



ENGLISH

# *RANGE SERVANT*<sup>®</sup>

<http://www.rangeservant.com>



## **USER'S MANUAL THE BLOWER SYSTEM**

# Index

<b>1</b>	<b><u>General information</u></b>	<b>4</b>
1.1	Preface	4
1.2	Manufacturer's declaration	5
1.3	Description	6
1.3.1	Blower System	6
1.3.2	Ball Management System	6
1.4	Identification	6
1.5	Technical specifications	7
<b>2</b>	<b><u>Safety</u></b>	<b>8</b>
2.1	General	8
2.2	Conformity with mandatory requirements	8
2.3	Remaining risks	8
2.4	Authorised use	10
2.5	Unauthorised use	10
2.6	Emergencies	10
2.6.1	Fire	10
2.7	Operational reliability	10
<b>3</b>	<b><u>How to use the Blower System</u></b>	<b>11</b>
3.1	Necessary qualifications	11
3.2	General	11
<b>4</b>	<b><u>Design and function</u></b>	<b>12</b>
4.1	General	12
4.2	Machine exterior	12
4.3	Machine interior	13
4.4	Description of components	13
4.4.1	Electronic components	13
<b>5</b>	<b><u>Maintenance</u></b>	<b>14</b>
5.1	General	14
5.2	Periodical maintenance	14

5.3	Maintenance intervals and instructions	14
5.4	Troubleshooting and repair	15
<b>6</b>	<b>Installation</b>	<b>16</b>
6.1	Factory testing and configuration	16
6.2	Installation of the Blower System	16
6.2.1	Adjustment of feeding wheel and ball stop	16
6.3	Ball Receiver	17
6.4	Overfill Protection	18
<b>7</b>	<b>Spare parts</b>	<b>19</b>
7.1	External	19
7.1.1	Control box	20
7.2	Internal	21
<b>8</b>	<b>Retailers and representatives</b>	<b>24</b>
8.1	Head Office	24
8.2	Your Sales Representative	24

Title:	br02blow-e.doc
Prepared by:	Johan Carlsson
Date:	29/06/2007
Number of words:	4001
Version:	41

# 1 General information

## 1.1 Preface

We congratulate you to your new Range Servant product. You have made a good choice! Not only have you chosen an excellent state-of-the-art Blower System 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 is mainly a generalised example of how the Blower System works when filling one unit.**

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

**Study this 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. Every person operating the machine must read these instructions.

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

The Blower System has a one-year warranty. 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 warrants the materials and function of the RANGE SERVANT product specified in these Instructions for Use for a period of one year after delivery from the factory. This engagement applies to repaired or replaced components for a period of three months. This warranty only applies to the original purchaser. It also only covers parts which the manufacturer, after inspection, finds to be faulty. Repair or replacement of parts is to be carried out by an authorised representative of the manufacturer. The manufacturer further warrants that the equipment supplied conforms to the accompanying product description. **THE WARRANTIES SPECIFIED IN THIS AGREEMENT CONSTITUTE THE MANUFACTURER'S ONLY LIABILITY TO THE BUYER. THE MANUFACTURER DISCLAIMS LIABILITY FOR ANY COMMITMENTS BEYOND THE LIMITATIONS OF THE WARRANTY CERTIFICATE.** The manufacturer further disclaims all liability for any commitment that may be given by any unauthorised person in connection with the sale of the equipment. The warranty does not apply to equipment that has been repaired or had parts replaced by any person/company not specifically authorised to do so by the manufacturer. The manufacturer's warranty liability also does not apply in cases where the equipment is misused, is damaged by negligence/accident or is handled contrary to the accompanying Instructions for Use. Finally, the manufacturer is under no circumstances financially liable for damage that may arise in connection with the sale or repair of the equipment, or injury to a third party in connection with its use.

## 1.2 Manufacturer's declaration

In accordance with Directive 89/392/EEC, article 4.2 and Appendix 2B

**Manufacturer:** **RANGE SERVANT<sup>®</sup>**  
Range Servant AB  
Skallebackavägen 11  
SE-302 41 HALMSTAD  
Sweden

### Representative:

(To be filled in by a representative established in the EU.)

.....  
*Company*  
.....  
*Address*  
.....  
*Telephone*

### Hereby declares that:

.....  
*Machine*  
.....  
*Type*  
.....  
*Serial number, manufacturing number etc.*

- Is intended for installation in a larger machine or can be combined with another machine, which will jointly constitute a machine covered by Directive 89/392/EEC, including amendments.
- Therefore does not conform in all respects with the conditions in this directive,  
and
- That the harmonising standards 292-1, 292-2 and 292-2A (or parts thereof) have been applied.
- That the following national technical standards and specifications (or sections thereof), have been applied

.....  
(Only where applicable)

and in addition declare that the machine may not be put to use before the machine in which it is to be installed or constitute part of, has been found to be and so declared in conformity with Directive 89/392/EEC and with corresponding national legislation, i.e. as a whole, including the machine referred to in this declaration.

Halmstad on .....  
*Date*

Elvis Knez .....  
President *Signature*

## 1.3 Description

### 1.3.1 Blower System

Long the World Leader in Golf Ball Management, Range Servant has been moving golf balls around the world for over a decade. Understanding that the daily burden of the golf range is to pick, wash and transport golf balls to a point convenient to its' customers, Range Servant offers a comprehensive program of Golf Ball Conveyors, Elevators and Blowers. Whether used individually, or as a system, the Range Servant Ball Transportation System is labour-saving and allows for increased profitability at the press of a button.

