

Instructions and Parts List

Tape Application Monitor (TAM)

Type 21800

Serial #: _____
For reference, record machine serial number here.

Important Safety Information

BEFORE INSTALLING OR OPERATING THIS EQUIPMENT
Read, understand and follow all safety and operating instructions.

Spare Parts

It is recommended you immediately order the spare parts listed in the “Spare Parts/Service Information” section. These parts are expected to wear through normal use, and should be kept on hand to minimize production delays.



This instruction manual covers safety aspects, handling and transport, storage, unpacking, preparation, installation, operation, adjustments, maintenance, troubleshooting, repair work and servicing plus parts list of the **3M-Matic™ Tape Application Monitor (TAM)**.

3M Industrial Adhesives and Tapes
3M Center, Building 220-5E-06
St. Paul, MN 55144-1000

Edition December 2018

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The manufacturer reserves the right to change the product at any time without notice.

Replacement Parts and Service Information

To Our Customers:

This is the 3M-Matic™/AccuGlide™/Scotch® equipment you ordered. It has been set up and tested in the factory with Scotch® tapes. If technical assistance or replacement parts are needed, call or fax the appropriate number listed below.

Included with each machine is an Instructions and Parts List manual.

Technical Assistance / Replacement Parts and Additional Manuals:

For technical assistance, contact our help line at 1-800-328-1390. Provide the customer support coordinator with the model/machine name, machine type, and serial number that are located on the identification plate (For example: Model - TAM Manual - Type 21800 - Serial Number 13282).

To order replacement parts, contact us:

CSPD division of Combi Packaging Systems LLC.
6299 Dressler Rd NW
North Canton, OH 44720

1-800-344-9883
e-mail: CSPD-CSR@combi.com
www.combi.com



3M Industrial Adhesives and Tapes
3M Center, Building 220-5E-06
St. Paul, MN 55144-1000

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Scotch™ are Trademarks of 3M,
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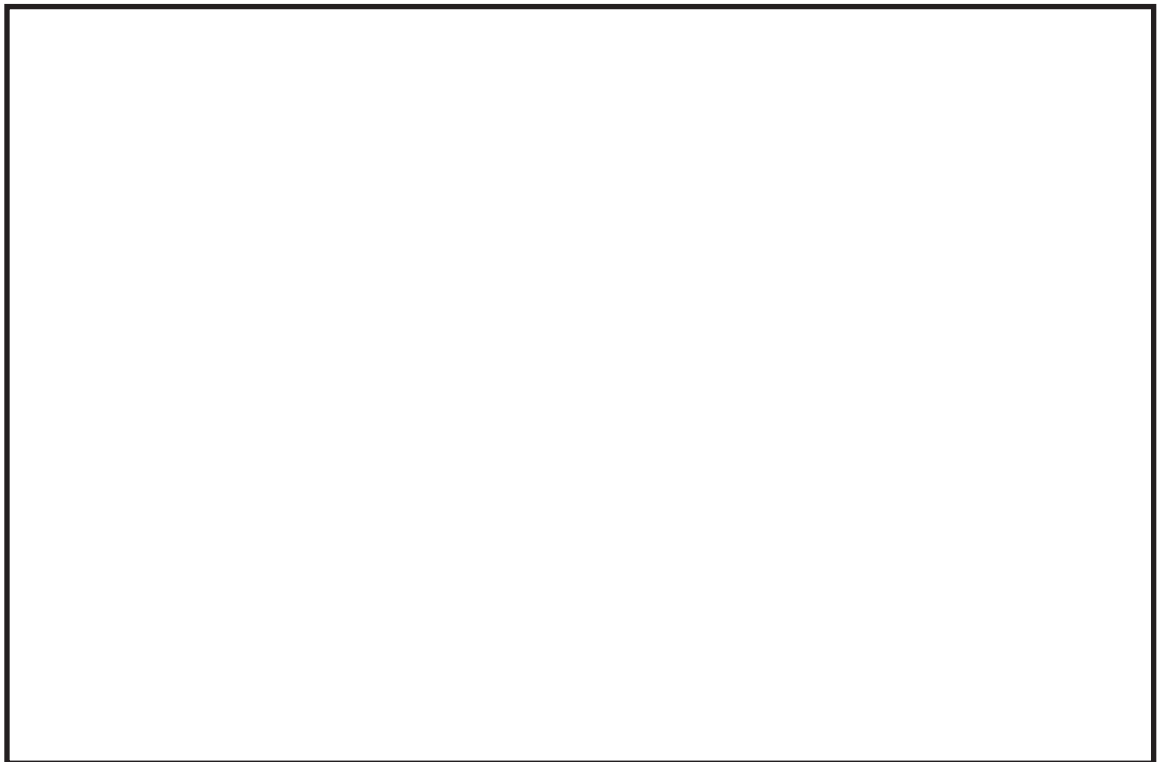
Replacement Parts and Service Information

To Our Customers:

This is the 3M-Matic™/AccuGlide™/Scotch® equipment you ordered. It has been set up and tested in the factory with Scotch® tapes. If any problems occur when operating this equipment and you desire a service call or phone consultation, call, write or fax the appropriate number listed below.

Included with each machine is an Instructions and Parts List manual.

**SERVICE, REPLACEMENT PARTS AND ADDITIONAL MANUALS AVAILABLE
DIRECT FROM:**



Order parts by part number, part description and quantity required. Also, when ordering parts and/or additional manuals, include machine name, number and type.



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St. Paul, MN 55144-1000

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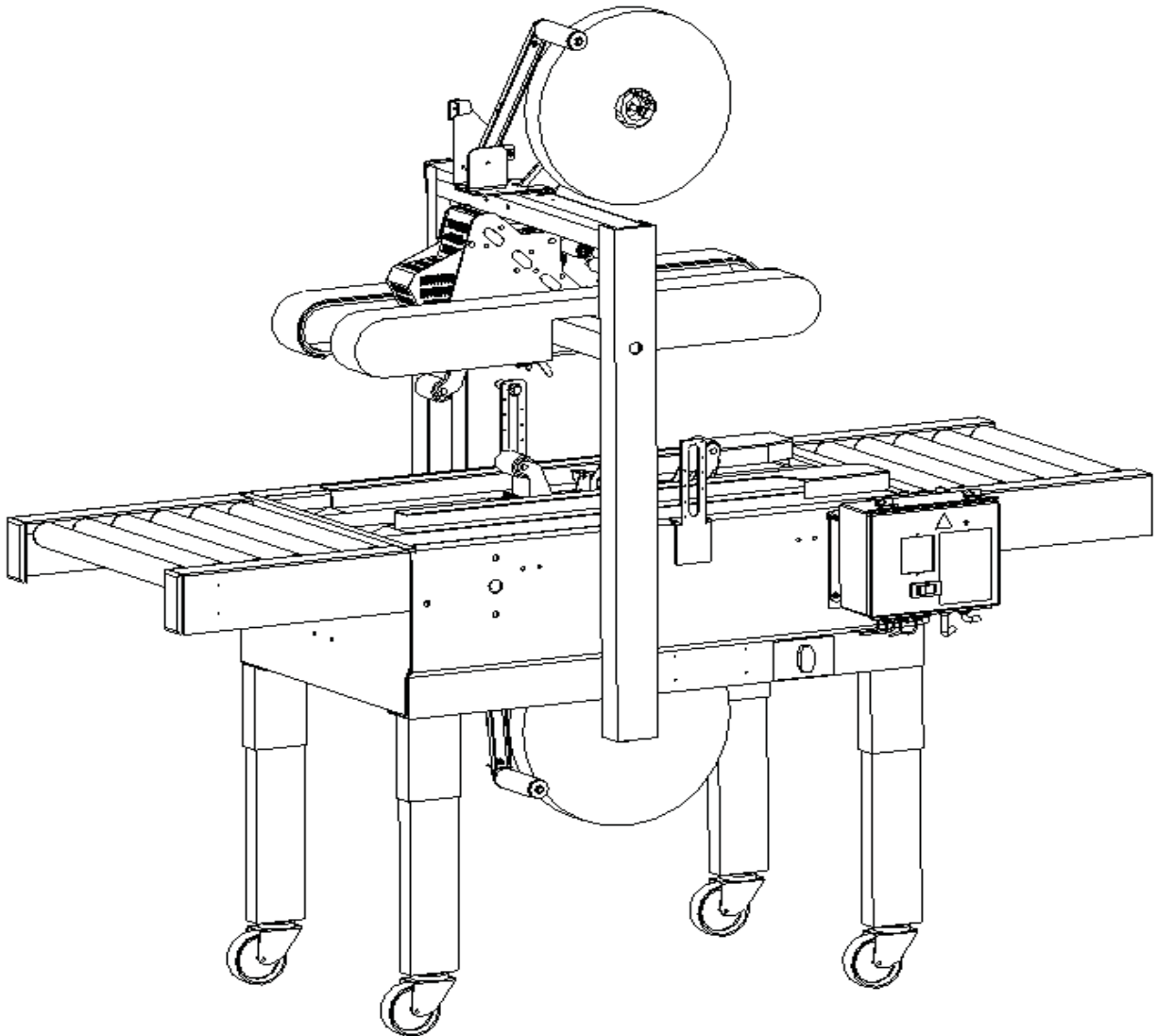
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Intended Use

The Tape Application Sensor Kit is specifically designed for use on 3M-Matic™ Case Sealers. The **Tape Application Monitoring Kit** is a self-contained control apparatus that identifies a tape related malfunction in box sealing operations. The control system continually monitors case sealing operations and will automatically stop the 3M-Matic™ case sealer when a tape related malfunction occurs. In addition, the control system will turn on an indicator light that is located on the control panel. Equipped with the ability to control up to two AccuGlide™ taping heads, the unit reliably detects the following tape application faults:

- Tape did not apply to box**
- Tape has broken or failed to cut off**
- Tape supply is low**

The **Tape Application Monitoring Kit** has been designed and tested for use with Scotch box sealing tapes and the 3M-Matic™ line of case sealing equipment models: 200a, 800ab, 800asb, 800r, 800rks, 800rf, 7000a, 7000r, 8000a, and 8000af.



Typical Installation of Tape Application Sensor Kit on 3M-Matic™ Case Sealer

Equipment Warranty and Limited Remedy

Equipment Warranty and Limited Remedy: THE FOLLOWING WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING , BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE:

3M warrants that the **3M-Matic™ Tape Application Monitor, Type 21800** will be free from defects in material and manufacture for a period of ninety (90) days after delivery. If any part is defective within this warranty period, your exclusive remedy and 3M's and seller's sole obligation shall be, at 3M's option, to repair or replace the part. 3M must receive written notice of any alleged defect within a reasonable time after it is discovered, but in no event shall 3M have any obligation under this warranty unless it receives such notice within five (5) business days after the expiration of the warranty period. To be entitled to repair or replacement as provided under this warranty, the part must be returned as directed by 3M to its factory or other authorized service station designated by 3M. If 3M is unable to repair or replace the part within a reasonable time after receipt thereof, 3M, at its option, will replace the equipment or refund the purchase price. 3M shall have no obligation to provide or pay for the labor required to install the repaired or replacement part or equipment. 3M shall have no obligation to repair or replace those parts failing due to normal wear, inadequate or improper maintenance, inadequate cleaning, improper operating environment, improper utilities, operator error, operator misuse, alteration, lack of reasonable care, or due to any accidental cause.

Limitation of Liability: Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from this 3M equipment, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including breach of warranty, breach of contract, negligence, or strict liability.

The foregoing Equipment Warranty and Limited Remedy and Limitation of Liability may be changed only by a written agreement signed by authorized representatives of 3M and seller.

Contents – Tape Application Monitor

Item	Description	Qty
1	Upper Dancer Arm Assembly	1
2	Lower Dancer Arm Assembly	1
3	Control Box Assembly	1
4	Box Present Bracket	2
5	Control Box Assembly Mounting Bracket	1
6	Nut Plate	1
7	Bracket Mounting Upper Assembly	1
8	Bracket Mounting Upper Assembly for 700 rks/aks	1
9	Bracket Mounting Upper Assembly for 7000a, 7000r, and 8000a.	1
10	Drill Template	1
11	Box Present Photo Electric Sensor with Reflector	1
12	Bracket Lower King	1
13	Cable – Tie Mount	5
14	Cable Tie	10
15	Screw – Cap Soc Hd. Hex Soc. Dr. M6 X 16mm Lg.	7
16	Washer – Plain M6	17
17	Screw – Cap Soc Hd. Hex Soc. Dr. M6 X 20mm Lg.	10
18	Washer – Plain M3	6
19	Screw – Cap Soc Hd. Hex Soc. Dr. M3 X 10mm Lg.	4
20	Washer – Plain M8	4
21	Screw – Cap Hex Hd. M8 X 16mm Lg.	4
22	Nut – M3	4
23	Nut – M6	4
24	Washer – Lock M6	4
25	Nut – Nylon M8	2
26	VHB Tape	1
27	Guard - Sensor	1
28	Instructions with Parts List Manual	1
29	Light Beacon Assembly (78-8095-1134-4) "Optional "	0
30	Lower Outboard Kit (70-0064-1104-8) "Optional "	0
31	Contact Relay (26-1014-8243-3) "Optional"	0

Important Safeguards



This safety alert symbol identifies important messages in this manual.

READ AND UNDERSTAND THEM BEFORE INSTALLING OR OPERATING THIS EQUIPMENT.



Caution: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or property damage.



Warning: Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury and/or property damage.



Warning

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.



Warning

- **To reduce the risk associated with hazardous voltage:**
 - Position electrical cord away from foot and vehicle traffic.



Warning

- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

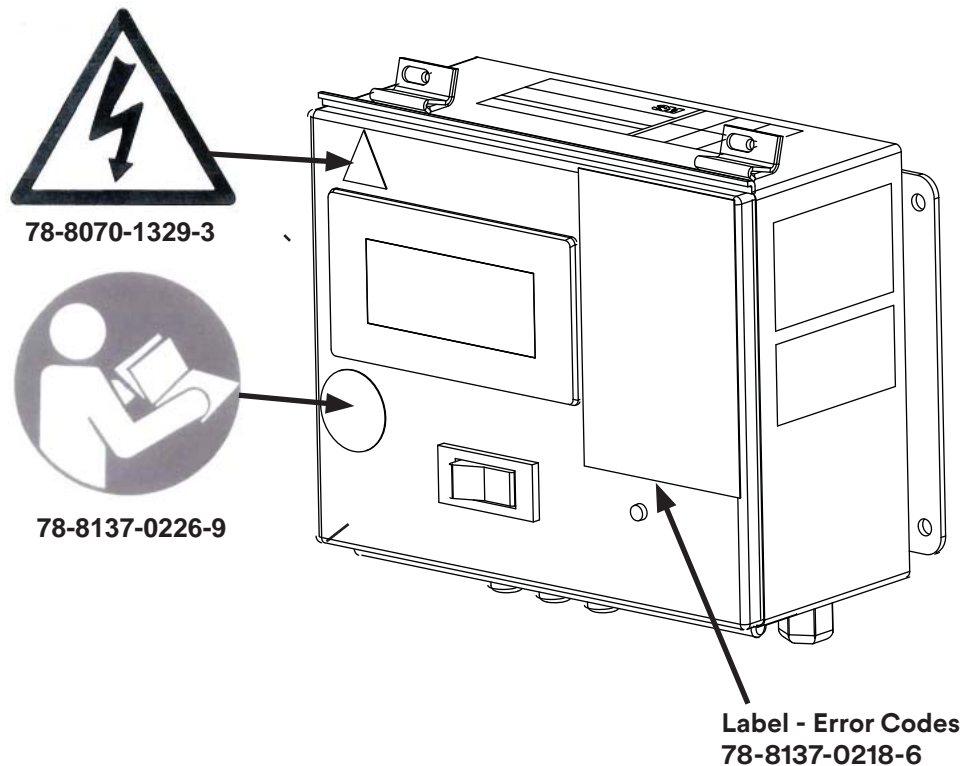


Caution

- **To reduce the risk associated with metal flyings or hot surface hazards:**
 - Use proper personal protective equipment when drilling mounting holes


Important Safeguards *(continued)*

Important – In the event the following safety labels are damaged or destroyed, **they must be replaced to ensure operator safety**. Replacement part numbers for individual labels are shown in the following figure and are available from **CSPD division of Combi Packaging Systems LLC**.



Replacement Labels/3M Part Numbers

Important Safeguards *(continued)*

 Warning
<ul style="list-style-type: none"> ● To reduce the risk associated with mechanical and electrical hazards: <ul style="list-style-type: none"> – Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer. – Allow only properly trained and qualified personnel to operate and service this equipment.

Skill 2 - Mechanical Maintenance Technician

This operator is trained to use the machine as the MACHINE OPERATOR and in addition is able to work with the safety protection disconnected, to check and adjust mechanical parts, to carry out maintenance operations and repair the machine. He is not allowed to work on live electrical components.

Skill 2a - Electrical Maintenance Technician

This operator is trained to use the machine as the MACHINE OPERATOR and in addition is able to work with the safety protection disconnected, to make adjustments, to carry out maintenance operations and repair the electrical components of the machine. He is allowed to work on live electrical panels, connector blocks, control equipment, etc.

Skill 3 - Specialist From the Manufacturer

Skilled operator sent by the manufacturer or its agent to perform complex repairs or modifications, when agreed with the customer.

Operator Skill Level Descriptions

Skill 1 - Machine Operator

This operator is trained to use the machine with the machine controls, to feed cases into the machine, make adjustments for different case sizes, to change the tape and to start, stop and restart production.

Important – the factory manager must ensure that the operator has been properly trained on all the machine functions before starting work.

Operator's Skill Levels Required to Perform the Main Operations on Machine

Operation	State of the Machine	Operator's Skill	Number of Operators
Installation and set up of the machine.	Running with safety protections disabled.	2 and 2a	2
Tape replacement.	Stopped by pressing the STOP button.	1	1
Ordinary maintenance.	Electric power disconnected.	2	1
Extraordinary maintenance (mechanical).	Running with safety protections disabled.	3	1
Extraordinary maintenance (electrical).	Running with safety protections disabled.	2a	1

Specifications

The 3M-Matic™ Tape Application Monitor has been designed and tested to work with the following 3M-Matic™ case sealers: 200a, 800ab, 800asb, 800r, 800rks, 800rf, 7000a, 7000r, 8000a, and 8000af. Additional information is required for 800rks and 800rf applications. Contact a 3M representative for more detail.

