



ABBERFIELD

INDUSTRIES

PTY LTD ABN 61 000 112 569

C22

*series*

## COIN VALIDATOR / CONTROLLER

### **C22 DESIGNATES:- COIN VALIDATOR USING THE 22 SERIES PLASTIC MOULDINGS**

The information detailed is 'generic' to cover the different validator types. This literature primarily covers the C22P validators. Suffixes may be added to cover specific applications. More specific information is provided in the technical notes for each of these applications.

## 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)

# C22 SERIES

## COIN VALIDATOR

### SPECIFICATION

- Up to 8 coins may be validated in the physical range 16 mm to 32 mm diameter and thickness to 3.5 mm. Coins are validated optically for a diameter measurement and washer detection, plus the rate of travel. Resistivity and permeability measurements are also taken for metal type verification.
- Two tables of acceptance / rejection criteria are included in the 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 reprogramme the validator. Note, after changing a switch position turn the supply for the system off and then on, to electronically reset the old switch positions.
- Operation by 12 Volts, A.C. or D.C.
- Inclusion of an inbuilt transformer to allow a primary supply voltage of the customer's choice (240V 50 cycles for Australia).
- As an alternate to the isolation transformer a solid state regulator can be fitted, allowing operation of the validator on 24V A.C. or D.C.

