



ENGLISH

RANGE SERVANT®

<http://www.rangeservant.com>



USER'S MANUAL FOR BALL DISPENSER

ULTIMA COMBI

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1 General Information

1.1 Preface

We congratulate you on your new Range Servant machine. You made a good choice! Not only have you chosen an excellent state-of-the-art Ball Dispenser with little demands on maintenance but you have also chosen quality. Quality is ensured with the help of modern production techniques, carefully chosen materials and the responsible workmanship of our staff.

This User's Manual contains all the information you'll need to fully understand the maintenance and operation of the machine.

The machine may be equipped with another, a bit more complicated control system referred to as the Select System, in which case some of the information given here does not apply. Please refer to the separate manual for the Select System.

Study the User's Manual carefully before using the machine. If these instructions are not followed, persons using the machine might be injured or the equipment itself be damaged. In many cases, following the instructions is a necessary condition for Range Servants' warranty to be applicable. Everybody operating the machine must read these instructions.

No part of this publication may be reproduced without the written authorisation by Range Servant.

The Ball Dispenser has a one-year warranty excepting payment means and parts subject to fair wear and tear. Study the warranty conditions carefully and keep them in a safe place. If you have any questions, or if problems should arise, please contact your Range Servant representative.

ONE-YEAR WARRANTY

RANGE SERVANT AB hereby grants a one-year warranty on material and functioning of the RANGE SERVANT product specified in this manual from the date of dispatch from factory. The warranty does not apply to payment means and parts subject to fair wear and tear. For replaced or repaired parts this undertaking is valid for a period of three months. The undertaking only applies to the original purchaser. Furthermore, it is limited to such parts that the manufacturer finds to be faulty when inspected. Repairs or replacement of parts may only be carried out by a representative authorised by the manufacturer. The manufacturer guarantees that the equipment delivered matches the product description supplied. **THE UNDERTAKINGS SPECIFIED IN THIS AGREEMENT CONSTITUTE THE MANUFACTURER'S SOLE OBLIGATION TOWARDS THE PURCHASER. THE MANUFACTURER DISCLAIMS RESPONSIBILITY FOR ANY UNDERTAKINGS OUTSIDE THE FRAMEWORK OF THIS WARRANTY CERTIFICATE.** The manufacturer is furthermore relieved of all responsibility for any undertakings made by outside persons during sales negotiations. The warranty agreement does not apply to such equipment that has been repaired or replaced by persons/companies not authorised by the manufacturer. Furthermore, the manufacturer's warranty undertaking does not apply in cases where the equipment is used incorrectly or has been damaged through improper maintenance/ accidents or has been handled contrary to instructions contained in the manual delivered with the product. Finally the manufacturer is relieved from financial liability for any kind of damage or injury that may arise in connection with sale and repair of the equipment or for injuries to third parties in conjunction with its use.

1.2 EC Declaration of Conformity

In accordance with the Machine Directive 89/392/EEC, annex IIA.

The Manufacturer:

RANGE SERVANT[®]

Range Servant AB
Skallebackavägen 11
SE- 302 41 HALMSTAD
Sweden

The Representative:

(To be filled out by a representative established within the EU)

Company

Address

Telephone

Declare that:

Ball Dispenser
Machine

Type

Serial no., manufacturing no. etc.

A) is in conformity with Council Directive 89/392/EEC of 14 June 1989 concerning approximation of the laws of the Member States relating to machines in particular as referred to in Annexe I to this Directive concerning essential health and safety requirements in connection with the design and manufacture of machines, as amended by Council Directive 91/368/EEC of 20 June 1991 on the amendment of Directive 89/392/EEC concerning approximation of the laws of the Member States relating to machines;

B) *(if applicable)*

are manufactured in accordance with the following regulations, directives etc.:

C) *(if the requirements under A have been fulfilled)* that the harmonised standards 292-1, 292-2 and 292-2A (or parts thereof) have been applied

D) *(if applicable)* are manufactured according to the following national standards and technical specifications:

Halmstad,

.....
Date

Elvis Knez
President

.....
Signature

1.3 Description

1.3.1 Ball Dispenser Ultima Combi

The Ball Dispenser Ultima Combi works as a stand-alone machine with an integrated system consisting of a ball washer and a ball elevator.

Range Servant's user-friendly ball dispensers are designed to accept different types of payment and to deliver, quickly and consistently, the exact number of balls. Prices are differentiated and several payment methods can be used in parallel. The number of dispensed balls per payment can be easily changed by the user himself. The balls are handled with care and only undamaged and clean balls are delivered to the player.

1.4 Identification

When contacting Range Servant, please identify your machine with the help of the information contained in the identification plate. The identification plate is well visible and firmly attached and contains the following information:

- Name and address of the manufacturer
- CE-marking
- Designation of series or type of machine
- Serial no., if any
- Year of manufacture

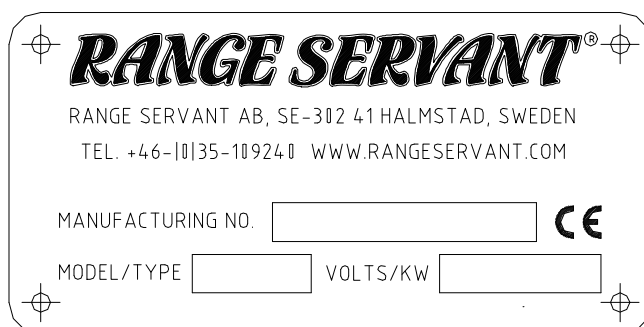


Figure 1: Product Identification Plate

1.5 Technical Specification, Ultima Combi

General	Ultima Combi*
Capacity (balls)	14 000
Capacity (balls/h)	25 000
Settings (balls/payment)	1-999
Dimensions:	
Height (mm)	2165
Width (mm)	1010
Depth (mm)	1010
Weight, with balls (kg)	824
Weight, without balls (kg)	177
Electric system:	
Mains voltage (V, 50/60 Hz)	230V, 50Hz
Control voltage (V, DC)	12 and 24V
Motor effect, feeding motor (W)	17,4W
Operating conditions:	
Operating temperature	+2 to +50°C

* Ball washer and vertical conveyor belt not included.

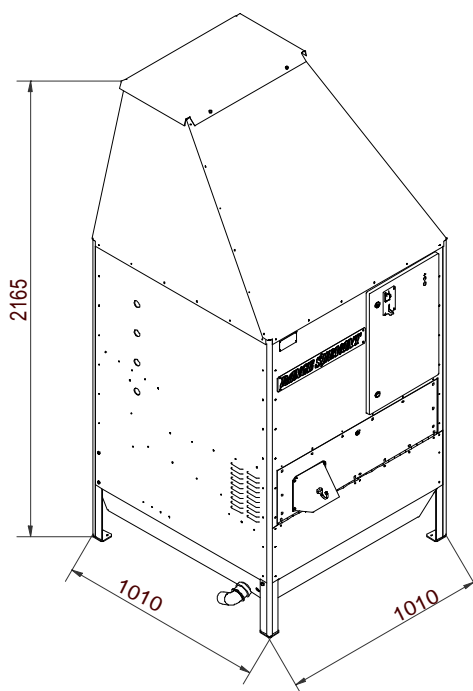


Figure 2: Ball Dispenser Ultima Combi

The level of airborne noise has been measured for an identical machine under normal operating conditions.

The values indicate the sound pressure level measured 1 m from the sides of the machine and 1,6 m from the floor or access platform.

Sound Pressure	
Sound pressure at the machine (dB, Lin)	XX
Sound pressure at the machine (dB, A)	XX

*The manufacturer reserves the right to alter any details of the products without prior notice.
Patented: EUROPE 99903992.8, AU 2445699, CA 2318910, USA PCT/SE99/00069, CN 99803416.9*

1.6 Technical Specification, Ball Washer 1200

General	BT-1200
Washing capacity (balls/min)	200
Hopper capacity (number balls)	400
Motor	24 V
Voltage (Volt, 50 Hz)	230
(Volt, 60 Hz)	115
Water consumption (l/min)	4
Water connection	R1/2"
Water pressure (bar)	1.96-12.0
Drain connection, diameter (mm)	75
Dimensions:	
Height (mm)	365
Width (mm)	660
Length (mm)	660
Operating Conditions:	
Operating temperature	+2 to +50°C



Figure 3. Ball Washer

1.7 Technical Specification, Vertical Conveyor Belt

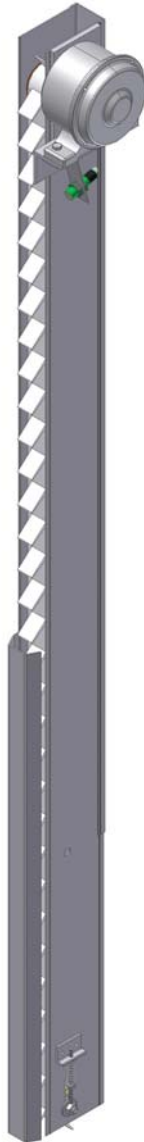


Figure 4. Vertical Conveyor Belt

General	Vertical Conveyor Belt
Transporting capacity (balls/min)	200
Motor	PMEE-12 CBG transmission ratio 1/50
Voltage	24V DC
Dimensions:	
Height (mm)	1990
Width (mm)	125
Operating Conditions:	
Operating temperature	+2 to +50°C

2 Safety

2.1 General

Safety measures are a combination of measures taken by the manufacturer when designing and building the machine and measures that have to be taken by the user.

The machine has been designed to operate according to its intended purpose. It has been designed and manufactured in such a way that configuration and maintenance can take place with the least possible risks to the operator, provided such work is carried out according to the instructions laid down in the User's Manual.

The objective of safety measures is to eliminate all accident risks during the operational life of the machine, which includes assembly and dismantling of the machine, including any hazards arising as a consequence of such abnormal circumstances as can be anticipated.

Accessories and spare parts that have not been approved by Range Servant can lead to personal injuries and/or equipment damage and affect the operational reliability of the machine. For the sake of safety you should therefore exclusively use accessories and original Range Servant spare parts recommended by Range Servant.

Such accessories and spare parts are specially intended for the machine and are approved by us with regard to safety.

All Range Servant retailers keep accessories and spare parts at your disposal along with competent advice. They also have the technical qualifications necessary for installing your machine and are informed about what technical changes are authorised.

We cannot assume the responsibility for any damage caused by accessories and spare parts that have not been approved by Range Servant nor for any damage due to unauthorised technical modifications.

2.2 Conformity With Mandatory Requirements

The Range Servant ball management machines fulfil the personal safety requirements of the EU Machine Directive 89/392/EEC as amended by Directives 91/368/EEC, 93/44/EEC and 93/68/EEC, with a special reference to Annex I of the Directive concerning essential health and safety requirements in connection with the design and manufacture of machines, as amended by Directive 91/368/EEC. Furthermore the harmonised standards 292-1, 292-2 and 292-2A (or parts thereof) have been applied.

The electrical equipment fulfils the safety provisions laid down in the EU low voltage directive 73/23/EEC, as amended by directive 93/68/EEC.

2.3 Remaining Risks

There are warning signs serving as a reminder and warning of any remaining risks, i.e. risks that we have not been able to eliminate, or sufficiently minimise, in our design and against which technical safety measures do not provide complete, or sufficient, protection. The warning signs shall be written in the local language and, on request, in the language understood by the respective operator. The signs are yellow with black characters and big enough to be readable from a distance of three meters.



Figure 5: Warning signs on front hatch

- Always disconnect the power supply to the machine before carrying out maintenance or service work. The mains switch is located in the lower right hand corner of the printed circuit board.



Figure 6: Warning sign in control box

- Never touch the circuit board or other electrical components in the control box. They can be conductive and cause injury to person and/or equipment damage
- Mechanical or electrical alterations may only be undertaken in consultation with Range Servant.

2.4 Authorised Use

The machine may only be used for the distribution of golf balls. It is equipped with a built-in ball washer so that only clean balls are distributed. For the machine to operate correctly the balls should not be damaged. Damaged balls tend to get stuck causing the machine to stop working.

Distribution of balls can start only provided the machine has been installed according to the instructions contained in this Manual.

2.5 Not Authorised

Accessories or spare parts not recommended by Range Servant might cause personal injury and/or equipment damage and affect the operational reliability of your ball dispenser. For safety reasons, use only such components and original parts as have been recommended by us. They are intended for your machine and are approved by us from the safety point of view as well.

We do not assume the responsibility for damage caused by accessories and spare parts that have not been approved by Range Servant or damage due to unauthorised technical changes.

2.6 Emergencies

2.6.1 Fire

In the event of fire water shall be used as an extinguisher.

Should fire start in the electric equipment, a carbon dioxide extinguisher must be used.

2.7 Operational Reliability

For trouble-free operation and long service life the instructions below should be followed:

- Place the ball-dispensing machine on a firm and level surface.
- Place the machine under cover so that only the front is accessible to members of the public. If the machine is card-operated it must stand under cover for the warranty to apply.
- Never strain the machine by loading it with more balls than recommended. The loading capacity for your machine is stated in the Technical Specifications.
- The machine should be connected to its own wall socket to prevent interference with its electronic system.
- Make sure that the electric box is always properly shut and covered when rinsing the machine. Moisture and water can damage the electrical components.
- When cleaning inside the dispenser never spray water directly onto the electric motor.

with a small circuit card consisting of two LED's, a green and a red one, giving continuous information to the user. Green LED indicates that the mains supply is on and red that payment has been made and that the machine is in the process of dispensing.

3.2.2 Getting Started

You can decide yourself how many balls you wish the machine to dispense per payment. The Ball dispenser accepts different payment methods and you are free to decide whether the machine shall make the same number of turns for all the different payments methods or not.

Connect the Ball Dispenser to the 230 VAC mains supply.

Adjust the ball dispensing knobs for the respective payment channel according to wish. Make your payment and check that the correct number of balls are dispensed. The machine dispenses balls at two different speeds – low and high. Dispensing starts at low speed, which allows for the conveyor belt to start running, and then continues at high speed. When there are only five balls left, the speed is again reduced to allow for the conveyor motor to stop at the right point preventing too many balls to be delivered. If you wish to adjust the speed of the conveyor belt, see the following chapter “Adjustment of conveyor belt speed”.

Y700 M20Example:

Payment Channel 1

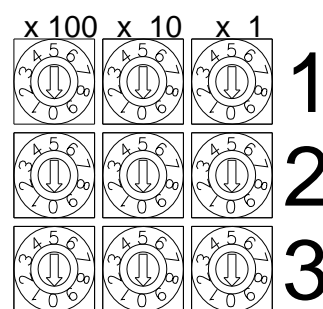
23 Balls $\times 100 = 0$
 $\times 10 = 2$
 $\times 1 = 3$

Payment Channel 2

54 Balls $\times 100 = 0$
 $\times 10 = 5$
 $\times 1 = 4$

Payment Channel 3

128 Balls $\times 100 = 1$
 $\times 10 = 2$
 $\times 1 = 8$



3.2.3 Adjustment of Conveyor Belt Speed

The control card BA-99 is equipped with two knobs for adjustment marked HI and LOW as well as with two micro-switches that are located on the upper left side of the card.