* 800r applications require additional machine modifications for proper operation.
(Contact the 3M-Matic Help Line)

Note: Components required to configure this system to monitor either an upper or lower taping head have been included. Additional components are required for outboard tape supply roll applications.
An optional conversion kit is available.

Power Requirements:

Input: 115 VAC, 10A, 60 Hz, 1 Phase
Cord connected, NEMA 5-15R, 3 pin 115 VAC outlet

Output: (3M-Matic™ case sealers control):
Solid state relay, Normally closed, 115/230 VAC, 25 amp rating, protected by
10 amp power switch/circuit breaker, open when:

Operating Environment:

NEMA 1

For use in dry, relatively clean environments at 35 – 120 deg F [2 – 48 deg C] temperatures

Important: Control box with components should not be washed down or subjected to conditions causing moisture condensation on components.

Regulatory

USA Standard Code of Regulations: FCC Part 15, Subpart B, Class A cUL 508A

Control

PLC (Keyence KV-N14AR) with key features:
Human Machine Interface Display (HMI)
(Keyence VT3-W4M) display for setting program parameters/displaying faults
Inputs: NPN/PNP 24VDC with LED indicators, Qty 8 (6 reserved, 2 spares)
Outputs: Relay with LED indicators, Qty 6 (4 Reserved, 1 Spare 24VDC, 1 Spare AC line voltage)
Power Supply: Internal switch mode 24 VDC 600ma

Specifications *(continued)*

Warning Panel LED Indicator:

Off: Normal operation

- On: (1) Power up light test - Momentary
 (2) Tape application fault - Flashing
 (3) Low tape - Continuous

Remote Warning Beacon Light (Optional):

The remote warning beacon light performance is identical to the panel mounted LED. The beacon light allows operators and maintenance personnel to observe fault conditions from a distance away from the case sealer.

Note: The Electrical Control box is equipped with the connection for the Remote Warning Beacon Light, no additional wiring is required.

Electrical Control Box

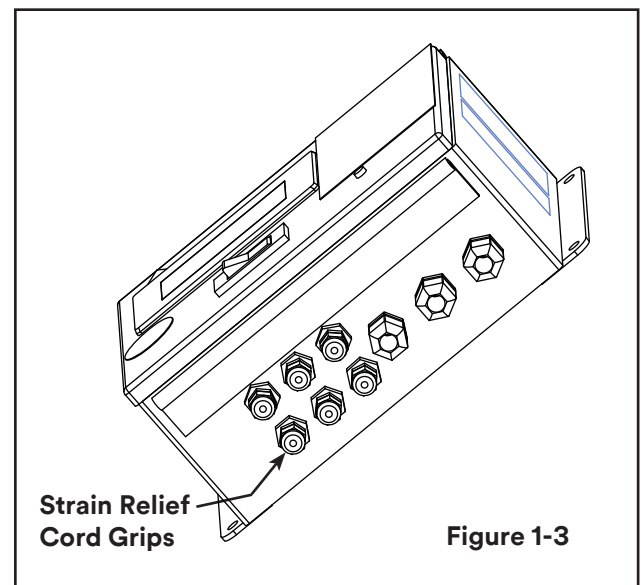
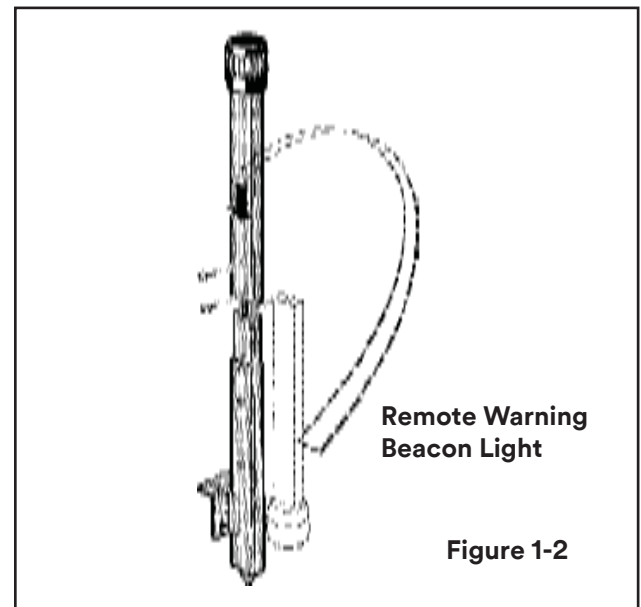
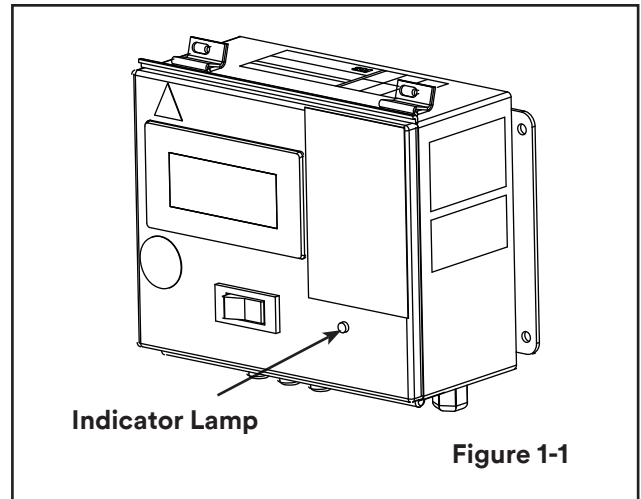
A din rail is used in the electrical control box to mount the primary components. Space is available on the din rail to mount one additional terminal block or an optional dry contact relay (See "Options/Accessories").

Strain relief cord grips are used to pass both control and power into and out of the electrical control box. One spare strain relief cord grip (PG 7) is available for additional input and/or output control signals. Examples of control signals include disabling a remote conveyor, interface to a host control or interface to an 800rks and 800rf case sealer PLC)

Control Box Dimensions:

	W	L	H
mm	267	229	114
[Inches]	[10.5]	[9]	4.5]

Weight: 14.5 kg [32 lbs.] Packaged





Installation and Set-Up

Receiving And Handling

After the machine has been unpacked, examine the components thoroughly for damage that might have occurred during transit. **If damage is evident, file a damage claim immediately** with the transportation company and also notify your 3M Representative.

Machine Set-Up

	Warning
<ul style="list-style-type: none">● To reduce the risk associated with mechanical and electrical hazards:<ul style="list-style-type: none">- Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.- Allow only properly trained and qualified personnel to operate and service this equipment.	
	Warning
<ul style="list-style-type: none">● To reduce the risk associated with hazardous voltage:<ul style="list-style-type: none">- Position electrical cord away from foot and vehicle traffic.	

Installation – General

The following instructions are presented in the order recommended for installing the Tape Application Monitoring Kit on your 3M-Matic™ case sealer.

Read the installation instructions completely before beginning installation. For future reference, record the Tape Application Monitoring Kit serial number on the front cover of this instruction manual in the space provided for future reference.

Control Box Assembly

The control box is mounted directly to the case sealer using the control box mounting bracket. For models: 200a, 800ab, 800asb, 800r, 800rks, 800rf, 7000a, 7000r, 8000a, and 8000af the recommended mounting position is on the on/off push-button side of the case sealer. Refer to **Figures 2-1 through 2-5**.

For models: 800rks and 800rf the recommended mounting position is on the underside of the machine's electrical control box.

Note: Because holes do not already exist in the electrical box of the 800rks and 800rf you must first position the control box mounting bracket then carefully mark and drill clearance holes (.343" dia.) for the (2) M8 mounting fasteners. Refer to **Figures**.

Installation and Set-Up *(continued)*

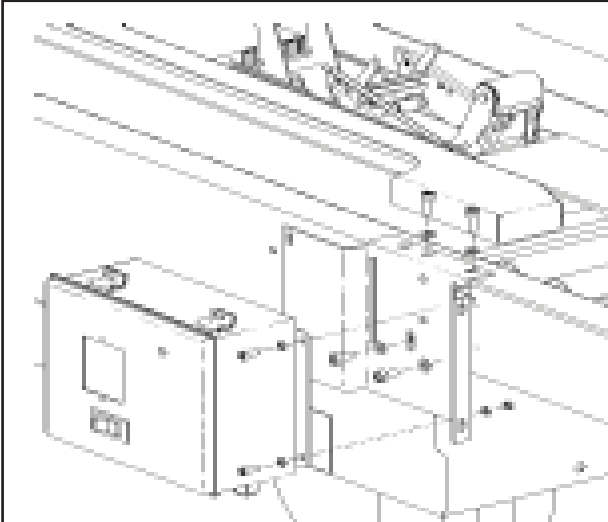


Figure 2-1 200a / 7000a Pro / 7000r Pro

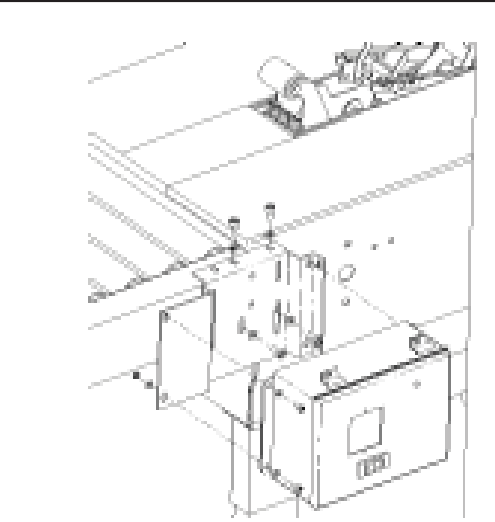


Figure 2-2 800ab / 800asb / 8000a

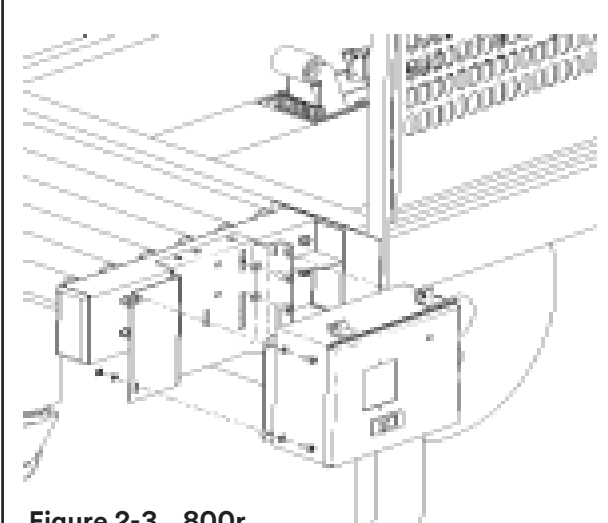


Figure 2-3 800r

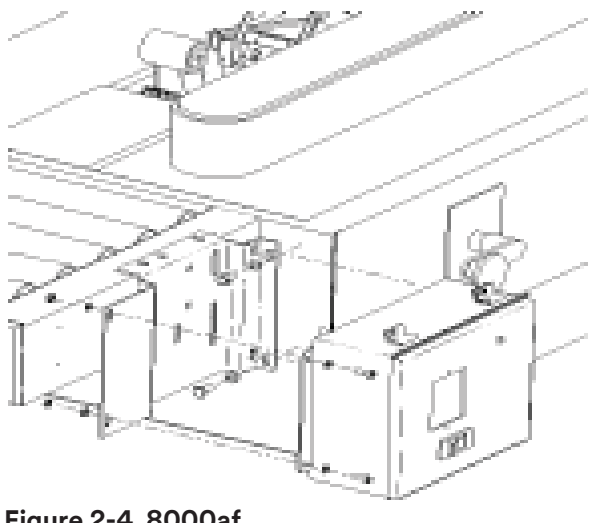


Figure 2-4 8000af

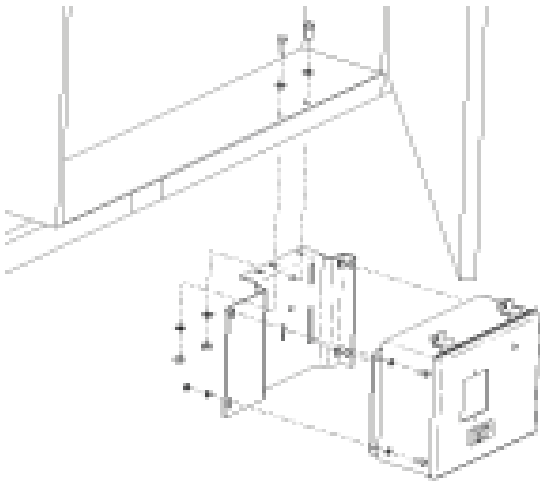


Figure 2-5 800rf / 800rks

Installation and Set-Up *(continued)*

Lower Dancer Arm

The lower dancer arm assembly is mounted directly to the case sealer's right hand lower drive frame using the nut plate, M6 screws (2) and washers (2) supplied in this kit. Mounting holes must be drilled in the lower drive frame on all case sealer models.

Note: This kit contains components to monitor both an upper and lower taping head on a single case sealer. Outboard tape supply roll mounting is possible with an optional lower to outboard conversion kit (See "Options/Accessories").

Lower Dancer Arm Mounting

The taping head tape drum bracket angle must be determined to properly position the Lower Dancer Arm assembly. Refer to **Figures 2-6 and 2-7** to determine which example represents the current machine configuration.

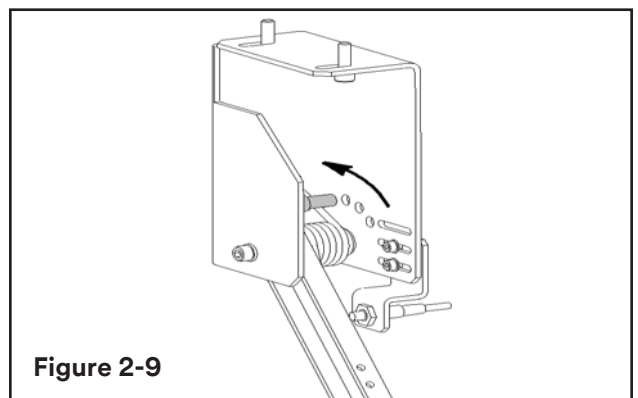
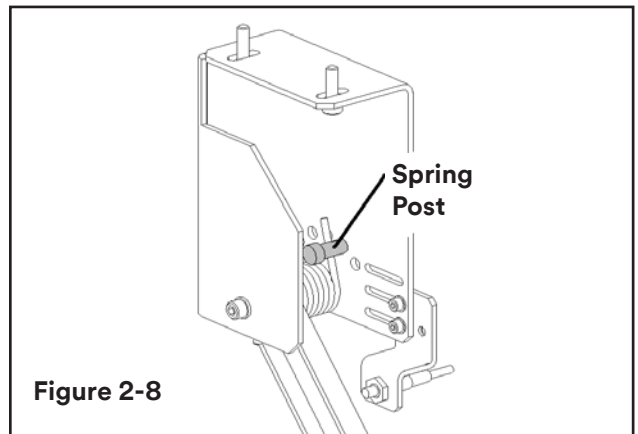
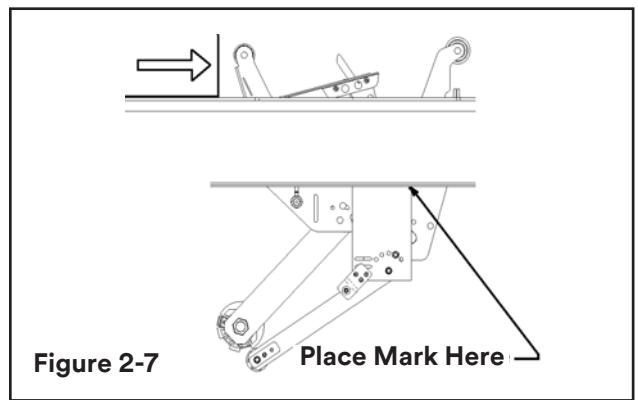
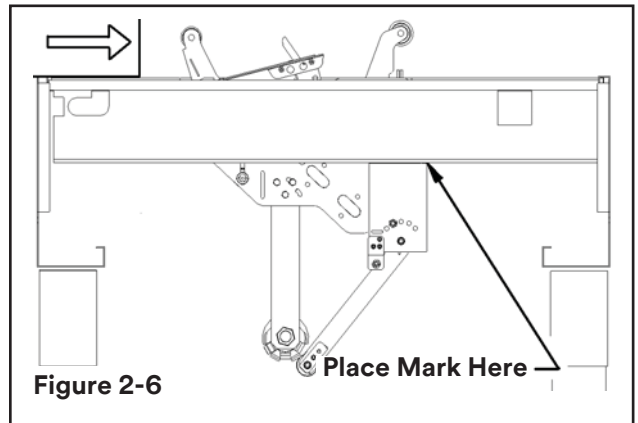
- 1) Remove the lower taping head supply roll
- 2) Properly position the taping head inside the case sealer cavity.
- 3) Position the Lower Dancer Arm spring post in the appropriate location. The factory spring post setting (**Figure 2-8**) corresponds to the bracket angle shown in **Figure 2-6**. The spring post must be moved (**Figure 2-8**) as the bracket angle changes to keep the dancer arm roller in contact with the tape drum (**Figure 2-7**).

Important: The spring post must be in the appropriate location to determine the correct mounting location.

- 4) Place and hold the lower dancer arm assembly on the bottom of the right hand drive frame so the dancer arm roller is in contact with the tape drum (**Figures 2-6 and 2-7**).

Note: Right hand is defined by viewing the machine from the entrance end.

- 5) Place a mark on the case sealer frame at the back of the dancer arm bracket (**Figure 2-6 and 2-7**).



Installation and Set-Up *(continued)*

- 6) Place the edge of the template on the mark made in step 5 also flush to the outer edge of the case sealer frame.
- 7) Mark the hole locations as shown in **(Figure 2-10)**.



Caution

- **To reduce the risk associated with metal flyings or hot surface hazards:**
 - Use proper personal protective equipment when drilling mounting holes

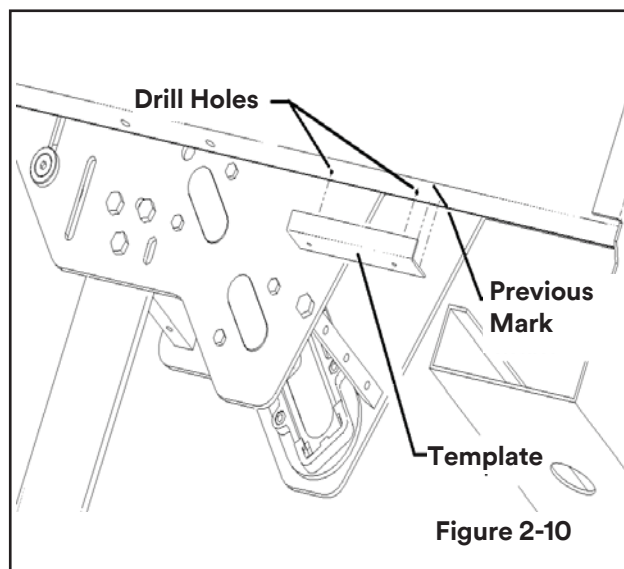


Figure 2-10

- 8) Remove the lower taping head from the case sealer and drill a 0.25 inch (6.5mm) hole at the marks made in step 7.

