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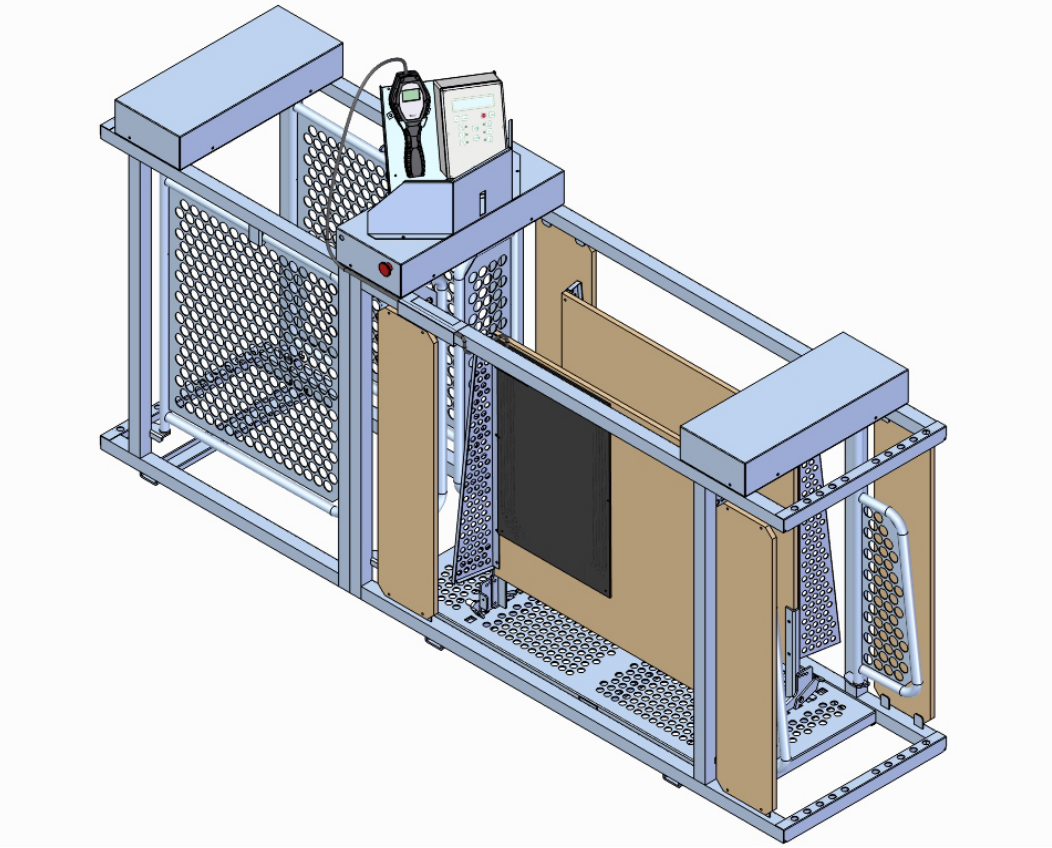
WSS 3000

Installation Manual

Manual WSS 2.0 Eng

May-2010



This documentation 2.0 WSS 3000 applies to the product WSS 3000 manufactured by BioControl, Norway.
Documentation version 2.0, replacing the last edition completely.

Modifications since last documentation version:
- *none – version 2.0*

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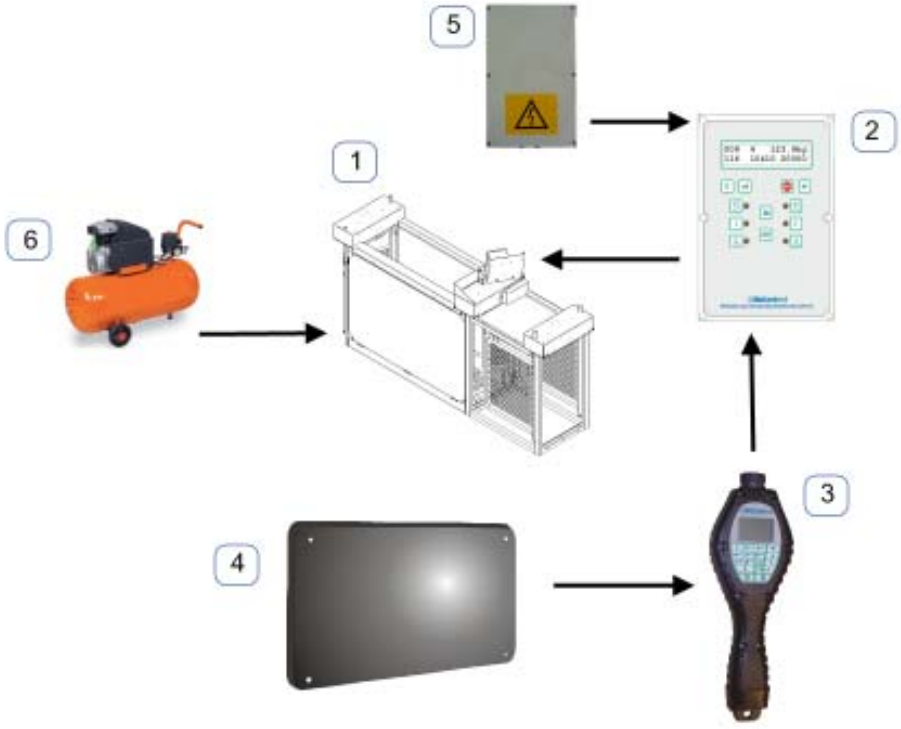
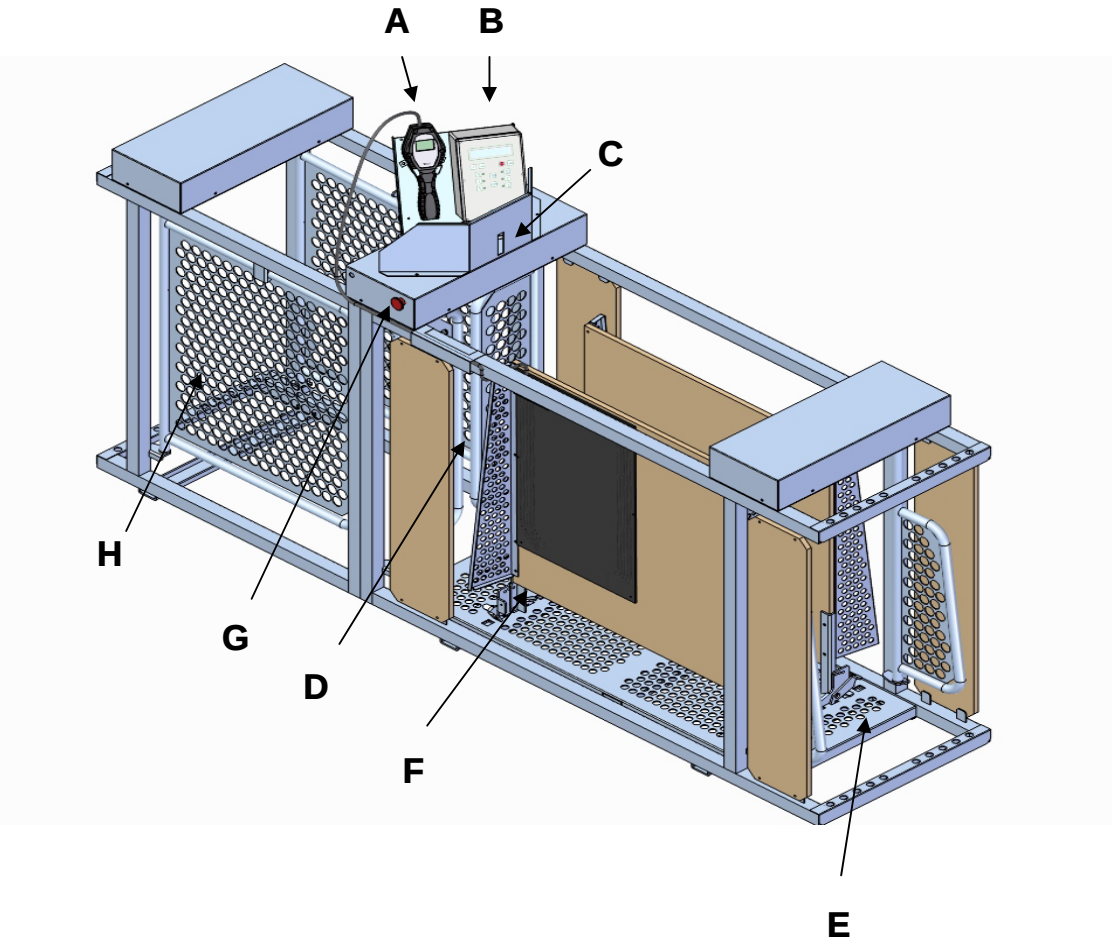
2. General description

