

January 2007

HUSSmann®

**INSTALLATION & SERVICE
INSTRUCTIONS
FOR**

HGM-1, 2 & 3 BS,TS SELF-CONTAINED

Medium Temperature Glass Door Merchandiser

HUSSmann®

First Call for help (US and Canada):

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Soporte Técnico y Asistencia (Mèxico):

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**P/N OII – HGM BS-TS Self-Contained
January 2007**

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Introduction –

The HGM-BS/TS models are self contained, medium temperature, vertical glass door merchandisers designed for the display of dairy products, deli items, beverages, and wine. Design features include self-closing glass doors, efficient foamed in place non-CFC insulation, and balanced R-134a refrigeration systems for energy saving performance.

Inspection upon receipt –

Upon receipt of the cabinet, carefully examine the crating for damage. If crate is damaged, make a note on the delivery ticket before signing. Carefully remove shipping crate and examine cabinet for “concealed” damage. If damage is found, contact the delivery carrier immediately and have his agent prepare an inspection report for the purpose of filing a claim. **THIS IS YOUR RESPONSIBILITY.**

Proper Location & Clearance –

Avoid locating the cabinet where direct sunlight would shine into the fixture or where drafts from air conditioning grills, fans and open doors could affect its operation.

Because the condensing unit is located at the top of the HGM-TS, at least twelve (12) inches of clearance should be allowed at the rear of the cabinet and at the top of the case. This clearance is necessary to provide free air movement to and from the condenser for maximum operating efficiency.

Because the condensing unit is located on the bottom of the HGM-BS, at least twenty four (24) inches of clearance should be

allowed in front of the case and six (6) inches of clearance at the rear to provide the necessary free air movement to and from the condenser.

INITIAL SET-UP Skid –

The skid should be left on the case until it is near its final location. The skid provides protection for both case and floor. The skid is removed by raising one end of the case approximately six inches. Block securely and remove the two skid bolts on the raised end. The procedure is repeated on the opposite end. When the skid bolts are removed, the case may be slid off the skid.

Leg Installation – Top Mounts only

After the case is near its final location and the skid has been removed, the NSF approved legs should be installed. The legs are packaged inside the cabinet. Replace the tape and door blocks. To install legs, raise one end of the cabinet approximately eight (8) inches, block securely, and install two legs.

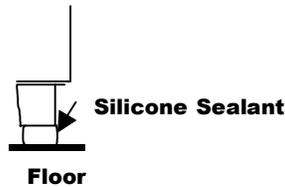
The leg mounting plates are factory installed and contain a ½ x 13 tapped hole to mate with the leg assembly. The procedure is repeated on the opposite end. The 3-door requires legs in the center. With cabinet legs installed, the cabinet should be positioned in its final location and leveled.

The cabinet is leveled by turning the bottom section of each leg. The self-closing doors require the cabinet to be properly leveled. End to end leveling will make the door (s) close with uniform speed and tightness. A slight pitch from front to rear is desirable.

THE CABINET BACK SHOULD NEVER BE HIGHER THAN THE FRONT.

Leveling and Sealing – Bottom Mounts only

The case can be leveled by shimming under the cabinet base frame, or by installing optional levelers. The self-closing doors require the cabinet to be properly leveled. End to end leveling will make the door (s) close with uniform speed and tightness. A slight pitch from front to rear is desirable.



Condensate Pan –

An electrically heated (300w, 115v) condensate pan is provided to evaporate the defrost water. The heated condensate pan slides onto the slide plate on the cabinet bottom on TS cases and has a thermistor. On BS cases the pan is screwed to the base of the case. The pan is removable for cleaning. A vinyl drain tube is provided for connection to the heated condensate pan. The drain must be trapped to guard against drain line freezing and for good sanitation practice.

Bottom Louvered Panel Removal –

The louvered panel provides access to the condensing unit and the electrical box.

Remove panel by removing the shipping screw (s) at bottom and lifting up and pulling forward. Remove shipping screw on

electrical box to allow the electrical box to slide out for servicing.

Top Decorative Panel Removal –

The top decorative panel is removed by lifting up and pulling forward.

Shelves –

Each cabinet is provided with 4 cantilever shelves per door that are adjustable on 1-inch increments and are tiltable. Each cabinet also has one bottom shelf per door. These shelves have one-inch legs to allow proper airflow in the cabinet. Behind the shelves are wire flue spacers which also allow for proper airflow. All shelves and flue spacers are white, epoxy coated for durability and ease of cleaning. Shelves should be adjusted to desired operating height.

When loading product, into the cabinet, care should be taken not to load product so that it touches the evaporator coil cover. Do not extend product past the front edge of the shelf. Extending past the edge will seriously effect internal air flow through out the cabinet.

Shelves are UL rated for a maximum load of 123 lbs. **DO NOT OVERLOAD SHELVES.**

Air Distribution and Rear Flue Spacer –

Air is drawn through the evaporator from front to rear and is discharged down the back wall, returning up the face of the glass door to the return air grill. **NOTE:** Rear flue

spacer must be in place as this forms a discharge air flue at the back of the cabinet.

Cord Model	Plug Nema Amperage	Designation
HGM-1-BS/TS	15	5 – 15 P
HGM-2-BS/TS	20	5 – 20 P

Electrical Connections –

The HGM-1 and 2 cases are supplied with a supply cord as charted below with a grounding prong for operation on a 115v power supply. Do not remove the grounding prong under any circumstances. The HGM-3 requires hard wiring to a 30 amp, 115v circuit.

Serial Plate Information –

The serial plate is located in the upper left-hand corner of the case interior. It has all the pertinent information needed for proper electrical installation. The serial plate should not be removed for any reason.

NOTE: Connecting this unit to any electrical supply other than specified on the serial plate will void the warranty and may result in serious damage with its own service.

Electrical –

	Unit H.P.	Hz/Ph	Volts	Run Amps	Fuse Size	Ship Wt.
1-BS	1/3	60/1	115			
2-BS	1/2	60/1	115	12.5	20 amp	825
3-BS	3/4	60/1	115	20.5	30 amp	1096
1-TS	1/3	60/1	115			
2-TS	1/2	60/1	115	12.5	20 amp	776
3-TS	3/4	60/1	115	20.5	30 amp	1050

BTU Capacities –

Rating Temps °F

	BTU/HR	EVAP	COND	AMB
1-TS/BS	2300	+25	110	90
2-TS/BS	2570	+25	110	90
3-TS/BS	3620	+25	110	90

The HGM cases use R-134a refrigerant. Check the serial plate for the specific refrigerant charge used.

Initial Start-up and Loading –

- ❖ Check the cabinet thoroughly for loose nuts and bolts and electrical connections. Inspect the refrigeration lines for any visible damage or chafing.
- ❖ Replace the electrical box cover.
- ❖ Start the cabinet and allow to pull down to operating temperature before loading.

General Upkeep and Cleaning –

1. To insure good sanitation, appearance, and minimum maintenance, the cabinet should be cleaned and washed regularly as sue demands. Clean with mild detergent and warm water. **DO NOT USE AN ABRA-SIVE CLEANER OR STEEL WOOL AS THEN WILL MAR THE FINISH.**
 1. Under normal conditions, after the cabinet is installed and running, very little maintenance should be required. However, the following list of housekeeping practices will assure trouble-free operation.
 - a) Check operation of condenser fan motors. Fan blades must turn freely.
 - a) Check drain pan and heater to prevent accidental overflow.
 - a) Make sure doors are closing properly and that the gaskets seal.
 - a) Make sure all evaporator fan motors are running. These can be seen through grill inside cabinet.
- a) Clean the cabinet with a mild detergent. this will insure good sanitation, and minimize maintenance. Never use an abrasive as this could mar the finish.
 - a) A regular program should be set up for the cleaning of the fin-and-tube condenser. Normally, this cleaning is required every 3 to 4 months, but the individual store application may shorten or lengthen this time period. Dust and dirt accumulation can cause serious efficiency loss.
 - a) On the BS cases (bottom mounts) access is gained to the unit area by removing the louvered grille. The unit slides forward to facilitate cleaning and for service. Care should be taken when pushing the unit back in place to insure that the pullout coil does not become kinked or damaged in some way.