Note: Carefully remove any burrs on the case sealer frame before fastening the dancer arm assembly.

- 9) Fasten the dancer arm assembly to the case sealer frame using (2) M6 screws, washers and the nut plate as illustrated in **Figure 2-11**.
- 10) Reinstall taping head without the tape supply roll.
- 11) Verify that the dancer arm roller is in contact with the empty tape drum.

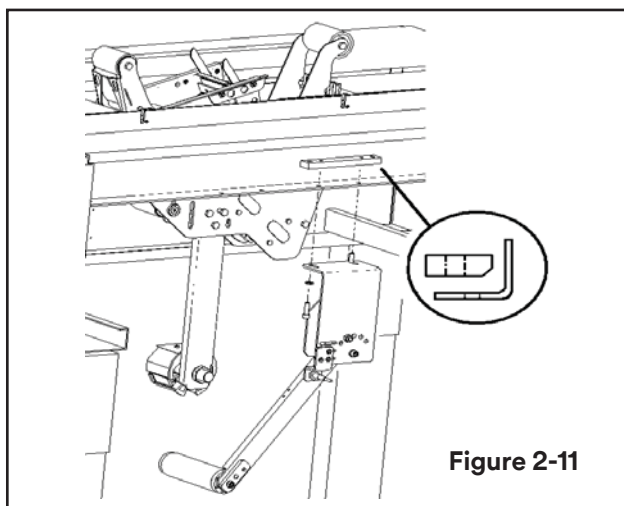


Figure 2-11

Installation and Set-Up *(continued)*

Upper Dancer Arm Assembly

The upper dancer arm assembly is mounted directly to the case sealer's inner column cross-member using one of the three supplied brackets.

- 1) Fasten the upper dancer arm assembly to the appropriate bracket (**See Figures 2-12**) using the M6 screws and washers.
- 2) Remove the tape supply roll from the upper tape drum.
- 3) Remove the fasteners used to secure the tape drum bracket to the inner column cross-member of the case sealer.
- 4) Place the dancer arm assembly over the tape drum bracket as shown in **Figures 2-12** and attach the entire assembly using the longer (4) M6 screws and washers supplied in this kit.

If the dancer arm roller does not align with the tape drum complete steps 5 and 6

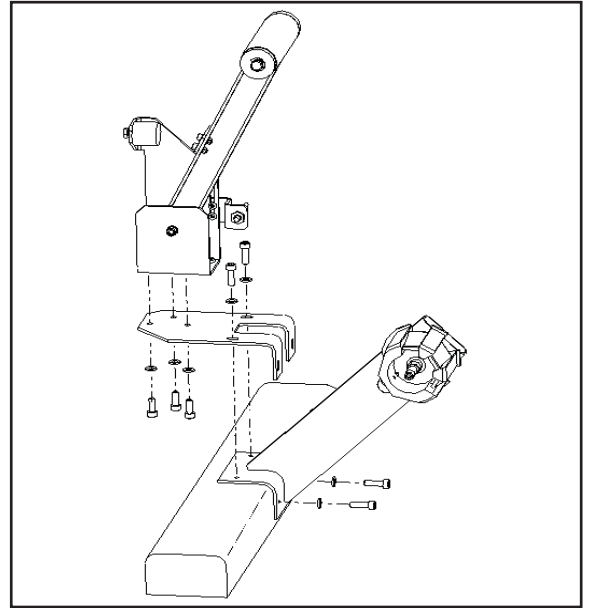


Figure 2-12

Installation and Set-Up *(continued)*

- 5) Remove the e-ring, roller, shaft, sensor and bracket to position on correct side as illustrated in **Figure 2-13**.
- 6) Thread the sensor into bracket until the end of the sensor is approximately .1mm (.039") from end of roller. Check to insure all seven targets are sensed as the roller turns.

Box Present Sensing Assembly

The box present sensing assembly consists of two identical brackets. One is used to mount the sensor and guard. The other is for mounting the reflector. Each bracket uses a 3M™ VHB™ acrylic foam tape to adhere the sensor/reflector bracket assemblies to the case sealer. These brackets have tabs for alignment "squaring" to the case sealer's base or column. They are also slotted to allow for additional adjustment of sensor and reflector along the bracket length.

Mounting Procedure

The guidelines for positioning the sensor/reflector brackets are listed below.



Warning

- To reduce the risk associated with pinches, entanglement and hazardous voltage:
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

- 1) Verify that the control box is properly mounted to the case sealer.
- 2) Determine the appropriate mounting location for your application. The box present sensor can be mounted at various locations from a point ahead of the applying roller to the end of the cutoff bracket. Whenever possible the sensor/reflector brackets should be positioned approximately ½" from the end of the lower taping head cutoff bracket. For applications with top taping only the position should be chosen using the upper taping head cutoff bracket. The sensor must also be positioned to detect the lowest height box without being blocked by taping head movement. Mounting location and adjustment will vary with each application (**See Figures 2-14**).

Important: Do not remove the VHB™ tape liner to mount the box present sensor brackets first determine the sensor beam location.

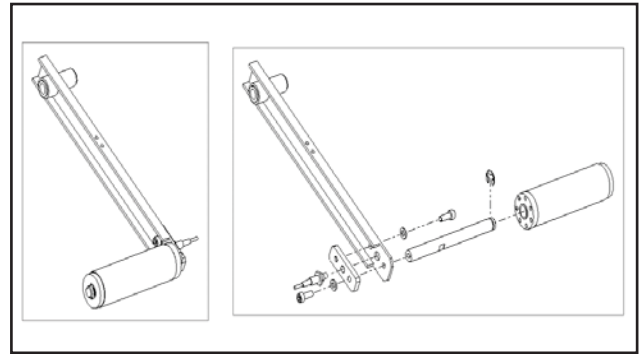


Figure 2-13

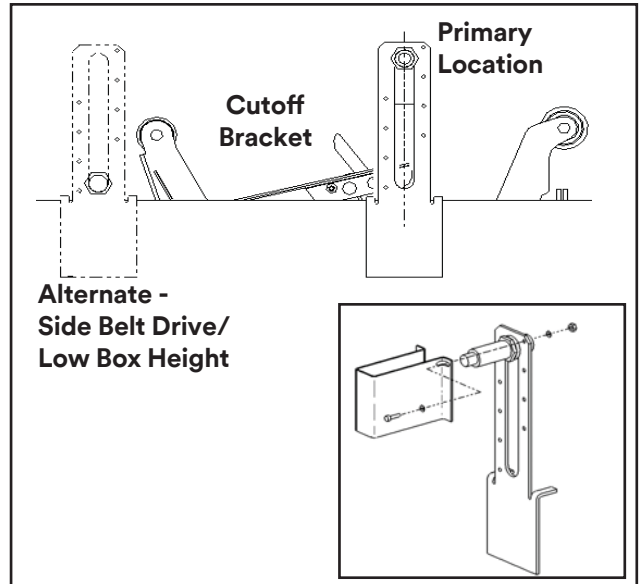


Figure 2-14

- 3) Connect the box present sensor into the box present control cable and turn power on.
- 4) Attach the sensor and reflector to the brackets. Whenever possible place the reflector/bracket assembly on the operator side of the machine and sensor/bracket assembly on the opposite side. This will reduce the chance of faults caused by contacting and possibly altering the sensor alignment.

Note: In certain applications the sensor and or reflector can be attached directly to the case sealer. The reflector can be removed from the bracket and attached using the VHB™ tape supplied in this kit (i.e. 800 Series).

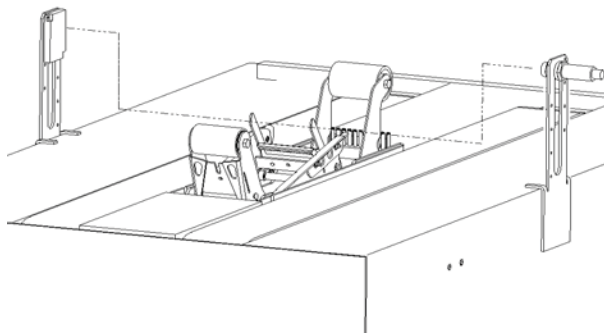
- 5) Move a box to the sensor location to turn on (i.e. primary sensor location in front of cutoff bracket or alternate as shown in **Figure 2-15**).
- 6) Position the Reflector and sensor brackets on opposite sides of the machine close to the final position.

Installation and Set-Up *(continued)*

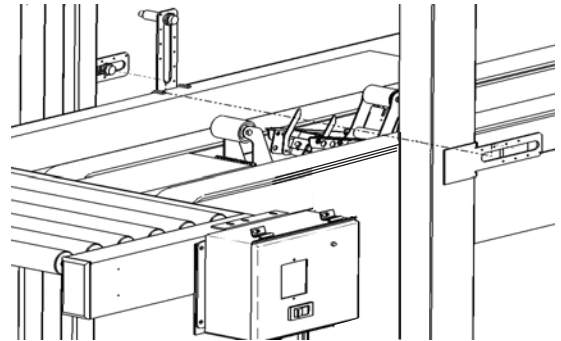
- 7) Slide the sensor and reflector brackets as required until the light (LED) on the sensor turns "On".

Note: The sensor LED is "On" whenever the sensors beam is reflected back to the sensor. (i.e. The reflector is aligned with the sensor and no object blocking the reflected beam).

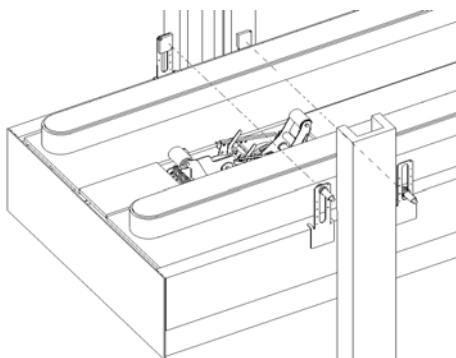
- 8) Check to insure the sensor beam is not blocked by any part of the taping head or case sealer when the equipment is in operation or at rest. The beam should only be broken by the box as it passes through the machine.
- 9) Mark the final position.



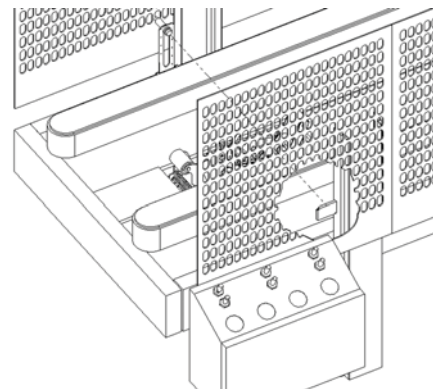
200a / 700a / 7000a



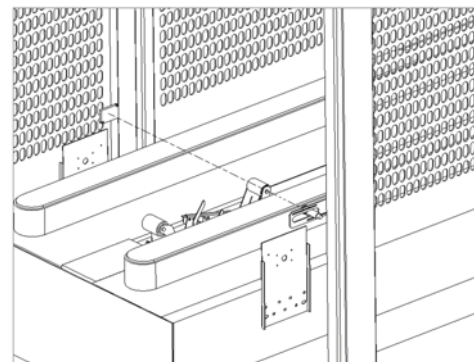
700r / 7000r (two possible locations)



800a / 800ab / 800asb /
8000af / 800r / 8000a
(two possible locations)



800rf



800rks

Figure 2-15

Installation and Set-Up *(continued)*

To Attach the Brackets:

- 1) Clean the general area where the brackets are to be mounted. Do not remove the final position mark.

Note: It is very important that this area is clean and dry to insure proper adhesion to surface. Use a water/alcohol solution mixture or equivalent cleaner approved for use on powder coat paint.

- 2) Remove the VHB tape liner(s) and “lightly” press the brackets into position.
- 3) Recheck sensor/reflector alignment before “firmly” pressing on each bracket to permanently mount the sensor and reflector assemblies.
- 4) Attach the sensor guard (See **Figure 2-16**).

Completing the Electrical Systems Connections

The remaining sensors must be connected. Each dancer arm assembly has (2) proximity sensors, a tape dispense and a low tape supply sensor.



Warning

- To reduce the risk associated with pinches, entanglement and hazardous voltage:
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

- 1) Turn off and disconnect the power to the control box.
- 2) Identify and route the control cables to the appropriate locations defined by bracket mounting. The cables are marked to indicate the appropriate sensor connection (i.e. UD - Upper Dispensing sensor, US - Upper low tape Supply sensor, LD - Lower Dispensing sensor, LS - Lower low tape Supply sensor).

Important: Cables must remain clear of moving parts and free to move if affected by machine adjustment.

- 3) Use the cable ties and cable mounts contained in this kit to secure the control cables to the case sealer.

Note: It is very important that this area is clean and dry to insure proper adhesion to surface. Use a water/alcohol solution mixture or equivalent cleaner approved for use on powder coat paint.

- 4) Connect the appropriate control cable connectors to each proximity sensor.
- 5) Connect the case sealer power cord to control box assembly and restore power (**See Figure 2-16**).

Important: The 800rks and 800rf case sealers require 3 phase electrical power. The standard configuration will not connect directly to these machines. Contact a 3M sales representative for additional information.

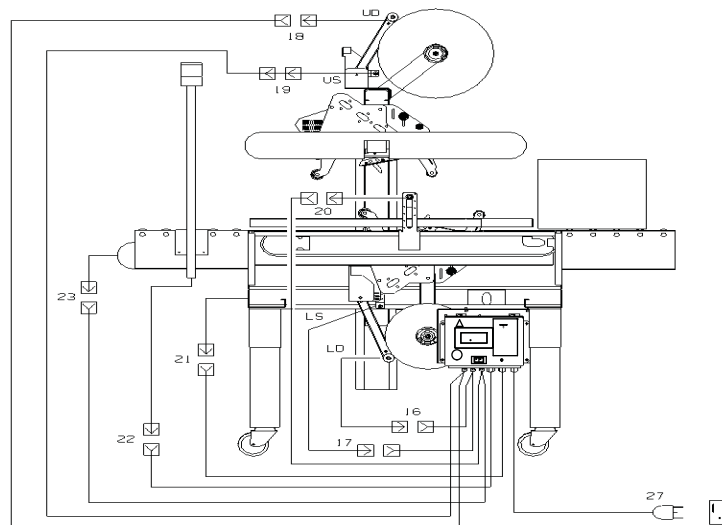


Figure 2-16

Installation and Set-Up *(continued)*

Adjusting the Low Tape Supply Sensor:

The dancer arm position is used to define the low tape condition. The arm rotates as tape is dispensed. The low tape sensor “turns on” when the arm rotation matches the low tape level setting. The sensor position is adjustable and is determined by your process requirements. There are two adjustments that will affect the proper operation of the low tape sensor.

The first is the gap between the sensor and target.

The second is the rotational position of the dancer arm.

Note: The Tape Application Monitor can be used to signal a low tape condition by turning on the panel indicator and (optional) beacon light. The system can be set to stop the case sealer when either the upper or lower low tape supply sensors detect a low tape condition. (Refer the Theory of Operation and Adjustments sections of this manual for further information on this feature.)

The sensor should be positioned to allow the operator ample time to replace the tape roll before adversely affecting your production process when the system is set to indicate a low tape condition.

To adjust the sensor:

1. Check distance between the sensor and target. The gap must be less than 0.079 inches (2mm) and must not touch the target or interfere with the motion of the dancer arm.
2. If necessary, loosen the M8 sensor jam nuts and reposition the sensor.
3. Rotate and hold the dancer arm in a position that represents your low tape condition. This can be accomplished by placing a spacer or a tape roll with the amount of tape that represents the low tape condition.
4. Loosen or remove the (2) M5 fasteners on the low tape sensor bracket and slide or reposition the bracket as required until the sensor turns "On" (indicated by the sensor LED). Slots are supplied to allow adjustment.
Figure 2-17 shows different bracket positions.
5. Retighten the fasteners.
6. Check and adjust as required until a satisfactory low level indication is achieved.

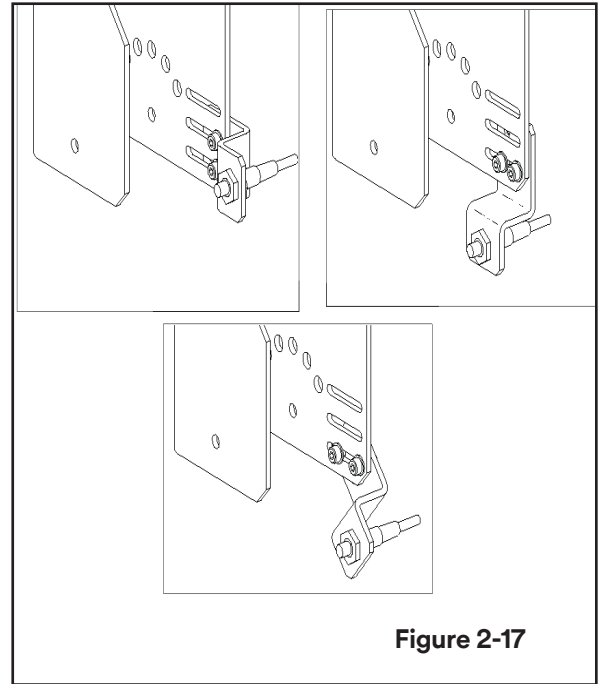


Figure 2-17

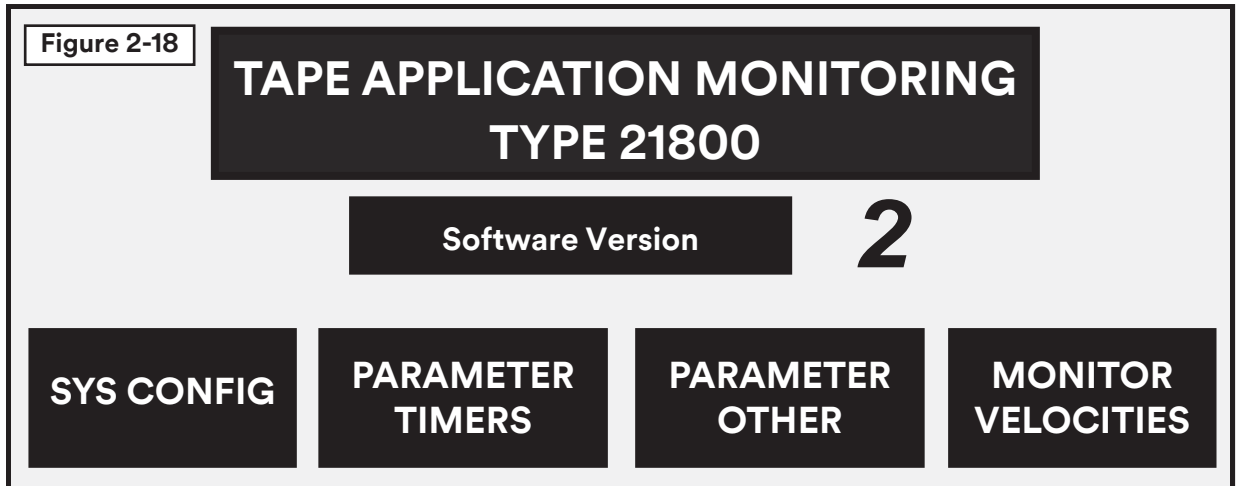
Setting the PLC Application Parameters

A remote HMI display mounted to the junction box cover is used to set the operational parameters and provide the necessary fault screens.

