

User manual

Natura Primus

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EC Declaration of conformity



Big Dutchman.

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In accordance with EC Directives:

- **Machines 2006/42/EG, Annex II / Part 1 / Chapter A**

Further applicable EC directives:

- Electromagnetic compatibility 2014/30/EU
- Low voltage 2014/35/EU



The product mentioned below was developed, constructed and produced in accordance with the above mentioned EC Directives and under sole responsibility of Big Dutchman.

Description:	System for rearing of laying hens
Type:	NATURA Primus
System no. and year of construction:	see customer order no.

The following harmonised standards apply:

- DIN EN ISO 12100:2011-03 Safety of machinery - General principles for design - Risk assessment and risk reduction
- EN 60204-1:2006/AC:2010 Safety of machinery - Electrical equipment of machines Part 1: General requirements
- DIN EN ISO 13850:2016-05 Safety of machinery - Emergency stop - Principles for design

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1 About this manual

Observe the instructions in this manual to ensure correct and safe use of the system.

Keep this manual safe for future use.

All persons assembling, operating, cleaning and servicing this system must be familiar with the contents of this manual.

These persons must always have access to the manual. Keep this manual in the immediate vicinity of the system for this reason.

Observe the comprised safety instructions!

If this manual is damaged or lost, request a new copy from **Big Dutchman**.

This manual is protected by copyright. The information and drawings included in this manual may not be copied without the manufacturer's consent, nor may they be misused or disclosed to third parties.

The contents of this manual may be altered without prior notice.

If you find mistakes or unclear information in this manual, please do not hesitate to let us know.

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1.1 Structure of the safety instructions

DANGER!

This indicates risks that will lead to personal injury resulting in death or to serious injuries.

WARNING!

This indicates risks that could lead to personal injury resulting in death or to serious injuries.

CAUTION!

This indicates risks or insecure procedures that could lead to moderate or minor injuries.

NOTICE!

This indicates notes preventing property damage and leading to an effective, economic and environmentally-conscious handling of the system.

1.2 Supplier's documentation

The supplier's documentation includes all instructions for components that are supplied by **Big Dutchman** but not manufactured by **Big Dutchman**, for example motors. These instructions are usually supplied with the respective component. If this is not the case or if the language of the corresponding country is not included, please request this documentation from **Big Dutchman** .

It is essential to observe the instructions in the supplier's documentation!

2 Safety

Lack of compliance with these instructions can cause severe danger to personal life and limb and damage the environment or the installation and may lead to the forfeiture of any damage claims. The non-compliance with these instructions can specifically lead to:

- failure of vital functions of the system,
- failure of prescribed maintenance methods,
- risk of injury due to electrical, mechanical and chemical influences.

2.1 General safety regulations

Only work with suitable tools and observe the local accident prevention regulations.

WARNING!

Live parts may be bare when performing different types of tasks. Touching live parts can lead to injuries caused by electric shock and short circuits.

- ▶ Set the main switch to "Off" before starting any repair or maintenance tasks.
- ▶ Secure the system against reactivation.
- ▶ Attach a fixed sign to indicate that maintenance and repair tasks are in process!
- ▶ Never touch bare electrical components.
- ▶ Equipment with bare electrical components must not be used by the operating staff.

Check safety and function control devices to ensure safe and accurate operation after carrying out any tasks.

Observe the regulations of local water distribution and power supply companies.

WARNING!

Defective or disassembled safety devices can lead to serious injuries or to death!

- ▶ It is strictly forbidden to remove or put out of operation any safety device.
- ▶ If safety devices are damaged, immediately put the system out of operation. Lock the main switch in zero position and eliminate any damage.
- ▶ Make sure that all safety devices are properly mounted and function after work on the system has been completed and before putting the system into operation (again).

⚠ WARNING!

- ▶ Parts lying about on the system and in its vicinity can cause persons to stumble and / or fall and thus risk injuring themselves by contact with system components.
- ▶ Parts lying about in or on the components can lead to serious damage of the system.
- ▶ Never deposit objects (e.g. spare parts, replaced parts, tools, cleaning tools etc.) in the accessible areas of the system or in the surrounding areas after having worked on the system!
- ▶ **Before** putting the system into operation again, assure yourself that all loose or replaced parts have been removed from the system components!

⚠ DANGER!

Persons may be electrocuted or suffer serious electrical injuries if water from leaking hoses, seals and pipes reaches live parts.

- ▶ Disconnect the main power supply.
- ▶ Interrupt the main water supply.
- ▶ Only now may you enter the part of the house where large quantities of water have escaped.

i NOTICE!

Leaking hoses, seals and pipes can cause structural damage or destroy electrical systems by short circuits.

- ▶ Check regularly whether large quantities of water are escaping and eliminate the leaks as soon as possible.

⚠ WARNING!

Children must not access the system. The safety distances for the system are not designed for children. A risk of injury cannot be excluded, even for supervised children.

2.2 Operator's responsibility

The operator is subject to the legal obligations regarding occupational safety and is responsible for the staff's safety. All safety, accident prevention and environmental protection regulations applicable for the area of use of the system must be observed. The following is especially important:

The operator must clearly specify responsibilities for operation, maintenance and cleaning.

The operator must provide the staff with the necessary personal protective equipment.

The operator is responsible for

- using the system in compliance with the designated use;
- ensuring that the system is only operated in an excellent state from the technical point of view and that maintenance intervals are observed;
- ensuring that his staff is trained to use the system;
- ensuring that operation instructions are prepared for the system.

2.3 Staff qualifications

Staff must consist of qualified persons who can be expected to perform their tasks reliably. Persons whose ability to respond is impaired, e.g. by alcohol, drugs or medication, must not work on the system. The operator is responsible for which persons he employs. **Big Dutchman** does not assume any liability for personal injury and property damage caused by insufficiently qualified staff.

2.4 Personal protective equipment

WARNING!

The following instructions apply to any task carried out on the system.

- ▶ Wear **close-fitting protective clothing** and **protective footwear**.
- ▶ Use **protective gloves** where there is a risk of hand injuries and **safety goggles** where there is a risk of eye injuries.
- ▶ Do not wear **any rings, necklaces, watches, scarves, ties or other items** which could get caught in parts of the system.
- ▶ Make sure that **long hair is always tied back**. Hair can get caught in driven or rotating working units or parts of the system, resulting in serious injuries.
- ▶ When working underneath the system **always** wear a **hard hat!**

2.5 Designated use

This system has been designed to keep and rear pullets of the species "Gallus Gallus" in an animal-friendly way for egg production.

The **Big Dutchman** system may only be used for the purpose for which it is designated.

Any deviating use is considered non-designated use. The manufacturer shall not be liable for any damage resulting from such non-designated use. The user alone bears the risk. The designated use also includes the exact compliance with operating, maintenance and assembly requirements of the manufacturer.

2.6 Prevention of reasonably predictable incorrect uses

The following uses of the Natura Primus system are not permitted and are considered improper use:

- Keeping species other than pullets of the species "Gallus Gallus" for egg production;
- Using liquids other than drinking water for the drinkers. This excludes additives and medicines suitable for being administered via the drinking water.
- Feeding feedstuffs not suitable for a chain feeding system;
- Using the system outdoors;
- Using the system at temperatures below 0°C inside the house;

- Treating the system with aggressive and/or corrosive substances to an extent not considered good and normal use;
- Loading the system mechanically in a way that exceeds the normal loads planned for the keeping of pullets in this system;
- Unsupervised manure removal;
- Starting the longitudinal manure removal before starting cross manure removal;
- Placing and keeping more birds in the system than permitted.

Big Dutchman excludes any liability in case of improper use of the system. Risks resulting from improper use is borne exclusively by the operator of the system!

2.7 Ordering of spare parts

CAUTION!

For your own safety, use original **Big Dutchman** spare parts only. For third-party products that have not been released or recommended and for modifications (e.g. software, control units), judging whether there is a safety risk in connection with **Big Dutchman** systems is not possible.

NOTICE!

The exact description of the spare parts to be ordered can be found by means of the position number in the spare parts list.

Indicate the following when ordering spare parts:

- the code number and description of the spare part;
- the customer number or order number;
- the current supply, e.g. 230 / 400 V – 3 Ph – 50 / 60 Hz.

2.8 Safety instructions when operating electrical appliances

NOTICE!

Only qualified electricians may install and work on electric parts / assembly groups in accordance with electro-technical regulations (e.g. EN 60204, DIN VDE 0100/0113/0160).

WARNING!

If an electric part is open, dangerous electric tensions are bare. Be aware of the danger and keep staff of other professions away from the danger zone.

NOTICE!

Do not install control devices directly in the house but in the service room to prevent corrosion caused by e.g. ammonia gas.

2.8.1 Protective-equipotential bonding (earthing) of the system

The system must be earthed professionally by the operator or a company commissioned by him at suitable points and according to the valid local guidelines and standards (e.g. IEC 60364-7-705 mod. 2006 / DIN VDE 0100-705: Low-voltage electrical installations – part 7-705: Requirements for special installations or locations – Agricultural and horticultural premises) for protective-equipotential bonding.

The earthing points must be connected with the foundation earth electrode.

Recommended earthing points:

1 x per system row near the foundation earth electrode.

The material required for earthing is not included in the Big Dutchman delivery.

2.9 Initial operation

NOTICE!

The following must be strictly observed for initial operation:

- ▶ Initial operation must be carried out by a qualified technician with the respective proof of knowledge (service technician).
- ▶ The following protocols and minutes required by **Big Dutchman** must be filled out during initial operation and made available to the operator: confirmation minutes and, if necessary, the corresponding inspection minutes.

2.10 System-specific safety regulations

The system is designed according to the state of technology and meets current safety requirements. Nevertheless, there are residual risks, which can be prevented as follows.

WARNING!

Danger of drawing-in due to rollers, chains, gear wheels and belts!

- ▶ Disconnect the system from the power supply before starting any work on the system, because the system may turn on unexpectedly when operated automatically.
- ▶ Secure the system against reactivation.
- ▶ Prevent contact with rotating and driven system parts in general!
- ▶ Assure yourself that all safety devices have been attached correctly.

2.10.1 Safety symbols on the system

NOTICE!

Safety symbols and instructions on the system must always be easily visible and undamaged.

- ▶ Clean safety symbols in case they are dirty, e.g. due to dust, animal excrement, feed remains, oil or grease.
- ▶ Immediately replace damaged, lost or illegible safety symbols.
- ▶ If a safety symbol or instruction is fixed to a part to be replaced, ensure that it will be fixed to the new part as well.

**General note!**

Read the manual.

Code no. 00-00-1240

**Danger of crushing due to rotating machine parts!**

Always lock and secure safety devices before putting the system into operation. Only authorised persons may open protection devices, and only when the system is idle.

Code no. 00-00-1187

**Danger of drawing-in due to operating auger, chain or rope sheaves!**

Never reach or climb into the feed hopper, the feed column, the feed pipes or the feed trough while the motor is running!

Code no. 00-00-1188

2.10.2 Important notes on the use of Tangit adhesive and Tangit cleaner

WARNING!

Tangit adhesive is flammable! Therefore:

- ▶ No open fires nor hot air blowers, gas brooders and open light bulbs in the work area!
- ▶ Do not smoke, weld or grind in the work room!
- ▶ Solvent vapours are heavier than air. Such vapours may cause unconsciousness and / or form explosive mixtures. Use and dry in well-ventilated areas only. Make sure that the area stays well-ventilated after gluing work is finished!
- ▶ Remove possible solvent vapour clouds before starting to weld or grind!
- ▶ Observe the general instructions and the instructions for use of the manufacturer.

WARNING!

Tangit adhesive and Tangit cleaner are dangerous to the health! When working with Tangit adhesive or Tangit cleaner, always

- ▶ Wear gloves!
- ▶ Wear eye protection!
- ▶ Wear breathing protection!
- ▶ Ventilate rooms!

Notes on the glueing of components:

- The adhesive is ready-for-use and must not be diluted. The adhesive must be thin and fluid. If it is viscous and does not flow off of a dipped spatula, then the content is too old and must not be used any more. Do not continue to use already open containers.
- Bevel cut edges and remove any burrs!
- The glue areas must be completely clean, dry and oil-free before coming into contact with the adhesive.
- Apply the adhesive evenly with strong brush strokes.
- Move the parts to be glued into their final position immediately after applying the adhesive and hold on to the parts for a few seconds until the Tangit adhesive has hardened. The entire glueing process must be completed within a period of 4 minutes.
- Do not rotate the parts during bonding, but push them straight together.

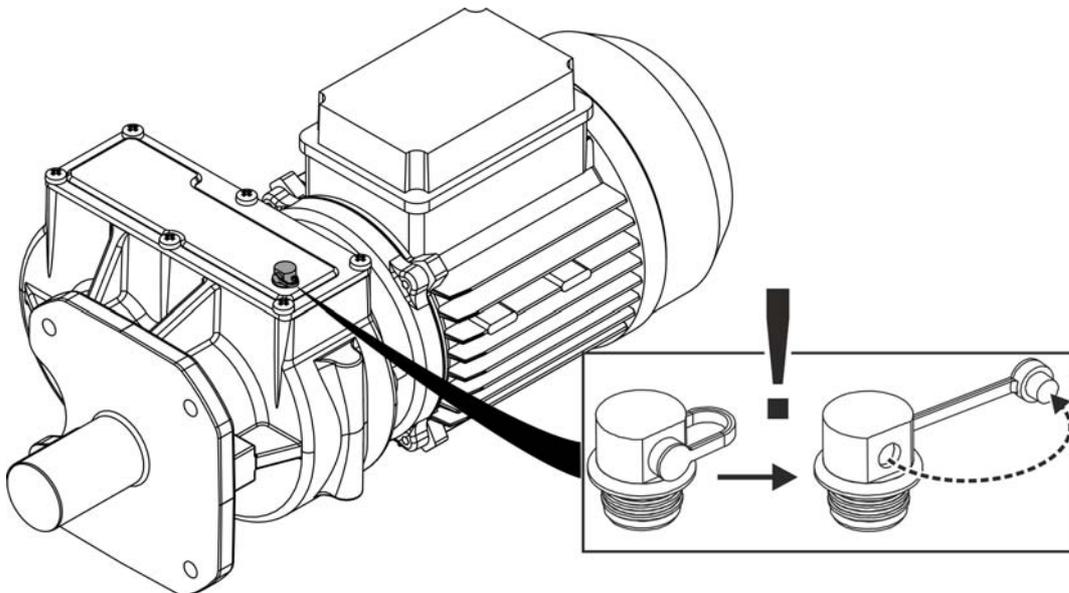
- Do not move the parts for a period of 5 minutes after glueing. For temperatures below 15°C this time has to be extended to 15 minutes.

⚠ CAUTION!

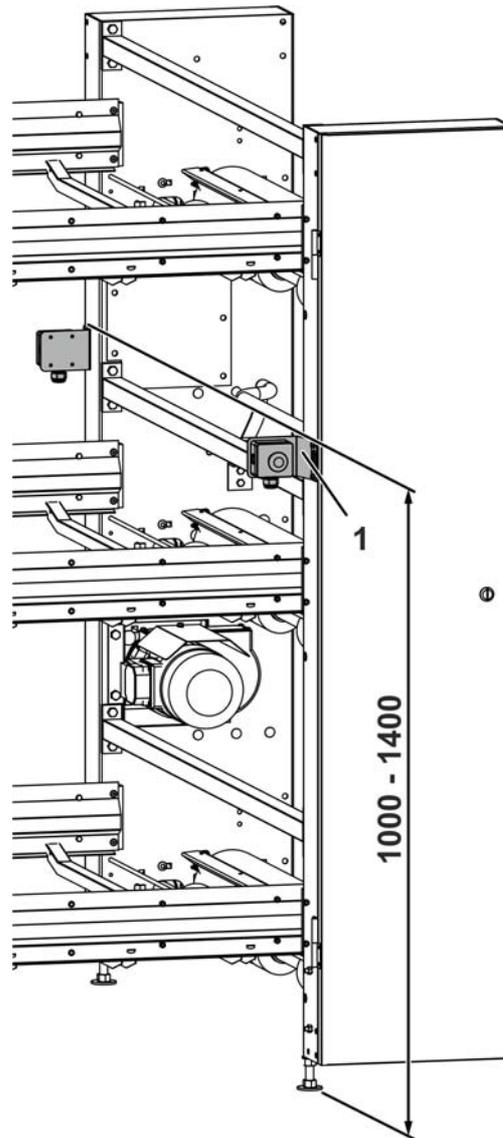
Before starting to use the Tangit cleaner and Tangit PVC-U, read and observe the corresponding technical data sheets! The data sheets provide instructions regarding pretreatment, handling, storing and product safety.

2.10.3 Important notes on putting gear motors into operation (aeration)**i NOTICE!**

Before putting the gear motors into operation, open the vent plugs of the gear motors if there is no automatic aeration included.



2.10.4 Overview of emergency shutdown switches at the system

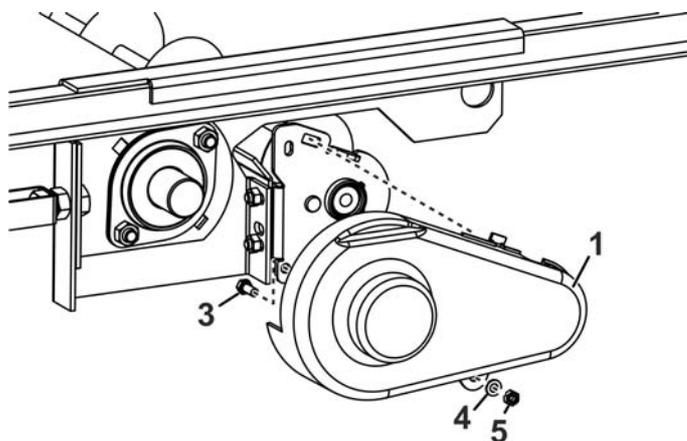


Switch for emergency shutdown at manure belt drive:

Pos.	Code no.	Description
1	83-09-3597	Emergency stop button cpl. for elevator/drive MB

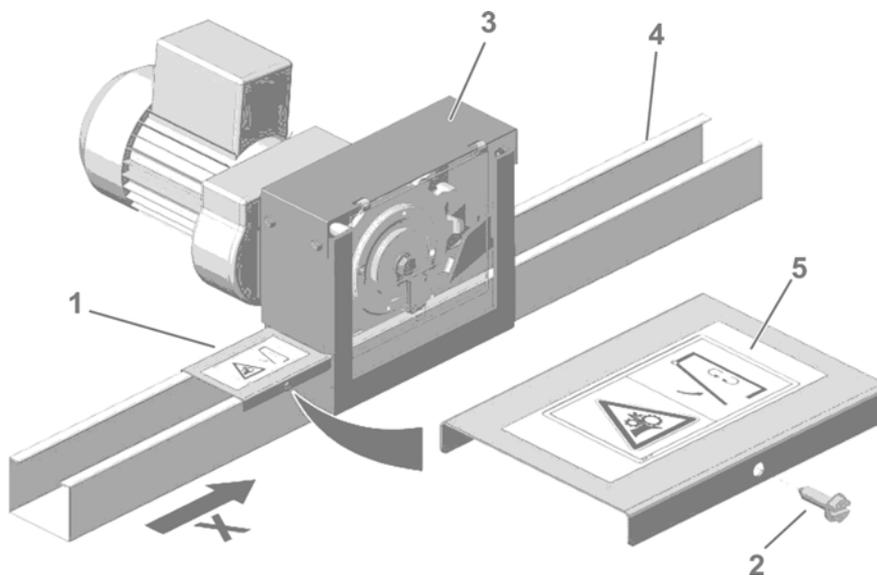
2.10.5 Overview of safety components of the system

At the manure belt idler unit:



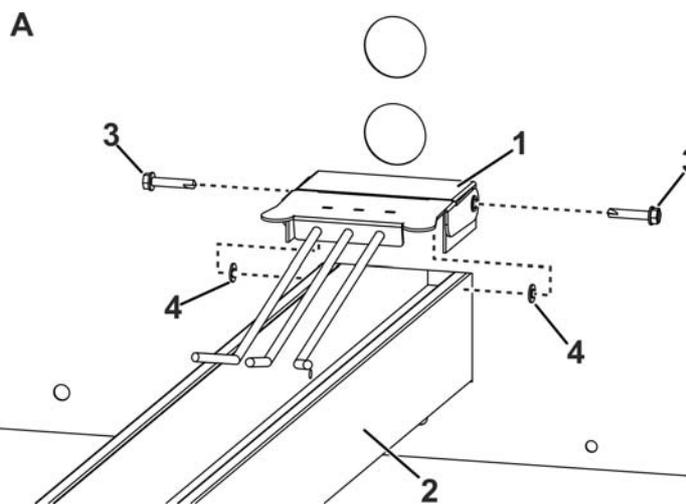
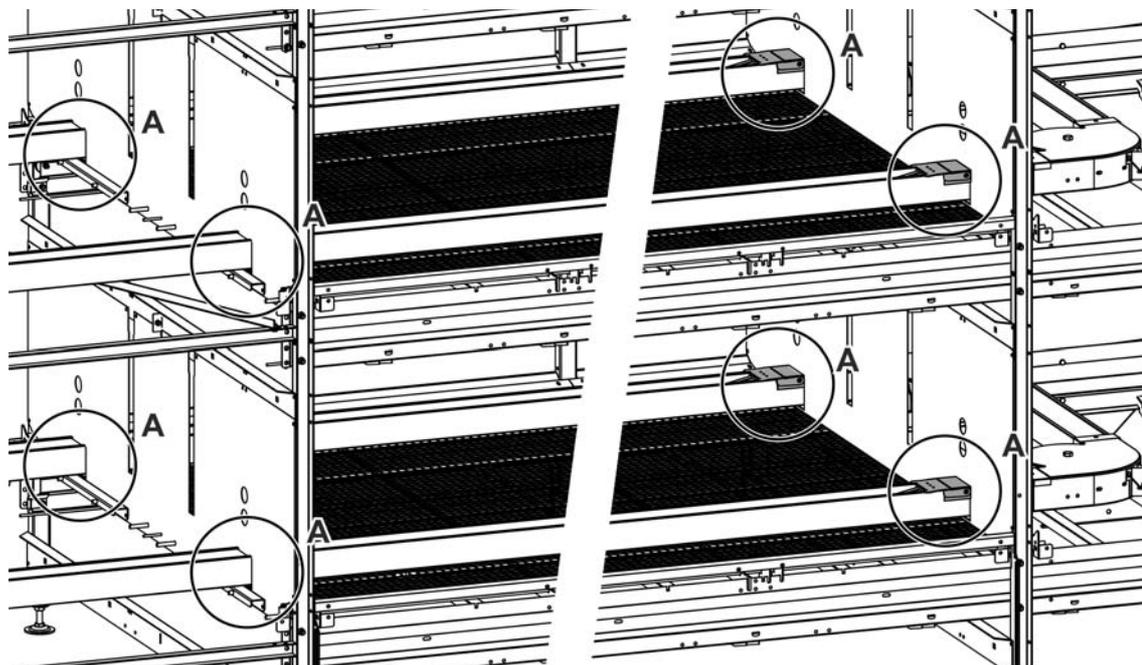
Pos.	Code no.	Description
1	83-04-9031	Guard cap right for chain drive XHD idler unit
2	83-04-6359	Guard cap left for chain drive XHD idler unit
3	99-10-1241	Hexagon head screw M 5x 12 galv. DIN 933 8.8 galv.
4	99-50-1146	Washer 5.3 DIN 433 galv.
5	99-10-1023	Hexagon nut M 5 galv. DIN 934-8

Safety guard for MPF drive:



Pos.	Code no.	Description
1	83-06-2300	Safety guard 120 mm for drive MPF
2	99-10-3882	Drilling screw 4.8 x 16 DIN 7504-K
3		MPF drive
4		Feed trough regular
5	00-00-1187	Pictograph: Danger of being crushed / protective equipment
X		Feed chain running direction

At the feed troughs (at the closed partitions/end set for manure belt drive, manure belt idler unit):



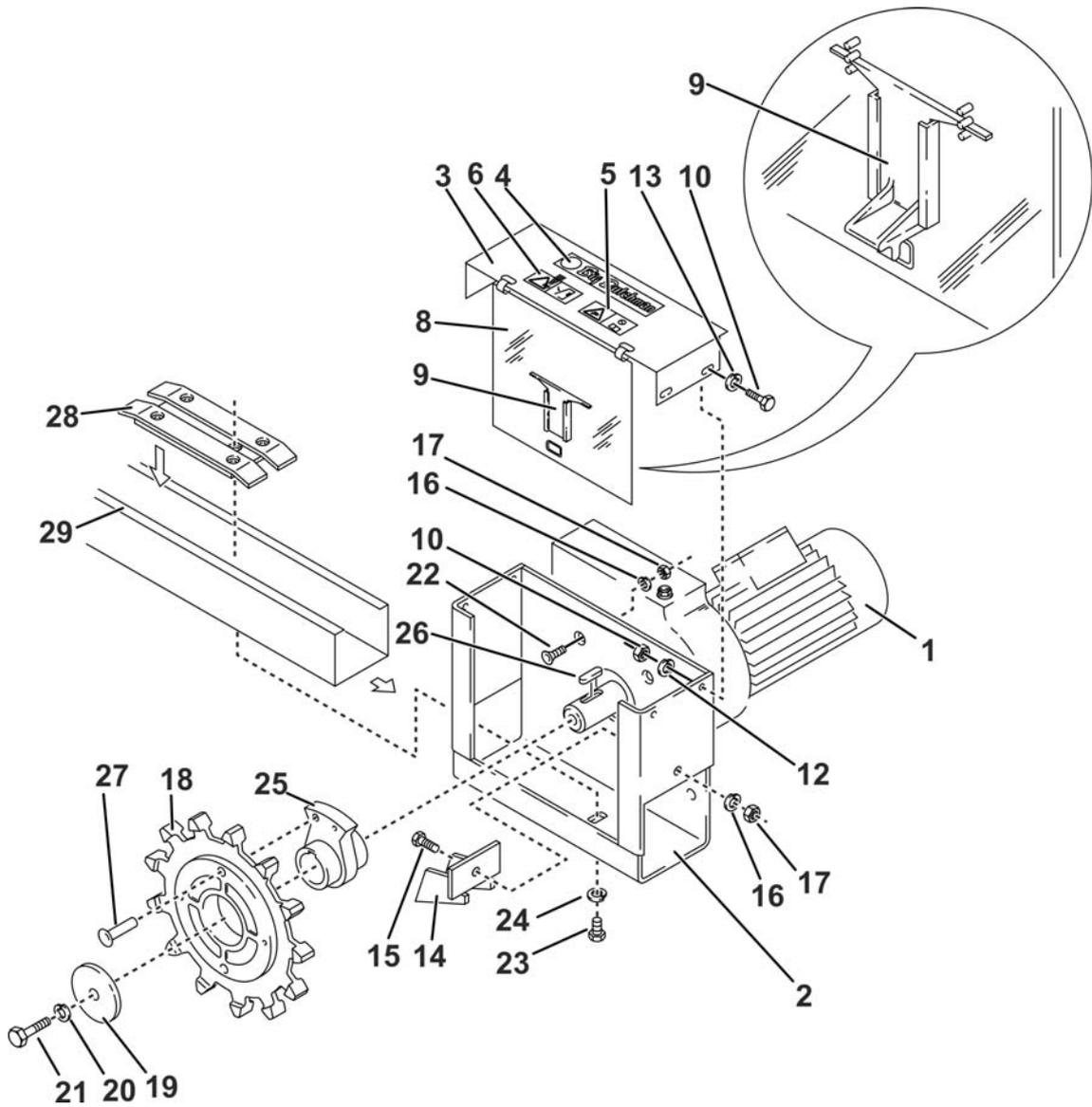
Pos.	Code no.	Description
1	83-01-4161	Chick guard 2003
2	15-20-1001	Feed trough 3000 Zn MCZ regular 1.2 mm
3	99-10-3938	Drilling screw 4.8x 25 DIN 7504-K galv.
4	99-20-1168	Washer B 5.3 DIN 125 galv.

