



Model TIM-21 Magnetic Stripe

Ticket Issuing Machine

Users Guide & Reference

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Drawings and Illustrations

<u>Drawing No.</u>	<u>Title</u>
AS102-200-05	TIM Controller Board Layout
AS102-200-00	TIM Housing and Base Mounting

Bill of Materials

BM102-300-00	TIM Bill of Material
BM102-200-05	TIM controller

1.0

General Description

The PPI Series TIM-21 Ticket Issuing Machine is a device for encoding and issuing a magnetic stripe ticket printed and encoded with the time and date for use in TPC-300/M and TPC-300/C revenue control systems.

The Ticket Issuing Machine consists of 3 main parts: the mechanism, the housing, and the controller.

Mechanism:

The ticket mechanism (Figure 1) is an integrated device that encodes and prints a magnetic stripe ticket. The mechanism is connected to the controller via a serial cable. A 2 pin connector at the top of the mechanism connects to 24VDC.

FIGURE 1

Housing:

The ticket machine housing is constructed of #14 Ga. steel. All seams are welded. Two doors on either side of the housing provide access to the ticket magazine and to the controller.

The hood, doors, and face plate are fabricated from #14 Ga. aluminum in order to prevent corrosion.

The finish is a three coat baked enamel. The textured finish resists scratches and will subdue dents which are more visible in clear finishes.

Controller:

The ticket machine controller provides all necessary logic to control the functions of the ticket machine. The controller includes a battery backed clock calendar and drives the 32 character LCD on the front of the machine. A detailed description of the functions of the controller is provided in Section 5.

2.0

Installation

Unpacking:

Specifically designed, reinforced packing cartons have been used to provide the best possible protection during transit. A careful visual inspection of the unit should be made as soon as it is removed from the carton for any damage incurred during shipping. In the event the unit has been damaged as a result of shipping, the carrier and PPI should be notified as soon as possible.

The ticket machine is shipped as a fully assembled unit. There is no need for field assembly of the equipment.

Remove all shipping tape and padding from the unit before attempting to operate the ticket machine.

Mounting:

To open the housing, unlock the doors located on the either side of the housing and lift them out of the frame. One door will provide access to the ticket magazine. The other will provide access to the controller and termination panel. (Figure 2)

The housing should be held firmly to the mounting surface by four bolts. Refer to the base mounting plan in drawing AS102-200-00 for bolt configuration. Refer to the appropriate Standard System drawings for recommended equipment placement and separation.

Power and field wiring:

Incoming power is connected to pins 1, 2 & 3 of the rail mounted terminal strip TB1 at the bottom of the termination panel. Incoming wires should be routed through the opening in the base of the housing to their appropriate termination points. Input voltage is 110-220VAC, 50/60 Hz unless labeled otherwise.

Remove the cover over terminal strip TB1 in order to connect the incoming power. All terminals are numbered for easy identification. It is very important to provide adequate voltage to this equipment (110-220VAC, 50/60Hz, 3A). Improper wire size will result in an excessive voltage drop which will cause the equipment to malfunction. Under no circumstances should the voltage drop exceed 10 volts under load conditions from the nominal 110VAC input.

Note: National and local electric codes require proper grounding of all equipment enclosures. In system installations where rigid metal conduits are used, the conduits can be used for grounding if permissible. In systems where plastic conduits or any other type of wire routing is used, a separate ground wire of sufficient size must be provided.

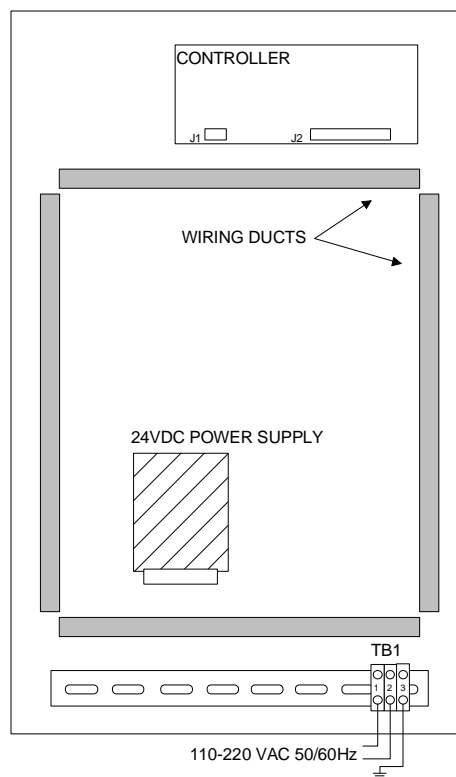


FIGURE 2

Field wiring is connected to the pins of J2 on the ticket machine controller. See drawing AS102-200-05 and the appropriate Standard System drawings for the proper pin connections. See Section 5 for an explanation of the controller functions.