Able to jump over tall obstacles, the Range Servant Blower allows the range owner to transport balls to the ball receivers - Ball Dispensers, Hoppers or Automatic Tee-Up Systems - from even the most remote locations. With almost limitless flexibility the Range Servant Blower can quickly and reliably fill one or several receivers with clean golf balls. As with all Range Servant Ball Management Systems, this can be done at the push of a button or automatically. Designed to minimise manual work and to keep the ball washing area separate from the rest of the range, the Range Servant Blower helps to keep the range efficient, clean and safe.

### 1.3.2 Ball Management System

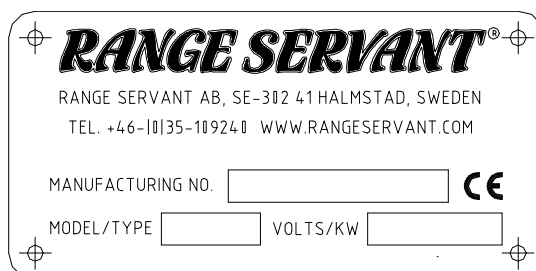
Range Servant can deliver a complete, flexible Ball Management System adaptable to any kind of driving range requirements. The Ball Dispenser can be combined with the work-efficient, environment friendly Ball Washer. The Ball Washer in turn can be connected to the Elevator, the Conveyor Belt or the Blower for the transport of clean, undamaged balls from Washer to Dispenser. The system also includes a Ball Picker machine picking up used balls from all over the driving range. Thus the circle is closed and manual work reduced to a minimum.

By applying our extensive know-how to the specific problems of every driving range, we are able to offer tailor-made solutions.

## 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:

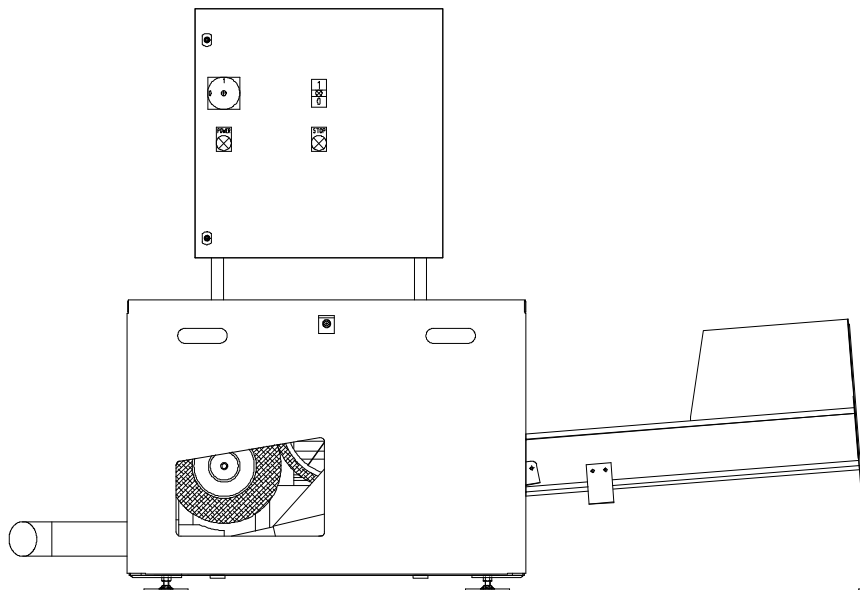
- Name and address of the manufacturer
- CE-marking
- Designation of series or type of machine
- Serial no., if any
- Year of manufacture



Figur 1: Product identification plate

## 1.5 Technical specifications

General	Blow 1	Blow 2	Blow 3
Capacity [balls/h]	24000	24000	24000
<b>Dimensions:</b>			
Height [mm] /([in])	585 (23)	585 (23)	585 (23)
Width [mm] /([in])	565 (22.2)	565 (22.2)	565 (22.2)
Length [mm] /([in])	805 (31.7)	805 (31.7)	805 (31.7)
Weight, without balls [kg]	104	111	117
<b>Electric system:</b>			
Voltage [V, 50 Hz]	400	400	400
Voltage USA [V, 60 Hz]	208	208	208
Control voltage [V, DC]	24	24	24
Effect, fan motor [W]	1500	2200	3000
Effect, feeding motor [W]	370	370	370
<b>Operating Conditions:</b>			
Operating Temperature [°C] /([° F])	+2 - +50 (+35- +122)		



Figur 2: Blower System.

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

*The manufacturer reserves the right to make amendments without prior notification.*

*Patents and patent applications:*

*SE 9600158-1, GB 9700709.0, US 5766085*

## **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 function for 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 the safety measures is to eliminate all risks of accident during the operational life of the machine which also includes the assembly and dismantling of the machine, even risks 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.

Damage caused by the use of accessories and spare parts not having been approved by Range Servant and damage due to unauthorised technical modifications are not covered by the warranty obligation.

### **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 follows 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 to the user 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. They are big enough to be readable from a distance of three meters.