Shear pin at the drive wheel of the feed chain:

The pusher fixed to the drive shaft moves the drive wheel of the feed chain via the shear pin (pos. 27). If the feed chain jams, the shear pin breaks, thus causing the feed chain wheel to stop. This prevents further damage. Use the shear pin 8x1.5x30 steel tubular rivet B DIN7340 (99-50-3913) for this purpose.

Only use the original shear pins!

Pos.	Code no.	Description
	10-93-5000	Drive MPF 1-L 12m 0.37kW ccw 400V 3PH 50Hz
1		gear motor
2	83-00-4647	Console MPF ccw
3	10-93-3192	Cover for drive gear MPF
4	00-00-1172	Type plate: Big Dutchman 135 mm x 25 mm
5	00-00-1186	Pictograph: Before maintenance work main switch "OFF"
6	00-00-1187	Pictograph: Crushing danger / protection device
7	10-93-3173	Protective cover MPF 1 line cpl. collapsible (pos. 8+9)
8	10-93-3154	Protective cover MPF 1 line collapsible
9	10-93-3174	Snap cover MPF 1 line PA6
10	99-10-1067	Hexagon head screw M 6x 16 galv. DIN 933 8.8
11	99-10-1045	Hexagon nut M 6 galv. DIN 934-8
12	99-20-1070	Spring washer A6 DIN 127 galv.
13	99-50-1147	Washer B 6.4 DIN 125 galv.
14	10-93-3153	Blank holder for chain 0498 MPF
15	99-10-1038	Hexagon head screw M 8 x 20 galv. DIN 933 8.8
16	99-50-1063	Spring washer A 8 DIN 127 galv.
17	99-10-1040	Hexagon nut M 8 galv. DIN 934-8
18	10-00-9543	Drive-gear reversible for MPF-drive
19	10-93-1109	Washer 14x58-6 DIN 1052 galv.
20	99-50-1205	Spring washer A 12 DIN 127 galv.
21	99-10-1274	Hexagon head screw M 12 x 30 galv. DIN 933 8.8
22	99-10-3877	Hexagon socket countersunk head screw M 8 x 25 DIN 7991 galv.
23	99-10-1068	Hexagon head screw M 10 x 20 galv. DIN 933 8.8
24	99-20-1055	Spring washer A 10 DIN 127 galv.
25	10-93-3104	Pusher Bo 35x57 MPF/CH
26	99-50-1149	Key 10x8x50 DIN 6885
27	99-50-3913	Shear pin 8x1.5x30 steel tubular rivet DIN 7340
28	38-91-3014	Guide plates with base plate for guide shoe SF/MPF
29	15-20-1001	Feed trough 3000 regular 1.2 mm (blank)



2.10.6 Overview of safety symbols and danger signs at the system

At the doors of the manure belt drive (inside and outside):

i NOTICE!

The doors of the manure belt drive are safety components!

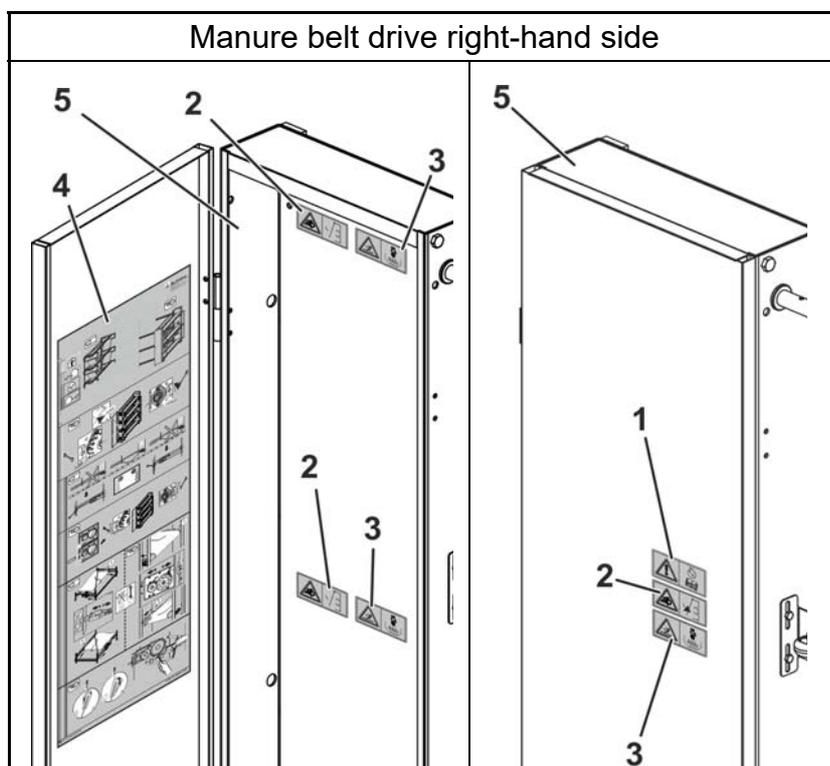
To order the doors, make sure to consult the **spare parts list "Manure belt removal system [HD / HD2-plus from 2012]"**.

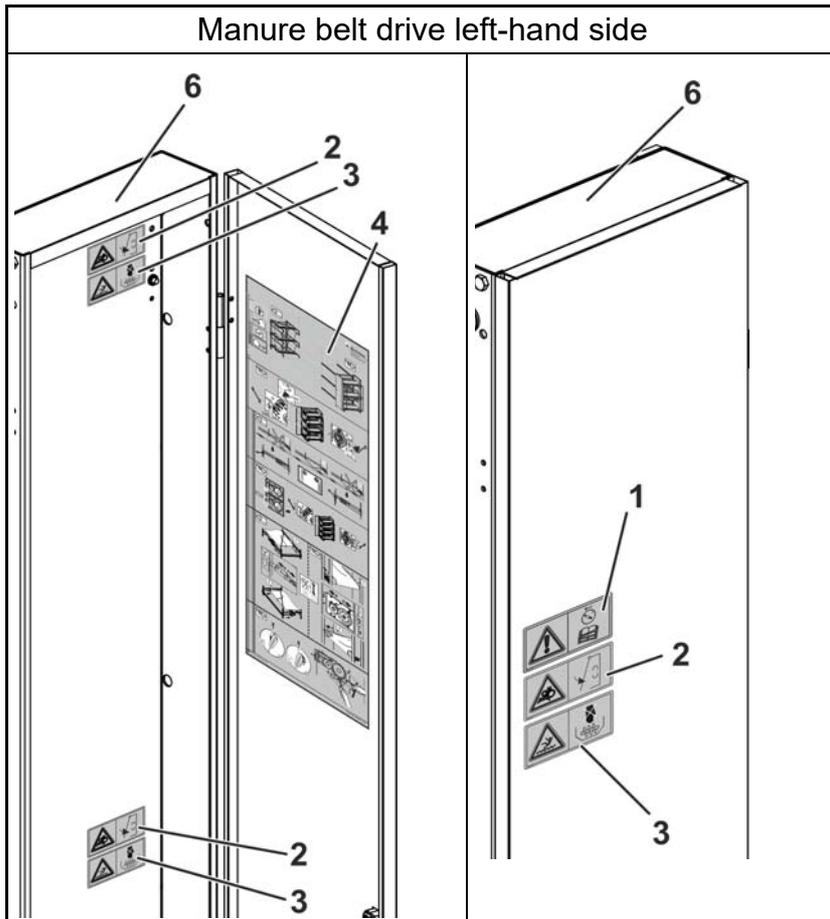
The manual can be ordered under the following code number, if necessary:

99-94-0452.

(Please also refer to the information under 1 "About this manual"

Pos.	Code no.	Description
1	00-00-1186	Pictograph: Before maintenance work main switch "OFF"
2	00-00-1187	Pictograph: Crushing danger / protection device
3	00-00-1188	Pictograph: Risk of injury / hopper
4	00-00-1330	Sticker INT: Adjustment end set manure removal
5		Side piece manure belt drive - right-hand side
6		Side piece manure belt drive - left-hand side

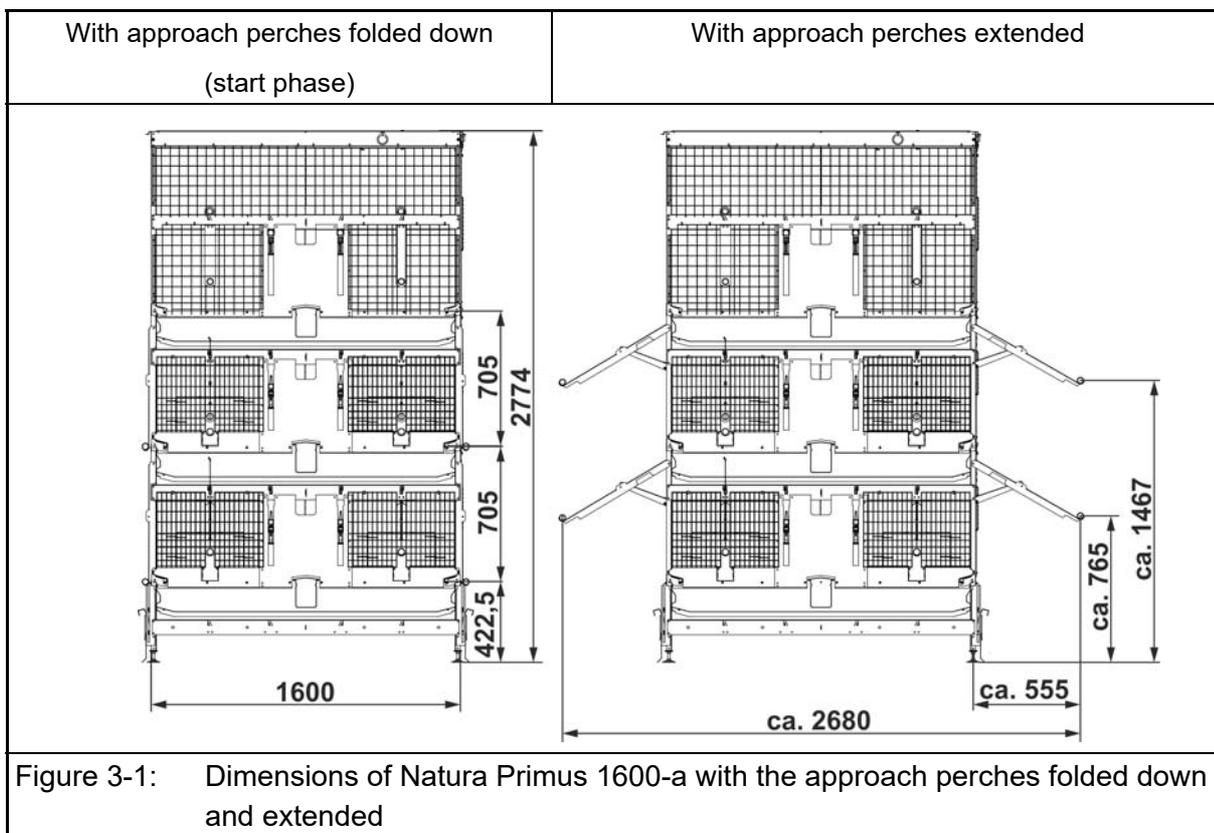


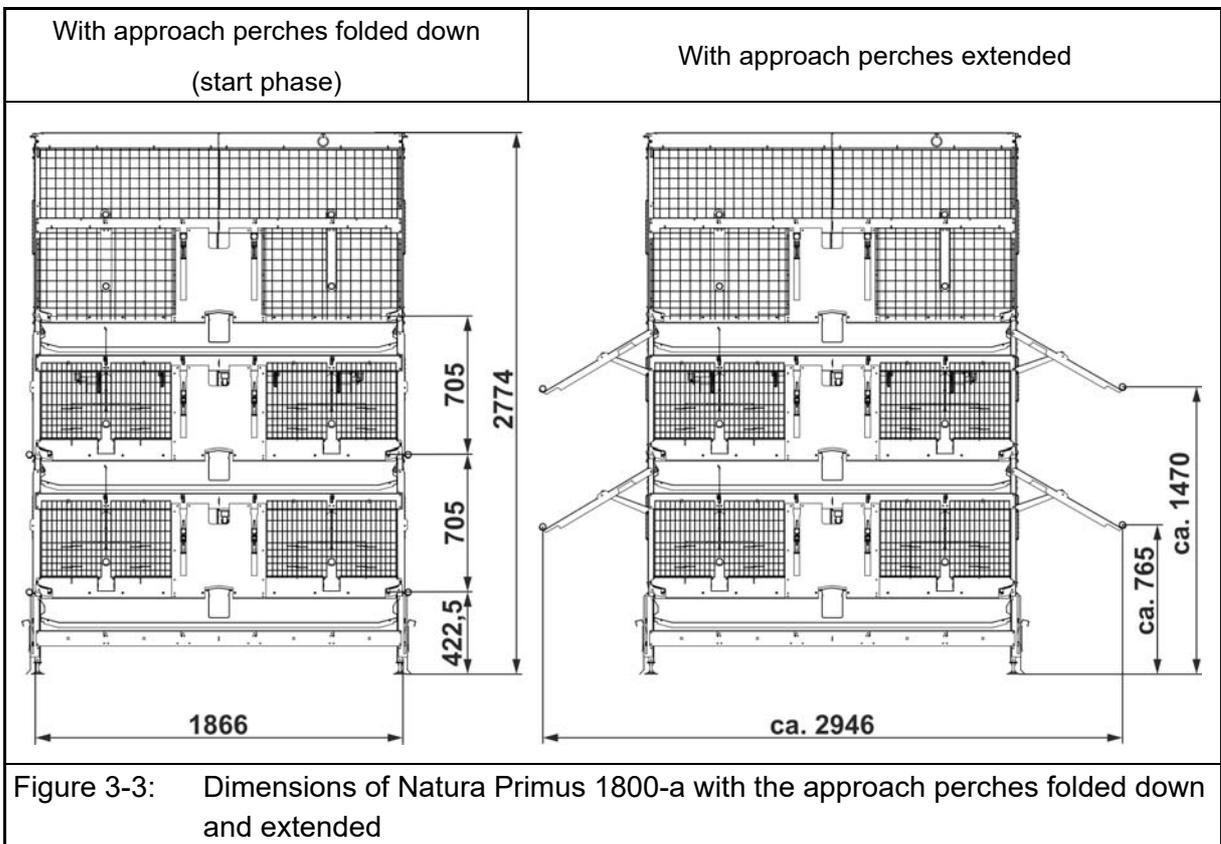
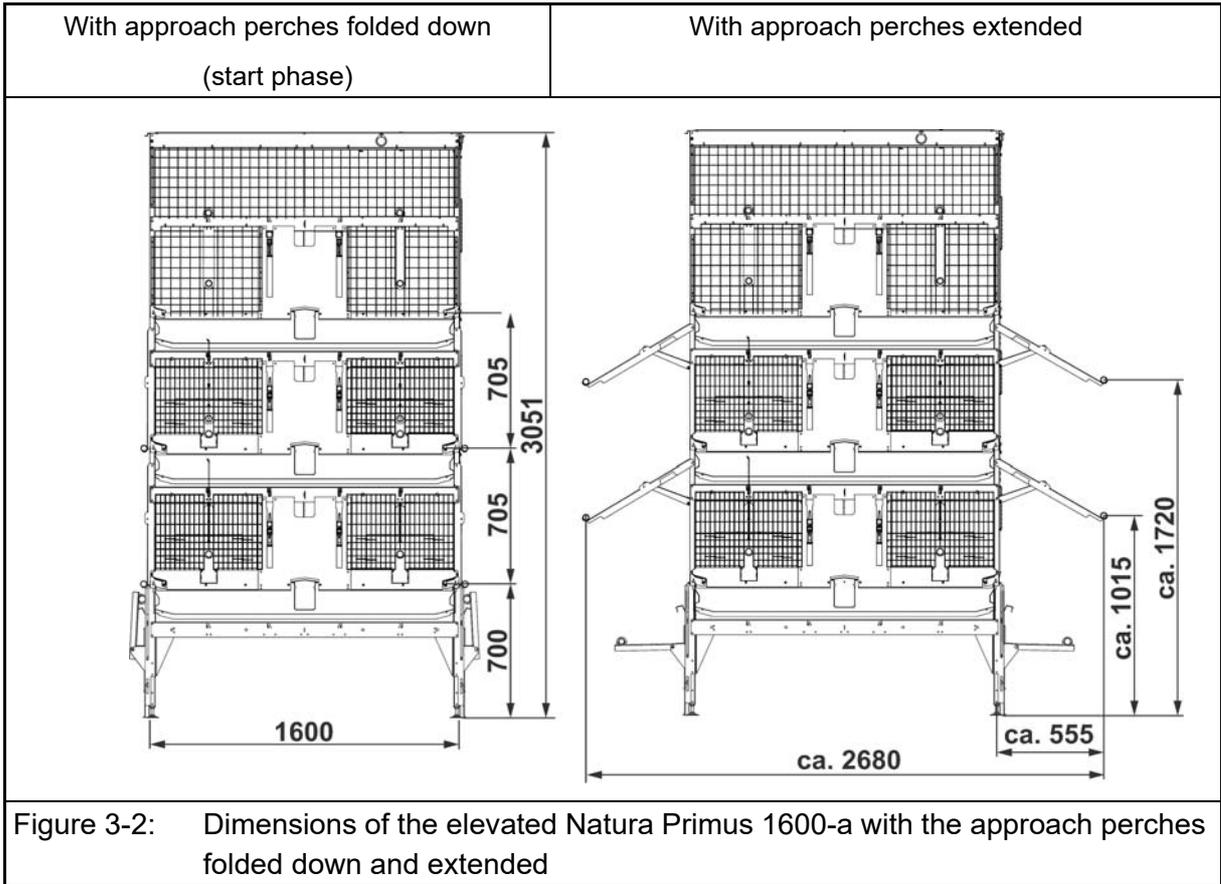


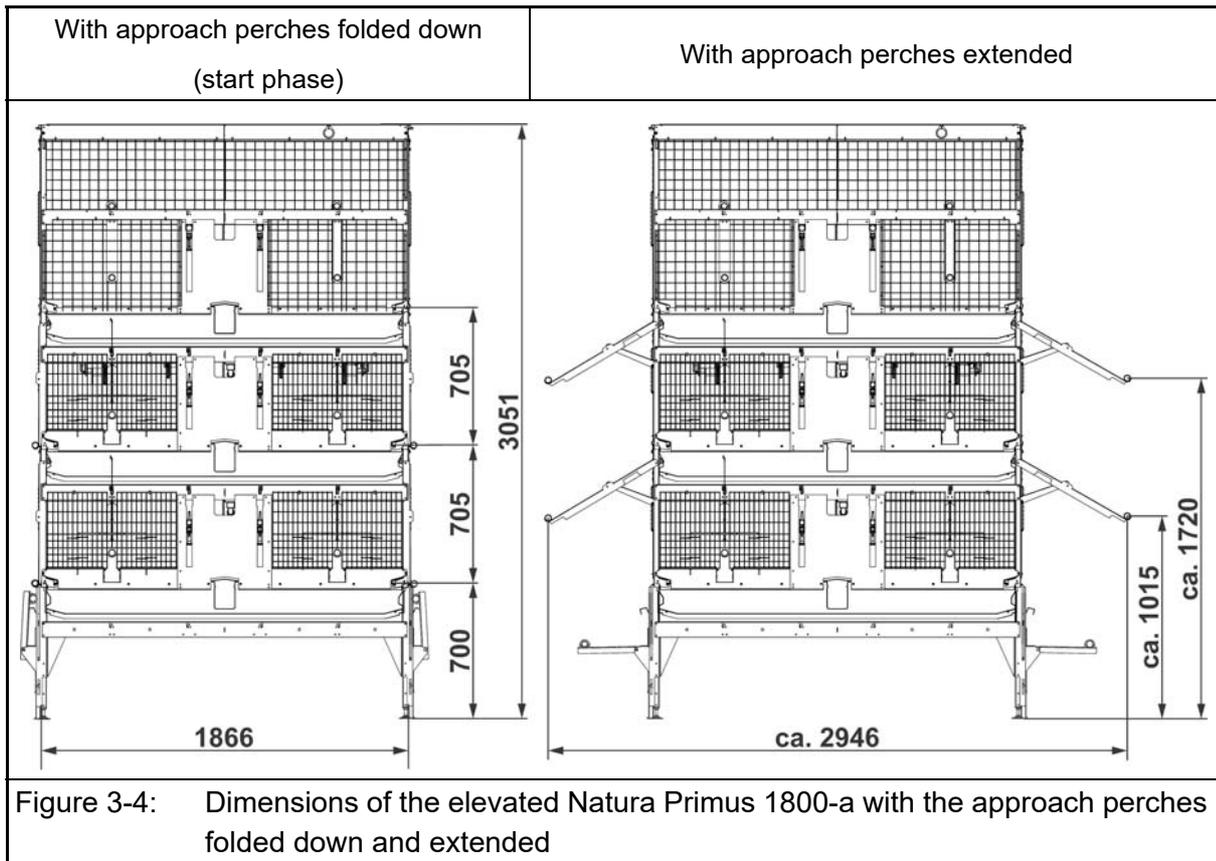
3 System description

The **Big Dutchman NATURA Primus** is a 3-tier system for the rearing of laying hens. This system is designed to create the conditions for a seamless transition from the rearing to the laying aviary. The objective is to produce uniform, healthy pullets and get a good start of the laying phase. In order for the birds to get used to the laying aviary system as soon as possible, *training* from the first day onwards is an essential prerequisite.

3.1 Dimensions







3.2 Available usable area

Available usable area Natura Primus 1600-a	Per section		Per runn. m house length for 1 row (=> 10 "Glossary")	
	Width [m]	Usable area [m ²]	Width [m]	Usable area [m ²]
1st tier (bottom)	1.600 x 2.412	3.86	1.600 x 1.000	1.60
2nd tier (centre)	1.600 x 2.412	3.86	1.600 x 1.000	1.60
3rd tier (top)	1.600 x 2.412	3.86	1.600 x 1.000	1.60
Sum		11.58		4.80

Table 3-1: Available usable area Natura Primus 1600-a

Available usable area Natura Primus 1800-a	Per section		Per runn. m house length for 1 row (=> 10 "Glossary")	
	Width [m]	Usable area [m ²]	Width [m]	Usable area [m ²]
1st tier (bottom)	1.866 x 2.412	4.5	1.866 x 1.000	1.87
2nd tier (centre)	1.866 x 2.412	4.5	1.866 x 1.000	1.87
3rd tier (top)	1.866 x 2.412	4.5	1.866 x 1.000	1.87
Sum		13.5		5.60

Table 3-2: Available usable area Natura Primus 1800-a

3.3 Feeding places and drinkers

Tier 1 and 2 serve as rearing tiers. The chicks are moved into these tiers and remain here during the first weeks until they are able to move between the different levels. Both tiers are equipped with feeding and drinking systems which can be adjusted to the birds' changing height.

NOTICE!

Height-adjustable drinker lines are absolutely essential in the 1st and 2nd tiers!

Since these are rearing tiers, the ability to adjust the height of the drinking lines to the changing size of the growing birds is essential.

Tier 3 serves as a resting zone. The birds should only be allowed access to this tier if they can move between the levels. In the standard version, tier 3 is equipped with a fixed drinker line, but not with a fixed feed line. A height-adjustable drinker line is an optional feature.

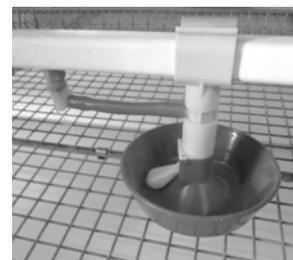
The **Big Dutchman** CHAMPION® feed chain distributes the feed in the feed troughs it runs through. It transports the feed through the troughs evenly, without separating it. The birds can access the trough from both sides. The depth of the trough as well as the inward rim prevent feed wastage. By default, a feed trough with height-adjustable perch is installed. A feed trough with fixed perch is optional.

Nipple drinkers on all levels ensure **water supply**. The nipple pipes are equipped with 360° nipples with a flow rate of 45 ml/min vertically and 30 ml/min horizontally. The way the nipples are distributed ensures easy access to the water. Drip cups at the nipple pipes collect splash water and thus prevent that the litter and the manure get wet. Wet manure has a negative effect on the climate in the house as it causes increased ammonia levels.

The chicks' bodies grow the most while they are in the rearing tier(s). Delayed water intake can cause their growth to slow down.

