays "Time Exceeded" error.	Refrigeration problem.	See below.
Vendor displays "Temperature Exceeded" error.	Refrigeration problem.	See below.
Refrigeration unit not running.	Door switch is not engaged.	Close door tightly.
		Check door switch harness connection.
		Replace defective door switch.
		Replace defective door switch harness.
	Temperature setting in the control board is set too high.	Reset temperature setting.
	Refrigeration relay harness disconnected.	Connect refrigeration relay harness.
Defective refrigeration relay.	Replace relay.	



## 6. SERVICE AND MAINTENANCE

### 6.1 Replacing the Control Chip

Occasionally it may be necessary to replace the control chip to take advantage of new software features. Please note that after replacing the chip it will be necessary to reprogram prices and any other variables such as option settings and blocking times that have been changed from the factory settings. The sensor should also be recalibrated and the motors will need to be reconfigured.

1. Disconnect the power to the control board by opening the fuse holder located on the right rail mount above the refrigeration unit power outlet. The fuse holder for older models can be located in the middle of the service door on the back of the main door.
2. Locate the control chip (see Figure 6).
3. Insert a chip removal tool in one of the slots located at the corners of the socket and pry the chip from the socket. Note that the chip has one chamfered corner which corresponds to a chamfer in the socket.
4. Press the new chip in place, making sure the chamfer is correctly oriented.
5. Reconnect the power to the board and check the software revision number. The revision number will be displayed for several seconds after connecting the power.

Calibrate the sensor, configure the motors, and program the prices and other settings (see Section 8. Service Mode).

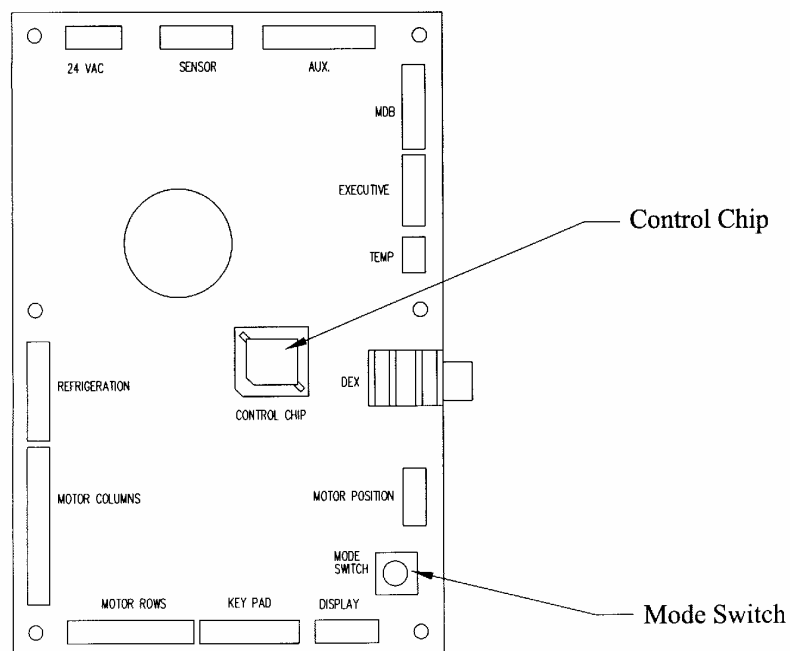


Figure 6. Control Chip

## 6.2 Cleaning the Refrigeration Unit

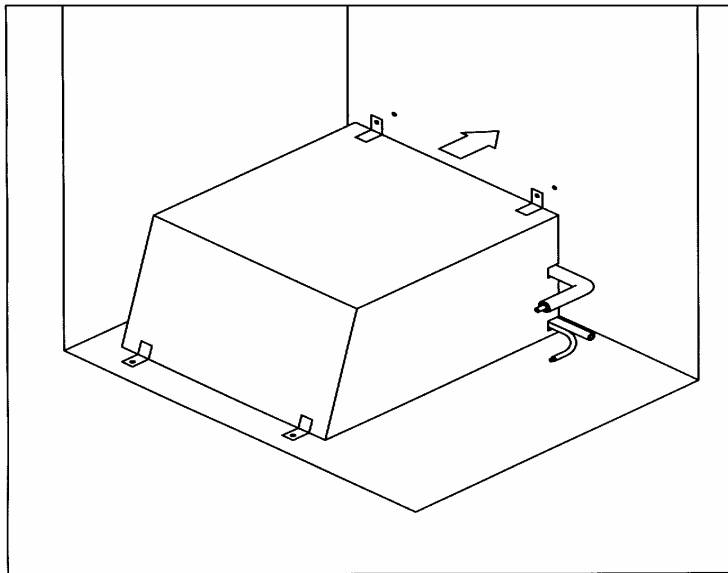
AMS recommends cleaning the refrigeration unit at least twice a year under normal conditions, more often in dusty environments.

1. Unplug the vendor.
2. Remove the refrigeration unit cover (see Figure 7).
3. Remove dust from the condenser coils with a vacuum or stiff brush. **CAUTION: Condenser fins are sharp!**
4. Remove dust from the inside of the rear screen.
5. Remove dust from the outside of the bottom screen.
6. Replace the cover

**CAUTION: Always wear eye protection and gloves when servicing vendor**

When reinstalling the refrigeration unit cover, it is important to seal the cover completely to prevent air leaks. Outside air leaking into the cabinet can cause condensation to form, which can lead to water overflowing the drain pan or ice build-up on the evaporator. Follow the procedure below to ensure proper sealing.

1. Locate the notches on the back edge of the right side of the cover (see figure 7). Remove any putty from the notches. Do not discard the putty. It will be reinstalled in a later step.
2. Set the cover in place, making sure the drain line and power cord pass through the lower notch. The insulated copper tubing should pass through the upper notch.
3. Push the cover tightly against the back of the cabinet and visually check that the foam gasket is making contact on all sides.
4. Continue to push on the cover while reinstalling the screws through the mounting tabs. Be careful to not overtighten the screws.
5. Remove the screen from the back of the cabinet.
6. Press the putty into the notches. Make sure to seal completely around the drain line, power cord, and insulated copper tubing.
7. Reinstall the screen.