3.0

Operation of the Ticket Machine

Loading tickets:

Before operating the ticket machine, tickets must be loaded. Make sure that power is connected to TB1 and that the power is turned on. In order to load tickets, open the door on the left side (as seen from the front of the machine) of the housing. The ticket magazine rests on 2 rails on the back of the termination panel. Lift the magazine up and out of the housing. Place a stack of tickets in the magazine. (Make sure that the tickets have the proper orientation as described below.) The magazine will hold at least 10,000 tickets. After the tickets are in the magazine, hang the magazine back onto the termination panel. There is an opening in the ticket housing just behind the ticket mechanism. Pass the tickets through this opening.

Insert the tickets into the mechanism. The magnetic stripe must be on the bottom of the ticket. The stripe must be near the left edge of the ticket (as seen from the back of the mechanism). There is a white roller at the back of the mechanism. The ticket must be inserted under this roller and pushed forward towards the black roller. As the ticket is pushed forward, a sensor will be triggered indicating that a ticket is present. At this point, the black roller will begin spinning. Push the ticket forward until it catches the black roller. Once the black roller grabs the ticket, it will automatically move the ticket to the proper position.

Issuing tickets:

Make sure that the ticket machine controller is on by moving the power switch SW1 at the bottom left of the controller board to the ON (up) position. The red LED at the top edge of the controller must be lit in order to indicate that the controller has power. The LCD on the face of the ticket machine should now display the message “IN SERVICE” followed by the time and date. When the ticket machine is first started, it may not have the correct local time. However, it is not necessary to change the time and date in order to make an initial test of the machine. For instructions on setting the time and date, see Section 5. To make an initial test of the machine, continue as described below.

In order for a ticket to be issued, the ticket machine must be “armed”, that is, the arming loop detector must detect the presence of a vehicle. (The ticket machine is armed as long as pins 1 & 2 of J2 on the controller are shorted.) The presence of a vehicle can be simulated by placing a metal object onto the detector loop in the roadway. When the machine is armed, the display will read “PUSH BUTTON FOR TICKET”. When the button on the face of the machine is pressed, a ticket will be printed and placed into the ticket chute. The display will show the message “PLEASE TAKE TICKET”. When the ticket is removed, the signal to open the gate will be sent and the display will once again show the time and date. The ticket machine will now be ready for the next vehicle.

4.0

Ticket Machine Controller

The ticket machine controller contains all necessary logic to control the functions of the ticket machine. See drawing AS102-200-05 for a layout of the controller board. The controller contains various connectors and terminal blocks for the connection of the mechanism and field wiring. An explanation of the controllers various functions and interconnections follows below:

Power:

Incoming power is connected to J1 pins 1 & 3. This connection is made at the factory. (The controller is rated for 110-220VAC 50/60Hz.)

LCD:

The 32 character LCD is connected to the controller via a 14 pin ribbon cable. The cable is connected to the 14 pin header labeled CN2. The red wire must align with pin 1. This connection is made at the factory. The brightness of the LCD can be controlled by adjusting the variable resistor marked R6 on the controller board.

Mechanism:

The mechanism is connected via a serial cable connected to the 10 pin header labeled CN1. This connection is made at the factory.

Arming:

The arming signal is connected to J2 pins 1 & 2. The arming signal should be a dry contact. The signal should be present only when a vehicle occupies the loop and the gate is in the down position.

Push for ticket button:

The push for ticket button is connected to J2 pins 3 & 4. A ticket will not be issued until the button is pressed. This connection is made at the factory.

Ticket in chute:

A sensor in the throat of the mechanism can be connected to J2 pins 5 & 6 in order to detect when a ticket is removed from the machine. The signal to open the gate will not be sent until the ticket is removed. This connection is made at the factory. (This connection is not used in most ticket machines as the ticket position is reported to the controller via the serial cable.)