Press the micro-switch corresponding to either adjustment knob HI or LOW; the conveyor belt starts moving. Use a small screw driver to adjust the speed. LOW regulates the starting speed and the dispensing speed for the last five balls. HI regulates the normal dispensing speed.

The LED marked STB on the photocell located above the conveyor belt shall be burning with steady light and the LED marked OP.L shall blink with each detected ball.

3.2.4 Adjustment of Photocell

The photocell is the component detecting the balls and signalling to the control system that the correct number of balls have been dispensed.

The photocell sends a red signal indicating where the balls are detected.

The photocell is adjusted as follows:

Place a ball on the highest point of the conveyor belt. Make sure it is in line with the photocell and that the red ray of light from the photocell hits the ball at a point about 2/3 of the height of the ball.

Move the ball sideways, all the while checking that the two LED's - STB and OP.L - of the photocell burn with steady light.

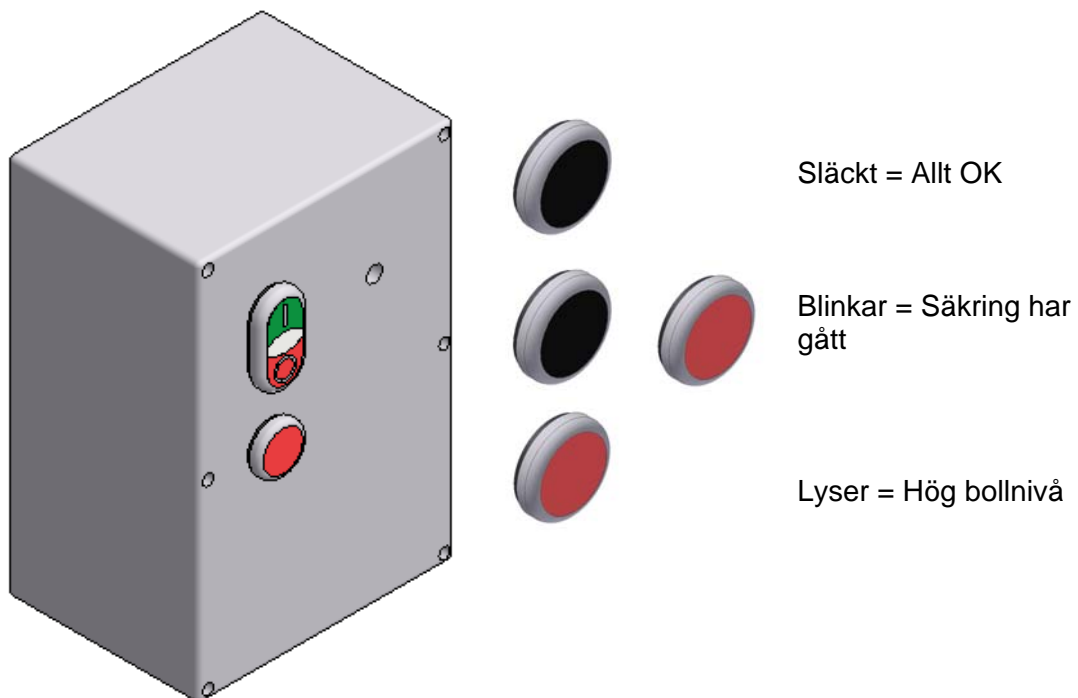
Start dispensing and check that OP.L blinks with each detected ball.

STB = Stability LED means that the reflecting light is sufficient for detection.

OB.L = Operating LED means detection of an object.

3.3 Warning Light

The red warning light at the rear of the machine signals three different modes; it can be unlit, blinking, or lit.



Figur 8: Kontrollbox till bolltvätt

Unlit

If the light is out, everything is in good working order.

Blinking

Blinking light signals that one or both thermal switches in the control box at the front of the machine have cut out.

This can indicate that the machine has been overcharged. To remedy, wait a minute or two, then reset the switch by pushing it upward to its original position. Check by starting the machine again. If it still does not work, call Range Servant for assistance.

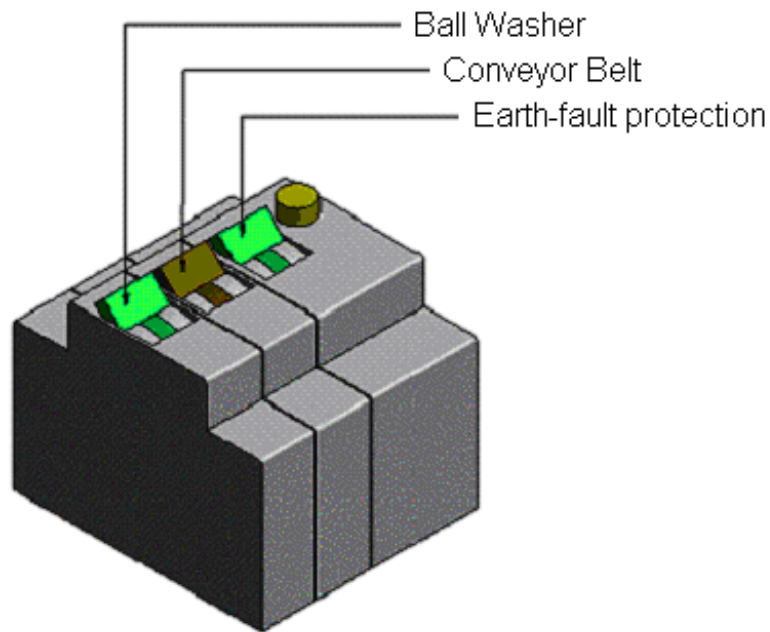


Figure 9: Motor protection with switches in their original position

Lit

If the light is on, this is a signal that the ball level is too high. A photocell checks the ball level sending a signal to the PLC, which in turn forwards the signal to the warning light, and the light comes on. After 7-8 min the vertical conveyor belt and the ball washer are stopped. The light will be on until the ball level has sunk to an acceptable level. Only then the machine can be started again.

ATTENTION! The machine cannot be started until the light has gone out.

3.4 Payment Methods and Prices

The Ball Dispenser is equipped with an operating panel where the customer can select the desired payment method. The panel contains two LED's, openings for coins or tokens, and a slot for magnetic cards or bill scanner.

The ball dispenser is also compatible with the Select.Lite™ software. Select.Lite™ is a complete and user-friendly front end for managing and controlling a ball management system. The payment methods available for the Select.Lite™ are the Select Members Card (MiFare), bar codes and tokens.

3.4.1 Range Servant® Pollett

Range Servant® has 16 different types of tokens for use in the Range Servant® mechanical token acceptor.

Token types: RS-1 to RS-IX, RS-A to RS-H

There are also two types of tokens for use in electronic coin acceptors.

Token types: RS-90, RS-91

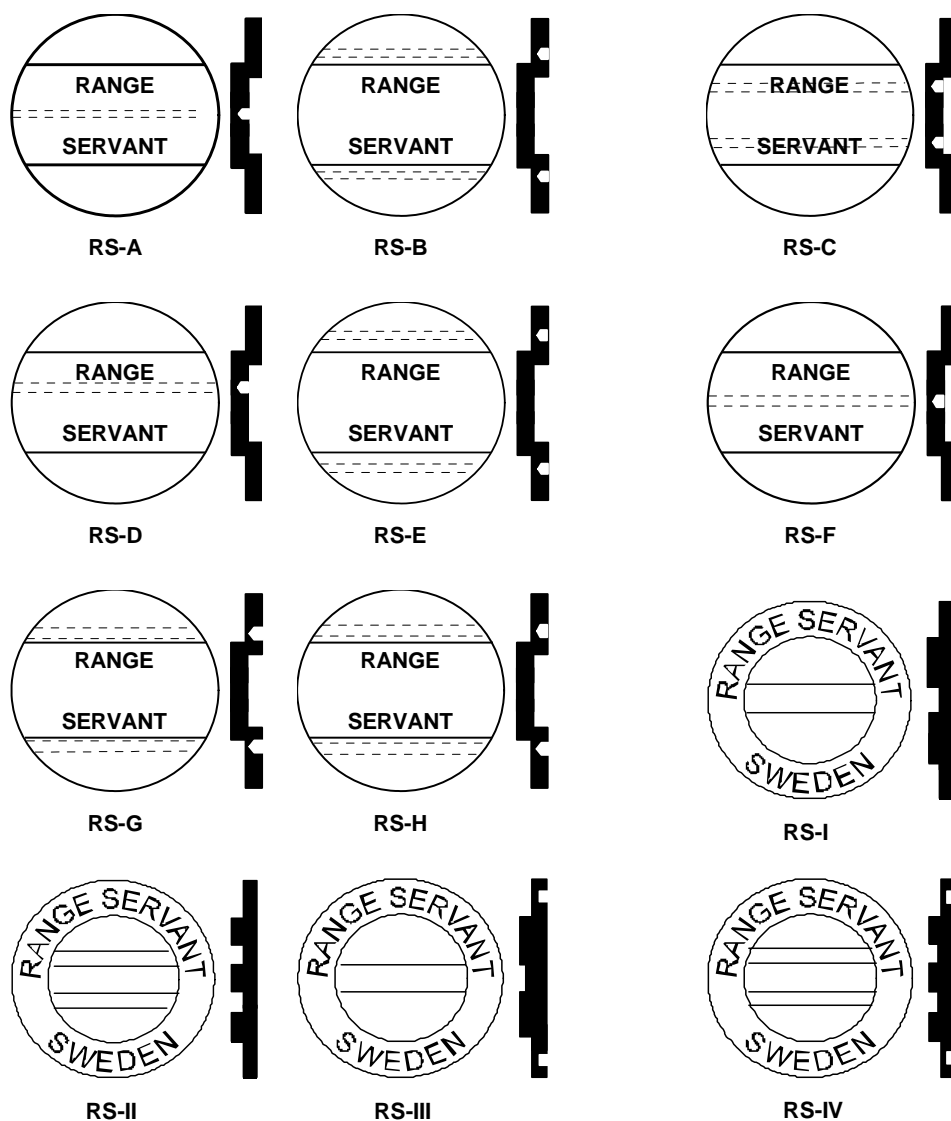




Figure 10: Tokens

3.4.2 Mechanical Coin Control

Mechanical coin control for one or two coins.

When a two coin control has been installed, this also includes a so-called adding circuit card.

This card allows for prices that are higher than the coin value.

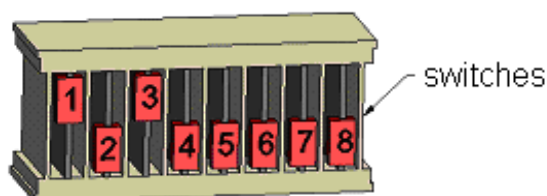


Figure 11: DIP switches

The adding circuit card (no. 107810) contains two 8-position DIPswitches marked DIP 1 and DIP 2 and two cable contacts.

The internal relation between the coins is set with the help of the DIP1 (switches 1-4).

The coin with the lowest value is always given value 1. The next setting determines how many times coin 2 is bigger than coin 1.

1-2 relation	(switch 2 ON)
1-5 relation	(switch 1+3 ON)
1-10 relation	(switch 2+4 ON)

Relay output port (1 sec. impulse output) DIP 1 switch 7+ 8 ON.

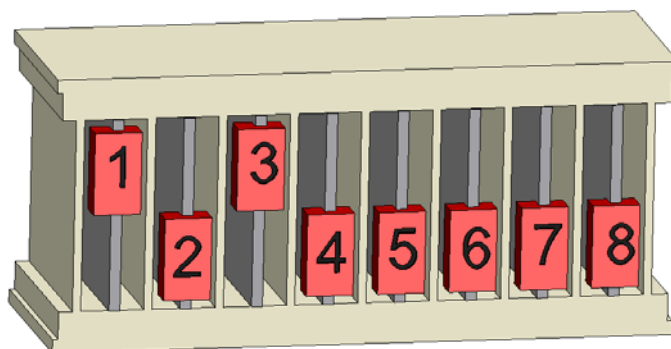
Figure 12: Mechanical coin control

The price is set and modified by changing the position of the switches on DIP 2. The value is binary which means that:

Switch	1 represents	1 x the smallest coin
	2 represents	2 x the smallest coin
	3 represents	4 x the smallest coin
	4 represents	8 x the smallest coin
	5 represents	16 x the smallest coin
	6 represents	32 x the smallest coin
	7 represents	64 x the smallest coin
	8 represents	128 x the smallest coin

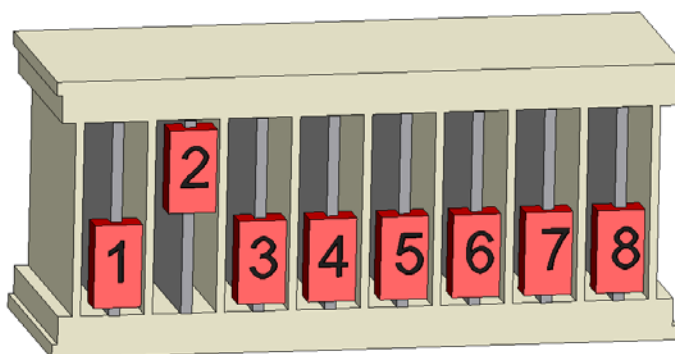
The switches can be variously combined to obtain prices ranging from the biggest coin to 255 times the smallest.

Example 1: The smallest coin is 5 SEK and the biggest 10 SEK.
 You wish to obtain a price of 25 SEK.
 Set switch 1 (=5 SEK) and 3 (=20 SEK) in the ON position.



$$5+0+20+0=25$$

Example 2: The smallest coin is 5 SEK and the biggest 10 SEK.
 You wish to obtain a price of 10 SEK.
 Set switch 2 (=10 SEK) in the ON position.



$$0+10+0+0=10$$

3.4.3 Electronic Coin Control Cashflow 340

The electronic coin control can be programmed for up to twelve different types of coins or ten coins plus the two electronic tokens RS-90 and RS-91.