OPERATION AND MAINTENANCE

Power Switches –

The power switch is located at the electrical box which is behind the top decorative panel (TS models) or bottom louvered panel (BS models). The switch will shut off al power to the case.

Temperature Control –

The electrical temperature control is located in the electrical box. The temperature control does not have an ‘OFF’ position.

Adjustments may be made by turning the knob on the face of the dial. Turning it clockwise will give warmer temperatures while counter-clockwise will give colder temperatures.

There is also an adjustable temperature differential (the difference between the cut-in temperature and the cut-out temperature) located on the back of the temperature control cover. When adjusting the differential, the temperature setting may also have to be adjusted. See figure below for internal adjustment locations.

The control has a range of -20°F to $+220^{\circ}\text{F}$ with a differential of 1° to 30° . It is factory set for approximately 29°F with a 10° differential. The temperature should be checked with a thermometer other than the case thermometer after it is running to insure that the case is running at the proper temperature for the product.

A picture of A319 Electronic Temperature Control and Board Layout is located on the last page of this booklet.

Thermometer –

The thermometer is located by looking through the right hand door onto the right hand end of the fan plenum.

The thermometer will also warm up rather rapidly when the case door is held open for a time such as when the case is being restocked or a shopper is making a decision on a product. After the door is closed it will take some time for the thermometer to pull back down to the case temperature. The thermometer and temperature control sense discharge air temperature which is $5\text{-}10^{\circ}$ colder than the case temperature.

The thermometer may be replaced by removing the two screws securing it to the evaporator fan grill. Lower the evaporator coil cover by removing the brass thumb screws

located at each end of the cover, and backing out the thumb screws located along the front edge of the cover.

Follow the sensing lead from the thermometer until you locate the sensing element. Loosen the clamp securing the element and remove the element. Remove the thermometer. Assemble in the reverse order making sure you first thread the element through the hole in the evaporator fan grill. Cleaning of the sensing element may also be accomplished in this manner.

Electrical Enclosure –

For servicing convenience, access is gained by removing the access panel and electrical box cover. The cabinet supply breakers should be disconnected before removing the enclosure cover.

Lighting –

Electronically powered T-8 lamps located inside each doorway provide interior lighting. The tubes are enclosed in a patented lens system to maintain proper heat around the bulb for maximum light intensity and to protect the product in case of breakage. See the Commercial instructions for the lens removal, attached at the back of this booklet.

Each HGM model has a convenient ON/OFF switch so lights may be turned off to conserve energy during hours when the store is closed. The switch is located inside the cabinet above the left hand door. This switch only controls the lights. 115 volt power must be shut off at the main power supply source located within the store prior to starting any service or maintenance work.

Light ballasts are located on mullions of the door frames. See the Anthony ballast removal instructions at the back of the booklet.

_____ –

Commercial Doors

See Door Instructions at the back of this booklet.

Refrigeration –

As stated previously, these cases are self-contained with the condensing unit mounted at the top or bottom. They are equipped with a hermetic compressor and a capillary tube. The condenser is of fin and tube construction and should be periodically cleaned to maintain efficient operation.

If it should become necessary to leak test the system, please adhere following notice:

NOTICE – Because of the CFC atmospheric considerations being taken today, we ask that leak testing be done with refrigerant 22 mixed with nitrogen. If the condensing unit nameplate designates a refrigerant other than R-22 remove all R-22 from the immediate area to avoid confusion after leak testing and evacuating the unit. Recharge the unit with proper refrigerant.

Leak Testing - CAUTION

The test gas cylinder must be equipped

with a pressure gauge and regulators so that system test pressures do not exceed maximum allowable limits. Do not ever use anything other than an R-22/Nitrogen mixture for leak testing.

Attach a refrigerant test gas cylinder to your service manifold and connect the manifold to the charging port on the liquid line valve. Charge an R-22/Nitrogen mixture into the system, raising the pressure to the remote unit's nameplate for the low side and high side pressures. Using the electronic detector, carefully check the entire system for leaks. Take special care to inspect all brazed and flare connections.

Evacuation –

After the system is proven leak tight, thoroughly evacuate the system according to the following procedure:

- ❖ Discharge the refrigerant-nitrogen mixture, allowing it to blow from the system as rapidly as possible, into an empty cylinder. Be sure that all service valves and solenoid valves are open to allow all of the mixture to be discharged.
- ❖ Connect a deep-drain vacuum pump to both the high and low side of the system. Pull a vacuum on the system to at least 1500 microns.
- ❖ Break the vacuum by adding refrigerant into the system until the pressure is above 0 psig. Always charge the refrigerant line into the system through a new drier in the charging manifold line. A 16 cubic inch drier is sufficient for this purpose.

- ❖ Repeat steps 2 and 3 two more times, the third time evacuating the system 500 microns.

Operational Data –

The following is typical data for HGM models based on lab tests, and may vary under field operating conditions.

Ambient Temperature	75°F
Head Pressure (psi)	120-135
Suction Pressure (psi)	9-12

Refrigerant Control

Refrigerant flow to the evaporator is controlled through the use of a capillary tube.

Because the suction line capillary tube assembly (sometimes referred to as heat exchanger or pull-out coil) has no moving parts, it very rarely if ever, needs servicing. However, should a leak occur in the system, it is possible that dirt, dust, or moisture may collect in the capillary tube causing the system to go into a vacuum. Should this occur, it is recommended that dry nitrogen or a dry refrigerant be forced through the system to clear the blockage.

If attempts to clear the restriction by this method are unsuccessful, the entire assembly, not the capillary tube only, should be replaced with a new factory ordered replacement.

TROUBLE SHOOTING

Symptom	Probable Cause (s)	Possible Solution (s)
Compressor runs continuously Product too warm	<ol style="list-style-type: none"> 1. Short of refrigerant 2. Inefficient compressor 3. Dirty condenser 	<ol style="list-style-type: none"> 1. Leak check, change drier, evacuate, and recharge 2. Replace 3. Clean
High Head Pressure	<ol style="list-style-type: none"> 1. Cabinet location too warm 2. Restricted condenser air flow 3. Defective condenser fan motor 4. Air or non-condensable gases in system 	<ol style="list-style-type: none"> 1. Relocate cabinet 2. Clean condenser to remove air flow restriction 3. Replace 4. Leak check, change drier, evacuate, and recharge
Warm storage temperatures	<ol style="list-style-type: none"> 1. Temperature control not set properly 2. Short of refrigerant 3. Cabinet location too warm 4. Too much refrigerant 5. Low voltage. Compressor cycling on overload 6. Condenser dirty 	<ol style="list-style-type: none"> 1. Reset control 2. Leak check , change drier, evacuate, and recharge 3. Relocate 4. Change drier, evacuate, and recharge 5. Check power 6. Clean
Compressor runs continuously product too cold	<ol style="list-style-type: none"> 1. Defective control 2. Short on refrigerant 	<ol style="list-style-type: none"> 1. Replace 2. Leak check, change drier, evacuate, and recharge
Compressor will not start no noise	<ol style="list-style-type: none"> 1. Blown fuse or breaker 2. Defective or broken wiring 3. Defective overload 4. Defective temperature control 5. Power Control 	<ol style="list-style-type: none"> 1. Replace fuse or reset breaker 2. Repair or replace 3. Replace 4. Replace 5. Check service cord or wiring conditions

TROUBLE SHOOTING CON'T

Symptom	Probable Cause (s)	Possible Solution (s)
Compressor will not start cuts out on overload	<ol style="list-style-type: none"> 1. Low voltage 2. Defective compressor 3. Defective relay 4. Restriction or moisture 5. Inadequate air over condenser 6. Defective condenser fan motor 	<ol style="list-style-type: none"> 1. Contact electrician 2. Replace 3. Replace 4. Leak check, replace drier, evacuate and recharge 5. Clean condenser 6. Replace