**Figure 7. Refrigeration Unit Cover**

## **6.3 Cleaning the Vendor**

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

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

## **6.4 Cleaning the Plastic door Liner**

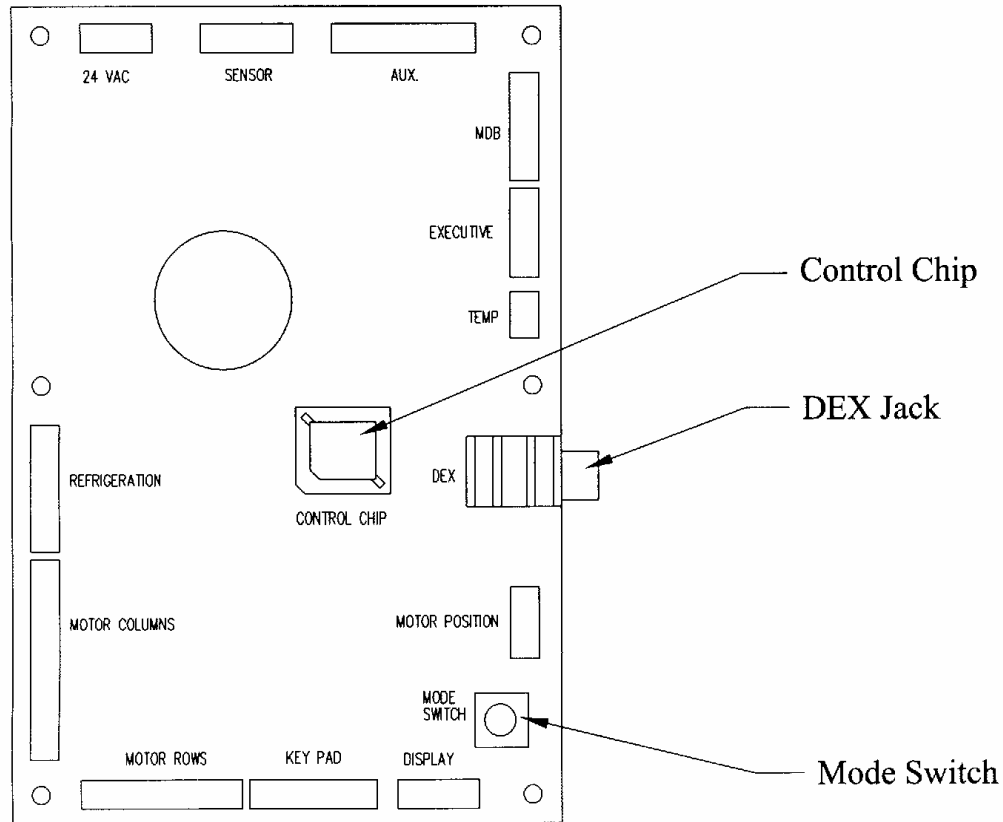
Some vendors use a door liner made from ABS plastic. This liner should be cleaned with a mild detergent diluted in water. Do not use chemical solvents or harsh detergents as these products could crack the liner.

## **6.5 Lubrication**

Once a year the bottle tray ball bearing rails should be lubricated with white lithium grease. The rail is constructed of three telescoping channel sections. Pull out the tray and apply a light coating of grease on the outside of the first two sections, along the top and bottom edges. Also apply grease on the inside of the last two sections along the top and bottom. Apply white lithium grease or similar lubricant to the lock bolt threads and the door hinges as necessary. Wipe off excess grease. No other lubrication is required.

## 7. MAJOR COMPONENTS

### 7.1 Control Board



**Figure 8. Control Board Components**

#### **Control Chip**

The control chip contains the software that controls vending and refrigeration (see Figure 8). The software can be upgraded by replacing the chip, but please note that all settings such as pricing, motor configuration, and sensor calibration will have to be reprogrammed (see **6.1 Replacing the Control Chip**).

#### **Mode Switch**

Pressing the mode switch (see Figure 8) allows the user to get in to the computer's service mode to change settings, access vend data, and check error codes for troubleshooting. Closing the door will automatically switch the computer back to vend mode.

#### **DEX Jack**

The DEX jack (see Figure 8) is provided for downloading of detailed vend data.

## 7.2 Vend Sensor

### **Emitter**

The emitter is located on the right side of the hopper when viewing the back of the door. The emitter sends a beam of non-visible light through a translucent diffuser and across the top of the hopper.

### **Detector**

The detector is located on the left of the hopper when viewing the back of the door. The detector is composed of two major components; the detector housing and the detector board. The detector receives the beam of light from the emitter and sends a signal to the control board based on the intensity of the beam. When a product drops through the beam, it causes a change in the intensity of the beam which is interpreted by the control as a successful vend.

## 7.3 Door

### **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 (see **4.3.2 Mounting and Connecting Coin Mechanism**).

### **Validator & Debit Card Reader Locations**

There are two locations that will accept bill validators and debit card readers (see **4.3.1 Mounting and Connecting Bill Validators and Card Readers**). The lower position meets the guidelines of the Americans with Disabilities Act (ADA) for access by handicapped persons.

### **Coin Box**

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

### **Door Switch**

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

### **Display**

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

### **Keypad**

The keypad is located below the display on the front of the door. A selection is made by keying in a letter and number combination (in any order) that corresponds to the location of an item in the machine. The keypad is also used to program the control (see **8. Service Mode** for details).

### **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 will 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.

## 7.4 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 (see **9.4 Tray Positioning**).

## 7.5 Trays

### Vend Motor

The vend motors are snapped into mounting holes on the back of each tray (see **9.5 Tray Configuration**). Each selection has one vend motor which is driven by a 24 VDC signal from the control board. Motors on snack trays do not have a conventional home position switch which would normally stop the motor after a 360° rotation. Instead, they will stop when the sensor has detected a vend, whether the rotation has been more or less than 360°.

### Helix

There are typically three sizes of helices in a vendor, approximately 2 5/8", 3", and 4". There are several pitches available in each size. The pitch is determined by counting the number of product openings in the helix (see **1.4 Standard Helix Configurations Available**).

### Divider

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

### Candy Pusher

The candy pusher keeps candies pushed to one side of the column. This is typically used with tall candy bars. The candy pusher is removed by pulling the bar free from the plastic clips. To reinstall, it is easiest to press the bar into the clip using pliers. (see **9.7 Pusher Bar Installation**)

## 7.6 Electrical Panel

### Fuse Holder

The fuse holder is located on the right rail mount above the refrigeration unit power outlet. Fuse holders for older models can be located in the middle of the service door on the back of the main door. It contains a 3 amp fast-blow fuse which is in the 24 VAC power supply to the control board. A spare fuse is located in the front of the fuse holder. The fuse holder is opened by pressing on the indicated side and pulling. The fuse holder can be used to disconnect power to the control board when MDB devices are being connected or disconnected, or when the board is being serviced.

### Transformer

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

### Filter

The filter removes electrical noise from the main power supply prior to the transformer to prevent problems with the control.

### Relay

The relay uses a 24 VDC signal from the control to close the switch on the high voltage power supply to the refrigeration unit.

**Ballast**

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

**Power Distribution Harness**

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

**Ground**

The ground plate has two connected studs. The left stud is used to attach the earth ground from the outlet. The right stud is the attachment point for the individual ground wires from the high voltage components.

## 7.7 Refrigeration (Chiller) System (Optional)

**Refrigeration Cycle**

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

**Temperature Control**

The evaporator fan runs continuously to circulate air within the cabinet. A temperature sensor located near the evaporator measures the temperature of air entering the evaporator. When this temperature is above the temperature setting in the control (see **8.6 Options**), 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.

## 7.8 Ventilation System (Optional)

On vendors equipped with a ventilation system, a continuously running fan circulates air through the vendor and exhausts through the back of the cabinet.

## 8. SERVICE MODE (on Control Board)

Access the service mode by pressing the mode switch on the control board. After displaying any errors, the first function is displayed. Press # to scroll through the functions. Return to vend mode by closing the door or pressing the mode switch.

<b>TOP LEVEL SERVICE MODE FUNCTIONS</b>	
<b>DISPLAY</b>	<b>DESCRIPTION</b>
CHANGE	Coin Pay Out
TUBE FILL	Coin Deposit
TEST VEND	Test Motors
PRICE	Set Prices
ACCT DATA	Historical Vend Data
OPTIONS	Options
STS	Space To Sales
BLOCKING	Sales Blocking
TIME/DATE	Set Time and Date
LANGUAGE	Set Display and Programming Language

### 8.1 Change

The **CHANGE** function is used to dispense coins from the changer. Press **1** through **4** (for a 4-tube changer) to dispense from each coin tube, starting with the lowest denomination.

<b>CHANGE FUNCTION</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
1	Dispenses lowest coin denomination
2	Dispenses second lowest coin denomination
3	Dispenses third lowest coin denomination
4	Dispenses highest coin denomination

### 8.2 Tube Fill

The **TUBE FILL** function is used to add coins to the changer through the coin slot. When a coin enters a tube in the changer, the denomination value of that tube and the number of coins in the tube are displayed. Using the tube fill function allows the control to keep track of how much money is available in the coin tubes to make change. This can be especially important when large bills or high denomination coins are used.