The WSS 3000 is designed to weigh and sort sheep and goats. The system consists of the handheld reader HHR3000 with panel antenna, a control unit, a photocell and a weighing platform. The weighing platform is mounted on two load cells. The unit has gates either to be operated manually or pneumatically.
NB: A compressor (100 l/min., 8 bar) with water-separator and pressure reducing valve must be available for operating the pneumatic version of the WSS 3000.



	Description
1	WSS 3000
2	Control unit
3	HHR 3000
4	HHR 3000 panelantenna
5	Powersupply
6	Compressor with pressure reducing valve for pneumatic WSS only

Figur 2.1. System overview



	Description
A	HHR 3000
B	Control unit
C	Photocell
D	Exit gate
E	Entry gate
F	Antenna
G	Emergency stop
H	Sortgates

Figure 2.2. WSS 3000 overview.

3. Installation

Conduct the installation of the WSS3000 properly and in accordance with this description. Faulty installation will result in bad performance of the system.

- WSS3000 must be installed on a stabile ground, eg. floor of concrete or wood.
- The electronic ear-tag must be installed on the same side for all animals using the WSS 3000.
- Panel antenna should be installed on the same side as the ear tag of the animals.
- Install the power supply minimum 1 meter away from the antenna to avoid noise that will reduce the reading performance of the ear-tags.
- HHR 3000 must have RS232-option
- It is important to install the unit in such a way that the antenna does not pick up animals outside the unit. See figure 3.1)

Reading electronic ear-tags is subject to electrical noise. Units like the motor on the compressor, ventilation fans, some fluorescent light sources etc. can be sources of noise and the WSS3000 should therefore not be installed close to such units.

The reading can also be affected by other readers for electronic tags. Normally one can not use such readers within 30 metres from the WSS 3000 to preserve a good reading distance from the panel antenna.

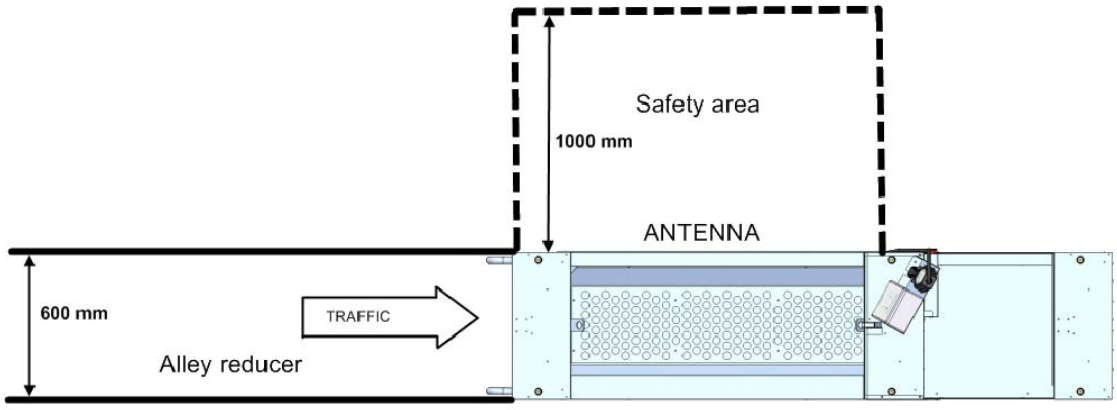
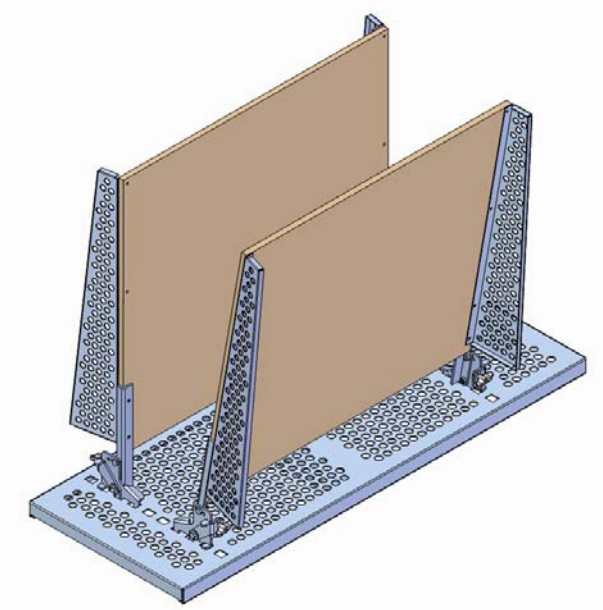


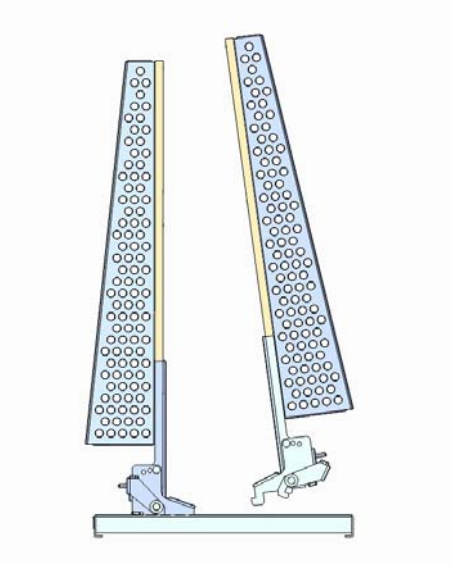
Figure 3.1. Recommended installation.