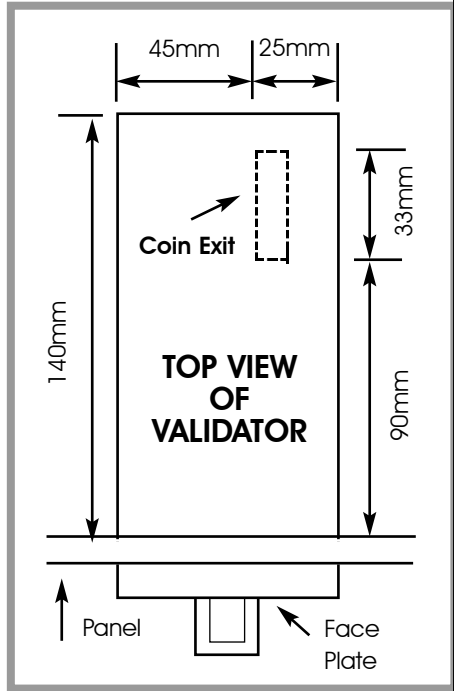
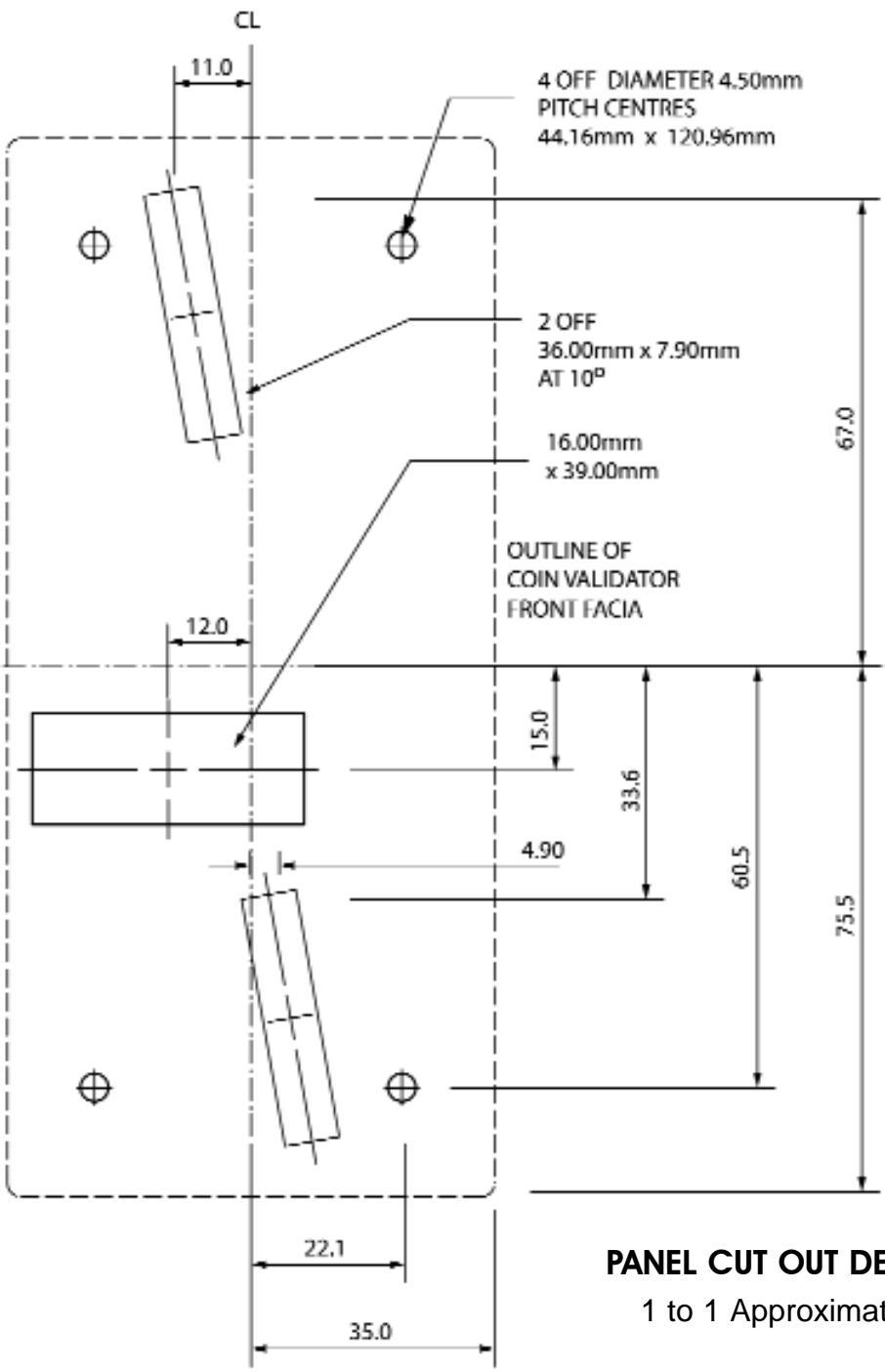
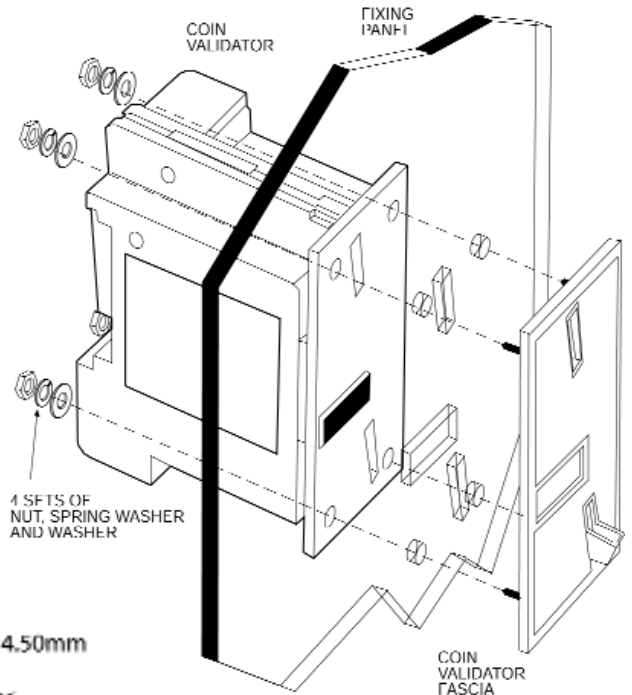


- 4 relay output (with common line), contacts rated at 10 Amps on 240 Volts. These are derated to 5 Amps for safety. If the contacts are to be isolated from each other the number of relays reduces, due to limitations on input terminations.
- 4 optocoupler inputs that operate on a nominal voltage of between 5 and 24 Volts A.C. or D.C. (limits in the order of 2 to 30 Volts). These same optocouplers have separate pin strip connection for a D.C. sourcing current of approximately 3 - 30 milliAmps (LED input). On this pin strip there are an additional 4 opto isolated inputs.
- On the main plug in / screw connect terminal block are two connections for audit requirements. Bridging these (external key switch, etc...) causes the display to show the total of coins since the system was installed, followed by the value of coins since the audit function was last interrogated. (Refer to data retrieval for full instructions).
- It is possible to expand the validator / controller to give up to four additional relay outputs on two separate commons.

