

Pig Performance Tester



User Manual
May 2018

Original instructions

 Vital
element
for
growth

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Pig Performance Tester



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1 Safety

Read this manual before using this product. Failure to follow the instructions and safety precautions in this manual may result in serious injury or death. Keep this manual in a safe location for future reference.

Symbols used in the manual

	<i>Danger</i>	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
	<i>Warning</i>	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	<i>Caution</i>	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
		Indicates important information but not hazard related.
		Suggestions and advice to perform certain tasks more easily.


General safety instructions


- Warning*
Always turn off the mains power supply when working on the electrical installation.
- Warning*
Always wear proper protection when installing and maintaining the PPT.
- Caution*
Installation and service should only be done by locally qualified personnel.
- Caution*
Install the system according to the local rules and regulations.
- Caution*
We advice to install and maintain the PPT with 2 persons.


Working environment

- Caution*
The installation area must be free from any obstacles, including animals.



 *Caution*
Make sure all components are installed out of reach of animals.

 *Caution*
Make sure all cables are properly concealed to prevent stumbling.

 *Caution*
Take into account the high concentrations of ammonia when installing and maintaining the PPT.

Animal welfare and safety

The automated actions of the Nedap Livestock Management systems do never discharge the installer and the user of the system from his/her responsibility to assure and to take care of the well-being of the animals.

Symbols used on the product



Danger of getting jammed, shut off before entering or servicing!



Starts automatically, shut off before entering or servicing!

Disclaimer

NEDAP does not warrant that the Pig Performance Tester will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose. NEDAP has made every effort to ensure that this manual is accurate; NEDAP disclaims liability for any inaccuracies or omissions that may have occurred. You expressly agree that your use of the Pig Performance Tester is at your sole risk.

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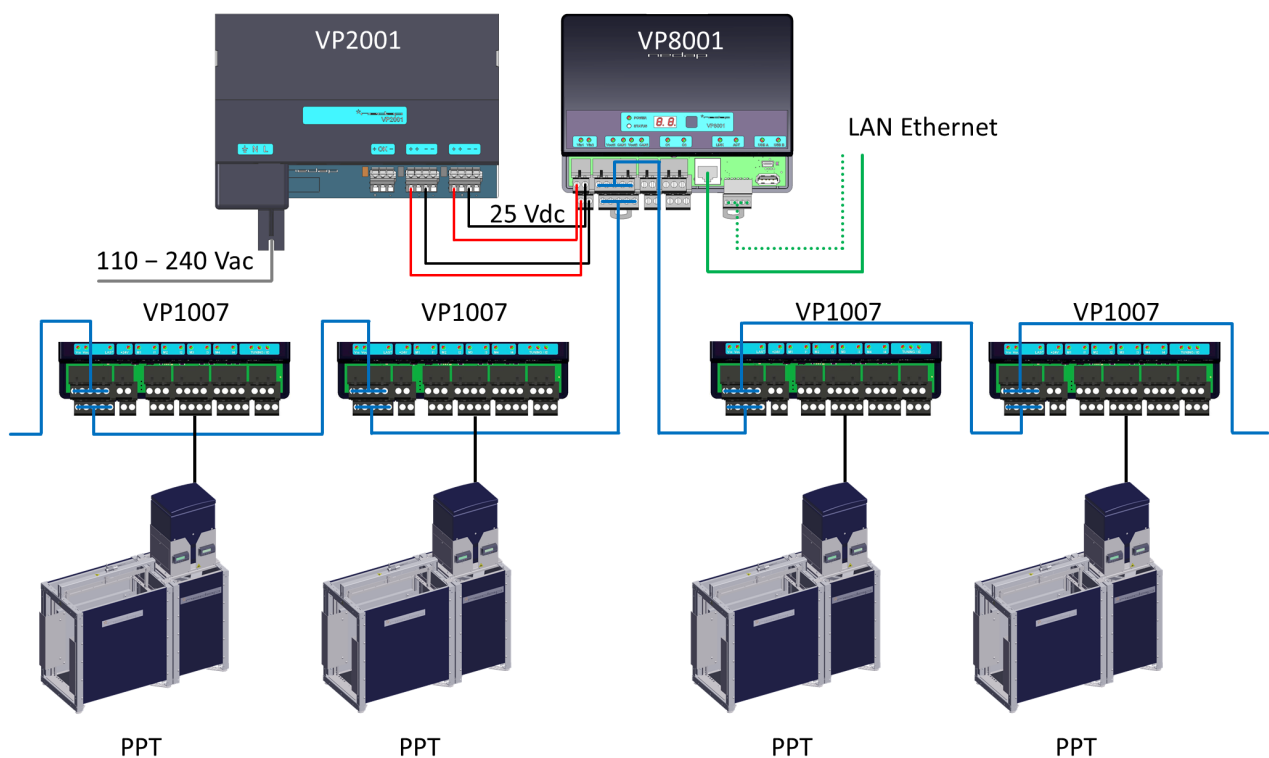


2 PPT overview

The Nedap Pig Performance Tester (PPT) consists of a weighing platform for pigs and a feed trough with a built-in weighing unit that measures the feed intake of individual pigs. The width of the pig weighing platform can be easily adjusted to the size of the pigs. The system has enough capacity to feed up to 15 pigs ad libitum without any restrictions.

System schematic

The PPT system is driven by a VP2001 power supply, a VP8001 and a VP1007. The PPT behavior component (BC) installed on the VP8001 defines which inputs and outputs can be connected and defines the functioning of the unit. CAN communication is used between the VP8001 and the VP1007. The VP1007 controls the inputs and output of the PPT. Ethernet is used to access the web server of the VP8001.



2.1 PPT introduction

In pig breeding, growth and feed conversion are the most important selection criteria. The Nedap Pig Performance Tester (PPT) is used to feed pigs and to collect pig performance data. Each time a pig visits the PPT, the station identifies the pig and measures the feed intake and the weight of the pig. The PPT is used for ad lib feeding in a group housing system up to 15 pigs per pen (usually piglets from a pre-selected boar-sow combination). The growth and the feed conversion rate are calculated from the feed intake and weight gain in order to rank the performance of individual animals.



Benefits

- Accurate recording of individual animal weights and feed intake
- Rapid insight into differences in performance
- Objective selection
- Safeguarding of your data
- Easy-to-operate system

Select earlier, optimize genetics

The collected feed intake and weight data are securely processed and are immediately available to you online. This means that you are quickly provided with insight into the differences in feed intake and growth between individual pigs. You can select pigs earlier, based on reliable data. The ability to continuously optimize the quality of your genetics is a great advantage.

Keep a close eye on feed quality

You can also use the system to monitor the quality of the feed, or study the effects of a different feed composition. Nedap has applied its years of experience with automation to pig breeding and pig management. In this way we contribute to a healthy and efficient population of pigs.

Cloud

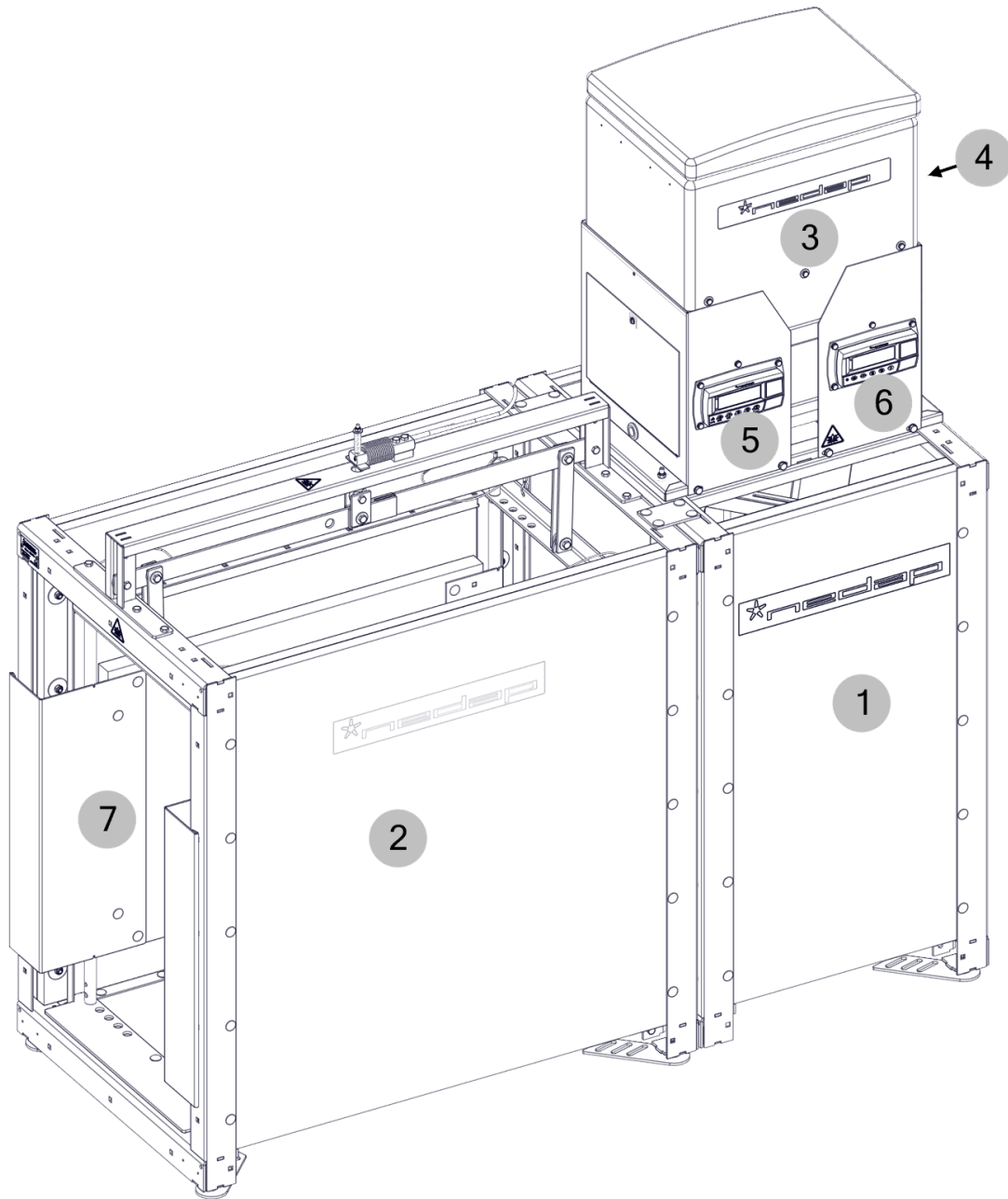
Raw data from the PPT are stored in the cloud.