3.1 Weigh platform

The weigh platform is mounted on 2 load bars. In the load bars there are electronic load cells. It is important that the platform does not touch other objects than the load bars. Therefore, one must keep it clean under the platform and inside and outside the load bars.

On the platform there are side-races. These races can be easily removed and adjusted with respect to the opening between the races and the angle of the races.





To adjust the width, loosen the wing-nut, press down the lock-brackett and lift out the race. Choose a new hole and put the race in again.
To adjust the angle, take out the bolt in each side as shown in figure 3.3, choose an angle and put the bolt back in a new hole.

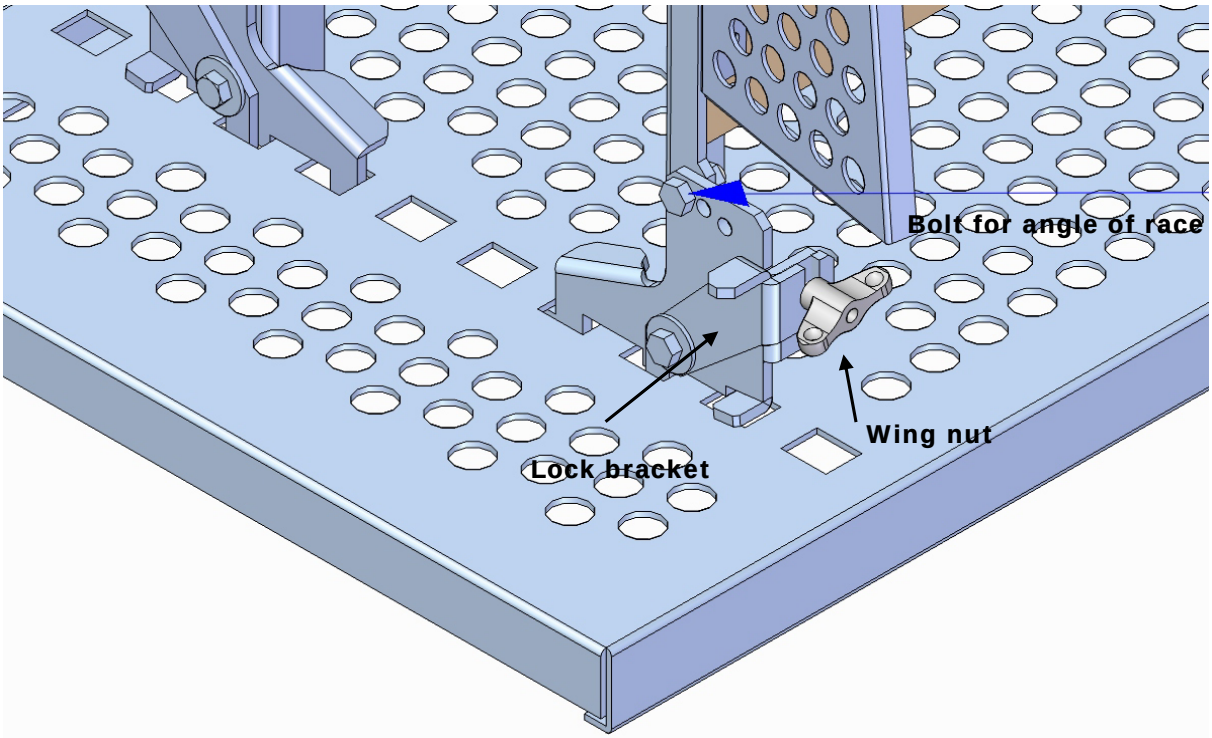


Figure 3.3 Attachment of side races.

3.2 Power supply

A power supply unit supplies current to the WSS 3000. Use only the original power supply unit from BioControl.

In: 220-230 V AC. Out: 13,2V DC.
A slow 5A glass fuse (5x20mm) prevents overload on the 13,2 V supply.

NB: Install the power supply unit minimum 1 meter from the antenna. Use grounded mains supply.

The antenna:
To avoid that the WSS3000 reads animals outside the unit, an area as show non figure 3.1 must be free from animals.

The reading is subject to metal objects near to the antenna. Equipment must not be installed in such a way that metal objects come close to the antenna.

3.3 Photo cell (only pneumatic systems)

The Photocell controls the closing of the entry-gate. It is roughly adjusted from factory, but should normally be adjusted by the user so the entry-gate closes as soon as possible after the animal has entered, but without squeezing it unnecessary. The photocell reacts better to white objects, so with dark animals, the cell must be adjusted. A mix of white and dark animals will make the automatic function of the system difficult.

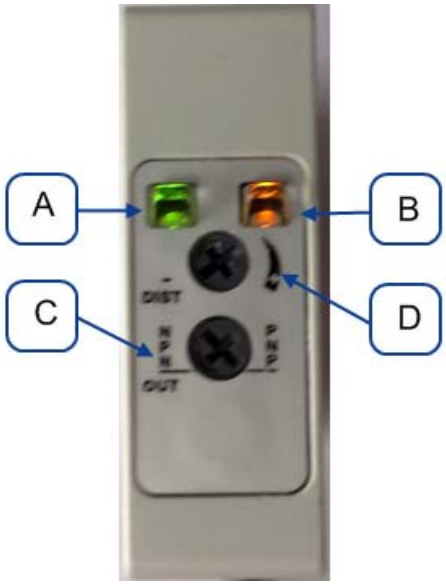


Figure 3.3. Photocell overview.

A – Green light indicates that the cell is powered.
B – Yellow indicates detection.
C – Function NPN or PNP. Shall be NPN.
D – Sensitivity.

3.4 Connections of the control unit

The panel antenna shall be connected to the HHR3000 wich must be connected to the WSS 3000 with the connection cable. Pneumatic WSS 3000 should be connected to a compressor with pressure about 5.5 Bar.

