



ABBERFIELD

INDUSTRIES

PTY LTD ABN 61 000 112 569

PVM50

*series*

PVM52

**PACKET  
DISPENSERS**

## TECHNICAL & SERVICE DETAILS

**ABBERFIELD INDUSTRIES PTY LTD**

32 Cross Street, Brookvale, Sydney, NSW 2100 Australia

Tel: (02) 9939 2844 Fax: (02) 9938 3462

International Tel: +61-2 9939 2844 Fax: +61-2 9938 3462

Email: [contact@abberfield.com.au](mailto:contact@abberfield.com.au)

Internet: [www.abberfield.com.au](http://www.abberfield.com.au)

# CONTENTS

<b>Section</b>	<b>Page</b>
PVM50 & PVM52 SERIES DESCRIPTION	4
INSTALLATION	4
BATTERY PACK	5
TESTING BATTERIES	5
CHANGING BATTERIES	5
BATTERY MODULE REMOVAL	6
MAINS OPERATION	6
MOTOR DRIVE MODULE	6
SOLD OUT SYSTEM	7
CHANGING SPIRAL BACKING PLATE	7
CHANGING SPIRALS	7
LOADING OF PACKETS	7
MAINTENANCE	8
COIN VALIDATOR	9
REMOVAL OF COIN VALIDATOR	9
NOTE VALIDATOR	9
REMOVAL OF NOTE VALIDATOR	9
CLEARING NOTE VALIDATOR	10
PRICE ADJUSTMENT	10
DATA RETRIEVAL	10
ERROR MODE	11
SERVICE MAINTENANCE	11



**PVM50 SERIES**



**PVM52 SERIES**

# PVM50 & PVM52 SERIES

## DESCRIPTION

The PVM50 is a three column coin operated spiral type vending machine and the PVM52 is a seven column with six selection coin and note operated machine. Different from the traditional machine in that the spirals are arranged across the machine to minimise the depth of the cabinet. This permits machines to be wall mounted, but by the inclusion of an optional stand they can be floor mounted.

Customers use is by first selecting a product and then inserting any Australian coins or notes. On reaching the vend price (or the first coin or note that exceeds the vend price), no further cash will be accepted, until the packet has been dispensed. Should the chosen product be sold out the machine display will flash "SOLD OUT".

These machines are battery operated using two low cost alkaline lantern batteries which will run the machine for many hundreds of product before the batteries need replacement. In storage, or if the machine is unused, there is no power consumed and the battery will last for its shelf life, which is two to three years. For very busy sites an additional two low cost alkaline lantern batteries can be fitted.

Alternatively, as a retro fittable option, the equipment can be mains operated; details on application.

The equipment has been designed for simple use, having no coin jamb clearance buttons, or packet dispense draws or access flaps. At the same time manipulation of the machine is minimised by the use of a very sophisticated coin validator and the packet delivery system prevents forced entry or manipulation. The sophisticated coin validator scans the coins for metal content as well as diameter, plus washer detection and strung coin detection. Included is an audit function of the number of packets sold and the cash received.

For ease of installation the machine can be removed from the back plate, which is mounted separately and then the machine is reassembled upon the wall. In like manner

should service be required the modular parts such as coin validator, note validator, battery pack assembly and packet dispense motors can be readily removed.

Two different keys number have been used on these machines for security reasons. These key numbers should be recorded in case replacements are needed in the future.

## INSTALLATION

The vending machines are modular in design to facilitate ease of installation and service.

1. Stand the machine upright on the floor or bench.
  2. Undo the locks and open the cabinet.
  3. A lead to the bottom to the motor dispense plate enters the cabinet door through a hole near the hinge pin. For the PVM50 machine, gently pull the lead back through this hole to expose a lead plug and socket connector. There is a large hole that allows a hand to feed the lead through.
- Unplug this lead and disconnecting the lead to the back plate. For the PVM52 undo the four screws near this cable entry and lift out the power supply to gain access to the in lead plug and socket. When disconnecting plugs, pull on the plug body, not the lead itself.
4. There will be two hinge pins, the bottom one being removable. Using a pair of pliers lift this bottom hinge out.
  5. Gently pull the bottom of the cabinet slightly forward from the back plate, or the back plate back from the cabinet.