Figure 3: 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 control box in the lower left corner of the printed circuit board.
- Know how to stop the Blower System quickly.
- Make sure that the control box is properly shut and covered.
- Do not open the side flap when the Blower System is running.



Figure 4: Warning signs in control box

- Never touch the circuit board or other electrical components in the control box. They can be current conducting and cause injury to person and/or equipment damage
- The fan becomes very hot during operation and remains hot for a while after stopping. Be careful not to touch the fan while it is hot.
- Mechanical or electrical alterations may only be undertaken in consultation with Range Servant.

## 2.4 Authorised use

The Blower System may only be used to transport golf balls.

For the machine to operate properly, the balls **must be clean and undamaged** or else they may get stuck and cause machine failure.

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

## 2.5 Unauthorised use

Using accessories or spare parts not recommended by Range Servant might cause personal injury and/or equipment damage and affect the operational reliability of your Blower System. For safety reasons, use only those components recommended by us. They are intended for your machine, they have been chosen for safety reasons and they are approved by the manufacturer.

Damage caused by the use of accessories and spare parts not having been approved by Range Servant or damage due to unauthorised technical changes are not covered by the warranty obligation.

## 2.6 Emergencies

### 2.6.1 Fire

Water shall be used as an extinguisher in the event of fire, except if the fire is located in the electric equipment, where 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:

- To ensure best possible durability and functional safety, the Blower System should be kept indoors.
- Place the machine on a firm and level surface.
- Never strain the machine by loading it with more balls than recommended. The loading capacity for the 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 never spray water directly onto the electric motor or fan.
- Repair work on blower fan should be done in the factory only. We do not take any responsibility for repairs made by third parties.

## **3 How to use the Blower System**

### **3.1 Necessary qualifications**

Due to the complex design and operation of the machine the person carrying out service and maintenance work must have the necessary qualifications. He is required to have attended a training course, in the form of comprehensive study of the User's Manual, followed by a written statement to the fact that he has well understood its contents.

If the person has to be absent from work for more than three months, training has to be repeated.

### **3.2 General**

When the start button on the Blower System is pushed, the fan starts to rotate. The fan builds up the air pressure before the feeding and guiding wheels start feeding balls into the hose. Feeding will continue until the stop button is pushed or the high level overfill protection reacts.

To stop the Blower System push the stop button. The feeding wheel will stop directly and the fan will continue to blow until the hose is completely emptied of golf balls.

The time to clear the hose at stop and start is determined by the distance between the Blower system and the receiving unit.

The fan blows air with high speed through the T-connection. The golf balls roll down through the ball chute toward the feeding wheel in a straight line. The feeding wheel makes sure that one ball at the time is fed into the T-connection. From the T-connection the golf balls are blown through the hose with the air from the fan.

The Blower System's capacity depends on the power of the fan. The power of the fan is determined by the distance that the balls have to be transported, that is, between the Blower System and the receiving unit.

## 4 Design and function

### 4.1 General

The Range Servant Blower System is of robust construction designed to meet high quality standards. It allows for the start-up, operation and transportation of golf balls to remain trouble-free.

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

The Blower System consists of a main frame to which the main components are attached. All essential components of the Blower System are manufactured of stainless steel, rust protected steel or aluminium.