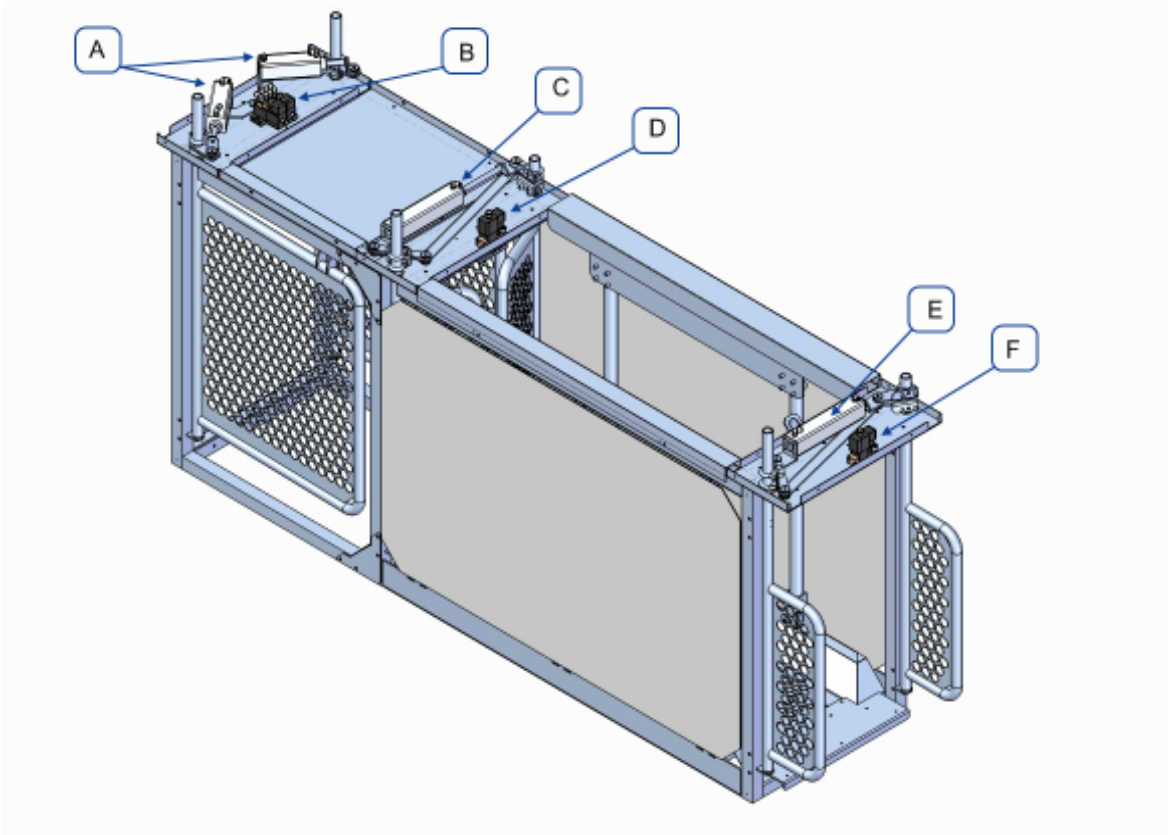
Table 3.1: Connections on the PCB of the control unit.

Connector	Function	Color	Description
1	Out	Red	Loadcell 2 stk
2	Out	white	Loadcell 2stk
3	Gnd	Yellow	Loadcell 2 stk
4	In	Green+Blue	Loadcell 2 stk
5	In	Grey+Black	Loadcell 2 stk
23	Gnd	Brown	Pin 1 RS232 til HHR
24	RS232-RXD	Grey	Pin 9 RS232 til HHR
25	RS232-TXD	Yellow	Pin 4 RS232 til HHR
32	Photocell GND	Blue	Photocell
34	Potocell +12V	Brown	Photocell
35	Out 1 +12V / 0V (PNP output)	White	Input
36	Out 1 GND	Black	Input
37	Out 2 +12V / 0V (PNP output)	White	Port 1
38	Out 2 GND	Black	Port 1
39	Out 3 +12V / 0V (PNP output)	White	Port 2
40	Out 3 GND	Black	Port 2
41	Out 4 +12V / 0V (PNP output)	White	Output
42	Out 4 GND	Black	Output
43	In 1 Normal high (NPN input)	Black	Photocell
44	In 2 Normal hgh (NPN input)	Wite	Photocell
47	+12V IN	Red	Powersupply Input
48	GND	Black	Gnd In
52	+12V_ID	Black	Charge of HHR

3.5 Pneumatics on WSS 3000

WSS 3000 has 4 pneumatic cylinders controlled by electro valves. There is an emergency stop button. When this is pressed, the pressure of the WSS 3000 is released. TO reset the emergency button, it must be turned.

NB: Be careful when you work with the pneumatics. Normally the emergency button should be pressed before any work is carried out to avoid the danger of squeezing.



	Description
A	Sortgate cylinder
B	Sortgate valve
C	Exit gate cylinder
D	Exit gate valve
E	Entry gate cylinder
F	Entry gate valve

Figure 3.4. Pneumatic parts for WSS 3000

Adjust the speed of movement on the cylinders by adjusting the screws on the valves as shown on the figure under, one screw for each movement (in/out) Adjust the air pressure from the compressor to desired force on the gates. Do not use higher pressure than necessary to avoid injuries to the animals.