# MOUNTING DETAILS

Panel mounting is achieved by fitting the face plate on one side of the panel and the validator on the other.

Slip fitting is possible with the addition of a mounting bracket to the bottom mounting screws. Screws through this extra bracket are usually covered by a cash box fascia.



**PANEL CUT OUT DETAILS**  
1 to 1 Approximately

# CALIBRATION

Using the SET and NEXT push buttons, plus the 8 way dip switch, located on the side of the coin validator, in conjunction with the display, it is possible to calibrate for any coin set. **This is normally a factory operation, but it can be done by a skilled technician.**

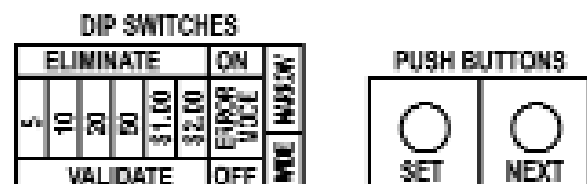
Coins must be in the physical range 16 mm minimum to 32 mm maximum and thickness up to 3.5 mm. Calibration can be implemented for any number of coins from 1 to 8.

When calibrating the validator a minimum of **two coins of each type** should be used. One in near new condition with no wear on the knurling around the coin and the second should be with the knurling worn. These then present the extremes of coins which will be used in the validator. NOTE: There is a time out on later versions of nine seconds where if one of the tables haven't been accessed the validator will revert to normal mode and accept C7 and C8 only. Therefore you have nine seconds to get from step 3 to step 6.

1. To calibrate a C22P coin validator first remove power from the unit.
2. Put all 8 dip switches in the up (ON) position.
3. Re-apply power, the screen will settle on "par" (parameters).
4. Put all dip switched down (OFF) except number 3 which remains up.
5. Press the button marked NEXT twice and the screen should then say "cal"(calibrate).
6. Press the button marked SET the screen should say C1, this is coin 1 and should be the lowest value coin being used.
7. If this is not the coin you wish to recalibrate then press the NEXT button until the desired coin number appears on the screen. Normal coin assignments for Australian coins is C1=5¢, C2=10¢, C3=20¢, C4=50¢, C5=\$1, C6=\$2, C7=Token 1, C8=Token 2.
8. Make sure the coin validator is held firmly and vertically on a flat surface, or its normal mounting position, when inserting 100 samples for the coin being calibrated; thrown in as well as rolled in. The display will count the samples inserted, with the coins returned via the reject slot.
9. Once 100 samples have been inserted, press the NEXT button to progress to the next coin; C2 should be on the screen. Insert 100 samples of coin 2. Continue the above procedure for each coin that requires calibration.
10. Once you have finished calibrating the

11. validator then scroll through the coins until C8 is on the screen.
11. Turn the power off. If recalibrating an existing coin set (no new coins or tokens calibrated) then set the dip switches to their normal operating position (normally all down to accept all calibrated coins) and return power to the validator. Check the validator is crediting the coins correctly by inserting several coins of each type. Calibration is now complete.
12. If a new coin or token was calibrated then it will need to have a value assigned to it. Put all the dip switches in the up (ON) position and re-apply power. The screen will settle on "Par".
13. Put all dip switches down (OFF) except number 3 which remains up.
14. Press the NEXT button once, the screen should say "Val"(value).
15. Press the button marked SET and the screen should say C1, this is coin 1 and should be the lowest value coin being used.
16. If coin 1 is the coin which you wish to assign a value then press the button marked SET, the screen will show 00.00 (or the coin value it had previously been assigned) the last digit will be flashing.
17. If this isn't the coin you wish to set then press the NEXT button until the desired coin is reached and then press the SET button.
18. To change the flashing digit press the NEXT button.
19. To progress to the next digit press the SET button. Continue steps 18 and 19 until the correct value has been set. Once the first digit is flashing then pressing the SET button will return the screen to C1-C8.
20. Once all the coin values have been set turn the power off.
21. Set the dip switches to their normal operating position (normally all down for the coin validator to accept all calibrated coins) and return power to the validator. Check the validator is crediting the coins correctly by inserting several coins of each type. Assigning value is now complete.

NOTE: calibration has occurred with the three parts of the validator as a set. Mixing the parts between different validators may put the calibration slightly out.