### 4.2 Machine exterior

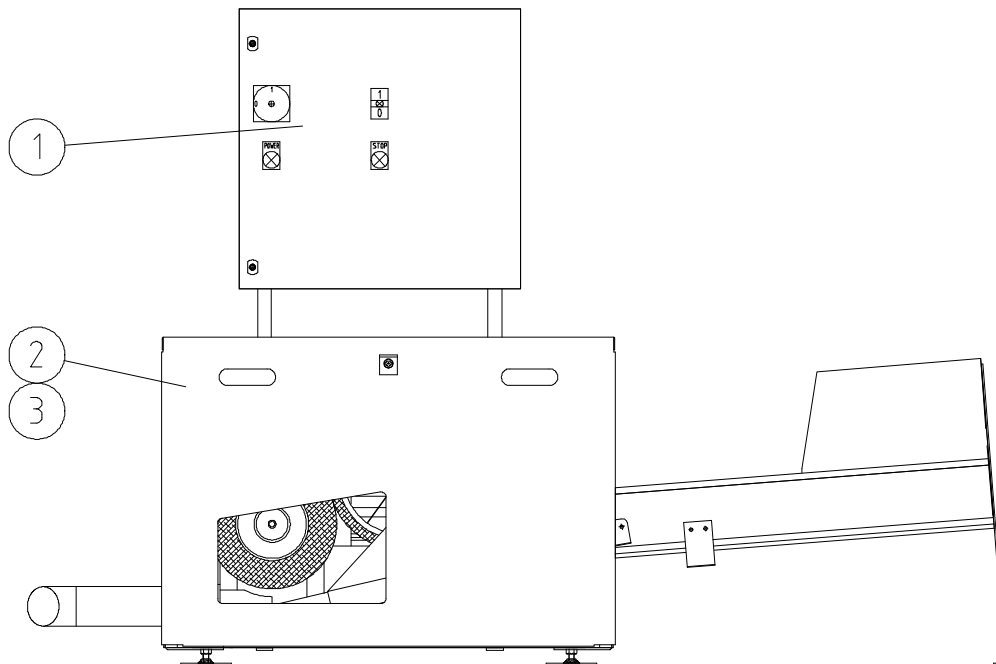


Figure 5: Blower System

Pos.	Designation
1	Control box door
2	Side flap for housing
3	Cover

### 4.3 Machine interior

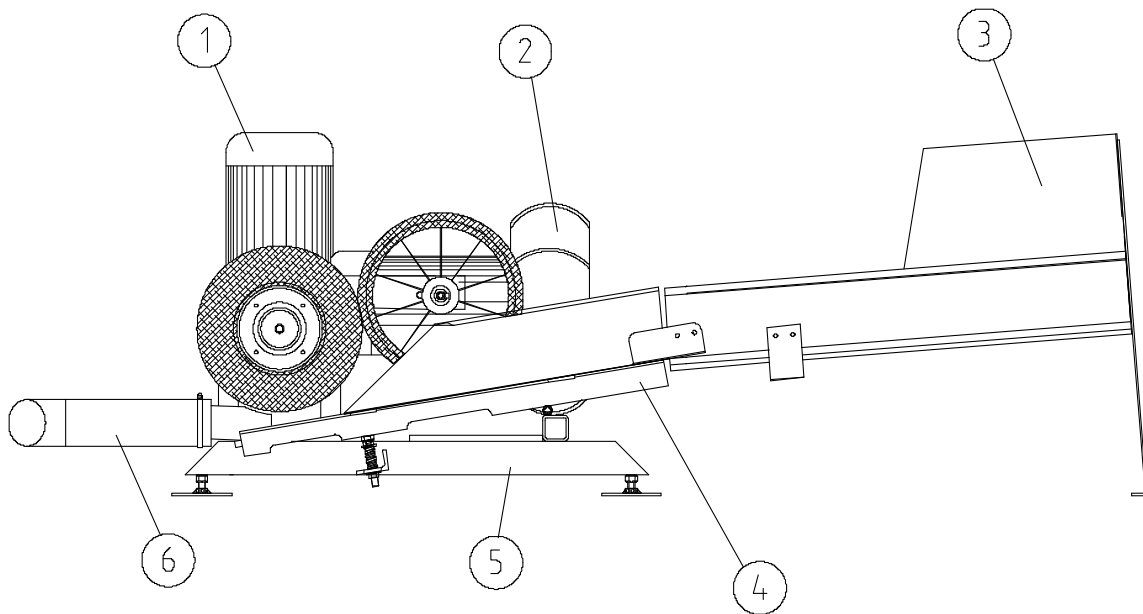


Figure 6: Blower System

Pos.	Designation
1	Feeding motor
2	Fan
3	Feeding chute
4	Ball chute
5	Frame
6	T-connection

### 4.4 Description of components

#### 4.4.1 Electronic components

The Overfill Protection consists of a high level control; the low level control is optional. Both high and low level controls consist of a photocell, giving signals to the system. The high level control prevents the receiving unit to be filled over its capacity and the low level control makes sure that the system starts feeding balls when the receiving unit is empty.

## 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 Periodical maintenance

### 5.3 Maintenance intervals and instructions

Maintenance intervals:

1. After 300 operating hours
2. Daily
3. Once every month

Maintenance intervals and instructions		1	2	3
1	Remove damaged balls and keep the feeding and ball chutes clean.		X	
2	Clean intake air filter.		X	
3	Tighten catch pin on the T-connection.	X		X
4	Make sure that the hose clamps are properly tightened.	X		X
5	Check that the guiding and feeding wheel rotates. Also check their attachments.		X	
6	If your machine is equipped with pneumatic tyre, check the pressure and if necessary fill up.			X
6	Check the distance between the feeding wheel and the ball chute.			X
7	Check all attachments and tighten screws if necessary.			X
8	Check that the ball blockage is well attached.			X

## 5.4 Troubleshooting and repair

Although the operation of the machine is most reliable, problems may arise for various reasons. The problem is then indicated on the service terminal as an alarm.

### Attention!

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

SYMPTOM	POSSIBLE CAUSE	REMEDY
The balls are not fed into the hose.	→ The feeding wheel does not rotate.	→ Check connecting cables and power to feeding motor.
	→ Balls are stuck in the hose	→ Clear the hose from balls.
	→ Build up of dirt on ball & feeding chute.	→ Clean both.
The feeding wheel does not start.	→ Feeding motor does not receive any power.	→ Check connecting cables and control box connections, see appendix.
	→ The Blower System does not receive any power.	→ Check TIME RELAY KT1, POWER SWITCH, EMERGENCY BUTTON, STOP BUTTON, F1, QM1-3 and O.P., ref. appendix.
The balls piles up before the ball receiver.	→ The wheels are not adjusted properly.	→ See page: Installation of Ball Receiver.
	→ The hose is not placed in a straight line before the ball receiver.	→ Place the hose according to description on page: Installation of the Ball Receiver.

Figure 7: Troubleshooting for Blower system

## **6 Installation**

### **6.1 Factory testing and configuration**

The Blower Systems are always tested and configured before delivery to the customer. On this occasion, all the 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 when ordering and to prevent defective products from being brought onto the market.

### **6.2 Installation of the Blower System**

Place the Blower System on a stable surface and level it with the help of the adjustable feet. Make sure that the flap can be opened easily.