Trouble Shooting Lighting System

Problem	Solution
Light's won't start	<ol style="list-style-type: none"> 1. Check light switch 2. Check continuity to ballast 3. Check to see if bulbs inserted properly into socket 4. Check voltage
Light's flicker	<ol style="list-style-type: none"> 1. Allow lamps to warm up 2. Check lamp shield for cracks 3. Check sockets for moisture and proper contact 4. Bulb replacement may be necessary 5. Check voltage 6. New bulbs tend to flicker until used
Ballast hums	<ol style="list-style-type: none"> 1. Check voltage 2. Replace ballast

Electrical Components Replacement List

Model	HGM-1-TS/BS	HGM-2-TS/BS	HGM-3-TS/BS
<u>Compressor</u>	<u>Tecum. AE44484</u>	Tecum. AKYY60Y	Cope. RSL4CIE-IAA
Cond. Fan Mtr.		EMS ESPL25EM1	EMS ESPL25EM1
Evap Fan Mtr	Bomax 310-5734	same	same
Light Ballast	Huss. # 6-S-166	same	same
Fluores. Lamp	F040W-T8-60"	same	same

HUSSMANN

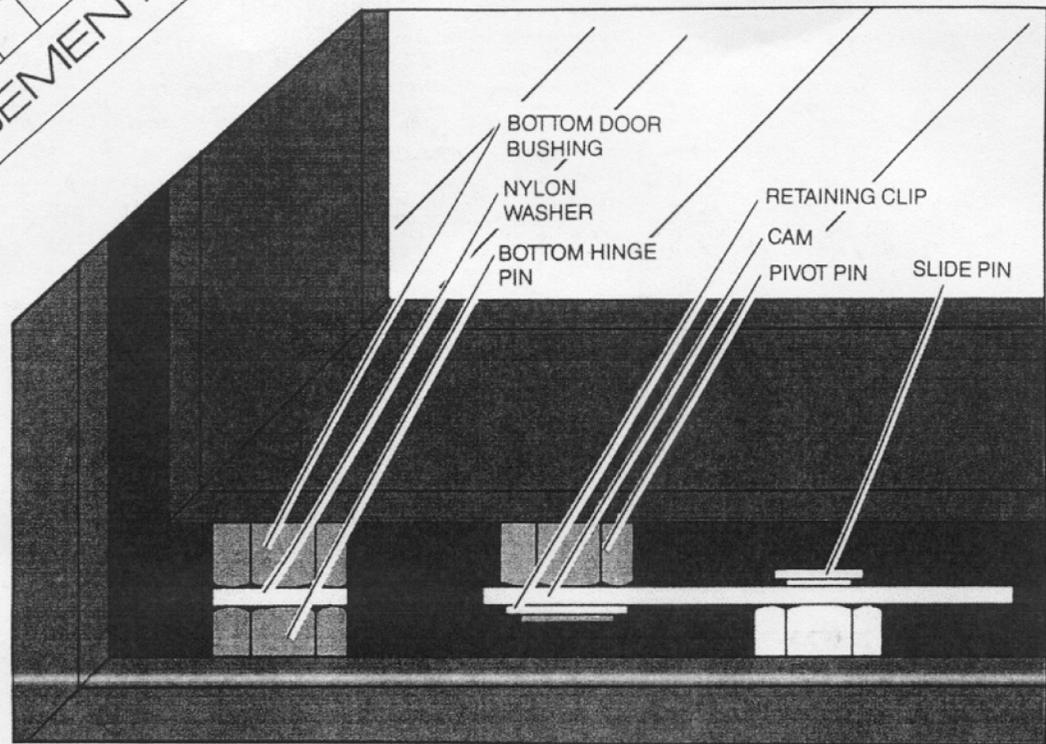
All Hussmann Self-contained cases have a full one year parts and labor warranty from the date of installation. In addition, self-contained cases carry a one-time compressor replacement warranty for a period of 5 years from date of installation. The original compressor will be replaced once at no charge if at any time during the 5-year period immediately following the case installation, the compressor fails due to a manufacturing defect. Labor is covered only for the first year after case installation. Failures that occur as a result of poor maintenance or cleaning practices will not be honored under the extended compressor warranty.

Its important to notify Hussmann of the date the case is put into service. A warranty registration card will be provided with the equipment. It is extremely important to complete the card and drop it in the mail. If this information is not provided within 30 days of installation, the case manufacture date will be the starting point of the warranty.

Labor submitted for coverage under the one-year warranty must be reasonable and be within the hourly rate range charged for the geographic area where the equipment is located. If a charge is considered excessive, Hussmann reserves the right to adjust the charge to an acceptable level. Hussmann may review adjusted claims within 30 days if petitioned by the submitting contractor.

When submitting a claim for compressor replacement, it is necessary to give the model and serial number of both the compressor being replaced and the new compressor. A receipt showing this information and the core credit (if applicable) should be included with the claim.

HOLD OPEN REPLACEMENT



- TOOLS REQUIRED**
- FLAT SCREWDRIVER
 - 5/16" WRENCH
 - 11/16" WRENCH
 - 3/4" WRENCH
 - PLIERS

HOLD OPEN REPLACEMENT

- 1** Remove door from frame.
 - a. Holding the top hinge pin with a 5/16" wrench loosen the lock nut with a 11/16" wrench. This will release the spring tension.
 - b. Open the door and remove the two screws from the door plug. Then unplug the cord from the frame.
 - c. With the door open about 90°, lift the hold open cam off the slide pin.
 - d. Lift the door up and out off the bottom hinge pin.

- 2** Use a flat screwdriver to remove retaining clip allowing cam to slide off.

CAUTION: NOTE ORIENTATION OF CAM POSITION.

- 3** Remove the pivot pin from the door and the slide pin from the frame with a 3/4" wrench.

CAUTION: NEVER REMOVE MORE THAN ONE PIN AT A TIME FROM EITHER THE DOOR OR FRAME.

- 4** Hand start the new pivot pin and the new slide pin and tighten both parts with a 3/4" wrench to approximately 25 foot pounds.
- 5** If bottom hinge bushing is black, do not remove. If it is not black, remove, slide spacer washer on, hand start hinge bushing and tighten with a 3/4" wrench to approximately 25 foot pounds.
- 6** Slide cam onto pivot pin, (orientation must be the same as before removal with offset toward frame). Hold cam in position and snap retaining clip in place with pliers.

- 7** Remove existing nylon washer and replace with the new piece.
- 8** Replace door by engaging top hinge pin into top bushing of door and lift door over bottom hinge pin allowing door to drop into proper position.

CAUTION: MAKE SURE NYLON WASHER IS IN PLACE ON BOTTOM HINGE PIN.

- 9** To adjust door tension.
 - a. Using a 5/16" wrench on top hinge pin, turn toward direction of door closing to increase tension.
 - b. Tighten top lock nut with a 11/16" wrench.

Installation is now complete, open and close door to check operation.

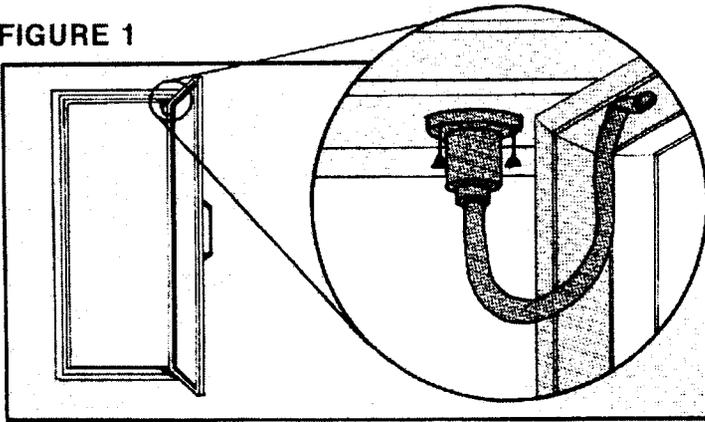
INSTALLATION PROBLEMS?