Note: For application specific data register and timer values refer to the Adjustments Section of this manual.

Parameter Setup thru HMI:

Following the Installation and Setup-Up instructions contained in this manual power up the TAM control box by pressing the rocker switch (located on the junction box) to the ON position and verify the screen shown is displayed on the HMI unit (**Figure 2-18**).



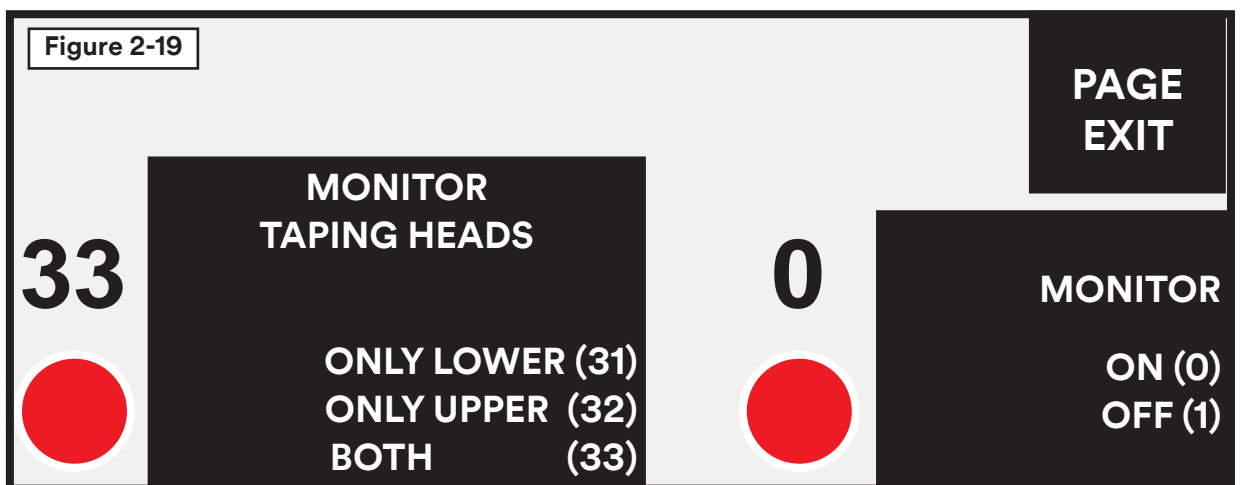
Press the “SYS CONFIG” Page to display the HMI display shown in (**Figure 2-19**).

Starting with the taping heads to monitor press the lower left button to set the following:

- 31: Monitor ONLY LOWER Taping Head
- 32: Monitor ONLY UPPER Taping Head
- 33: Monitor BOTH Taping Heads (FACTORY SETTING)

Press the second button (i.e. Lower Right) to enable or bypass tape monitoring as follows:

- 0: ON Monitor (FACTORY SETTING)
- 1: OFF Monitor By-Pass



When completed, press the “PAGE EXIT” to return to the main menu.

Installation and Set-Up *(continued)*

Press the “PARAMETERS TIMERS” Page to display the HMI display shown in Figure 2-20. Set timers TH051-TH055 (in 100th of a second) as required per the application as follows:

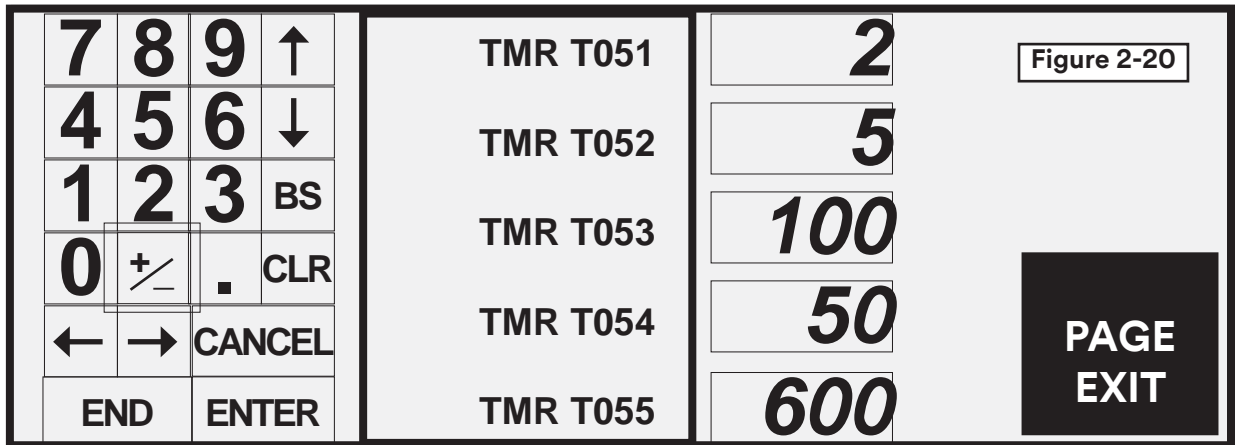
TH051 = 2 (FACTORY SETTING): Represents the time for the leading edge of the box to travel from box present sensor to the tape head cutoff bracket (just before the tape is cut).
See chart below for example TH051 calculations.

TH052 = 5 (FACTORY SETTING): Represents the time after applying measurements (Velocity V1) have completed and tape cut measurements (Velocity V2) have begun.

TH053 = 100 (FACTORY SETTING): Represents the time allotted for measurement (Velocity V2) after tape would have been cut.

TH054 = 50 (FACTORY SETTING): Represents the time after detecting an apply fault before the case sealer is shut-off (i.e. Allows box to clear the taping head).

TH055 = 600 (FACTORY SETTING): Represents the maximum time to process a box before enabling a fault condition. Typically if this time is exceeded a box jam has occurred and the case sealer is shut down to prevent premature belt wear.



Example: Timer TH051 Calculation #1

*IFT/MIN	* N/SEC	**DISTANCE[IN]	CALCULATION (DISTANCE/BELT SPEED)*100
78	15.60	.5	(0.5/15.6)*100
102	20.40	.5	(0.5/20.4)*100
150	30	0.5	(0.5/30)*100

Example: Timer TH051 Calculation #2

* FT/MIN	*IN/SEC	**DISTANCE[IN]	CALCULATION (DISTANCE/BELT SPEED)*100
78	15.63	6	(36/15.6)*100
102	20.4	36	(36/20.4)*100
150	30	36	(36/30)*100

* Belt Speed

** Distance from box presence sensor to lower cut-off bracket of taping head.

Note: For Monitoring upper taping head ONLY - DISTANCE = Box presence sensor to upper taping head Cut-off bracket.

When completed, press the “PAGE EXIT” to return to the main menu.

Installation and Set-Up *(continued)*

Press the “PARAMETERS OTHER” Page to display the HMI display shown (Figure 2-21) Starting with the BELT SPEED press the button to set the following:

- 0: 78 FPM Belt Speed
- 1: 102 FPM Belt Speed (FACTORY SETTING)
- 2: 150 FPM Belt Speed

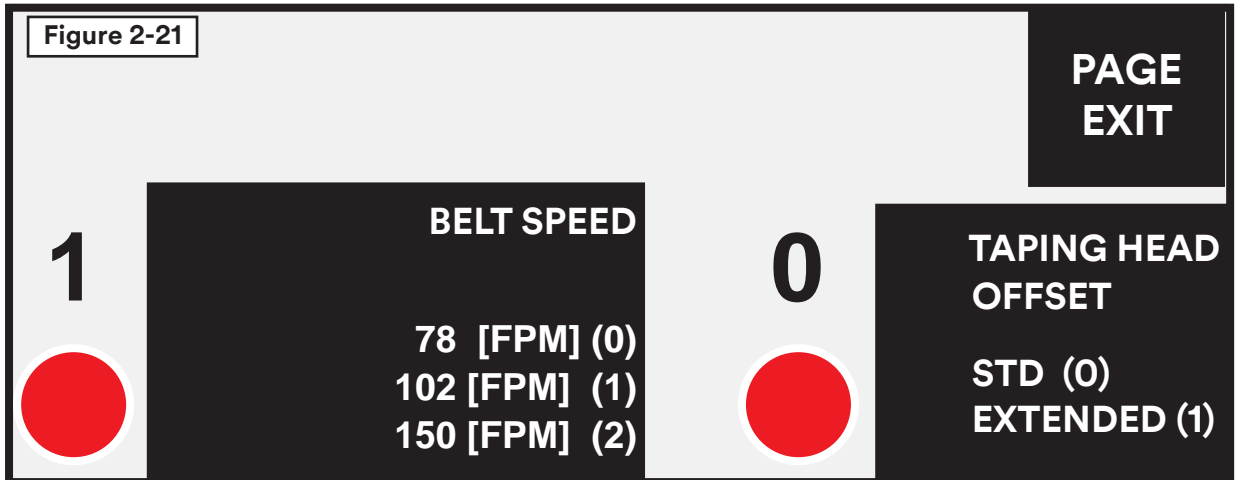
Set the TAPING HEAD OFFSET:

- 0: STANDARD (FACTORY SETTING)
- 1: EXTENDED



Warning

- To reduce the risk associated with mechanical and electrical hazards:
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.



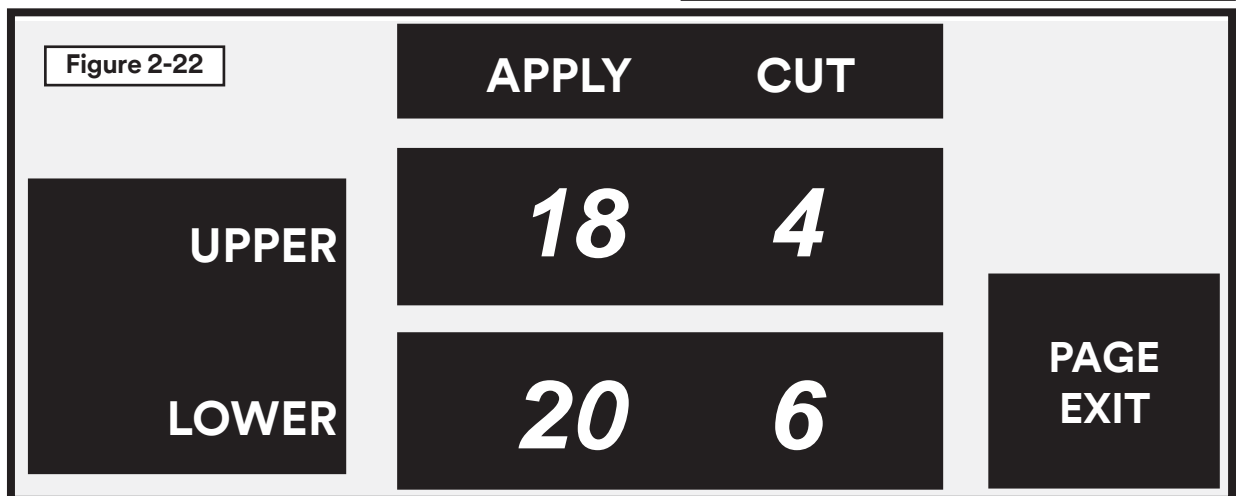
When completed, press the “PAGE EXIT” to return to the main menu.

Press the “MONITOR VELOCITIES” Page to display the HMI display shown in Figure 2-22. This screen is used to check the tape apply and cut velocities to ensure that both the tape apply and cut velocities are in acceptable ranges after setup.



Warning

- To reduce the risk associated with pinches, entanglement and hazardous voltage:
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.



When completed, press the “PAGE EXIT” to return to the main menu.

Theory of Operation *(continued)*

General

This section contains general information about the Tape Application Monitoring System. For a more complete description refer to Operation and adjustment Sections of this manual.

This tape application monitoring system is PLC controlled with the ability to signal or stop your 3M-Matic™ case sealer if the machine is running low on tape, if the tape did not cut, or if tape was not applied as the box passes through the case sealer.

The operation is based on information received from the sensors supplied with this system. They sense the presence of electrical current supplied to the case sealer, the presence of a box as it passes through the machine, the dispensing of tape from the supply roll and a low level of tape on the supply roll. The system becomes part of your 3M-Matic™ case sealer with no changes required to your existing AccuGlide™ taping heads.

This system consists of a current sensor, a box presence sensor and 2 dancer arm assemblies for monitoring tape activity of both an upper and lower taping head. Each sensor is independently adjustable for your specific application.

The dancer arm assemblies are spring loaded mechanisms designed to remain in contact with the tape supply rolls on your case sealer. A special "dancer arm roller" is attached to the end of the "dancer arm" along with a sensor to detect supply roll movement as the tape is dispensed. A second sensor at the opposite end of the arm senses the angular position of the dancer arm. As the supply roll gets smaller the arm moves closer to the sensor and the point you have selected to replace the roll.

The current sensor is located in the main control box. It is placed in-line with the case sealer's power cord wiring and is used to detect current flow and determine whether or not the case sealer is running. This sensor allows the system to reset automatically after a fault condition is corrected by simply restarting the case sealer.

The PLC controller contains programs to interpret the information received from these sensors. This system has a setup menu for selecting the system configuration and operating parameters for the application.

Operational Explanation

The box presence sensor assembly consists of a reflector and a sensor mounted on opposite sides of the case sealer. The sensor LED turns "Off" when a box passes between the sensor and reflector. The assembly is attached directly to the case sealer's base frame or column by means of a 3M™ VHB™ doubled sided foam tape. The sensor and reflector must be positioned to detect the lowest height box without being blocked by the action of the taping head. Refer to the "Installation and Setup" section for recommended mounting.

The spring loaded dancer arm assembly is mounted adjacent to each taping head to be monitored. The dancer arm roller is placed in contact with the tape supply roll to monitor tape movement and supply level. Seven targets spaced equally around the circumference of the dancer arm roller, pass the tape dispensing sensor to indicate when tape is dispensed. The information obtained from the tape dispensing sensor is used to calculate the tape apply V1 (i.e. supply roll tape velocity while taped is being applied) and tape cut V2 (i.e. supply roll tape velocity after tape has been cut). The calculations occur at two different points with information obtained from the box presence sensor. The first calculation for V1 begins when the leading edge of the box reaches the tape cutoff bracket and ends when the trailing edge reaches the cutoff bracket. The calculation for V2 begins at a point after the trailing edge has passed the cutoff bracket and ends after the time expires on TH053. The tape apply and tape cut velocities (V1 & V2) are run independently and compared to preset values. A tape apply velocity less than or tape cut velocity greater than these preset values will generate a fault code and stop the case sealer. Refer to **Figures 3-1 through 3-3** and following detailed explanation for further information.

Note: The following explanation is for both upper and lower taping head monitoring. It includes additional detail on program timers used to delay the start of the velocity calculations for the upper head due to the physical offset of the upper and lower taping heads (upper taping head is approximately 5 ½" behind the lower taping head position/for Standard Position).

Theory of Operation *(continued)*

Upper and Lower Tape Head Monitoring (Detailed description)

The typical installation and taping head orientation is shown in **Figure 3-1**. The box enters the case sealer from right to left in the illustrations. The leading edge of the box is detected by the box present sensor (**Figure 3-2**) starting timer TH051. Timer TH051 is adjustable and represents the time required for the box to travel from the sensor to the taping head cutoff bracket (based on the belt speed).

The PLC begins counting pulses the instant TH051 "times out". The pulses are accumulated from the lower tape dispense sensor as the tape supply roll rotates. These pulses are counted until the trailing edge of the box passes the taping head cutoff bracket (**Figure 3-3**). The tape, at this point, has not been cut and the tape apply velocity (V1) is calculated.

$$V1 = \frac{(\text{Pulses}) * (\text{Encoder Constant})}{\text{Elapsed Time}}$$

Encoder Constant = linear travel distance per pulse of the dancer arm roller.

Elapsed Time = Time from the sensing of the leading edge to the trailing edge of the box.