6. Lift the cabinet up a little to disengage the top slip hinge. The machine will now be in two parts.
7. Lay the back plate on its back.

8. Unplug the lead at the bottom of the motor plate.
9. Remove the four nuts beneath the spiral dispense mechanisms.
10. Lift the bottom of the dispense mechanism free of the mounting screws and slide the top out of the top joggle.
11. Lift the dispense mechanism free.
12. Use the back plate as a template to mark the wall drilling points. Using a spirit level is recommended, to ensure the cabinet will be square.
13. Bolt the back plate to the wall most securely. It is recommended that loxins are used, these being far more secure than dynabolt or plastic wall plugs. Use a 15mm loxin which takes a 10mm bolt, plus a heavy washer under the bolt head. Loxins are also more attractive since only the bolt head is visible. The long exposed thread of a dynabolt may also present a problem.
14. Reassemble the machine. Before commissioning the machine it will be necessary to cut the plastic ties securing the left hand end of the spirals. These were in place to permit transport of the equipment.
15. The vend price for each packet should have been set before delivery of the machine. To reset the price refer to the price adjustment section of the coin validator details.

## BATTERY PACK

The system is driven by 2 x 6 volt lantern batteries.

If extra long battery life is required a second pair of batteries can be added. This is recommended.

Non rechargeable, standard alkaline batteries are recommended. In storage or in rarely used machines the battery life would be the "shelf" life of the battery, typically three years.

Tests show that in a regularly used machine, dispensing 10 packets every day, two batteries should last for one year.

This remarkable battery life is achieved by implementing special electronics that draws out the very last amount of energy from the batteries.

Even greater battery life is obtained by spraying silicon onto the spirals, to reduce the friction of their operation.

## TESTING BATTERIES

Hold down any product select button for more than 10 seconds and the display will then indicated 'Good' or 'Low Battery'.

## CHANGING BATTERIES

In the PVM50, above the coin validator is the battery module.

To replace the batteries;

1. Undo the screw on the back of the battery box and slip the cover slightly backwards, then sideways and then off.
2. Remove the old batteries.
3. Smear petroleum jelly (vaseline) on the contacts on the new battery and onto the matting surfaces of the battery cradle.

4. Fit two new batteries which can be inserted in any orientation, provided the contacts face forward.
5. If a second set of batteries is to be used (recommended but not essential) these can be placed directly onto the top of the first two batteries.
6. Refit the battery module cover to retain the batteries under spring contact.

For the PVM52 the batteries are housed under the product delivery ramp. Remove the four screws holding the battery plate and proceed as previously described.

## BATTERY MODULE REMOVAL

For model PVM50:

1. Unplug the lead from the battery module going to the coin validator, plus the lead from the battery module going to the motor drive module.
2. Using a spin tight nut runner undo the outer four nuts holding the battery module in place.
3. Lift the battery module back and free from the cabinet.

For model PVM52:

1. Undo the four screws holding the battery cover.
2. Undo the two screws masked by the battery cover.
3. Draw the battery module backwards and tilt to allow the top edge circuit board to clear the metal surround.

## MAINS OPERATION

Although the machine is intended for battery operation it has the ability to be converted to mains operation.

Even better, if converted to mains use and the batteries are left in place, then the machine reverts to battery operation in the case of a mains failure.

To convert means adding an approved 12V DC plug pack and connecting this to a socket provided on the battery module. Using an unapproved plug pack may cause damage to the machine and only qualified persons should fit these plug packs.

Fitting a plug pack is done in one of two ways.