As an option, all nipple drinkers can be equipped with one starter cup per section to facilitate water intake at the beginning.

The chicks then do not have to peck at the nipples, but can instead drink from the small cup. Using starter cups is not obligatory, especially considering their one clear disadvantage: They are not as hygienic as nipple drinkers. Replace the starter cups with nipples after approx. 10 days.



1 Drinker lines

2 Feeding lines

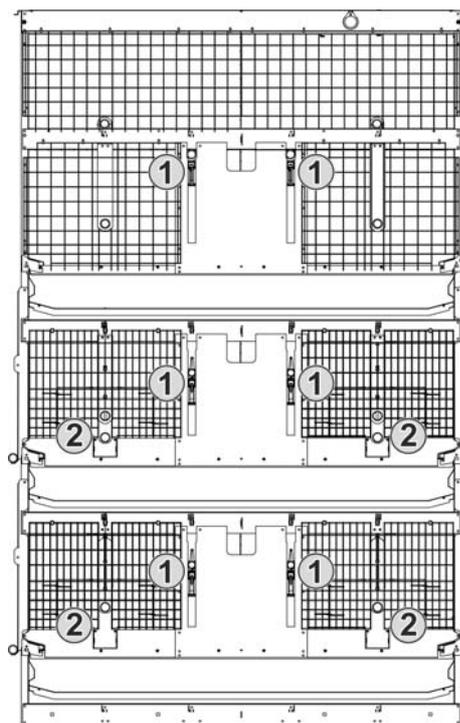


Figure 3-5: Feeding and drinking lines

Available feeding places	Per section		Per runn. m house length for 1 row	
	Number [pcs.]	Feeding place [m]	Number [pcs.]	Feeding place [m]
Feed troughs	4.00 x 2.412 m x 2	19.30	4.00	8.00
Available drinkers – Natura Primus 1600-a	Per section		Per runn. m house length for 1 row	
	Number [pcs.]	Number of nipple drinkers [pcs.]	Number [pcs.]	Number of nipple drinkers [pcs.]
Drinker lines tier 3	2.00 x 8	16.00	2.00	6.63
Drinker lines tier 1 and 2	4.00 x 10	40.00	4.00	16.58
Total		56.00		23.22

3.4 Partitions

Within the section:

The *foldable partitions* have the advantage that they can be folded closed, e.g. before vaccinations (using needles), or for moving the birds out. Catching the birds becomes easier because they have less space to move around. As an option, the partitions can remain closed during the entire rearing phase. Closing the partitions makes it easier to catch the birds, but also limits their freedom of movement inside the house.

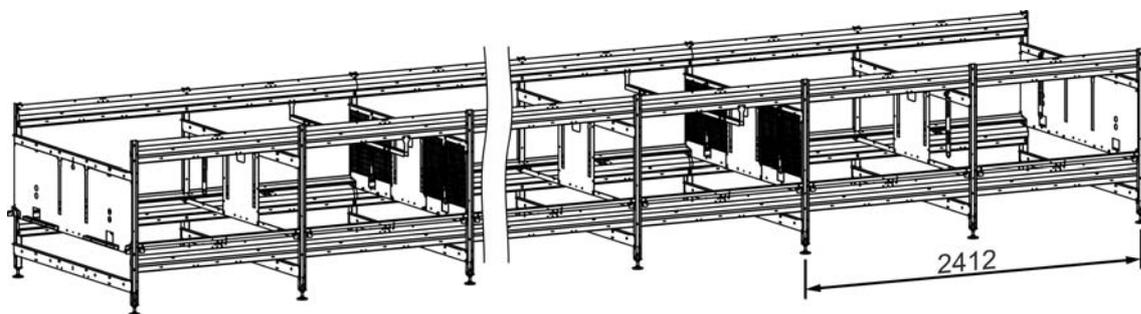


Figure 3-6: Schematic of the foldable partitions every 2412 mm (at the main stillages)

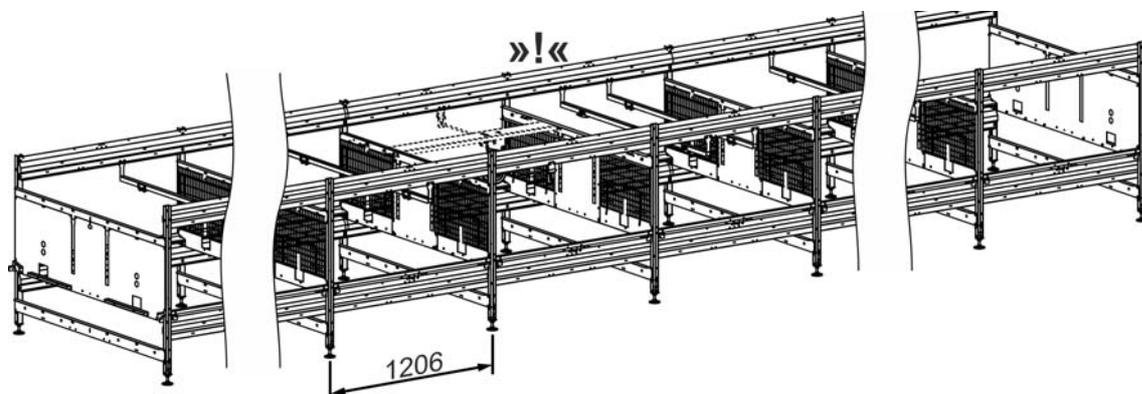


Figure 3-7: Schematic of the foldable partitions every 1206 mm (at the main and intermediate stillages)

The partition at the intermediate stillage for nipple drinker and perch height adjustment (see »!«) is turned around by 180° and mounted to the *cross members drinker adjustment Primus*.

Towards the outside of the system:

After opening the *front grids*, the birds may be granted access to the litter after they have become used to the system. If the pullets leave the system too early, they will not find their way back at night or have problems doing so.

Below the system:

Using the *cover plates* prevents the birds from entering the area under the system. For cleaning purposes, the plates can either be folded or slid up to have easy access to the area below the system.



Figure 3-8: Foldable cover plate



Figure 3-9: Sliding cover plate

3.5 Perches

Perches support the birds' natural urge to sit in elevated places (=> 10 "Glossary"). They also help the birds to move between the levels. The perches used as approach aids can be folded down automatically. This ensures that the pullets sleep in the system instead of above the scratching area, i.e. on the perch.

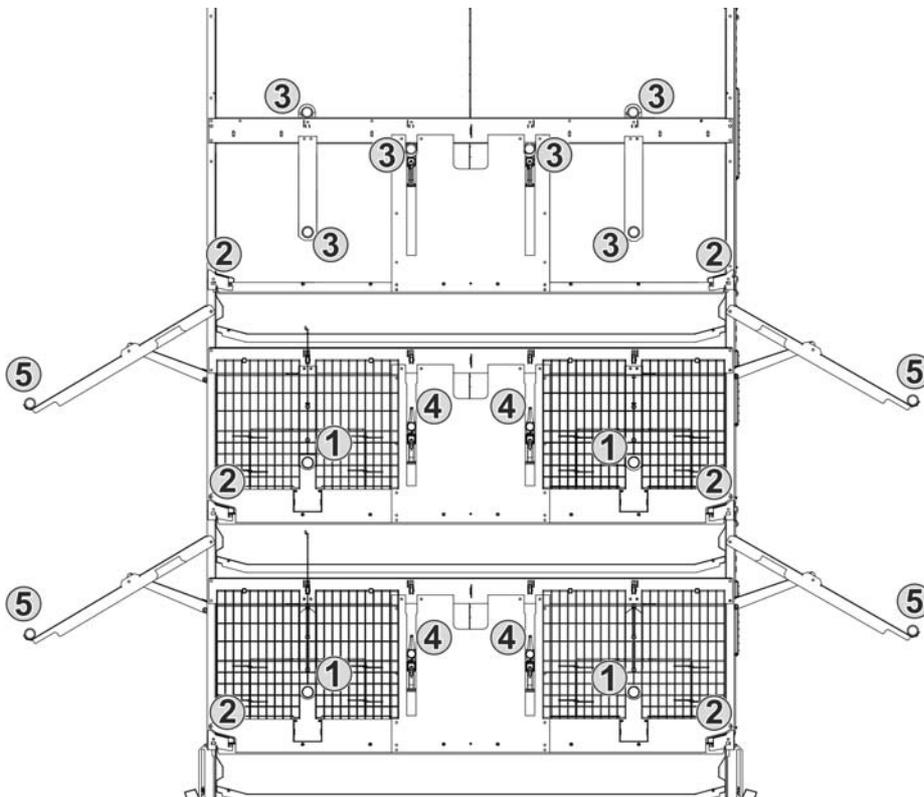


Figure 3-10:
Available perches and approach aids

Available perches		Per section		Per runn. m house length for 1 row	
		Number [pcs.]	Perch [m]	Number [pcs.]	Perch [m]
①	Above the feed trough	4.00 x 2.412	9.65	4.00 x 1.00	4.00
②	Special profile as approach aid	6.00 x 2.412	14.47	6.00 x 1.00	6.00
③	Others, above the manure belts	6.00 x 2.412	14.47	6.00 x 1.00	6.00
④	Above the drinkers, height adjustable	4.00 x 2.412	9.65	4.00 x 1.00	4.00
⑤	As approach aid	4.00 x 2.412	9.65	4.00 x 1.00	4.00
Total			57.89		24.00

3.6 Cable winches

Technical data

Nominal capacity	based on the first layer of the coiled cable on the winch:	544 kg (1200 lbs)
	based on the outermost layer of the coiled cable on the winch:	172 kg (379 lbs)
Gear ratio:		4.1 : 1
Reel diameter:		Ø 33 mm
Holding capacity of the reel: Cable diameter x cable length:		Ø 4.76 mm x 1600 mm (3/16" x 55 ft)
Dimensions (L x W x H):		183 mm x 272 mm x 150 mm
Handle	Length:	206 mm
	Required manual force:	13.5 kg
Net weight:		3.5 kg

Height adjustment of the feeding and drinker lines:

A cable winch is installed in the centre of each row and tier. Use this winch to adjust the height of the nipple drinkers and the tube above the feed trough.

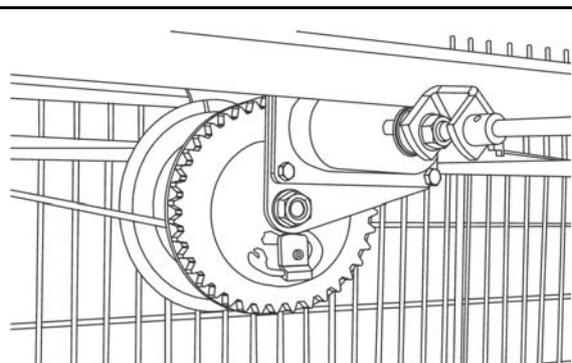


Figure 3-11: Cable winch for height adjustment

Central actuation of the front grids:

The cable winches for the centrally actuated front grids can be found in the end set.

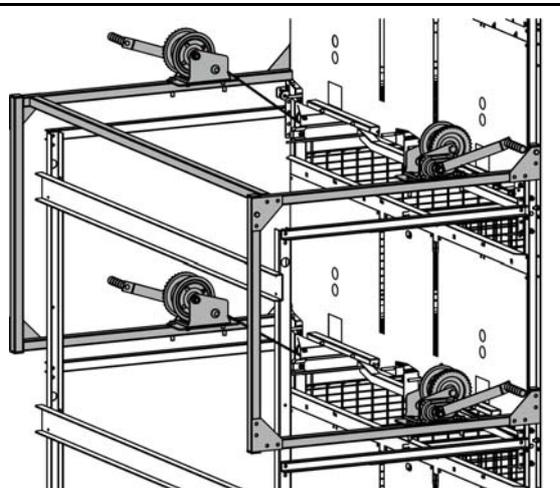


Figure 3-12: Cable winches for centrally actuated front grids

3.7 Chick bridge and chick ramp

Chick bridges and ramps help the birds to reach the lower and central levels after the system has been opened.

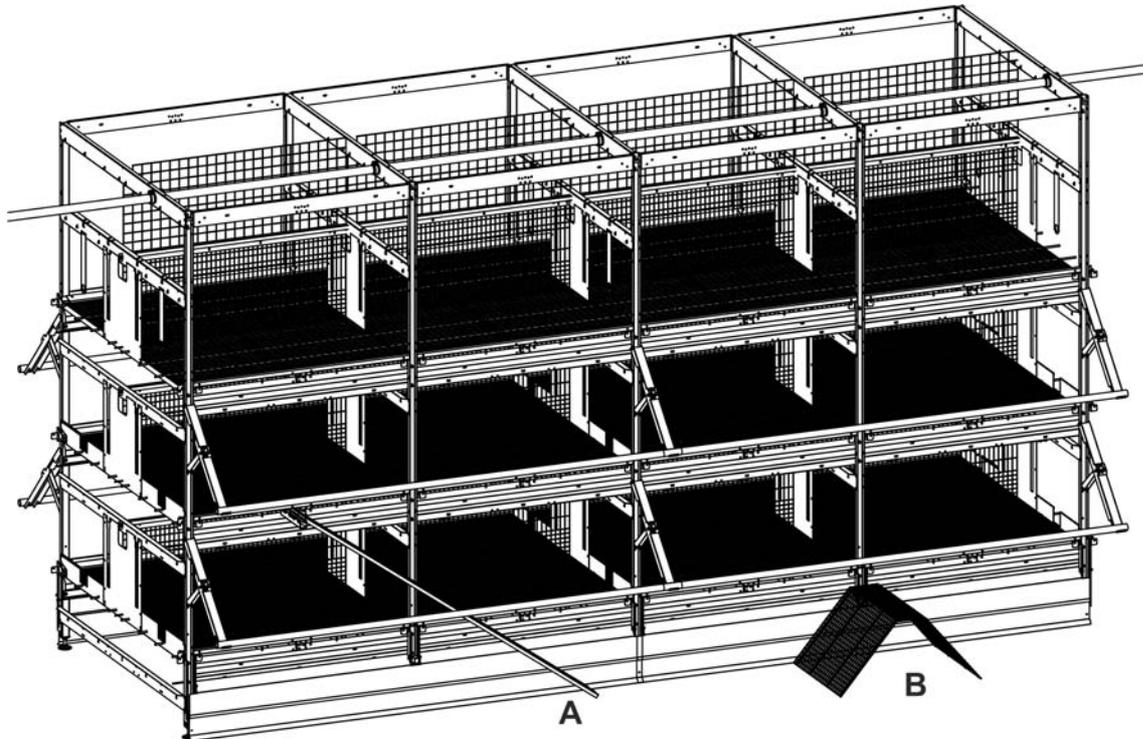


Figure 3-13: Chick bridge and chick ramp

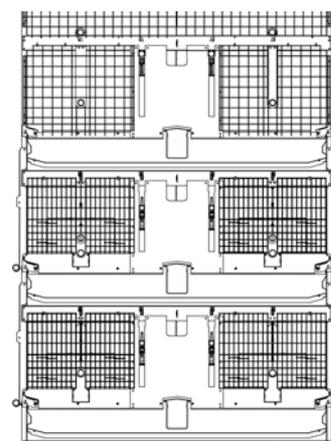
Distribution of the chick bridges and ramps along the section:

A	B	A	B	A	B
2412	2412	2412	2412	2412	2412
B	A	B	A	B	A

Pos.	Code no.	Description
A	38-30-6001	Chick ramp wire grille cpl NAT-Primus
B	83-09-7477	Chick bridge wire mesh NAT-Primus
	83-03-0065	Chick bridge wire mesh NAT-Primus elevated

3.8 Manure drying (optional feature)

The Natura Primus with manure drying has *air ducts* installed above the manure belts. The air flowing from these ducts dries the manure on the belts. This helps to reduce the ammonia content in the house as well as the weight of the manure. Manure removal intervals can be shortened because the manure belts are stressed less.



3.9 Notes for layout and calculation

i NOTICE!

Observe the local valid implementing regulations of the animal protection laws when designing the system.

Criterion	Minimum requirements
Stocking density per m ²	18 birds (from day 35)
Stocking density per m ² usable house floor surface	36 birds (from day 35)
Stocking density per m ² litter area	54 birds (from day 54)
Feeding (longitudinal troughs)	min. 45 mm trough side per bird
Drinkers	max. 10 birds per drinking nipple
Perches	from week 10: 100 mm/bird (recommended: 150 mm/bird)
Number of levels	max. 4 levels above the house floor, distance of min. 400 mm, min. every other tier with manure belt, otherwise not considered usable area

(Recommendation of LAVES [Lower Saxony State Office for Consumer Protection and Food Safety])

3.10 Overview of the standard version and additional options

The following overview shows the standard features of a Natura Primus system and the optional features which may be installed additionally or instead of the standard features.

3.10.1 Drinker lines

Standard	
Tiers 1 and 2	Height-adjustable drinker line
Tier 3	Fixed drinker line

Option	
Tier 3	Height-adjustable drinker line

3.10.2 Feeding lines

Standard	
Tiers 1 and 2	Feed trough with height-adjustable perch
Tier 3	No feeding system

Option	
Tiers 1 and 2	Feed trough with fixed perch
Tier 3	Feed trough with fixed perch

3.10.3 Partitions within the section

Standard	
Tiers 1 and 2	Foldable partition every 2412 mm (at the main stillages)
Tier 3	Fixed partition (wire) per section (2412mm)
All tiers	Fixed partition (closed) at the end set stillages / for cross division of the house

Option	
Tiers 1 and 2	Foldable partition every 1206 mm (at the main and intermediate stillages)
Tier 3	No partition
	Fixed partition (wire) every 1206mm (at the main and intermediate stillages)

Option	
All tiers	No foldable partition between a last half section (1206 mm) and a complete section (2412 mm)
	No foldable partition
	Additional fixed partition for cross division of the house

3.10.4 Front grids

Standard	
Tiers 1 and 2	Sliding front grid with separate actuation

Option	
Tiers 1 and 2	Sliding front grid with central actuation
Tier 3	Sliding front grid with separate actuation
	Sliding front grid with central actuation

3.10.5 Cover plates

Standard	
	Collapsible cover plates

Option	
	Liftable cover plate with separate actuation
	Liftable cover plate with central actuation

4 Operating the house and system components

4.1 Litter area

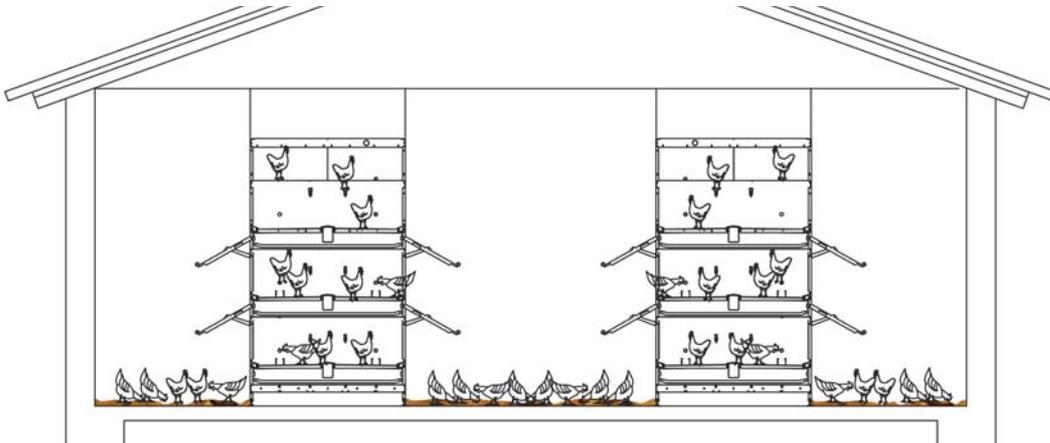


Figure 4-1: Natura Primus litter area (standard height)

Use the following materials in the litter area:

- sand or gravel (up to a grain size of 8 mm)
- wood shavings
- wheat, rye or spelt groats
- bark mulch
- woodchips

Make sure that the litter is dry and clean. Straw must be free from fungus. Wood shavings must originate from untreated wood and must not raise dust.

Litter is first required when the chicks leave the system. Bring the litter in when the house is completely dry. A height of 1 to 2 cm is sufficient. Re-litter places where moisture may gather, if necessary.

No condensation may form between the floor and the litter, especially when outside temperatures are low. Ammonia rates increase if litter is moist. High ammonia rates can cause problems with the intestines and foot pads (centres of inflammation in the birds' bodies) as well as coccidiosis, and accelerate corrosion of the equipment in the house.

4.2 Lighting program

NOTICE!

Recommendation:

Consult with the breeder and the egg producer regarding the lighting program.

- Often, an intermittent lighting program (=> 10 "Glossary") is recommended for the beginning of the rearing phase (up to day 10).
- The better the lighting program during the rearing phase and the laying period match, the easier is the start for the layers in the laying house.

Shortening the light day during the first weeks of rearing sensitizes the chicks to light stimuli. Extending the light day towards the end of the rearing phase stimulates the pullets.

General notes regarding the lighting program:

- The lighting program should start as soon as the chicks are moved into the house to ensure that they get used to the program from the very beginning.
This also applies if the chicks are still in the rearing tier and do not yet have to return to the system for the night.
- Dim any unwanted external light sources.
- Consider strain, age and stress situation of the flock when adjusting the brightness in the house. A light intensity of no less than 20 lux at the birds' eye level is recommended.

To make the system more attractive for the hens at night, the light in the system (LED tube lamp) can be switched off during the light day. It is only switched back on shortly before the lighting program dims the light in the evening.

This light in the system helps the birds with orientation to find their way into the system. Dim the light of the other lamps in the system after all laying hens have reached the Primus system.



NOTICE!

The lighting program may not be extended as long as the pullets are not to be stimulated.

**NOTICE!**

Problems with the birds' water intake due to insufficient lighting of the system.

- ▶ Always ensure that the system is lighted sufficiently to make finding nipples and starter cups easier for the birds.

4.2.1 Example of a lighting plan for the rearing phase

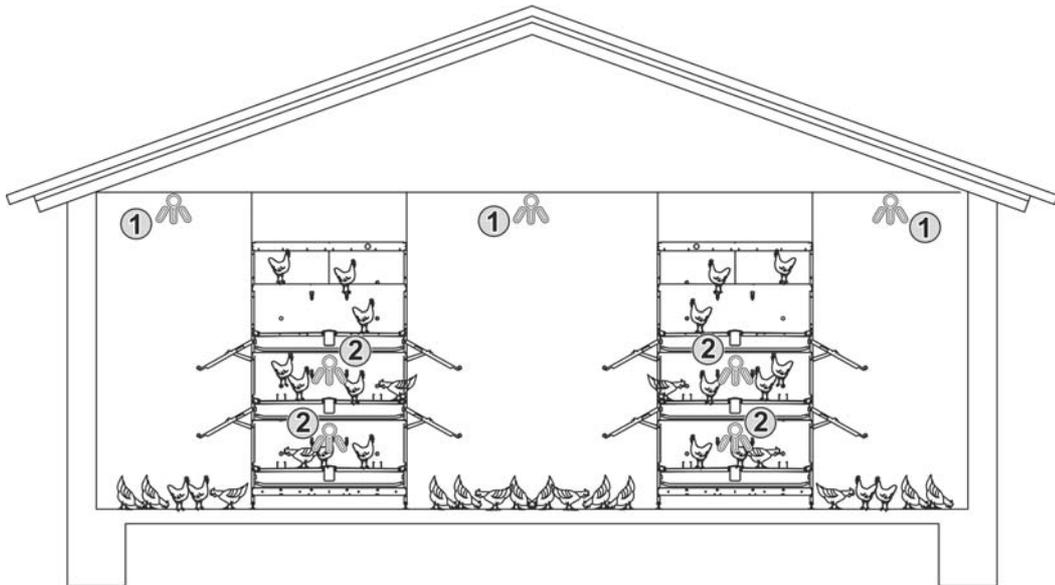
Age (in weeks)	Light period (in hours)
Week 1	Intermittent lighting program: Darkness for 6 hours at night / during the day approx. 4 hours of light and 4 hours of darkness, intermittently (stimulates the chicks to eat and drink during the light day)
2	14
3	12
4	10
5	9
6	9
7	9
8	9
9	9
10	9
11	9
12	9
13	9
14	9
15	9
16	9
17	10
18	11
19	12
20	13

4.2.2 Sequence of a light day

4.2.2.1 Regular system height [standard]

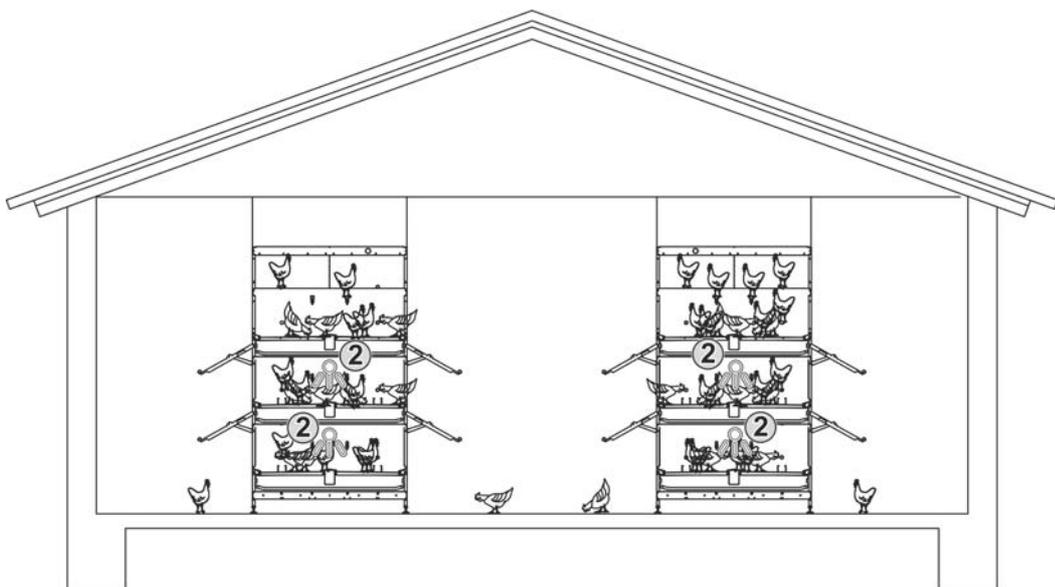
Day:

1. The ceiling lights (pos. 1) are switched on.
2. The LED tube lamps within the system (pos. 2) may also be switched on.