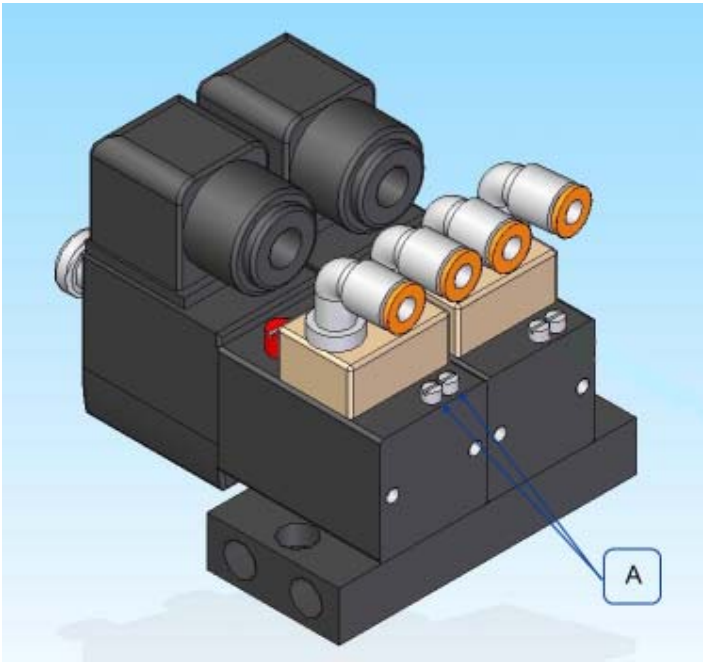


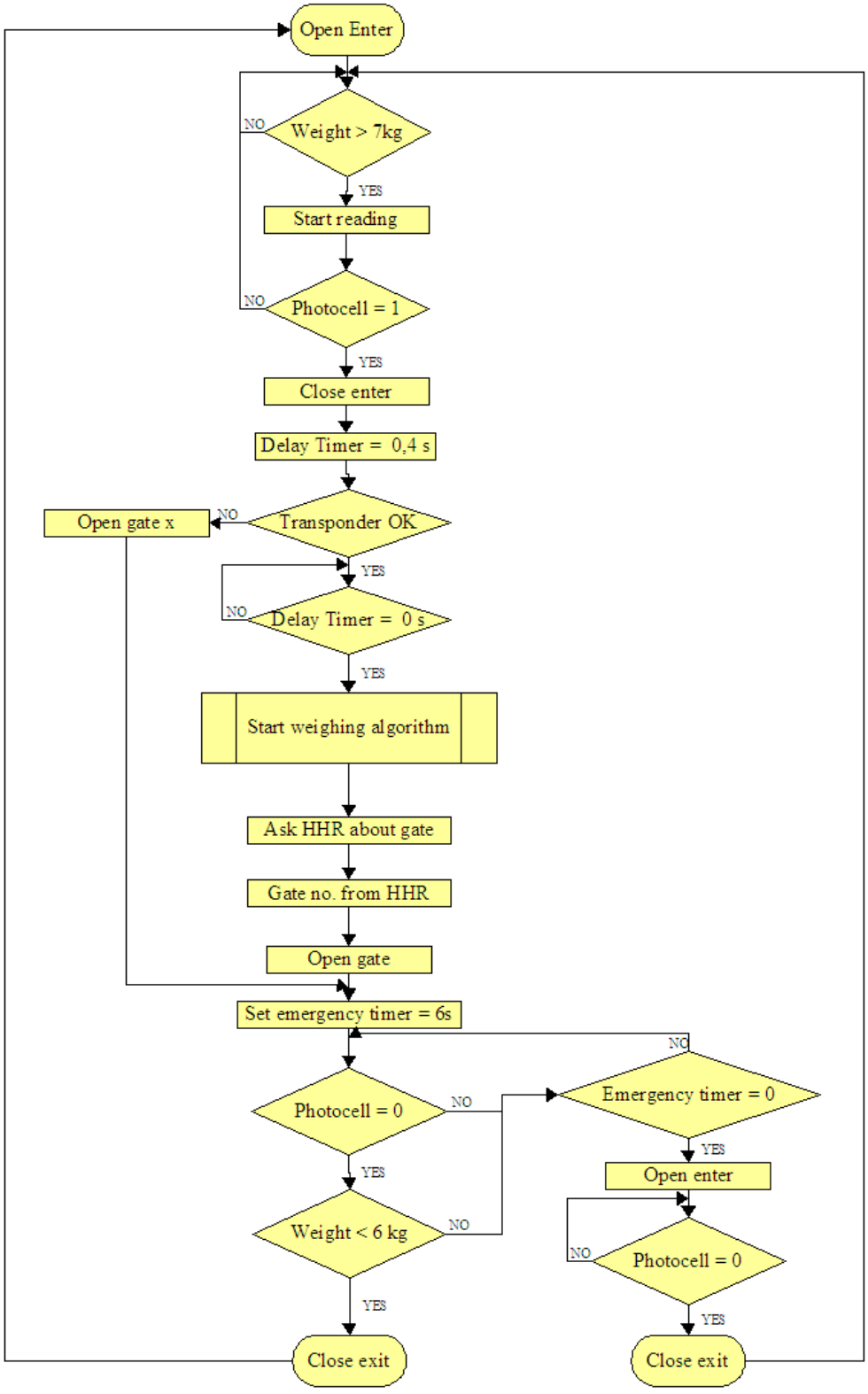
Figure 3.5. Electrical valves

4 How does it work- the WSS 3000?

4.1 Description of the control software

The algorithm for Weight and Sort mode is present below on graphs 1. When weight on platform is higher than 7kg the HHR 3000 starts generating the filed in the antenna and looking for EID. When Sheep pass the photocell rear gate is closed. EID is OK and sheep pass the photocell WSS starts weighing algorithm witch is looking for stable weight. When the weight is stable WSS ask HHR about number of gate and open correct gate if weight is not stable after 2,5s algorithm take current weight. It was made to shorten the time of weighing. Sheep leaves and when exit weight <6kg and photocell disappear WSS close exit gate and open enter.
Appendix A contains the WSS timing diagram.

Diagram 1. Sort and weigh function



4.2 HHR 3000

Figure 4.1. HHR 3000 overview

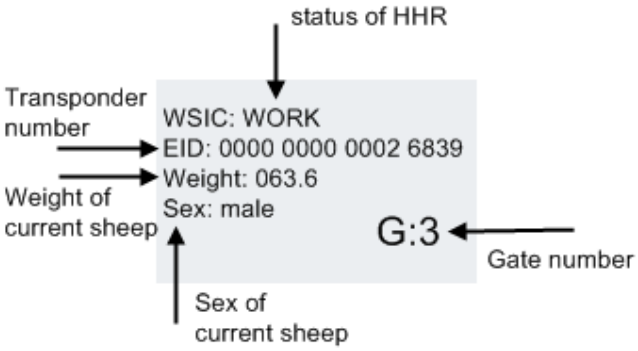


Figure 4.2. HHR display overview

Example menu of HHR 3000:

1. *Sorting- go* to this menu and press any numeric key for start operating WSS on display should be visible status: **WORK**.
2. *View/Edit DB* – enable to view and edit data base.
3. *Settings* – go to this menu for set sorting min and max weight
4. *Date/Time* – enable to set date and time
5. *Info RS232* – enable to see RS232 parameters of transmission

Note: Menu of HHR is programmable, see also HHR manual.

4.3 Electronic control unit

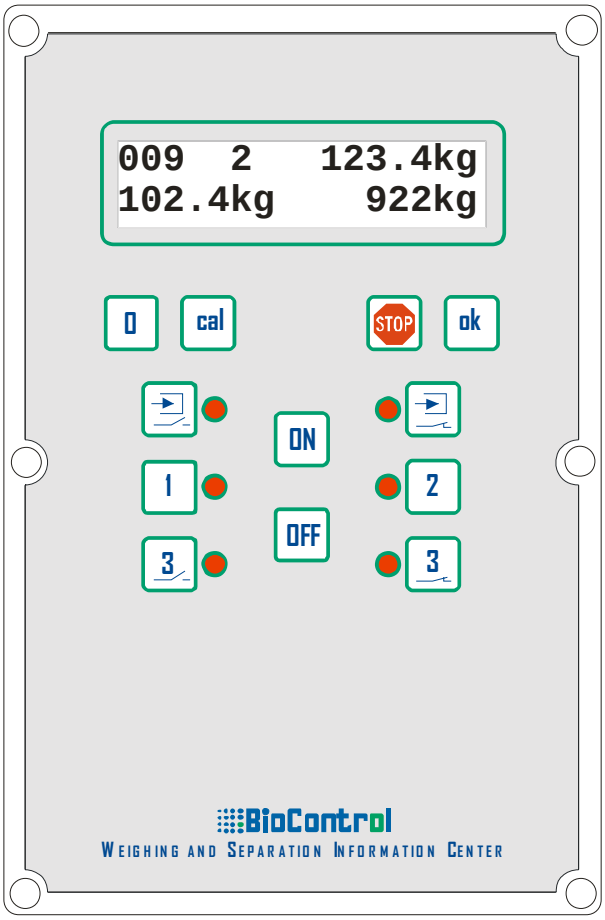


Figure 4.3. Electronic control unit overview

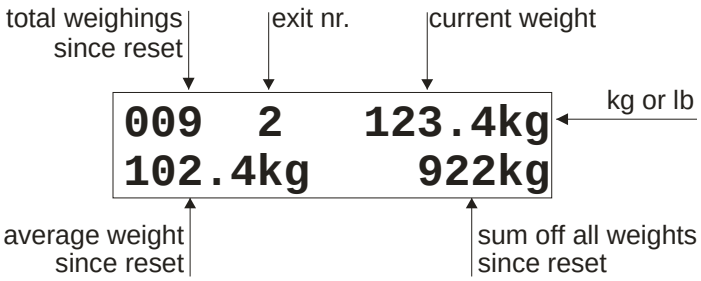
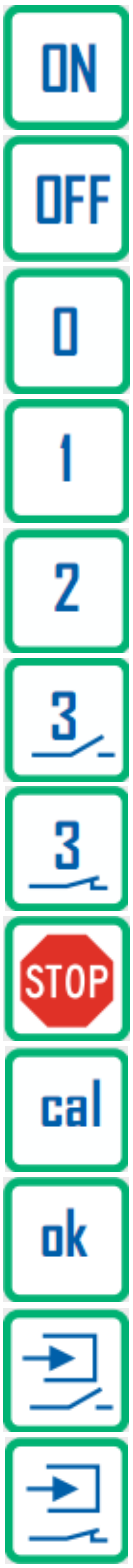


Figure 4.4. Display overview

Figure 4.5. WSS 3000 keyboard description.