Make sure that the ball chute is correctly placed and that the golf balls roll easily down to the feeding and guiding wheels.

The control cabinet should be placed on a wall or stand and must only be opened if the mains switch is turned off.

Position the hose as straight as possible between the Blower System and the receiving units, this to prevent power loss.

Connect the control cabinet, the blower fan and the feeding wheels according to the electrical drawings enclosed in separate folder.

If the rated current indicated on the rating plate is being exceeded during operation, it should be checked whether the available voltage supply and frequency are in accordance with the indicated data. The drive motor is sized for power requirements up to a maximum allowed pressure. At higher pressures the power consumption will increase with overheating as consequence. Observe that overheating could occur because of compression heat even when the power of the motor is not exceeded.

After connection, check that the fan rotates in the specified direction and that the feeding wheel rotates clockwise and the guiding wheel counter-clockwise.

#### **6.2.1 Adjustment of feeding wheel and ball stop**

The distance between the feeding wheel and the ball chute should be approximately 40 mm. The balls must not be allowed to pass through the gap under the feeding wheel.

The ball stop is situated inside the feeding chute. To adjust the ball stop, the T-connection has to be removed and the ball chute loosened. Adjust the ball stop so that the balls can not roll through the outlet without being forced by hand.



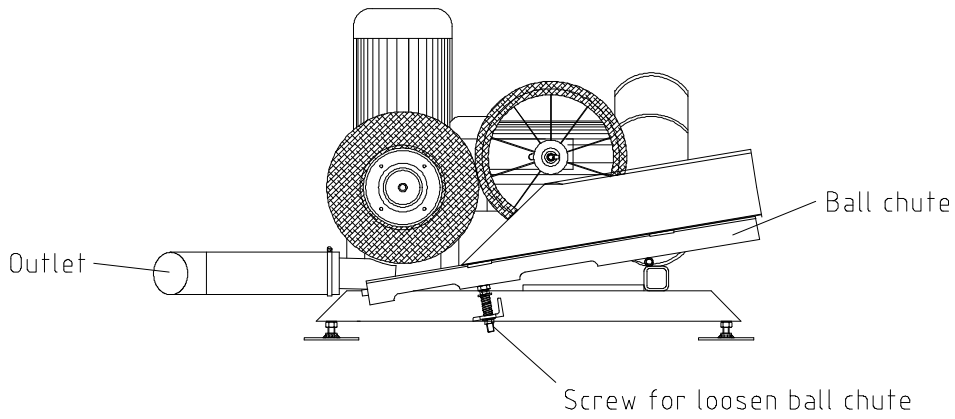


Figure 8: Main parts

### 6.3 Ball Receiver

Place the Ball Receiver on the receiving unit. The hose should be vertical for at least 50 cm above the receiving unit. The Ball Receiver should be adjusted so that the balls flow evenly without getting stuck. The Ball Receiver serves to reduce noise and to prevent damage to the receiving unit.

Make sure that the hose is properly attached.