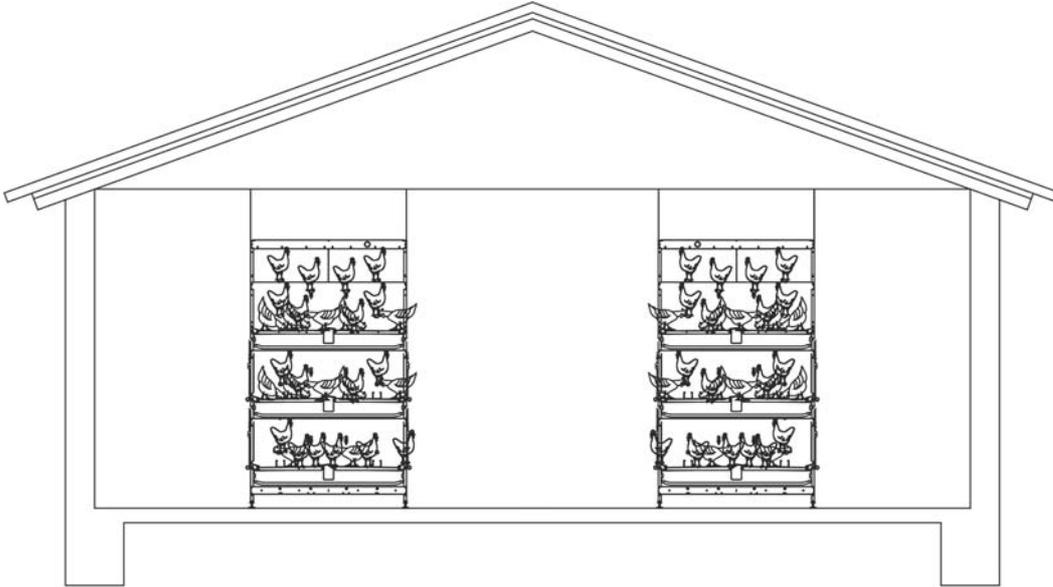
Twilight phase:

1. Before dimming the ceiling lights (pos. 1), switch on the LED tube lamps within the system (pos. 2).
2. After dimming and then switching off the ceiling lights (pos. 1), dim and switch off the LED tube lamps (pos. 2).



Night:

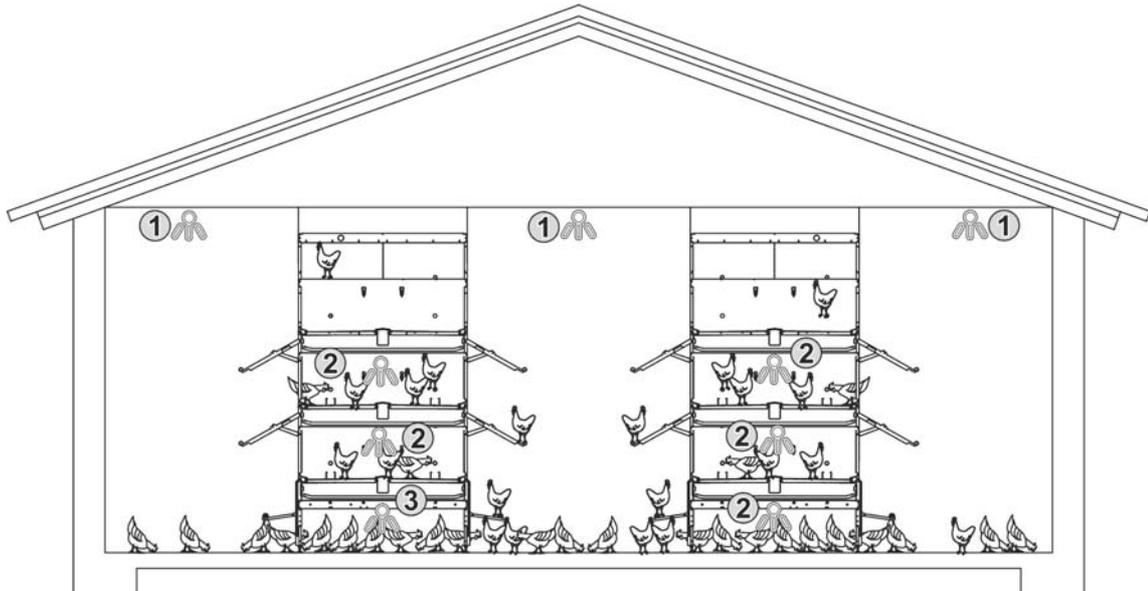
1. The entire lighting inside the house (pos. 1 and 2) is switched off. The pullets have returned to the system to rest.



4.2.2.2 Elevated system [option]

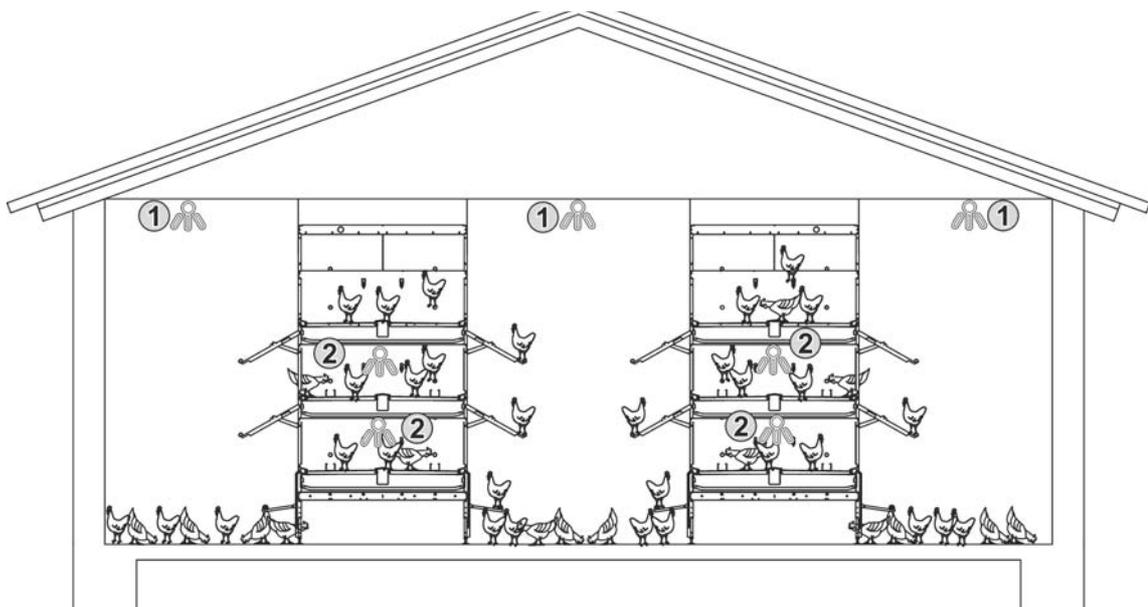
Day:

1. The ceiling lamps (pos. 1) are switched on.
2. The LED tube lamps within the system (pos. 2) may also be switched on.
3. The LED tube lamps below the system (pos. 3) are switched on.



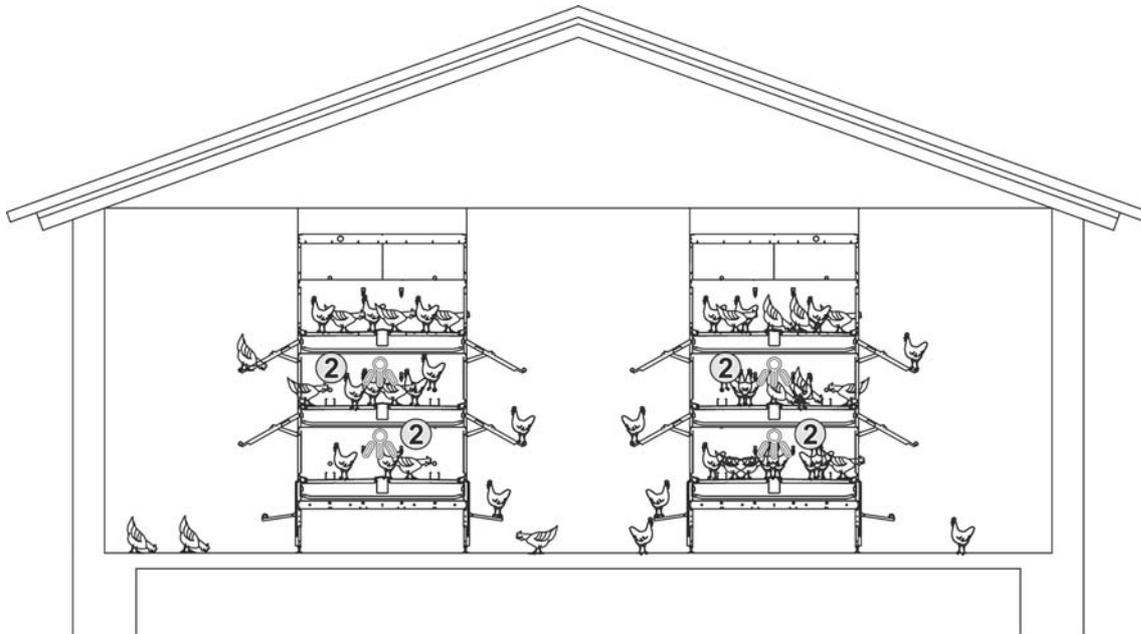
Twilight phase 1:

1. Before dimming the ceiling lights (pos. 1), switch on the LED tube lamps within the system (pos. 2).
2. After the LED tube lamps in the system (pos. 2) have been switched on, the LED tube lamps below the system (pos. 3) may be switched off.

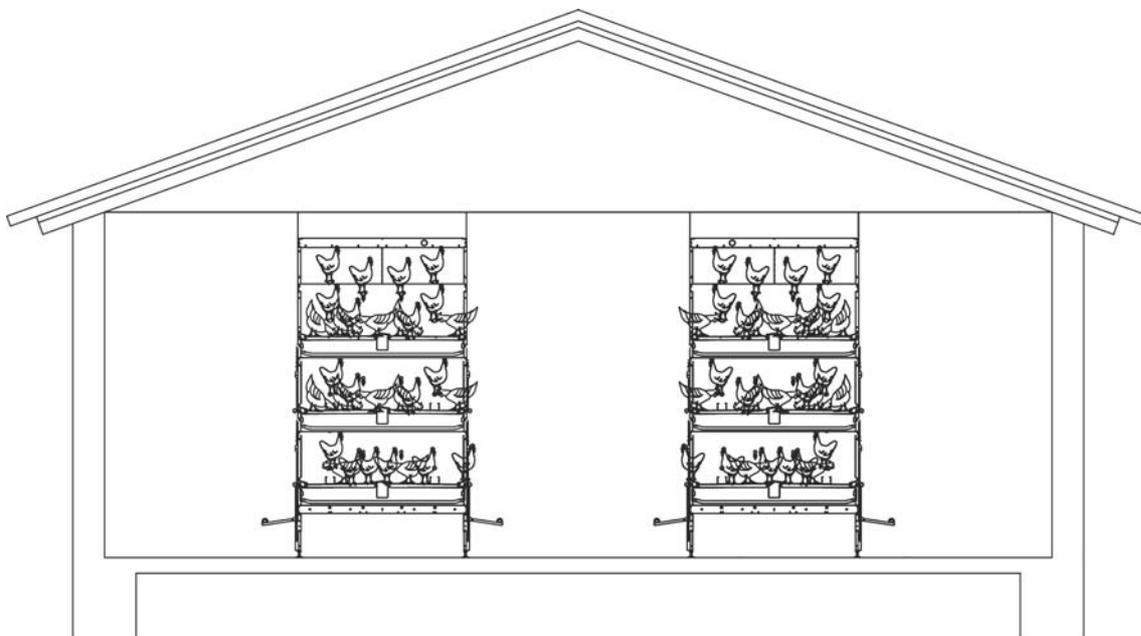


Twilight phase 2:

- Dim and switch off the ceiling lights (pos. 1). Next, dim and switch off the LED tube lamps within the system (pos. 2).

**Night:**

1. The entire lighting inside the house (pos. 1 and 2) is switched off. The pullets have returned to the system to rest.



4.2.3 Preventing external light sources in the house

External light sources in the house can lead to uncontrolled distribution and movements of the birds, especially during the summer. This happens because it might already be bright in some places of the house before the actual lighting is switched on. The birds will then start to become active too early. It might also happen that in other places of the house, it is still bright, even though the lighting was already switched off. The birds would then use the external light source as reference and spend the night in the litter instead of in the system.

- It is therefore necessary that openings for daylight can be dimmed out, e.g. by means of shutters, wooden plates, blinds, etc.
- Openings for ventilation, e.g. exhaust air chimneys, wall fans or air inlets, must be equipped with a light trap.
- If the service room is not separated and brightly lit, this will animate the birds to move towards the light source. If the service room is also lit during the night, this might stop the birds from returning to the system.

Only switch on the light in service rooms not separated from the house if it is absolutely necessary, and switch it off again as quickly as possible.

4.3 House climate

NOTICE!

Consult the breeder or your veterinarian regarding the house climate.

Prevent draughts and too high air speeds. Depending on the age of the birds, they will move away from draughty areas if the air speed is too high, leading to an unequal distribution of the birds.

The house climate affects the well-being and performance of the birds.

4.3.1 Limit values

- Avoid dangerous concentrations of harmful gases, as they will affect both the birds and the workers. Observe the following limit values:

Parameter	Limit values
O ₂	not below 20 %
CO ₂	lower than 0.3 % (< 3,000 ppm)
CO	lower than 40 ppm
NH ₃	lower than 20 ppm
H ₂ S	lower than 5 ppm
ppm = parts per million	

- The relative air humidity should be between 50 and 75 %.

The house temperatures affect the birds' growth. Check the birds' behaviour to find out whether the temperature in the house is correct. Chicks which are cold crowd together in corners or on the chick paper and do not move much.

Chicks which are warm try to get away from the heat. For example, they poke their heads through the front grids.

- Heat the house to 32 to 36°C at bird level before moving the birds in. This temperature is lowered in steps to 17 to 18°C by week 17 or 18. This is the optimum temperature for laying hens when they are moved to the laying area.
- Enter the temperature curve into the climate computer.

High temperatures in connection with high air humidity and/or high ammonia rates can affect humans and birds as well as the housing equipment negatively.

4.3.2 Climate concept

Adjust the fresh air inlets or chimneys in a way that the air flows above of system and into the centre of the house. The clean fresh air will then mix with the consumed house air, thus creating a uniform temperature.

Oxygen is supplied and heat, CO₂ and humidity are transported outside.

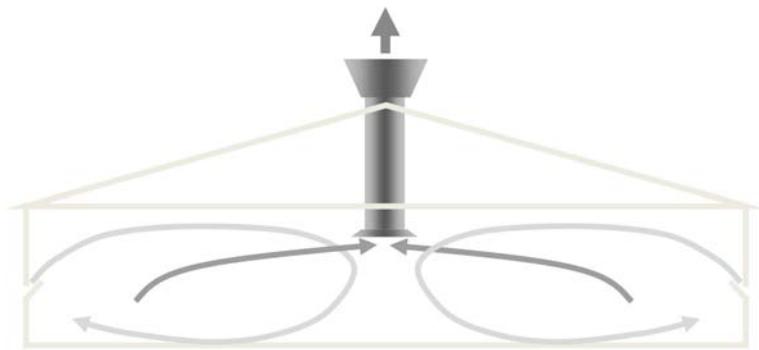
The goal is that the birds distribute evenly inside the system. Draughts and high air speeds should be prevented. Depending on the age of the birds, they will move away from draughty areas if the air speed is too high, leading to an unequal distribution of the birds.

Each house has a specific climate concept that defines the positions of fresh air and exhaust air elements.

Example for a climate concept with lateral fresh air supply and exhaust air chimneys on the ridge; fresh and exhaust air flows are indicated:

Climate concept with lateral fresh air supply and exhaust air chimney on the ridge.

Please refer to the corresponding manuals for adjusting and operating the climate components.



4.4 Manure belt ventilation

NOTICE!

Always refer to the **user manual "Manure belt ventilation [air mixer / radial fan]"** regarding operation of the manure belt ventilation system.

The manual can be ordered under the following code number, if necessary: 99-94-0183 (manure belt ventilation).

(Please also refer to the information in chapter 1 "About this manual").

4.5 Feeding technology

4.5.1 Safety instructions

WARNING!

Risk of crushing and entanglement due to running feed chain and rotation parts on the MPF drives.

- ▶ Before working on the feed supply, it is essential to shut off the power supply as the feed supply can otherwise switch on automatically!
 - ▶ Protective covers over the MPF drive may only be opened when the feed supply has been shut down!
 - ▶ **Never** touch the rotating parts of the MPF drives and **never** reach into them!
 - ▶ **Never** reach into the feed trough when the feed chain is running!
-

WARNING!

Make sure that the safety guard (83-06-2300) is installed in front of the MPF drive (in moving direction) before operating the MPF drive!

4.5.2 Operation of the system

Pre-tension the feed chain correctly. Monitor the feed chain after starting it. If the chain links at the drive exit slide slightly on top of each other while the chain is running, the tension is correct.

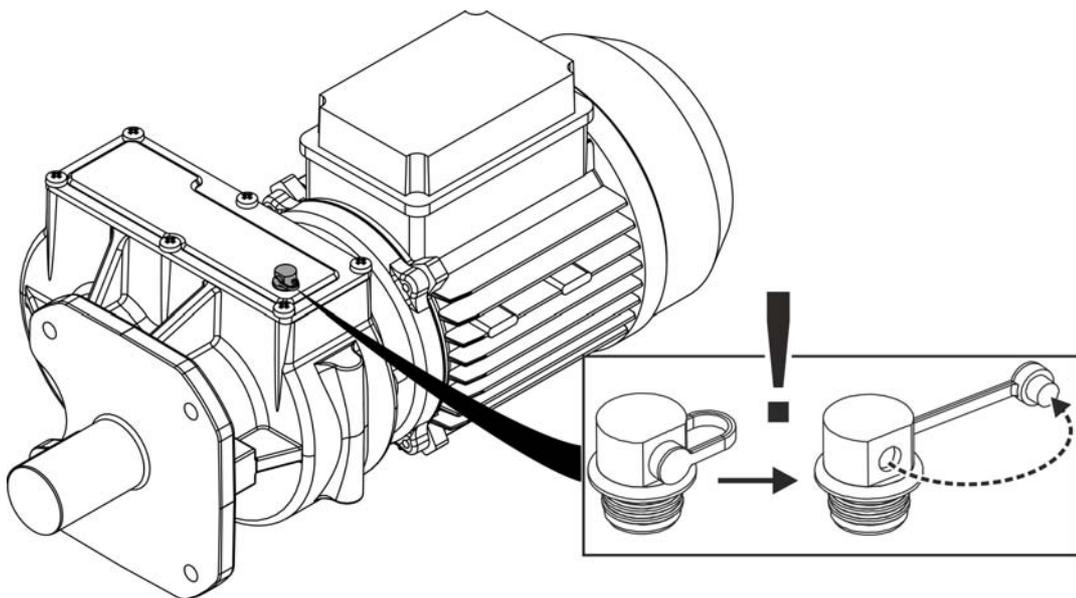
Retension the Champion feed chain after a running in phase of 2 to 6 weeks, as per the previously defined schedule. Paint wear in the chain links leads to extension of the chain.

Check the tension of a new feed chain every week until the length no longer changes. Afterwards, checking the chain tension once per month is sufficient.

If you need to correct the chain tension, please refer to chapter 6.2.1 "Checking and correcting the tension of the feed chain"

NOTICE!

Before putting the gear motors into operation, open the vent plugs of the gear motors if there is no automatic aeration included. (see chapter 2.10.3)



At the end of the rearing phase, the birds must have reached a specific size. This size can only be reached with optimum feed supply. In addition to the composition of the feed, a smooth functioning of the feeding technology is very important.

NOTICE!

If you have questions regarding the ideal feed composition, please consult the breeder or the mixed feed plant.

Adjust the feeding according to the pullets' growth phase to promote optimum development.

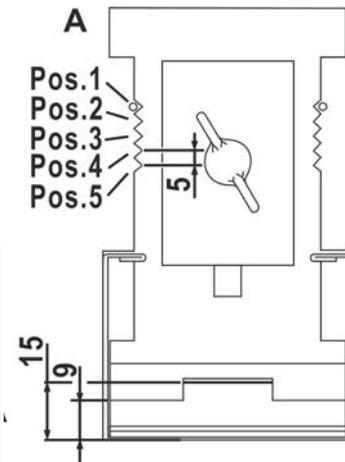
Feed level slide at the feed column:

The feed level slide regulates the feed level inside the trough. It can be set to five different positions. Position 1 corresponds to the lowest feed level, position 5 to the highest.

The following feed quantities will be available in the trough with meal for laying hens of the usual texture:

Feed quantities at different positions of the feed level slide of the feed column:

Pos.	Feed quantity [g/m]	These figures are standard values and may vary depending on the composition of the feed.
1	490	
2	640	
3	830	
4	1000	
5	1230	



- Set the feed level slide to a medium level at the beginning of the rearing phase (position 3). With time, adjust the feed level slide to receive a uniform, low level for all feed chains.

4.6 Water supply

4.6.1 Safety instructions

WARNING!

Persons may slip or get injured where water mixes with dirt or feed remains.

- ▶ Immediately shut off the main water supply.
- ▶ Eliminate any leakage.
- ▶ Ensure that the danger area is safe.

DANGER!

Persons may be electrocuted or suffer serious electrical injuries if water from leaking hoses, seals and pipes reaches live parts.

- ▶ Disconnect the main power supply.
- ▶ Interrupt the main water supply.
- ▶ Only now may you enter the part of the house where large quantities of water have escaped.

NOTICE!

Temperatures below 0°C in empty houses can cause nipple pipes to burst when they freeze.

- ▶ Drain the entire nipple drinker line if the equipment is not used for some time and temperatures below 0°C can be expected for the respective period.

Record the daily water consumption of the pullets to be able to recognise changes quickly! Search for the cause and remedy the problem as soon as possible.

Use the master copy "Daily production" in chapter 11 "Checklist key points summary" to record the water consumption.

4.6.2 Water quality

Clean water is an important prerequisite for a good rearing result. The birds should always receive drinking water.

You can judge the quality of the water based on these characteristics immediately and without other tools:

- The water should be colourless.
- The water should be clear and not murky.
- The water should not smell.

When judging the quality of the water, ask yourself whether you would drink it yourself.

Water quality: parameters and limit values/recommendations for poultry

Parameter	Unit	Recommended limit value	Remarks
Grain size for insoluble particles and suspended matter	µm	< 60	In addition, a filter is necessary.
pH value		6.5 - 8.5	
Total hardness	mg/l	< 20	
Calcium	mg/l	< 100	
Magnesium	mg/l	< 50	
Iron	mg/l	< 0.2	
Manganese	mg/l	< 0.05	

Water quality: parameters and limit values/recommendations for poultry

Parameter	Unit	Recommended limit value	Remarks
Germs total	Quantity/ ml	100	-
Coliform bacteria	Quantity/ ml	0	-
Nitrate	mg/l	25	Values between 3 and 20 mg/l can already stunt the development.
Nitrite	mg/l	4	-
Chloride	mg/l	250	Values of approximately 14 mg/l can already be harmful if the sodium value is higher than 50 mg/l.
Copper	mg/l	0.6	Higher values cause a bitter taste.
Lead	mg/l	0.02	Higher values are toxic.

Parameter	Unit	Recommended limit value	Remarks
Sodium	mg/l	50	Values higher than 50 mg/l stunt the development when chloride and sulphate values are also high.
Sulphate	mg/l	250	Higher values cause indigestion. If chloride and magnesium values are high, development is stunted at more than 50 mg sulphate per litre.
Zinc	mg/l	1.5	Higher values are toxic.

Sodium chloride content (NaCl)	mg/l	330	Total sodium chloride content:	
			< 1,000 ppm (=> 10 "Glossary")	very good
			1,000 - 3,000 ppm	acceptable
			3,000 - 4,000 ppm	poor (liquid manure)
			> 4,000 ppm	dangerous (damage to the kidney)

4.6.3 Operation of the system

NOTICE!

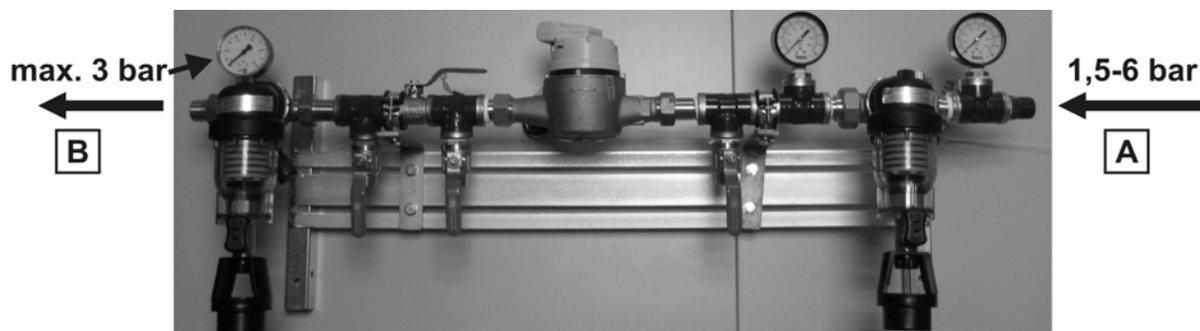
Always refer to the **user manual "Drinking systems"** regarding operation of the nipple drinker lines.

The manual can be ordered under the following code number, if necessary: 99-94-0099 (drinking systems).

(Please also refer to the information in chapter 1 "About this manual")

A= The **supply pressure** on site has to be **between 1.5 and 6 bar**.

B= The **output pressure** (pressure displayed on the manometer of the pressure reducer/filter combination) should **not exceed 3 bar**.



- Set the pressure reducer at the manometer of the water connection unit to 1.5-3 bar.
- Set the pressure regulator of the nipple drinker line to the desired water column.
- Adjust the required height of the nipple drinker line by using the cable winch for nipple pipe adjustment.