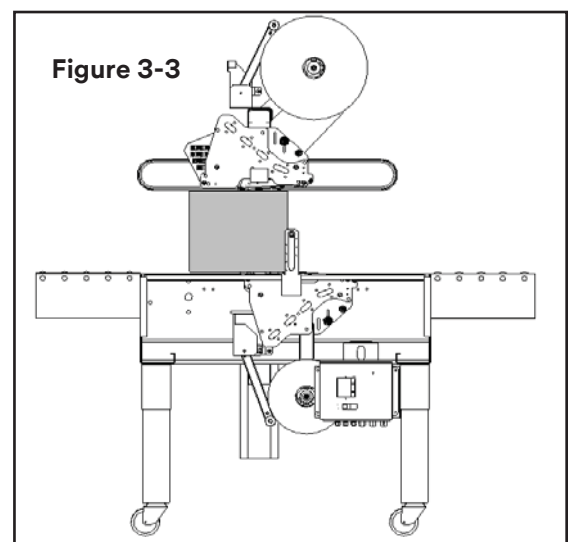
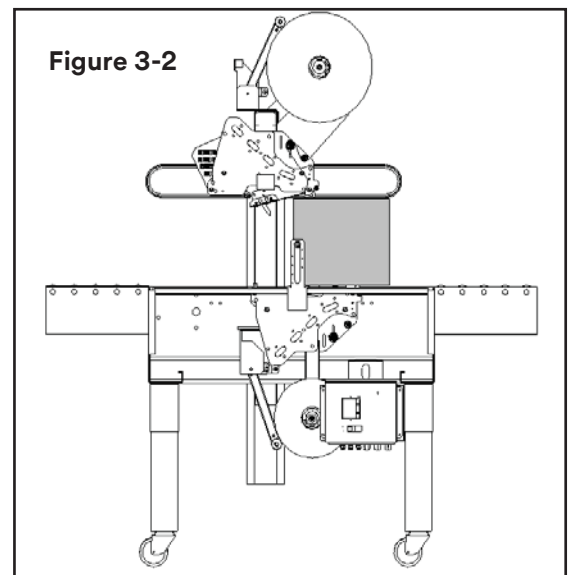
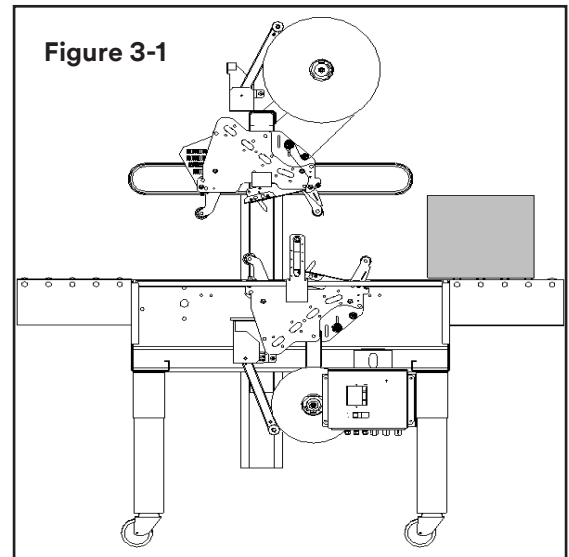
There are three (3) software filters used to determine that the tape applied successfully between positions illustrated in **Figures 3-2 to 3-3**. A fault will be generated if either condition is satisfied.

The first filter is a general calculation that compares the calculated velocity (V1) to a preset V1min. If (V1) is less than or equal to (V1min) the system will generate a NO APPLY fault and stop the case sealer.

Note: (V1min) is set at half the expected belt speed. For your 3M-Matic case sealer that runs at 15in/sec, (V1min) is set to 7 in/sec.

The second filter is used to ensure tape was dispensed continuously as the box passed through the case sealer. The Elapsed Time and pulse count are divided into smaller segments. If at least one pulse was measured during the last segment of the apply cycle (i.e. just before the tape is cut) then tape was successfully applied to the box. If the pulse(s) measured during the last segment of time equals zero a NO APPLY fault is generated.

The last filter used is to determine if the tape was successfully cut. As the trailing edge of the box passes the taping head cutoff bracket (**Figure 3-3**) timer TH052 starts. This timer is similar to TH051 and represents the amount of dwell time after the apply cycle has completed and the cut cycle begins.



Theory of Operation *(continued)*

Timer TH053 begins and pulses from the tape dispense sensor are accumulated when TH052 "times out". Velocity V2 represents the tape velocity after being cut and is calculated after TH053 "time out". During normal operation the tape supply roll will slow and stop after the tape is cut and velocity V2 will be significantly less than V1. The system compares V2 to V1 and if that value is greater than 60% of V1 a TAPE DID NOT CUT fault will be generated and the system will stop the case sealer.

Fault conditions are indicated on the HMI display (See "Operation" Section for PLC fault codes). The fault will also be indicated by the control panel indicator light and the beacon light (Optional).

The system is automatically reset after a fault conditions by restarting the case sealer.

The program software algorithm is illustrated in **Figure 3-4**.

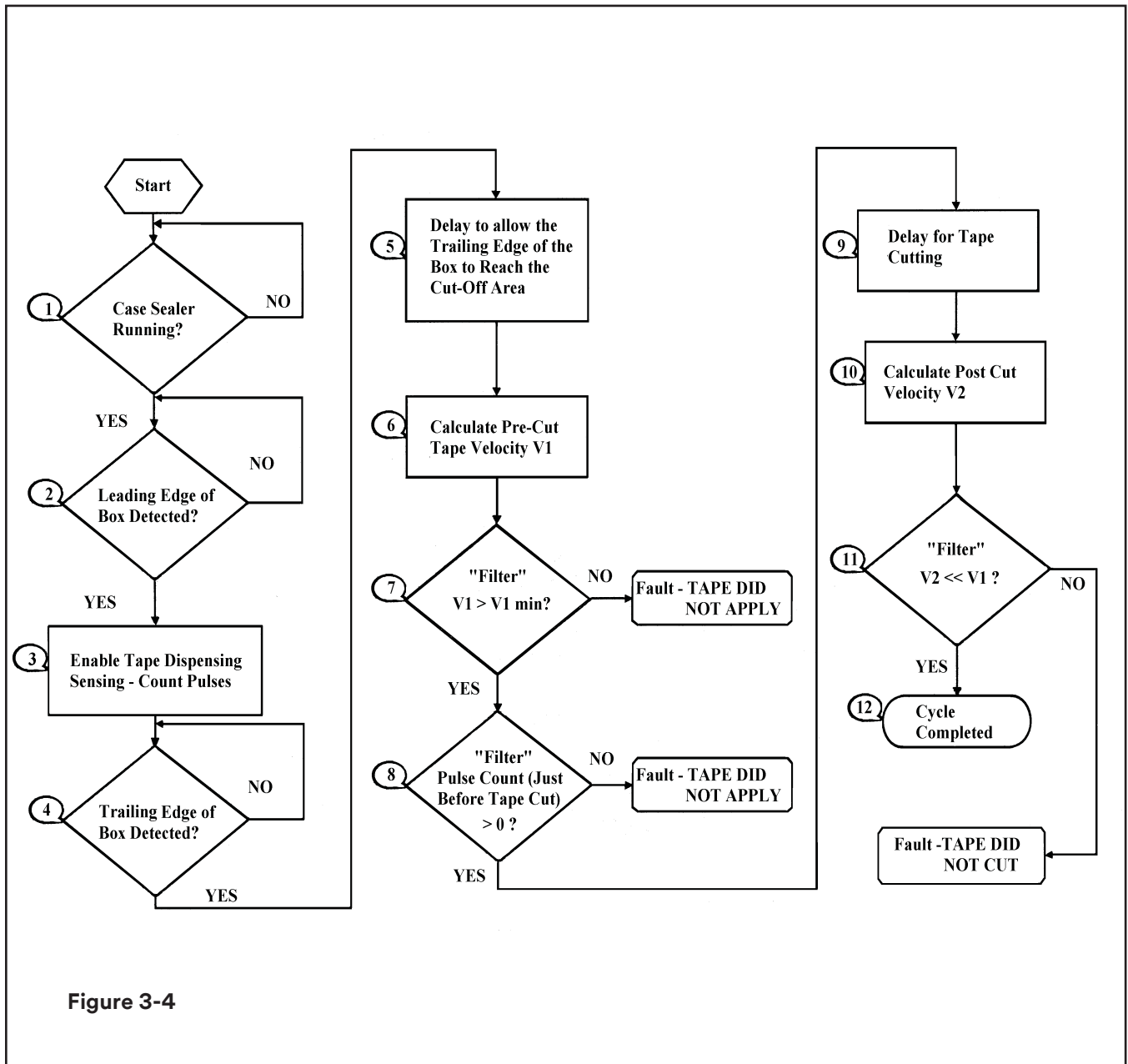


Figure 3-4

Operation



Warning

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.
- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

Loading Tape Supply Roll

The tape application monitoring system is independent of the taping head. This allows you to remove the taping head without having to disconnect any electrical or pneumatic lines.

To remove or add a tape supply roll to the upper or lower outboard tape drum:

- 1) Pull the spring loaded dancer arm away from the tape roll until it contacts the holding magnet (**Figure 4-1**). The magnet will hold the dancer arm away from the tape drum allowing you to easily remove and install tape rolls.
- 2) Rotate the dancer arm away from the holding magnet and allow it to rest on the new tape roll.

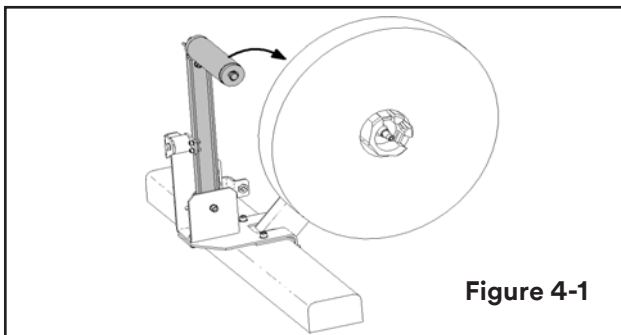


Figure 4-1

Note: No magnets are used in standard lower taping head applications (Tape bracket/drum attached to the taping head). Simply lift from the case sealer to replace the supply roll. Place the taping head back into the machine with the new tape roll (**Figure 4-2**).

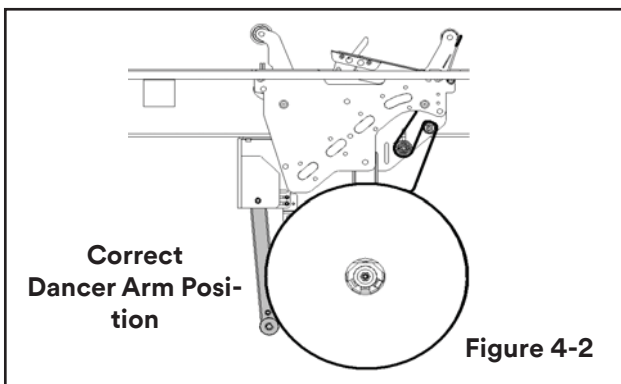


Figure 4-2

- 3) Follow the standard threading procedure when replacing the supply roll of the taping head.

Note: The Dancer arm roller is not part of the tape path. Do not wrap tape around/over the dancer arm roller.

- 4) Verify that the supply roll is contact the dancer arm roller for proper operation.

Note: It is possible to insert the supply roll behind the dancer arm assembly roller (**Figure 4-3**). This will prevent proper operation and a no apply tape fault will occur.

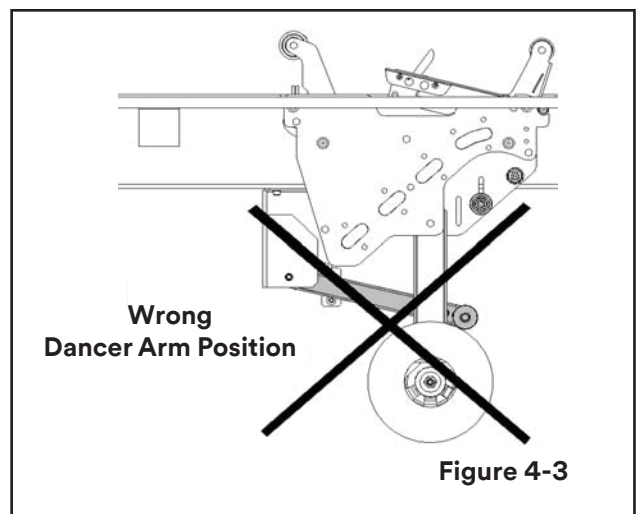


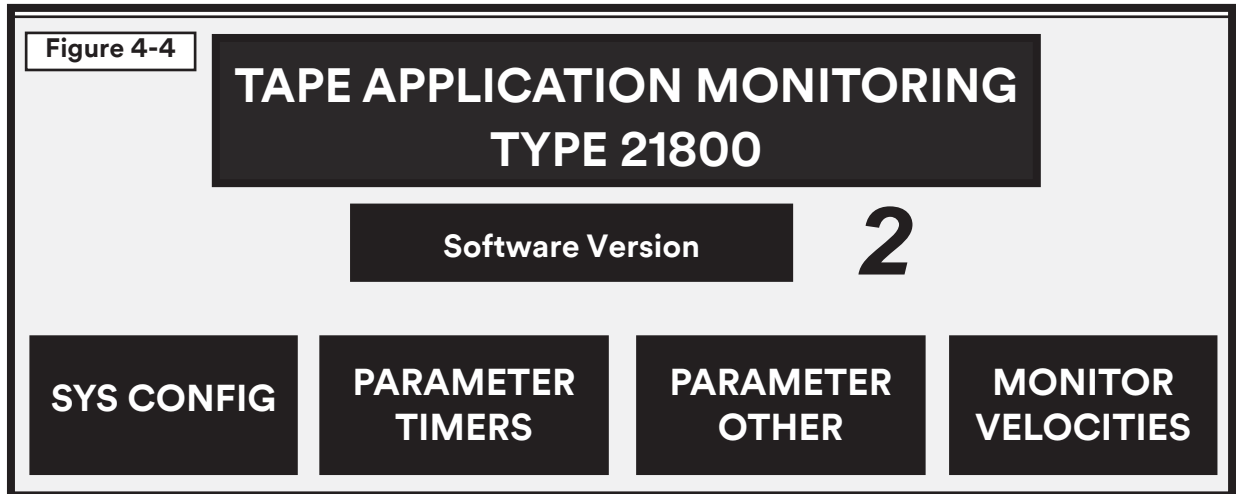
Figure 4-3

Operation *(continued)*

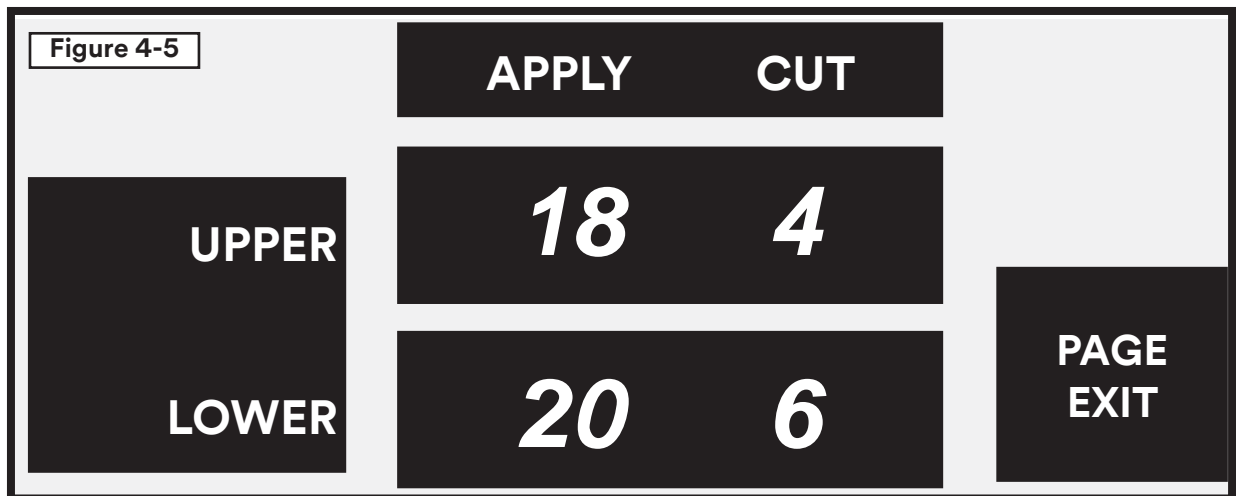
System Checkout & Operating Sequence

The system is now ready to use. The following steps will be used to determine proper operation of the Tape Application Monitor:

- 1) From the main menu (**Figure 4-4**)



Press the "MONITOR VELOCITIES" Page to display the HMI display shown (**Figure 4-5**). This screen is used to check the tape velocities to ensure that the both the tape apply and cut velocities are in acceptable ranges after setup.



- 2) Run a box through your case sealer.
- 3) Watch the HMI display and note the values that appear on the screen after box goes through machine. Verify both the apply and cut values (i.e. velocities inches/sec) for each taping head being used. In general the expected apply value should be close to the case sealer belt speed (i.e. 15-22 for a belt speed of 20 inches/sec) and the cut value should be close to zero (i.e. << apply value).
Note: If the unit faults the display screen will display the appropriate fault screen (**Figures 4-6A - 4-6H**).
- 4) For values outside of the ranges listed above please refer to the troubleshooting section of this manual.

Figure 4-6A

FAULT CODE "101"

LOWER Taping Head: Tape did not apply to box. Check tape supply roll. Tape is broken, not on taping head apply roller, or supply roll is empty Correct then RESET by pressing the Start PB on case sealer

Figure 4-6B

FAULT CODE "102"

LOWER Taping Head: Tape did not cut. Check the taping head for proper position of the tape on the apply roller or issues with the cutting blade. If not resolved check the case sealer for proper alignment. RESET by pressing the Start PB on case sealer

Figure 4-6C

FAULT CODE "201"

UPPER Taping Head: Tape did not apply to box. Check tape supply roll. Tape is broken, not on taping head apply roller, or supply roll is empty Correct then RESET by pressing the Start PB on case sealer

Figure 4-6D

FAULT CODE "202"

UPPER Taping Head: Tape did not cut. Check the taping head for proper position of the tape on the apply roller or issues with the cutting blade. If not resolved check the case sealer for proper alignment. RESET by pressing the Start PB on case sealer

Figure 4-6E

FAULT CODE "66"

BOX INTERVAL ERROR: Boxes too close together for TAM to monitor properly. Insure to allow a minimum gap of 18 inches between boxes. **RESET** by pressing the Start PB on the case sealer

Figure 4-6F

FAULT CODE "121"

LOWER Taping Head: Internal overflow error. PLC error or **LOWER TAPE DISPENSE** proximity sensor issue. **RESET.** Press the Start PB on the case sealer

Figure 4-6G

FAULT CODE "221"

UPPER Taping Head: Internal overflow error. PLC error or **LOWER TAPE DISPENSE** proximity sensor issue. **RESET.** Press the Start PB on the case sealer

Figure 4-6H

FAULT CODE "25"

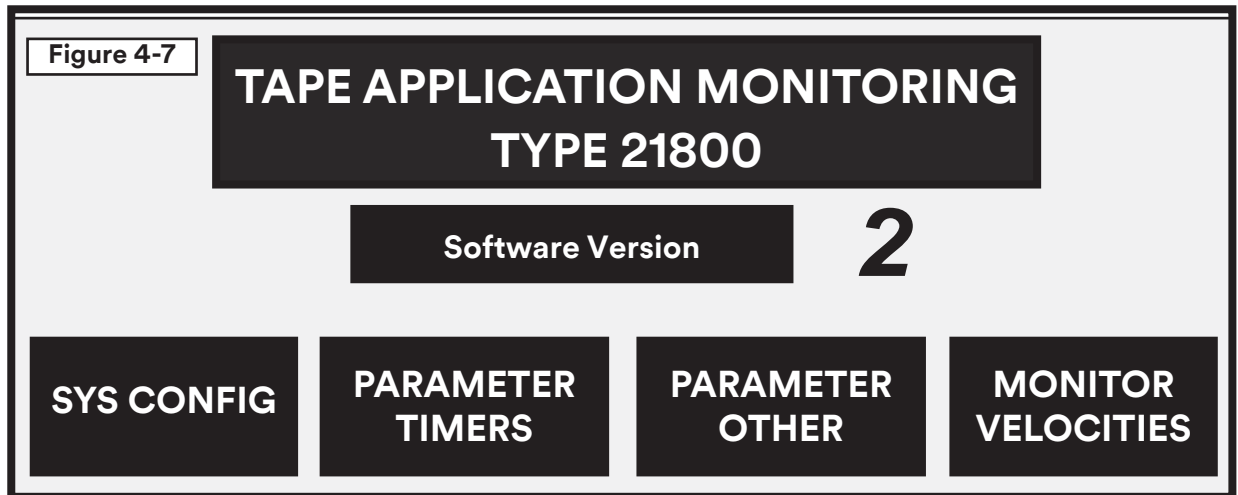
BOX JAM: Case Sealer Disabled
RESET: Press Start PB on case sealer

Operation *(continued)*

Operating Sequence:

With the tape application monitoring system in place and all connections completed.