Inhibit:

A short across J2 pins 7 & 8 will place the machine in stand by mode. The display will read “OUT OF SERVICE” and the machine will not issue tickets. This input can be used by low ticket sensors, differential counters, etc. to control the function of the machine.

Gate up:

Pins 9 & 10 of J2 will provide the output to raise a gate. The signal will be sent when the ticket is removed from the chute. This is a contact closure of 500ms duration.

Aux. Output:

Pins 11 & 12 of J2 provide an auxiliary output. This contact is normally open but will close when the inhibit signal (pins 7 & 8) is present. When the inhibit signal is no longer present, the contact will open again. The aux output can be used to control such things as a full sign or to provide an alarm if the ticket stock is low. The contact is rated 1A @ 120VAC.

Setting the time, date, and lane number:

Before the ticket machine can be taken into service, the time, date, and lane number must be set. These settings are programmed via a 4 key keypad. The key pad is plugged into the RJ12 connector CN3 near the center of the controller board. (The connector is marked “Keypad”.) The key pad is needed only when the settings are changed. It does not otherwise need to be connected and can be put away when not in use. The key pad has 4 keys as shown below:

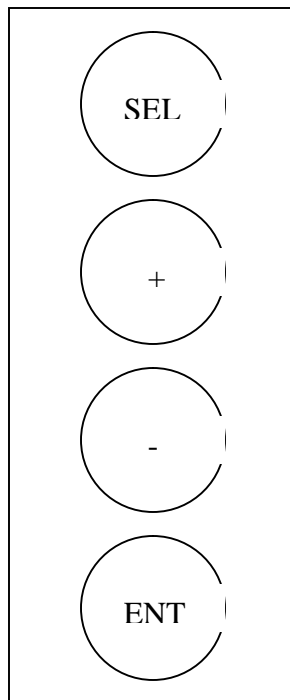


FIGURE 3

The SEL button selects the parameter to be set. There are 6 parameters: hours, minutes, month, day, year, and lane number. The plus (+) and minus (-) buttons increase and decrease the number and the ENT key saves the changes.

In order to set the hours, press the SEL key once. (Press SEL only once. Do not hold down the SEL key. Holding the key down will cause the controller to cycle through the parameters.) After the SEL key is pressed, the display will read “SET HOURS: ##” where ## is the current hour. Use the + and – keys to set the correct hour. (The time is in 24 hour format so the hours are from 0 to 23.) After the correct number has been set, press the ENT key. This will save the change and exit from programming mode. The display should now show the new time.

The remaining parameters are set in the same way. Pressing the SEL key twice will advance the display to the minutes. Pressing the SEL key will always advance the display to the next parameter. After any parameter has been changed, the ENT key must be pressed to save the change. Pressing the SEL key again will move to the next parameter, however, any changes will not be saved. If a number is entered that is too high, 25 for the hour for example, the display will show an “INVALID ENTRY” message and the parameter will not be changed.

The last parameter is the lane number. This is a number from 1 to 99. In a facility with more than 1 ticket machine, it is important that each machine have a different lane number so that if 2 machines issue a ticket at the same time, the tickets can be differentiated by the fee computers. Also, if the ticket machine is used in an on-line system, each machine must have a different lane number so that it can be properly identified by the central computer. If two machines are set to the same lane number, the communications will not work reliably.

5.0 Maintenance and Trouble Shooting

The Ticket Issuing Machine is designed for a minimum of maintenance. The knife is self sharpening and requires no routine maintenance. The mechanisms ink jet cartridge will last for about 23,000 tickets.

Preventative maintenance:

PPI suggests that the mechanism be cleaned about once each month. Any dust build-up on the mechanism can be blown off using a compressed air can. The ticket path should be free of any paper shavings. The belts on the side of the mechanism should be inspected for any wear. A belt showing obvious signs of wear such as frayed edges should be replaced. The magnetic head can be cleaned using a special cleaning card available from PPI.

Trouble shooting:

If the ticket machine should fail to operate, make the following checks:

Always make sure that all cables and connectors are properly connected.

Make sure that the machine has power. Check TB1 for proper input voltage.

Make sure that the red LED on the controller is on. If it is not, check for proper input voltage on J1. Check the fuse to see if it has been tripped.

Check the 24VDC power supply for proper output voltage.