*Dip Switches and Buttons on the side of the coin validator table for Recording Coin Parameters*

# ADJUSTING CALIBRATION

Coin	Diameter		Period		Amplitude	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
C1						
C2						
C3						
C4						
C5						
C6						
C7						
C8						

**The normal calibration procedure is all that is ever needed and the following information is for special circumstances only.**

Sometimes there is a desire to vary the standard calibration criteria, to invalidate a closely matched fraudulent coin or increase the certainty of correct validation of closely matched coins. Understanding the calibration criteria and recording set values in a table will allow evaluation of the equipment's operation and from this it can be seen where adjustments to the calibration criteria will help in achieving a particular result. First understand that there are three measurements being taken for each coin, (optical detection of diameter and "induced" electronic readings referred to as amplitude and period. For each of these parameters there is a reference number that is set into the coin validator calibration tables. It is possible to write up a table indicating these readings.

1. Follow steps 1. to 7. from the calibration procedure and bring the desired coin on to the screen.
2. Press the SET button this will show the first entry of the coin table, it should be between 3000 and 7500.
3. Enter the displayed values for all coins in the table provided, this will then help to show how far each parameter can be adjusted before overlapping another coin and possibly causing miscredits. Also if any adjustments made to parameters cause problems then you have a record of the original values that you can enter back into the validator.
4. To move to the next coin parameter press the NEXT button.
5. After all parameters for that coin have been displayed the screen will return to C1-C8.
6. To advance to the next coin press the NEXT button.
7. To display parameters for the coin press the SET button.

8. Repeat steps 3 to 7 until all coins have been recorded.
9. **An overlap in all 3 parameters (diameter, period and amplitude) between 2 or more coins will cause miscredits of coins which fall into these parameters, but ONLY if they occur simultaneously.**
10. To change parameter press the SET button while that parameter is on the screen. The last digit (right side) will flash, this is the digit that can be adjusted.
11. To advance the value of the flashing digit press the NEXT button. The digit can then be scrolled from 0 to 9 and back to 0.
12. To move to the next digit press the SET button.
13. Repeat for all digits and once the first digit (left side) is flashing then pressing the SET button. The display will return to the coin number, C1-C8.
14. Press the NEXT button to advance to the next coin and repeat steps 10 - 13 to change other coin parameters.
15. After adjusting the desired parameters make sure the screen is showing a coin number C1-C8. Remove power to the validator.
16. Set the dip switches to their normal operating positions and re-apply power.
17. Test the validator to see if the adjustments made do not cause problems with any of the coins normally used.

**NOTE:** Some time a difficult fraudulent coin can be "calibrated" so as to record its reference numbers (Diameter Period and Amplitude). Then the validator is recalibrated to remove the fraudulent coin details, but the numbers taken can be used to determine how best to adjust the Diameter Period and Amplitude readings for the valid coin set.

# PRICE ADJUSTMENT

## TO PROGRAM COPY PRICES

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 00.00.
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.

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.

## OPERATING PARAMETERS

The validators have a number of other adjustments that can be field adjusted, such as the length of time of the output relay pulse. These adjustment are application specific and may therefore have a different effect on each type of unit.

In this regard even the price adjustment procedure may vary between unit types and details should be attached to the side of the coin validator.

For clarity on these matters please refer to Abberfield Industries technical support.

# 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.

# SERVICE

## MAINTENANCE

## 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 & amplitudes
- 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 (ie 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 Diameter2
- Opt3 Cash box

### 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.

# OPERATING PROGRAMMES

As well as validating coins the device can control other machines via a number of inputs and outputs. Special software programmes can be provided to meet specific industry or customer needs. Then the instruction label each side of the coin validator changes to satisfy the specific application. Two typical applications are for photocopier control and car park boom gate control and many others are possible.

## PHOTOCOPY CONTROL

### COIN VALIDATORS

**SERIES: 22 - PC301**

SECURITY SCREW

SERIAL # .....  
 PROGRAM .....  
 VERSION .....  
 BATCH # .....