Turn on WSS 3000

Turn off WSS 3000, reset all values on LCD display

Emergency gate, any data will be stored

Open gate 1

Open gate 2

Open exit

Close exit, stop automatic operation

Stop automatic operation

Calibration button

Start operation

Open entrance

Close entrance

4.4 Menu of WSS

Note: to enter the menu keep holding “STOP” and then press the “OK” key without releasing “STOP”, to change value use “0” or “cal” button, to go out from the menu press any gate button. See also figure on next page.

MENU 1. Mode A – enable to change mode of operation. Following modes are available:

MANUAL- in this mode WSS 3000 can work without an air compressor. All gates are operate manually by user.

SEMIAUTOMATIC – in this mode user can chose gate on WSS keyboard. Action depends on HHR application. More info about WSS function settings in HHR 3000 application see HHR manual.

FULLAUTOMATIC – this is unattended mode, all action is controlled by HHR 3000 and WSS 3000.

MENU 2. Mode B – enable to change working mode of WSS, available modes:

- Sort and weigh
- Only sorting

MENU 3. Unknown event gate – enable to set gate number for unknown events e.g. reading new transponder, transponder not read.

MENU 4. Min. Weight – animal weight must exceed this load before the visit is initialized. Default value is 8kg. Available values from 6 kg/lb to 60 kg/lb step 1 kg/lb.

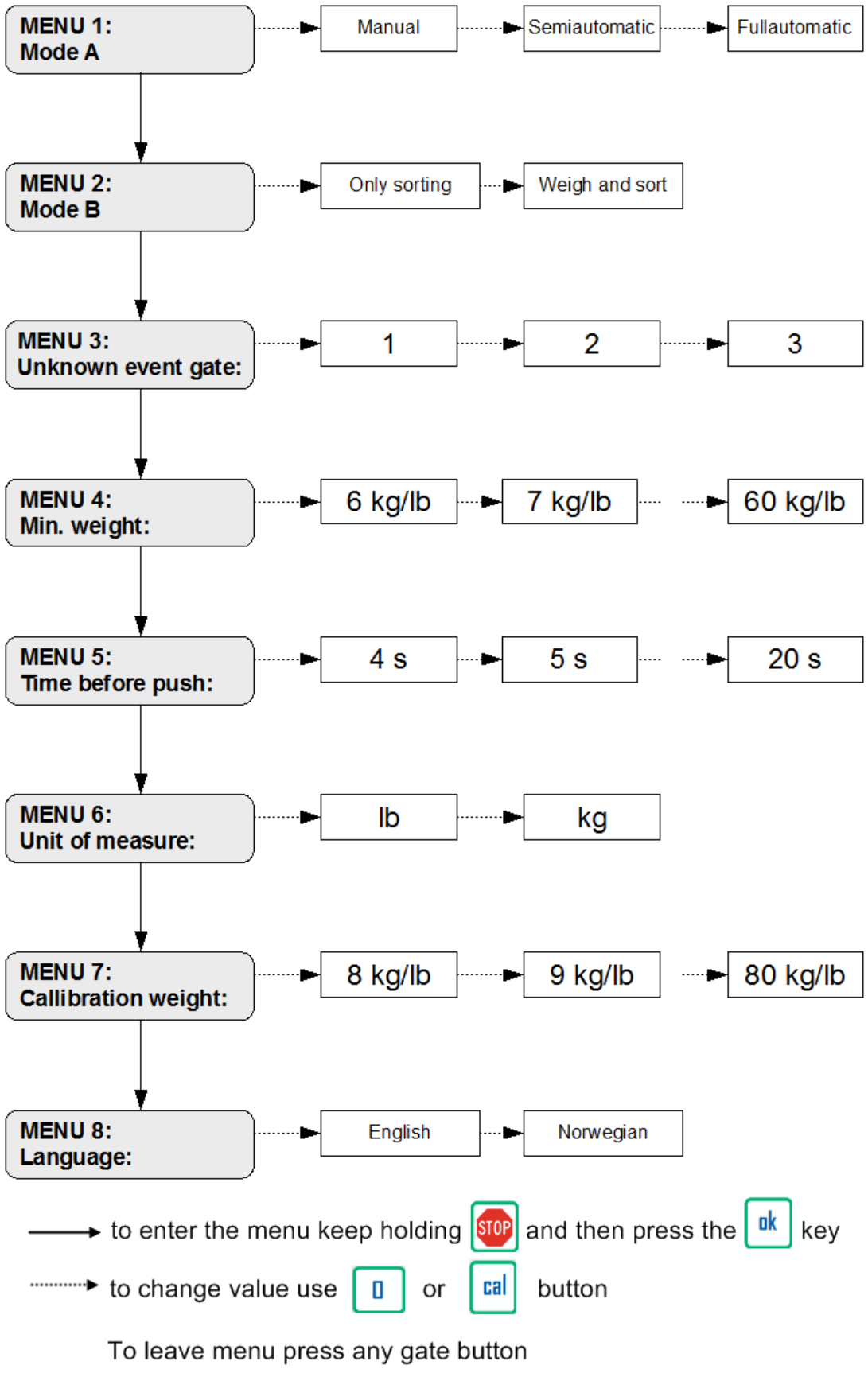
MENU 5. Time before push- if exit gate is open and animal doesn’t go out after that time WSS open enter gate and next animal should push this sheep. Available time from 4s to 20s step 1s.

MENU 6. Unit of measure – kg or lb if you change unit repeat calibration procedure.

MENU 7. Calibration- enable to change calibration weight, default weight is 20kg. Available values from 8 kg/lb to 80 kg/lb step 1 kg/lb.

MENU 8. Language – enable to change language of WSS 3000 menu.

Figure 4.6. Display menu WSS 3000.



4.5 Software version

- **Software of HHR**

Note: Make sure both Operating System and Application software in HHR are correct. More details about changing software you will find in HHR 3000 manuals.

Operating System:

OS ver. 3.39 or higher - this is special version OS for HHR witch support WSS 3000. To upload OS for HHR use HHRProgram Loader 3.39.exe or higher

Application:

EXAMPLE WSIC XX.txt – You can upload this app with standard HHManager procedure.