## 8.3 Test Vend

The **TEST VEND** function is used to test or configure the vend motors. When a motor is tested, it will run briefly to confirm that it is working properly. This is useful for troubleshooting and also to confirm the configuration.

All vend motors must be recognized, or *configured*, in the computer's memory. Pressing \* 2 will automatically check for the presence of a motor at every possible motor position. The *motor matrix* is the record of all positions where a motor is detected (see **9.3 Tray Configuration**). When motors are moved, removed or added, the motor matrix must be reconfigured. After configuration, the total number of motors is displayed.

<b>TEST VEND FUNCTION</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
XX	Test the selected motor
*X	Test all motors on the selected tray
*0	Test all motors in the vendor
*1	Test for missing matrix motors
*2	Configure the motor matrix

## 8.4 Price

The **PRICE** function is used to enter the prices for the products in the vendor. Enter the number of the selection to edit the price. Enter the four digits of the price (example: \$1.25 would be **0 1 2 5**). Note that the price must be divisible by the smallest denomination coin. Note that there are several options for saving the price.

<b>PRICE FUNCTION</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
XX	Edit the price for selection XX
**	Save the price for the selection
*1	Save the price for all selections on the tray
*2	Save the price for all selections in the vendor
* Hold	Exit without saving at any time

## 8.5 Accounting Data

The **ACCT DATA** function displays both historical and resettable values for cash and vends. Historical values do not reset. To set the resettable values to 0, press **5** and then press and hold **\***.

<b>ACCOUNTING DATA FUNCTION</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
1	Displays historical vends
2	Displays historical cash
3	Displays resettable vends
4	Displays resettable cash
5	Enter reset function
* Hold	Resets values while "RESET" is displayed

## 8.6 Options

The **OPTION** functions are as follows:

<b>OPTION MODE</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
1	Bill escrow
2	Forced vend
3	No cheat
4	Lotto
5	Calibrate sensor circuit
6	Change banner message
7	Displays the current temperature reading
8	Set the refrigeration cut-in temperature
9	Bill changer
0	Serial number
A	Vend delay
G	Change operation of "G" Tray

### 8.6.1 Bill Escrow

Press **1** to display the state of the Bill Escrow option. Press **1** again to toggle states. Press \* to save and return to **OPTIONS**. Bill escrow is used only for older model bill validators. When bill escrow is enabled, the validator holds the last bill inserted when credit exceeds the highest priced selection. This bill can be returned when the coin return is pressed, provided that Force Vend is not enabled (see below). The balance of the credit will be returned in coins.

### 8.6.2 Force Vend

Press **2** to display the state of the Force Vend option. Press **2** again to toggle states. Press \* to save and return to **OPTIONS**. When force vend is enabled, the customer cannot get credit returned until a selection is made. This feature is not active during the first ten minutes after closing the door.

### 8.6.3 No Cheat

Press **3** to display the state of the No Cheat option. Press **3** again to toggle states. Press \* to save and return to **OPTIONS**. When no cheat is enabled, the vendor will not vend the product unless there is adequate change. Credit is automatically refunded. When No Cheat is disabled, the vendor will vend the product, and attempt to pay back the correct change. If a coin tube does not have sufficient coins, the customer will lose the credit.

### 8.6.4 Lotto

When Lotto is enabled, the vendor will refund the credit after a preset number of vends. Press **4** to display the state of the Lotto option. Press **4** again to toggle the states between ON and OFF. If OFF is selected, press and hold \* to save and return to **OPTIONS**. If ON is selected, press and hold \* to change Lotto count. The count number can be set from 01 to 99. Press and hold \* again to save Lotto count and return to **Options**.

## 8.6.5 Calibrate Sensor

Press **5** to calibrate the vend sensor. “**WAIT**” and a series of numbers will be displayed for approximately one minute. Calibration parameters will be briefly displayed. The parameters will be labeled as “Pulse”, “Basis”, and “PWM”. Acceptable parameters for the “Pulse”, “Basis”, and “PWM” are as follows: Pulse - 7-14, Basis - In the 100’s, PWM - 375-675. The control automatically returns to **OPTIONS** when calibration is complete. To exit before the calibration is complete, press \* or the mode switch. The sensor should be calibrated and tested each time the vendor is placed in a new location or whenever a sensor component (emitter, detector, detector housing, or control board) is replaced (see **4.4.5 Calibrating the Sensor** for the procedure for vend testing after calibration).

## 8.6.6 Banner Message

Press **6** to enter the message option. This option will allow the user to enter a message that will scroll across the display while the vendor is idle. The display will show “**BANNER IS**” and the programmed banner message, followed by “**CHANGE Y/N.**” Press **1** to change within five (5) seconds, or press any other key to exit. If **1** is selected the display will show “**1 FOR NEW, 3 FOR DEFAULT. PRESS 1, 3**”. Press **1** to change the message or **3** to revert back to “**AMS SENSIT**”.

Choose the message characters on the Keypad Mapping Chart below, and key in the corresponding entry from the chart. Note that mistakes can be corrected by pressing \* **H** (backspace). The maximum length of a message is thirty-six (36) characters. Press # to save the new message.

One horizontal line will appear on the display where the next character will be entered. This will change to two horizontal lines when \* is pressed once, and three horizontal lines when \* is pressed twice. In the event the \* key is pressed too many times, continue to press \* until the correct number of horizontal lines appear on the display.

KEYPAD MAPPING CHART					
Character	Enter	Character	Enter	Character	Enter
<b>A</b>	A	<b>T</b>	* 3	-	8
<b>B</b>	B	<b>U</b>	* 4	<b>ENTER</b>	#
<b>C</b>	1	<b>V</b>	* E	,	9
<b>D</b>	2	<b>W</b>	* F	.	0
<b>E</b>	C	<b>X</b>	* 5	<b>BACKSPACE</b>	* H
<b>F</b>	D	<b>Y</b>	* 6	*	* 7
<b>G</b>	3	<b>Z</b>	* G	/	* 8
<b>H</b>	4	<b>1</b>	** 1	<	* #
<b>I</b>	E	<b>2</b>	** 2	>	* 9
<b>J</b>	F	<b>3</b>	** 3	=	* 0
<b>K</b>	5	<b>4</b>	** 4	!	** A
<b>L</b>	6	<b>5</b>	** 5	?	** B
<b>M</b>	G	<b>6</b>	** 6	:	** C
<b>N</b>	* A	<b>7</b>	** 7	;	** D
<b>O</b>	* B	<b>8</b>	** 8	#	** E
<b>P</b>	* 1	<b>9</b>	** 9	\$	** F
<b>Q</b>	* 2	<b>0</b>	** 0	%	** G
<b>R</b>	* C	<b>SPACE</b>	H	&	** H
<b>S</b>	* D	<b>+</b>	7	'	** #

## 8.6.7 Temperature

Press **7** to display the current temperature in the cabinet. The temperature will appear for two seconds.

## 8.6.8 Refrigeration Temperature Setting

Press **8** to set the refrigeration cut-in temperature. The temperature will be displayed in both Celsius and Fahrenheit. Press **1** to increase the cut-in temperature. Press **2** to decrease the cut-in temperature. Visi-Combo Food vendors are equipped with Health and Safety software that is automatically enabled when refrigeration cut-in temperatures are set at 40-41°F/4-5°C. Press **\*** to save and return to **OPTIONS**.

## 8.6.9 Bill Changer

Press **9** to display the state of the bill changer option. Press **9** again to toggle states. Press **\*** to save and return to **OPTIONS**. When the bill changer function is enabled, the vendor will act as a bill changer. Insert a bill in the validator, then press the coin return to dispense change. The bill changer function will override the force vend function, which normally prevents credit from being returned until a selection is made.