(In use from 970801 Mars® model Cashflow 340)

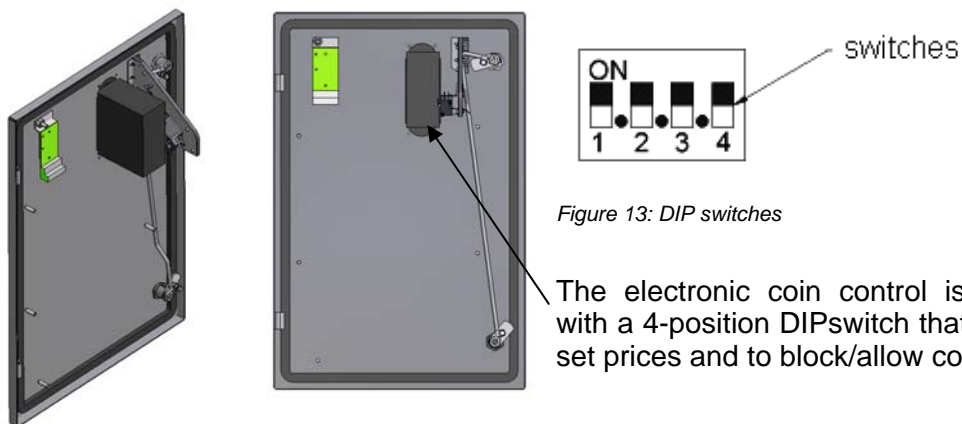


Figure 13: DIP switches

Figure 14: Electronic Coin Control Cashflow 340

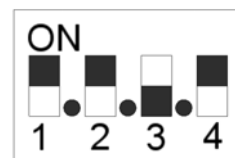
3.4.3.1 Change of prices, blocking of coins etc... Cashflow 340.

The following instructions describe how to modify prices, block coins etc.

1. Cut the power supply to the coin control.
2. Dismount the coin control from its holder and remove the interface protection by pulling it downwards. Re-mount the coin control in its holder.
3. Switch on the power supply to the coin control.
4. Adjust the position of the switches according to the respective function.
If the switches are already in the correct position, then do the following:
 - Change the position of one switch.
 - Switch off the power supply and switch it on again.
 - Re-set the switch in the correct position and press the coin return button.
5. Carry out the desired function.
6. Again cut the power supply to the coin control and re-mount the interface protection.
7. Switch on the power supply.

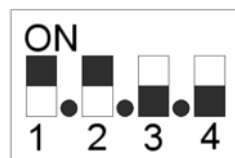
Blocking a coin

1. Position the switches 1-4 as shown in the diagram.
2. Press the coin return button once.
3. Insert the coin you wish to block and check that it is blocked.
4. Press the coin return button once.
5. Check that the setting has been carried out.



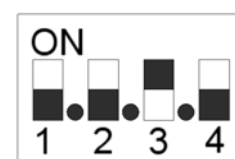
Allowing a coin

1. Position the switches 1-4 as shown in the diagram.
2. Press the coin return button once
3. Insert the coin you wish to allow and check that it is accepted.
4. Press the coin return button once
5. Check that the setting has been carried out.



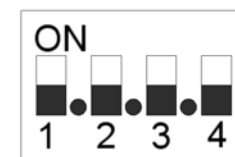
Changing the price

1. Position the switches 1-4 as shown in the diagram.
2. Press the coin return button once
3. Insert the coin you wish the price to be and check that it is accepted.
4. Press the coin return button once.
5. Check that the setting has been carried out.



Testing the coin output port

1. Position the switches 1-4 as shown in the diagram.
2. Press the coin return button.
3. Check that the machine starts dispensing.



3.4.4 Manual Magnetic Card Reader (EMC-30):

This is done by sliding a magnetic card through a card reader. The cards can be programmed to dispense anything between 1 and 30 baskets.

The card reader is equipped with a two-digit display showing the number of dispenses left on the card.

You will find the wiring diagram for Magnetic card reader EMC-30 in paragraph 6.3.2.4

Slide the card downwards through the scanner with the dark magnetic strip held away from you and facing left. The figure, which appears in the display, shows the number of baskets (including this one!) that you can fill from the machine.

If you only want to know how many baskets you have left, press the knob on the left-hand side of the scanner and hold it while sliding the card through. This does not reduce the number of baskets left, as no balls will be dispensed.

Keep the card safe. Do not bend it, and keep it away from strong magnetic fields.

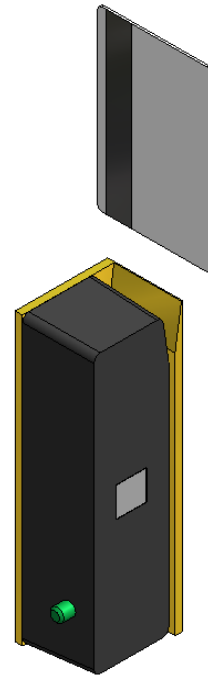


Figure 15: EMC-30

3.4.5 e-range

e-range works either with buttons or separately.

The user buys an electronic key (e-key) that is programmed with a number of purchases. The key can easily be re-programmed.

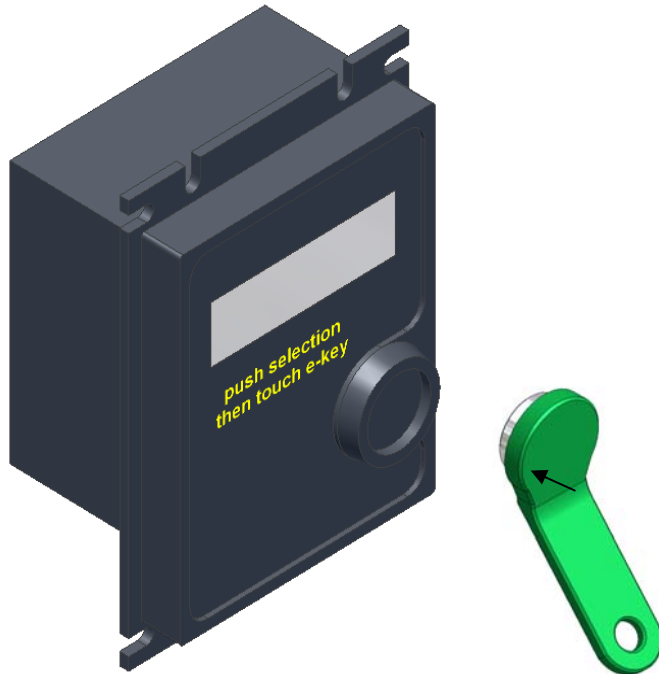


Figure 16: e-range and e-key

With the buttons on the right-hand side of the e-range select the desired size of basket. Then press the electronic key against the key socket on the e-range. The number of dispensings left will be shown in the display and balls will be dispensed.

If the device is not equipped with buttons, the same number of balls will be distributed each time. The balls are distributed when the electronic key is pressed against the key socket. While balls are being dispensed, the number of dispensings left will be shown in the display.

Only provided the e-range is equipped with buttons you can use the buttons to check how many purchases you have left without balls being dispensed. Else you cannot.

3.4.6 Select Control System

The Select Control System is a control system designed to facilitate the distribution of golf balls as well as debiting work. Its main task is to collect and transfer information from the ball dispenser to any stationary or portable PC. The software allows the golf range owner to obtain reports and statistical information etc.

The Select Control System is used in combination with the various payment methods such as Keyboard, Magtek and Transponder reader. It can furthermore be programmed to collect information from the Token Mechanism and the Electronic Coin Control. These, however, work separately and are not necessarily used in combination with the Select system.

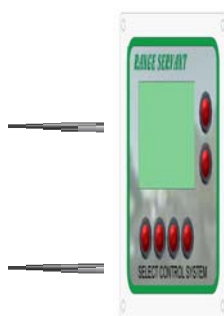


Figure 17: Select

When payment has been made with one of the above payment methods, information about how much the customer has paid and how many balls are distributed will appear in the Select LCD display.

3.4.7 Transponder Reader

This card reader works in combination with the Select system exclusively.

Hold the card in front of the card reader so it can read the chip on the card. The reader communicates with Select, transmitting information about how much the customer has paid and how many balls will be distributed which is then shown in the Select display. For balls to be distributed the button under OK must be pressed.



Figure 18: Transponder Reader

3.4.8 Magnetic Card Reader (Magtek)

Take care not to bend the card and keep it away from strong magnetic fields.

This card reader works in combination with the Select system exclusively.

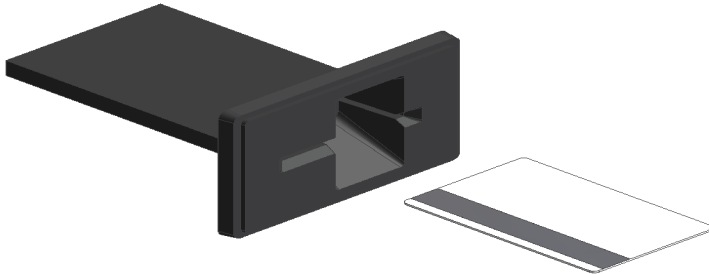


Figure 19: Magnetic Card Reader

The magnetic card is inserted in the reader. The reader communicates with Select transmitting information about how much the customer has paid and how many balls will be distributed, which is then shown in the Select display. The reader awaits confirmation and balls are distributed when the button under OK is pressed.

3.4.9 Keyboard

This keyboard works in combination with the Select system exclusively.

Use the keys to enter the PIN code from your receipt. Information about the price per ball will appear in the Select display. Select the desired number of balls and press the button under OK.

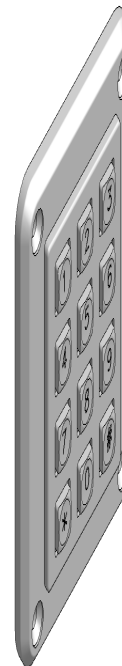


Figure 20: Keyboard

4 Design and Operation

4.1 General

The machine is intended for use as a golf ball dispenser and includes a ball washer, a vertical conveyor belt and a ball magazine. Inside it is fitted with two plates on two levels for load reduction and, at the bottom, a grid.

After the balls are loaded into the machine they pass through a ball washer. When thoroughly cleaned, they are transported by the vertical conveyor belt to the top of the machine where they are stored in the ball hopper.

The grid consists of a number of ball ducts, arranged next to each other and ending above a conveyor belt transporting the balls to the ball chute.

A photocell is installed in connection with the conveyor belt counting the balls being transported by the belt.

All interior surfaces are inclined so that the balls are continuously flushed downwards. The lower level allows for damaged balls and debris to be sorted out.

All essential parts of the Ball Dispenser are manufactured of stainless steel, rust protected steel or aluminium.

The Range Servant Boll Dispenser has been designed in order to provide driving range owners with a long-lasting, reliable, practical and economic golf ball management system.

4.1.1 Exterior, front

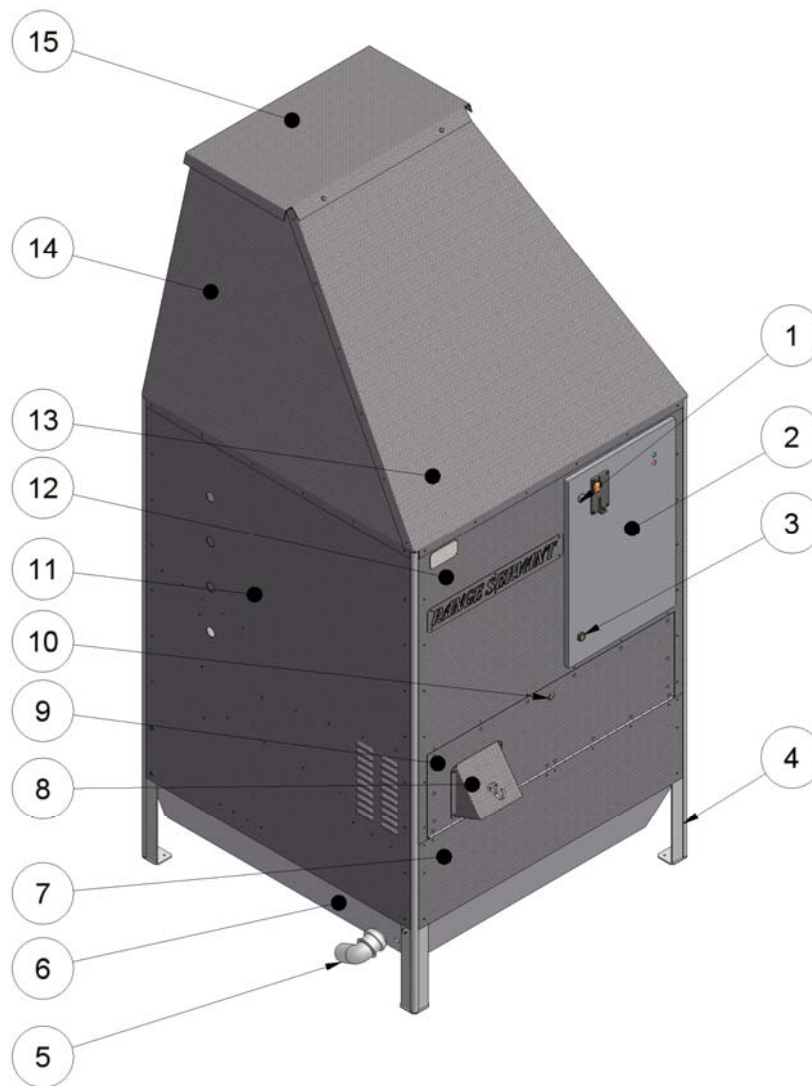


Figure 21: Exterior, side-to-front view

Pos.	Designation
1	Upper lock for control box
2	Control box door
3	Lower lock for control box
4	Legs
5	Curved waste water pipe
6	Collecting tray
7	Lower front panel
8	Ball chute
9	Front hatch
10	Lock for front hatch
11	Left side panel
12	Upper front panel
13	Front panel, conical top
14	Side panel, left cone top
15	Top plate

4.1.2 Exterior, Rear

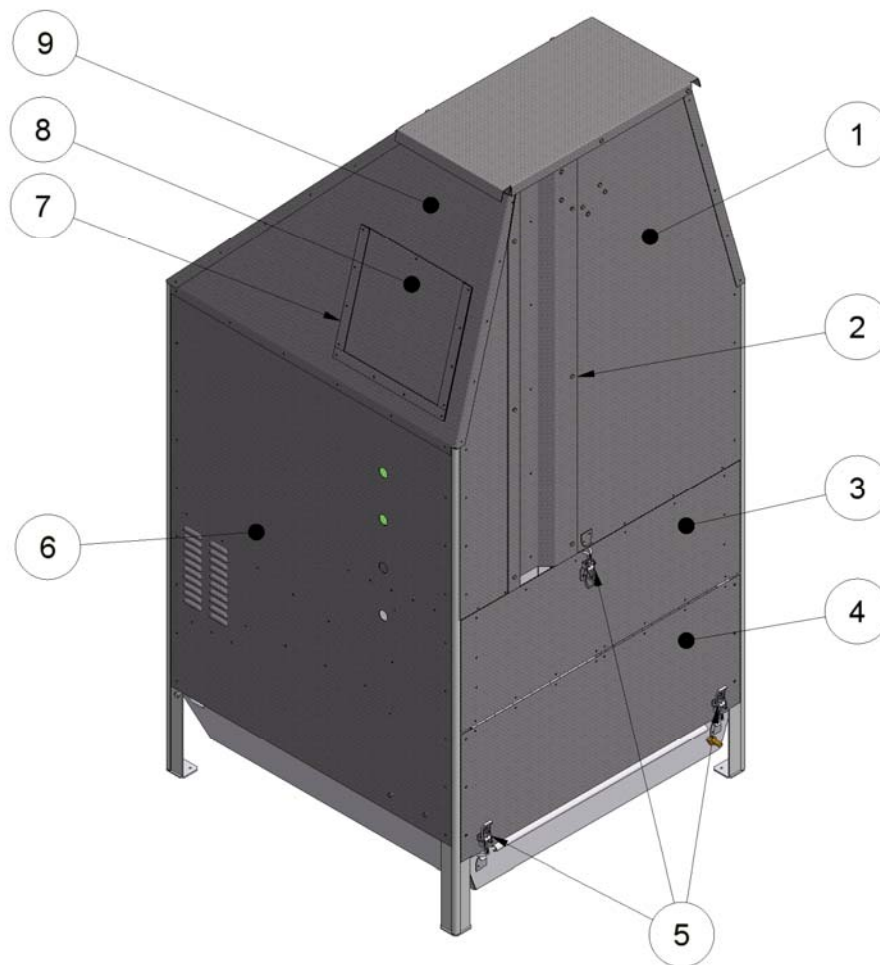


Figure 22: Exterior, Viewed rear-to-side

Pos.	Designation
1	Rear upper panel
2	Read panel for vertical conveyor belt
3	Rear hatch
4	Rear lower panel
5	Eccentric lock
6	Right side panel
7	Service hatch seal
8	Service hatch
9	Side panel, right cone top