These data are available on request at a fee in the form of a .csv file by email, or under agreement for research purposes.

Data can also be acquired at a fee by means of an API (see <http://connect.nedaplivestockmanagement.com>).



Components



- 1. Feed weighing module
- 2. Animal weighing platform
- 3. Feed hopper
- 4. VP1007 in V-box 1

- 5. Animal weight indicator
- 6. Feed weight indicator
- 7. Adjustable sidewalls



3 Using the unit

3.1 Working principle

The PPT station is used for ad lib feeding; there is always feed available in the trough. If the feed weight gets too low, the trough will be refilled automatically with five portions of feed. Portions are dispensed, unless the PPT is switched off.

The PPT station identifies an animal when the feed weight in the trough changes or when an animal is identified by the RFID antenna.

One weighing indicator shows the weight of the pig, the other weighing indicator shows the weight of the feed in the trough. The actual feed weight is displayed in grams with a resolution of 1 gram. The actual body weight is displayed in kilograms with a resolution of 0.5 kg.

The feed intake is calculated by subtracting the current feed weight in the trough from the feed weight before the pig entered the PPT.

- The feed intake is assigned to the animal, and stored in the VP8001's database and the cloud.
- The duration of the visit is assigned to the animal, and stored in the VP8001's database and the cloud.
- The animal weight is assigned to the animal, and stored in the VP8001's database and the cloud.

The feed intake (consumed grams of feed per day), the growth (gained weight per day) and the FCR (feed conversion rate = grams of feed intake per gram of growth) are calculated from the collected data.

Refill parameters

Feed weight \leq 500 grams + no animal present \rightarrow Refill + portion size is stored for calibration.

Feed weight \leq 500 grams + animal present \rightarrow No refill, wait until animal has left or feed weight \leq 200 grams.

Feed weight \leq 200 grams + animal present \rightarrow Refill.

Registered consumed feed intake of pigs

End weight $>$ 200 grams: Feed intake is registered (start weight – end weight).

End weight \leq 200 grams: Feed intake is registered; start weight is calculated (start weight + five x portion size – end weight).

Auto calculation of the portion size

After a refill (\leq 500 grams + no animal present) the portion size is stored and added to the rolling average of the last five refills.




Use a tag for calibration at startup of the installation and when changing feed type.

3.2 Preconditions

1. Start with a batch of equal pigs (same week of birth).
2. Tag pigs when their body weight is between 6 - 25 kg (blue ear tag for males, pink ear tag for females).
3. Start with pigs with a body weight of approx. 25 kg.
4. Ad libitum feeding principle (there is always feed available in the trough).




5. Maximum 15 pigs per PPT when feeding pellets.
6. Maximum 12 pigs per PPT when feeding mashed feed.
7. Supply approx. 1 m² of floor space per pig when slats are available.
8. Supply approx. 1.2 m² of floor space per pig when limited slat surface is available.

 *Most animals are accustomed to the system after three full days.*


3.3 Operating the PPT

Operation

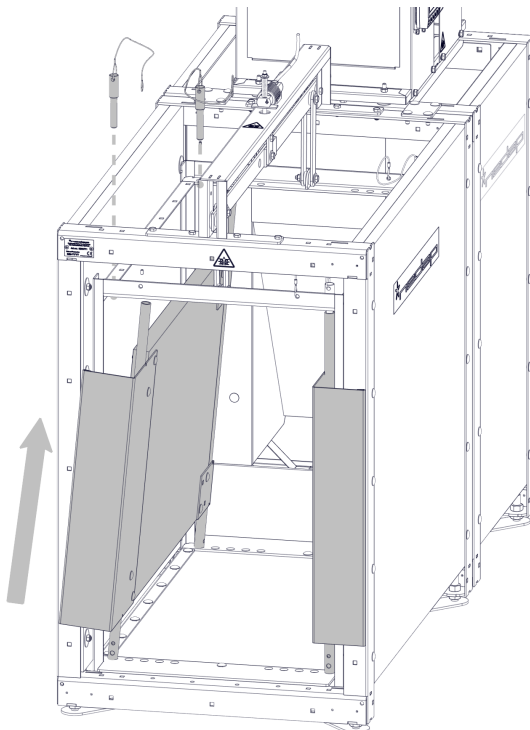
The PPT functions automatically. Under normal circumstances, only regular checks, cleaning and some maintenance (see [Maintenance scheme \(page 19\)](#)) must be done.

 *A reliable internet connection is an absolute requirement for the PPT to operate.*

Width of the weighing platform

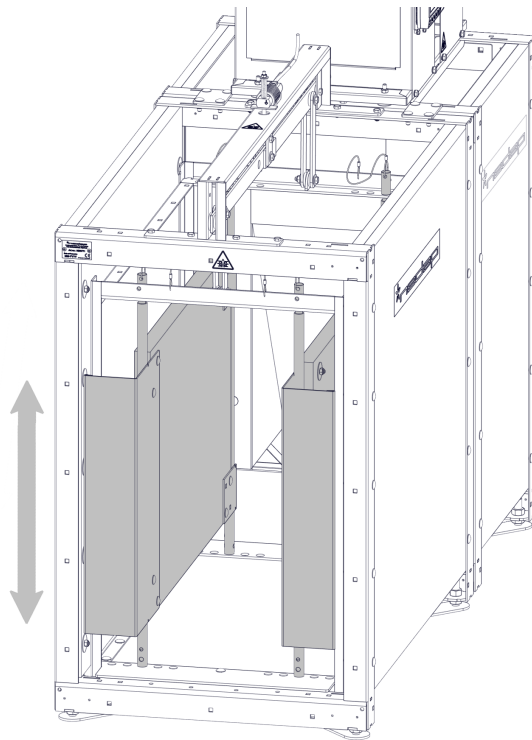
 *Adjust the width of the animal weighing platform to the size of the pigs. Pigs should not be able to stand side by side, pass each other or to turn around inside the unit.*


1. Lift the 2 pins.






2. Tilt the side wall and lift it to reposition it.



 Always adjust both sidewalls equally in order to center the entrance to the feed trough relative to the animal weighing platform.

3. Use the holes at the top and the bottom to establish the correct width.
4. Place the 2 pins in the corresponding holes.

 Always use the same hole on the top and bottom in order to set the side walls vertical and parallel to the outer frame.

3.4 Functions and controls

After logging in to Velos on a PC, smartphone or tablet, the main menu appears on screen. The menu options that are applicable to the PPT are explained in the following sections.

3.4.1 User tasks

Supply animals


Pigs automatically receive an animal number in the Velos program, consisting of the group number and the last 3 digits of their tag number. (GGGTTT).



First batch of animals

1. Make sure all animals are tagged and the system is fully operational.
2. Move the tagged animals in the pen. They will be identified in the PPT and automatically be assigned an Animal number, Location, Sex, Tag number, Supply date and a Start weight. The start weight of an individual animal is the median of the first two full days.
3. The key values are calculated from the supply date onward. Adjust individual start weight if necessary:
 - a. In Velos click on **Farm**.
 - b. In the field **Farm overview**, select the location and click on **View animals**.
 - c. Click on the animal number of the animal for which you want to adjust the start weight.
 - d. On the tab *Pig Performance Testing*, click on **start weight** and fill in the correct start weight.
 - e. Click on **Ok** to save the data.