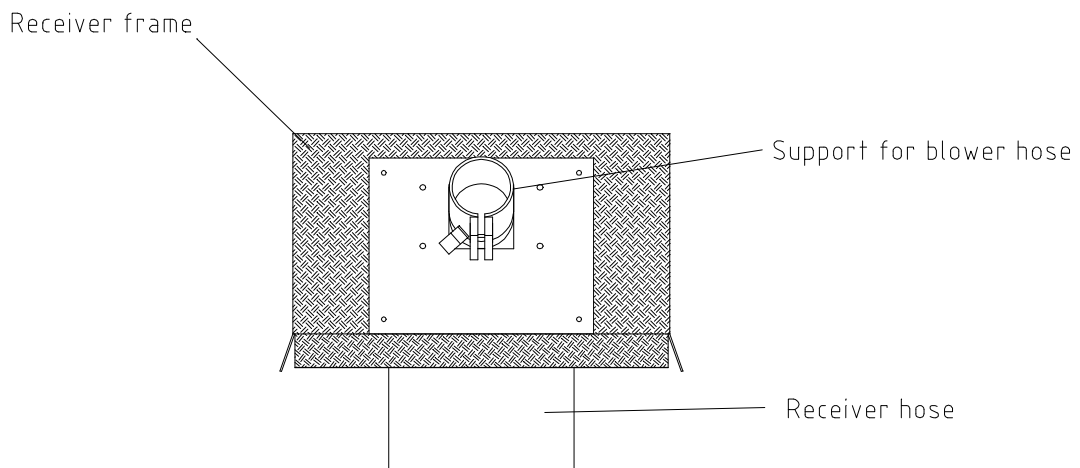


Figure 9: Ball receiver

## 6.4 Overfill Protection

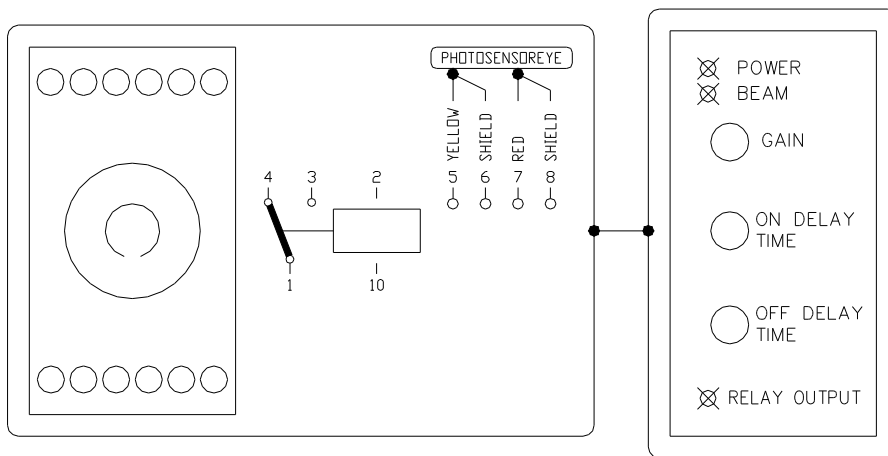


Figure 10: Electronics for low level control

Cut off the cable and cable covering to the correct length and connect the photocell to the socket of the OPTO-amplifier OEM203N (PC).

- Shield (both) No. 8
- Red No. 7
- Yellow No. 5

See electrical drawings and wiring diagram enclosed in separate folder.

The cut outs for photocell and screws should be  $\varnothing 25/\varnothing 3,5$  mm, cc 32 mm.

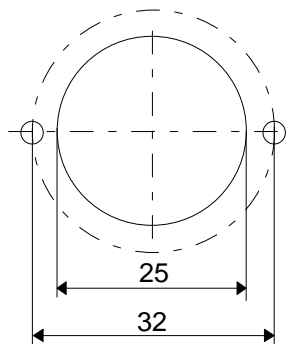


Figure 11: Cut out for photocell

## 7 Spare parts

In this chapter you will find detailed drawings of the Blower System 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

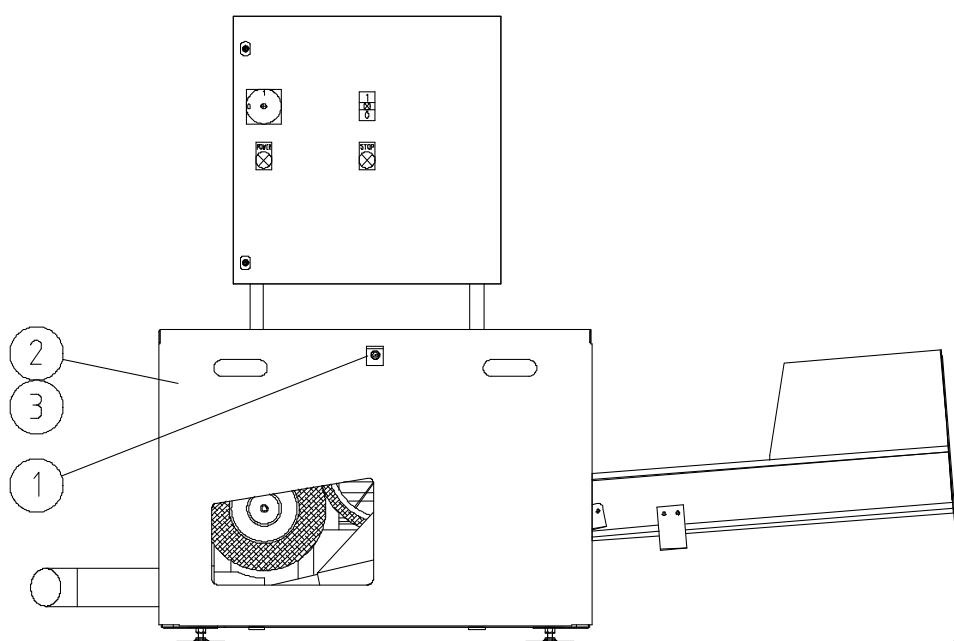


Figure 12: Front view

Pos.	Part No.	Designation	Qty.
1	BAA0010	Lock for side flap	2
2	BAM0017	Side flap	2
3	BAM0002	Housing	2