Call us
toll-free for
solutions.

1-800-237-3940



FIGURE 1

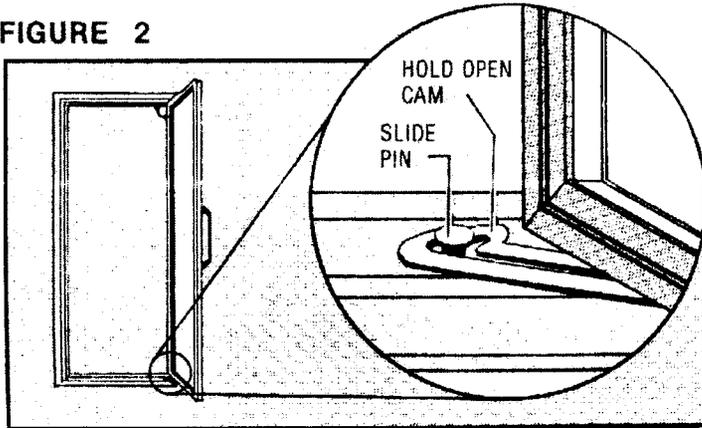


DOOR REMOVAL

- 1 Remove door plug connected to frame (Fig. 1).
- 2 Loosen the top hinge pin locknut and allow hinge pin to move freely.
- 3 Opening door to a 90 degree position, disconnect the hold open cam (Fig. 2) by lifting the cam over the slide pin.

With door open, lift up and pull out on the bottom of the door. Once the bottom of the door is off the bottom hinge pin and away from the frame, pull down on the door to disengage the door from the top hinge pin. (Fig. 4 A-C). **CAUTION:** Do not lose the nylon washer which rests on the bottom hinge pin.

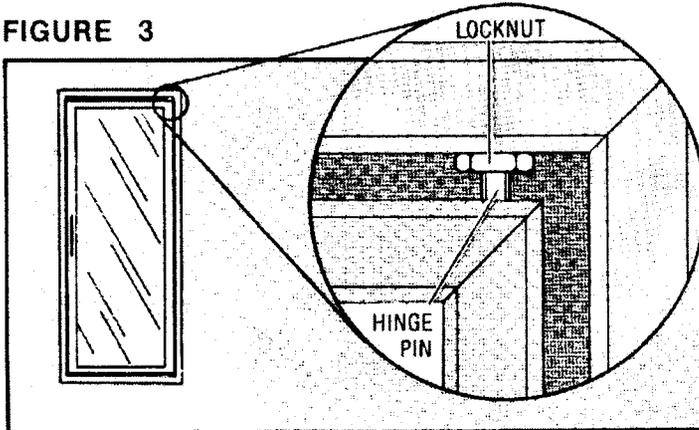
FIGURE 2



CAUTION:

TO AVOID INJURY, BE SURE ALL ELECTRICAL POWER IS DISCONNECTED FROM FRAME AND DOOR WHILE SERVICING OR ADJUSTING.

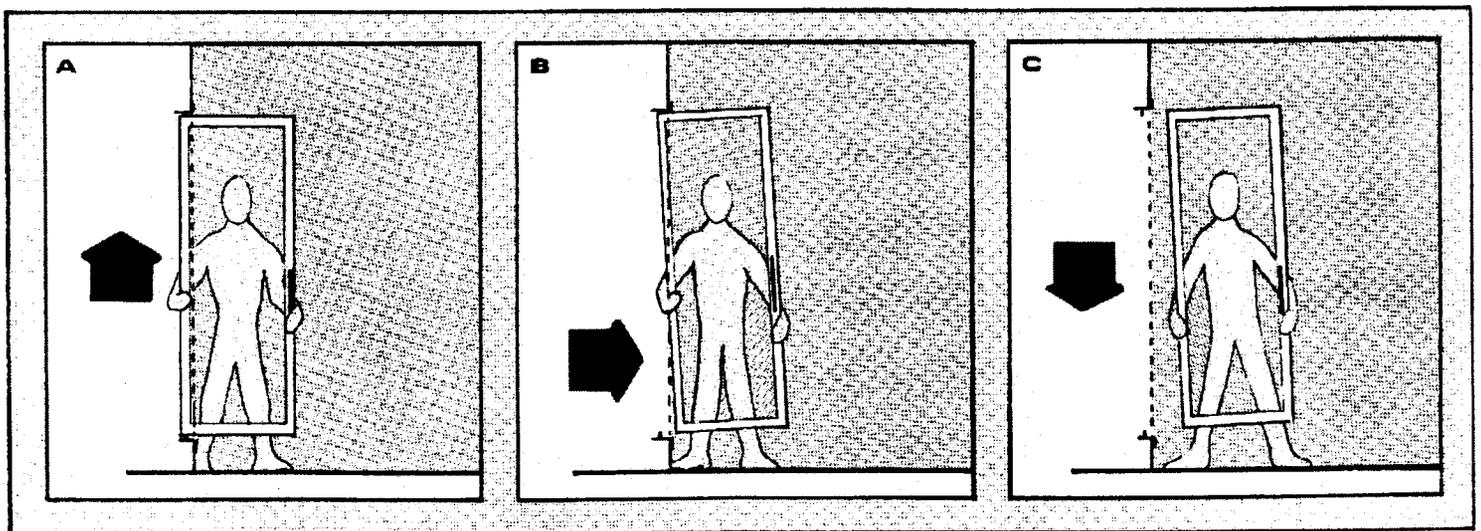
FIGURE 3



DOOR INSTALLATION

- 1 Hold door at a 90 degree angle to frame and lift door into top hinge pin.
- 2 Seat door on bottom hinge pin. Make sure nylon washer is in place and attach hold open cam to slide pin.
- 3 Tighten upper hinge pin locknut after adjusting door tension (see door tension adjustment on page 3).
- 4 Attach and secure the door plug.