- **Software of WSS board:**
  WSS 3000 XX.XX – pre-installed

4.6 Tara and calibration

Note: this must be done before firs using and also when changing the unit of measure! The scales should be controlled with not too long intervals.

To calibrate use the following procedure:

- Empty the platform totally,
- Make Tare first: keep holding “STOP” and then press the “0” key without releasing “STOP”. After a few seconds the display will show 0.0 Kg.
- Put the calibration load (normally 20 kg check menu Calibration) into the platform.
- Press and keep holding “STOP” and then Press the “CAL” key without releasing “STOP”. After a few seconds the display will show 20.0 Kg or 19.9 Kg.
- Take out the load and the display shall return to 0.0 Kg. If it does not return to zero, the steps 2 to 5 can be repeated. This can be necessary if the weight is far out from the correct calibration.

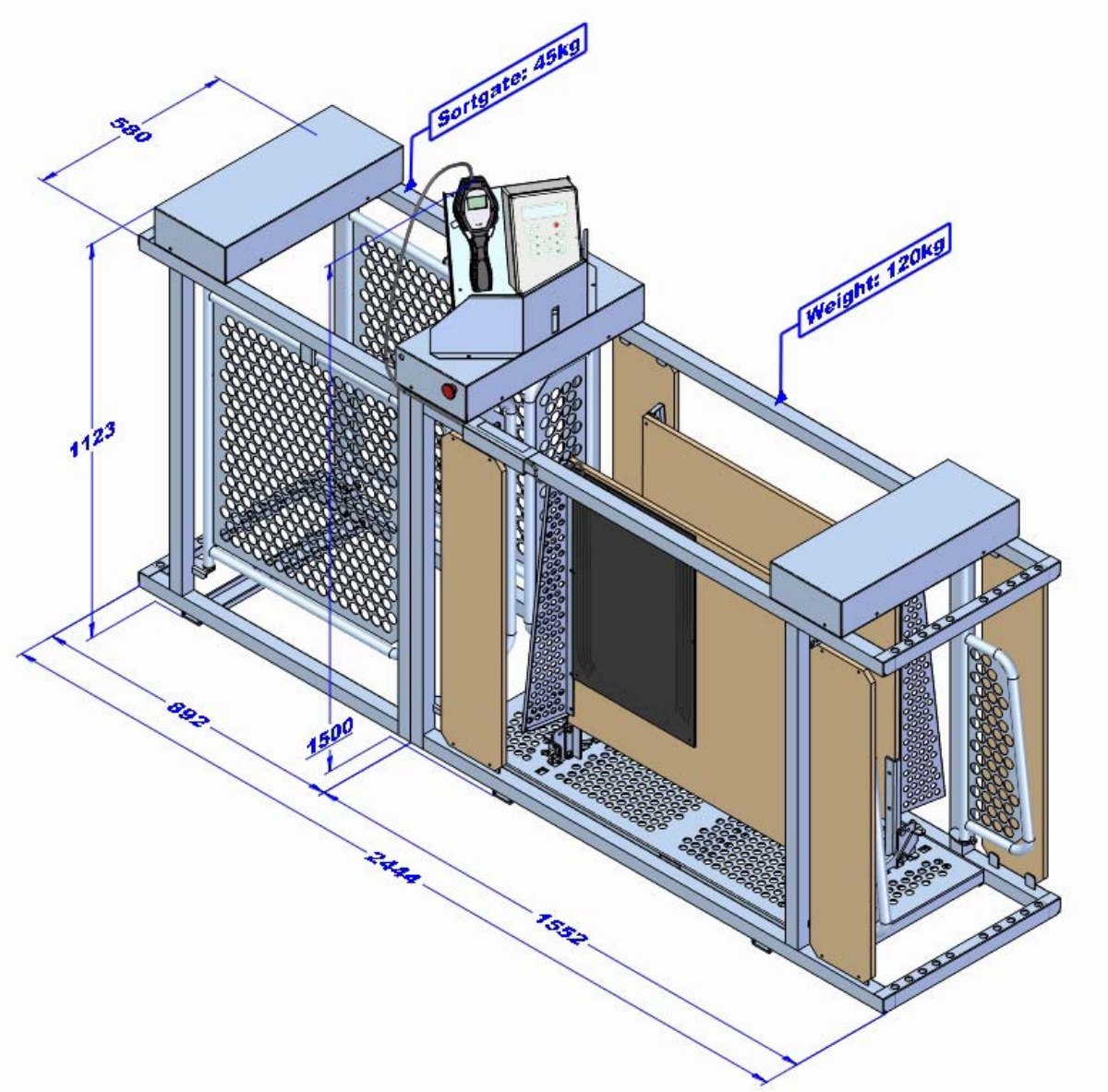
Before commencing any maintenance, shut off the air supply and exhaust downstream pressure. Switch off the electrical current.