New batch of animals

1. Go to **Farm** and in the field **Farm overview**, select the location that will get a new supply of pigs.
2. Go to the tab *Pig Performance Testing* and click on **Supply animals**.
3. Click on **Download** to save the data of the existing location on your PC.
4.  *Always download and save the data of the present location!*
5. Make sure all animals are tagged.
6. Move the tagged animals in the pen. They will be identified in the PPT and automatically be assigned an Animal number, Location, Sex, Tag number, Supply date and a Start weight. The start weight of an individual animal is the median of the first two full days.
7. The key values are calculated from the supply date onward. Adjust individual start weight if necessary:
 - a. In Velos click on **Farm**.
 - b. In the field **Farm overview**, select the location and click on **View animals**.
 - c. Click on the animal number of the animal for which you want to adjust the start weight.
 - d. On the tab *Pig Performance Testing*, click on **start weight** and fill in the correct start weight.
 - e. Click on **Ok** to save the data.

Remove animals from location

Remove sick or lame animals from the location if necessary.



1. Enter the departure date in the **Farm overview** or via **Quick entry**.
2. Change the location of the animal to the removed animal location 9999.

Daily use of the PPT

Items that need attention are displayed on the Velos **Dashboard**. Click on the link to view detailed information. Check feed intake attentions or view the **Farm overview**, **Location** or **Animal overview** for further information.


1. Check animals with a low feed intake attention (default less than 500 g based on yesterday) in **Dashboard > Feeding - Feed intake**. The 500 g threshold for this attention can be adjusted in **Settings > Feeding - Attentions**.
2. Check the group visit overview if a portion is assigned to the group instead of an animal in **Dashboard > Pig Performance testing > Group visit**.



-  The attention will pop up when a group visit intake exceeds 70 g in 24 hours.
-  – Unassigned portions will be shown in the group visit screen. This can happen if an animal was not identified (for example due to a lost ear tag) during a visit. The animals with the lowest number of visits will be shown at the bottom of the list. If the number of visits is zero this is probably due to a lost ear tag. Unassigned feed intake can be manually assigned to one animal, or choose "None" to remove the attention.
- When an unassigned feed intake is manually assigned to an animal, the status of the animal changes to '1' in the report. This way animals for which a manual action was taken are easily recognizable.

3. Check the feed intake group averages each day, see **Farm overview** to compare it to the previous day and the average location feed intake.

4. Always replace an ear tag as soon as possible when an animal has lost its ear tag!

-  The feed intake accuracy cannot be guaranteed when one or more animals have lost their ear tag!

5. Enter the new ear tag number in the basic data screen of the particular animal.

Farm overview

View the Basic, Pig Performance and Feed intake data in **Farm > Farm overview**. Check the averages of the Pig Performance Testing and Feeding data. Check the feed intake average every day to compare it to the previous day and the average feed intake.

Pig Performance Testing data farm overview

Farm overview > << Select >>					
No. of male	14				
No. of female	13				
Add animal					
Pig Performance Testing					
Location	FCR	ADG	ADFI	Weight	Days
100001_Loc-1	3.1	706	2155	82.9	9
100002_Loc-2	3.8	549	2112	76.8	9

All data below the PPT header are yesterday's cumulated data, except for today's feeding data, these data are cumulated data from the current day. All data are averages of the locations in this location.

Item	Meaning
FCR	Feed Conversion Rate, ADFI / ADG, measure of the pig's performance.
ADG	Average Daily Growth = Total weight gain / number of full days on the system.
ADFI	Average Daily Feed Intake = Total feed consumed / number of full days on the system.
Weight	The average of the weights of yesterday.
Days	Number of full days since the first animal was identified.



Feeding data farm overview

Farm overview > << Select >>

No. of male: 14
No. of female: 13

[Add animal](#)

Pig Performance Testing | **Feeding**

Location	Feed intake (kg)	Today			Yesterday		
		Visits	Duration	Feed intake (kg)	Visits	Duration	
Loc-1	8.3	47	03:11:47	26.8	156	11:04:34	
Loc-2	0.5	16	30:07	24.5	49	07:18:37	
Average	4.4	31	01:50:57	25.7	102	09:11:35	

The Feed intake, Visits and Durations are cumulated data per location. Compare the data from today and yesterday to the location averages.

Location overview

View the Basic, Pig Performance, Feed intake and Weight location data in **Farm > Location overview**.

Pig Performance Testing data are yesterday's cumulated data, feeding and weighing data are current data.

Pig Performance Testing data location overview

Farm overview > 100002, Loc-2 < >

No. of animals: 13

[View animals](#) [Add animal](#)

Pig Performance Testing | **Feeding** | Weighing

Completed days on system	9	Avg. Daily Feed Intake	2112
Avg. Start weight	71.9	Avg. Daily Growth	549
Avg. End weight	76.8	Avg. Feed Conversion Rate	3.85
Avg. Total feed intake	19.0		
Avg. Weight gain	4.9		

Average Feed Conversion Rate

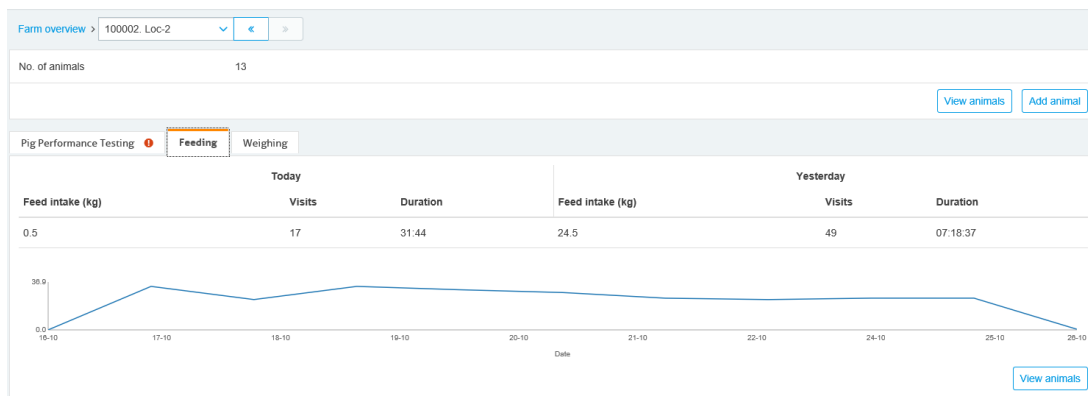
[Supply animals](#)

Item	Meaning
Completed days on system	Number of full days since the animals were identified.
Avg. Start weight	Avg. of the median of the animal weights of the first 2 full days.
Avg. End weight	Avg. of the median of the animal weights of yesterday.
Avg. Total feed intake	Avg. of the total feed intake.

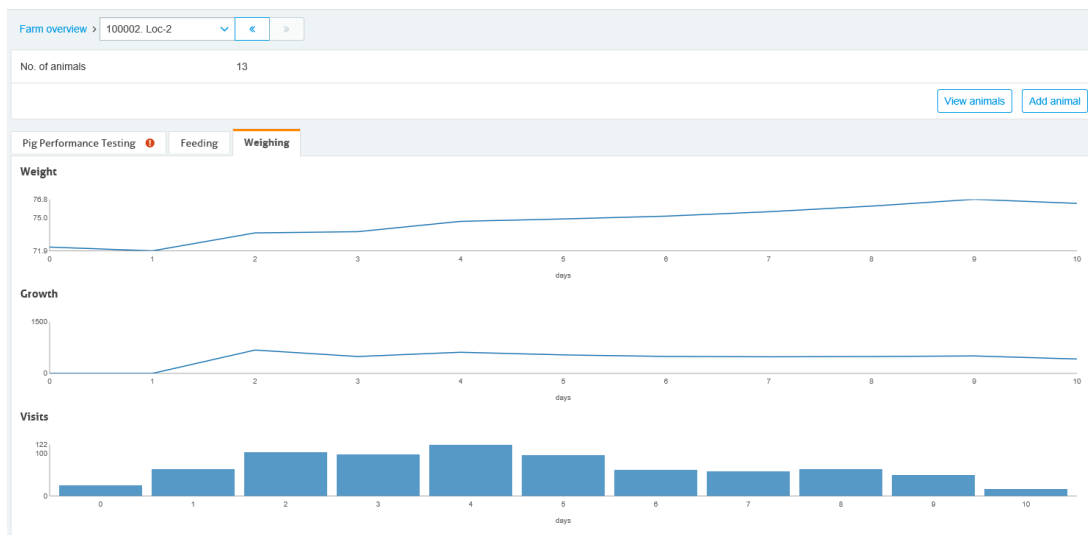


Item	Meaning
Avg. Weight gain	Avg. of the weight gain.
Avg. Daily Feed intake	Avg. total feed intake / number of days on the system.
Avg. Daily Growth	Avg. weight gain / number of days on the system.
Avg. Feed Conversion Rate	Avg. total feed intake / Avg. weight gain.