### 7.1.1 Control box

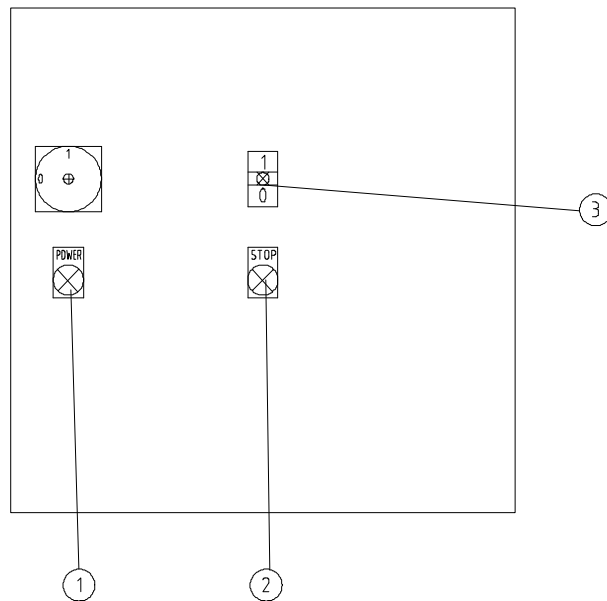


Figure 13: Control box, door. Filling one unit

Pos.	Part No.	Designation	Qty.
1	-	Lamp	1
2	-	Lamp	1
3	-	Pushbutton	1

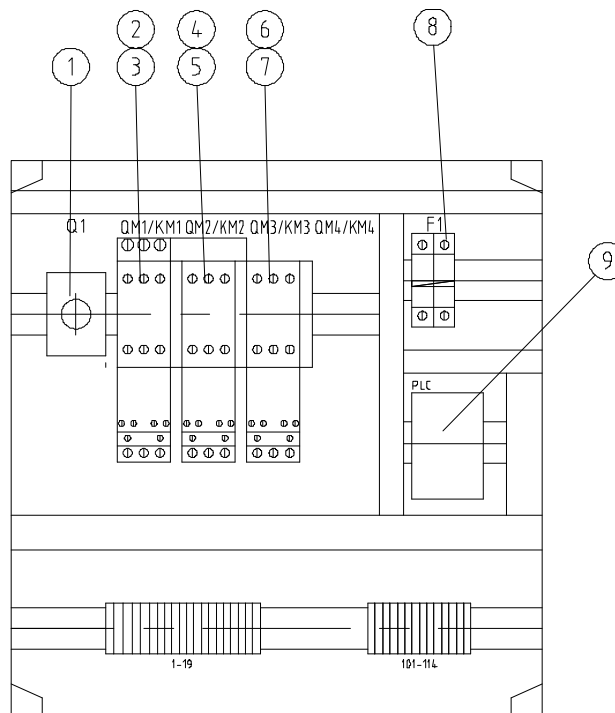


Figure 14: Control box. Filling one unit.

Pos.	Part. No.	Designation	Qty.
1	-	Mains switch	1
2	-	Manual motor starter	1
3	-	Contactor	1
4	-	Manual motor starter	1
5	-	Contactor	1
6	-	Manual motor starter	1
7	-	Contactor	1
8	-	Manual motor starter	1
9	-	PLC	1

## 7.2 Internal

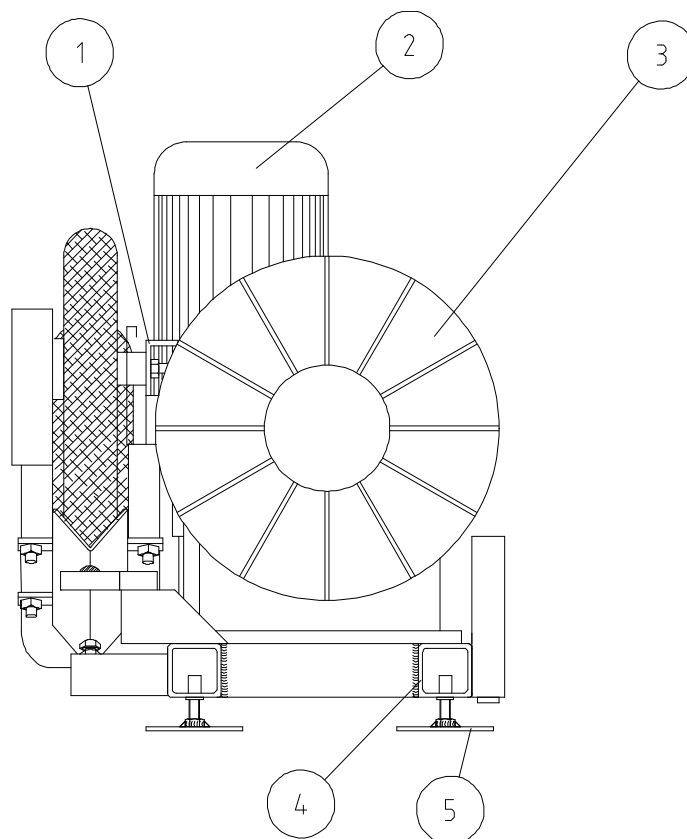


Figure 15: Without housing, side view

Pos.	Part No.	Designation	Qty.
1	970 195	Guiding wheel mounting	1
2	803 040	Feeding motor	1
3	BAA0000	Fan, 1.5 kW	1
3	BAA0001	Fan, 2.2 kW	1
3	BAA0002	Fan, 3.0 kW	1
4	970 177	Blower frame	1
5	610 601	Adjustable foot	4