4.1.3 Interior

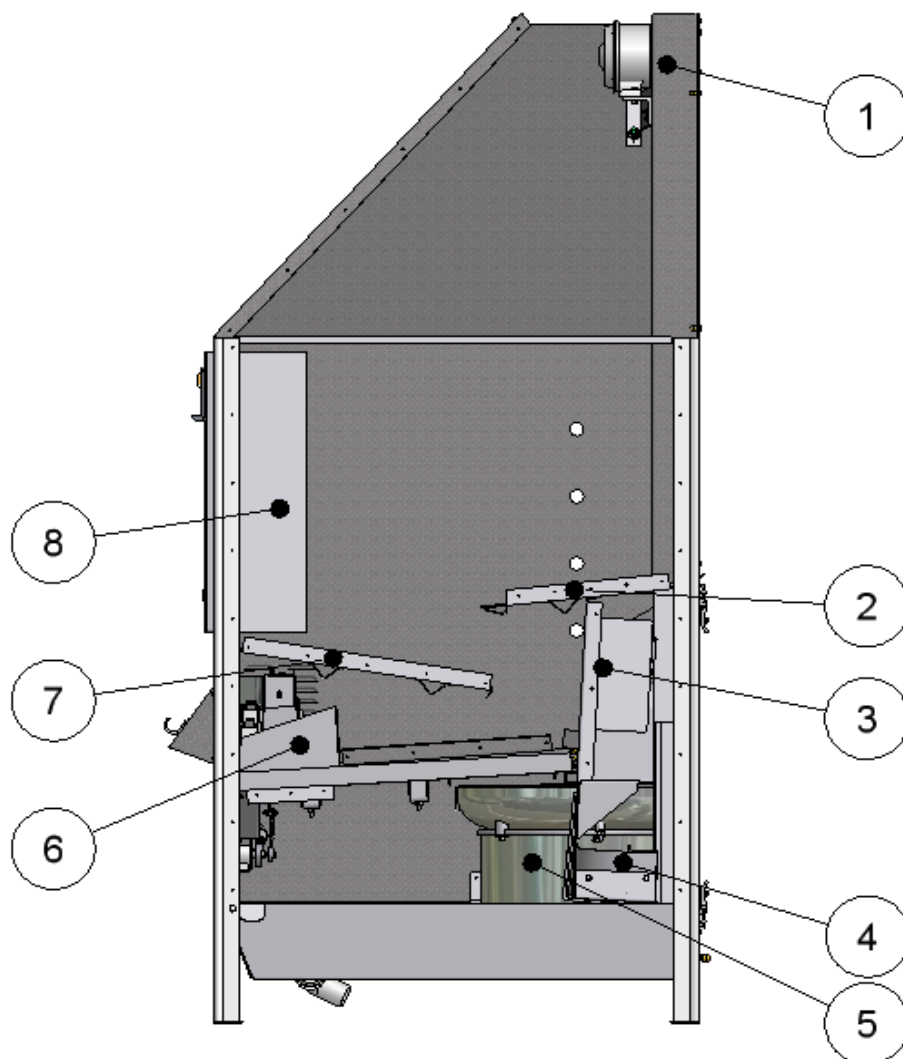


Figure 23: Ball dispenser interior, side- view

Pos.	Designation
1	Vertical conveyor belt
2	Upper inclined plate
3	Vertical grid plate
4	Ball duct
5	Ball washer, Combi 15
6	Ultima grid
7	Lower inclined plate
8	Control box

4.2 Main Components

4.2.1 Ball Washer

The Ball Washer consists of a horizontally placed tub about 0.5 m in diameter with an intake opening in its centre. The tub is mounted on the washer, which is equipped with a rotating rubber disc and a stationary brush. The balls enter through the intake opening and are cleaned in the washer between the rubber disc and the brush. From there they roll into the ball duct where they are lined up and guided onto the vertical conveyor belt.

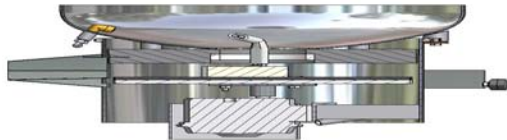


Figure 24: Cross-section of ball washer

4.2.2 Vertical Conveyor Belt

The vertical conveyor consists of an aluminium H profile, an electric conveyor motor, a driving pulley and a conveyor belt. The balls are discharged from the ball duct onto the conveyor belt which is divided into compartments and are transported to the top portion of the machine where they are placed in the ball hopper.

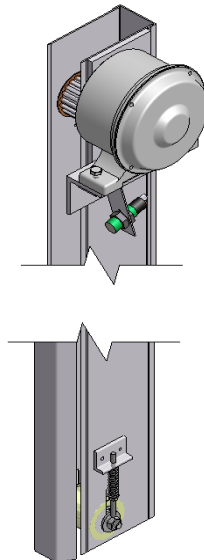


Figure 25: Vertical Conveyor Belt

4.2.3 Grid

The lowest level inside the Ball Dispenser Ultima Combi consists of a grid. On top of the grid is a vibrating plate set into motion by a vibrator motor. At one end of the vibrating plate is a funnel-shaped ball duct discharging onto a conveyor belt divided into compartments. The conveyor belt runs between a lower and upper pulley. The angle of the conveyor belt is designed so that the balls automatically roll on from one compartment to the other until all compartments are filled with balls. An electric conveyor motor runs the upper pulley and thus the conveyor belt. The conveyor motor is connected to an electronic control circuit including a photocell located next to the conveyor belt counting the balls passing on the belt.

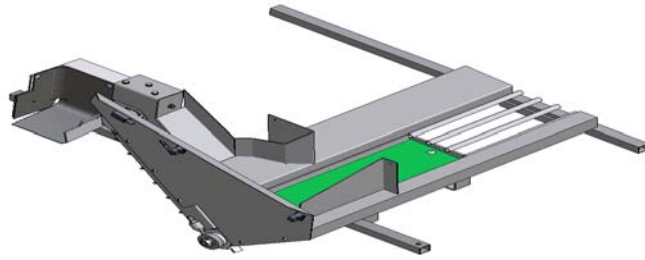


Figure 26: Grid

4.2.4 Payment Methods

The ball dispenser can be operated with tokens, coins or magnetic cards. Each machine can run more than one payment system at the same time, for example combining token/coin or token/coin/card. The number of balls dispensed need not necessarily be the same for the different forms of payment (see the examples).

Below you can read how to alter the price on the coin mechanism, both for manual operation and the electronic system.

The price per unit when using a card mechanism is determined by the price of the card and your choice of the number of balls dispensed per card. The cards can be programmed to dispense anything between 1 and 30 baskets. The magnetic cards are programmed by Range Servant®

5 Maintenance

5.1 General

Range Servant will provide accessories and original spare parts together with competent advice.

Maintenance carried out correctly minimises defects and ensures maximum service life and reliable operation. Any malfunctions are detected at an early stage and are therefore easily corrected. Regular maintenance minimises defects and equipment breakdown.

The following maintenance instructions only refer to the most common problems and their causes.

5.2 Maintenance Intervals and Instructions

Maintenance interval:

1. After 300 operating hours
2. Once every month
3. Once every golf season

Maintenance Intervals and Instructions		1	2	3
1	Machine Exterior:			
1.1	Lubricate eccentric lock, lid and front hatch locks and hinges of lid and front hatch with ordinary lubricating oil.		X	
1.2	Lubricate eccentric lock, lid and front hatch locks and hinges of lid and front hatch with ordinary lubricating oil.			X
2	Machine Interior:			
2.1	Lubricate linking arms with ordinary lubricating oil.		X	
2.2	Wipe the photocell that counts the balls. The photocell is located above the conveyor belt. Use a piece of cloth moistened with pure alcohol.			X
2.3	If chemical fertilisers are used on the driving range, we recommend that the dispenser is cleaned thoroughly once a month to prevent corrosion of the machine's internal components. Cut the power supply to the machine, open the front hatch, remove grass and other debris and rinse with clean water.		X	
2.4	Empty the machine, sort out worn or damaged balls, stones and grit etc and clean the inside with normal clean water. (Do not spray water directly onto the electric motor.)			X
2.5	Clean and dry the ball duct (located after the grid).		X	
2.6	Clean and dry the conveyor belt. Particularly check the belt underneath to make sure there is no grass stuck to the teeth.		X	
3	Electronic Components:			
3.1	If the machine is fitted with a magnetic card reader EMC-30 the reader head has to be cleaned. Moisten a piece of cloth with methylated spirit, wind it round the card and slide the card through the reader 5-10 times.			X

5.3 Troubleshooting and Repair, Ultima Combi

Although the operation of the machine is most reliable, problems may arise for various reasons.

Attention!

To reduce the time spent on troubleshooting, always start by checking that cables and connections are clean and tightened.

Symptom	Possible Cause	Corrective Measure
The Ball dispenser does not start.	→ The power supply is not connected.	→ Connect the power supply.
	→ The ON/OFF switch on the circuit card is not "ON".	→ Set the switch in the "ON" position.
	→ Defective fuse(s) on the circuit card.	→ Replace the fuse(s) (2.5A/250V).
	→ Payment method defect.	→ Check the voltage with volt meter. The voltage shall fall from 5VDC to 0VDC when active. All payment methods must be NO (Normally Open).
	→ One payment channel is active.	→ Measure the payment channel voltage and check that no channel is 0VDC.
	→ Debris is stuck between cogs and cogwheel	→ Clean and adjust belt tension.
The Ball Dispenser delivers too many balls.	→ The photocell is not correctly adjusted.	→ Adjust the photocell according to instructions (paragraph 3.2.4 "Adjustment of photocell")
The Ball dispenser delivers too few balls (dispensing is interrupted).	→ The conveyor belt derails.	→ Lubricate linking arms with thin lubricant.

Figure 28: Troubleshooting for Ultima Combi

5.4 Troubleshooting and Repair, Payment Methods

5.4.1 Troubleshooting

Use the following chart to identify faults.

Symptom	Possible Cause	Corrective Measure
The Ball Dispenser does not start.	<p>→</p> <p>→ Token contacts do not close.</p>	<p>→ Check the voltage with volt meter. The voltage should fall from 5VDC to 0VDC when active (=closed position). The token switch must be connected in the NO position (Normally Open).</p> <p>→ Check that the token cable is not damaged or has stuck.</p>
	→ The (Mechanical) Coin Control switch does not close.	→ See above for token switch.
	→ The coin output port of Electronic Coin Control Cashflow 340 is not activated.	<p>Activate coin output of Cashflow (acc. to 3.3.3.1 "Change of price, blocking of coins etc."). Measure payment channel with voltmeter. Voltage should fall from 5VDC to 0VDC when active. Check the price setting.</p>
	→ The magnetic card reader EMC-30 shows nothing in the display.	<p>→ There are no dispenses left on the card. Try a new card.</p> <p>→ Check that resistor 33k Ohm is not defective. See paragraph 3.4.4.</p>
	→ The card reader EMC-30 indicates purchases but the displayed number does not change and dispensing does	→ Check that the mechanical switch of the reader unit is not closed.

Figure 19 Troubleshooting, Payment Methods.

5.5 Troubleshooting and Repair, Ball Washer 1200

5.5.1 Troubleshooting

Faults can be identified using the following chart:

Symptom	Possible Cause	Corrective Measure
The ball washer does not let out any balls.	<p>➡ Dirt or other debris has got stuck in the machine.</p>	<p>➡ Remove any debris stuck in the machine.</p>
	<p>➡ The brush is worn and needs to be changed.</p>	<p>➡ Check the distance between the brush (no. WGM0014) and the rubber disc (no. WGM0015). If the distance is greater than 35-37 mm the brush is likely to be worn.</p>
No water comes out of the washer.	<p>➡ Water nozzles are clogged.</p>	<p>➡ Clean by drilling or driving a drill (1.5 mm) through the nozzle or dismantle and clean.</p>
No water arrives in the washer.	<p>➡ The water supply is closed off.</p>	<p>➡ Check that the water supply is opened.</p>
	<p>➡ Water valve is defective.</p>	<p>➡ Check the water valve (no. 10 530) by listening to the valve when the washer is started. A clicking sound must be heard, else the valve is defect and must be changed.</p>
The washer does not stop/start.	<p>➡ Something is stuck in the washer.</p>	<p>➡ Open the washer and check for ball halves, big stones or similar objects. Remove.</p>

Figure 30: Troubleshooting Ball Washer 1200.

5.6 Troubleshooting and Repair, Conveyor Belt Fr Dispensing

5.7 Troubleshooting

To identify a fault use the following chart:

Symptom	Possible Cause	Corrective Measure
The belt is slipping.	→ The belt is not correctly tensioned.	→ Check whether the belt needs tensioning.
The belt does not start running.	→ The photocell is blocked.	→ Check whether the photocell is blocked, remove any debris.
The belt is locked.	→ A ball has got stuck in the belt.	→ Remove the ball.

Figure 31: Troubleshooting, Conveyor Belt for Dispensing.

Fi

5.8 Troubleshooting and Repair, Warning Light

5.8.1 Troubleshooting

Faults can be identified using the following chart:

Symptom	Possible Cause	Corrective Measure
The light is blinking.	→ Overload.	→ Let the machine rest for a few minutes, push up the switches and re-start the machine.
The light is lit.	→ High ball level.	→ Wait until the lamp has gone out, then re-start the machine.

Figure 32: Troubleshooting, Warning Light.

5.9 Operation Test

After reparation or maintenance, the operation of the machine should be tested by running the machine with the front and back hatches open, making a payment and checking that everything works to satisfaction.