4.7 Getting started

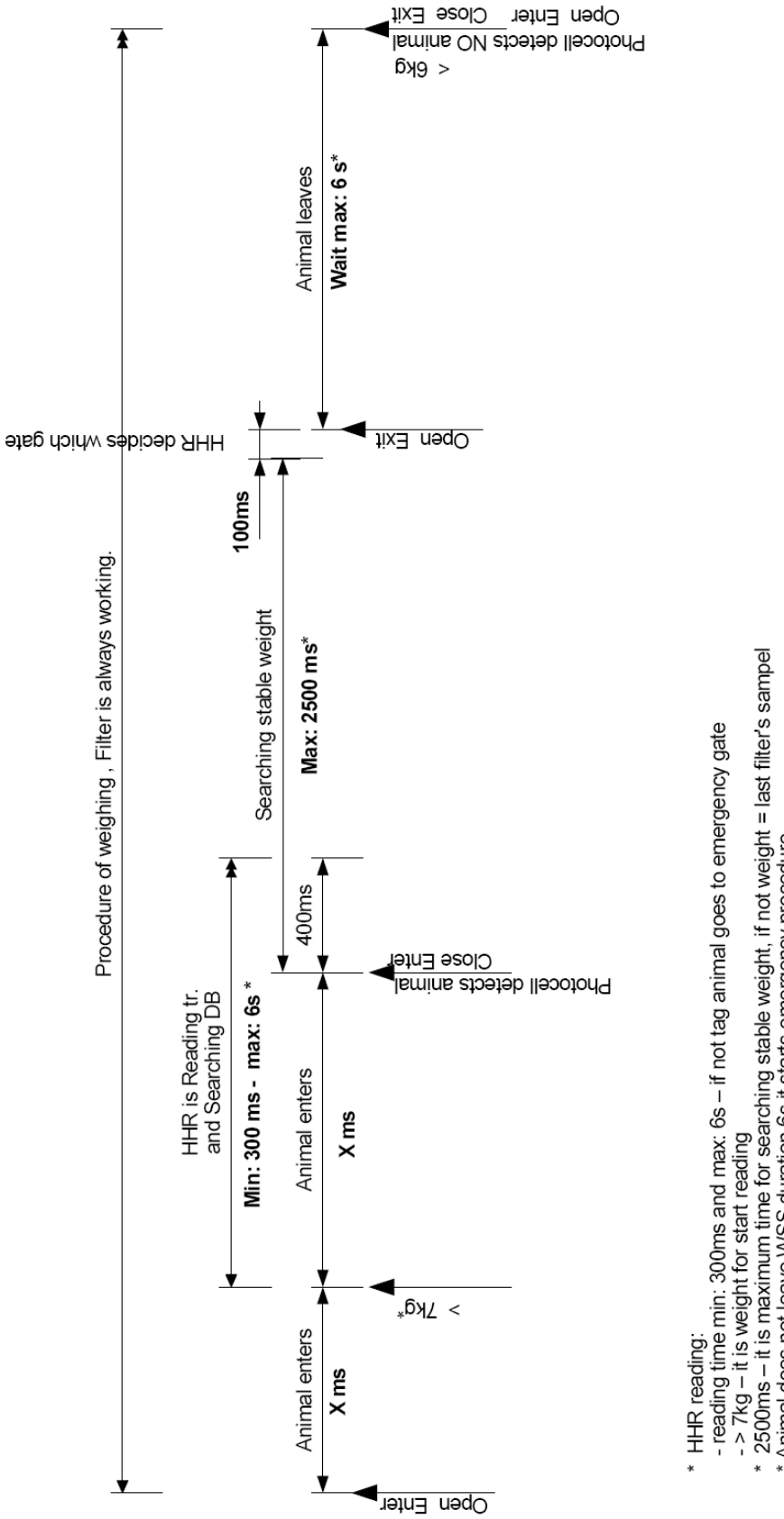
- Connect all cables according to description above
- Set sensitivity of photocell
- Chose Unit of measure
- Make tara and calibration
- Select working mode of WSS: “Sort and weight” or “Only sorting”
- Set Emergency gate in WSS
- Set in HHR weights for sorting, menu “Settings”
- Go to menu “Sorting” in HHR and set “WORK”
- Press button “OK” on WSS to start work mode “AUTO”

The operational mode will start and the system is in function.

5. Dimensions of WSS 3000



Appendix A: WSS timing diagram



Appendix B: overview WSS operation and HHR data storage

Table B.1. WEIGHT and SORT mode

Mode B	Mode A	Event	WSS's LCD message	Gate operation	Chosen key	Data stored in HHR			Data stored in WSS			
						Weight	Date	Gate	Total	Average	Weight	Weight counter
WEIGT and SORT	MANUAL	Reading tag	MANUAL	farmer chooses	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			MANUAL	farmer chooses	OK	YES	YES	NOT	YES	YES	YES	YES
			MANUAL	farmer chooses	1,2,3	YES	YES	YES	YES	YES	YES	YES
		No tag	NO TAG	farmer chooses	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			NO TAG	farmer chooses	OK	NOT	NOT	NOT	YES	YES	YES	YES
			NO TAG	farmer chooses	1,2,3	NOT	NOT	NOT	NOT	NOT	NOT	NOT
	SEMIAUTOMATIC	Reading known tag	PRESS OK.	emergency gate	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			PRESS OK.	from HHR	OK	YES	YES	YES	YES	YES	YES	YES
			PRESS OK.	farmer chooses	1,2,3	YES	YES	YES	YES	YES	YES	YES
		Reading New tag	MANUAL	emergency gate	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			MANUAL	from HHR	OK	YES	YES	YES	YES	YES	YES	YES
			MANUAL	farmer chooses	1,2,3	YES	YES	YES	YES	YES	YES	YES
		No tag	NO TAG	emergency gate	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			NO TAG	emergency gate	OK	NOT	NOT	NOT	YES	YES	YES	YES
			NO TAG	farmer chooses	1,2,3	NOT	NOT	NOT	YES	YES	YES	YES
	FULL AUTOMATIC	Reading known tag	-	from HHR	-	YES	YES	YES	YES	YES	YES	YES
		Reading New tag	MANUAL	emergency gate	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			MANUAL	from HHR	OK	YES	YES	YES	YES	YES	YES	YES
			MANUAL	farmer chooses	1,2,3	YES	YES	YES	YES	YES	YES	YES
		No tag	NO TAG	emergency gate	0	NOT	NOT	NOT	NOT	NOT	NOT	NOT
			NO TAG	emergency gate	OK	NOT	NOT	NOT	YES	YES	YES	YES
			NO TAG	farmer chooses	1,2,3	NOT	NOT	NOT	YES	YES	YES	YES

Table B.2. WEIGHT and SORT mode

Mode B	Mode A	Event	WSS's LCD message	Gate operation	Chosen key	Data stored in HHR			Data stored in WSS			
						Weight	Date	Gate	Total	Average	Weight	Weight counter
ONLY SORT	MANUAL	Reading tag	MANUAL	farmer chooses	0	-	NOT	NOT	-	-	NOT	NOT
			MANUAL	farmer chooses	OK	-	YES	NOT	-	-	YES	YES
			MANUAL	farmer chooses	1,2,3	-	YES	YES	-	-	YES	YES
		No tag	NO TAG	farmer chooses	0	-	NOT	NOT	-	-	NOT	NOT
			NO TAG	farmer chooses	OK	-	NOT	NOT	-	-	YES	YES
			NO TAG	farmer chooses	1,2,3	-	NOT	NOT	-	-	YES	YES
	SEMIAUTOMATIC	Reading known tag	PRESS OK.	emergency gate	0	-	NOT	NOT	-	-	NOT	NOT
			PRESS OK.	from HHR	OK	-	YES	YES	-	-	YES	YES
			PRESS OK.	farmer chooses	1,2,3	-	YES	YES	-	-	YES	YES
		Reading New tag	MANUAL	emergency gate	0	-	NOT	NOT	-	-	NOT	NOT
			MANUAL	from HHR	OK	-	YES	YES	-	-	YES	YES
			MANUAL	farmer chooses	1,2,3	-	YES	YES	-	-	YES	YES
		No tag	NO TAG	emergency gate	0	-	NOT	NOT	-	-	NOT	NOT
			NO TAG	emergency gate	OK	-	NOT	NOT	-	-	YES	YES
			NO TAG	farmer chooses	1,2,3	-	NOT	NOT	-	-	YES	YES
	FULL AUTOMATIC	Reading known tag	-	from HHR	-	-	YES	YES	-	-	YES	YES
		Reading New tag	MANUAL	emergency gate	0	-	NOT	NOT	-	-	NOT	NOT
			MANUAL	from HHR	OK	-	YES	YES	-	-	YES	YES
			MANUAL	farmer chooses	1,2,3	-	YES	YES	-	-	YES	YES
		No tag	NO TAG	emergency gate	0	-	NOT	NOT	-	-	NOT	NOT
			NO TAG	emergency gate	OK	-	NOT	NOT	-	-	YES	YES
			NO TAG	farmer chooses	1,2,3	-	NOT	NOT	-	-	YES	YES