If possible, swap components with another ticket machine to determine if any one component is defective.

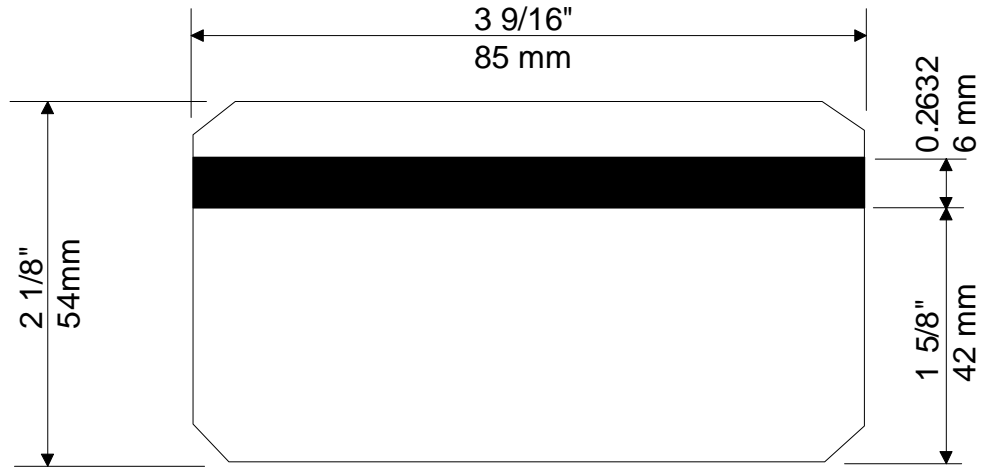
Replacing ink jet cartridges:

The ink jet cartridge should be replaced once the printing begins to fade. To replace the cartridge, locate the black lever (see below) above the cartridge. Pull the lever up to release the cartridge. Once the cartridge is released, lift it up and out of the mechanism. Replace it with a new cartridge and push the lever back to the fully down position.

LEVER

FIGURE 4

Appendix A - Ticket Stock



Paper thickness: 0.15mm minimum, 0.8 mm maximum.

Corners must be trimmed as shown to prevent tickets from "catching" inside the mechanism.

Blank areas of ticket can be used for custom printing.

BILL OF MATERIAL 102-300-00

TIM-21 MAGNETIC STRIPE TICKET ISSUING MACHINE

ITM. #	QTY	PART NUMBER	DESCRIPTION		
MECHANISM					
1	1	102-300-01	magnetic stripe ticket issuing mechanism		
2	1	800-070-10	24VDC power supply		
CONTROLLER					
3	1	102-200-05	Ticket machine controller		
HOUSING					
4	1	102-500-12	Base w/2 doors		
5	2	102-500-12/D	Door		
6	3	500-400-02	Lock w/2 keys		
7	1	102-500-14	Hood		
8	1	102-300-15	Face plate		
9	1	102-500-13	Mounting pan		
10	1	102-500-19	Mounting panel		
11	1	102-500-15	Mechanism mounting pedestal		
12	1	800-100-15	DIN rail (12")		
13	2	800-100-16	DIN rail end stop		
14	1	800-006-67	3 position terminal block		
15	1	102-500-41	Ticket magazine		
16	1	800-105-15	Illuminated push button		
17	6	800-100-16	1" X 1" x 12" wire duct		
18	1	800-028-08	24VDC relay & DIN rail socket		
19	7	500-013-03	8-32 X 1/2" rd hd screw		
20	7	500-143-01	#8 split washer		
21	7	500-193-01	#8 flat washer		
22	4	500-021-04	5/16 - 18 X 3/4" hex bolt		
23	4	500-151-01	5/16 split washer		
24	6	500-081-01	#10 hex nut		
25	4	500-145-01	#10 split washer		
26	2	500-016-18	10-32 X 5/16" binding hd screw		
27	2	500-145-02	#10 int lock washer		
28	4	500-077-01	#4 hex nut		
29	4	500-137-02	#4 int lock washer		