6 Installation

6.1 Factory Testing and Configuration

Before delivery to the customer the ball dispensers are tested and configured. On this occasion all parameters of the control system are adjusted according to the customer's wishes.

Our objective when carrying out this final check is to verify that the product corresponds on all accounts to the requirements laid down by the customer on ordering and to prevent defective products from being brought onto the market.

6.2 Unpacking and Assembly

For trouble-free operation, place the ball dispenser on a firm and level surface.

We recommend that the machine be located under cover and that only the front of the machine be accessible to members of the public. If the machine is card-operated, it must stand under cover according to the terms of the warranty.

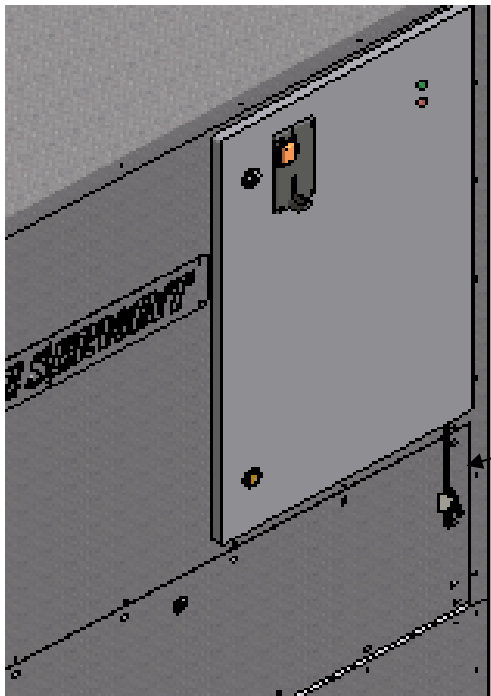


Figure 33: Location of keys on delivery

Remove the keys tied to the cable hanging from the control box.

The keys are identical and are used for opening the control box

Inside the control box there are another two identical keys which fit the front inspection hatch.

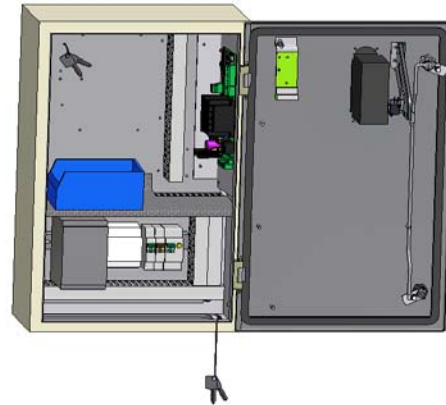


Figure 34: Keys in Control Box

Open the lid of the ball dispenser and remove the package containing a plastic tray, ball chute, the number of tokens ordered for the machine and other accessories, if any.

Place the plastic tray inside the control box so that the tokens fall directly into the tray. If the machine is both coin and token operated, there will be two trays for sorting both forms of payment at source.

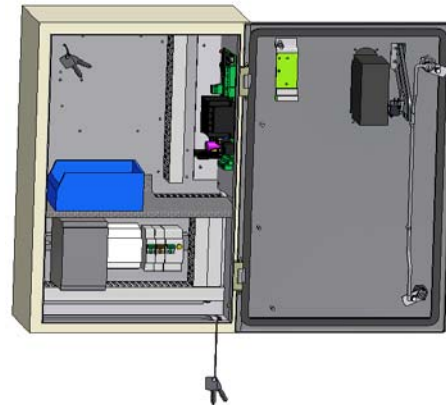


Figure 35: Location of plastic tray.



Figure 36: Mounting of ball chute.

Screw the ball chute into place over the hole in the front hatch.

The electric cable is located in the bottom of the machine and is pulled out through the hole at the bottom.

IMPORTANT! Do not connect the cable until the machine is ready for operation.

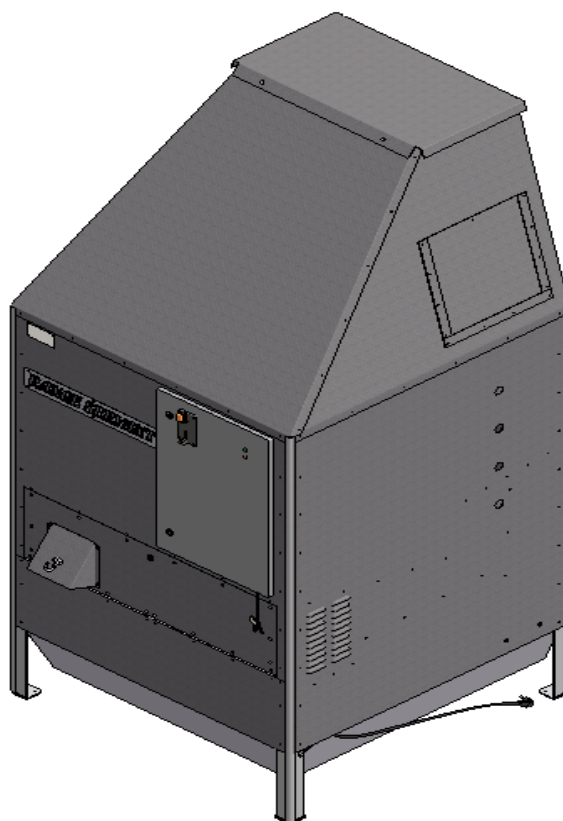


Figure 37: Connection of electric plug.

6.3 Installation, Wiring Diagram

To ensure safe and reliable operation, the control system must be correctly installed and grounded (earthed) and provided with good immunity against electronic noise.

6.3.1 Wiring Diagram for Connection of BA-99 to the Ball Dispenser

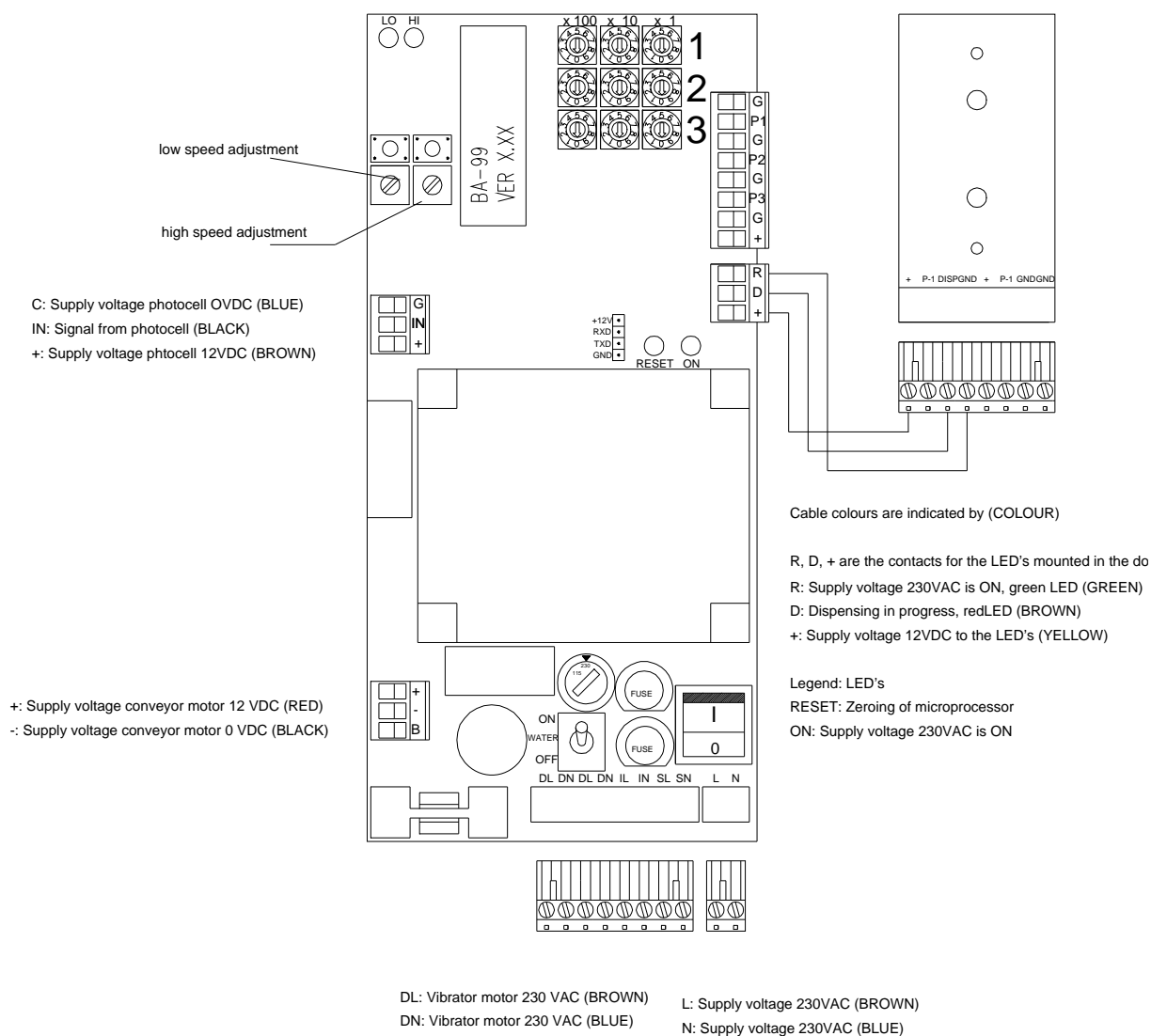


Figure 38: Wiring Diagram for Connection of Ultima Combi Ball Dispensers

6.3.2 Wiring of Payment System

6.3.2.1 Token Control

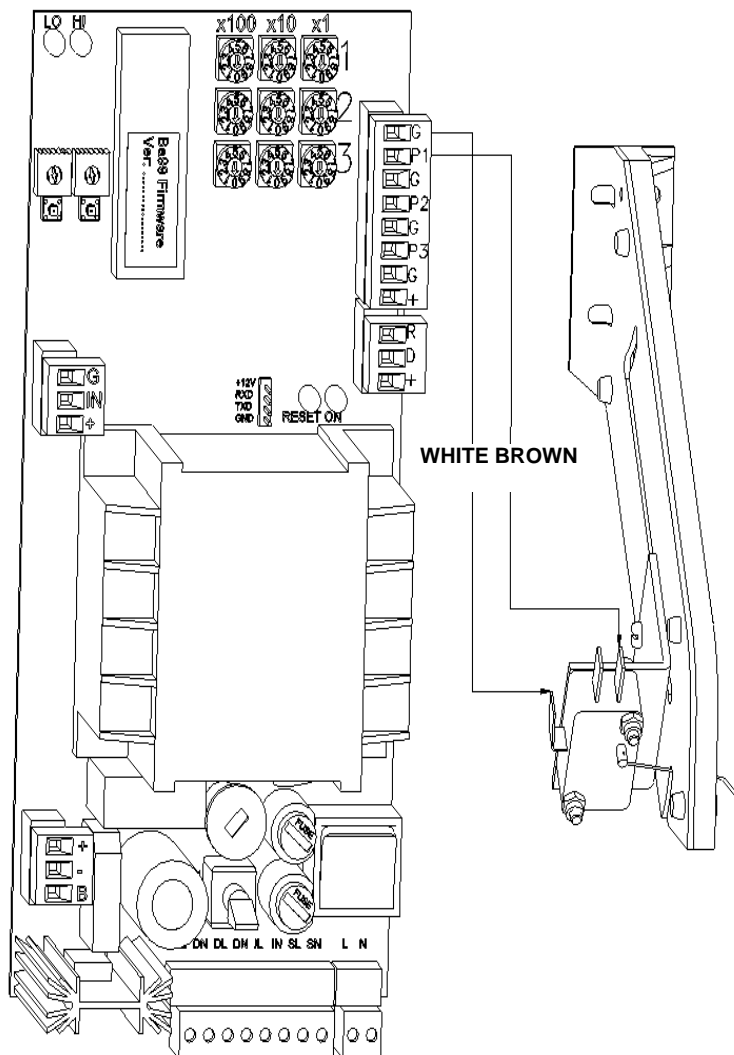


Figure 39: Wiring of Range Servant Token Control.

The token control micro switch is to be installed in the **NO** position - **N**ormally **O**pen.

6.3.2.2 Mechanical Coin Control

Wiring of the mechanical coin control is the same as for token control, see chapter **Error! Reference source not found.** Token control