Make sure that the height of the water containers is also adapted when adjusting the nipple drinkers (at the beginning of the row).

- Use suitable agents to flush the nipple pipe after assembly, administration of medicines and/or cleaning the house.
- Let water stand in the nipple pipes, if possible, to prevent drying and clogging of the nipples. Flush the nipple pipes regularly to prevent formation of a biofilm.
- Remove the starter cups (where applicable) after some weeks. The open water in these cups can become a hygiene problem after some time. The pullets need to learn to drink all water they require from the nipples.

4.6.3.1 Pressure regulator

i NOTICE!

Always refer to the **user manual "Drinking systems"** regarding operation of the pressure regulator.

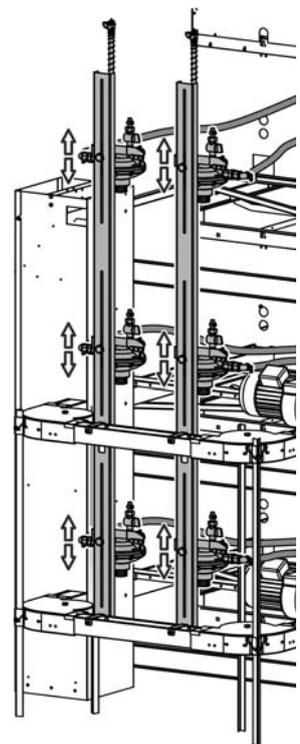
The manual can be ordered under the following code number, if necessary: 99-94-0099 (drinking systems).

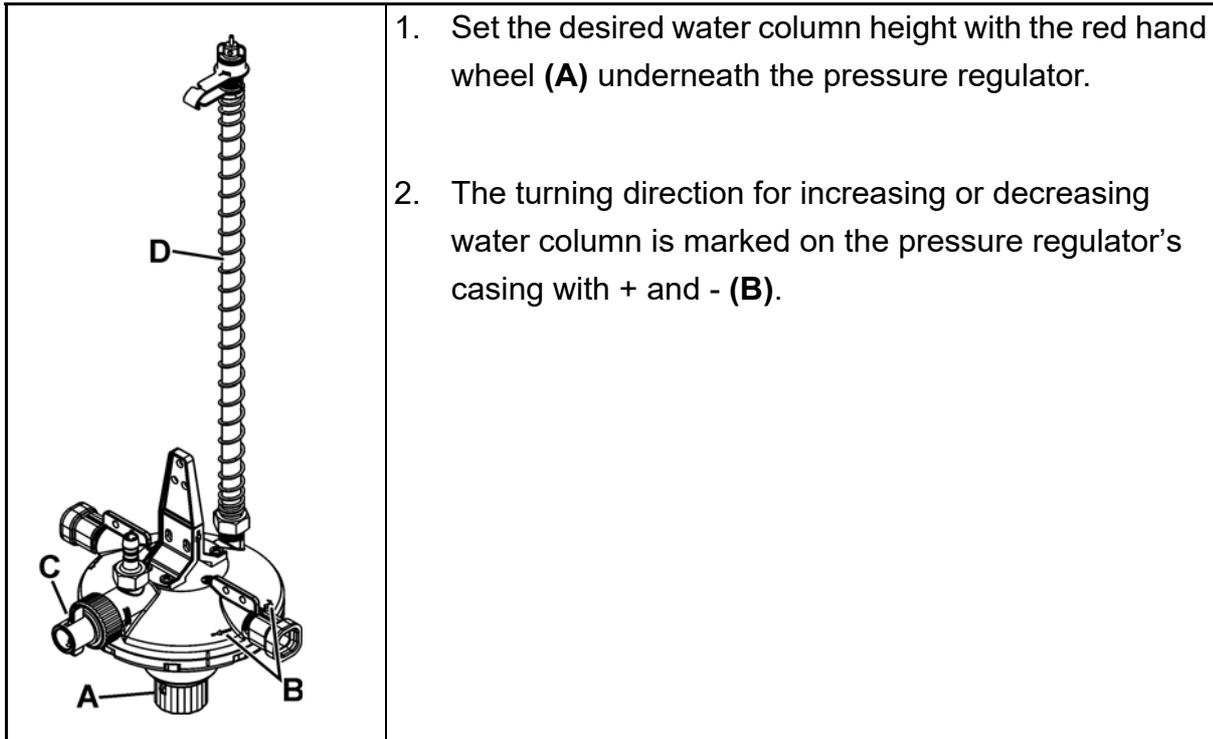
(Please also refer to the information in chapter 1 "About this manual").

i NOTICE!

Do not exceed the maximum supply pressure of 3 bar at the pressure regulator. A higher supply pressure will damage the pressure regulator, especially after having restricted the water (=> 10 "Glossary") and the subsequent sudden filling of the previously empty water lines.

- The supply pressure at the pressure regulator should be between 0.3 and a maximum of 3 bar.
- Pressure regulators can be set to a wide range of different output pressures. The water pressure at the nipple can therefore be adapted to the birds' age and weight. The water columns of pressure regulators can be adjusted steplessly from 0 to 100 cm (i.e. 0.1 to 1 bar).
- The set output pressure at the regulator does not depend on the supply pressure. If, for example, the supply pressure rises or falls because the consumed water quantities change between day and night, this will not affect the water column of the nipple drinker line.
- The output pressure can be adjusted using a hand wheel. A float ball in the flexible breather tube at the pressure regulator indicates the water pressure.





1. Set the desired water column height with the red hand wheel **(A)** underneath the pressure regulator.
2. The turning direction for increasing or decreasing water column is marked on the pressure regulator's casing with + and - **(B)**.

- Raise the output pressure at the beginning of the rearing phase. This will cause drops to form at the nipples, making it easier for the chicks to find access to the water in the first days. The water column is higher at the beginning of the rearing period for this reason.

Set the output pressure of all drinker lines to an evenly low level during the remaining course of the rearing period.

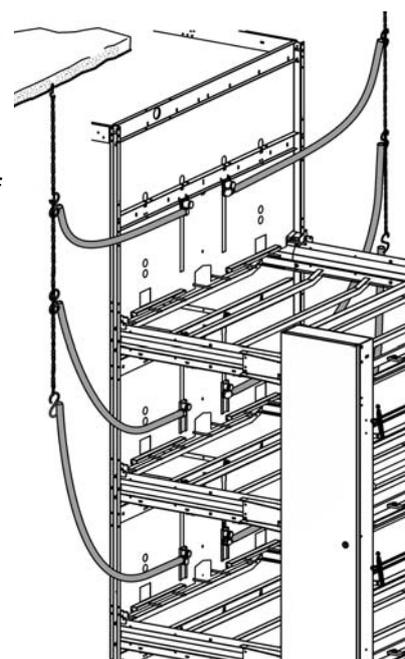
- Check the daily water consumption of the birds and record the values.

Use the master copy "Daily production" in chapter 11 "Checklist key points summary" to record the water consumption.

4.6.3.2 Drain at end of row

A breather hose is installed at the end of the nipple drinker line. The water pressure can also be found at this hose.

- Check the height of the water column at the end of the nipple drinker line every day. Correct the pressure, if necessary.



4.6.3.3 Flushing the drinker lines

NOTICE!

Always refer to the **user manual "Drinking systems"** regarding flushing of the drinker lines.

The manual can be ordered under the following code number, if necessary: 99-94-0099 (drinking systems).

(Please also refer to the information in chapter 1 "About this manual").

Water of a low quality causes growth problems and has negative impacts on bird health.

Drinker lines are a hotbed for microbial communities (so-called "biofilm"). Potentially pathogenic substances that are toxic for the birds can settle in this biofilm. As soon as a biofilm has formed, there is a risk of reactions between the bacterial community and the medicines administered via the drinking water. The effectiveness of medicines, especially vaccinations, can thus be lowered.

A regular flushing can remove remains and thus reduce the formation of a biofilm. Depending on the contamination of the drinking water, flushing the nipple pipes may be necessary every 14 days or once per month. The more often the pipes are flushed, the better the reduction of the biofilm.

If the temperatures are very high, flushing the nipple pipes provides the birds with cooler water. Regular flushing is therefore important especially at the beginning of the rearing period, when the temperatures inside the house are still very high.

 NOTICE!

The connecting elements of the nipple drinker line may get damaged if the water pressure is too high. Check and, if necessary, correct the pressure regularly.

Flushing a nipple pipe with a length of 100 meters takes approximately 3 minutes.

If you flush a drinker line, the flushing water leaves the drinker line through the breather unit at the end of the row. This water must be drained from the house. Connect a hose to the breather unit at the end of the row for this purpose.

As an alternative, a rinsing outlet may be installed. The breather hose is then connected with a drain pipe, which usually runs crosswise through the house above the end sets and then out of the house.

4.6.3.4 Option for the L3200 pressure regulator: Fully automatic flushing system (flushing kit)

i NOTICE!

Always refer to the **operation manual "Automatic flush system Flush Control"** regarding operation of the automatic rinsing system.

The manual can be ordered under the following code number, if necessary: 99-94-0533 (Flush Control).

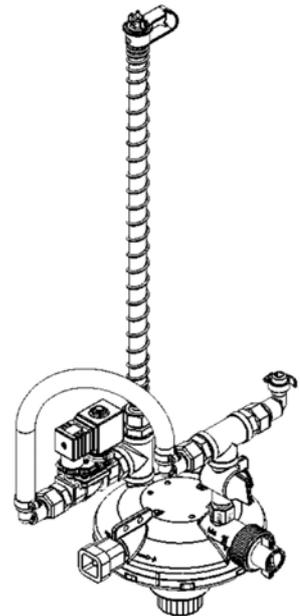
(Please also refer to the information in chapter 1 "About this manual").

As an option, the flushing system can also be controlled automatically. A 24 volt solenoid valve (code no. 30-63-3618) is installed as bypass in front of the pressure regulator L3200 in each nipple drinker line.

If this valve opens, the pressure regulator is bypassed and the water from the water connection unit streams directly into the nipple drinker lines. Thanks to the high speed of the water, deposits and dirt are flushed from the inner walls of the tubes.

Flushing a nipple drinker line with a length of 100 meters takes approximately 3 minutes. Each line is controlled individually. Lines are rinsed one after the other.

To remove all remains from the nipple pipe, a rinsing outlet to drain the dirty water is required at the end of each line. A computer controls the solenoid valve according to previously set rinsing dates and times. The flushing system can also be controlled semi-automatically by starting the flushing process at the computer at the desired time. Flushing is then carried out without assistance from the staff.



4.6.4 Administering medicines / vaccinations via the water supply system

Using the **Big Dutchman** medicator makes it possible to dispense medicines automatically.

NOTICE!

Always refer to the **user manual "Medicator 9-3400 I/h"** regarding operation of the medicator.

The manual can be ordered under the following code number, if necessary: 99-94-0042 (medicator).

(Please also refer to the information in chapter 1 "About this manual").

NOTICE!

The pH value of the water must be < 6.0 when administering medicines via the water. The optimal pH value for the drinking water is between 6.5 and 8.5!

Acidic water affects vaccines and medicines!

Ensure that no disinfectants remain in the lines during preparation and subsequent vaccination.

NOTICE!

Fatty and sticky medications must not be mixed in with the water supply. All medications used must be completely water-soluble.

Meter and prepare the medicines outside of the system by stirring them in a container. Make sure that the medicines dissolves completely in the water! This solution can then be filled into the drinking system as drinking water, readily dosed and mixed according to regulations.

The medicines are automatically dispensed by means of a **Big Dutchman** medicator. If medicine does not dissolve well and is still administered via the water, it is recommended to protect the nipple drinker by means of an additional filter behind the medicator. Use a pressure reducer/filter combination for this purpose.

For retrofitting, you may also install a filter between the bypass and the pressure reducer.

NOTICE!

The medicator must never be allowed to run dry! Always keep it filled with water and protected from frost.

4.7 Manure removal

NOTICE!

Always refer to the **user manual "Adjustment of the manure belt"** regarding pre-adjustment of the manure belt at the manure belt drive and at the manure belt idler unit.

The manual can be ordered under the following code number, if necessary: 99-94-0431 (adjustment of the manure belt).

(Please also refer to the information in chapter 1 "About this manual").

4.7.1 Safety instructions

WARNING!

- ▶ After installation and each starting up, close all safety doors at the manure belt drive.
- ▶ Secure the safety doors against inadvertent opening.
- ▶ Before working on the manure belt drive, it is essential to shut off the power supply as the manure collection can otherwise switch on automatically!
- ▶ Safety doors may only be opened when the manure collection has been shut down.
- ▶ Never touch the drive, guide and idler rollers when the manure collection is switched on!

NOTICE!

Never let the manure removal system run unattended!

Instruct the farm staff responsible for the manure removal system thoroughly!

4.7.2 Manure removal intervals

- Manure must be removed **daily** in systems **without manure belt ventilation!**
- Manure must be removed at least **every 5 days** in systems **with manure belt ventilation.**

NOTICE!

Lengthening the manure removal intervals can cause damage to system parts.

- Observe requirements and regulations by the authorities.

4.8 Winch 350 kg for wall mounting incl. crank

This type of winch has been tested in accordance with the requirements of the following regulations: VBG 8 DA (winches, hoisting and hauling devices) and DIN EN 13157 (Cranes - Safety - Hand powered cranes)

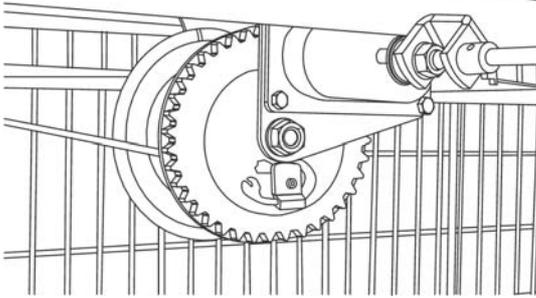
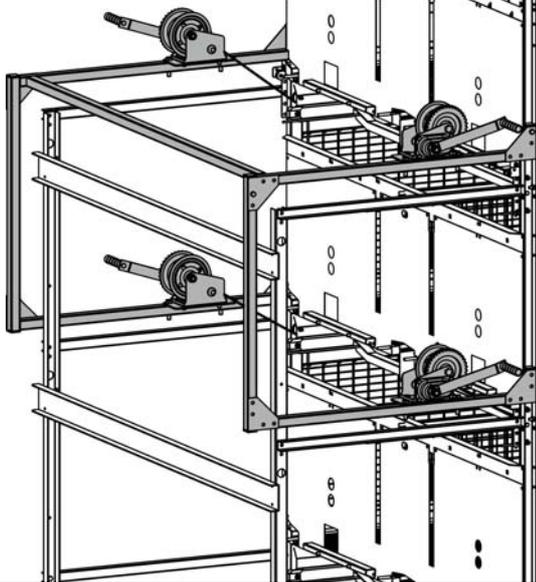
NOTICE!

Replace the cable if it is damaged!

WARNING!

In the event of improper use the cable winch may cause serious injury.

- ▶ You must read the following instructions carefully.
 - ▶ **Never** use a motor to operate the winch. It is designed exclusively for manual operation.
-

<p>A cable winch is installed in the centre of each row. Use this winch to adjust the height of the nipple drinkers and the tube above the feed trough.</p>	<p>The cable winches for the centrally actuated front grids can be found in the end set.</p>
	
<p>Figure 4-2: Cable winch for height adjustment</p>	<p>Figure 4-3: Cable winches for centrally actuated front grids</p>

⚠ WARNING!

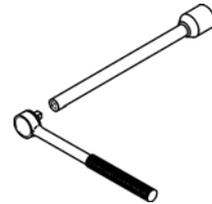
Improper use of the cable winch may result in serious injuries.

- ▶ In case of manually operated winches, you must always keep the handle tightly in your hand. Do not release when there is a load on the winch and the detent pawl is in unlocked position. Otherwise, the handle can spin violently, thus causing severe injuries.
- ▶ Do not pull on the handle of manually operated winches when the detent pawl is locked.
- ▶ Do not exceed the nominal capacity of the winch. Excess load may cause premature failure and could result in serious personal injury.
- ▶ Manually operated winches must not be operated with a motor.
- ▶ Do not allow children to operate the winches.
- ▶ The winches may only be used by persons who are familiar with the operation.
- ▶ Do not load the winch when the cable is fully unwound. Keep at least **three full turns** of cable on the winch!

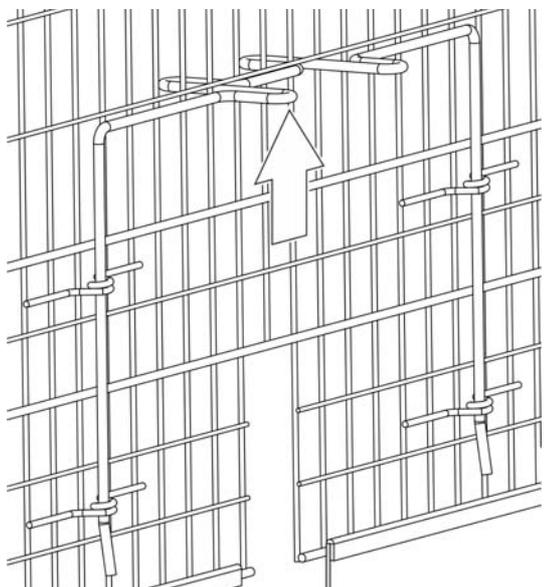
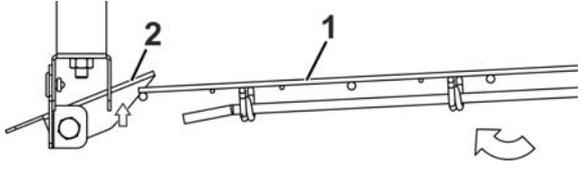
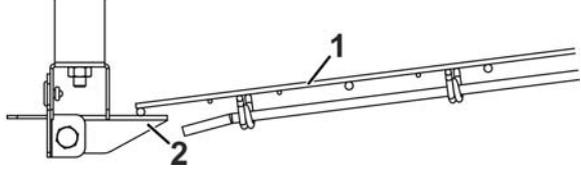
1. Tighten all nuts before using the winch.
2. Oil all shafts and gear wheels before operating it for the first time.
3. Carry out a static test on the winch. Load the winch for 10 minutes with a load 1.5x greater than the nominal load.
4. Turning the hand crank clockwise raises the load. Turning it anti-clockwise lowers it.
5. Turning the hand crank clockwise and thereby raising the load causes the ratchet to make a clicking noise as it engages. It does not make a clicking noise when lowering.
6. To lock the load in position on the winch, turn the hand crank slowly clockwise until you hear two “clicks”. Then slowly release the crank. You can lock the load in any position you want.

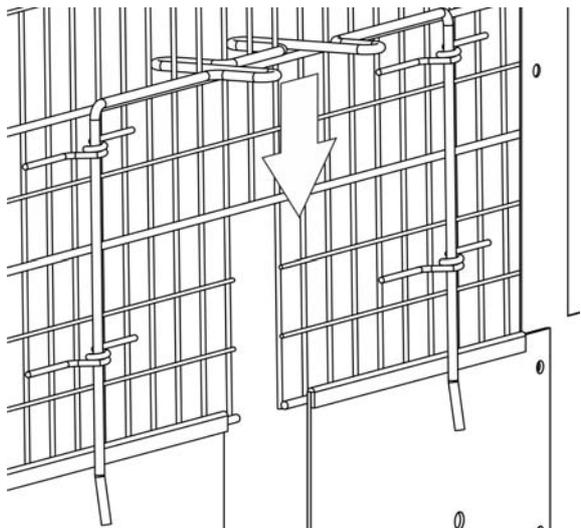
A standard socket wrench with extension is required to operate the manual cable winch in the centre of the system.

Use the crank to operate the cable winches in the end set.



4.9 Foldable partitions

Opening partition	1. Push the locking bar upwards.	2. Fold up the foldable partition (pos. 1) until the drop latch (pos. 2) has fallen back into the upright position.	
			
			3. Set down the partition (pos. 1) on the level surfaces for the drop latch (pos. 2).

Closing partition	1. Press the handle of the locking bar down and raise the separating wire mesh up to get it past the locking bar.	
	2. Close the partition and push the locking bar down.	

4.10 Sliding front grids in tier 1 and 2

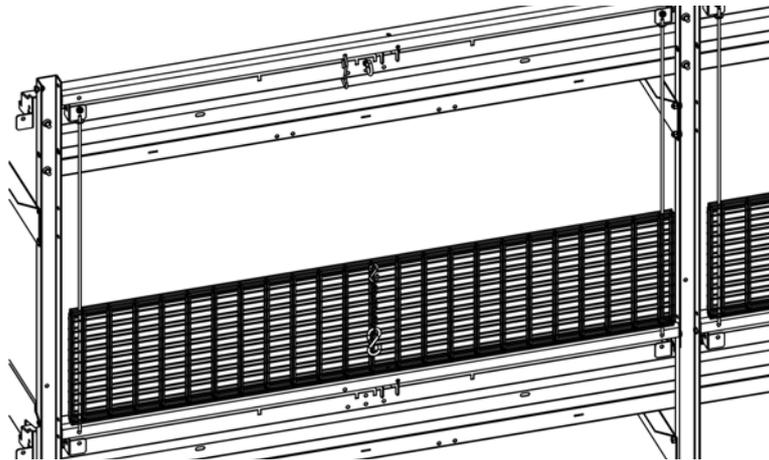
NOTICE!

Front grids are essential in tier 1 and 2!

Not until the pullets have reached a certain age may they be granted free access to the scratching area by opening the system.

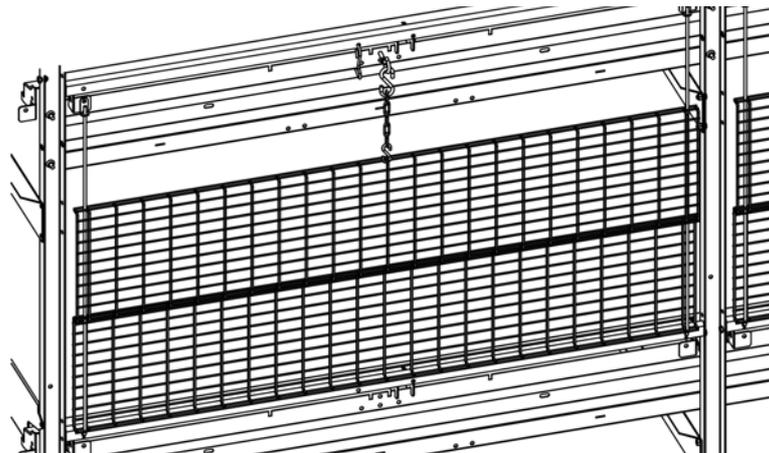
Stage 1 / half-open:

Detach the S-hook from the hook bolt and let the top front grid slide down.



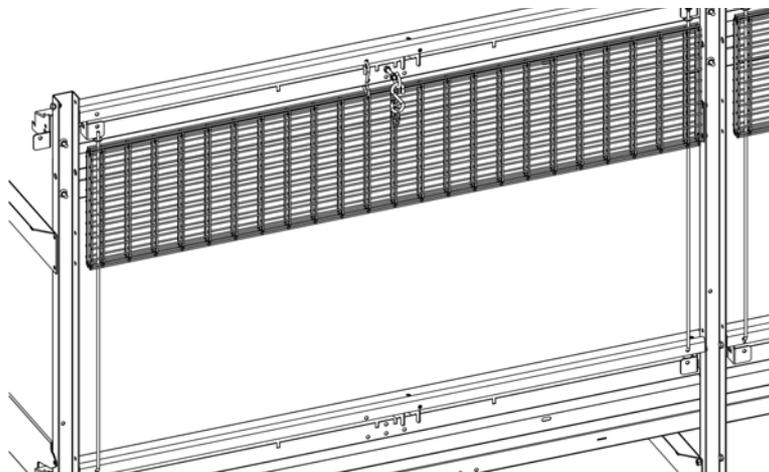
Stage 2 / closed:

Attach the S-hook of the chain into the hook bolt.



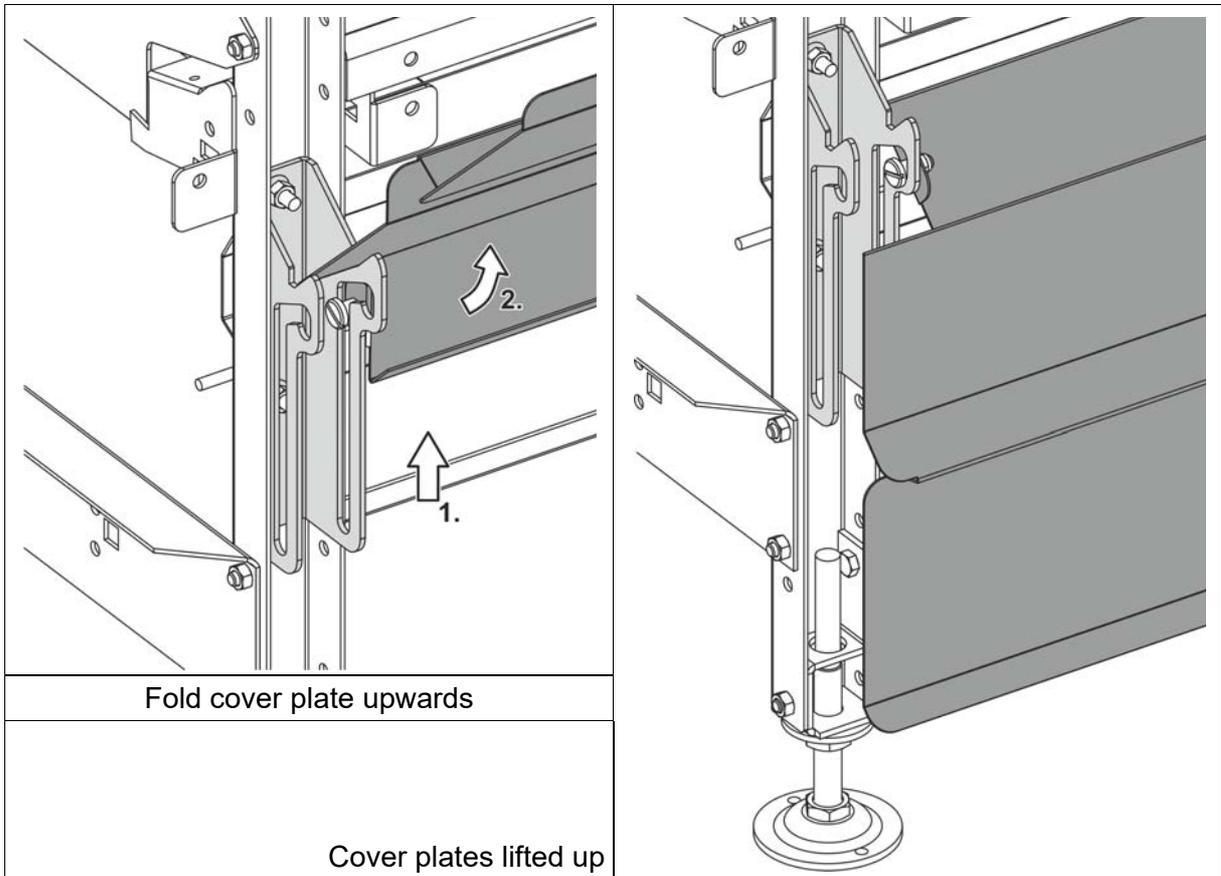
Stage 3 / open:

Slide the two front grid halves upwards and hook the wire hooks into the front grid halves.