## 8.6.10 Serial Number

Press **0** to enter the serial number option. This option will allow the user to enter a serial number which will appear in the Dex data. The controller will prompt the user to "**Enter Number**" or "**Change Y/N**". Press **1** to change within five (5) seconds. Then the user can enter the serial number. Press **2** to exit without changing the serial number.

## 8.6.11 Vend Delay

This option continues to run the selected vend motor for 350 milliseconds after the sensor detects the product, changing the final position of the helix. Some products, when loaded onto the trays, will benefit from having the helix at a different position. Careful consideration must be given to how a product rests in the helix to avoid being able to be easily shaken out of the helix.

Press **A** to display the state of the vend delay option. Press **A** again to toggle the state between YES and NO.

## 8.6.12 G Tray Setup

This option allows the user to set up tray 7 for either a Gum and Mint unit (which uses a switch on the vend motor to stop after one motor revolution), a seventh tray or a 1.5" Helix tray. Press "**G**" to display the state of the switch function. The display will read "**G-SWITCH**" followed by either "**Y**" or "**N**". **Y** indicates the vendor is set up for the gum and mint unit, **N** sets tray 7 to operate similar to trays 1 through 6, and the 1.5" Helix tray.

## 8.7 Space To Sales

The **SPACE TO SALES** (STS) feature allows the linking of multiple selections which contain the same product. This prevents consumers from vending a particular selection until it is empty (and leaving other selections containing the same product full). This is especially important for perishable products which are typically loaded with the soonest expiration dates at the front of the helix. STS is limited to selections that are directly beside each other and on the same tray.

Press **1** to display "**DFLT STS?**", press **\*** to set STS to the default value (selections linked only to themselves) and exit.

Press **2** to display "**CLEAR STS?**", press **\*** to clear all links and exit. Caution: this will result in selections not linked to anything, including themselves. Selections **will not vend** under this condition! Press **1** to display "**DFLT STS?**", press **\*** to set STS to the default values and exit.

Press **3** to display "**VIEW STS**". When a selection is entered, it is displayed on the left and any linked selection(s) blink on the right in numeric order (A2, A3, etc.). If a selection is not linked, it will display "**NONE**" and will not vend (see item **2** above). Press \* to exit.

Press **4** to display "**EDIT STS**". To establish a link, enter a selection number of the group to be linked. This will be displayed on the left and linked selections or the word "**NONE**" will be displayed on the right. Add additional selections to the link by entering the appropriate selection. The word "**NONE**" will disappear and the additional selection(s) will blink on the right of the display. Delete selections by entering the linked-to selection number, keeping in mind that a selection must remain linked to itself. All selections to be linked must be side by side and in the same tray. Press \* to return to the "**EDIT STS**" display, press \* again to return to the "**STS**" prompt.

Linking Example:

To link **B3** through **B6**:

1. While STS is displayed, press the **4** key. "**EDIT STS**" will be displayed.
2. Press **B3** (the leftmost selection). "**B3 - NONE**" will be displayed
3. Press **B4**. "**B3 - B4**" will be displayed.
4. Press **B5**. **B3** will be displayed on the left and **B4** and **B5** will alternate on the right.
5. Press **B6**. **B3** will be displayed on the left and **B4**, **B5** and **B6** will alternate on the right.
6. Press \* to save and exit.

## 8.8 Blocking

The **BLOCKING** function is used to enable sales blocking for the entire machine by day for two (2) selected time periods per day.

Press **1** to display the setting for each day of the week. Press and hold \* to turn blocking ON or OFF for that day. Press \* to save the setting and advance to the next day.

Press **2** to set the first time period. Set the time when the vendor will be OFF. Press \* to toggle from hours to minutes. Press and hold \* to save the setting. Then set the time when the vendor will be back ON. Again, press and hold \* to save the setting.

Press **3** to set the second time period, using the same procedure as above.

Note that the vendor will not vend during both time periods each day that blocking is enabled. Money is automatically returned during these periods.

<b>BLOCKING MODE</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
1	Select active sales blocking days
2	Edit first blocked time period
3	Edit second blocked time period
*	Enter value and advance
* Hold	Save and exit

## 8.9 Time/Date

The **TIME** function sets the time, date, year, and Daylight savings.

Press **1** to set the time and date. "**HH.MM**" is displayed, followed by the 24-hour time in hours and minutes. Enter the current hour and minutes, then press \* to save the entry and advance to date. "**MM/DD**" is displayed, followed by the month and day in 2 digit numbers. Enter the current month and day, then press \* to save the entry and advance to year. "**WD/YY**" is displayed, followed by the day of the week and last two digits of the year. Enter the current year. The day of the week is set automatically. Press \* to exit.

Press **2** to display the current daylight savings settings. Press \* to toggle between America, Australia, Europe and off. Press and hold \* to save the displayed setting.

Press **3** to enable or disable the clock. Press \* to toggle between on and off. Press and hold \* to save the displayed setting. When the clock is enabled, the time will be displayed intermittently with the scrolling message. Note: the clock cannot be disabled if the Health and Safety feature is enabled (see section 8.6.8)

<b>TIME MODE</b>	
<b>ENTRY</b>	<b>DESCRIPTION</b>
1	Set the time, date and year
2	Enable / disable daylight savings
3	Enable / disable clock
*	Toggle between ON and OFF
* Hold	Save and exit

## 8.10 Language

The **LANGUAGE** function allows the point of sale messages to be displayed in English, Israel, French, Spanish, German, Italian, Dutch or to change the actual message. Service mode messages remain in English or Spanish, depending on the software version.

When **LANGUAGE** is selected, the display will show “**LANGUAGE**—“ followed by the current language setting. When \* is pressed, the display will scroll through the various options. Pressing \*\* will set the display language. Note: because of the inability of the display to produce Israeli letters, only numbers are used for selectios in Israel. Messages will remain in English.

Select “**PROGRAMMED**” allows the point of sale messages to be edited Use the Keypad Mapping Chart in section 8.6.6 for reference. Because there are no default settings for these messages, AMS recommends not editing the point of sale messages. The following is a list of the factory programmed messages:

1. PLEASE MAKE ANOTHER SELECTION
2. PLEASE USE EXACT CHANGE
3. REMOVE PRODUCT
4. MOTOR OK
5. SOLD OUT
6. NOT HOME
7. NO MOTOR
8. JAMMED
9. SELECTIONS BLOCKED
10. OUT OF ORDER, 1
11. OUT OF ORDER, 2
12. OUT OF ORDER, 3

## 9. TRAY ADJUSTMENTS

### 9.1 Snack, Candy, and Food Tray Removal and Installation

#### 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.
3. 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. Before installing the tray, make sure the black plastic covers are on the tabs on each side at the back of the tray. To install the tray, slide the tray all the way to the rear. It will automatically drop into position. Make sure the harness slack is draped to the outside of the rail.

### 9.2 Bottle Tray Removal and Installation

#### Removal

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

#### Installation:

**CAUTION:** An incorrectly installed tray can disengage from the rails and fall when extended.

(Note: It is recommended that installation be performed by at least two people)

1. Fully extend the slide rails in the cabinet and hold in position.
2. Move the ball carriers out to the ends of the slide rails (see Figure 9) and hold in position.
3. Route the tray harness over the rail in the cabinet and into the right column. Connect the tray harness to the appropriate receptacle.
4. Align the rails on the sides of the tray with the extended slide rails and insert. Continue to hold the ball carriers and slide rails in place until the rails on the tray are firmly engaged in the ball carriers.
5. Push the tray in completely to lock the rails together.
6. Carefully extend the tray to check for proper installation. Support the tray to prevent falling if the rails are not properly engaged. Visually inspect the rails, and gently pull the front of the tray side to side to make sure the rails will not disengage.