1. Wired through an approved doubly insulated lock grommet in the base of the machine and with the in line plug pack stored in the cabinet cavity. The low voltage lead is then loomed together with the wiring harness under the product dispense tray and plugs into the battery module.
2. Alternatively the same procedure is followed but the plug pack is housed outside of the machine (just like a laptop computer plug) and only the low voltage enters the cabinet.

## MOTOR DRIVE MODULE

This module houses the spiral drive motors and their control electronics, plus the product sold out detection system.

The module can be easily removed for service or replacement, as it disengages from the spiral drive via "dog clutches" on each spiral.

To remove first unplug the lead to the bottom of the motor module. Then remove the three screws on the vertical front face of the modules then lift the module free.

When reassembling it will be necessary to slightly rotate each spiral whilst refitting the module, to engage the dog clutches.

However first have the spiral in the position where it will have dispensed a product and completed a quarter of a turn. This corresponds to the left hand end of the spring facing to the front, away from the back plate.

## SOLD OUT SYSTEM

When a product selection button is pressed a visible light beam is sent down the hollow section of the spiral base plate and is reflected off the inside of the cabinet back to the motor module.

The stock in the machine interrupts this light beam but if the dispenser is sold out the beam is detected. If detected the machine display says "SOLD OUT" and the coin and note validator are not enabled.

## CHANGING SPIRAL BACKING PLATE

With the PVM50, behind the spiral is a removable backing plate. This is used to ensure that the packet is engaged properly by the spiral, and avoids the packet bending around the spiral.

If larger or more rigid packets are to be used the backing plate can be removed or replaced with one of a different thickness.

## CHANGING SPIRALS

The spiral installed has been chosen to best suit the product for which the machine was designed. However if another packet size is to be dispensed the spiral may need changing.

This is achieved by rotating the spiral by hand, anticlockwise, until the right hand end "tail" that enters the plastic drive boss is a little less than

vertical, sloping towards the front of the machine. This equates to 10 past the hour on a clock face.

Then the spiral can be angled so that it can be disengaged from the plastic boss.

New spirals are re-assembled in reverse order.

When the new spiral is installed and the machine operated to ensure the spiral is parked in the home position, the "tail" on the left end must be in the correct position. This is between the 10 past the hour and 20 past the hour. If out of position the last packet in the stack will be half vended and maybe at risk of falling accidentally.

Adjustment of the position requires:

1. Remove the screws to the front of the motor mounting plate.
2. Pivoting from the back, rotate this plate until the pins on the motor boss disengage from the spiral boss.
3. Rotate the spiral to the correct left hand end "tail" position.
4. Re-engage the motor boss pins in the spiral boss and re fasten the screws.

## LOADING OF PACKETS

It is most important that the loading of the packets in the vending spirals is done with care. Failure to follow the correct procedure can result in a failure to dispense correctly.

First ensure that the size and particularly the thickness of the pack are suitable for the pitch of the dispensing spiral. These spirals are easily replaced if there is a need to change the pitch.

To load the machine:

### MODEL PVM50:

1. Insert the packet so that it sits evenly on the flat area of the tray, not half in and falling into the centre hollow section. Gently press the packet down to ensure best performance.

It is particularly important to ensure the back edge of the packet is well back. This ensures the sold out sensors operate correctly and that catching of the edge of the packet under the spiral is avoided.

2. Experience will show the best way to load a spiral. Remember the greater the spiral pitch the easier it is to load, but the smaller the pitch the greater the number of packets that fit into the machine.

5. Make sure that there are no gaps in the loaded spiral, in particular the end gap. Vending a packet will confirm the machine is ready for use.

### MODEL PVM52:

#### Most Important

Loading of packets is easy if done properly and impossible if done otherwise. As a packet is slid into place the bottom leading edge will catch onto the spiral and prevent proper full insertion.

To prevent this, if loading from right to left hold the packet up gently press in as the leading corner comes near the spiral push this corner towards the packet dispense motors, with the fingers of the other hand. This is a very quick and easy process.

If loading from the left to right, hold the packet up and gently press in. This time use a finger of the right hand to hook around the leading lower edge of the packet and gently pull the packet towards the motors.