FIGURE 4

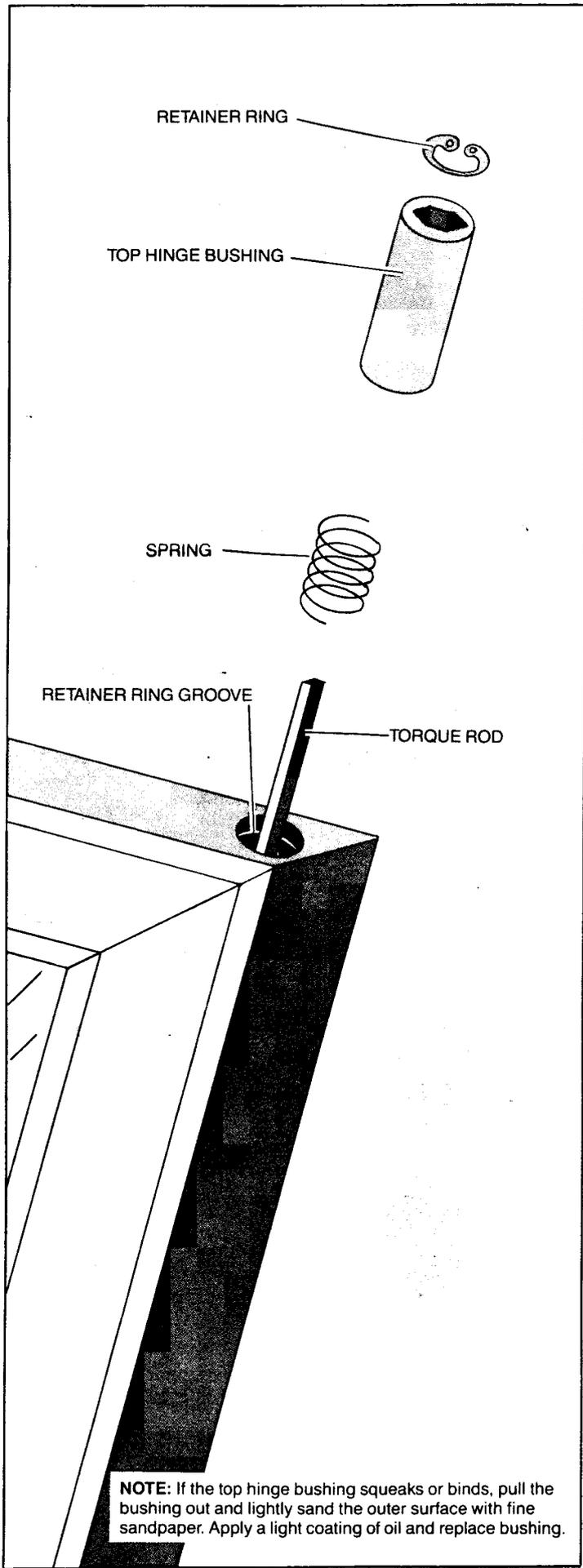


TOP BUSHING REPLACEMENT

- TOOLS REQUIRED**
- 5/16" WRENCH
 - 11/16" WRENCH
 - HAMMER
 - RETAINER RING PLIERS

TOP HINGE BUSHING REPLACEMENT

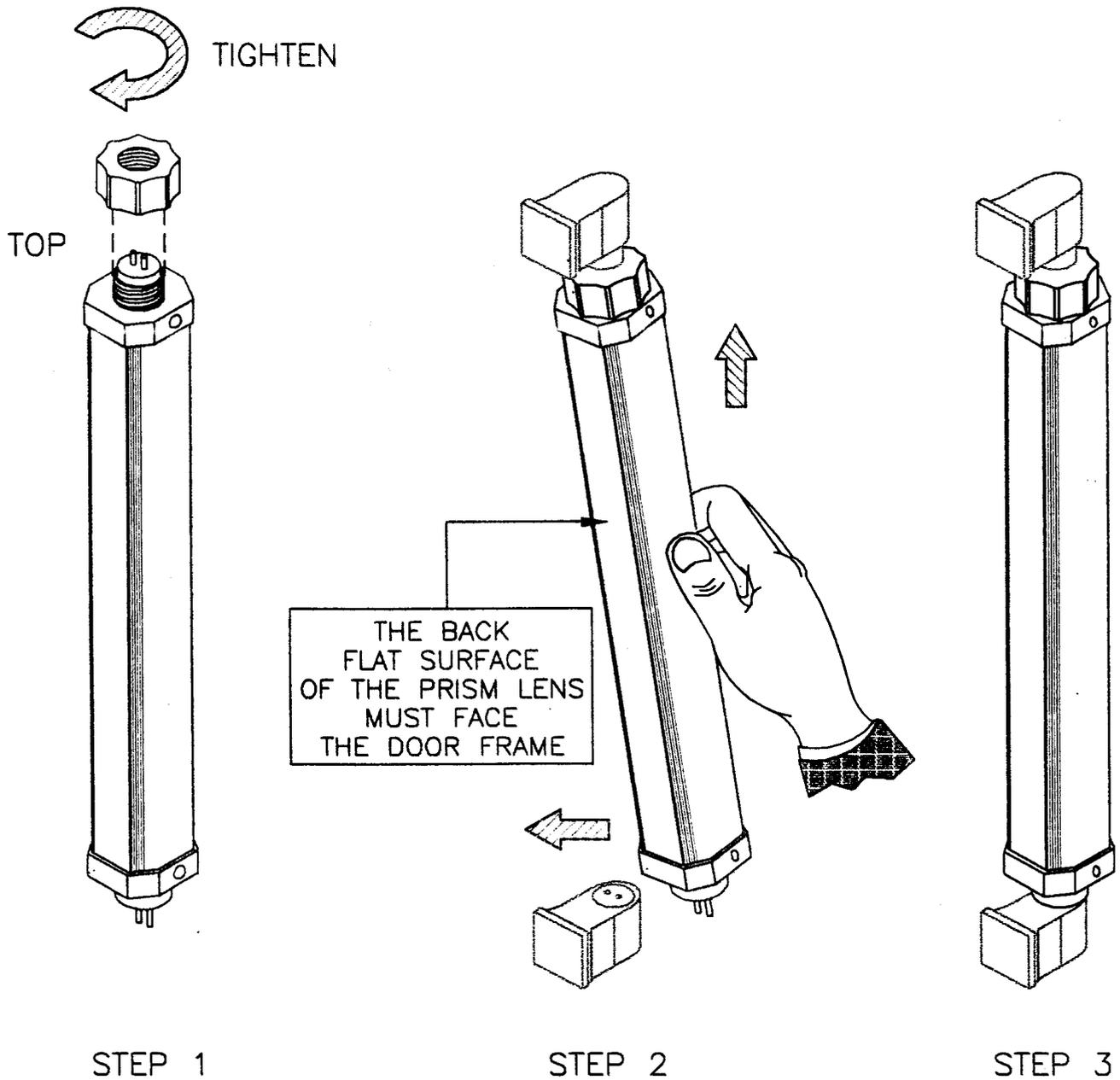
- 1** Remove door from frame as follows:
 - a. Holding the top hinge pin with a 5/16" wrench loosen the 11/16" lock nut. This will release the spring tension.
 - b. Open the door and remove the two screws from the door plug. Then unplug the cord from the frame.
 - c. With the door open about 90°, lift the hold open cam off the slide pin.
 - d. Lift the door up and out off the bottom hinge pin.
 - 2** Remove the retainer ring from the top hinge hole by compressing the open ends together using retainer ring pliers.
 - 3** Pull the top hinge bushing from the door. If it is still attached to the torque rod, do not pull it more than 6" out of the door. If the bushing is not attached to the torque rod, pull the torque rod from the top hinge hole but not more than 6".
 - 4** To replace top hinge bushing, hold the torque rod and pull old bushing off. If bushing is black, remove old spring from the torque rod and slide new spring in place. If bushing is beige, do not remove spring. To install new top hinge bushing align square of torque rod to square hole in top hinge bushing and tap onto torque rod.
 - 5** The torque rod and hinge bushing can now be pushed back into the door. Top hinge bushing should go low enough to expose retainer clip groove. If groove is not visible, then the top hinge bushing is not far enough on the torque rod. Once the groove is visible, then replace the retainer ring by compressing the open ends.
- NOTE:** Before replacing door remove existing nylon washer from bottom hinge pin and install new washer in place.
- 6** Replace door by engaging top hinge pin into top bushing of door and lift door over bottom hinge pin allowing door to drop into proper position.
 - 7** To adjust door tension.
 - a. Using a 5/16" wrench on top hinge pin, turn toward direction of door closing to increase tension.
 - b. Tighten top lock nut.



NOTE: If the top hinge bushing squeaks or binds, pull the bushing out and lightly sand the outer surface with fine sandpaper. Apply a light coating of oil and replace bushing.