- 1) Turn the control box switch to the ON position. The panel indicator light briefly turns on and then goes off, the HMI will display the main screen (**Figure 4-7**).



- 2) Turn ON the case sealer.

Note: For units with the optional remote beacon light, this light will also cycle on to off.

- 3) Run a box through your case sealer and observe any fault conditions that occur (**Figures 4-6A - 4-6-H**).

After Correcting the Fault Condition:

- 4) Reset the Tape Application Monitoring system by pressing the “Start Button” on your case sealer.

Note: If the suggestions (**Figures 4-6A - 4-6H**) don't clear the fault condition after attempting a reset, refer to the troubleshooting section of this manual.

- 5) Return to step 2 and repeat until the system is operating normally

Fault Code	Description
101	LOWER or LOWER OUTBOARD Taping Head: Tape did not apply to the box. Check tape supply roll. Tape is broken or supply roll is empty.
102	LOWER or LOWER OUTBOARD Taping Head: Tape has not cut. Check case sealer adjustment or the taping head blade
201	UPPER Taping Head: Tape did not apply to the box. Check tape supply roll. Tape is broken or supply roll is empty.
202	UPPER Taping Head: Tape has not cut. Check case sealer adjustment or taping head blade
121	LOWER or LOWER OUTBOARD Taping Head: Internal overflow error. Refer to the trouble shooting section.
221	UPPER Taping Head: Internal overflow error. Refer to the trouble shooting section.
66	BOX INTERVAL ERROR: Boxes too close together Refer to the trouble shooting section.
25	Box Jam - Case Sealer Disabled

Adjustments



Warning

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.
- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

There are five timers used to configure this system for your application.

Note: The timer values are in 100th of a second.

Press the “PARAMETERS TIMERS” Page to display the HMI display shown (Figure 5-1).

Set timers TH051-TH055 (in 100th of a second) as required per the application as follows:
(Reference “Settable Timers” section in this manual).

TH051 = 2 (FACTORY SETTING): Represents the time for the leading edge of the box to travel from box present sensor to the tape head cutoff bracket (just before the tape is cut).
See below for example TH051 calculations.

TH052 = 5 (FACTORY SETTING): Represents the time after applying measurements (Velocity V1) have completed and tape cut measurements (Velocity V2) have begun.

TH053 = 100 (FACTORY SETTING): Represents the time allotted for measurement (Velocity V2) after tape would have been cut.

TH054 = 50 (FACTORY SETTING): Represents the time after detecting an apply fault before the case sealer is shut-off (i.e. Allows box to clear the taping head).

TH055 = 600 (FACTORY SETTING): Represents the maximum time to process a box before enabling a fault condition. Typically if this time is exceeded a box has jammed occurred and the case sealer is shut down to prevent premature belt wear.

7	8	9	↑	TMR T051	2	PAGE EXIT
4	5	6	↓	TMR T052	5	
1	2	3	BS	TMR T053	100	
0	+/-	.	CLR	TMR T054	50	
←	→	CANCEL		TMR T055	600	
END		ENTER				

Adjustments *(continued)*



Warning

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.
- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

Example: Timer TH051 Calculation #1

			CALCULATION (DISTANCE/BELT SPEED)*100
*IFT/MIN	* N/SEC	**DISTANCE[IN]	
78	15.60	.5	$(0.5/15.6)*100$
102	20.40	.5	$(0.5/20.4)*100$
150	30	0.5	$(0.5/30)*100$

Example: Timer TH051 Calculation #2

			CALCULATION (DISTANCE/BELT SPEED)*100
* FT/MIN	*IN/SEC	**DISTANCE[IN]	
78	15.63	6	$(36/15.6)*100$
102	20.4	36	$(36/20.4)*100$
150	30	36	$(36/30)*100$

* Belt Speed

** Distance from box presence sensor to lower cut-off bracket of taping head.

Note: For Monitoring upper taping head ONLY - DISTANCE = Box presence sensor to upper taping head Cut-off bracket.

When completed, press the "PAGE EXIT" to return to the main menu.

Maintenance

Dancer Arm Roller

Periodically inspect the dancer arm assembly roller to insure that it freely turns and the outer knurled surface of the roller is clean and not greatly worn. If any of the above conditions occur this could cause the roller to slip and not properly turn in response to a turning tape supply roll. If replacement of any of the parts is necessary please refer to the "Replacement Parts Illustrations" and "Parts List" of this manual.

Do not apply lubricant to the dancer arm roller. The dancer arm roller is designed to work without lubrication.

Troubleshooting

Troubleshooting Guide

Problem	Cause	Correction
Average Velocity V1 (pre-cut) for a given taping head is too low (i.e. < 11) or case sealer continuously shuts down with a tape did not apply error. (i.e. HMI displays "User 101" or "User 201")	1. Box is slipping as it travels through the machine.	Check the box height or width adjustment to prevent box to belt slippage
	2. Dancer arm roller is not turning	2A. Check to insure dancer arm assembly is in proper position and providing adequate force against the tape supply roll. 2B. Check to insure knurled surface of dancer arm roller is clean and not worn. 2C. Check roller shaft and roller inner diameter for problems. 2D. Check to insure tape dispense proximity sensor is not located too far in and contacting roller.
	3. Tape dispense proximity sensor is too far from roller "targets".	Loosen and move head of proximity sensor within 1mm (.040") of back of roller to sense targets.
	4. Setup parameter timer TH051 is not set to the proper value.	Set to correct value. Value should be set to the amount of time it takes the leading edge of the box to travel from the box present sensor to within ½" of the end of the cutoff bracket for lower taping head. If only the upper taping head is monitored adjust to within ½" of the upper head's end of cutoff bracket.
Average Velocity V2 (post-cut) for a given taping head is too high (i.e. > 4)	Sampling time T053 is set too low.	Check timer. Typically this value is set between 80 – 100. Note: Higher values delay when the case sealer will be shut off in the advent of a fault, thus allowing the box to escape the machine before shutdown.
The tape application monitoring system doesn't generate a fault and shut down the case sealer when the tape does not cut.	1. There is no gravity or powered out-feed conveyor at the exit end of the case sealer.	If the newly sealed box is allowed to stop at the exit end of the case sealer this can appear as a normal tape cut (i.e. V2 << V1). Add a conveyor to remove the box.
	2. Sampling time T053 is set too low.	Check timer. Typically this value is set between 80 – 100. Note: Higher values delay when the case sealer will be shut off in the advent of a fault, thus allowing the box to escape the machine before shutdown.

Electrical

The PLC has a switched mode power supply, which is used to provide 24VDC @ ½ amp power for the various input sensors, HMI, panel indicator and output relays. The PLC power connection originates from the load side of the circuit breaker switch through a line fuse. Power enters through connection 27 and connects to the DPST circuit breaker switch (Refer to **Figures 2-16 and 5-1**). The PLC has eight (8) inputs, configured to accept current sinking NPN style sensors. It also has six (6) dry contact output relays. Four (4) are configured 24VDC and two (2) for AC. Power for your case sealer is obtained through connection 21 and is switched on or off by means of the solid state relay (CR) using PLC output 502.

A current sensor is positioned on the AC line of the case sealer between the DPST circuit breaker switch and relay CR Case Sealer is used to determine if the case sealer is running. The sensor ("go, no go" gauge) provides closure of a dry contact relay, turning "On" PLC input 000 if the current exceeds the value set by the dial indicator located on the current sensor. The amount of current flowing through the circuit is not critical. The sensor is set at the minimum value. The current sensor resets the Tape Application Monitor when the operator presses the "ON" push-button of the case sealer after an error has occurred. When PLC input 000 is off all inputs are ignored and tape monitoring will not take place until the case sealer is started and input 000 turns on. The program sequence starts when the case sealer is running and a box is detected at PLC input 002 through connection 20. During program sequence if tape does not apply or cut a fault condition is generated and relay CR Case Sealer is momentarily cycled from "on – off – on" to briefly remove power from connection 21. This action removes power from the 3M-Matic™ case sealers latching circuit to stop the case sealer until the ON push-button is depressed. Press the case sealer "ON" push-button restarts the case sealer, the control algorithm clears the fault and the system resets.

The lower dancer arm assembly tape dispense sensor and low tape supply sensor connect through external connections 16 and 17. These connections represent PLC inputs 004 and 003.

The upper dancer arm assembly tape dispense sensor and low tape supply sensor connect through external connections 18 and 19. These connections represent, PLC inputs 006 and 001.

The control panel indicator light and optional dry contact relay for controlling a remote powered exit conveyor are connection 23. These represent PLC output 503 and requires the optional relay.

The optional remote beacon light is connected to the power cord connection 22 that provides AC rather than DC power from PLC. This represents output 501.

Electrical Diagram



Warning

- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

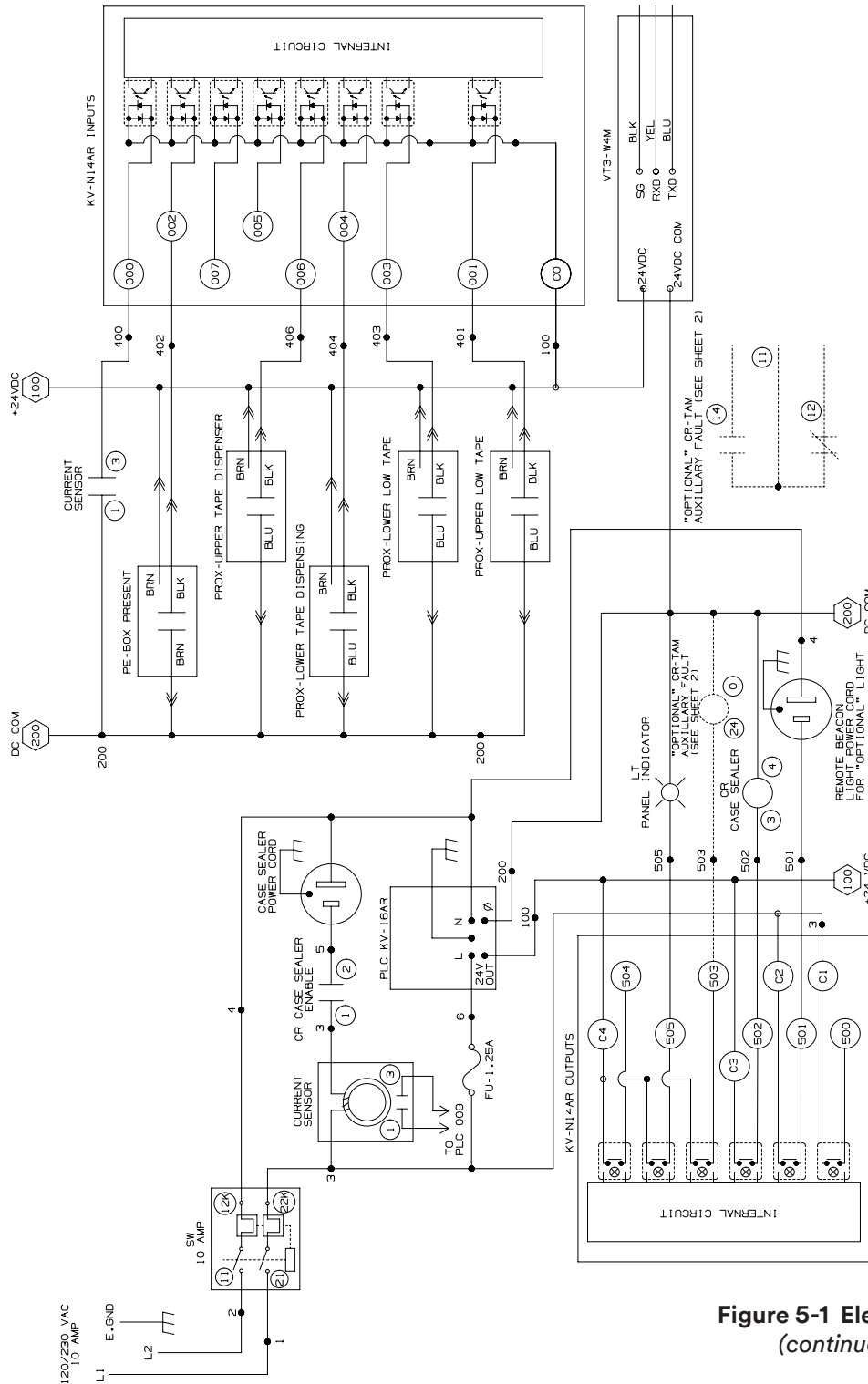


Figure 5-1 Electrical Diagram
(continued on next page)

Electrical Diagram



Warning

- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

WIRE TERMINATIONS

MODEL	A	B	Z	Y
800RKS	207 "START LAMP"	8 (DC COM)	4 (+24 VDC)	IN001
800RF	027 "RUN LAMP"	0 (DC COM)	2 (+24 VDC)	IN19
1400RF				
2000RF				

NOTES

1. FIELD CONNECTIONS NECESSARY FOR 240VAC 3 PHASE MACHINES (I.E. 800RKS, 800RF, 1400RF, 2000RF) AND FOR AN AUXILIARY FAULT OUTPUT (I.E. DISABLE OUTFEED CONVEYOR).
2. FOR 240VAC 3 PHASE MACHINES RELAY CR-SEALER IS USED TO ENABLE MOUNTING INSURE TO BE CONNECTED TO CR-SEALER RELAY.
3. CR-TAM RELAY IS USED FOR 240VAC 3 PHASE MACHINES OR AS A AUXILIARY OUTPUT TO SIGNAL A TAPE FAULT.

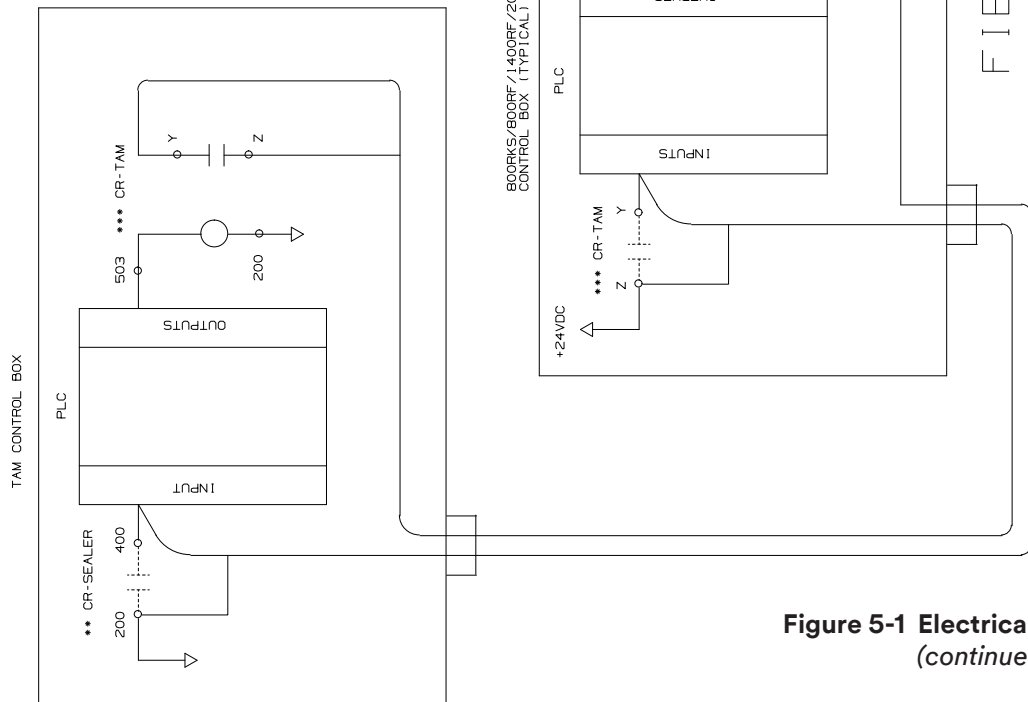


Figure 5-1 Electrical Diagram
(continued)

PLC Memory Map

Please refer to table II below for PLC inputs, outputs, special “settable” internal control registers and settable internal timers with accompany description.

Input	Output	Registers	Timers	Description
000				Current Sensor
001				UPPER – Low Tape Proximity Sensor
002				Photo Eye - Box Present Sensor
003				LOWER – Low Tape Proximity Sensor
004				LOWER – Tape Dispense Proximity Sensor
005				SPARE - Not in Use
006				UPPER – Tape Dispense Proximity Sensor
007				SPARE - Not in Use
	500			SPARE - Not in Use (AC Voltage Common)
	501			“Optional” Remote AC (120/240) Beacon Light
	502			Case Sealer - Solid State Relay
	503			“Optional” Dry Contact Relay. This output is used to stop an 800rks or 800rf in the event of a fault condition. This output could also be used to halt an external conveyor or signal a host controller. Output is normally ON and is OFF under a fault condition.
	504			SPARE - Not in Use (DC Voltage Common)
	505			Panel Indicator Light 24V DC
		DM0075		System Configuration Register (31=Lower Only, 32=Upper Only, 3=Both Taping Heads). Factory setting DM0075 = 33.
		DM0080		By-Pass Register (1=By-Pass Enable, <>1 = Normal TAM Operation. Factory setting DM0080 = 0.
		DM0100		Taping Head offset distance (0 = Standard 1 = Offset).
		DM0105		Case Sealer Belt Speed (0=15 ips 1=20 ips 2=30 ips).
			TH051	Represents the distance in “time” from the box present sensor to within ½” from the end of the lower taping head cut-off bracket (i.e. just before the tape would cut). When possible the box present sensor should be positioned very near the lower taping head cut-off bracket so the value of TH051 is small. In cases where this is not possible position the sensor just in front of the lower taping head apply roller. However, if there is no lower taping head used then position the box present sensor as close to the upper cut-off bracket.
				Note: In all cases position the sensor to trigger before the tape would cut. As an example for a 15 ips case sealer belt speed and a box present sensor positioned to trigger ½” before the tape would cut TH051, would be set to 3 hundreds of a second [TH051 = distance/velocity = (1/2/15)*100]. In applications where only an upper taping head is used (i.e. DM0075 = 32) TH051 represents the time in hundreds of a second from the box present sensor to just before the upper taping head cuts. Factory Setting TH051 = 2.