Feeding data location overview



Weighing data location overview



Animal overview

View the Pig Performance Testing, Feeding and Weighing data for the location and individual animals. Go to **Farm > Farm overview > Select location**. The data are displayed in a series of graphs and statistics.

Click on **View animals** to view individual animal data. Click on an animal number to display the data. By clicking << or >> you can go to the previous or next animal.

Pig Performance Testing data is yesterday's cumulated data, feeding and weighing data is current data.



Pig Performance Testing data animal overview

Farm overview > 100002, Loc-2 > Animal 2660 < >

Basic data [edit](#)

Number	2660	Life No	
Group	99, Group	Responder	984000100611660
Location	100002, Loc-2		
Sex	Female		

Calendar [edit](#)

Cycle: 0

Pig Performance Testing | Feeding | Weighing

Completed days on system	9	Daily Feed Intake	2222
Start weight	76.0	Daily Growth	694
End weight	82.3	Feed Conversion Rate	3.20
Total feed intake	20.0		
Weight gain	6.3		

Feed Conversion Rate

Item	Meaning
Completed days on system	Number of full days since the animal was identified.
Start weight	Median weight of the first 2 full days. Can be adjusted.
End weight	The median of the weights of yesterday.
Total feed intake	Total weight of the feed consumed by the animal.
Weight gain	Weight gain in kg since the start.
Daily Feed intake	Total feed intake / number of days on the system.
Daily Growth	Total weight gain / number of days on the system.
Feed Conversion Rate	Total feed intake / total weight gain, a measure of the pig's performance.

Feeding data animal overview

Farm overview > 100002, Loc-2 > Animal 2660 < >

Basic data [edit](#)

Number	2660	Life No	
Group	99, Group	Responder	984000100611660
Location	100002, Loc-2		
Sex	Female		

Calendar [edit](#)

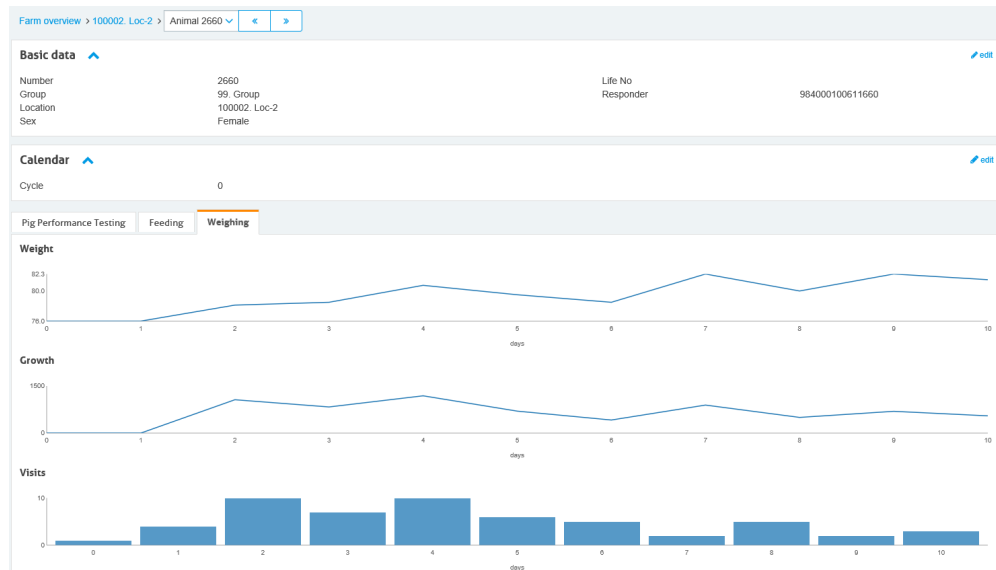
Cycle: 0

Pig Performance Testing | **Feeding** | Weighing

Today			Yesterday		
Feed intake (kg)	Visits	Duration	Feed intake (kg)	Visits	Duration
0	1	18	1.9	2	42:10



Weighing data animal overview



Download CSV data

The recommended way to download the CSV data is via **Reports**.

1. Go to **Reports > Pig Performance Testing > Download CSV data**.
2. Select the locations for which the data is needed. When the data for only one location (for example location 2) is needed, fill in 2 – 2. To download data from multiple locations (for example 10 until 20), fill in 10 – 20.
3. Fill in the period for which the data must be downloaded, for example 01-12-2017 – 31-12-2017.
4. Select the output format for the data (currently only Excel is available).
5. Click **Apply** to download the data.

Reports

To view the animal performance data, follow the next steps:

1. In the menu, click on **Reports**.
2. Select the format of the report (HTML or Excel).
3. Click on **Submit** to generate the report.

Reports > Feeding > Feed Intake attention

This report is based on yesterday's feed intake data. Adjust the feed intake attention threshold if necessary. The feed intake data from today, yesterday and the day before yesterday is listed.

Reports > Feeding > Feed Intake visits

This report shows every single visit from every pig visit to the PPT station from a preselected date. For example the date, duration and the feed amount.



Reports > Pig Performance Testing - Animal data

This report is a general animal data overview.

Reports > Pig Performance Testing > Ranking the pigs

This report is used for ranking the animals on FCR (feed conversion rate). The growth (average gained weight per day) and the feed conversion rate (consumed feed / growth) are calculated with the measured weight and the feed intake of the animal.

Ranking the pigs						
Location	Animal Life No	FCR	Feed intake (g/d)	Growth (g/d)	End weight (kg)	Completed days on system
1	1659	1.80	2084	1160	73.8	14
1	1677	1.96	1257	642	59.0	14
1	1073	1.97	1830	928	70.5	14
1	1682	2.08	2076	1000	72.0	14
1	1689	2.12	2287	1080	75.6	14
1	1675	2.14	2059	964	74.0	14
1	1616	2.30	1934	839	67.8	14
1	1527	2.31	1858	803	68.8	14
1	1512	2.32	2362	1017	83.2	14
1	1753	2.45	2012	821	72.0	14
1	1740	2.51	2603	1035	83.5	14
1	1066	2.52	2115	839	75.8	14
1	1658	2.62	2151	821	76.5	14
1	1607	2.88	1797	625	70.2	14
2	2238	2.01	2155	1071	70.5	14
2	2735	2.03	2176	1071	78.0	14
2	2765	2.05	1761	857	63.0	14
2	2487	2.06	2275	1107	74.0	14
2	2752	2.13	2168	1017	71.2	14
2	2582	2.14	2174	1017	71.8	14
2	2669	2.17	2054	946	73.8	14
2	2660	2.17	2095	964	75.2	14
2	2280	2.22	2100	946	71.0	14
2	2651	2.43	1823	750	63.0	14
2	2518	2.54	2267	892	67.5	14
2	2674	2.71	1646	607	64.0	14
2	2757	2.84	1775	625	65.0	14

version v5.51 number of items: 27 13-10-2017 13:10

Reports > Pig Performance Testing > Feed Intake Group

This report is a feed intake overview per location from a preselected date with data of the feed that could not be assigned to an animal.

3.4.2 Feed calibration

Normal feed calibration



Normal feed calibration is advised when a new type of feed is used and to check if the feed dosing is correct.

1. Make sure no animals can enter the PPT during the feed calibration.
2. Put the calibration tag (set up by the installer and left behind for the user) in the antenna field and remove it.



The feed motor will now dose 5 portions of feed with an interval of 2 seconds.

3. The PPT measures the stable weight to calibrate the feed portion.



Normal feed calibration will not start when there is more than 1400 grams of feed in the trough. Remove some of the feed and restart the calibration.

Reactivate initial feed calibration



To reactivate initial feed calibration (for example after cleaning and / or before supplying a new batch of animals) you must toggle the switch on the PPT 3 times.

1. Switch off the PPT with the switch on the V-box 1 and wait until the status light blinks 1x to indicate that the PPT is disabled.



2. Switch on the PPT with the switch on the V-box 1 and wait until the status light is breathing to indicate that the PPT is enabled.
3. Switch off the PPT with the switch on the V-box 1 and wait until the status light blinks 1x to indicate that the PPT is disabled.
4. Switch on the PPT with the switch on the V-box 1 and wait until the status light is breathing to indicate that the PPT is enabled.
5. Switch off the PPT with the switch on the V-box 1 and wait until the status light blinks 1x to indicate that the PPT is disabled.
6. Switch on the PPT and wait until the status light flashes once every 7 seconds to indicate that "Initial feed calibration" is activated.
7. Perform initial feed calibration.