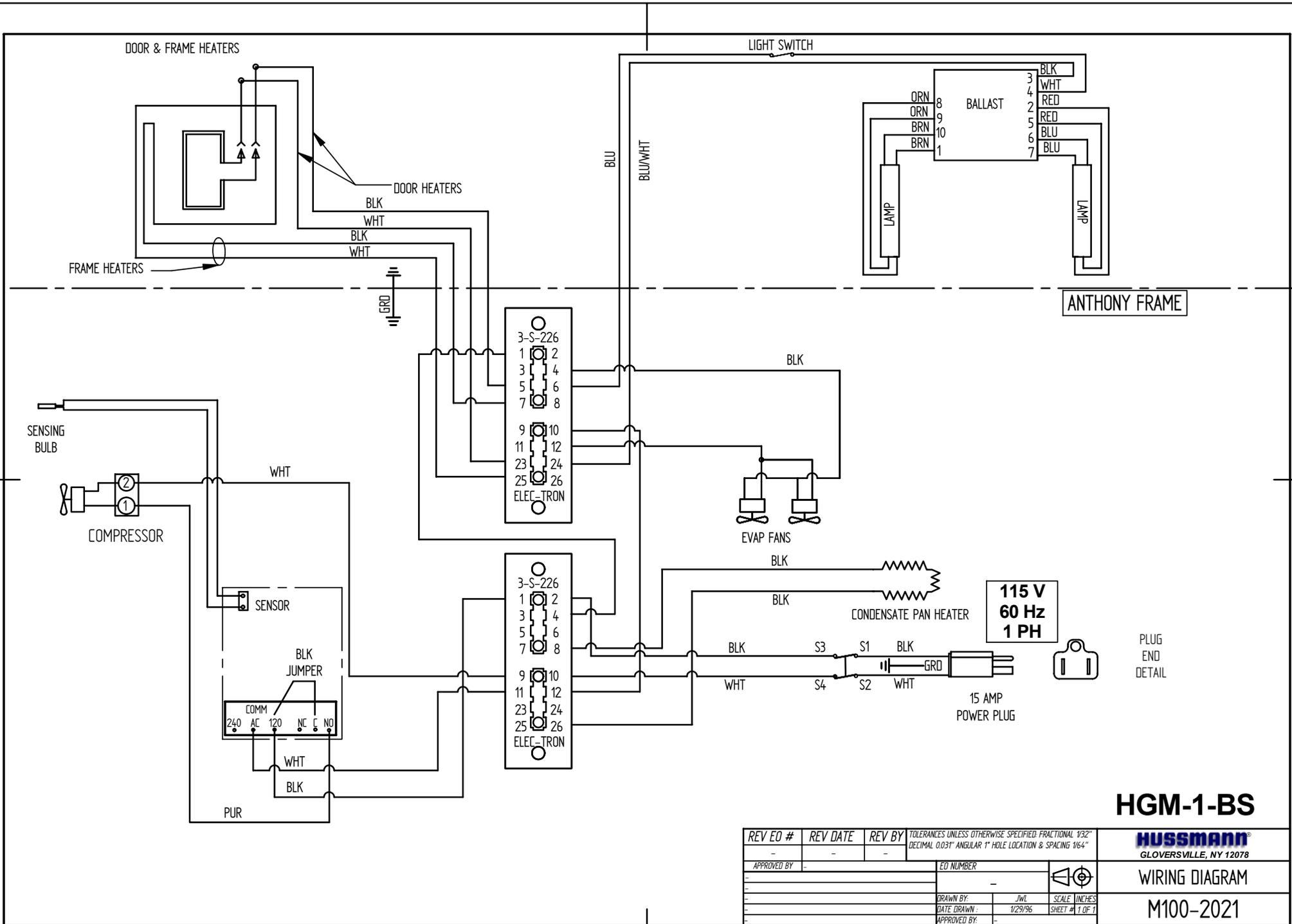


PRISM LENS LAMP INSTALLATION T8 AND T10



**COMMERCIAL
REFRIGERATOR
DOOR COMPANY**

6200 PORTER ROAD SARASOTA, FL 34240
(941) 371-8110
(800) 237-3940 FAX: (941) 377-2850



HGM-1-BS

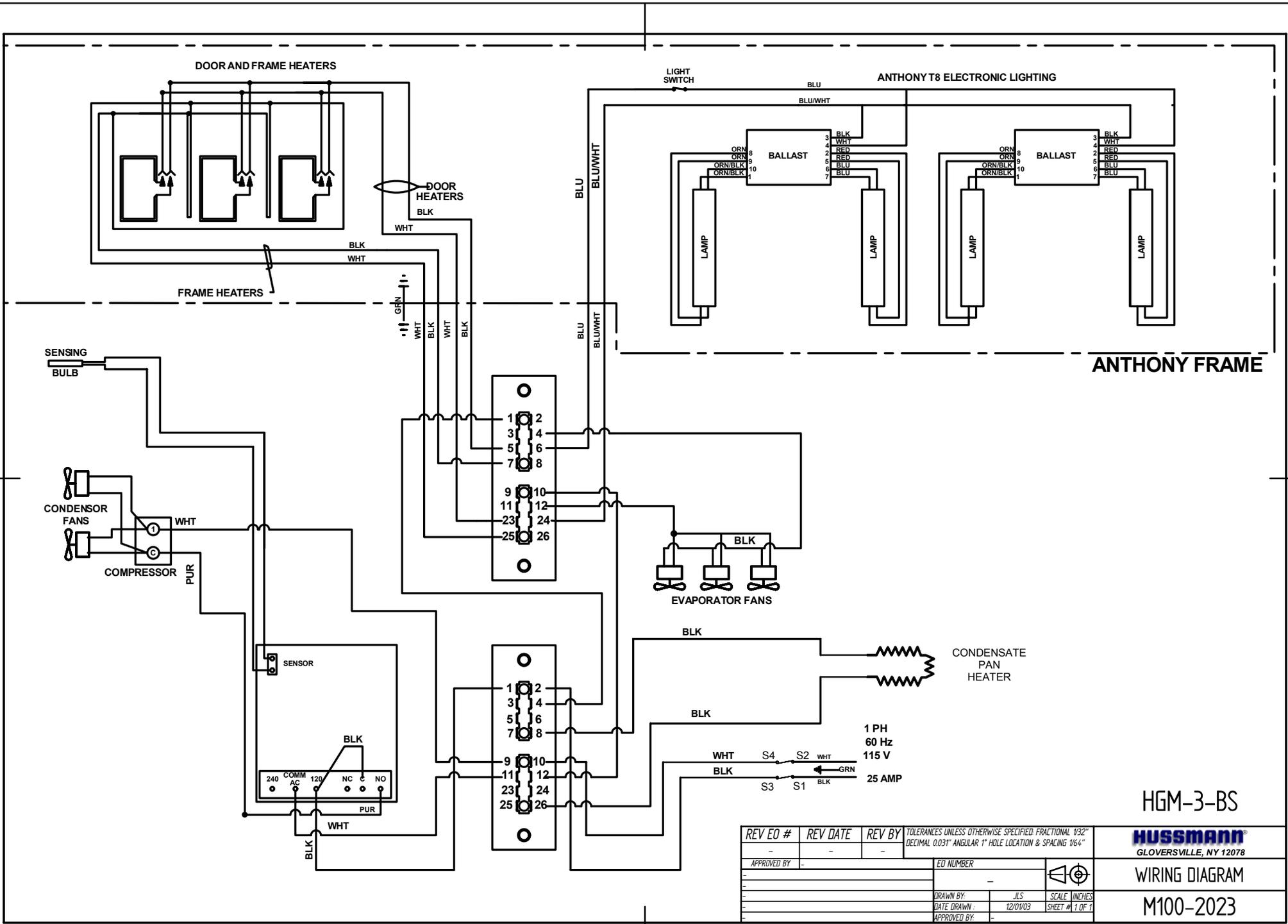
HUSSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM

M100-2021

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"
-	-	-	-	
APPROVED BY:			EO NUMBER	
DRAWN BY: JWL			SCALE: INCHES	
DATE DRAWN: 1/29/96			SHEET # 1 OF 1	
APPROVED BY:				