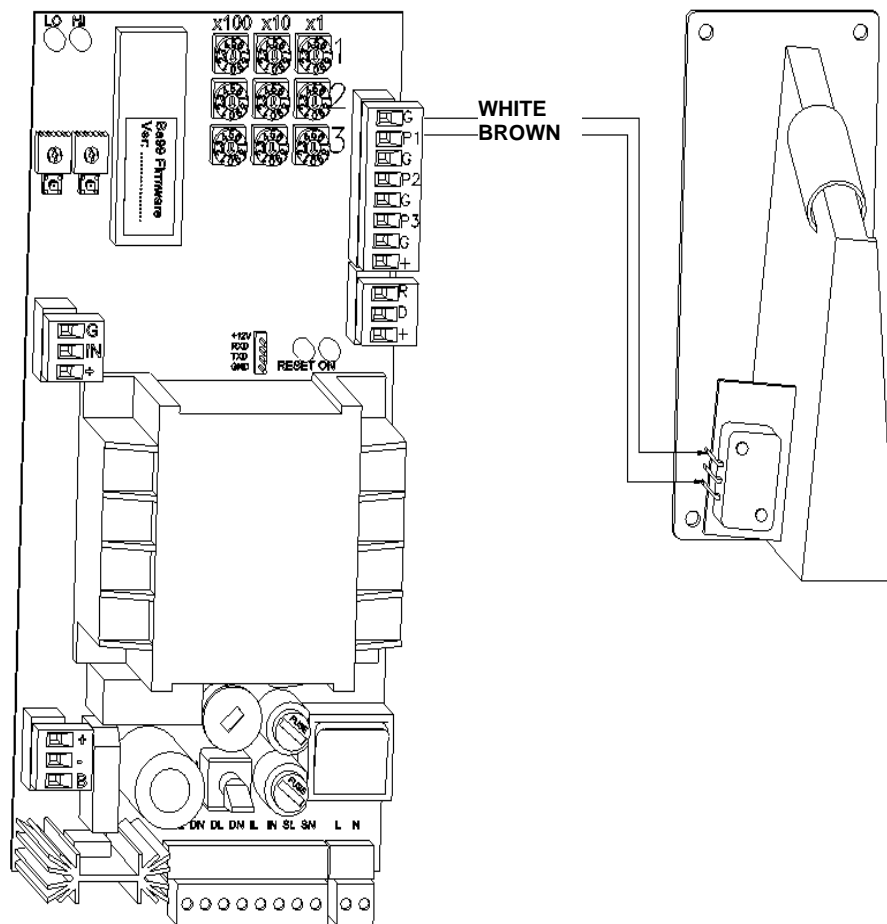


Figure 40: Wiring of the one coin mechanical coin control

6.3.2.3 Electronic Coin Control (Mars® Cashflow 340)

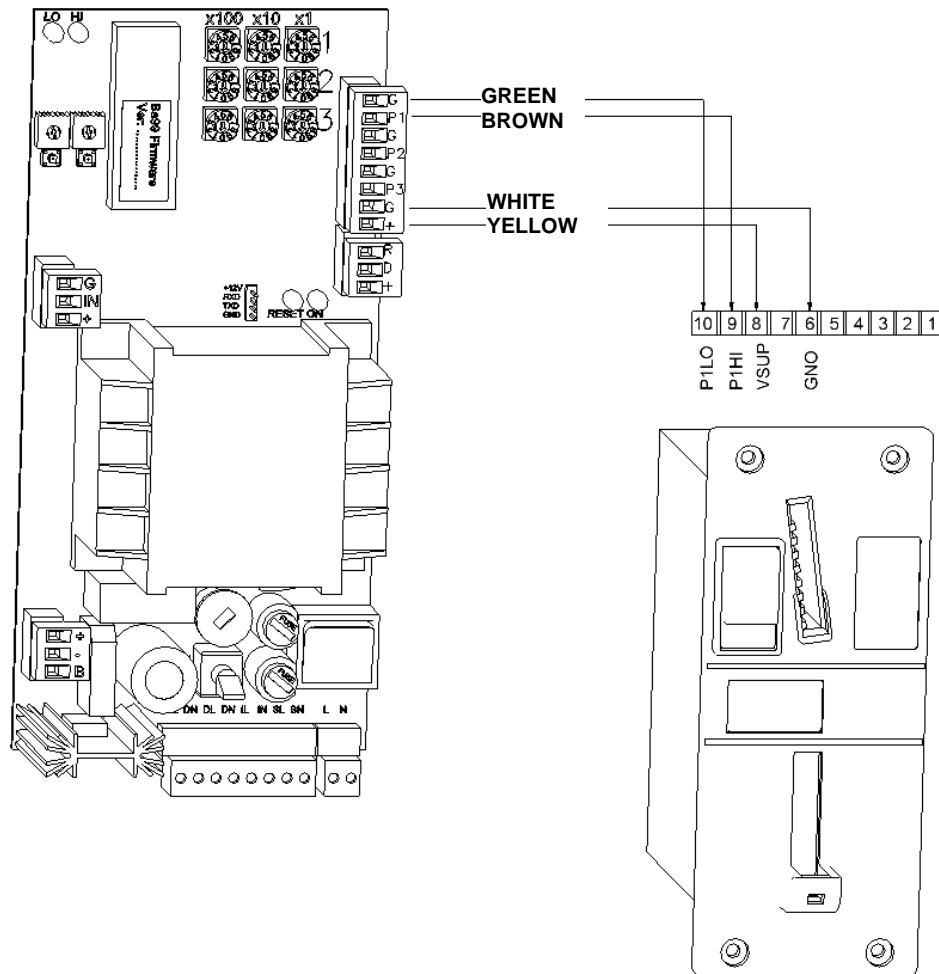


Figure 41: Wiring of the Coin Control Mars® Cashflow 340..

The electronic coin monitor Cashflow 340 is a totaliser, programmed to send a signal causing the ball dispenser control system to start dispensing when the internal pre-set price has been reached. Twelve different types of coins/tokens can be programmed.

6.3.2.4 Magnetic Card Reader EMC-30

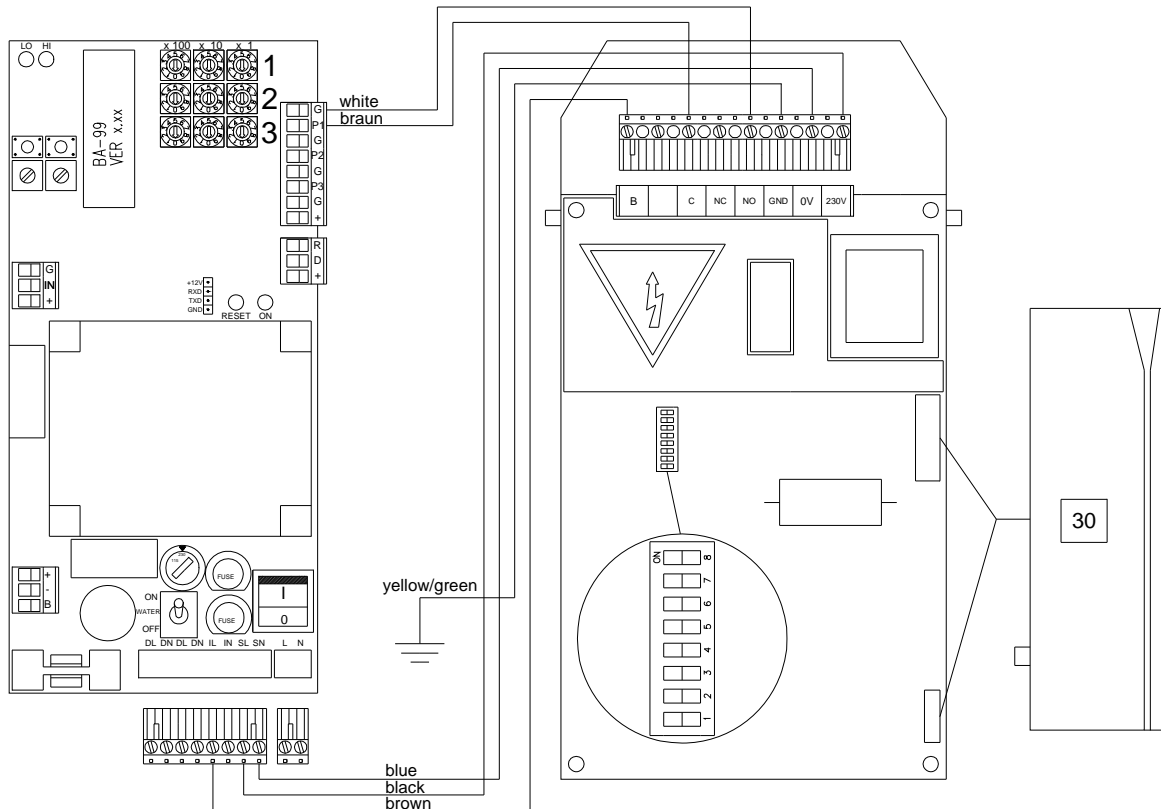


Figure 42: Wiring of the card reader EMC-30

The Card Reader uses pre-programmed magnetic cards that can be programmed for up to 30 purchases.
The magnetic cards will be programmed by Range Servant.

6.3.2.5 Counter

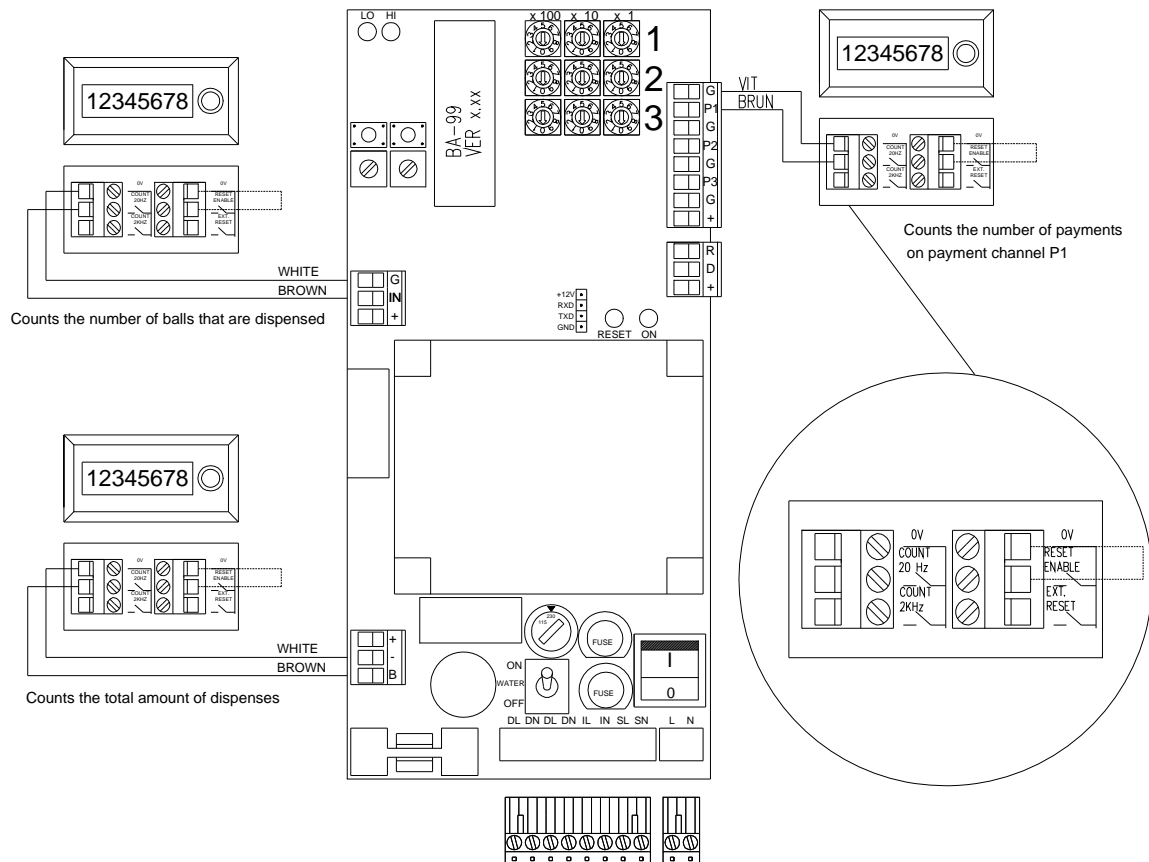


Figure 43: Wiring of counter.

6.3.3 Wiring Diagram for Connection of BA-97 to the Ball Dispenser

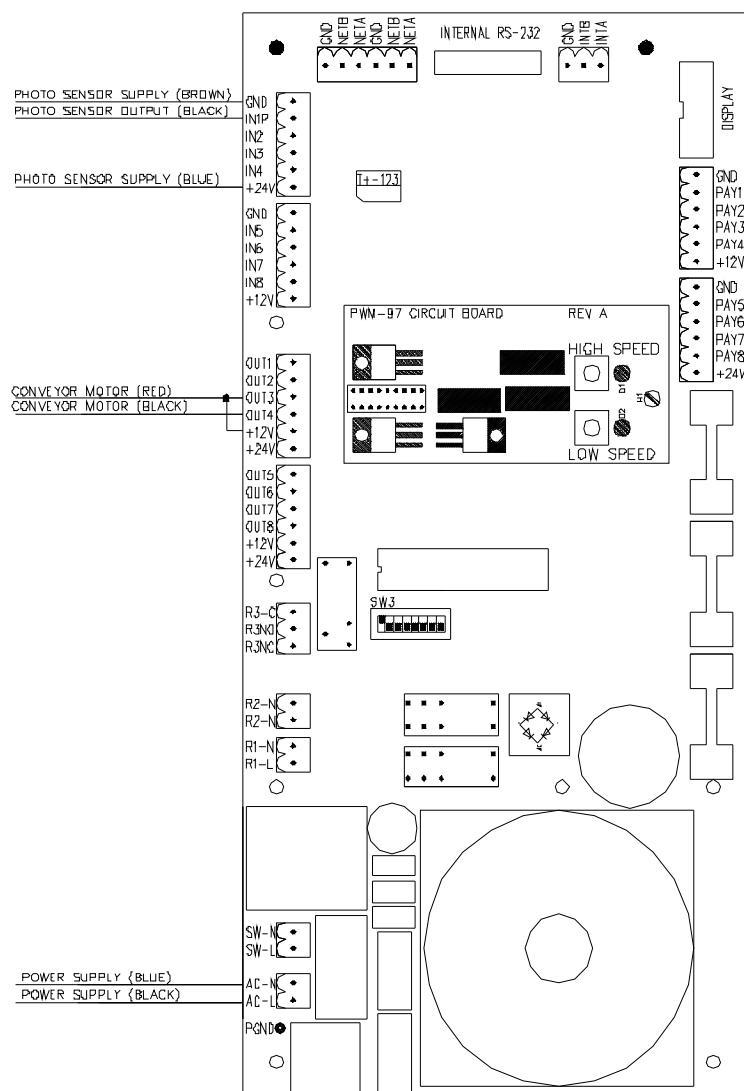


Figure 44: Connection of BA-97 to Ball Dispenser Select Select

6.3.4 Cables

ATTENTION! No cables may be exchanged without the prior consent of Range Servant.

6.3.4.1 Cable Specifications

Unit	Cable Type
Mains supply	RKK 3x0.75mm ²
Motor (Vibrator)	RKK 3x0.75 mm ²
Motor (Dispenser)	RKK 2x1mm ²
Photocell	LIYY 4x0.22mm ²

6.3.4.2 Power Supply

All machines can be supplied with 230/115 VAC +/- 10% 50-60Hz.

7 Spare Parts

In this chapter you will find detailed drawings of the ball dispenser showing the location of the different spare parts. The tables accompanying the drawings contain information about spare parts number and designation and the quantity of each spare part installed per machine model.

()= Optional accessories are marked with a parenthesis around the digit representing quantity.

- = The alternative marked with "-" depends on the customer's choice of equipment.