Initial feed calibration

 *Make sure there is ALWAYS sufficient feed available in the feed hopper.*

1. Make sure the hopper is filled with feed.

 *A metal ball is highly recommended when using mashed feed*

2. Be sure the feed trough is empty and clean (weight must be below 100 g).
3. Put the calibration tag in the PPT antenna field to activate the initial calibration procedure.
4. Remove the calibration tag from the antenna field once the calibration procedure has started.

 *The motor will now dispense 10 feed portions to fill the auger and the trough. Then the feed motor will pause for 5 seconds. Now the stable weight is measured. The feed motor will now dose 5 portions of feed. The stable weight is measured again to calibrate the feed portion. This will ensure that the systems operates without "system attentions".*








4 Maintenance


4.1 Maintenance scheme

Check the entire system after the first two weeks of use. Due to temperature fluctuations and vibrations some moving parts might need adjustment or bolts and nuts might need tightening.

Maintain the PPT according to the scheme below. Regular maintenance is necessary to keep the unit in optimum condition and to retain the weighing accuracy. See the Standard Operation Procedures (next chapters) for detailed information on how to perform common maintenance tasks.

 *It is easier to perform maintenance if you isolate the pigs first.*

When	Check	Action	Who
Daily	Check if the animal weighing indicator shows "0 kg" when there is no pig on the animal weighing platform ¹⁾ .	Briefly push the ">T< TARE" key to set the display to "0 kg" if necessary ²⁾ .  <i>Only for the animal weight indicator!</i>	User
Weekly	<ol style="list-style-type: none"> 1. Check the feed trough for feed clogging. 2. Check for obstructions under or against the animal weighing platform. 3. Check for dung or dirt on the weighing platform. 	<ol style="list-style-type: none"> 1. Remove clogging if necessary . 2. Remove obstructions if necessary. 3. Remove dung and / or dirt.  <i>Caution Never powerwash the electric components of the PPT.</i>  <i>Push the ">T< TARE" key if necessary. Only for the animal weight indicator!</i>	User
Monthly	Check both scales with a known weight (see Standard Operation Procedures).	Recalibrate if necessary.	User Service Partner
Every new batch	Check if all screws, bolts and nuts are properly tightened.	Tighten if necessary.  <i>Do not tighten the moving parts of the weighing platform, they must be able to turn easily, without excessive clearance.</i>	User Service Partner
	Check if the dosing cup is horizontally aligned after dosing the feed.	Adjust if necessary.	User Service Partner
	Check if the load cell bolts are properly tightened (30 Nm (22 lbf.ft.)).	Tighten if necessary.	User Service Partner

 ¹⁾ Due to environmental factors, the **animal** weight indicator may from time to time show weight values that are slightly above or below zero. This does NOT require to push the ">T< TARE" key.

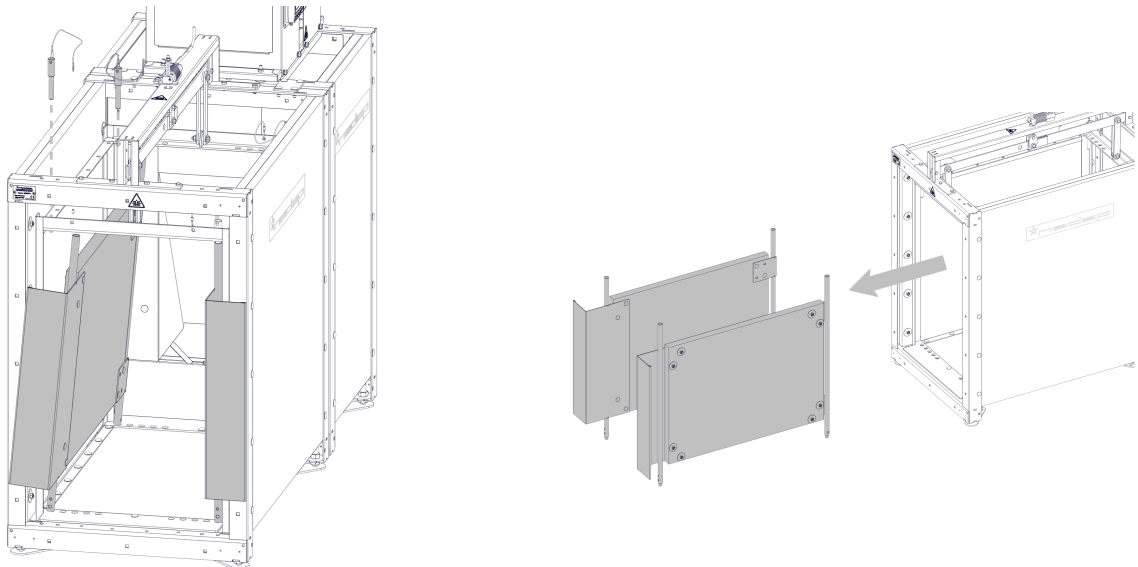
²⁾ Do NOT push the "ZERO" button to set the weighing indicator to 0 kg. If you do this, the unit must be recalibrated.



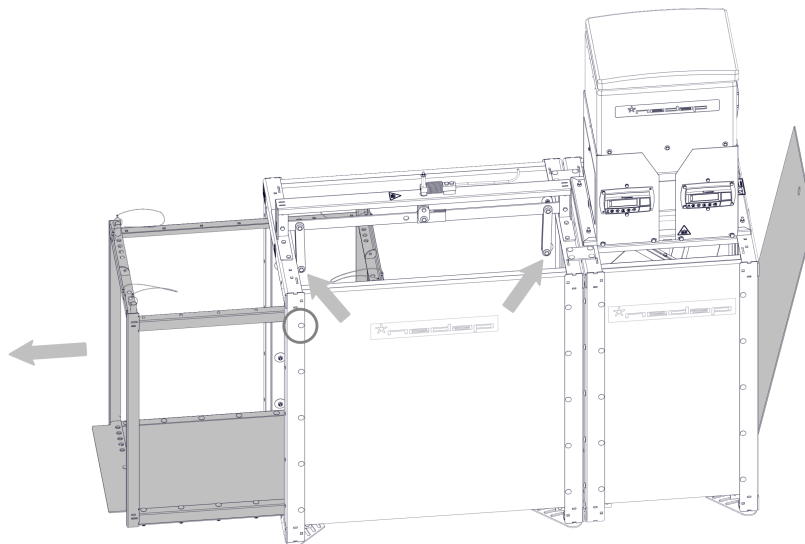
4.2 Standard Operation Procedure: cleaning and before supplying

Cleaning

1. Empty the hopper and trough.
2. Remove the pins and take out the adjustable side walls.



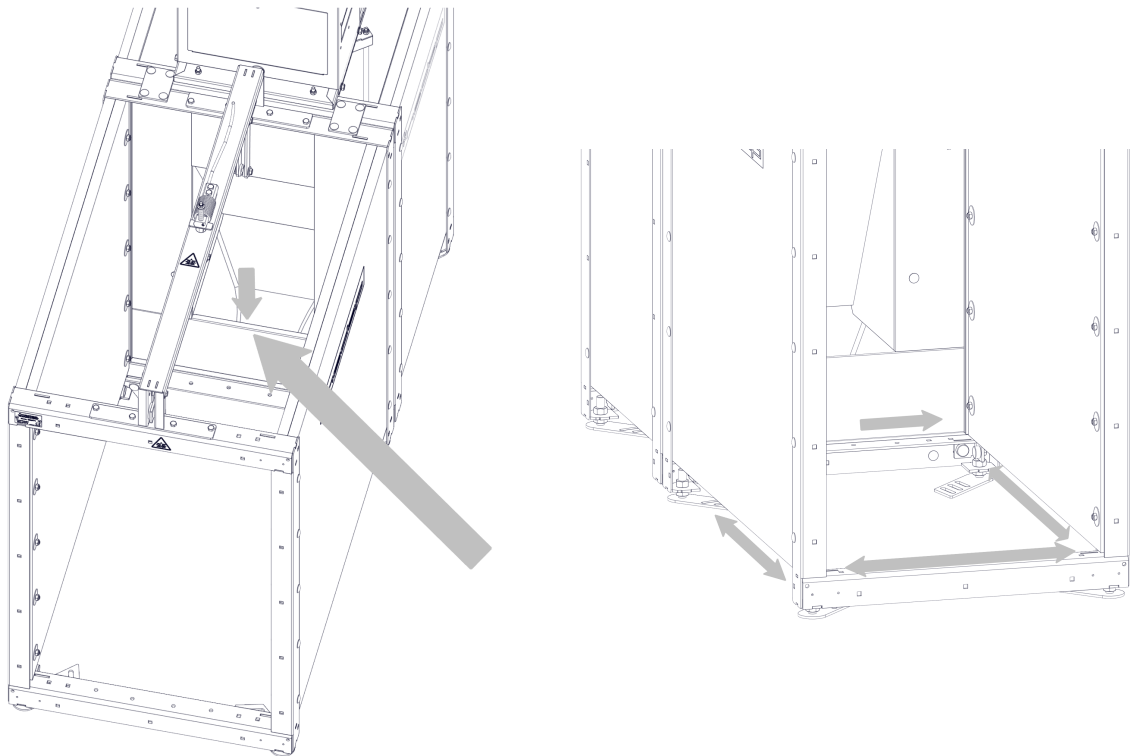
3. Loosen the indicated bolts and take out the inner part of the animal scale and the back plate.