## MAINTENANCE

The machines are virtually maintenance free. However to obtain the best performance there are some simple maintenance procedures.

### REDUCING FRICTION

The function of the spiral is to push the packets sideways. However since the spiral rotates there is a tendency for the spiral to drag the packet around. Proper maintenance can substantially reduce this drag. The two reasons for carefully maintaining the spiral and dispense tray are:

**1. To increase the battery life, less drag equals less power consumed.**

**2. Reducing drag reduces the chance of the loose edges of the packet being dragged under the spiral.**

Reducing drag is achieved by applying a silicon based spray to the spiral and spiral bed. In particular spray the leading edge of the spiral, that is the part that pushes onto the packet.

The packet delivery slide should also be maintained in the same manner.

This maintenance should be carried out when ever the surface looks like they are losing their shine, perhaps every six months.

### SOLD OUT SENSORS

The sold out function is by a light beam from the motor board being reflected on the left end of the cabinet and reflected to the receiving sensor. This is a red light that shines only when the button is pressed.

The reflective surface to the left of the cabinet should be kept clean. Perhaps using window cleaning spray for a smear free finish.

## COIN VALIDATOR

Two tables of coin acceptance / rejection criteria are included in the equipment design (wide and narrow). Selection is by a dip switch on the side of the validator (accessed without tools) and in normal operation the wide setting is used for best acceptance of worn or damaged coins, but in case of potential fraudulent use, the narrow setting is easily engaged.

Another switch engages the diagnostic reporting function where any coin not validated will momentarily show a code on the display, indicating the reason for the failure to validate, plus other codes for other fault conditions.

There are a further 6 dip switches that can be used to invalidate the acceptance of different coin denominations. These refer to the first 6 coins in the set up table (which usually covers all those normally required). Switched to the "Validate" positions coins will be accepted as normal, but if any switch is in the "Invalidate" position that coin will be automatically rejected. In this way the range of coins to be accepted can be quickly set without needing to reprogrammed the validator.

NOTE: after making a switch change turn the supply voltage off and then on for the system to electronically reset the old switch positions.

## REMOVAL OF COIN VALIDATOR

First unplug the two leads and plugs from the rear of the coin validator. Do not unscrew the wires just pull the assemblies back and they unplug.

Pull on the plug assembly not on the wires.

The coin validator is held in place by 4 nuts on screws attached to the face plate.

Use a "spin tight" nut runner to access these nuts. Undo and lift the validator free.



## NOTE VALIDATOR

The note validator can be set to validate chosen notes only. For these machines it is normally set to only accept \$5.00 and \$10.00 notes. To change the settings refer to Abberfield Industries technical support team.

## REMOVAL OF NOTE VALIDATOR

First unplug the lead to the rear of the note validator.

The note validator is held in place by two screws. Remove these and withdraw the note validator.

# CLEARING NOTE VALIDATOR

To clear jammed notes or foreign matter from the note validator first remove the validator from the machine.

Then hold the top section and pull up the moulded plastic catch to the front of the validator. Then pull the lower section forward and free from the top part. Any obstruction will then be obvious.

# PRICE ADJUSTMENT

1. Remove supply power to the validator.
2. Locate Dip Switches and Push Buttons and set all Dip Switches to UP (or ELIMINATE)
3. Turn supply power back on.
4. While Display is scrolling though "ABBERFIELD" etc. Set all Dip Switches to DOWN (or VALIDATE) position.
5. When Display shows "PAR" press SET button once so that display now shws "P0".
6. P 0 is price #1.
7. To change this price push the 'SET' push button again.
8. The display will then show the current price for this price with the last digit flashing 00. 0
9. To change this digit push the 'SET' push button until the desired figure is shown, 0 to 9.
10. To change another digit push the 'SET' push button until the desired digit is flashing.
11. Then push the 'NEXT' push button to change its value.
12. Once you have stepped through all 4 digits then the display will read 'PO'
13. Again, to advance to the next price push the 'NEXT' push button until the desired price position is reached.
14. PO to P5 are the price positions for prices 1 to 6.
15. To change all the prices repeat above procedure.
16. **Do not change P6 to P9 unless instructed by the manufacturer.**
17. Once all the prices you desire the validator to work on have been set, turn the validator off and then return the dip switches to their normal position, (usually all down). Then turn the power back on.