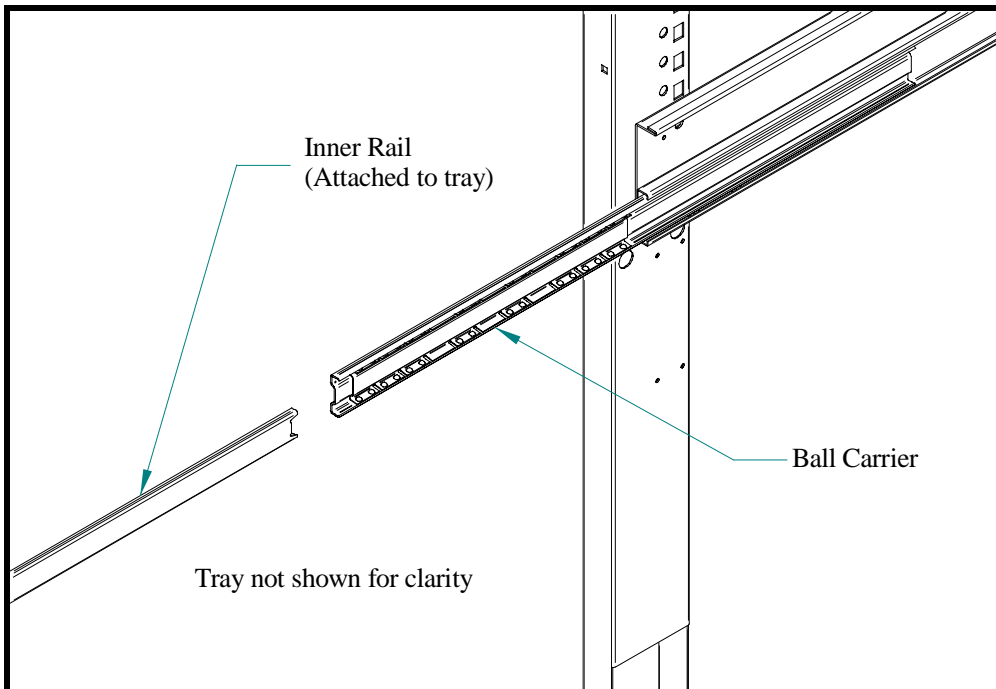


Figure 9. Bottle Tray Rails

### 9.3 Bottle Tray Helix Replacement

The helix adapters on the bottle trays do not snap in and out as they do on the snack and candy trays. Due to the weight of the bottles, the adapters are retained in the motor by a screw. This screw is located on the back of the motor and is screwed into the split in the back end of the helix adapter. The screw must be removed before the helix adapter can be pulled out of the motor housing. When reinstalling the helix adapter, the screw should be replaced. The screw should be inserted just until the head contacts the helix adapter. Do not tighten the screw any further. **Failure to replace the screw may result in the helix of a loaded column pulling free from the motor and falling out of the tray while the tray is being loaded.**

### 9.4 Tray Positioning

The trays can be moved to different vertical positions within the cabinet. They are adjustable in 1 inch increments. To reposition a tray, first remove the tray for access to the support rails. Each rail is held in place by screw located at the front of each rail. The front of the rail can now be lifted upward and disengaged from the vertical column. Pull forward to disengage the rail from the slots at the back of the cabinet.

To reinstall the rail in the new position, locate the rear “T” slots that will be used. Then push the two tabs at the back of the rail into the appropriate slots. Engage the hooked tabs at the front of the rail into the appropriate rectangular holes and pull down. Make sure the rail is level. Align the round hole in the rail with the hole in the column and replace the screw.

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.



## 9.5 Tray Configuration

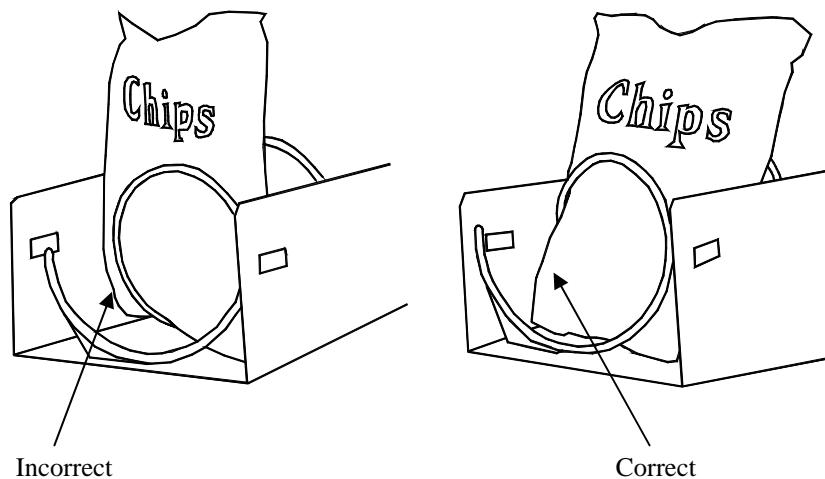
All trays except bottle trays can be configured by the user to hold 5 to 10 selections (39" cabinets) or 4 to 8 selection (35" cabinets). Typically the vend columns are set to single (2.66") or double (5.32") width, to be used with the standard small or large helices, respectively. Single and double 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 or 10 sets of motor connections depending on the model. The first set of connections (at the end of the harness) is position 1, followed by 2, 3, and so on. The last set (nearest the wire jacket) is position 8 (35" cabinets) or 0 (39" cabinets). 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 2). Each set of connectors has a wide and a narrow connector, corresponding to a wide and a narrow tab on the back of the motor.
6. Place the correct label in front of each column, according to the motor connections used.
7. Reconnect the harness, routing it over the rail and through the back of the column.
8. Reinstall the tray.
9. After changing the tray configuration, it will be necessary to reconfigure the motor matrix. In the service mode, advance to **TEST VEND** and press \* 2 (see **8.3 Test Vend**).

## 9.6 Large Bag Vending Instructions

To avoid large bag 'hang-ups', the bag must be loaded 'left corner first' into the helix. The bottom left corner of the bag should not be behind the helix, it should be in front of the helix (see Figure 10). An incorrect loading may cause the bag to fall top first, which could lead to a hang-up between the tray and the glass. Loading the bag correctly prevents the bag from falling top first.



**Figure 10. Large Bag Vending**

## 9.7 Pusher Bar Installation

The candy pusher is an adjustable bar that mounts to any tray divider to keep tall candies from falling sideways (see Figure 11). Four pusher bars are provided with the standard glass front vendor.