4. Clean the pen and the PPT's in general.



5. Clean all critical *edges* at the animal scale & trough in detail.
Scrape away feed residue from the trough and remove it to prevent feed clogging in the feed trough.

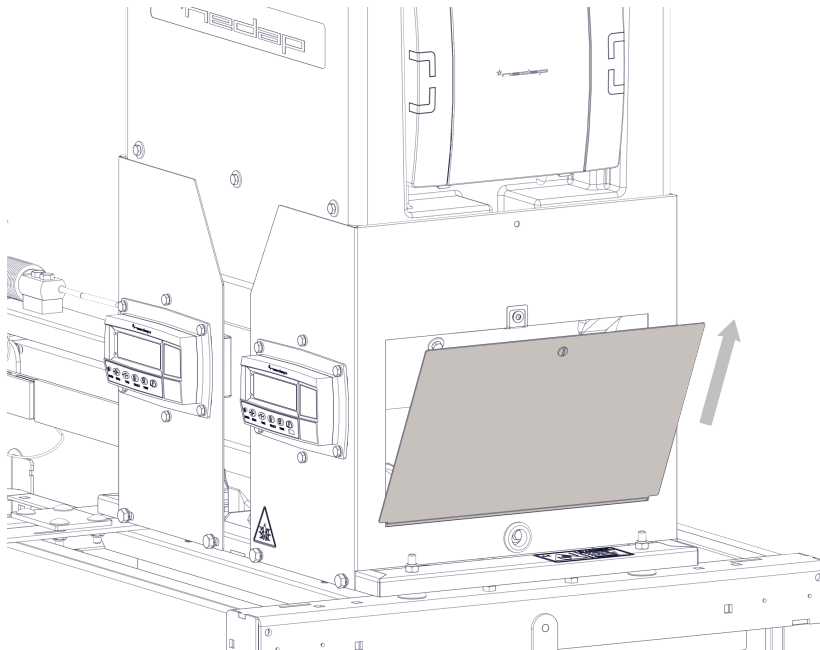


6. Remove water from the trough.
7. Replace the inner part of the animal scale and the back plate.
8. Be sure the animal scale and the trough can move freely.
9. Both indicators should display about ZERO: [$<10,0$ g] / [$\pm 0,5$ kg].

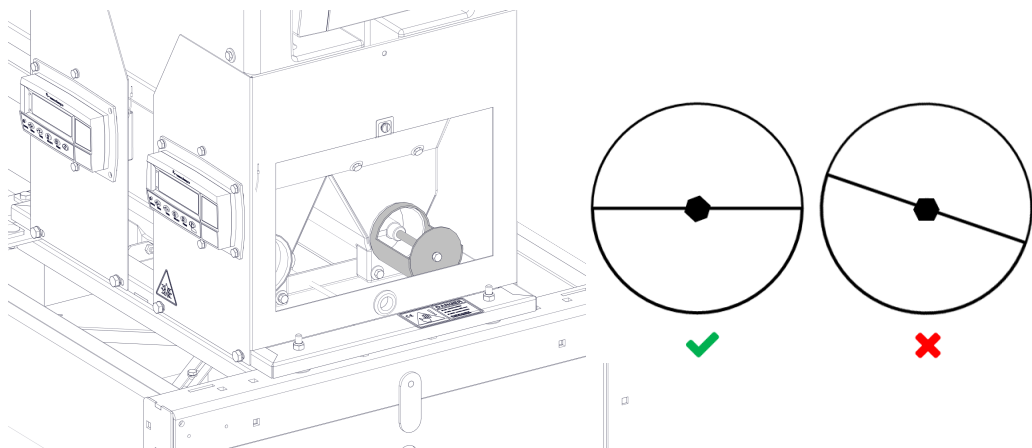


Before supplying

1. Dismount the feed hopper plate.



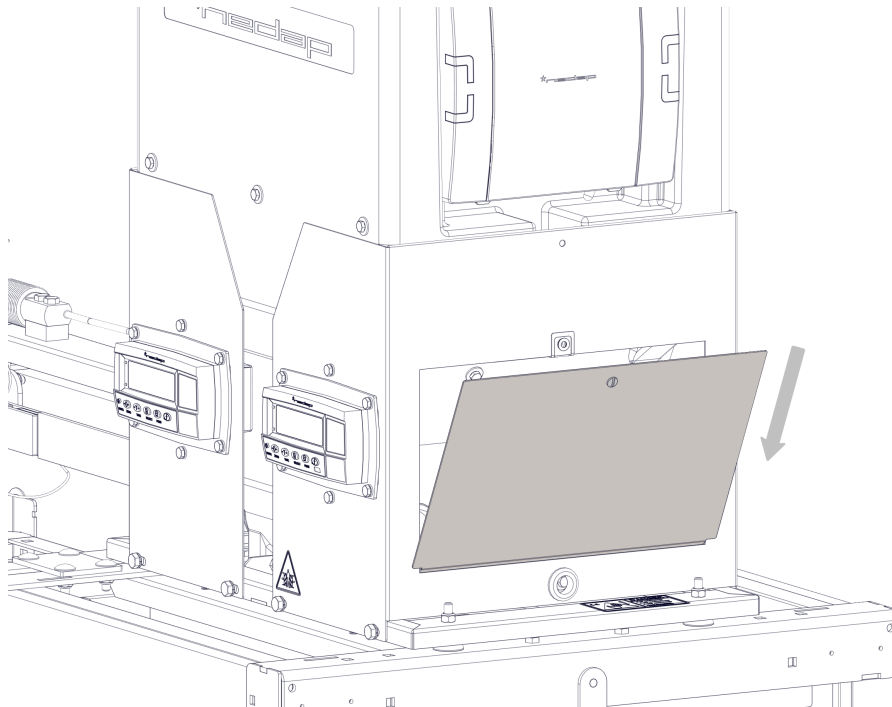
2. Check if the feed cup is clean and in the correct position.
 - a. Check if the dosing cup is horizontal after rotation.



- b. If the cup is not horizontal, loosen the fixing bolt and adjust the position.
 - c. Tighten the bolt to fix the cup in the horizontal position.



- d. Re-mount the feed hopper plate.



3. Be sure the hopper, auger and feed cup are dry.
4. Refill the hopper with fresh/dry feed.
5. Perform an initial refill (10 + 5 portions).
6. Remove some feed until the indicator displays ~600 g.
7. Put a known exact weight in the trough [$1000 \pm 0,1$ g].
8. The indicator should display $\sim 600 + 1000 = 1600$ g [max. deviation: ± 5 g].
9. Put a known exact weight at the animal scale [80 kg ± 100 g] (4 weights of 20 kg ± 25 g)
10. The indicator should display $80,0$ kg [max. deviation: $\pm 0,5$ kg]

Recalibrate the weighing indicators if the deviation is higher than noted at 8. and 10.

4.3 Standard Operation Procedure: during batches

1. Put known exact weight [$1000 \pm 0,1$ g] in trough.
2. Indicator should display $+ 1000$ g [max. deviation: $\pm 5,0$ g].
3. Put known exact weight [20 kg ± 100 g] on two positions at animal scale.
4. Indicator should display $20,0$ kg [max. deviation: $\pm 0,5$ kg]

Only TARE animal scale if necessary.

Recalibrate weighing indicators if deviation is higher than noted at 2. and 4.

**Caution**

- NEVER press TARE button of trough indicator.
- NEVER press ZERO button trough indicator & animal indicator.

4.4 Standard Operation Procedure: verifying total feed intake

Quick version *

- Close feed line valve above PPT hopper.
- Wait until the PPT indicates 'hopper empty' + note date/time stamp.
- Refill hopper with known amount of feed [20,0 kg] of feed & note date/time stamp.
- Wait until the PPT indicates 'hopper empty' again & note date/time stamp.
- Cumulate individual feed intake between time stamps from report.
- Maximum difference between cumulated feed from report and 20,0k g [± 600 g = 3%].

* The hopper sensor indicates empty hopper in a refill process of five portions. It is unknown when the sensor indicates 'empty hopper': after 1 or 5 portion. Therefore the maximum difference is set to ± 600 g.