# DATA RETRIEVAL

A data retrieval mode allows the unit to display the number of operations at each price since the last resetting of the log data.

## MAIN LOG TABLE

1. If the Audit Log input is shorted momentarily or kept shorted, the display will show the normal data log with the omission of the Gross revenue.
2. If the Audit Log input is shorted twice in one second then the display will show the full data log including the Gross revenue since the unit was installed.

Display	Function
Log 1	Main log number (increments in reset)
t0t	Total revenue since last data reset in the format.
AAAA BB.BB	\$AAAABB.BB
GrOS	Gross revenue since installation in the format
AAAA BB.BB	\$AAAABB.BB
vv.vv	Price (if not set to zero)
n	Number of operations at price vv.vv
	vv.vv and n repeats until all prices for the application have been displayed.
End	

## RESET MAIN LOG TABLE

When the display shows 'End' if the Audit log input is shorted again more than 2 seconds then the total revenue and the number of operations for each price are reset to zero. The display will show 'rSt' acknowledging that the log data was reset. The log number will be incremented to next value. The short should be removed whilst the display shows 'rSt'.

NOTE: If the coin validator By-Pass inputs are energised and the Audit Log input is shorted as for normal data retrieval the log of the free operations will be displayed.

# SERVICE

## ERROR MODE

Setting the 7th dip switch up to the ON position allows the display to show error messages for each coin deposited.

nE20	Width low
nE21	Width high
nE22	Coin masked by dip switch
nE23	Coin masked by coin value set to 00.00
nE25	Coin didn't enter cash box
nE26	Cash box opto blocked
nE30	Metal amplitude low
nE31	Metal amplitude high
nE32	Metal period low
nE33	Metal period high
E34	No match for all width, period & amplitude
E50	Coin jammed, didn't follow sequence
E99	Coin metal response could not be measured

Where n = coin number (1 to 8) on which the error occurred (i.e. the nearest match).

### POWER ON ERROR REPORT

At power up the optics of the unit are checked.

If an optic is found not to be working (due to components failure or optical blockage) an error message is displayed as show below.

Opt0	Wake up
Opt1	Diameter 1
Opt2	Diameter 2
Opt3	Cash box

## MAINTENANCE

### DISASSEMBLY

There are three active parts to the coin validator, the control unit, power supply and face plate. The control unit plugs into a display circuit board forming part of the centre plate and power supply on the opposite side. This assembly is held together by two security screws, one from each side of the unit. They form one assembly, covered by a single serial number.

### PROCEDURE

1. Using a neat fitting bladed screwdriver, remove the right-hand plastic holding screw located under the ledge on the right side.
2. Remove the identical left-side screw located at the top of the left moulding.
3. The two side mouldings are now free to slide off the middle fascia moulding. They are removed by pulling directly backwards from the fascia.

### CLEANING OF COIN TRACK

After considerable use there may be a build up of dirt on the coin track that impedes the flow of coins and the validator will need opening for cleaning. Also foreign objects placed in the validator which do not pass through the system will need to be cleaned out. To disassemble remove the two security screws, one each side of the validator. These are clearly marked with the control board screw being at the top and the other screw being at the bottom on the other side. The control board mechanism can then be withdrawn by pulling backwards. When cleaning the coin track it is important to ensure that the two optical sensing holes are not filled with dirt. Clean with industrial alcohol or methylated spirits. Take care not to leave a residue in the optical sensor holes but do not use a pin or similar to clean into the holes as the optical lens may be scratched.

**NOTE:** Care should be taken in reassembling the validator to ensure that the pins on the front display board make proper physical connection into a mating socket on the control board.