PLC Memory Map *(continued)*

Input	Output	Registers	Timers	Description
			TH052	Represents the amount of time AFTER measurements for calculation of (V1) (ie. tape apply or pre-cut) and BEFORE starting measurements for calculation of (V2) (post-cut). This value is normally set to 5 hundreds of a second in order to make sure tape has cut before beginning to take measurements for (V2). Factory Setting TH052 = 5.
			TH053	Represents the amount of time you sample AFTER the tape has been cut in order to determine the tape has properly cut. After the sample time has expired (V2) is calculated. Within reason the longer sampling time provides a better indicator of post-cut conditions but allows the box to travel further (i.e. escape the case sealer) before turning off the case sealer in the advent of a fault. This value is typically set at 80 - 100 hundreds of a second for a belt speed of 20 ips. If a second box enters case sealer before TH053 has expired the value of time used in the calculation for determining (V2) is the current accumulation of time at that instance. Factory Setting TH053 = 100.
			TH054	Represents the amount of time after detecting an apply fault before the case sealer is shut off. This allows the box to clear the taping head to ease the removal after a fault occurs. Factory Setting TH054 = 50.
			TH055	Represents the amount of time the monitoring system allows for a box to be processed before enabling a fault. Exceeding this time should represent a box jam and is used to minimize belt wear. Factory Setting TH055 = 600.

Replacement Parts – Illustrations and Parts Lists

Spare Parts

It is suggested that the following spare parts be ordered and kept on hand:

Qty.	Part Number	Description
2	26-1006-1320-2	Fuse - Slo-Blow, 5X20mm 1.25A Littelfuse 2181.25

Replacement Parts Ordering Information and Service

Refer to the first page of this instruction manual "Replacement Parts and Service Information".

Options/Accessories

For additional information on the options/accessories listed below, contact your 3M Representative.

Part Number	Option/Accessory
70-0064-1104-8	Optional Outboard Lower Dancer Arm Conversion Kit
78-8095-1134-4	Optional Remote Beacon Light Kit
26-1014-8243-3	Optional Dry Contact Relay

Replacement Parts – Illustrations and Parts Lists

Tape Application Monitor

To Order Parts:

1. Refer to first illustration, Frame Assemblies, for the Figure Number that identifies a specific portion of the machine.
2. Refer to the appropriate Figure or Figures to determine the parts required and the parts reference number.
3. The Parts List that follows each illustration, includes the Reference Number, Part Number and Part Description for the parts on that illustration.

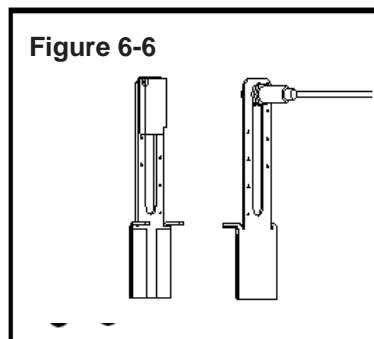
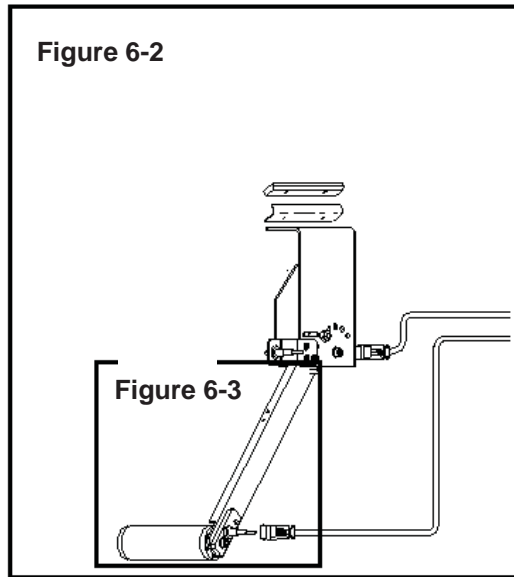
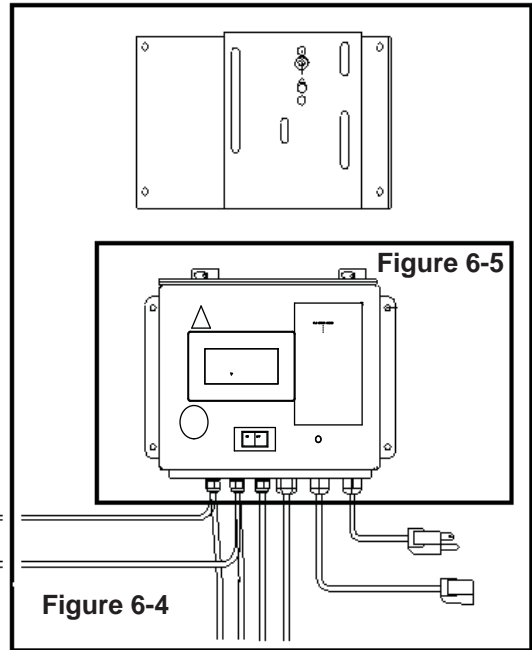
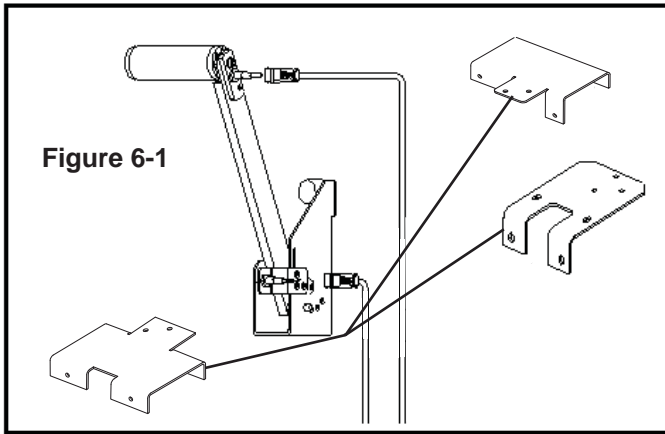
Note – The complete description has been included for standard fasteners and some commercially available components. This has been done to allow obtaining these standard parts locally, if desired.

4. Order parts by Part Number, Part Description and Quantity required. Also include machine name, number and type.

Important – Not all the parts listed are normally stocked items. Some parts or assemblies shown are available only on special order. Contact 3M/Tape Dispenser Parts to confirm item availability.

5. Refer to the first page of this instruction manual “**Replacement Parts and Service Information**” for replacement parts ordering information.

Tape Application Monitor (TAM)



Frame Assemblies

Tape Application Monitor (TAM)

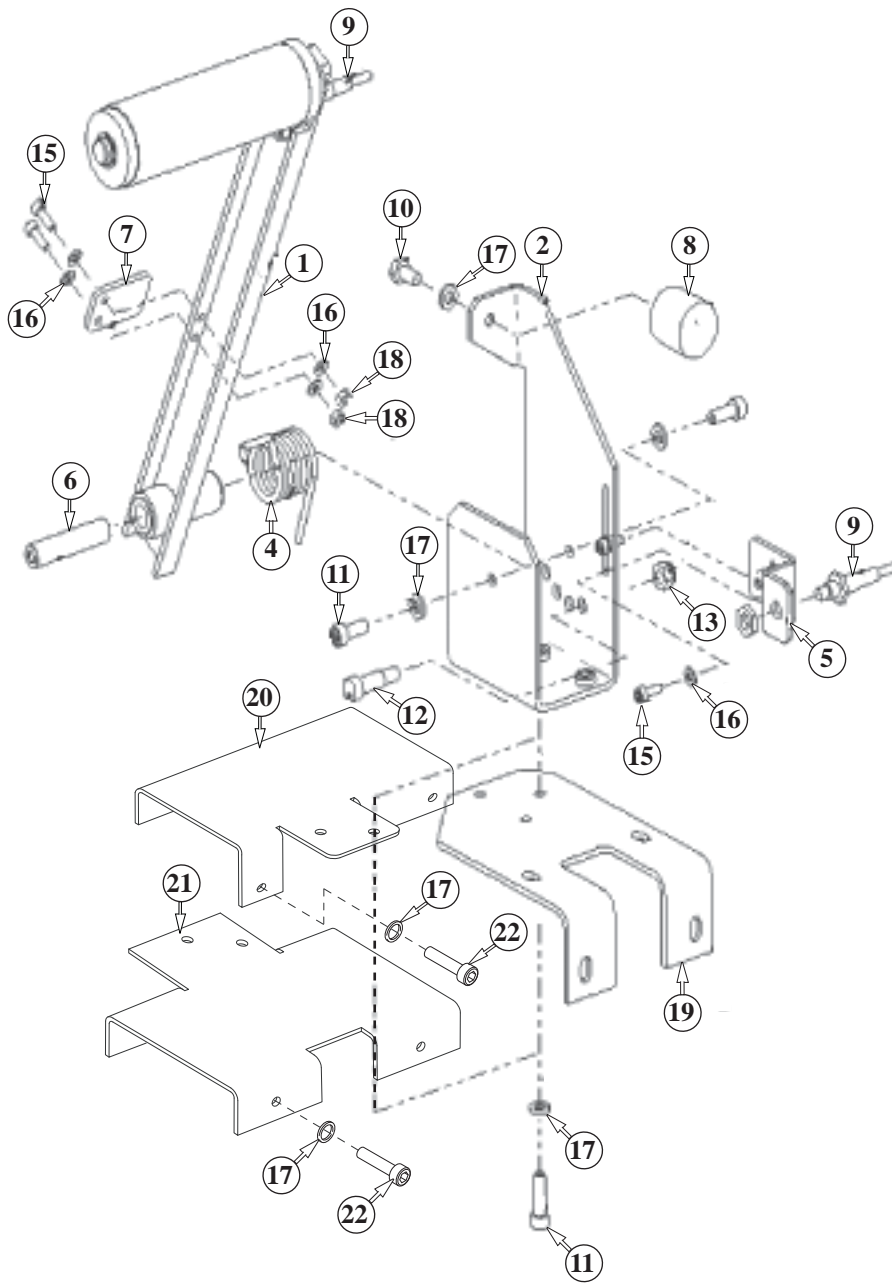


Figure 6-1

Tape Application Monitor (TAM)

Figure 6-1

Ref. No.	3M Part No.	Description
1	78-8133-9680-7	Assembly - Arm Swing
2	78-8133-9681-5	Bracket - "U" Main Upper
4	78-8137-0003-2	Spring - Torsion R/H
5	78-8133-9682-3	Bracket - Hold Sensor
6	78-8133-9685-6	Shaft - Spacer Pivot
7	78-8137-0002-4	Plate - Magnet Stop
8	26-1016-2465-3	Magnet - Pot 27mm Dia X 25mm M6 X 1.0, Eclipse 833
9	26-1016-2466-1	Sensor - Prox NPN 2mm M8, Omron E2A-S08KS02-M5-C1
10	26-1016-2493-5	Capscrew - Hex Hd. A/Stl M6 X 1.0 X 8mm Lg., Stl Zn Plt
11	26-1014-8755-6	Capscrew - Soc. Hd. Dr. M6 X 1.0 X 16mm Lg., Stl Zn Plt
12	12-7990-7756-0	Screw - Shoulder Hex Soc Dr. 5/16 Dia X .62 Lg., A/Stl
13	26-1016-2494-3	Nut - Loc Hex, Nylon Insert Steel, 1/4-20, A/Stl Zn Plt
15	26-1016-2509-8	Capscrew - Soc Dr. Hex Dr. M4 X 0.7 X 12mm Lg., A/Stl Zn Plt
16	26-1016-2496-8	Washer - Plain, A/Stl. Narrow M4
17	26-1000-0010-3	Washer - Plain, A/Stl. Narrow M6
18	26-1005-0641-4	Nut - Lock Hex, Nylon Insert Steel, M4, A/Stl Zn Plt
19	78-8133-9696-3	Bracket - Mount TAM Upper Arm
20	78-8137-8700-5	Bracket - Mount 7000a/7000a3/8000a/8000a3
21	78-8137-8701-3	Bracket - Mount 7000r/7000r3
22	26-1014-8756-4	Capscrew - Soc Hd. Hex Soc Dr. M6 X 1.0 X 20mm Lg., A/Stl Zn Plt

Tape Application Monitor (TAM)

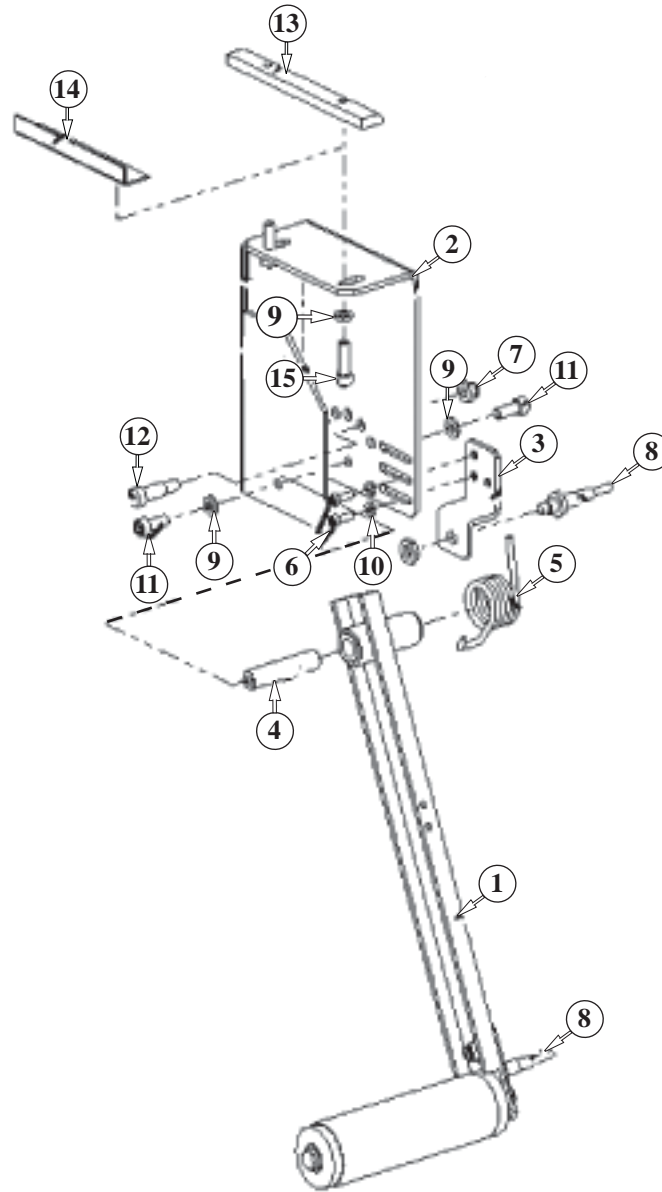


Figure 6-2

Tape Application Monitor (TAM)

Figure 6-2

Ref. No.	3M Part No.	Description
1	78-8133-9680-7	Assembly - Arm Swing
2	78-8133-9699-7	Bracket - Mount Lower
3	78-8133-9682-3	Bracket - Hold Sensor
4	78-8133-9685-6	Shaft - Spacer Pivot
5	78-8137-0004-1	Spring - Torsion L/H
6	26-1016-2509-8	Capscrew - Hex Soc Dr. M4 X 0.7 X 12mm Lg A/Stl Zn Plt
7	26-1016-2494-3	Nut - Loc Hex, Nylon Insert Steel, 1/4-20 A/Stl Zn Plt
8	26-1016-2466-1	Sensor - Prox NPN 2mm M8 Omron E2A-S08KS02-M5-C1
9	26-1000-0010-3	Washer - Plain, A/Stl. Narrow, M6
10	26-1016-2496-8	Washer - Plain, A/Stl. Narrow, M4
11	26-1014-8755-6	Capscrew - Hex Hd. M6 X 1.0 X 16mm Lg., Stl Zn Plt
12	12-7990-7756-0	Screw - Shoulder Hex Soc Dr. 5/16 Dia X .62 Lg., A/Stl
13	78-8133-9679-9	Plate - Nut
14	78-8137-0020-6	Template
15	26-1014-8756-4	Capscrew - Hex Soc Dr. M6 X 1.0 X 20mm Lg., A/Stl Zn Plt

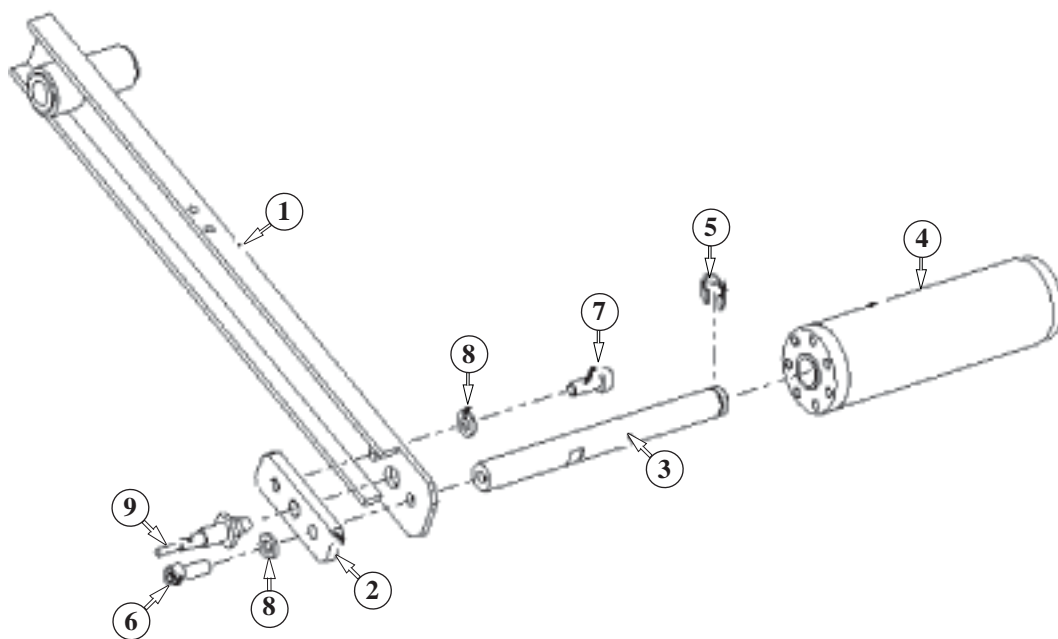


Figure 6-3

Figure 6-3

Ref. No.	3M Part No.	Description
1	78-8133-9684-9	Assembly - Arm Swing Bushing
2	78-8133-9687-2	Block - Sensor
3	78-8133-9689-8	Shaft - Roller
4	78-8137-0006-5	Roller Assembly
5	78-8656-4012-8	Ring - Retaining E-Ring, Waldes 5133-50 1/2" Shaft
6	26-1014-8756-4	Capscrew - Hex Soc Dr. M6 X 1.0 X 20mm Lg., Zn Plt
7	26-1014-8755-6	Capscrew - Hex Soc Dr. M6 X 1.0 X 16mm Lg., Zn Plt
8	26-1000-0010-3	Washer - Plain Narrow, M6
9	26-1016-2466-1	Sensor - Prox NPN 2mm M8, Omron E2A-S08KS02-M5-C1