PLUG
END
DETAIL

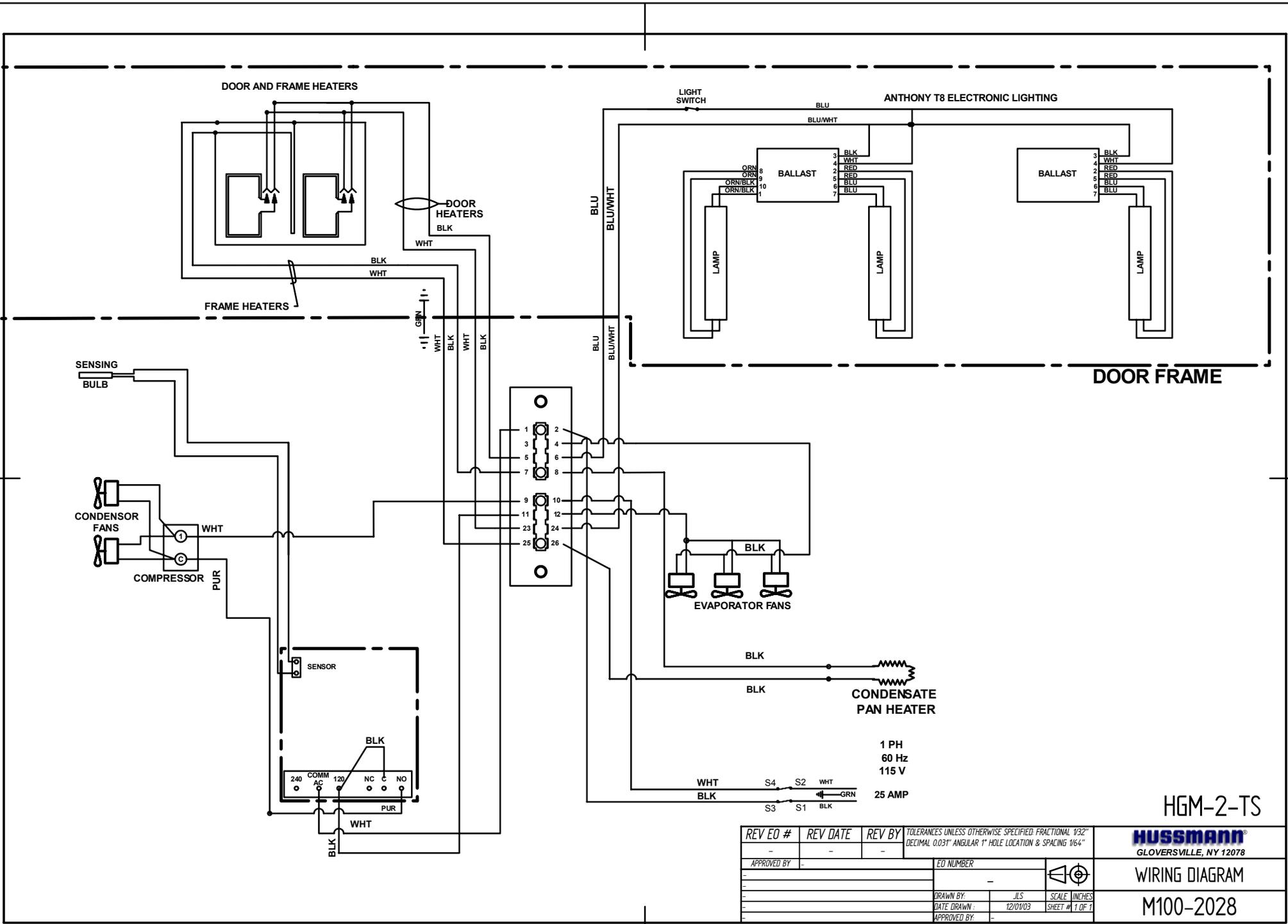


HGM-3-BS

HUSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM
M100-2023

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"
-	-	-	-	
APPROVED BY:				ED NUMBER
				-
DRAWN BY:		JLS		SCALE INCHES
DATE DRAWN:		12/01/03		SHEET # 1 OF 1
APPROVED BY:				

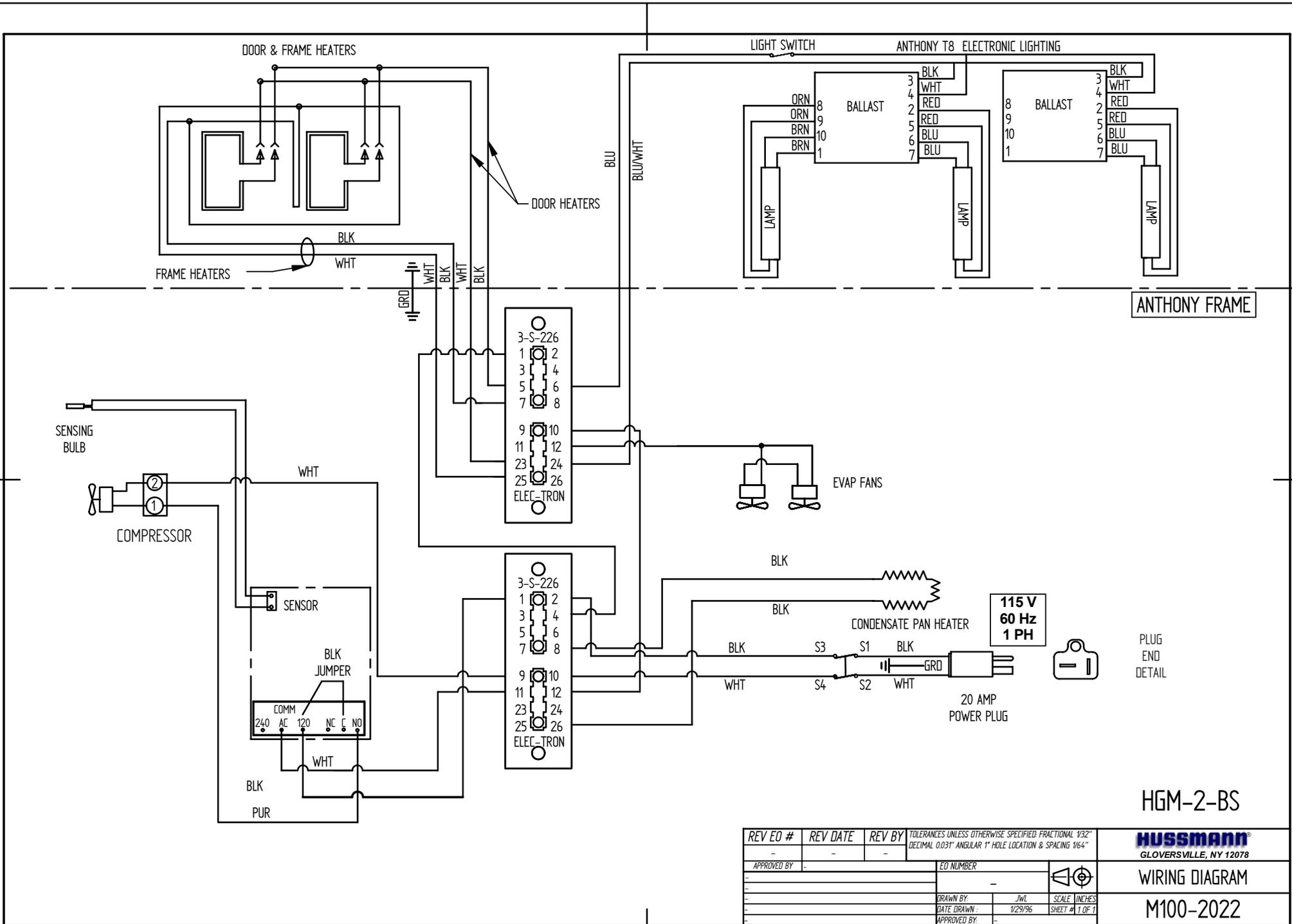


HGM-2-TS

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"
-	-	-	-	
APPROVED BY:	ED NUMBER			
DRAWN BY:	JLS	SCALE INCHES		
DATE DRAWN:	12/01/03	SHEET #	1 OF 1	
APPROVED BY:				

HUSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM
M100-2028



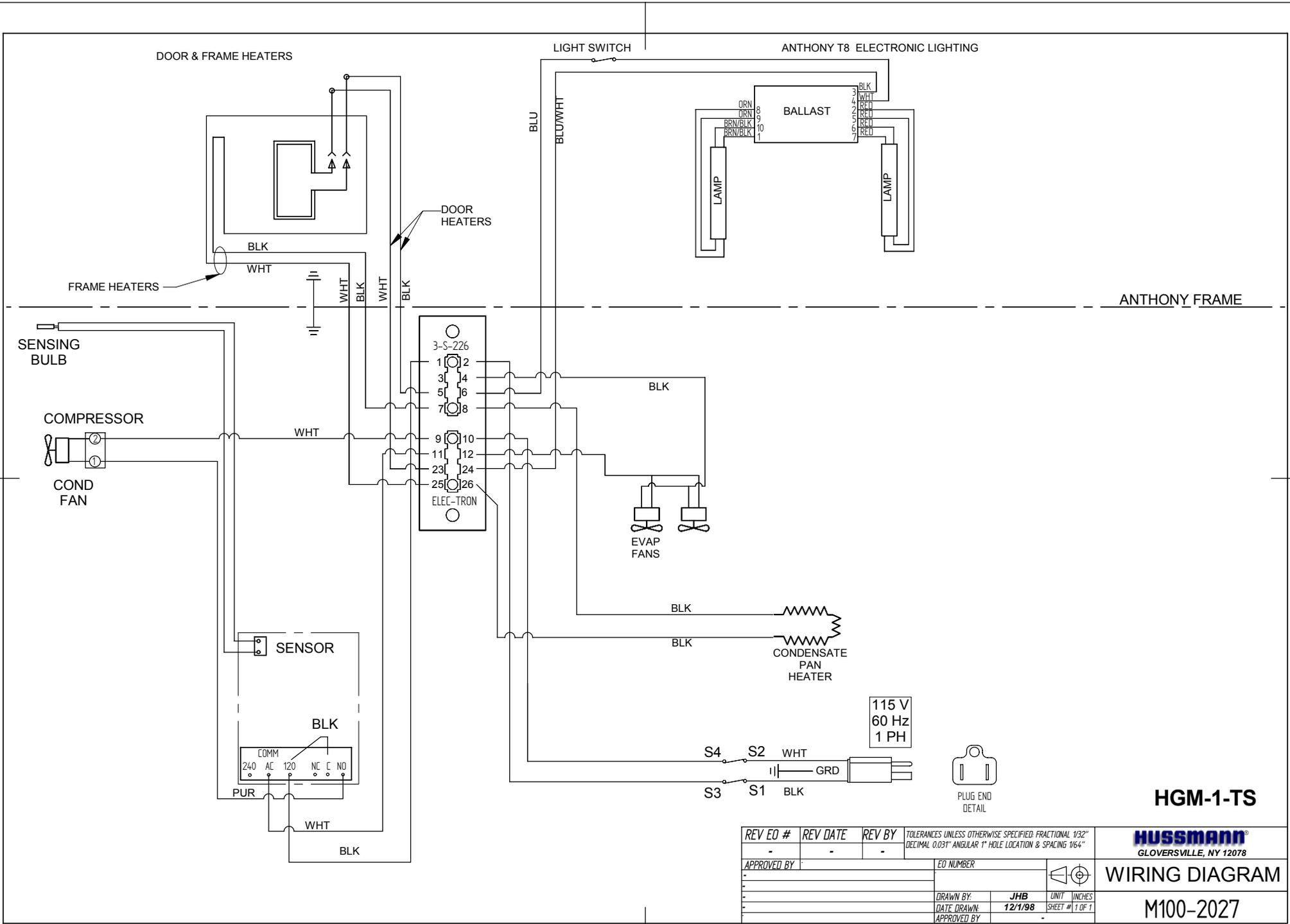
HGM-2-BS

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"
-	-	-	-	
APPROVED BY:				EO NUMBER
				-
DRAWN BY:		SCALE INCHES		SHEET # 1 OF 1
DATE DRAWN:		1/29/96		
APPROVED BY:				

HUSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM

M100-2022



HGM-1-TS

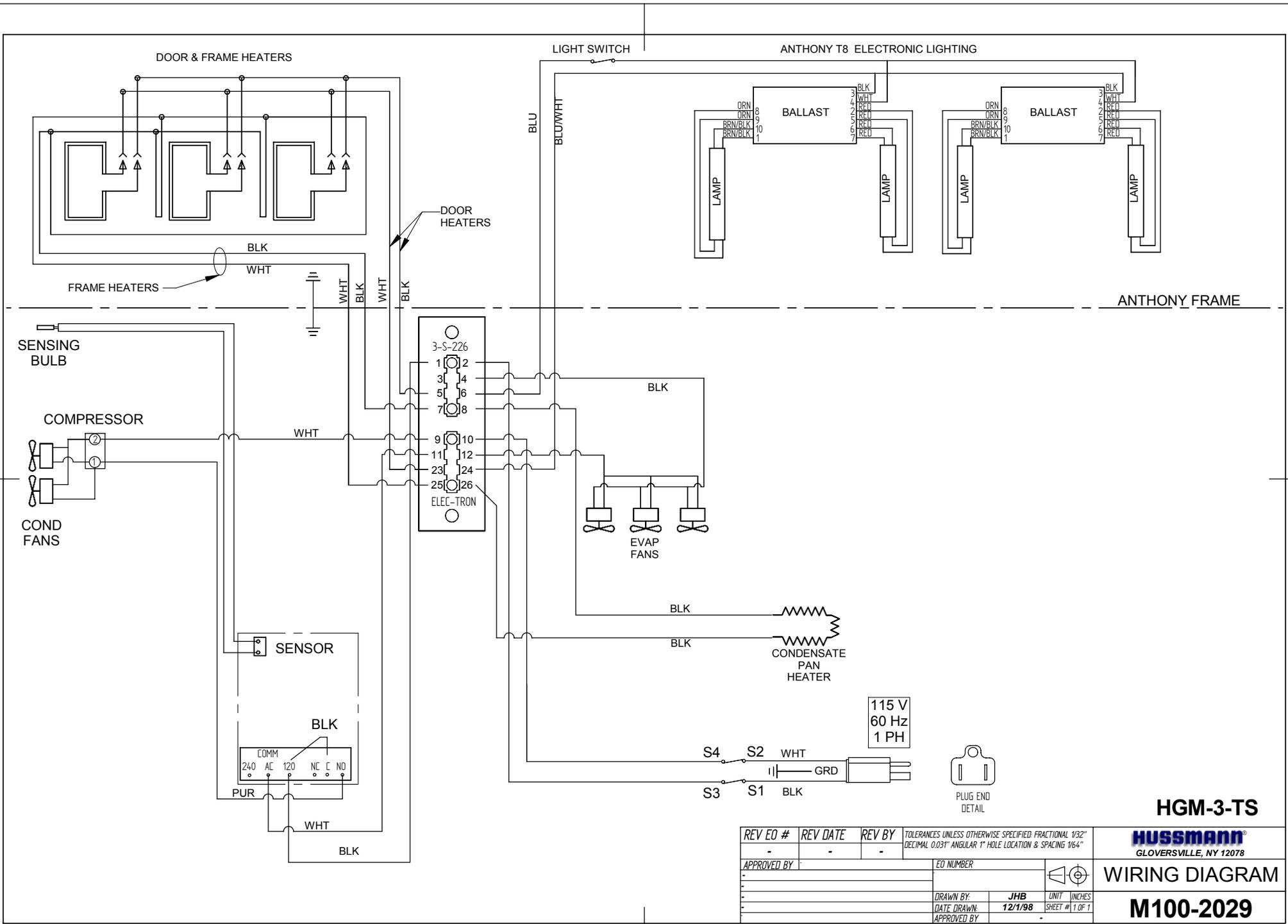
HUSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM

M100-2027

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"
-	-	-	-	
APPROVED BY:				ED NUMBER
DRAWN BY: JHB				UNIT: INCHES
DATE DRAWN: 12/1/98				SHEET # 1 OF 1
APPROVED BY:				





HGM-3-TS

HUSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM

M100-2029

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1" HOLE LOCATION & SPACING 1/64"
-	-	-	-	
APPROVED BY:				EO NUMBER
DRAWN BY: JHB				UNIT: INCHES
DATE DRAWN: 12/1/98				SHEET # 1 OF 1
APPROVED BY:				