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

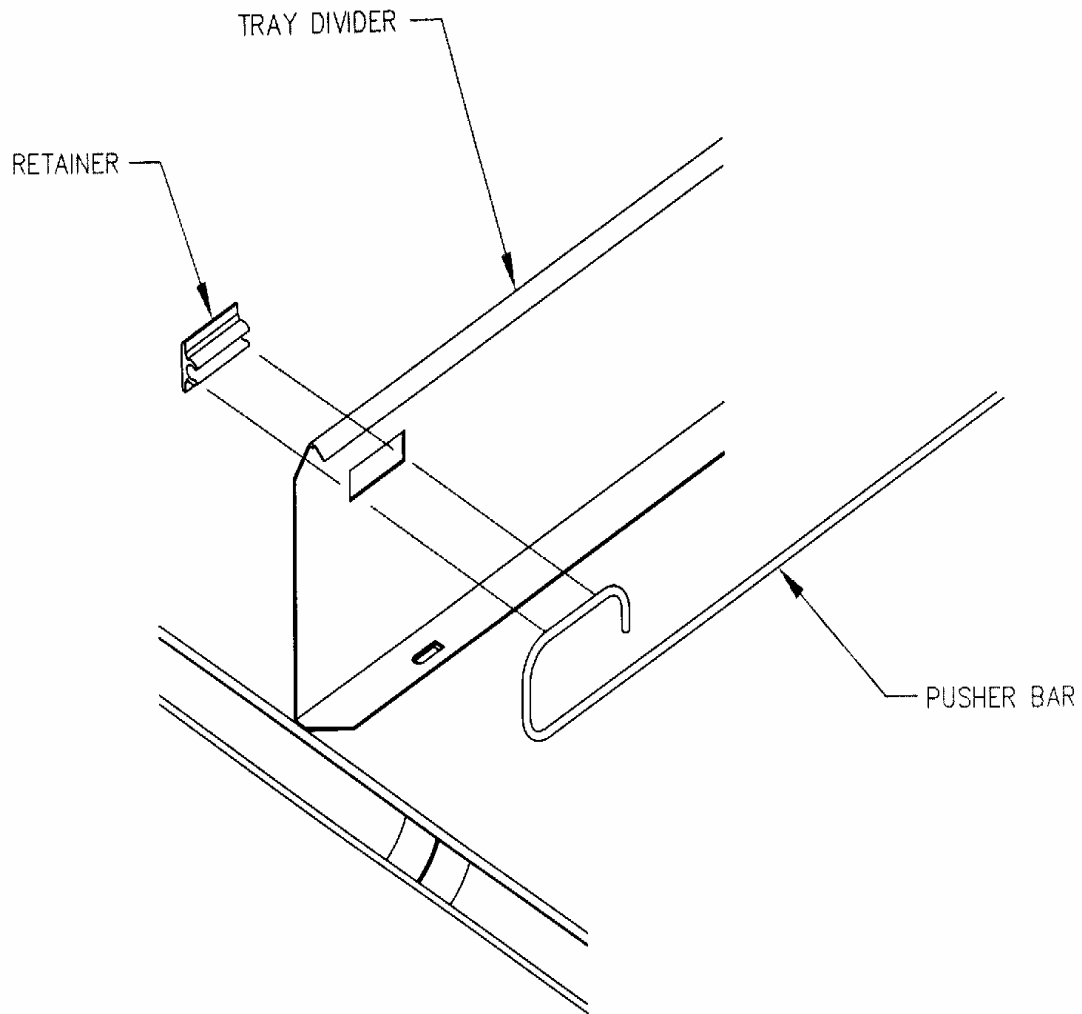


Figure 11. Pusher Bar Installation

## 9.8 1.5" HELIX TRAY ADJUSTMENT AND LOADING

### 9.8.1 GENERAL INFORMATION

Some vendors are equipped with a 1.5" Helix Tray designed to vend small candy, gum and mint packs. The 1.5" Helix Tray can also be ordered separately; the following part numbers describe what installation kits are available:

Part No. 21562 – Kit, 1.5" Helix Tray (35")
Part No. 21563 – Kit, 1.5" Helix Tray (39")
Part No. 21564 – Kit, 1.5" Helix Tray, Reduced Depth (35")
Part No. 21565 – Kit, 1.5" Helix Tray, Reduced Depth (39")