Tape Application Monitor (TAM)

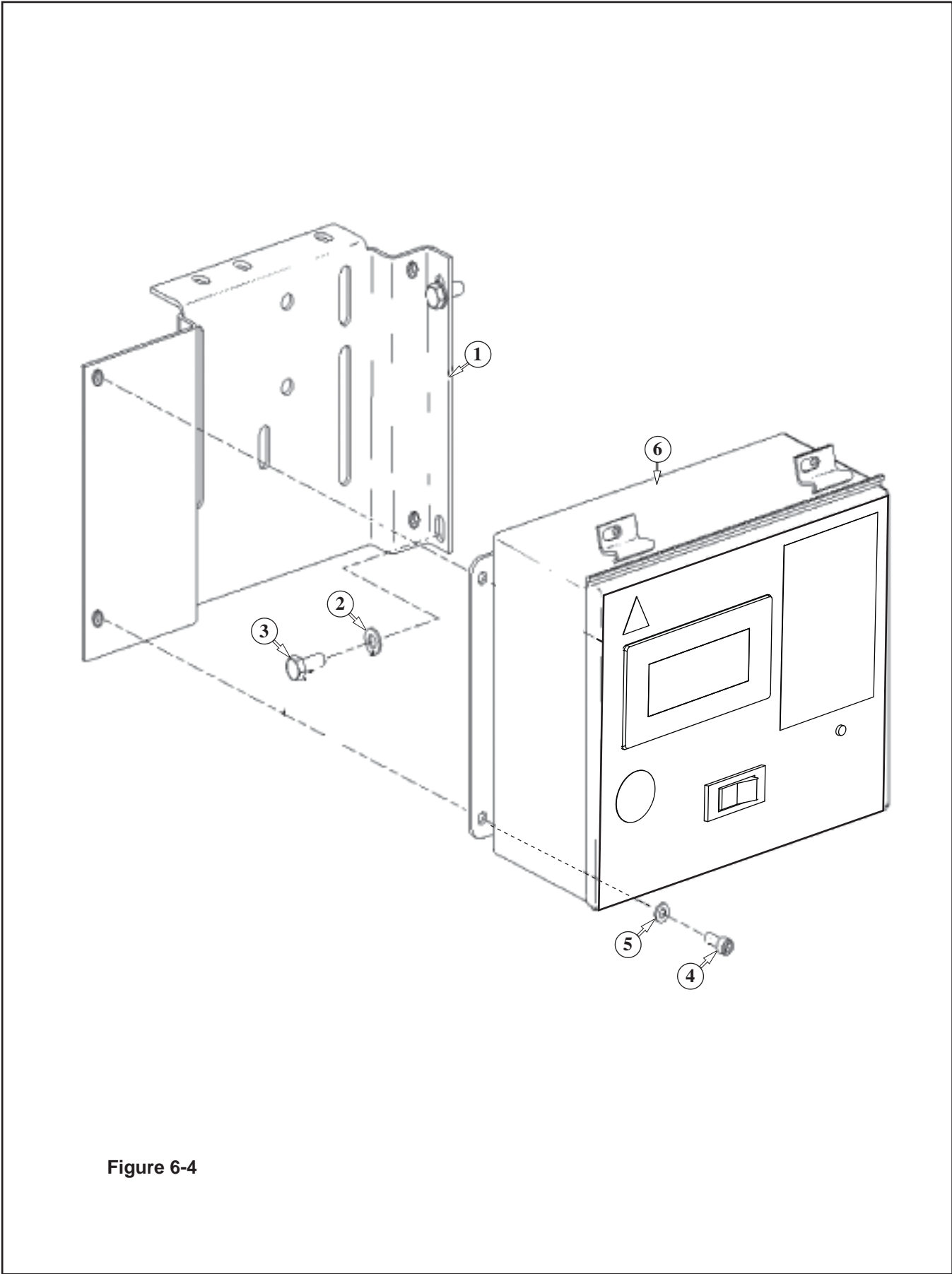


Figure 6-4

Figure 6-4

Ref. No.	3M Part No.	Description
1	78-8133-9694-8	Bracket - Sensor
2	78-8017-9318-9	Washer - Plain M8 Narrow, A/Stl Zn Plt
3	26-1016-2500-7	Capscrew - Hex Hd. M8 X 1.0 X 16mm Lg., A/Stl Zn Plt
4	26-1014-8756-4	Capscrew - Hex Soc Dr. M6 X 1.0 X 20mm Lg., Zn Plt
5	26-1000-0010-3	Washer - Plain Narrow, M6
6	78-0025-0244-7	Assembly - Electrical Control Box

Tape Application Monitor (TAM)

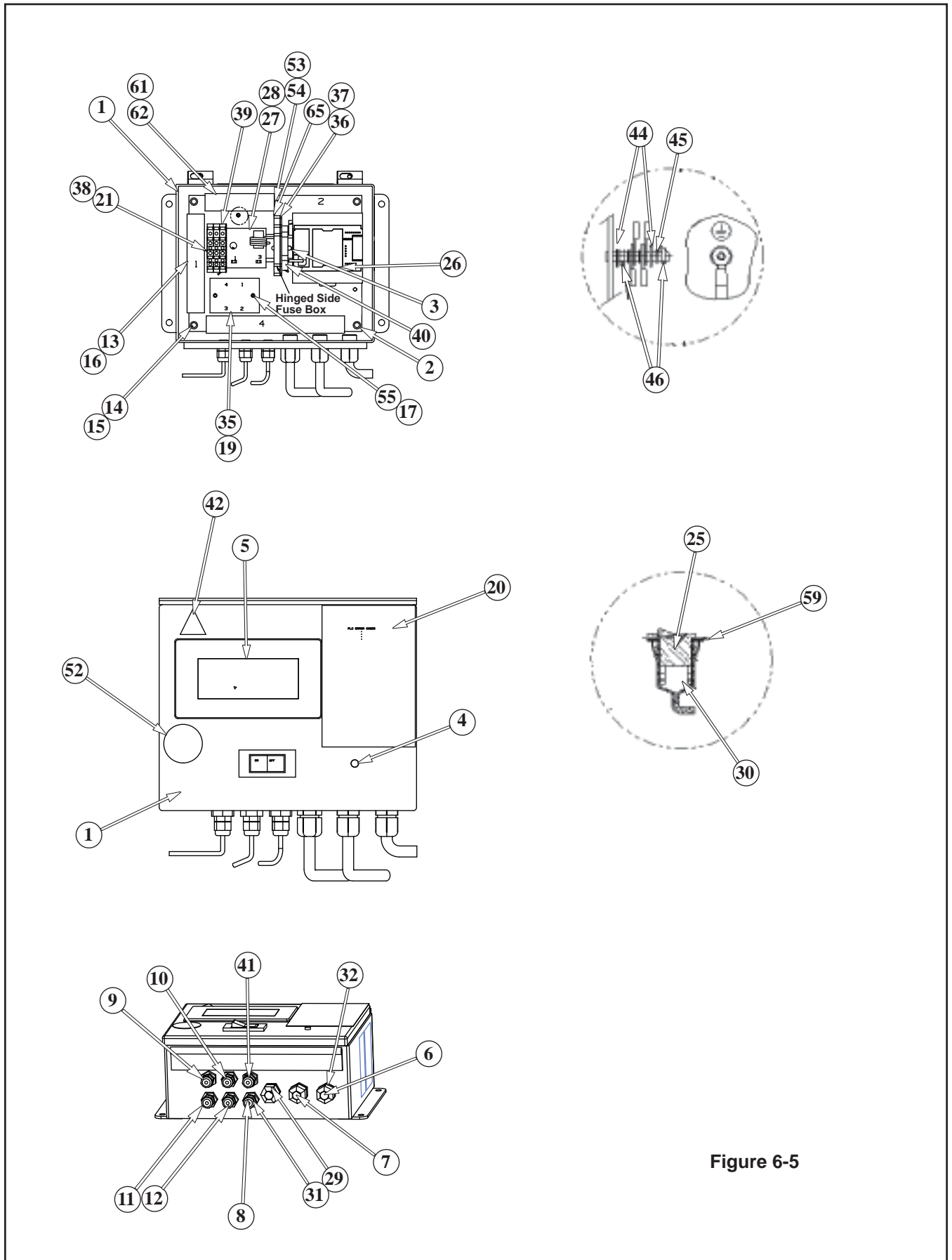


Figure 6-5

Tape Application Monitor (TAM)

Figure 6-5

Ref. No.	3M Part No.	Description
1	78-0025-0245-4	Box - Junction Modified
2	78-0025-0246-2	Panel - Modification
3	78-8137-0131-1	Rail - Din Modification
4	78-0025-0248-8	Assembly - Display Light
5	78-0025-0549-9	Assembly - HMI Display
6	78-8137-0207-9	Assembly - Power, Input Cord
7	78-0025-0559-8	Assembly - Power, Case Sealer Cord
8	78-0025-0249-6	Assembly - Box Present Cable
9	78-0025-0548-1	Assembly - Cable, Dispensing, Upper
10	78-0025-0554-9	Assembly - Cable, Low Supply, Upper
11	78-0025-0555-6	Assembly - Cable, Dispensing, Lower
12	78-0025-0556-4	Assembly - Cable, Low Supply, Lower
13	78-8137-0130-3	Duct - Wire, Short
14	78-8137-0129-5	Duct - Wire, Long
15	78-8137-0216-0	Cover - Wire Duct, Long
16	78-8137-0217-8	Cover - Wire Duct, Short
17	26-1016-0248-5	Standoff Hex Male 8-32 UNC Female 8-32 UNC
19	78-8137-0023-0	Plate - Relay Guard
20	78-8137-0218-6	Label - Error Codes
21	26-1016-2476-0	Jumper - 3-Pole Q3 Weidmuller 0336500000
25	26-1016-2560-1	Switch - Circuit Breaker, DPST 10A/250V, ETA 3120-F323-P7T1-W01D-10A
26	78-0025-0243-9	Assembly - Controller, PLC
27	78-0025-0560-6	Assembly - AC Current
28	26-1016-2479-4	Adapter - Din Rail, SSAC P1023-20
29	78-0025-0558-0	Beacon Light Cord Assembly
30	26-1016-2481-0	Switch - Terminal Shroud, ETA Y304-275-01
31	26-1014-8988-3	Strain Relief - Straight, Liquid Tight, Thru, .114 - .250 Dia, PG 7 Hub, Heyco #3208
32	26-1011-5441-2	Strain Relief - Straight, Liquid Tight, Thru, .230 - .395 Dia PG11 Hub, Heyco #3214
35	26-1016-2483-6	Relay - Solid State 25A Output, 3 - 32VDC Control, Crouzet 84134010
36	26-1016-2484-4	Block - Fuse, Wiedmuller ASK1 0474560000
37	26-1006-1320-2	Fuse - Slo-Blow, 5X20mm 1.25A Littelfuse 2181.25
38	26-1014-8924-8	Block - Terminal, Weidmuller DK 40V/35 # 590160000
39	26-1016-2486-9	Plate - End, Weidmuller APDK40 1397160000
40	26-1014-6788-9	Block - Terminal, Ground, Green/White, Sprecher & Schuh VUPE4-6
41	18-9221-6200-5	Pin - Dowel, 3/16" Dia X 3/4" Long, Steel Zinc Plt,
42	26-1016-2487-7	Label - Electrical Shock, HCS 6010C-ISO
44	26-1016-2498-4	Washer - Lock, Serrated External Tooth, M5 Zn Plate Steel
45	26-1016-2499-2	Washer - Regular, Spring External Tooth, M5 Zn Plate Steel
46	26-1004-4659-5	Nut - Hex M5 X .08 Zn Plate Steel
50	26-1016-2490-1	Thermal Compound - Silicone Oil Base, 2 oz Jar, Wakefield Engineering #120-2
52	26-1016-2491-9	Label - Read, HCS #6126C-ISO (not shown)
53	26-1002-6527-6	Screw - Button Hd. Hex Soc Dr. #10-32 X 3/8" Lg., Steel Zn Plt (not shown)
54	26-1005-7999-9	Washer - Plain M10, A/Stl Zn Plt. Type A Narrow (not shown)
55	26-1001-7118-5	Screw - Button Hd. Hex Soc Dr. 8-32 X 3/8" Lg., Steel Zn Plt Stl
56	26-1014-8699-6	Washer - Plain M8, Steel Zn Plt
59	26-1016-2561-9	Spacer - Switch, 3120-F3, Panel Thickness < 4mm ETA Y303-675-01
61	78-8137-0482-8	Duct - Wire 3.5"
62	78-8137-0481-0	Cover - Wire Duct 3.5"
65	26-1016-2627-8	Plate - End, Weidmuller ASK-1 # 380360000

Tape Application Monitor (TAM)

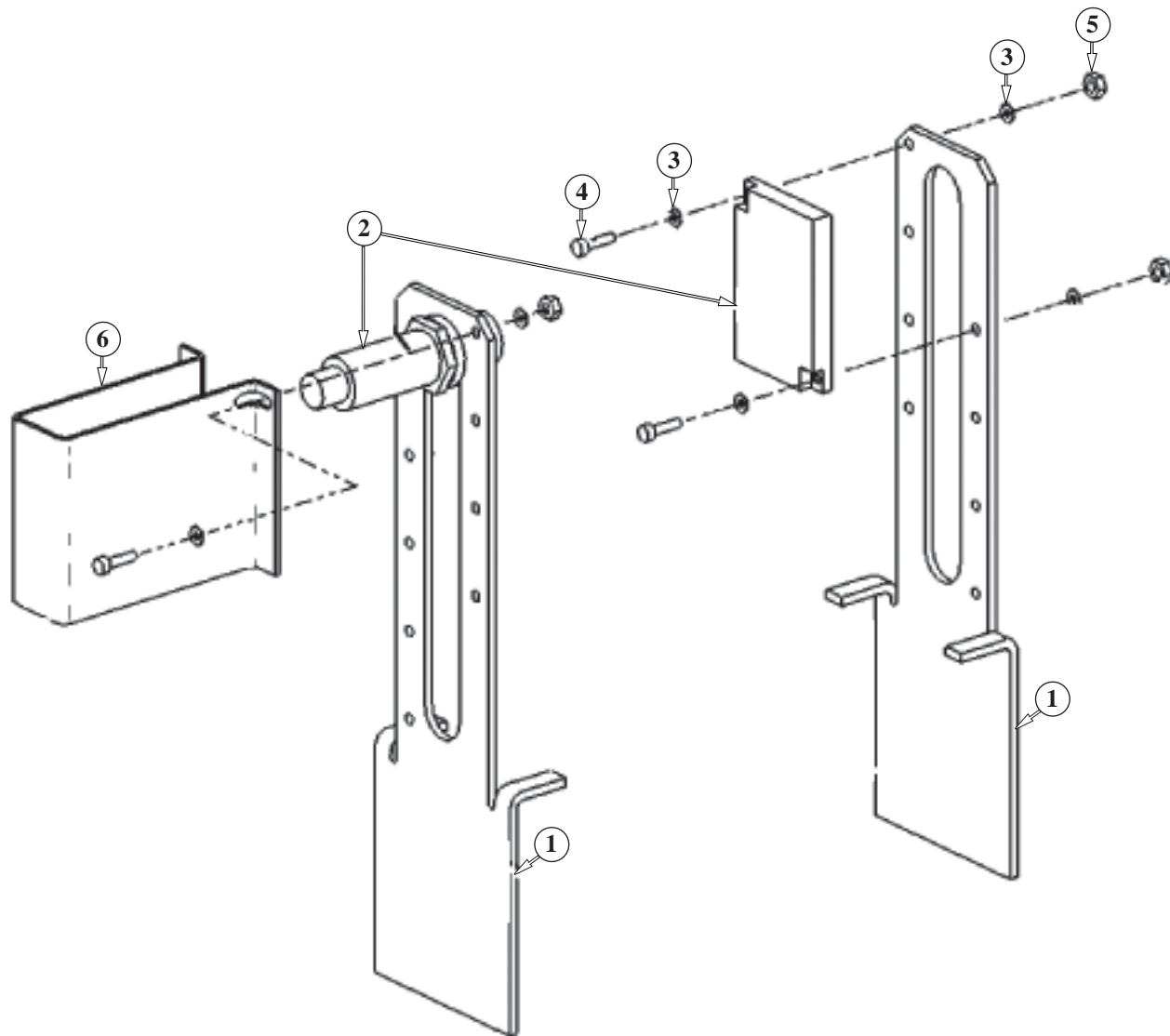


Figure 6-6

Figure 6-6

Ref. No.	3M Part No.	Description
1	78-8137-0260-8	Assembly - Bracket, Bed Sensor
2	26-1016-2470-3	Switch - PhotoElectric W/Reflector, Omron E3F2-R2C4-P1
3	26-1014-5501-8	Washer - Plain, M3 Narrow, A/Stl Zn Plt
4	DY-1102-0041-6	Capscrew - Button Hd, Soc Dr. M3 X 12mm Lg A/Stl Zn Plt
5	26-1003-6901-1	Nut - Hex ,M3, A/Stl Zn Plt
6	78-8137-1014-8	Guard - Sensor