A reliable (but more time consuming) SOP is to (vacuum)clean the hopper before and after and weight the exact amount of feed. In this way it is exactly known how much feed has been dosed. This amount must be compared with the individual feed intakes from the report. Difference should then be 1% or less.






5 Recalibrate the PPT

These procedures may be necessary to recalibrate the PPT after changing the feed type, replacing a weighing indicator or after cleaning the PPT.

- Disable the PPT before recalibrating.
- Make sure the feed trough is empty.
- Make sure the feed trough can move freely.
- Make sure the animal weighing platform can move freely.
- Make sure nothing leans on or against the animal weighing platform and remove excessive dirt.

Calibration procedure feed trough weighing indicator (address 1)

 *The feed trough must be calibrated with 2 standard (metric) weights of 1,000 g ± 0.1 g before it can be used. Using 2 equal weights for calibration is important, otherwise the weighing accuracy is too small to obtain dependable results.*

Action	Display
1. Switch off the PPT with the switch on the V-box during calibration and check if the display shows grams!	"0 g"
2. Push and hold the "I" and the "f" keys of the weighing indicator at the same time until "Full SEtuP" appears in the display, followed by "bUiLd".	"Full SEtuP". "bUiLd".
3. Push the ">0< ZERO" key twice.	"CAL".
4. Push the ">T< TARE" key once.	"ZErO".
 <i>Check if the feed trough is empty, clean and free from obstacles on, under or against it.</i>	
5. Push the "f" key twice.	"Z in P", followed by "0 g".  <i>This is the 0 g calibration level of the feed trough.</i>
6. Push the ">0< ZERO" key once	"CAL"
7. Push the ">T< TARE" key twice.	"SPAN".
8. Push the "SELECT" key once.	"002000 g" (or another number) blinks in the display.
9. Push the "f" key once.	The first digit blinks.
10. Enter the calibration weight that is going to be used. a. Push the "PRINT" key to edit the first digit. b. Push the "SELECT" key to go to the next digit. c. Repeat steps 1 and 2 until "002000 g" is shown in the display.	"002000 g" must become visible in the display.
11. Put 2 standard (metric) weights of 1,000 g ± 0.1 g exactly in the center at the bottom of the feed trough.	"002000 g" must become visible in the display.
12. Push the "f" key once to set this calibration level for the PPT.	"S in P".



Action	Display
13. Push and hold the "I" and the "f" keys at the same time until "SAvinG" appears in the display and a beep sounds. The calibration settings are now stored.	"SAvinG".
14. Remove the calibration weight. The display should now show "0 g".	"0 g".
15. Switch on the PPT with the switch on the V-box if you only have to calibrate the feed trough weighing indicator.	

The weighing indicator displays only grams.

Recalibrate if the display indicates >10g when the feed trough is clean and empty.

If you push the ">0< ZERO" key by accident, the unit must be recalibrated as described in the procedure above.


Calibration procedure animal weighing indicator (address 2)


The animal weighing platform must be calibrated with 4 minimum metric weights of 20 kg ± 25 g before it can be used. Using 4 equal weights for calibration is important, otherwise the weighing accuracy is too small to obtain dependable results.


Action	Display
1. If necessary, switch off the PPT with the switch on the V-box and check if the display shows kilograms!	"00.0 kg"
2. Push and hold the "I" and the "f" keys of the weighing indicator at the same time until "Full SEtuP" appears in the display, followed by "bUiLd".	"Full SEtuP". "bUiLd".
3. Push the ">0< ZERO" key twice.	"CAL".
4. Push the ">T< TARE" key once.	"ZEro".
Check if the animal weighing platform is empty, clean and free from obstacles on, under or against it.	
5. Push the "f" key twice.	"Z in P", followed by "00.0 kg". This is the 0 kg calibration level of the animal weighing platform.
6. Push the ">0< ZERO" key once	"CAL"
7. Push the ">T< TARE" key twice.	"SPAN".
8. Push the "SELECT" key once.	"00080.0 kg" (or another number) blinks in the display.



Action	Display
9. Push the "f" key once.	The first digit blinks.
10. Enter the calibration weight that is going to be used. a. Push the "PRINT" key to edit the first digit. b. Push the "SELECT" key to go to the next digit. c. Repeat steps 1 and 2 until "00080.0 kg" is shown in the display.	"00080.0 kg" must become visible in the display.
11. Put 4 known metric weight of 20 kg ± 25 g exactly in the center of the animal weighing platform.	"00080.0 kg"
12. Push the "f" key once to set this calibration level for the PPT.	"S in P".
13. Push and hold the "I" and the "f" keys at the same time until "SAvinG" appears in the display and a beep sounds. The calibration settings are now stored.	"SAvinG".
14. Remove the calibration weight. The display should now show "0.0 kg".	"0.0 kg".
15. Switch on the PPT with the switch on the V-box.	

 *The weighing indicator displays only kilograms.*

 *Push the ">T< TARE" key to set the weighing indicator to zero (0 kg) if any number shows in the display when the animal weighing platform is clean and empty.*

 *If you push the ">0< ZERO" key by accident, the unit must be recalibrated as described in the procedure above.*




6 Troubleshooting

If the PPT does not function correctly or if an error message is displayed in Velos, use the following sections to try to solve the issue.

6.1 LED indications V-box 1

State	Cause	Solution	Who
Blue light on the V-box 1 flashes	Error	Check for System attentions in Velos.	User
Blue light on the V-box 1 is off	Power is off	<ul style="list-style-type: none"> • Check power supply VP2001. • Check circuit breaker / fuse and cabling. If this does not solve the problem, call Service Partner.	User

 *When the system is functioning properly, the blue light on the V-box 1 is "breathing".*

6.2 System attentions

General inspection of malfunctions

If the PPT is not functioning correctly, a system attention (alarm) is displayed in Velos. Check the system attention if one is shown.

1. In Velos go to **Dashboard > System attentions** to check the malfunction.
2. Check the cause of the system attention and solve the malfunction (see chapter "Trouble shooting").
3. Remove the system attention after having solved the problem.
4. Call your Service Partner if you are unable to solve the malfunction.



Troubleshooting

System attention	Cause	Solution
The amount of feed added during refill is not sufficient.	<p>This system attention appears when the PPT refills too little feed. When for example the feed calibration weight is 100 g, the feed weight after refill should be 500 g (5 refill portions x 80 g each). When the weighing indicator shows less, for example 300 g, there was too little refill and the system attention appears.</p> <p>The PPT has stopped the refill process, feed intake registration will proceed until the feed weight gets below 50 grams or timeout exceeds 120 minutes.</p> <ul style="list-style-type: none"> The feed hopper is not filled in time; possible clogging of feed in the feed line or feed hopper. The feed line does not run frequently; sensors on the feed line are not working properly or are not mounted in the correct position. 	<ul style="list-style-type: none"> Check the feed line setup and the feed composition. <ul style="list-style-type: none"> <i>A malfunction of the feed line might influence the accuracy of the system!</i> Check if the weighing scale is working correct: <ol style="list-style-type: none"> Clean the trough completely. Put a test weight of 1 kg on the weighing scale. Check if the weighing indicator displays 1000 g. Check if the monitor page in Velos of the PPT (Maintenance > Monitoring > Behavior Components > click link View) shows 1000 g. When the weighing indicator and/or the monitor page do not show 1000 g, calibrate the PPT, see Calibrate the PPT in the Service manual.
No stable weight during initialization	<p>After a power cut or when submitting the Behavior Component, a stable start weight of the feed is required. If the feed weight is not stable during a certain amount of time, this system attention will pop up.</p>	<p>Check if the feed trough can move freely without the rods touching any of the grommets of the guiding system.</p> <ul style="list-style-type: none"> <i>Wait until animals have left the PPT. The feed weight in the feed trough must be lower than 2,000 grams.</i>
Hopper empty	<p>On the Velos Dashboard an attention appears when the hopper empty sensor does not detect feed in the hopper for > 5 seconds.</p> <p>The feed intake registration will continue, but the PPT stops the refill process.</p>	<p>Refill the hopper.</p> <ul style="list-style-type: none"> <i>When the sensor detects feed again, the PPT will proceed without generating a system attention!</i>
Communication timeout		See Solve Communication timeout in the Service manual.


6.3 Status indications


The PPT shows its status in the display of the VP1007. The table only shows the most common status numbers.

Other status numbers or a sequence of status numbers may be shown in the display as well.

The number or number sequence that is displayed shows what the PPT is doing.