### 9.8.2 TRAY ADJUSTMENT AND LOADING

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

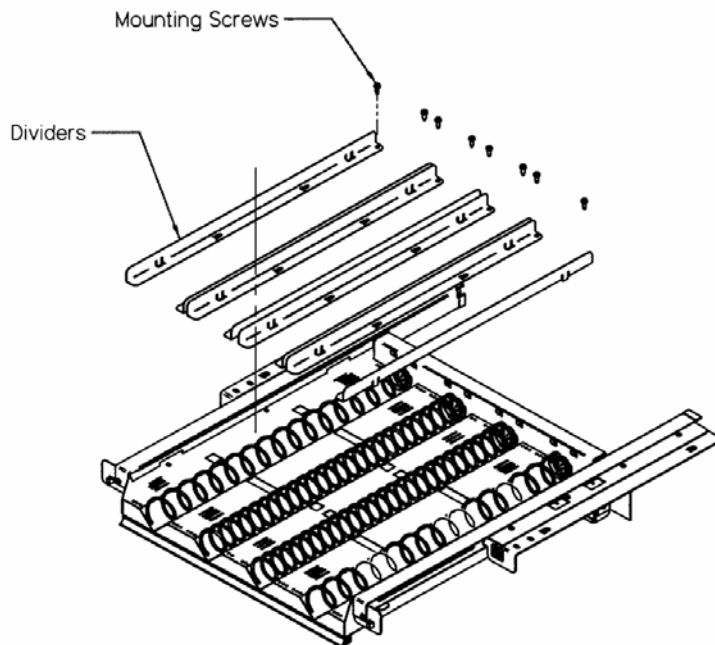
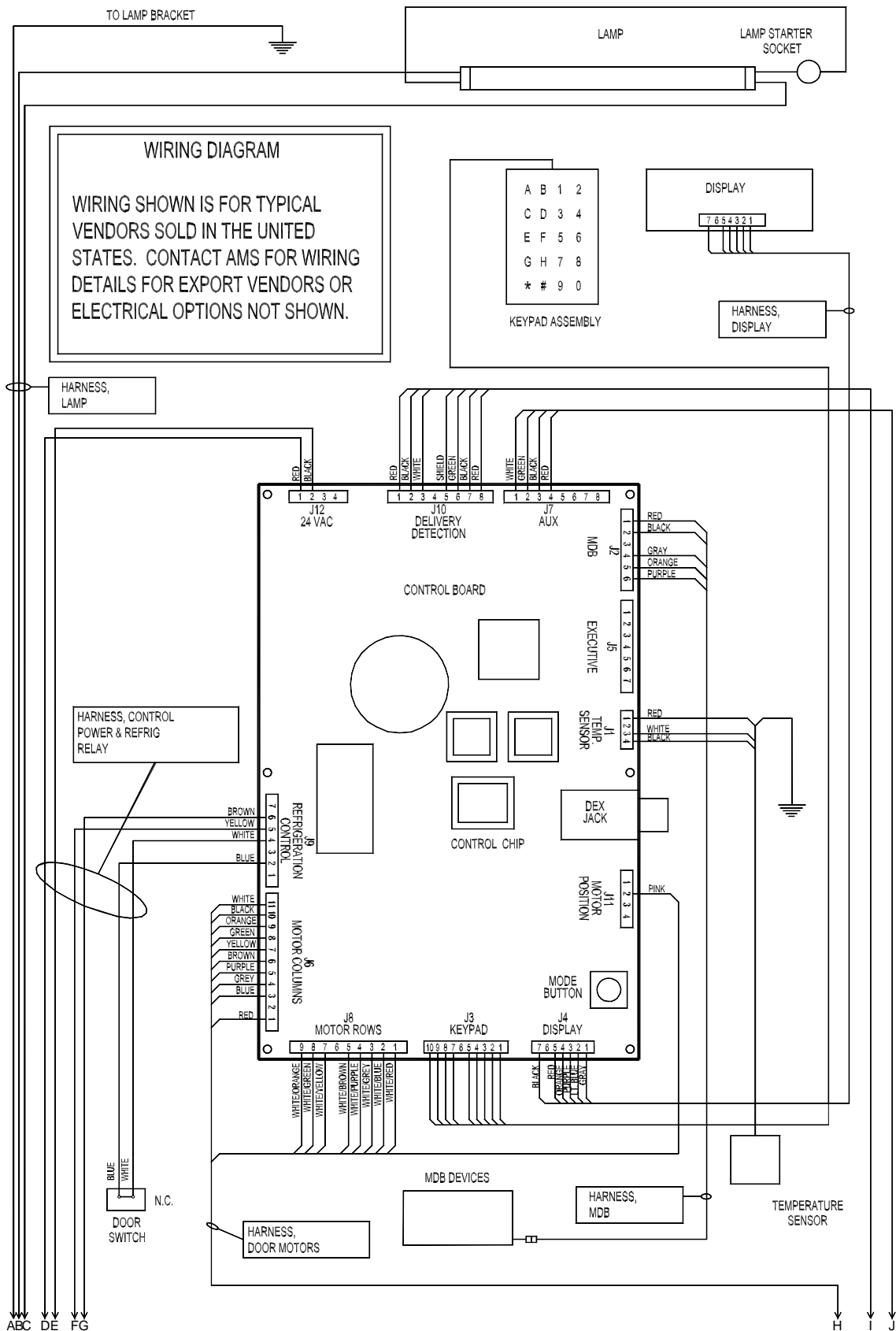
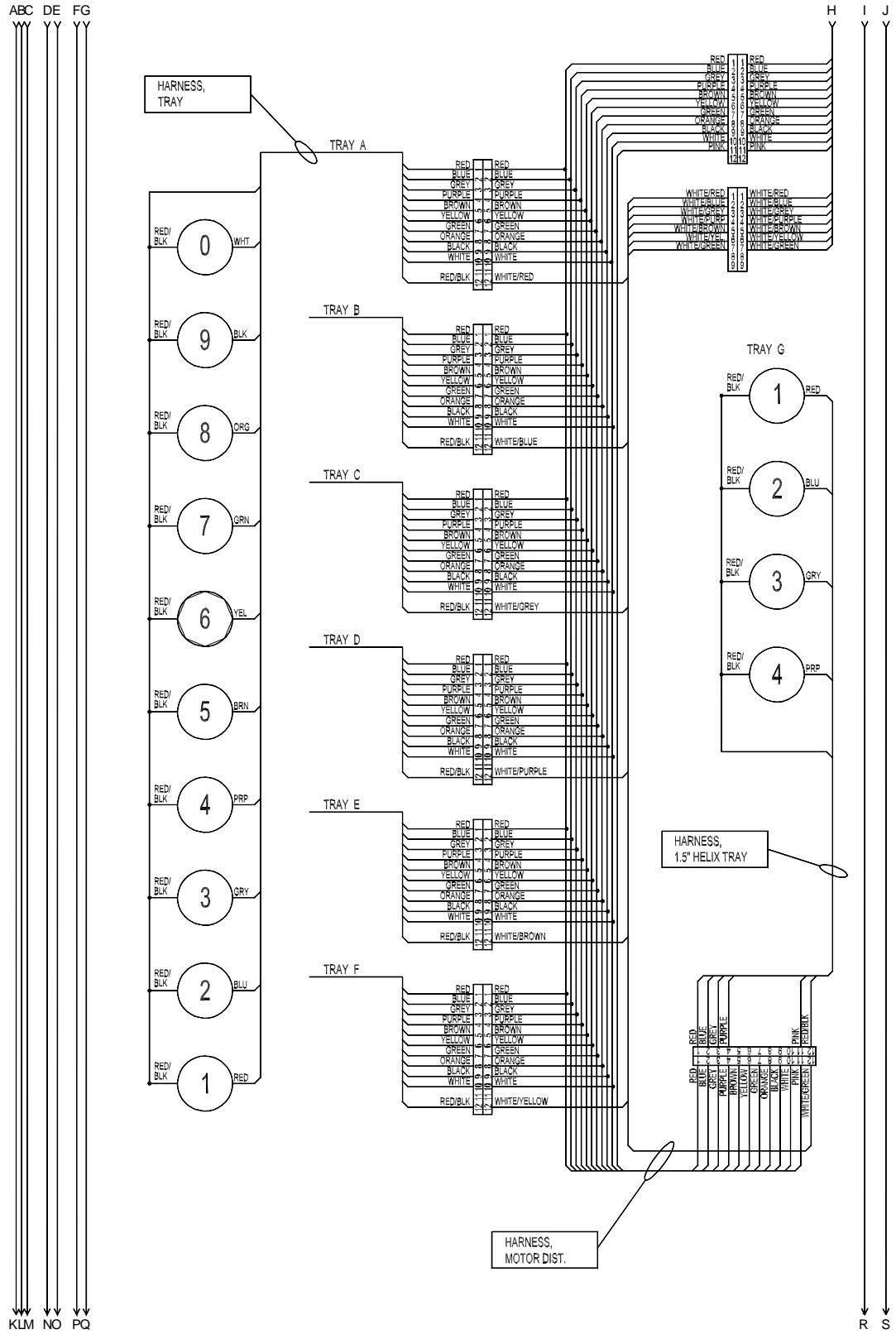