7.1 External

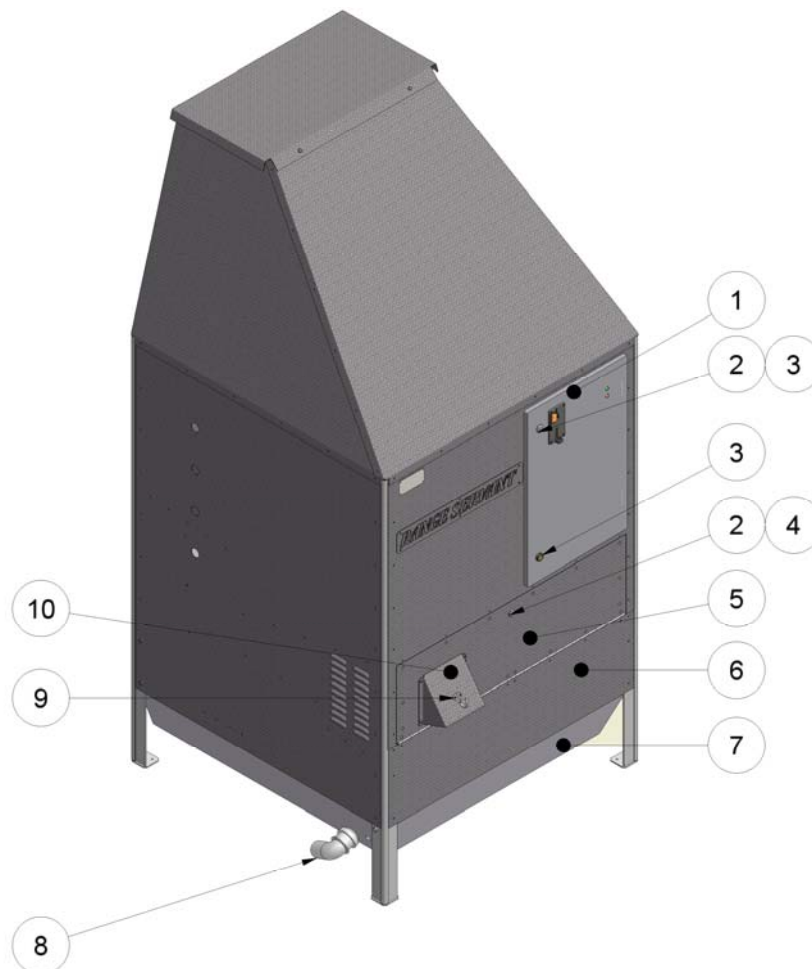


Figure 45: Front view

Pos.	Part. No.	Designation	Qty.
1	OBM0130	Control Box	1
2	101900	Lock for control box and front hatch	1
3	101950	Shackle, control box door	2
4	101960	Shackle, front hatch	1
5	GBM0009	Front hatch	1
6	GBM0011	Lower front panel	1
7	GBM0013	Collecting tray	1
8	106100	Curved drain pipe	1
9	DJA0000	Hook	1
10	GAM0009	Ball chute	1

7.2 Internal

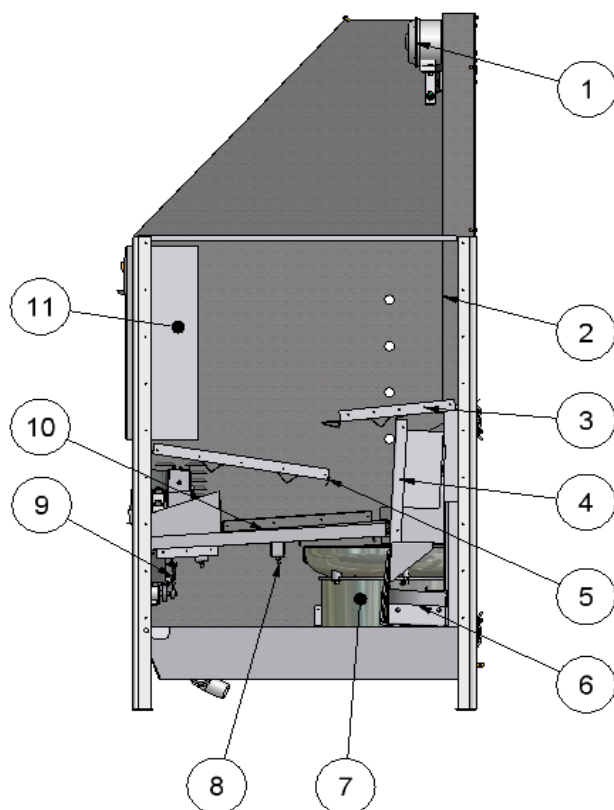


Figure 46: Internal side view

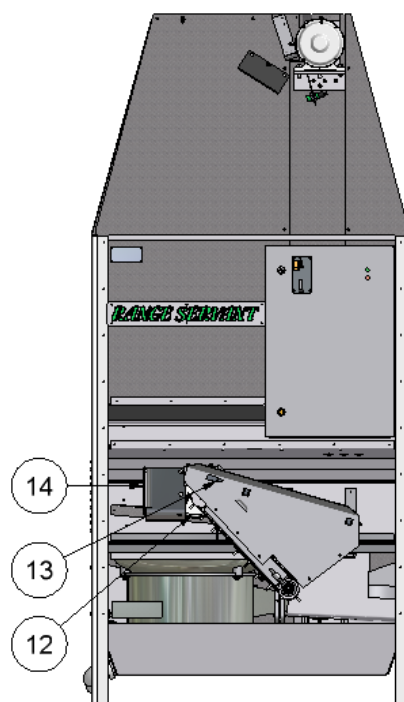


Figure 47: Internal front view

Pos.	Part No.	Designation	Ultima Combi
1	GAM0000	Vertical conveyor belt	1
2	GBM0017	Rear plate, conveyor belt	1
3	182600	Upper inclined plate	1
4	GBM0013	Vertical grid plate	1
5	182700	Lower inclined plate	1
6	GAM0009	Ball duct	1
7	WHM0035	Ball washer	1
8	DJA0004	Shock absorber	1
9	DJM0057	Linking arm	1
10	DJM0074	Ultima grid	1
11	-	Control Box	1
12	DJA0003	Motor	1
13	930218	Photocell, counter	1
14	DJM0080	Ball shute plate	1

7.3 Vertical Conveyor Belt

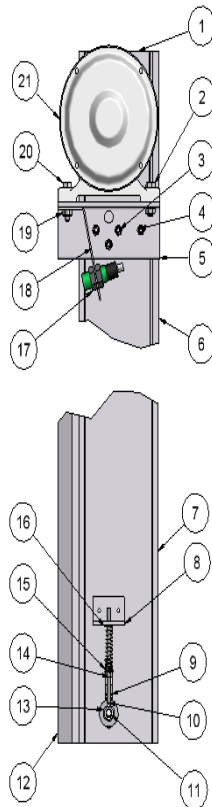


Figure 48: Vertical Conveyor Belt

Pos.	Part No.	Designation	Qty.
1	GAM0013	Motor plate	1
2	ISO 4017 - M8x30	Hexagonal screw	1
3	ISO 4762 - M6x25	Screw for hexagonal hole	2
4	ISO 10642 - M6x20	Screw with countersunk head for hexagonal hole	2
5	GAM0014	Motor holder	1
6	GAM0015	Profile lid	1
7	GAM0012	Frame, vertical conveyor belt	1
8	CAM0006	Holder	2
9	CAM0008	Slide bearings	1
10	CAM0005	Adjustment screw	2
11	ISO4014- M10x80	Hexagonal bolt	1
12	GAM0031	Belt protection, vertical conveyor belt	1
13	ISO 4032 M10	Hexagonal nut	1
14	ISO 4032-M6	Hexagonal nut	6
15	CAM0007	Spring	2
16	D6.7-14x1.5	Washer	4
17	CAA002	Photocell	1
18	GAM0035	Photocell holder	1
19	ISO 4032 - M8	Hexagonal nut	2
20	ISO 4017 – M8 x 35	Hexagonal screw	1
21	CAA0000	Motor Pmee 12CBG 1/50	1

7.4 Ball Washer

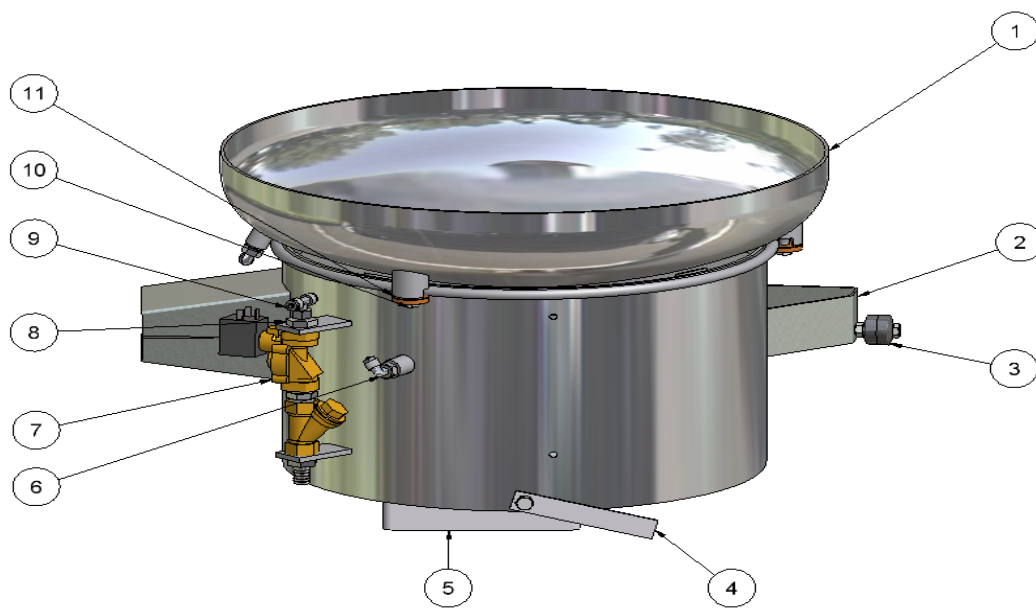


Figure 49: Ball Washer

Pos.	Part No.	Designation	Qty.
1	WHM0039	Ball hopper	1
2	WHM0036	Casing	1
3	WHM0053	Support roller	1
4	GAM0048	Cable holder	1
5	GAM0049	Protective plate, motor	1
6	WGA0007	Elbow fitting	2
7	WHA0003	Water valve 24V DC, complete	1
8	WHA0002	Reducer fitting ext. 1/2", int. 1/4"	1
9	WGA0001	Tee fitting	1
10	OEA0045	Plate	3
11	ISO4017- M8x20	Hexagonal bolt	5

7.4.1 Grid

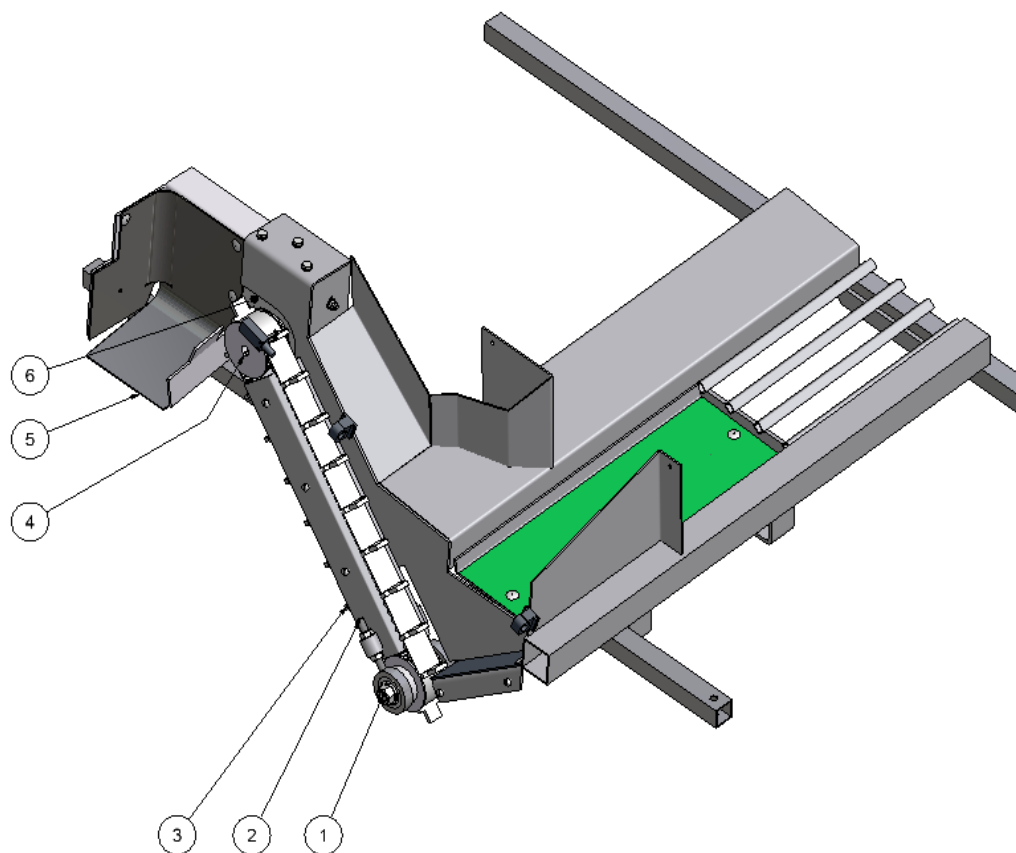


Figure 60: Grid

Pos.	Part No.	Designation	Ultima Combi
1	DJM0054	Pulley axle, conveyor belt	1
2	DJM0055	Clamp screw	2
3	DJA0006	Conveyor belt for ball dispensing	1
4	DJA0003	Conveyor motor	1
5	DJM0080	Ball chute	1
6	DJM0048	Conveyor belt pulley	1

7.5 Control Box

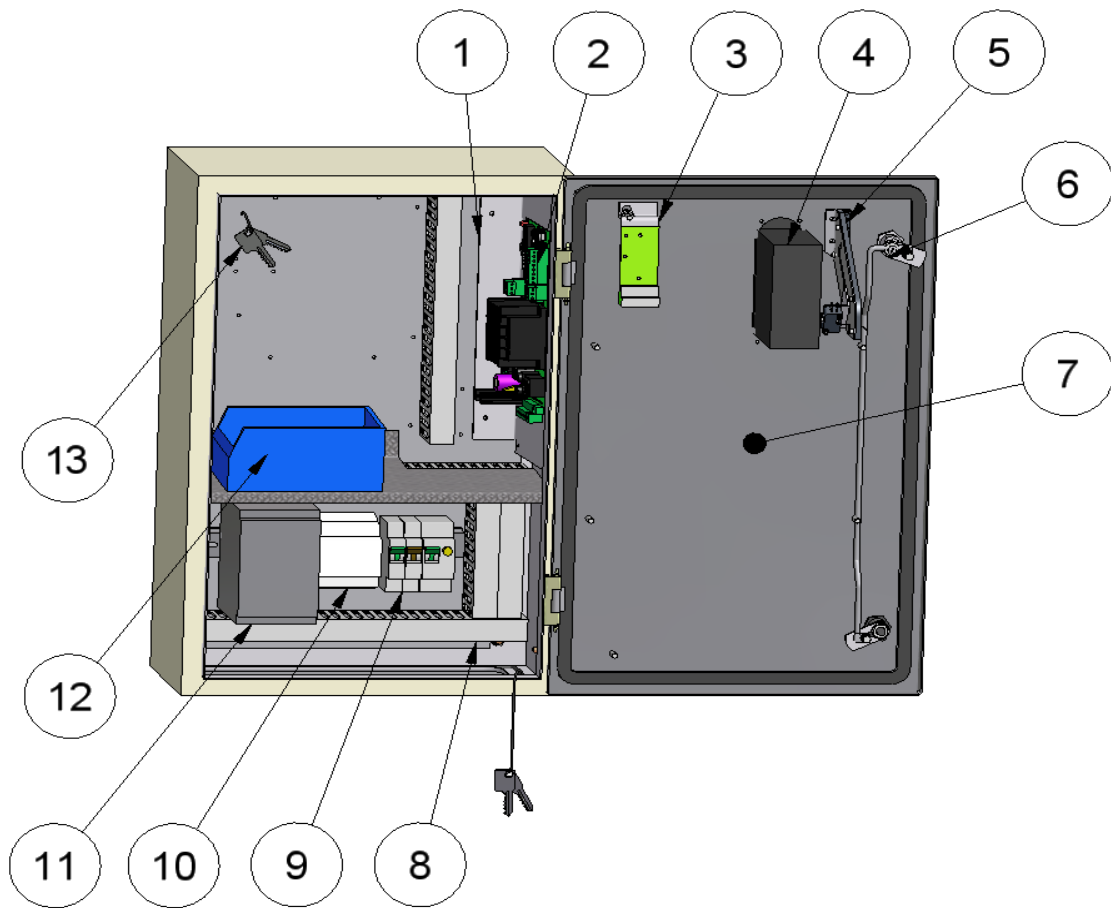


Figure 50: Control box

Pos.	Part No.	Designation	Ultima Combi
1	970072	Mounting plate	1
2	930125	Printed circuit board BA-99	1
3	930295	Circuit board with LEDs- 99	1
4	107900	Electronic coin control, Cashflow 340	(1)
5	10 8600	Token mechanism	(1)
6	101900	Complete lock	1
7	OBM0173	Control box door	1
8	930263	Cable holder	5
9	OAE0237	Fuse PLSM-B4, water & elevator	(1)
	OAE0236	Fuse PLSM-B6, for Washer Combi	(1)
	OAE0235	Earth fault protection, PKNM-6/N/c/003-A	(1)
10	OAE0234	Control relay Easy 512-DC-TC for Combi	(1)
11	OAE0189	Power supply unit , SL10.100 24V DC	(1)
12	109400	Token tray, big	(1)
12	109410	Token tray, small	1
13	101920	Key	4

() = Optional equipment is within brackets.