BILL OF MATERIAL 102-200-05

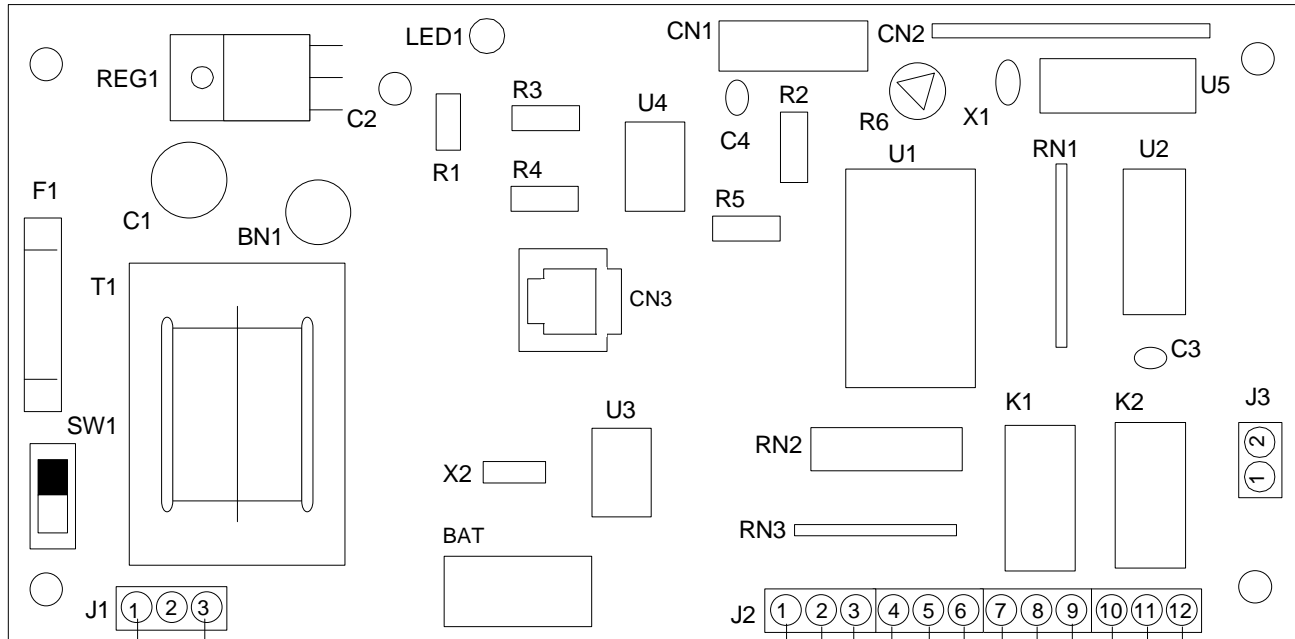
TICKET ISSUING MACHINE CONTROLLER

ITEM*	QTY	PART NUMBER	DESCRIPTION		
-	1	102-200-05	PC board		
T1	1	800-080-24	12VAC 12VA transformer		
SW1	1	800-105-09	On/Off switch		
F1	1	800-023-01	8/10 A fuse		
-	2	800-024-03	PCB fuse clip		
REG1	1	800-039-09	7805 regulator		
-	1	800-025-06	heat sink		
C1	1	800-045-37	470 uF cap		
C2	1	800-045-12	10 uF cap		
BN1	1	800-042-07	bridge rectifier		
J1,J2	5	800-006-47	3 pos. terminal block		
LED1	1	800-036-10	T1 3/4 LED		
R1	1	800-055-15	330 ohm res.		
R4	1	800-055-29	10K ohm res.		
CN1	1	800-009-86	10 position shrouded header		
-	2	800-029-24	8 pin DIP socket		
U3	1	800-037-15	DS1302 clock IC		
U4	1	800-033-12	LTC1487 RS485 driver		
R5	1	800-055-09	100 ohm res.		
BAT	1	800-069-05	3.6V NiCad battery		
X2	1	800-041-06	32.768 kHz crystal		
CN2	1	800-009-124	14 position header		
R2,R3	2	800-055-19	1000 ohm res.		
CN3	1	800-009-85	RJ12 connector		
-	2	800-029-29	18 pin DIP socket		
X1	1	800-041-05	4MHz resonator		
R6	1	800-068-08	10K variable resistor		
U5	1	800-032-11	EDE702 LCD driver		
U2	1	800-037-12	UNL2803 I/O driver		
U1	1	800-037-14	BS2 Logic controller		
RN1	1	800-067-07	10K res. network		
RN3	1	800-067-08	47K res. network		
RN2	1	800-067-06	1K res. network		
K1,K2	2	800-028-40	SPDT relay		
-	1	800-500-01	4 key keypad		
-	1	-	serial cable		
-	1	800-004-39	32 character LCD		
-	1	-	LDC cable		

-	1	800-029-27	24 pin DIP socket		
C3,C4	2	800-045-38	.1 uF cap		
J3	1	800-006-46	2 pos. terminal block		

* Refer to drawing AS102-200-05

Note: R3,R4,R5,C4,U4,J3 are utilized for optional RS485 communications and may not be present on all boards.