Figure 12. 1.5" HELIX TRAY

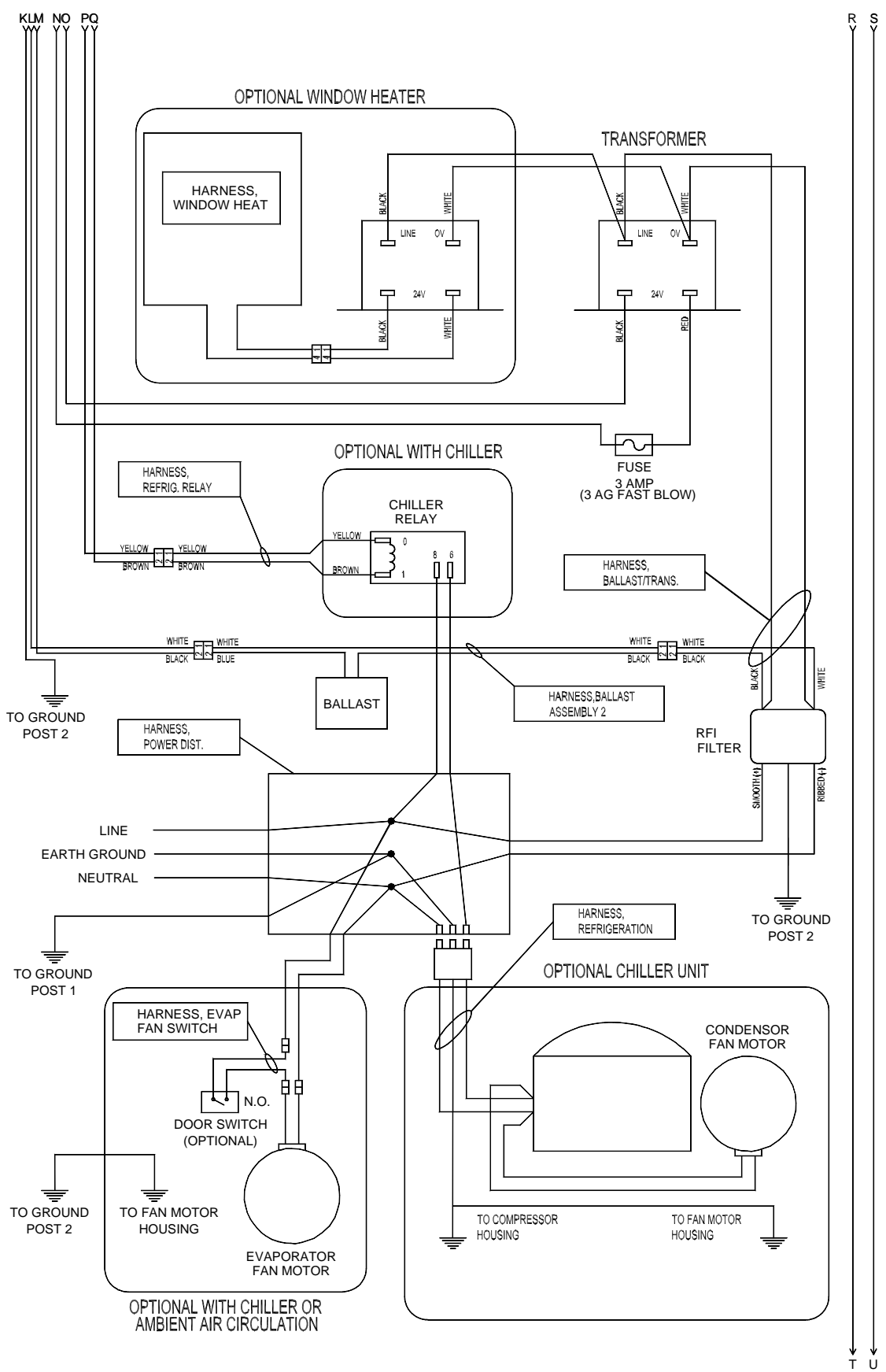
# 10. WIRING DIAGRAM



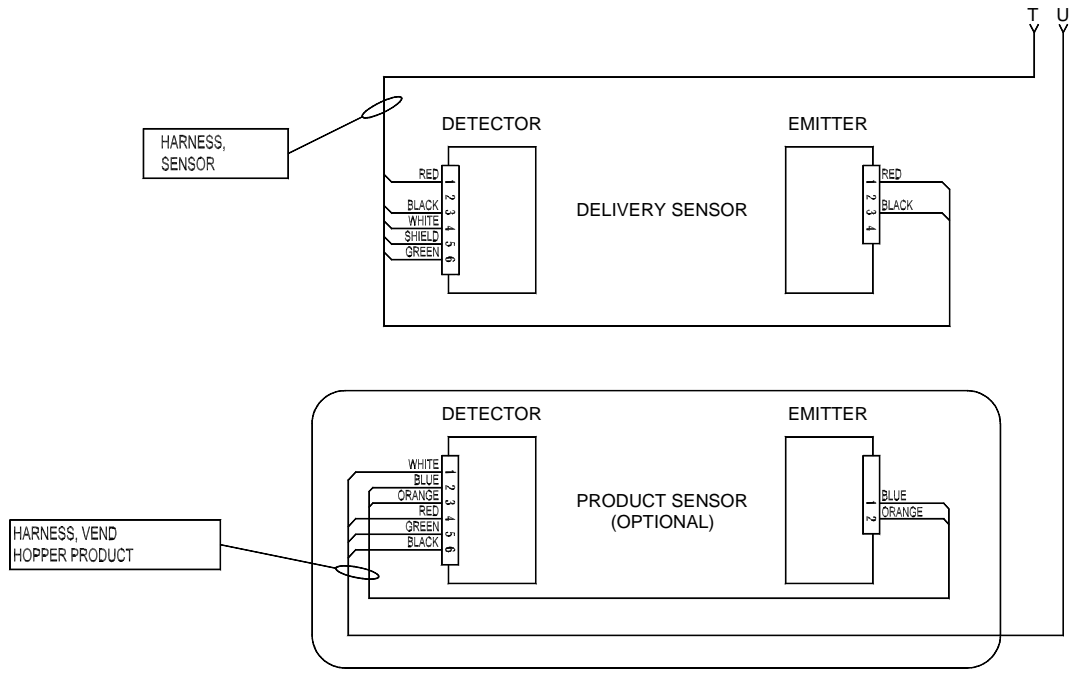
Wiring Diagram, Sheet 1 of 4



Wiring Diagram, Sheet 2 of 4



Wiring Diagram, Sheet 3 of 4



**Wiring Diagram, Sheet 4 of 4**

## 11. DEX Fields Supported

<u>DEX Field</u>	<u>Description</u>
ID101	Machine Serial Number
ID102	Machine model number
VA101	Value of all paid sales since installation
VA102	Number of all paid vends since installation
VA103	Value of all paid sales since last reset
VA104	Number of all paid vends since last reset
MA501	Cold Food
MA502	Total cold food paid sales since installation
MA503	Total cold food paid sales since reset
CA302	Value of cash to coin box since reset
CA303	Value of cash to tubes since last reset
CA304	Value of bills since reset
CA401	Value of cash dispensed since reset
CA402	Value of cash manually dispensed since reset
CA801	Value of cash overpay since reset
CA1001	Value of cash filled since reset
VA1403	Number of bills to stacker since reset
TA203	Value of vend token sales since reset
TA204	Number of vend token vends since reset
DA203	Value of card sales since reset
DA204	Number of card sales since reset
PA101	Product number
PA102	Product price
PA103	Product identification
PA203	Number of product vended since reset
PA204	Value of paid product since reset
EA201	Event identification, one free product vends
EA202	Number of events since last reset
EA204	User defined field, value
EA201	Event Identification, Promotion vends
EA202	Number of events since reset
EA204	User defined field, value
EA201	Event Identification, tube value (.05, .10, .25, 1.00)
EA204	User defined field, value
EA301	Number of data reads since installation
EA302	Date of this read out
EA303	Time of this read out
EA304	This terminal/interrogator identification
EA305	Date of last read out
EA306	Time of last read out



## 12. OPTIONAL EQUIPMENT

**Part No. 21562 – Kit, 1.5” Helix Tray (35”)**

**Part No. 21563 – Kit, 1.5” Helix Tray (39”)**

**Part No. 21564 – Kit, 1.5” Helix Tray, Reduced Depth (35”)**

**Part No. 21565 – Kit, 1.5” Helix Tray, Reduced Depth (39”)**

A four selection helix tray that mounts below the bottom tray in glass front vendors.

**Part No. 20449 - Kit, Candy Pusher**

The candy pusher is an adjustable bar that mounts to any tray divider to keep tall candies from falling sideways. Four of these are provided with the standard glass front vendor.

**Part No. 20450 - Kit, Helix Splitter**

The helix splitter is a plastic divider that can be inserted into a small helix to divide each coil into two product openings, thereby doubling product capacity. The helix splitter works best with narrow products such as Life Savers.

**Part No. 20535 - Kit, Cup Rail, Small Helix**

**Part No. 20536 - Kit, Cup Rail, 4” Helix**

**Part No. 20723 - Kit, Cup Rail, 3” Helix**

The cup rail is a flat plastic bar that can be placed inside the helix to provide a flat surface for rigid flat-bottomed packages that otherwise do not stay upright when placed in a helix. Examples would be drink boxes or bottles, or individual serving cups of soup, pudding, etc.

**Part No. 20675 - Kit, Ventilator, 110V (35”)**

**Part No. 20676 - Kit, Ventilator, 110V (39”)**

The ventilator kit provides outside air circulation through the vendor.

**Part No. 20575 - Kit, Chiller, 110V (35”)**

**Part No. 20574 - Kit, Chiller, 110V (39”)**

The chiller kit is a refrigeration unit that can be used to convert an ambient vendor into a chilled vendor.

**Part No. 20664 - Kit, Banking Spacer**

**Part No. 21166 - Kit, False Leg**

False leg is to be installed on all machines having 2 or more bottle trays to prevent machine tipping during loading. **Failure to install the false leg could result in serious injury.**

**Part No. 20665 - Kit, Window, Dual Pane Glass (35”)**

**Part No. 20427 - Kit, Window, Dual Pane Glass (39”)**

The dual pane glass window is insulated and features a thicker pane on the exterior side.

## **13. 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.