7.5.1 Control box door for mechanical coin control

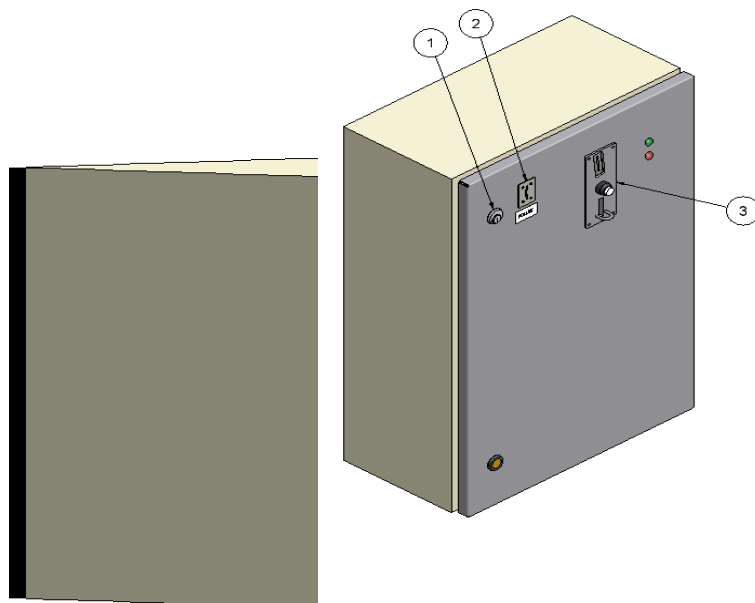


Figure 51: Control box, token, card reader and mechanical coin control

Figure 52: Control box, token, and mechanical coin control

Pos.	Part No.	Designation	Ultima Combi
1	101900	Lock	1
2	-	Token plate for token used	1
3	OKA0000	Mechanical coin control	(1)
4	108000	Card reader EMC-30	(1)

() = Optional equipment is within brackets.

7.5.2 Control box door for electronic coin control

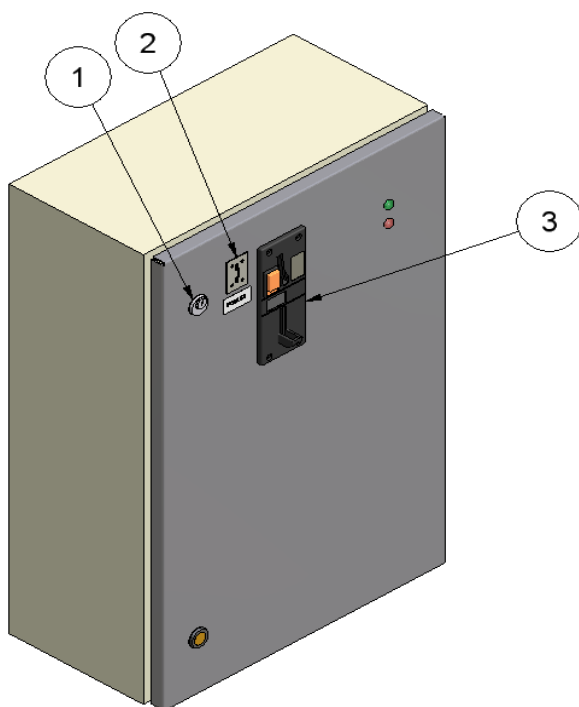


Figure 53: Control box, token and electronic coin monitor

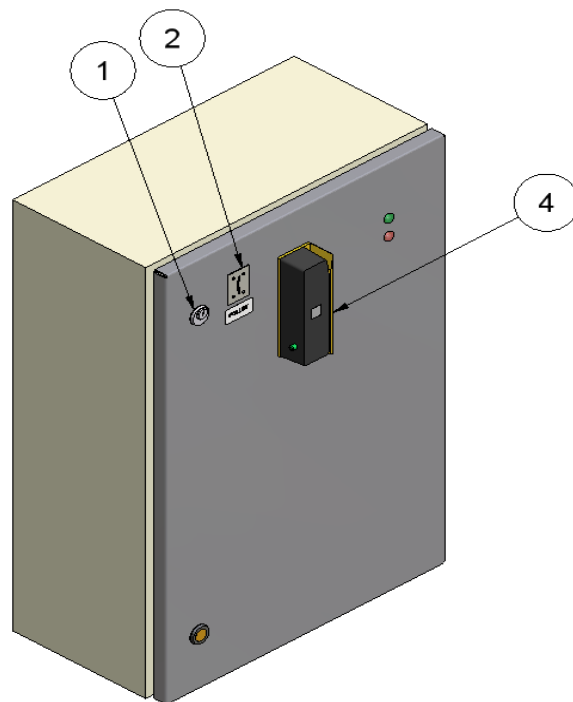


Figure 54: Control box, token and card reader

	Part No.	Designation	Ultima Combi
1	101900	Lock	1
2	-	Token slot for the token used	1
3	107900	Electronic coin monitor, Cashflow 340	(1)
4	108000	Card reader EMC-30	(1)

() = Optional equipment is within brackets.

7.5.3 Inner side of control box door for mechanical coin control

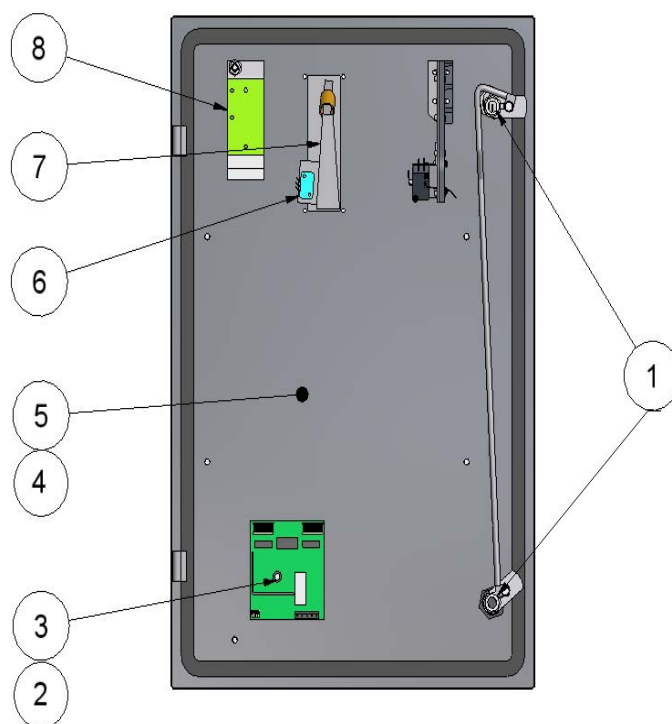


Figure 55: Inner side of control box door for mechanical coin control

Pos.	Part No.	Designation	Ultima Combi
1	10 1900	Complete lock	(1)
2	10 7800	Circuit card 1/5, 2 coin mechanism	(1)
3	10 7810	Circuit card 1/2, 2 coin mechanism	(1)
4	OBM0172	Opening for token and 1 coin	(1)
5	-	Opening for token and 2 coins	(1)
6	10 7720	Micro switch	(1)
7	10 7700	Coin control, 1 coin	(1)
7	10 7710	Coin control, 2 coins	(1)
8	930295	Circuit card with LED's -99	1

() = Optional equipment is within brackets

7.5.4 Inner side of control box door for electronic coin control.

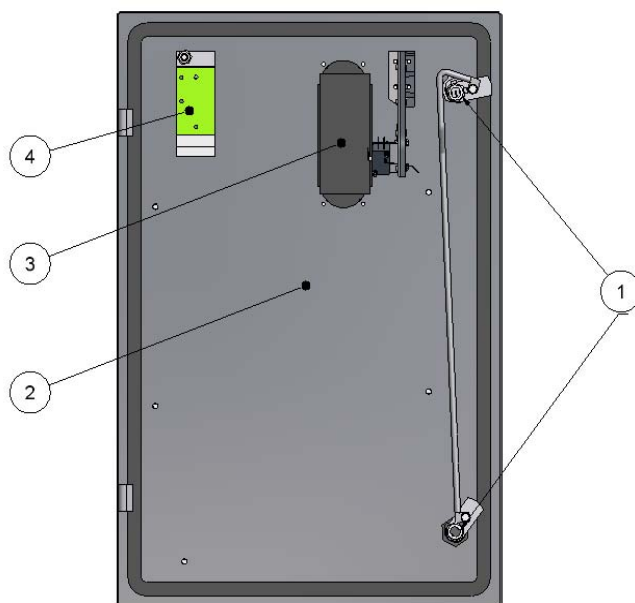


Figure 56: Inner side of control box door for mechanical coin control

Pos.	Part No.	Designation	Ultima Combi
1	10 1900	Complete lock	1
2	OBM0173	Control box door	1
3	107901	Electronic coin control, Cashflow 340	(1)
4	930295	Circuit card with LEDs-99	1

() = Optional equipment is within brackets

7.5.5 Inside the control box, EMC-30 card reader

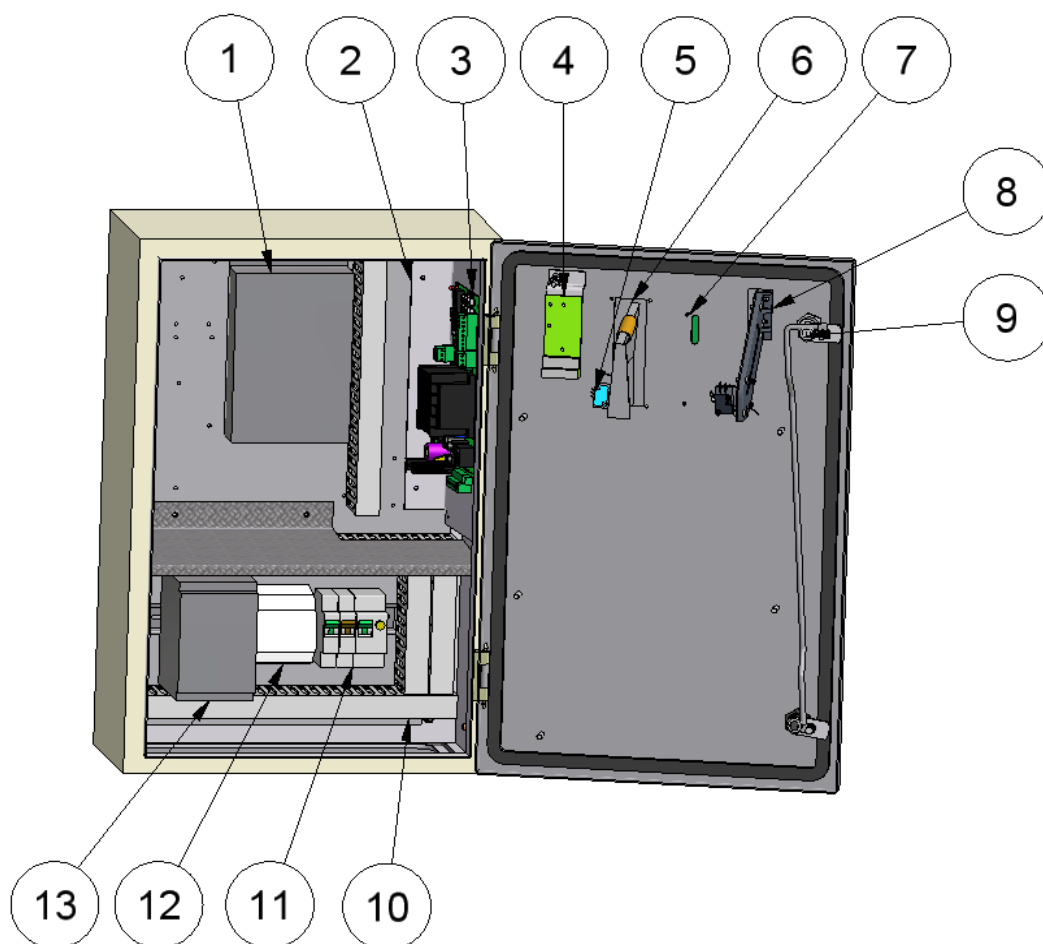


Figure 57: Inside the control box, EMC-30 card reader and mechanical coin control

Pos.	Part No.	Designation	Ultima Combi
1	10 8000	Card reader	(1)
2	97 0072	Mounting plate	1
3	93 0235	Circuit board BA-99	(1)
4	93 0295	Circuit board with LED - 99	1
5	10 8900	Complete micro switch	(1)
6	10 7700	Coin monitor, 1 coin	(1)
7	10 7720	Micro switch	(1)
8	10 8600	Token mechanism	(1)
9	10 1900	Complete lock	(1)
10	10 9500	Cable duct	(1)
11	OAE0237	Fuse PLSM-B4, water & elevator	(1)
	OAE0236	Fuse PLSM-B6, for Washer Combi	(1)
	OAE0235	Earth fault protection, PKNM-6/N/c/003-A	(1)
12	OAE0234	Control relay Easy 512-DC-TC for Combi	(1)
13	OAE0189	Power supply unit	(1)

() = Optional equipment is within brackets.

8 Retailers and Representatives

The following list contains all the necessary information concerning the Range Servant representative closest to where you live.

The list is continuously updated on our home page <http://www.rangeservant.com>

8.1 Head Office

Sweden

Range Servant AB

Skallebackavägen 11

SE 302 41 HALMSTAD

Telefon: +46 35 10 92 40

Fax: +46 35 10 82 20

E-Mail: sales@rangeservant.com

8.2 Your Retailer