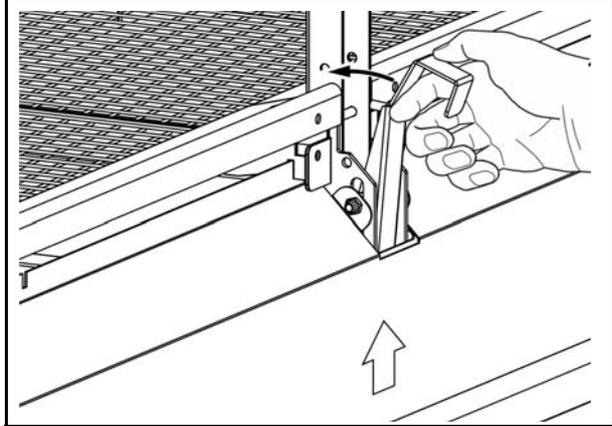
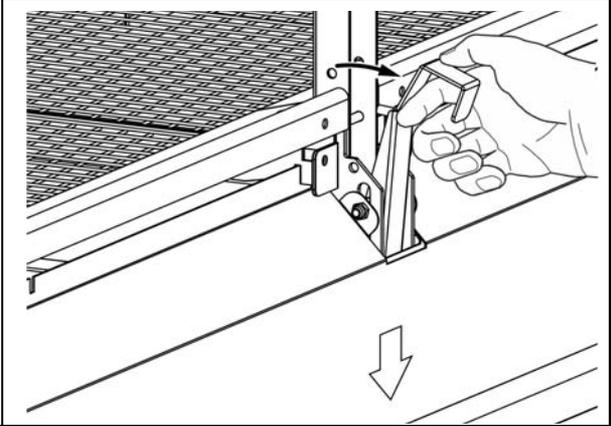
4.11 Cover plates

Foldable cover plates:

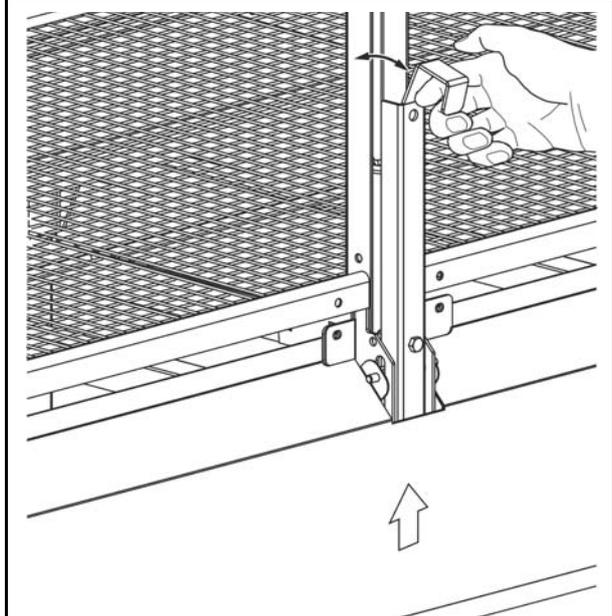
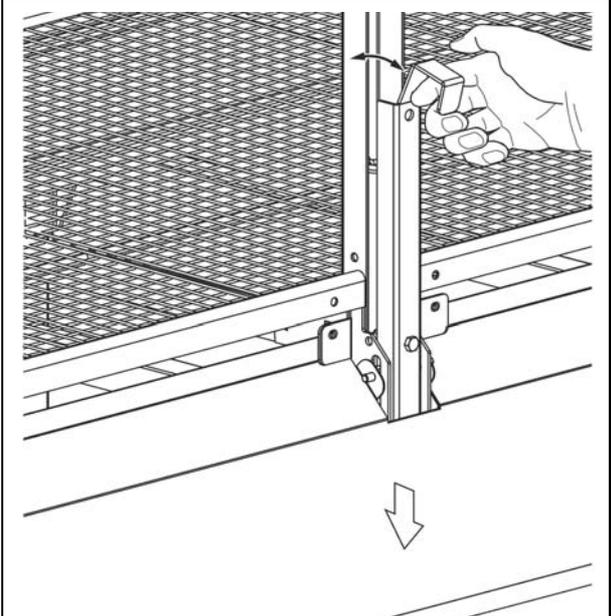


Sliding cover plates:

Regular system height [standard]:

<p>Figure 4-4: Opening cover plates</p>	<p>Figure 4-5: Closing cover plates</p>
	
<p>Pull the cover plates upwards with the lock. The screw on the lock hooks onto the screw between the guide plates.</p>	<p>Gently pull the lock upwards and towards yourself so that the lock detaches from the screw. Let the cover plates slowly slide downwards.</p>

Elevated system [option]:

<p>Figure 4-6: Opening cover plates</p>	<p>Figure 4-7: Closing cover plates</p>
	
<p>Pull the cover plates upwards with the lock. The screw on the lock hooks onto the eye bolt at the post.</p>	<p>Gently pull the lock upwards and towards yourself so that the lock detaches from the screw. Let the cover plates slowly slide downwards.</p>

5 Management

The rearing of pullets in aviary systems requires a special management adapted to the individual requirements of the birds during the entire rearing period. It is very important that the birds have enough time during the rearing period to get to know the house with its equipment. The more familiar the birds are with the rearing aviary, the easier they familiarise themselves with the laying house.

5.1 Important information

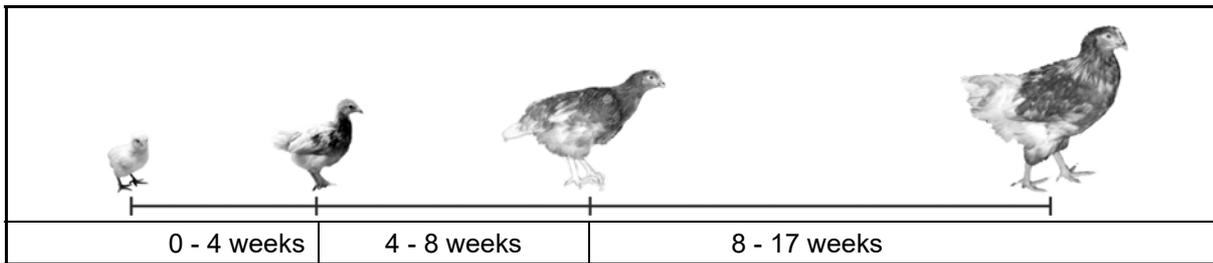
Before using the system during operation:

- Initial operation must be carried out by a qualified technician with the respective proof of knowledge (service technician).
- The system's operator must have received all minutes required by **Big Dutchman** and completely filled out: confirmation minutes and the additional inspection protocols, if applicable, as well as notes concerning the works in an occupied house.
- Carry out any work in the house quietly. Avoid stressful situations for the birds. The birds should never be scared or startled.
- Never step onto unreinforced components. This includes the folding approach aids! Use climbing aids such as inspection carts or ladders for all inspections in higher system areas.
- Check the feed and water consumption daily and record the results in a checklist. A template is available in chapter 11 "Checklist key points summary".

On the basis of these values, deviations and possibly occurring problems can be recognised quickly regarding both bird health and equipment. Causes can thus be discovered and eliminated more quickly.

- A permanent exact observation of the birds as well as a careful control of the environment is indispensable during the entire rearing period. All measures must be adapted to the individual development of the birds and their environment. The development of the birds can be non-uniform for different reasons (e.g. moving the day-old chicks in during winter or summer). Therefore, decide individually for each batch which measures are to be taken at what time.

5.2 The rearing phase



5.2.1 Before moving-in

- Clean and disinfect the house carefully (=> chapter 7). The house must be dry and completely free of disinfectants. Ensure this for example by ventilating the house.
- Start heating the house no less than 24 hours before moving the birds in to ensure that the floor is warm enough and that no moisture remains in the component parts. Check that the **ventilation and heating settings** are correct and functioning. The air direction plates should be adjusted in a way that the air does not flow directly to the birds. Set the farm PC and the ventilation rate to correspond with the current bird age.

NOTICE!

Observe the recommendations of the breeder regarding the optimal temperature for the chicks and pullets.

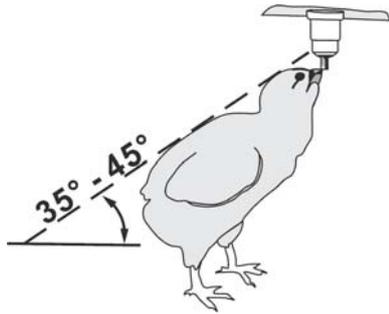
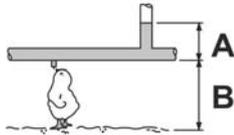
- Place chick paper on the bottom wire grilles, especially behind the feed trough.
- Let the feed chain run to fill the troughs in the second tier (and in the first tier as well, if you plan to place birds there) with feed.
 - Observe the recommendations of the breeder and the feed producer for an optimal feeding of the chicks and pullets.
 - Additional feed can be distributed on the chick paper to facilitate feed consumption during the first days and to keep the animals occupied.
- Make sure the height-adjustable perch above the feed trough is at the correct height by adjusting it in a way that one hand fits between the upper edge of the trough and the perch. Please refer to chapter 4.8.



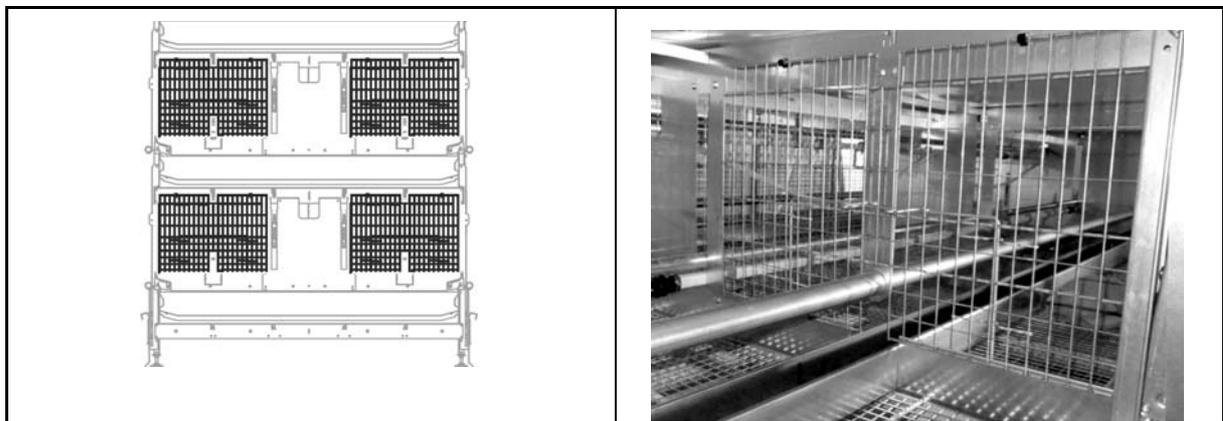
- Flush al **drinker lines** with fresh water shortly before moving the birds in.
Adjust the height of the nipple drinkers to meet the size of the chicks using the cable winches in the centre of the system. Please refer to chapter 4.8 "Winch 350 kg for wall mounting incl. crank".

i NOTICE!

Make sure that there is no air in the nipple drinker line and that the water pressure is appropriate.

Water column:		
Day 1 - 7:	A = 100 mm	
Day 8 - 21:	A = 100 - 200 mm	
> day 21:	A = 200 mm	
		
Figure 5-1: Optimum angle between nipple and beak for chicks aged one week		

- Close the foldable partitions. Please refer to chapter 4.9 "Foldable partitions"



- Fold down the automatically folding perches.



5.2.2 Day 1: Moving the chicks in



NOTICE!

Only place the chicks in houses that are completely clean and dry!

In case the house consists of several section and/or in case of several houses, plan in advance how many chicks are moved in per section and how many transport containers must be brought to each section.

- Place the birds between the feed trough and the drinker line. This ensures that the chicks quickly find feed and water.

<p>Move the chicks into tier 2. This tier ensures good heating and the monitoring height for the farm staff is ideal.</p>	
<p>Figure 5-2: Area for moving in the chicks in tier 2 between feed trough and nipple drinkers</p>	

<ul style="list-style-type: none"> Close one half of the front grids (stage 1 / half-open => chapter 4.10 "Sliding front grids in tier 1 and 2"). <p>This makes it easier to place the chicks into the system over the grids.</p>	<p>Figure 5-3: Area for moving in the chicks in tier 2 between feed trough and nipple drinkers</p>
---	--

Alternatively, the chicks can be distributed between tiers 1 and 2 when they are moved in. This way, the birds have more space at the beginning and do not have to be moved. As the tube above the feed trough and the drinker line in the first tier are height-adjustable, the birds can easily be moved directly into the first tier. However, the working height is sometimes not very comfortable.

5.2.3 Week 1: Familiarisation

- Leave the front grids half-open so it is easier to inspect the birds.

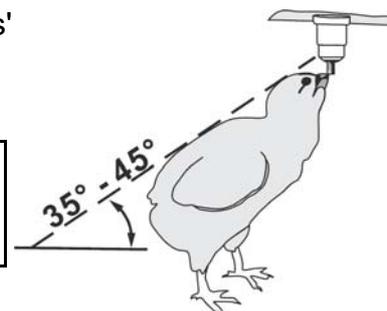
Close the front grids before the birds are big enough to jump over them (after 3 to 5 days) (stage 2 / closed => chapter 4.10 "Sliding front grids in tier 1 and 2").

- Let the feed chain run several times per day, even if the feed trough is still filled. This helps the birds to get used to the running feed chain.

- Adjust the height of the nipple drinkers to the birds' size.

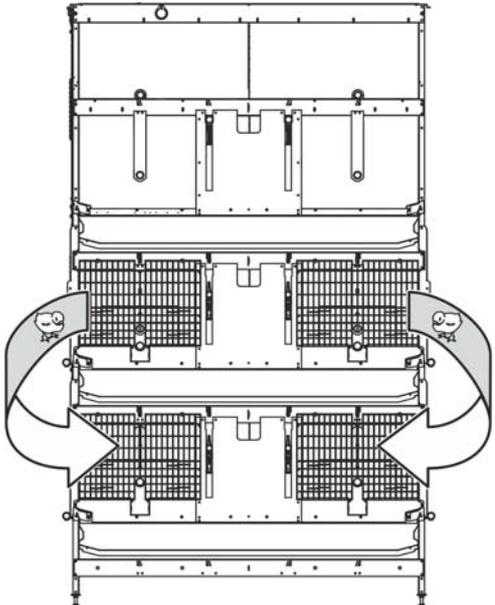


	Figure 5-4: Optimal angle between nipple and beak for chicks aged less than 1 week
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5.2.4 Week 2: Distributing the birds between tier 1 and 2

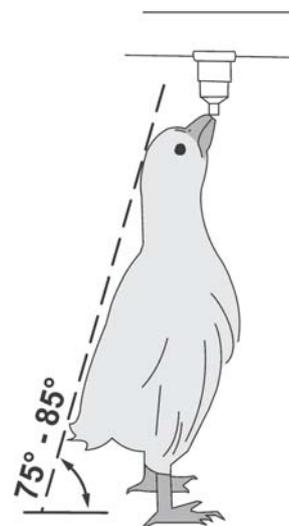
- Distribute the birds between tier 1 and 2.

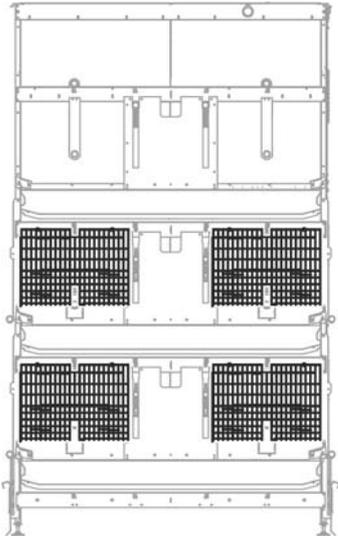
	<p>Place 50 % of the chicks in tier 1.</p> <p>While moving the chicks, you can vaccinate them or carry out other measures, if applicable.</p>
---	--

- Adjust the height of the nipple drinkers to the birds' size.

	<p>Figure 5-5: Optimal angle between nipple and beak for chicks aged more than 1 week</p>
--	---

- Open the foldable partitions within the system at this point. Please refer to chapter 4.9 "Foldable partitions".



		
		
	<p>This provides the birds with more freedom of movement in longitudinal direction through the system.</p> <p>Close the partitions if you need to catch or lock the birds (e.g. for vaccinations or to move them out).</p>	

5.2.5 Week 4: Letting the birds out of the system



The birds should now be big and strong enough to move around in the litter and to return to the system.

Make the following preparations:

- Extend the folding perches as far as necessary to fix the chick ramps below them.
- Distribute the chick ramps (pos. A) and chick bridges (pos. B) on alternating sides once per section.

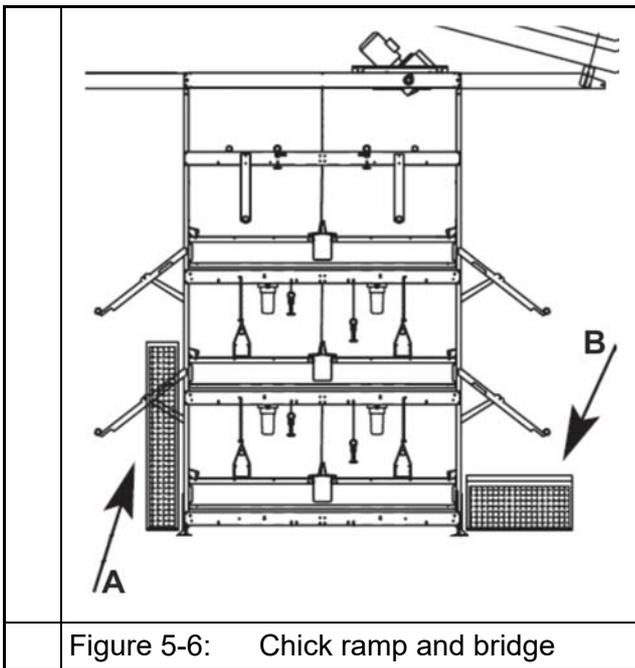
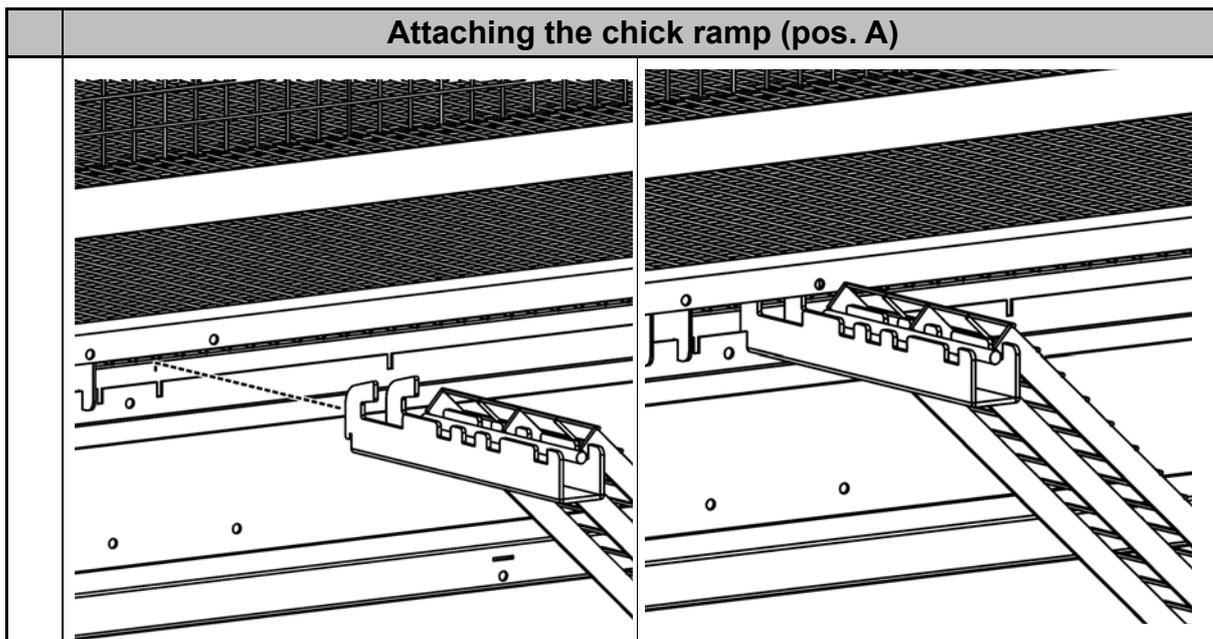


Figure 5-6: Chick ramp and bridge

A	B	A	B	A	B
2412	2412	2412	2412	2412	2412
B	A	B	A	B	A

Pos.	Code no.	Description
A	38-30-6001	Chick ramp wire grille cpl NAT-Primus
B	83-09-7477	Chick bridge wire mesh NAT-Primus
	83-03-0065	Chick bridge wire mesh NAT-Primus elevated



When the birds get used to jumping from the perch to the system after some time, the automatically folding perches can be extended further, step by step. As long as the chick ramps are attached to the system, the perches cannot be completely folded down.

- Distribute a thin layer of litter in the litter area of the house floor. This litter will absorb the moisture of the manure. The litter must not be distributed perfectly; this is instead done by the birds.

=> chapter 4.1 "Litter area"

- Open the sliding front grids manually or, if applicable, centrally by means of a cable winch (=> please also refer to chapter 4.10).

The birds can leave the system and jump to the floor. Use a hook to fasten the manually opened front grids (=> also refer to chapter 4.10 stage 3 / open).

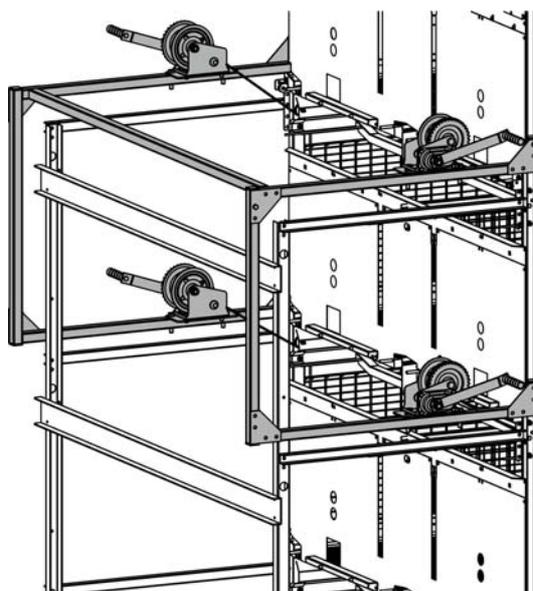
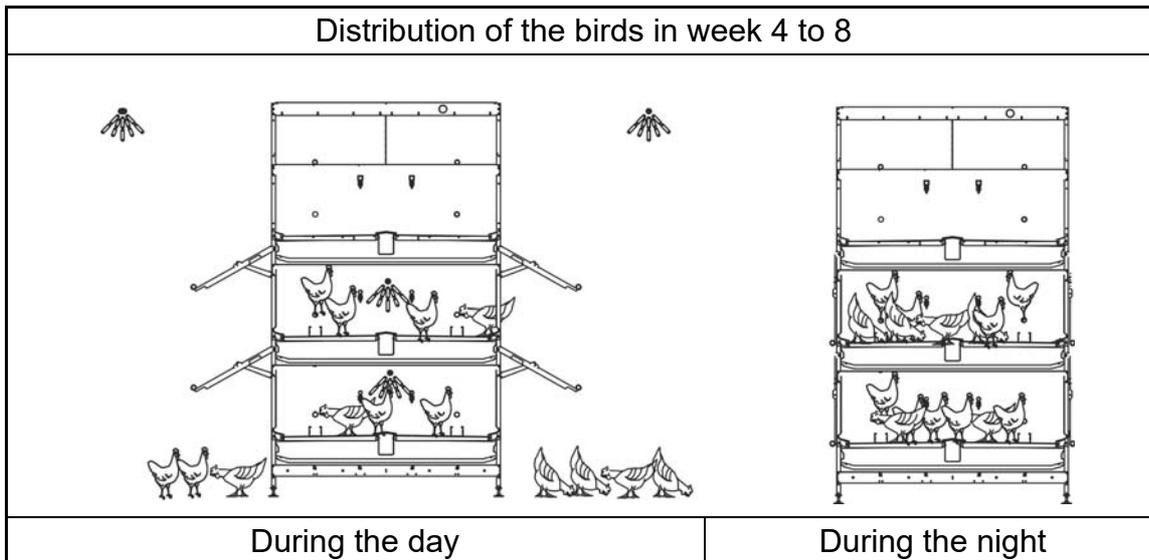


Figure 5-7: Cable winches for centrally actuated front grids

- During the first nights, make sure to check whether all birds have returned to the system. Move the birds that are still in the litter into the system.

Carry out these checks until all birds are finding their way back to the system for the night. Usually, this happens after a few days.

If the birds are used to sleeping in the system, they accept the nests in the laying house more easily and are able to consume feed and water in an optimum manner.