 *User action is required is when the status number is "2, 74, 80 or 99". In this case an alarm is blocking the PPT.*

 *When status code "99" appears, in Velos go to System attentions on the Dashboard to check the malfunction (see also Troubleshooting (page 28)).*

No.	Status
2	Initialization <ul style="list-style-type: none"> • Waiting for the Weighing Indicator to complete initialization. • Waiting for first stable weight from the Weighing Indicator.
11	Weighing feed <ul style="list-style-type: none"> • Wait until the minimum feed weighing interval time has elapsed. • Perform a weighing of the feed in the feed trough.
14	Calibrate <ul style="list-style-type: none"> • Refill portions have been supplied. • Perform a weighing of the feed in the feed trough. • Calculate the calibration values.
15	Check animal <ul style="list-style-type: none"> • Read the antenna to check if there is an animal.
16	Weighing animal <ul style="list-style-type: none"> • Perform a weighing of the animal.
71	Start a refill (5 portions) <ul style="list-style-type: none"> • Initialize the refill parameters.
72	Check refill <ul style="list-style-type: none"> • If no refill is busy, check if a refill is needed and start it. Refill can start if hopper is not empty and: <ul style="list-style-type: none"> – A calibration tag is detected and the weight in the feed trough is lower than 1400 grams. – There is no animal in the PPT and the weight in the feed trough is below 500 grams and last refill is more than 3 minutes ago. – There is an animal in the PPT and the weight in the feed trough is below 200 grams and last refill is more than 3 minutes ago. • If a refill busy, check if it is finished or continue with it.
73	Refill portion <ul style="list-style-type: none"> • Dose one refill portion.
74	Handle wait initial refill <ul style="list-style-type: none"> • Initial refill is necessary, waiting for correct starting conditions: <ul style="list-style-type: none"> – Calibration tag is detected. – Weight in feed trough is below 100 grams. – Hopper is not empty.
75	Handle start initial refill <ul style="list-style-type: none"> • Initial refill is started. <ul style="list-style-type: none"> – Dose 10 portions with 2 seconds interval to make sure the auger is completely filled. – Wait 3 seconds more so feed drops completely in the feed trough. – Measure the starting weight for a refill.



No.	Status
80	Off <ul style="list-style-type: none">The PPT is switched off by means of the switch.
99	Error <ul style="list-style-type: none">There is an alarm.

Most common status sequences

- After startup and initial refill is not necessary: 2, 11... and continue normal action.
- After startup and initial refill is necessary: 2, 74, 75, 71... and continue refilling.
- Normal action when an animal weigher is present: 11, 72, 15, 16, 11... and so on.
- Normal action when no animal weigher is present: 11, 72, 15, 11... and so on.
- If a refill is necessary the normal sequence is interrupted: 11, 72, 71 and continue refilling.
- Refilling (5 portions): 5x 73, 15, 16, 11, 72, followed by 14, 11 and continue normal action.



There are other sequences that will be shown in the display. In these sequences some states may be active for a very short period. Therefore they are not visible in the display.



7 Handling instructions

Storage

- If the product is to be stored for some time, make sure that it is under a protective cover to prevent dirt and moisture from entering.
- Do not expose the product to direct sunlight and / or adverse weather conditions such as storm, rain, hail or snow.
- Storage temperature range: -25 – +70 °C (-13 – +158 °F).
- Relative humidity (Rh) < 93% @ 45 °C / 113 °F (non-condensing).

Disposal

Dispose of waste and residues according to local rules and regulations.



8 Glossary

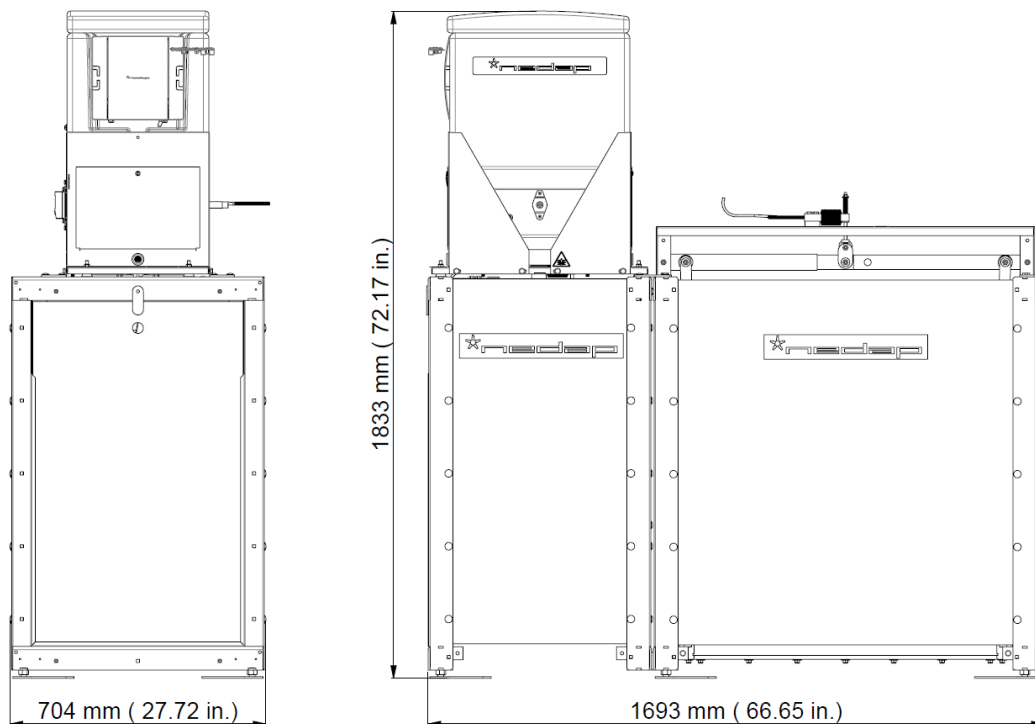
Term	Description
Behavior component	The behavior of a standard hardware component and / or the total management system, set by Velos software
CAN (bus)	Controller Area Network. A standard serial bus to connect electronic controllers
DHCP	Dynamic Host Configuration Protocol
ESF	Electronic Sow Feeding
Ethernet	Network communication standard for PCs in a LAN
LAN	Local Area Network
RFID	Radio Frequency IDentification
Router	Networking device that forwards data packets between computer networks
Switch (connection box)	Connects VPU's to a PC (network)
V-box	Housing for V-packs
V-pack	VPU or VP
VP1001	Reader motor controller
VP1007	Reader Input/Output controller
VP2001	Power supply (25 Vdc, 2x 4 A)
VP3001	Reader Input/Output controller
VP8001	Velos Processing Unit (VPU)
VPU	Velos Processing Unit
Velos cable	Shielded 6-pole communication / power cable to connect VPU's and V-packs
Velos software	Nedap software to control the system



9 Technical specifications

Item	Specification
Dimensions (L x H x W), transport, single unit	1,711 x 1,263 x 704 mm (67.36 x 49.72 x 27.72 in.)
Dimensions (L x H x W), transport, stacked units	1,711 x 2,526 x 704 mm (67.36 x 99.45 x 27.72 in.)
Dimensions (L x H x W), mounted	1,693 x 1,833 x 704 mm (66.65 x 72.17 x 27.72 in.)
Weight (single unit)	235 kg (518.1 lb.)
Weighing range / resolution (feed)	2,000 g (4.4 lb.) / resolution 1 g (0.035 oz.)
Weighing range / resolution (animal)	150 kg (330 lb.) / resolution 0.5 kg (1.1 lb.)
Construction material frames	All stainless steel PP panels Hot dip galvanized steel (ISO 1461)
Operating temperature range	-10 – +45 °C (-14 – +113 °F)
Operational relative humidity	Rh < 93% @ 45 °C / 113 °F
Enclosure protection class	IP65 (if covers, glands and cables are installed correctly)

Dimensional drawing (mounted)





10 Declaration of Conformity

Declaration of Conformity

We, the undersigned,

Company	N.V. Nederlandsche Apparatenfabriek "Nedap"
Address, City, Country	Parallelweg 2, 7141 DC Groenlo, The Netherlands
Phone number	+31 544 471 111
Fax number	+31 544 463 475

certify and declare under our sole responsibility that the following equipment:

Product description / Intended use	Pig Performance Tester
Manufacturer	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	Nedap
Type	9208771 and 9216049

is tested to and conforms with the essential requirements of Electromagnetic Compatibility, as included in following standards:

Standard	Issue date
NEN-EN-ISO 12100 - Safety of machinery - General principles for design - Risk assessment and risk reduction	2010

and therefore complies with the essential requirements and provisions of **Council Directive 2006/42/EC Machinery Directive** on the approximation of the laws of the Member States relating to the applicable essential health and safety requirements of the directive.

The following laboratories and institutions performed the tests and issued the relevant reports:

Report numbers	Issued by
DOC020013 - Checklist Machinery Directive Evaluation VELOS PPT	Nedap Livestock Management

The technical documentation as required by the Conformity Assessment procedure is kept at the following address:

Company	N.V. Nederlandsche Apparatenfabriek "Nedap"	
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E-mail	info@nedap.com	
	TCF nr	280415.01
	Drawn up in	Groenlo, The Netherlands
	Date	28 Jun 2015
	Name / Position	Jacques Hulshof, Approbation Officer



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