**INPUTS**  
 12 to 24V AC or DC

- 12 LED Input price C
- 11 LED Input price B
- 10 LED Input price A
- 9 bypass cancel credit coin inhibit
- 8 TXD
- 7 RXD
- 6 OV

**OUTPUTS**

- 4 Copy Enable
- 3 Common
- 2 Common
- 1 Common

**SETTING PRICES**

Power off - Set dip switches up.  
 Power on - Display shows PAR.  
 - Set dip switches down.  
 - Push SET button.  
 PO on display (price one).  
 - Push SET button.  
 Current price one on display (last digit flashing 00.0-0.0).  
 - To change push NEXT until new figure shown (0 to 9).  
 - Push SET (next digit flashes 00.0-0.0).  
 - Repeat above for all digits. Display returns to P0.  
 - Push NEXT for next price.  
 - Repeat above for prices 1 to 6 (P0 to P5) DO NOT PROGRAM PAST P5.  
 - When prices are set Power off  
 - Reset dip switches to operating position. Power on.

ELIMINATE		ON	
5¢	10¢	20¢	50¢
10¢	20¢	\$1.00	\$2.00
VALIDATE		ERROR MODE	WIDE NARROW
		OFF	

PUSH BUTTONS	
○	○
SET	NEXT

ABBERFIELD INDUSTRIES  
 32 Cross Street, Brookvale  
 Sydney 2100 Australia  
 T: (61) (02) 9939 2844  
 F: (61) (02) 9938 3462  
 E: contact@abberfield.com.au

Label on Control Board Side

### COIN VALIDATORS

**SERIES: 22 - PC301**

## POWER SUPPLY

SERIAL NO. ....

+ 6

- 5

4

3

2

1

} A3 TRAY

} 12V D.C. IN

} 12V D.C. OUT (40Ma max)

} 12V A.C. IN

} 240V A.C. IN

Remove screw to disassemble

**ABBERFIELD INDUSTRIES**

PTY. LTD. ABN 61 000 112 569

32 Cross Street, Brookvale  
 SYDNEY, NSW, 2100  
 AUSTRALIA

TEL: (61) (02) 9939 2844  
 Fax: (61) (02) 9938 3462  
 contact@abberfield.com.au  
 www.abberfield.com.au

Label on Power Supply

## BOOM GATE CONTROL

### COIN VALIDATORS

**SERIES: 22P BOOM GATE CONTROL**

SECURITY SCREW

SERIAL # .....  
 PROGRAM .....  
 VERSION .....  
 BATCH # .....

**INPUTS**  
 12 to 24V AC or DC

- 12 LED Input price C
- 11 LED Input price B
- 10 LED Input price A
- 9 bypass cancel credit coin inhibit
- 8 TXD
- 7 RXD
- 6 OV

**OUTPUTS**

- 4 Boom gate
- 3 Car park full
- 2 Common
- 1 Common

**SETTING PRICES**

Power off - Set dip switches up.  
 Power on - Display shows PAR.  
 - Set dip switches down.  
 - Push SET button.  
 PO on display (price one).  
 - Push SET button.  
 Current price one on display (last digit flashing 00.0-0.0).  
 - To change push NEXT until new figure shown (0 to 9).  
 - Push SET (next digit flashes 00.0-0.0).  
 - Repeat above for all digits. Display returns to P0.  
 - Push NEXT for next price.  
 - Repeat above for price 2 (P0 to P1) P2, P3 and P5 are operating parameters, P4 sets car park capacity.  
 - When prices are set Power off  
 - Reset dip switches to operating position. Power on.

ELIMINATE		ON	
5¢	10¢	20¢	50¢
10¢	20¢	\$1.00	\$2.00
VALIDATE		ERROR MODE	WIDE NARROW
		OFF	

PUSH BUTTONS	
○	○
SET	NEXT

ABBERFIELD INDUSTRIES  
 32 Cross Street, Brookvale  
 Sydney 2100 Australia  
 T: (61) (02) 9939 2844  
 F: (61) (02) 9938 3462  
 E: contact@abberfield.com.au

Label on Control Board Side

### COIN VALIDATORS

**SERIES: 22**

## POWER SUPPLY

SERIAL NO. ....

+ 6

- 5

4

3

2

1

} 12V DC IN

} 12V DC OUT (40Ma max)

} 12V AC IN

} 240V AC IN

SECURITY SCREW

**ABBERFIELD INDUSTRIES**

PTY. LTD. ABN 61 000 112 569

32 Cross Street, Brookvale  
 SYDNEY, NSW, 2100  
 AUSTRALIA

TEL: (61) (02) 9939 2844  
 Fax: (61) (02) 9938 3462  
 contact@abberfield.com.au  
 www.abberfield.com.au

Label on Power Supply