110-220 VAC
50-60 Hz

ARMING {
PUSH BUTTON {
TICKET IN CHUTE {
INHIBIT {
OPEN GATE {
AUX OUTPUT {

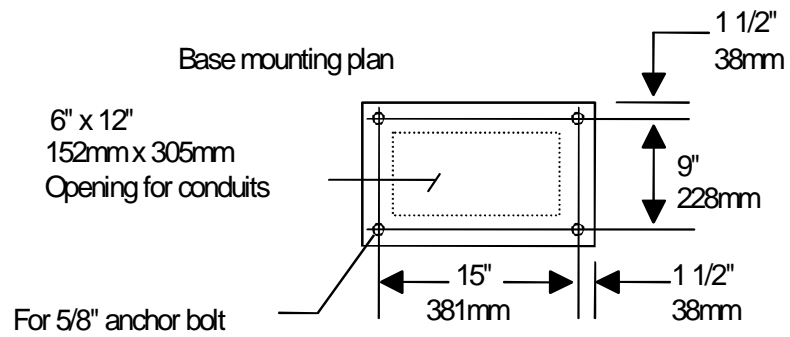
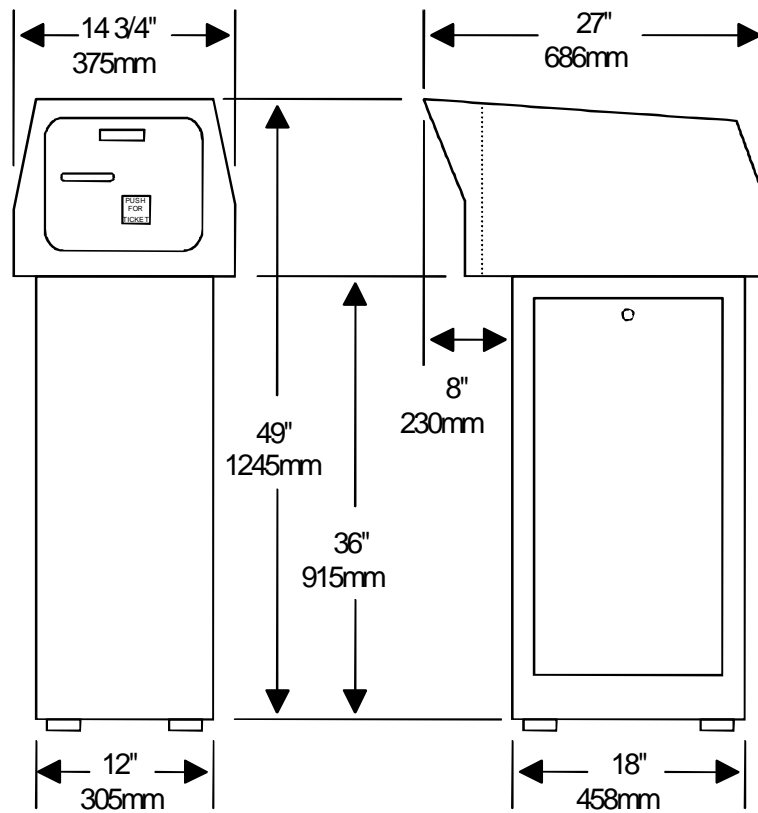
NOTE: R3,R4,R5,C4,U4,J3 are utilized for optional RS485 communications and may not be present on all boards.

**TICKET ISSUING MACHINE CONTROLLER -
BOARD LAYOUT AND ELECTRICAL CONNECTIONS**

AS102-200-05

SHEET 1 OF 1





PPI reserves the right to make technical changes at any time without prior notice.

TICKET ISSUING MACHINE HOUSING AND
BASE MOUNTING

AS102-200-00

SHEET 1 OF 1