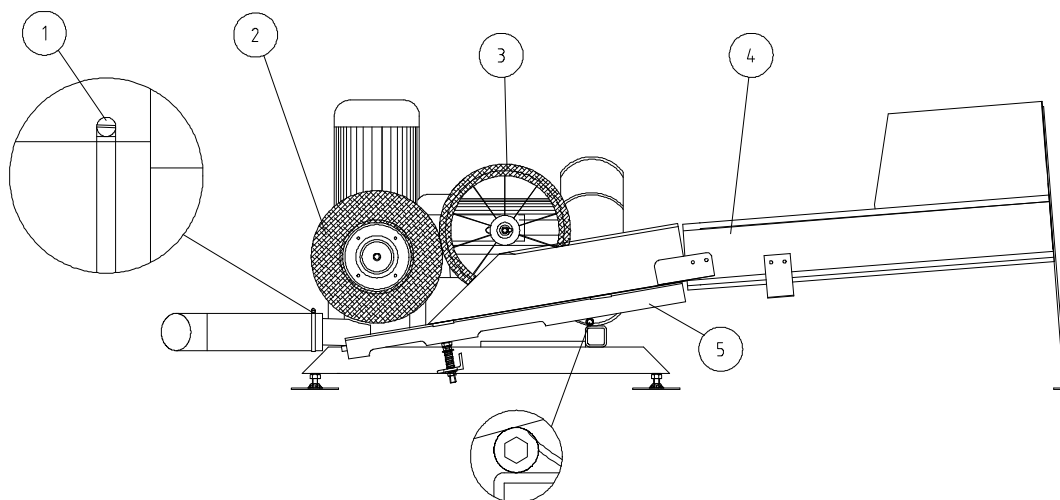


Figure 16: Without cover, side view

Pos.	Part No.	Designation	Qty.
1	970 158	Hose clamp 28	1
2	970 161	Feeding wheel	1
3	970 163	Guiding wheel	1
4	970 033	Feeding chute	1
5	970 178	Ball chute	1

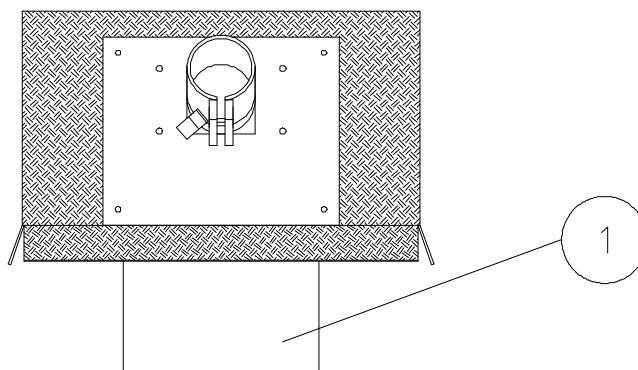


Figure 17: Ball receiver

Pos.	Part No.	Designation	Qty.
1	BDM0000	Rubber hose	1

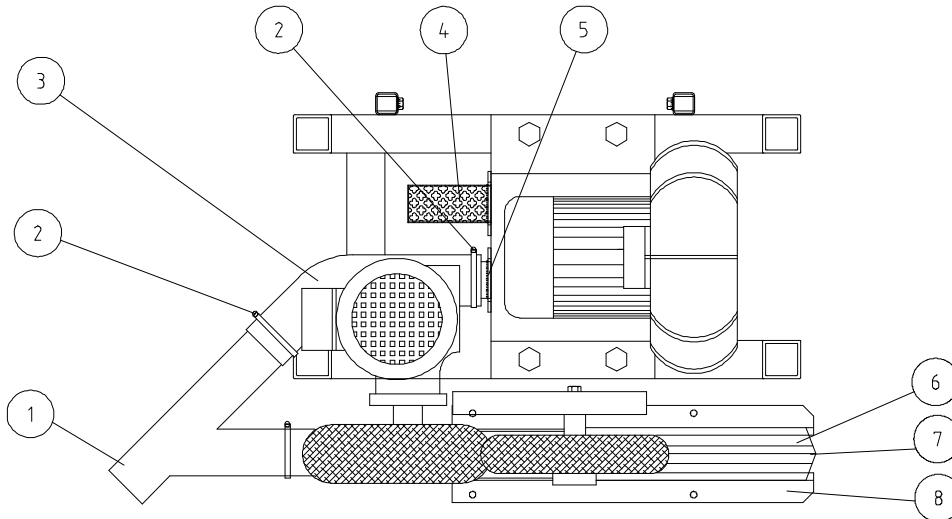


Figure 18: Cross section, side view

Pos.	Part No.	Designation	Qty.
1	970 156	Y-connection	1
2	970 157	Hose clamp 60	4
3	803 510	Connection hose L=360 mm	1
4	BAM0032	Intake air filter	1
5	BAM0032	Hose fitting	1
6	BAM0036	Wear protection	2
7	970178	Ball chute	1
8	970 199	Side guiding panel, front	2

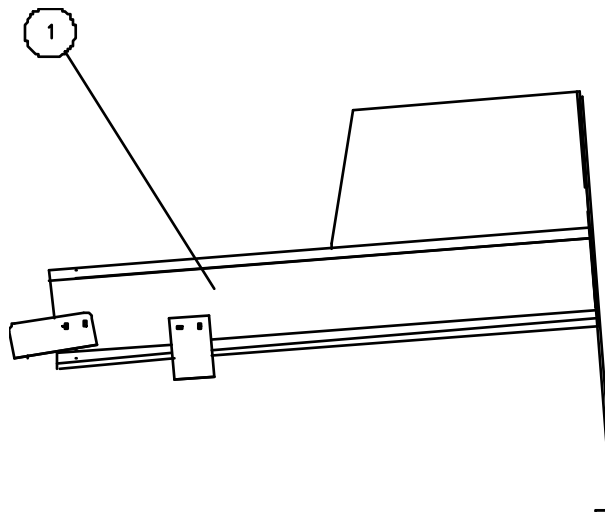


Figure 19: Cross section, side view

Pos.	Part No.	Designation	Qty.
1	970 033	Feeding chute	1

## 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

302 41 HALMSTAD

Telephone: +46 35 10 92 40

Fax: +46 35 10 82 20

E-Mail: [sales@rangeservant.com](mailto:sales@rangeservant.com)

### 8.2 Your Sales Representative