- If front grids are installed in tier 3, leave these closed for the time being. If there are no front grids, ensure that no birds stay permanently in tier 3.

It may happen that pullets jump into the third tier but do not dare to jump down again. Drive these birds from of the tier.

- If you need to catch the pullets, e.g. to vaccinate them, close the foldable partitions and the front grids.

	
<p>Close the foldable partitions first to make the groups smaller => chapter 4.9 "Foldable partitions".</p> <p>Close the front grids during the night while the birds are sleeping => chapter 4.10 "Sliding front grids in tier 1 and 2"</p>	

- Remove the chick bridges after approx. 1 to 2 weeks and the chick ramps after 2 to 3 weeks. From then on, the folding perches can be folded down completely for the night.

5.2.6 Week 8: Opening tier 3



- If front grids are installed in the third tier, open these manually or centrally.

The pullets are now strong and big enough to reach the third tier and to leave it again.



Figure 5-8: Front grid tier 3 closed

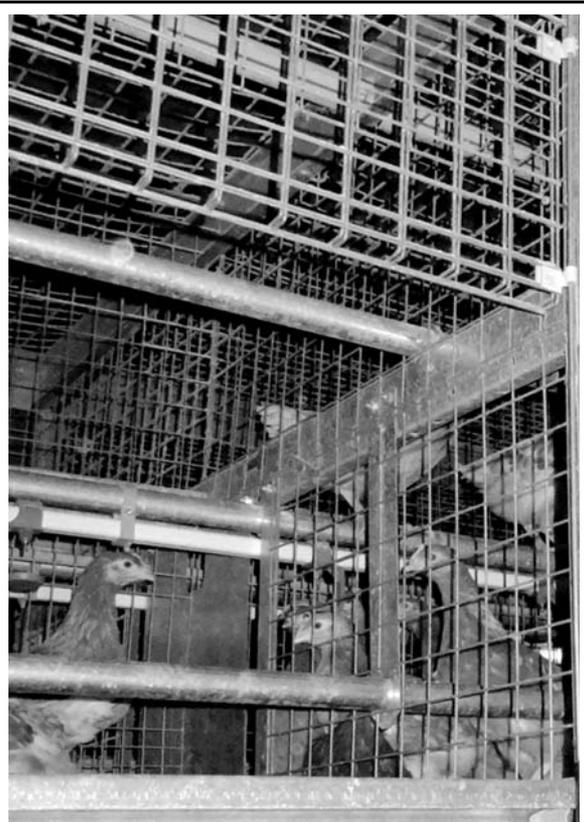
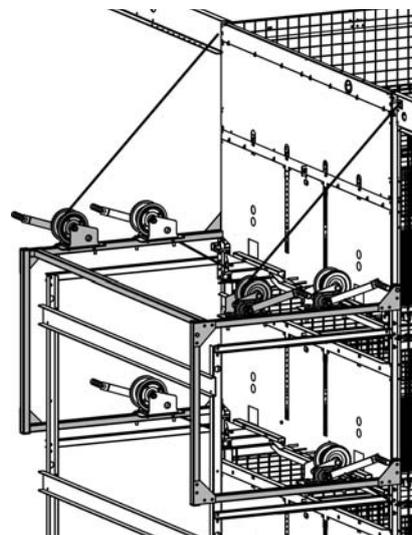


Figure 5-9: Front grid tier 3 open

Figure 5-10: Cable winch for centrally actuated front grids tier 3



i NOTICE!

The cover plates remain closed in systems with a regular height [standard].

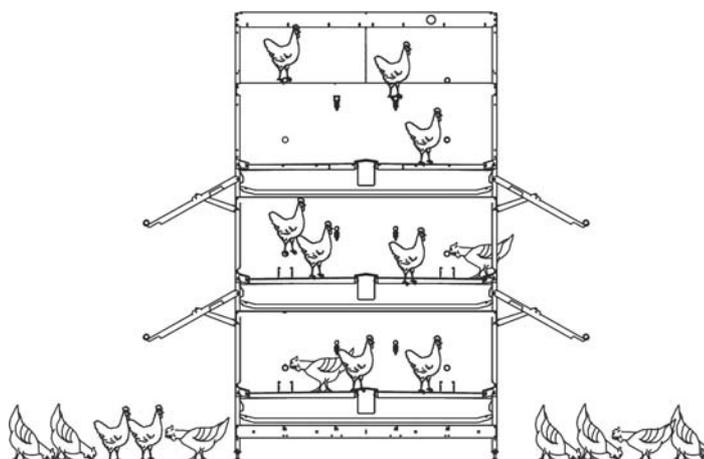


Figure 5-11: Tier 3 open in a system with standard height

In elevated systems [option], the area below the system can also be used as litter area. However, the birds should only be granted access to this area when they are strong enough to enter the system without bridges or ramps.

- Open the cover plates below the system so the pullets can reach this area. Please refer to chapter 4.11 "Cover plates".

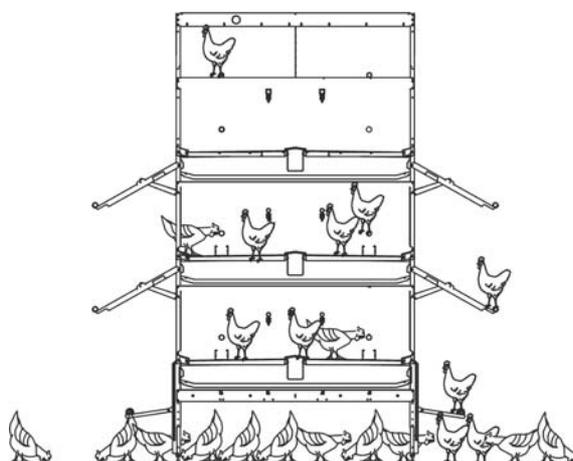


Figure 5-12: Tier 3 and cover plates opened in an elevated system [option]

5.2.7 Week 17: Moving the birds out



After 16 to 18 weeks, the pullets are normally moved from the rearing house to the laying house.

Make the following preparations:

- Close the foldable partitions in the system at least one day before moving the birds out. Please refer to chapter 4.9 "Foldable partitions".
- Lock the pullets in the system in the night before moving them by closing the front grids. Please refer to chapter 4.10 "Sliding front grids in tier 1 and 2".
- Fold down the automatically folding perches.
- Remove the litter from the litter aisles with a broom and shovel, or a small tractor or wheel loader.

NOTICE!

The birds may experience extreme stress or you might damage the system.

► Remove the litter very carefully and quietly.

- Expose the birds to as little stress as possible when catching them, then place them in the containers for moving-out.

5.2.8 Service period

Start dry cleaning the house after all pullets have been moved out.

- Open the cover plates. Please refer to chapter 4.11 "Cover plates".
- Clean the area below the system, e.g. with a broom.
- Let the manure belts run to remove manure from the system.
- Sweep the entire house.

NOTICE!

Afterwards, the house must be cleaned and disinfected thoroughly => 7 "Cleaning and disinfection during the service period".

6 Maintenance

NOTICE!

Please refer to the specific **user manuals** for maintenance of the individual components.

The manuals can be ordered under the following code numbers, if necessary:

99-94-0099 (drinking systems), 99-94-0042 (medicator),

99-94-0431 (adjustment of the manure belt), 99-94-0183 (manure belt ventilation)

(Please also refer to the information in chapter 1 "About this manual").

6.1 Maintenance intervals

Daily

Feeding

Check the **MPF drives** for possible dust deposits. Make sure to remove these to prevent overheating of the drives!

Check the **feed chain circuits** for foreign objects or dirt and remove them immediately, if necessary!

Check whether the **feed chain corners** function correctly. Remove dirt such as feathers, feed clumps and foreign objects immediately.

Check whether all **feed chains** work.

Check whether the supply of the **feed column** is blocked by foreign objects or dirt. Remove all foreign objects and dirt as they might block the feed from entering the trough, thus straining the feed chain.

Drinkers

Check at least once per day whether all connections, couplings and nipples of the **nipple drinker line** are tight.

Check the tightness of the entire **drinking system**.

Check the water column height at the **pressure regulator** and at the **breather hose**.
Clean the breather hoses of the nipple drinker lines to read the water level, if necessary.

Check the system pressure of the **water connection unit**.

Lighting

Check all **lamps** and replace defective ones.

Ventilation

Check whether the **fan** and the **air flaps** function correctly.

Weekly

Feeding

Check the **feed chain tension**.

If the feed chain buckles during feeding, immediately switch off the drive! Search for causes of the buckling. If the feed chain gets stuck, remove obstructions or foreign objects in the feed circuit, if applicable.

Check the **feed chain** for straight running.

Align the drive, if necessary. Replace the guide shoe in case of wear and tear. If the feed troughs have moved, re-align them.

Check whether the **feed chain corners** are parallel with the feed troughs. Align them, if necessary.

Check the **feed chain corners** for wear of the plastic plain bearings, guide rails, guide brackets, bearing bushes.

Check the feed level at the **feed level slide** of the feed column. Remove foreign objects such as feathers or other dirt.

Drinkers

Check the **filter** at the filter combination and clean it, if necessary. If it needs to be replaced, only use water filters with sufficient mesh width and flow rate.

Manure removal

Check the **drives** for possible dust deposits. Make sure to remove these to prevent overheating of the drives!

Check whether the chain wheels and roller chains need lubrication and lubricate them, if necessary.

Check the shear pin and the tension of the roller chains.

Ventilation

Check the filter mats for dust deposits and clean them with pressurised air or a vacuum cleaner, if necessary.

Monthly

Feeding

Determine the runtime of the **feed chain**. During one feeding, the feed chain must cover the entire length of the circuit plus 10 additional meters.

Make sure that the time for the circuit is not set too long. A circuit time that is too long can cause the feed to overflow when it returns to the feed column, that pellets are ground or that more energy than necessary is used.

Drinkers

Clean the **drip cups** of the nipple drinker line.

Take **water samples** and have a laboratory check them, also for iron and limescale content.

Ventilation

Check the ventilation system for worn V-belts.

4 to 6 weeks after initial operation

Feeding

Correct the feed chain tension. Colour abrasion can cause changes to the length of the chain.

Quarterly

Feeding

Check the **reversible drive gear** and the guide shoe SF/MO for wear and correct functioning. If the drive gear is heavily worn at the teeth and the contact surface of the guide shoe, reverse it or replace it.

During/after the service period

Feeding

After cleaning, the **feed chains** and **feed troughs** must be completely dry.

Lubricate the **corner shafts** after wet cleaning to prevent rusting of the bearing seat.

Manure removal

Check the **chains**, **wheels** and **chain tensioner** for wear and tear. Lubricate the chain drives after wet cleaning.

NOTICE!

Slacken the manure belts completely, if the temperature in the house drops below 15° C. Because the belts shrink greatly as the temperatures drop, system parts may otherwise be damaged. The next time the birds are put into the house, the manure belts must only be retensioned when the normal house operating temperature has been reached.

Ventilation

Check the **hoses** of the breather system for leakage.

As needed

Drinkers

Clean the **water filter** at a pressure difference of ≥ 0.5 bar.

Flush the **nipple pipes** every 14 days or monthly, depending on the water quality. Flush more often in case of high temperatures to prevent heat stress.

Manure removal

Clean the **scrapers** after every manure removal.

Manure must be removed **daily** in systems **without manure belt ventilation!**

Manure must be removed at least every 4 days in systems with manure belt ventilation.

6.2 Feeding technology

Check the entire feeding system at least once per day.

WARNING!

Risk of crushing and entanglement due to running feed chain and rotation parts on the MPF drives.

- ▶ Before working on the feed supply, it is essential to shut off the power supply as the feed supply can otherwise switch on automatically!
- ▶ Protective covers over the MPF drive may only be opened when the feed supply has been shut down!
- ▶ **Never** touch the rotating parts of the MPF drives and **never** reach into them!
- ▶ **Never** reach into the feed trough when the feed chain is running!

NOTICE!

- ▶ Remove all small parts such as screws, nuts, wire brackets etc. from the feed and end set troughs.
- ▶ Do not install the Champion feed chain before thoroughly examining the feed troughs.

6.2.1 Checking and correcting the tension of the feed chain



NOTICE!

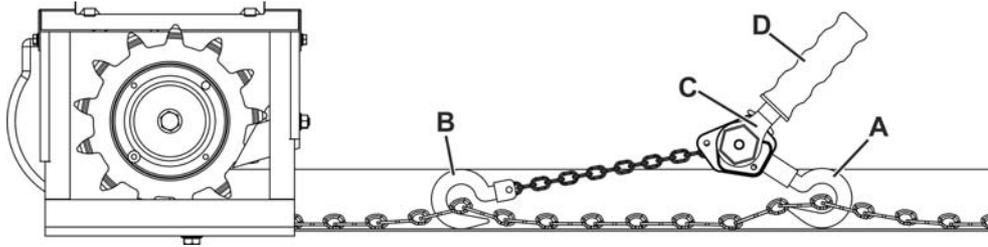
Check the tension of the feed chain regularly. It is affected by factors such as humidity, texture and fat content of the feed.

Directly after installation, the tension of the feed chain may change. Colour abrasion of the chain links can lengthen the chain. Re-tension the feed chain after 4 to 6 weeks.

The feed chain is correctly tensioned if the links of the feed chain slide slightly on top of each other at the exit of the MPF drive but do not lift more than 10 mm while the system is running. Remove or add chain links to change the chain tension.

NOTICE!

Observe the instruction manual that is supplied with the feed chain tensioner and **pay special attention to the safety and handling instructions!**



1. Fix the hook **(A)** of the feed chain tensioner behind the MPF drive at the feed chain.
2. Put the lever **(C)** into the central position "FREE" and pull the hook **(B)** from the lever tensioner in order to hook it in at the other side of the feed chain.
3. Move the lever **(C)** to the "UP" position. Tighten the feed chain by using the manual lever **(D)** until the chain links between the hooks are lying on the floor of the feed trough.

WARNING!

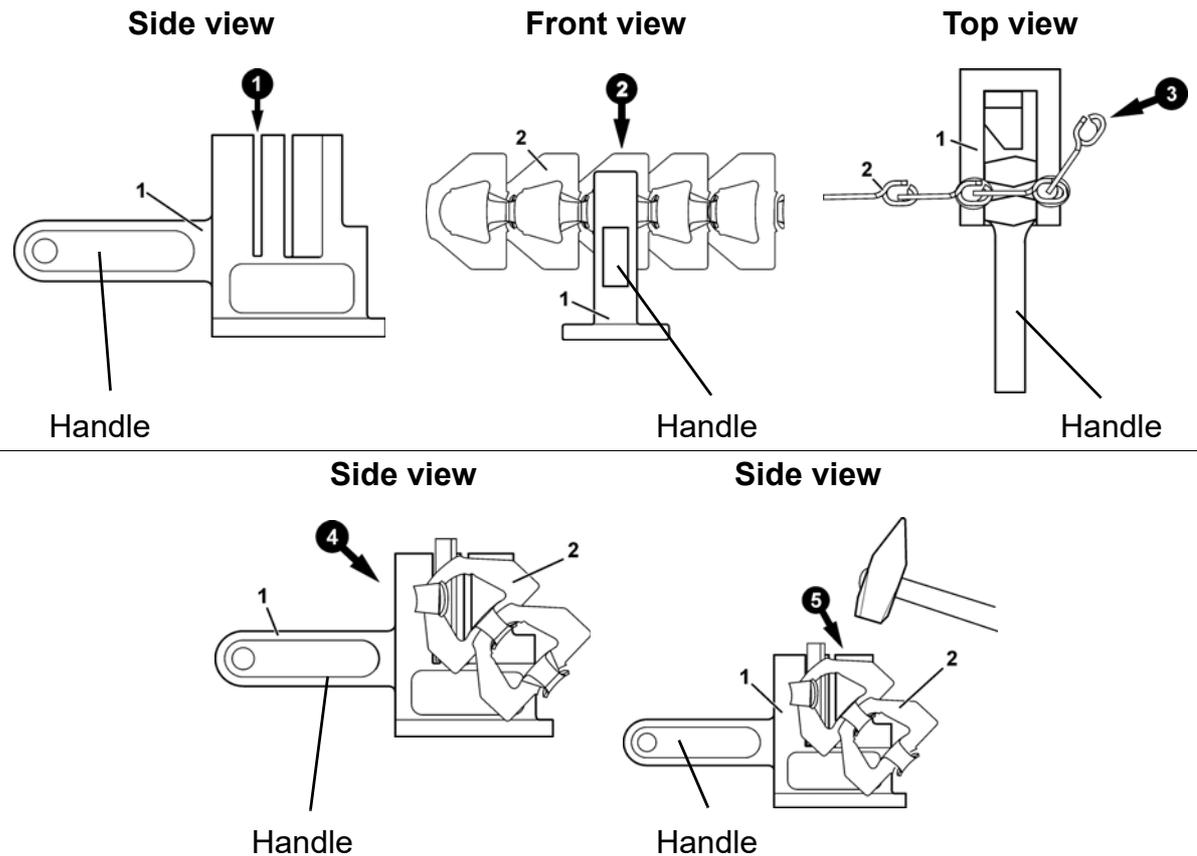
You can be injured by parts flying around when fitting the feed chain.

- ▶ Always wear protective goggles when fitting the chain!

NOTICE!

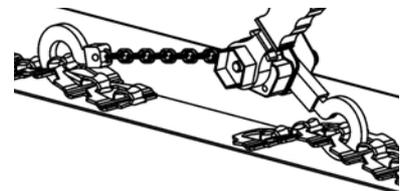
- ▶ Always use the feed chain breaker (10-00-0025) to separate and join feed chain links.
- ▶ Never try to bend up the hook of the Champion feed chain or to close it by means of a hammer. This causes the material to become brittle so that the hooks break when the feed chain is taken into operation!

4. Separating chain links:
 - Use the slot directly next to the handle.
 - Guide the feed chain (pos. 2) into the slot of the feed chain breaker (pos. 1).
 - Bend the feed chain backwards (away from the handle).
 - Turn the feed chain downwards to be able to remove the closed end of one chain link from the opening of the next link's curved part.
 - Hammer directly onto the chain link until the links separate.



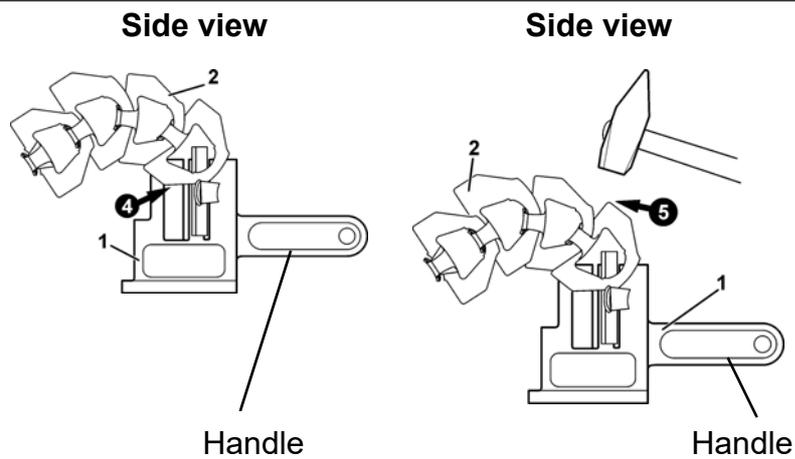
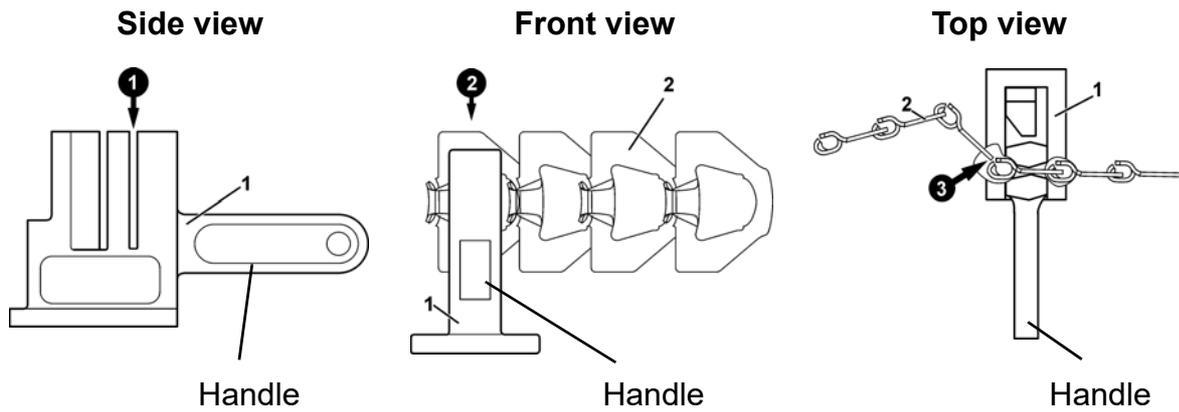
5. Change the length of the chain by removing or adding chain links until it has the correct length.

6. Pump the manual lever (D) evenly and pre-tighten the feed chain until ends of the feed chain can be connected.



7. Joining chain links:

- Use the slot directly next to the handle.
- Guide the last chain link into the slot of the chain breaker.
- Position the closed end of the first chain link above the opening of the last link's curved part.
- Turn the first chain link upwards diagonally until the closed end fits into the opening of the last link's curved end.
- Hammer directly onto the first chain link until the two links are joined.



8. Move the lever (**C**) to the position “DN” (=down) and release the lever tensioner.
9. Release the two load hooks (**A+B**) from the feed chain and remove the feed chain tensioner.

6.2.2 MPF drive

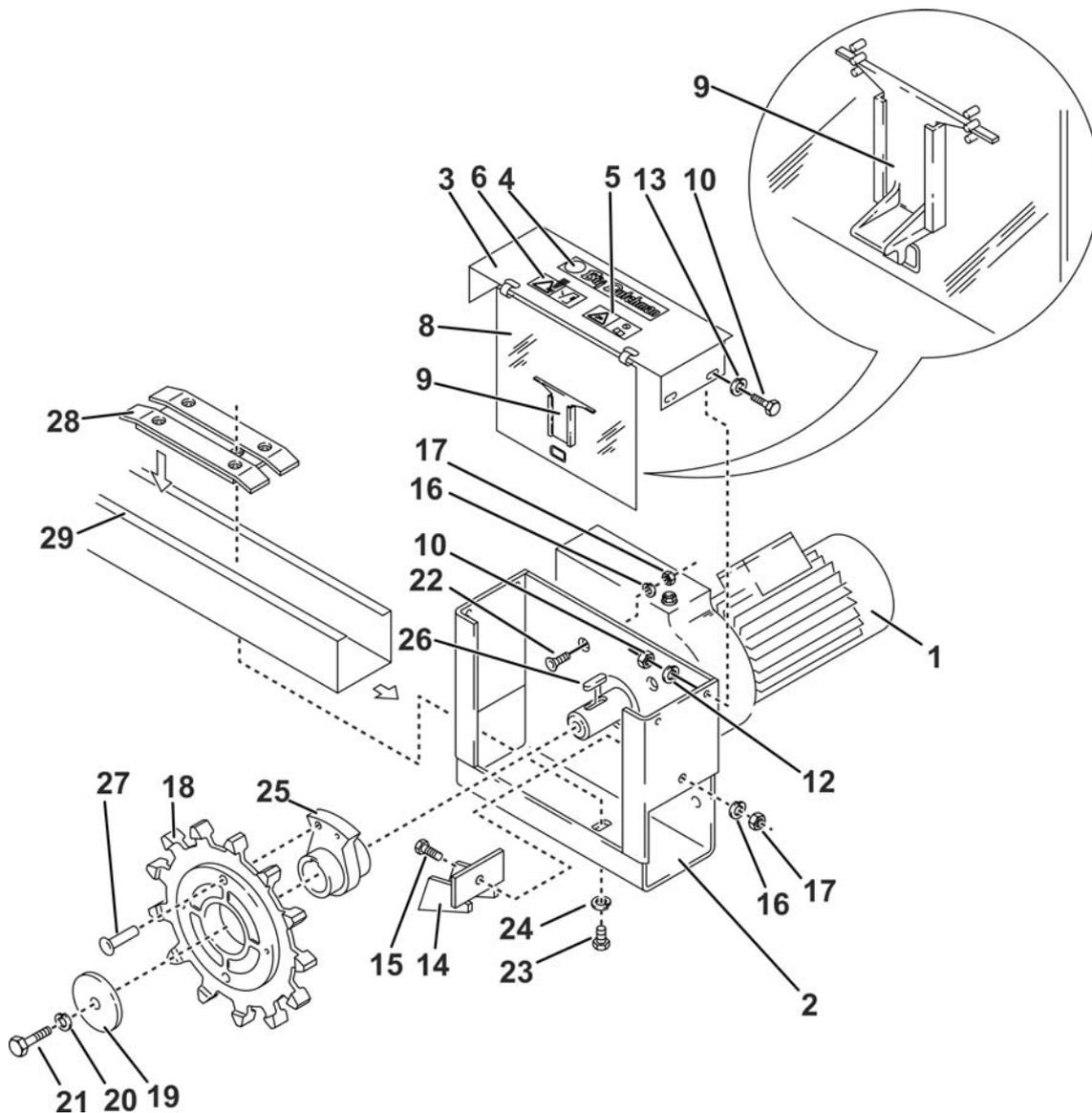
NOTICE!

Never replace a broken shear pin (pos. 27) without eliminating the cause for the fracture!

Make sure to close the protective cover after maintenance/repair works. Opening the cover must require tools.



Pos.	Code no.	Description
	10-93-5000	Drive MPF 1-L 12m 0.37kW ccw 400V 3PH 50Hz
1		gear motor
2	83-00-4647	Console MPF ccw
3	10-93-3192	Cover for drive gear MPF
4	00-00-1172	Type plate: Big Dutchman 135 mm x 25 mm
5	00-00-1186	Pictograph: Before maintenance work main switch "OFF"
6	00-00-1187	Pictograph: Crushing danger / protection device
7	10-93-3173	Protective cover MPF 1 line cpl. collapsible (pos. 8+9)
8	10-93-3154	Protective cover MPF 1 line collapsible
9	10-93-3174	Snap cover MPF 1 line PA6
10	99-10-1067	Hexagon head screw M 6x 16 galv. DIN 933 8.8
11	99-10-1045	Hexagon nut M 6 galv. DIN 934-8
12	99-20-1070	Spring washer A6 DIN 127 galv.
13	99-50-1147	Washer B 6.4 DIN 125 galv.
14	10-93-3153	Blank holder for chain 0498 MPF
15	99-10-1038	Hexagon head screw M 8 x 20 galv. DIN 933 8.8
16	99-50-1063	Spring washer A 8 DIN 127 galv.
17	99-10-1040	Hexagon nut M 8 galv. DIN 934-8
18	10-00-9543	Drive-gear reversible for MPF-drive
19	10-93-1109	Washer 14x58-6 DIN 1052 galv.
20	99-50-1205	Spring washer A 12 DIN 127 galv.
21	99-10-1274	Hexagon head screw M 12 x 30 galv. DIN 933 8.8
22	99-10-3877	Hexagon socket countersunk head screw M 8 x 25 DIN 7991 galv.
23	99-10-1068	Hexagon head screw M 10 x 20 galv. DIN 933 8.8
24	99-20-1055	Spring washer A 10 DIN 127 galv.
25	10-93-3104	Pusher Bo 35x57 MPF/CH
26	99-50-1149	Key 10x8x50 DIN 6885
27	99-50-3913	Shear pin 8x1.5x30 steel tubular rivet DIN 7340
28	38-91-3014	Guide plates with base plate for guide shoe SF/MPF
29	15-20-1001	Feed trough 3000 regular 1.2 mm (blank)



i NOTICE!

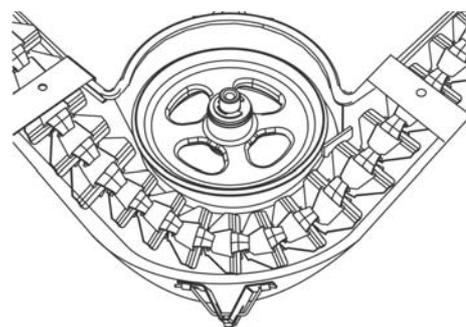
Grease the contact surfaces between the pusher and the drive gear (pos. 18) when changing or reversing the drive gear. It is essential that there is always sufficient grease between the contact surfaces of the pusher and the drive gear.

Under normal conditions, there is no need for oil or grease changes at the gear motor. If an oil change is indeed required (e.g. after leakages), strictly observe the instructions of the gear motor's manufacturer. Please find more information on this on the sticker at the gear motor. A quantity of 90 g of grease is required for motors type ESTA with 0.37 kW, and 280 g for the 0.75 kW version.

6.2.3 Checking the feed chain corner

Check the feed chain corners as follows:

1. Relieve the tension of the feed chain.
2. Remove the wing screw, plain washer, cover, retaining ring and distance washer.
3. Check whether the corner wheel chafes along the bottom of the feed chain corner, whether the play of the bearing is too large and whether the corner wheel can swing on the shaft.
4. Remove the corner wheel from the shaft, including the bush.
5. Remove encrusted feed remains etc., replace the bearing, if necessary.
6. The corner wheel has to turn easily on the shaft.
7. Re-assemble the feed chain wheel in reverse order.



6.3 Water supply

DANGER!

Persons may be electrocuted or suffer serious electrical injuries if water from leaking hoses, seals and pipes reaches live parts.

- ▶ Disconnect the main power supply.
- ▶ Interrupt the main water supply.
- ▶ Only now may you enter the part of the house where large quantities of water have escaped.

NOTICE!

Leaking hoses, seals and pipes can cause structural damage or destroy electrical systems by short circuits.

- ▶ Check regularly whether large quantities of water are escaping and eliminate the leaks as soon as possible.

6.4 Winch 350 kg for wall mounting incl. crank

1. Test the winch statically. Load the winch for 10 minutes with a load 1.5 times higher than the nominal load.
2. Turning the hand crank clockwise raises the load. Turning it anti-clockwise lowers it.
3. Turning the hand crank clockwise and thereby raising the load causes the ratchet to make a clicking noise as it engages. It does not make a clicking noise when lowering.
4. To lock the load in position on the winch, turn the hand crank slowly clockwise until you hear two “clicks”. Then slowly release the crank. You can lock the load in any position you want.

i NOTICE!

Replace the cable if it is damaged!

1. Select a cable which can absorb 5 times as much as tractive force as admissible at the cable winch (safety factor = 5).
2. Observe norm ISO 4308 when selecting the cable (cranes and lifting appliances; selection of wire ropes)
3. Fix the cable(s) to the cable winch.

The following graphics show how to fix the cable(s) depending on the mounting position of the winch.

If two cables are used: Fix the cable by threading the end through the cable screw and tightening the nut.

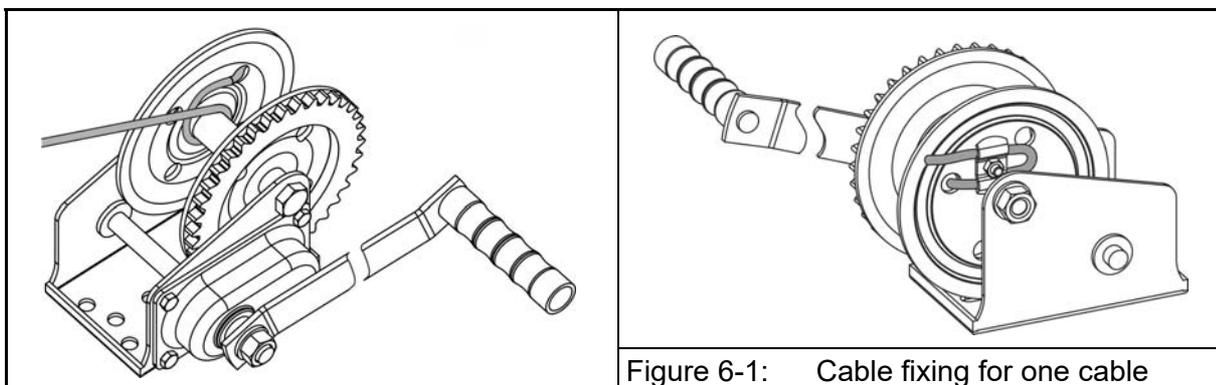
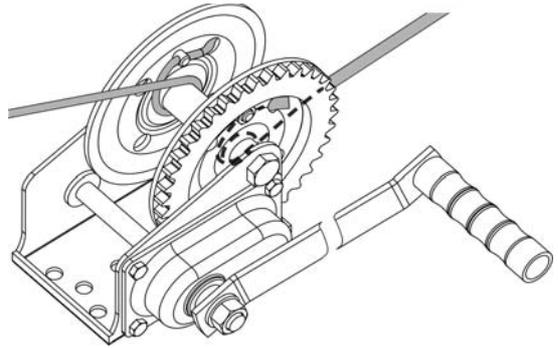


Figure 6-1: Cable fixing for one cable

Guide the cable straight to the winch. If it is guided e. g. over an angle, the cable can become severely worn.

4. Guide the cable straight to the winch. If it is guided e. g. over an angle, the cable can become severely worn:

„Danger of accidents!“



7 Cleaning and disinfection during the service period

Different cleaning and disinfection measures can guarantee ideal hygiene on a farm.

All measures have the following goals:

1. Reduce or eliminate contamination.
2. Prevent disease.
3. Create ideal conditions for high animal performance.

Since circumstances differ from farm to farm, **Big Dutchman** recommends the following measures to guarantee farm hygiene:

7.1 Hygiene measures for maintaining a high hygiene level

To guarantee farm hygiene, **Big Dutchman** recommends taking the below measures:

- The farm staff is not allowed to have contact to birds or other poultry outside of the farm!
- All vehicles should be disinfected before entering the farm. Install sprinkler hoses and wheel baths for the tyres at a place outside the farm!
- The farm should be fenced in! Only open the gate when required!
- No other poultry and birds may be on the farm!

Farms should always be safeguarded against invasion of wild birds, if possible! The buildings themselves must be protected against the invasion of birds of any kind (even the smallest oscine birds). This can be realised e.g. by installing bird screens in front of the ventilation openings.

- There should be no rodents on the farm! Draw up a plan for elimination and ensure that this plan is observed!
- Eliminate weed on the farm premises!
- No feed should be left open anywhere on the farm! Store feed in a dry place to which the animals have no access!
- The service room of every house should be equipped with hand sanitizer and disinfectant mats!
- All hygiene requirements should be complied with not only during the batch, but also during the entire service period!

- Keep the number of unnecessary visitors to the farm as low as possible. Upon entering the farm / the buildings, all visitors should put on protective clothing and write down their name in the visitors' log!

The farm should be equipped with a showering facility to change clothes and to prevent the introduction of germs!

7.2 Staff health and safety

Big Dutchman would like to remind you that for all methods used on the farm, including the hygiene program, the safety and well-being of your staff should always be carefully considered. For most countries, there are laws and or/provisions which should be complied with.

Do not forget to provide your staff with protective equipment required for the correct carrying out of their tasks.

The protective equipment includes:

- protective clothing
- safety shoes
- protective mask, if necessary
- eye protection
- nose and mouth mask
- gloves

Be very careful when using disinfectants, especially gaseous agents, since many agents available on the market may be harmful for the staff.

- Shut off the power when cleaning live parts!
- Protect moisture-sensitive parts such as control cabinets and motors from splash water during wet cleaning by covering them!
- Water in combination with dust and feed remains can lead to slippery floors!
- Cleaning agents and disinfectants can cause corrosion! Observe the manufacturer's instructions!

7.3 Cleaning and disinfection

7.3.1 Comparison between wet and dry cleaning

The system may either be wet-cleaned or dry-cleaned. Wet cleaning allows for a more effective disinfecting process.

The system must be ventilated dry **immediately** after a wet cleaning. If the system is not dried and is damp for a very long time, rust may form and can damage the components.

Dry cleaning is the best option regarding a long service life of your system, but it may not be the right method for you. We learned from different customers worldwide that dry cleaning alone is not able to sufficiently reduce the number of germs, thus causing more diseases in the birds and in turn reducing the animal performance.

Wet cleaning removes biological substances and germs more efficiently from the system than dry cleaning.

If your program includes the use of disinfectants, you should also consider that biological substances might protect the germs.

Young birds with low immune systems are exposed to germs which originate from the last herd and which were not eliminated during the cleaning process. **Big Dutchman** recommends discussing the details with your veterinarian.

7.3.2 Service life of equipment

NOTICE!

If you use thermal disinfection, ensure that the temperature does not exceed 60°C.

Temperatures above 60°C can damage the equipment in the house. **Specifically, plastics may deform.**

Big Dutchman uses the best corrosion-free steel grades available on the market. In some models, specific parts, especially in critical areas of the system, are made of Galfan steel which provides the highest protection possible.

Still, it is common knowledge that some methods influence the product's service life negatively, independent of the quality of the corrosion protection and the supplier of the equipment. These unfavourable methods include:

- (a) wet cleaning of the components if they are not immediately dried afterwards;
- (b) high-pressure cleaning which may be more aggressive than normal cleaning, depending on the equipment and the duration of the cleaning process;

(c) use of disinfectants which can damage steel or plastics and shorten the service life if they are used in high concentrations or longer than necessary.

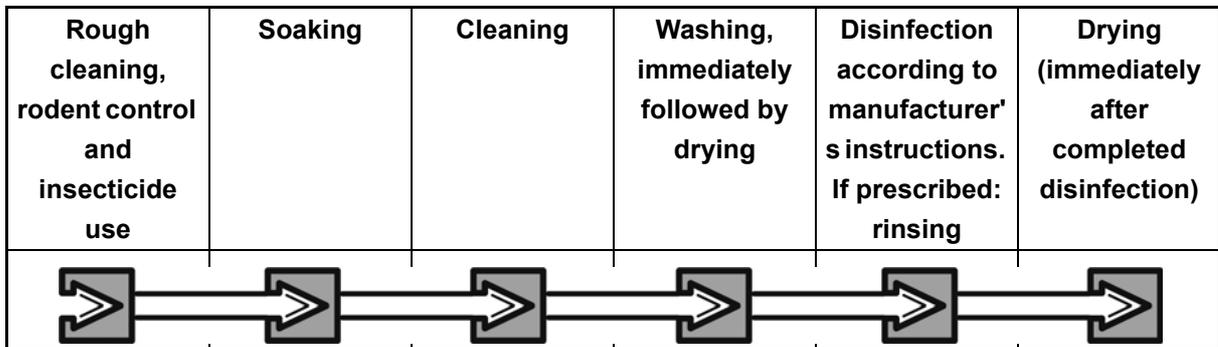
These notes also refer to the building if this is made of coated steel.

i NOTICE!

When choosing the disinfectant, you must pay attention to the corrosion resistance. Especially the disinfectants on acid basis tend to dissolve the zinc coat of galvanized components.

7.3.3 General cleaning and disinfection process

Cleaning must be carried out in a way that the surface structure, colour and original condition are clearly visible in every case.



7.3.4 Before cleaning

- For a quick and thorough cleaning process with a high-pressure cleaner, open the front grids completely and move the tubes above the feed troughs and the drinkers into the highest position.

i NOTICE!

Please refer to chapter 4.8 "Winch 350 kg for wall mounting incl. crank"

7.3.5 Primary cleaning, combating of rodents and applying insecticides

1. Remove all remaining feed as well as litter rests and manure from the system!

Let silo and feed auger run dry, open the feed columns and remove any remaining feed.

NOTICE!

If the litter is to be removed from the aisles via the manure belt, only place litter on the manure belt while the belt is running. Never load manure belts that are not running with litter!

NOTICE!

The feed conveying tubes must be completely empty before cleaning the house with water!

Rests can harden through the moisture. They are also a hygienic risk.

2. Clean the area below the system. Lift the cover plates for this purpose. Use a broom to remove the dirt under the system.
3. Remove dust from all equipment and from all places with covers!
4. Treat the walls and ceilings in the still warm house with insecticides!
 - Cleaning and disinfecting make no sense if flies distribute new germs on the disinfected surfaces.
5. Eliminate rodents (mice, rats) and arthropods (=> 10 "Glossary") which may transmit and spread pathogens for animal diseases.
6. Move all objects that can be removed from the house outdoors.
7. Clean the inside of the air duct, if applicable.
8. Check the entire system for material fatigue. Cracks in the material are an ideal hotbed for vermin.

7.3.6 Soaking

1. **Only if possible:** To make sure that the surfaces do not dry early during the following soaking procedure, both ventilation and heating should be switched off before starting with the soaking.
2. Soak the interior of the building, walls, ceilings and the residual equipment approx. 10 hours before the **wet cleaning**. Use fat- and protein-dissolving products.
 - **During soaking make sure that** sufficient liquid arrives on the dirt in order to dissolve the dried dirt layer.
3. Avoid a re-drying of the dirt until the wet cleaning is started.

NOTICE!

Thorough soaking can reduce the duration of the following cleaning period considerably.

7.3.7 Wet cleaning

NOTICE!

During wet cleaning with a heavy-duty high-pressure cleaner, large amounts of water may flow onto the manure belt within a very short time period. The water may not be able to drain off the belts and will then accumulate in the cavities between the manure belt supports. Such water accumulations put a high load on the supports. The manure belt supports may bend or be torn from the side rails, thus damaging the manure belt drives.

1. Perforate the manure belts in the centre (if necessary).

Please also observe the notes in the manual "Assembly of the manure belt"!

2. Use high-pressure cleaners to clean the house, starting at the ceiling and continuing towards the floor. Pay special attention to air inlets, piping, edges and the upper side of beams.
3. Ensure good lighting so that dirt can be easily spotted.
4. Sweep the wash water towards the manure cross channel using a broom.
5. Clean the breathing hoses with a bottle brush.
6. Clean all parts of the feed supply system and the feed silo thoroughly. It is essential that feed remains are removed from the concrete areas below the silos. These feed remains would attract rodents and wild animals otherwise.

7. Clean the equipment brought outside as well as the building envelope and any additional concrete areas.
8. Note that some components of the system and the building should not be wet cleaned, e.g. electric motors, electric user panels and other parts which may be damaged by water.

 NOTICE!

Protect the drives from penetrating wash water!

9. **Big Dutchman** motors can be cleaned gently, but not with high-pressure cleaners.

 NOTICE!

Let the manure belts and the feed chains run permanently in all tiers during wet cleaning!

10. Check the manure belts permanently to be able to react immediately at the manure belt idler unit or at the manure belt drive in case of drifting manure belts.

 NOTICE!

Drinkers and water containers not cleaned thoroughly are potentially dangerous. They should therefore always be thoroughly cleaned and disinfected (refer to chapter 7.3.9 "Disinfection").

 NOTICE!

The cleaning process has been successfully finished when all cleaned parts are visually clean and the drained off water is free from dirt particles.

7.3.8 Rinsing and drying

1. After washing it is advisable to rinse the surfaces and equipment with clean water to remove residues of cleaning agents.
2. Rinse the house starting with the ceiling and working down to the floor.
3. Ventilate the house thoroughly after having completed the cleaning so that it can dry quickly.
 - **Remove water accumulations which cannot dry fast enough by hand!**
4. Pump cleaning water out of the manure cross channel.
5. Oil all the chain wheels, roller chains and rust-sensitive parts again.
6. After cleaning, carry out necessary repair and maintenance works.
7. Only start the feed chain again when the feed chain and the feed channel are completely dry.
8. Check the holes in the air ducts for clogging after cleaning.

NOTICE!

A thorough and careful house cleaning is an imperative precondition for a successful house disinfection!

7.3.9 Disinfection

Many hygiene programs all over the world demand the use of disinfectants after the cleaning process. You should however keep in mind that many disinfectants may reduce the service life of your installation.

For the choice of the correct disinfectant, please observe the following:

- Could the disinfectant endanger the **health** of persons?
 - Take all necessary measures (e.g. protective clothing, gloves and respiratory equipment, etc.) to exclude any dangers for the persons handling the disinfectants!
- Which **infectious agent** can be combated with the disinfectant?
 - No one disinfectant has the same effect on all germs.
 - Change the agents regularly to prevent resistance.If you have questions, please consult your veterinarian.
- For which **temperature range** is the disinfectant provided?

- If the disinfectant is used at temperatures other than those specified, the efficacy of the agent will be reduced.
- Is the disinfectant appropriate for the treatment of **galvanized steel**?
 - Unsuitable disinfectants can lead to corrosion of the steel and destroy it!
- Is the disinfectant appropriate for the treatment of **plastics**?
 - Unsuitable disinfectants can destroy plastics!
- Is the disinfectant appropriate for the treatment **of other materials existing in your house**?
 - Unsuitable disinfectants can destroy these materials.

 NOTICE!

The instruction leaflet and/or packing or the safety data sheet of the manufacturer will provide you with information regarding the protection of persons handling the disinfectant and regarding the resistance of various materials to the disinfectant.

In any case, you should weigh up the advantages and disadvantages for each single component of your system when you decide to use a disinfectant.

Please also consider its involvement in the entire process of your hygiene program.

Disinfection procedure:** NOTICE!**

If you use thermal disinfection, ensure that the temperature does not exceed 60°C.

Temperatures above 60°C can damage the equipment in the house. **Specifically, plastics may deform.**

Below you will find a description of a wet disinfection:

1. Please consider and observe the usage recommendations of the manufacturer regarding concentration, soaking time, admissible ambient temperature, temperature of the components to be disinfected and quantity of the disinfectant solution!
2. Take all measures (e.g. protective clothing, gloves and respiratory equipment, etc.) to exclude any dangers for the persons handling the disinfectants!
3. Never mix several disinfectants! This may render individual disinfectants ineffective.

**WARNING!**

Mixing different disinfectant can cause explosive reactions.

- ▶ Never mix different disinfectants if mixing is not explicitly permitted.

4. The surfaces and objects to be disinfected must be clean and dry!
 - Residual moisture or puddles in the house can lead to a dilution of the disinfectant and thus to a reduction of the efficacy. Consequently, more disinfectants must be applied in order to achieve an optimal result.
5. The disinfectant is applied starting in the back of the house and working to the front respectively starting with the ceiling and working down to the floor.
6. Make sure that the disinfectant is spread over all surfaces!
 - The working solution should be spread with a pressure of max. 10 to 12 bar and a reduced flow rate. Otherwise, aerosols (=> chapter 10) will easily form and change the wetting characteristics.
7. Fill the water lines and drinking systems in the empty house with a disinfecting solution to kill algae, bacteria and fungi. Let the disinfecting solution soak for at least one day.
8. During the soaking time, the ventilation system should be switched off if possible in order to avoid that the surfaces dry up too fast.
 - **The treated houses may only be entered with a respirator mask for a certain time, depending on the method of applying, soaking time and active agent.**
9. The disinfected surfaces and objects should be rinsed thoroughly if the specifications of the disinfectant manufacturer demand this.

i NOTICE!

The feeding and drinker systems however must **always** be rinsed thoroughly after the disinfection.

Drinker lines must **always** be rinsed on the **inside** after completed disinfection. In case the soaking time is too long, the drinking nipples may become leaky. Chlorous disinfectants are to be regarded as especially critically in this connection.

All residues of the disinfectant should therefore be removed.

Checking the disinfection results:

Appropriate steps should be taken to check the efficiency of the disinfection.

1. Take adhesive film tests and swab samples of housing equipment and surfaces!
 - The total number of germs / cm² is determined with these tests. It should be below 1000 CFU (= colony forming units).

i NOTICE!

If the germ presence is determined to be too high following cleaning and disinfection, the above measures are to be repeated and the moving a new batch in is to be postponed.

7.3.10 Drying after a complete and successful wet disinfection procedure

The system must be ventilated dry **immediately** after a complete and successful wet disinfection procedure.

If the system is not dried and is damp for a very long time, rust can form and thus damage the components.

8 Re-starting the system

Check the entire system for functionality before starting the next rearing batch when restarting the system after cleaning and disinfection.

- Check whether the entire feeding system works.
No water may remain in the feed trough.
- Check whether the drinkers work.
No substances originating from cleaning and disinfection may remain in the drinkers. Thoroughly flush the entire drinker line.
- Check whether the motors work.
- Decide on the litter material you want to use and order it from the supplier for the corresponding date.
- Check whether the approach perches can be extended and folded down.
- Check all manually movable system parts for functionality, such as front grids, foldable partitions, height adjustment of drinkers and tubes above the feed trough,...

9 Troubleshooting

The faults listed here are examples. A fault must not necessarily be caused by one of the reasons stated here.

Please contact **Big Dutchman** whenever necessary.

9.1 Feeding system

9.1.1 Feed chain

Fault	Cause	Remedy
Feed chain cracked.	Foreign object in the feed trough.	Remove the foreign object(s).
	Feed got wet, swelled up/hardened and accumulated in the corners.	Remove the hardened feed. Make sure that feed does not get wet!

9.1.2 Gear motor

Fault	Cause	Remedy
Gear motor gets too hot.	The plug was not removed from the gear motor's bleeder screw before putting it into operation.	Remove the plug.
	Dust deposits on the housing lead to insufficient cooling of the motor.	Remove the dust and keep the housing clean.
	The protective motor switch was not set to the correct current.	Correct the set value.
	Oil level in the gearing incorrect or too low.	Check the quantity and type of gear oil. Change the oil, if necessary.
	Overloading of the motor because feed chain tension is too high or too low.	Adjust the chain tension (=> 6.2.1 "Checking and correcting the tension of the feed chain").

9.1.3 Shear pin at the MPF drive

i NOTICE!

Only use the original **Big Dutchman** shear pins!

Never replace shear pins with nails, screws or other bolts!

Fault	Cause	Remedy
Shear pins tend to break.	A machine part (feed chain, corner, corner wheel) is blocked by a foreign object.	Remove the foreign object.
	Feed chain buckles the feed trough, the chain tension might be too low.	Correct the chain tension. => chapter 6.2.1 "Checking and correcting the tension of the feed chain"
	Tensile load on the feed chain is too high, the chain tension might be too high.	Correct the chain tension. => chapter 6.2.1 "Checking and correcting the tension of the feed chain"
	Feed chain gets stuck.	Align the respective feed chain corner or coupling for feed trough or replace them.
	Drive guide shoe is rough in some places, feed chain gets stuck.	Polish the drive guide shoe or replace it.
	Drive wheel of the feed chain is worn.	Reverse the drive wheel of the feed chain or replace it.
	Drive wheel of the feed chain and guide shoe are not aligned correctly.	Correct the play by 0.5 to 1.0 mm.
	Feed circuit takes too long.	Adjust the feed circuit times. Consider two feedings directly after one another, but with shorter circuit times, if necessary.
Feed chain corners move.	Tighten all feed chain corners and install them in a way that they cannot move during operation.	

9.1.4 Feed chain wheels

Fault	Cause	Remedy
Feed chain wheels are not running.	Feed chain tension too high or too low.	Check and correct the tension of the feed chain. => chapter 6.2.1 "Checking and correcting the tension of the feed chain"
	Foreign objects are stuck in the corner wheel.	Remove the foreign object.
	Plastic bearing bush was knocked out.	Remove the corner and replace the plastic bearing bush. => chapter 6.2.3 "Checking the feed chain corner".
	Shaft for corner wheel is not installed correctly in the housing.	Remove the corner and assemble the components again in the correct order. => chapter 6.2.3 "Checking the feed chain corner".

9.2 Water supply

Fault	Cause	Remedy
Nipple pipes and nipple drinkers are clogged.	The cross section is constricted due to water deposits or formation of a so-called "biofilm" in the pipes or due to fatty medicines administered via the drinking water.	Flush the nipple pipes thoroughly. Remove the nipples and clean them, if necessary.
	Foreign objects accumulated in the nipple pipe.	Flush the nipple pipes thoroughly. Remove the nipples and clean them, if necessary.
	Coupling of the pipes has displaced.	Replace the coupling.
	Air bubbles in the supply.	Install the plastic hoses without forming traps.
	Air bubbles in the nipple pipe.	Flush the nipple pipes thoroughly. Actuate the nipples to aerate them.

9.3 Manure removal

i NOTICE!

Always refer to the **user manual "Adjustment of the manure belt"** to remedy faults and their causes.

The manual can be ordered under the following code number, if necessary: 99-94-0431 (adjustment of the manure belt).

(Please also refer to the information in chapter 1 "About this manual").

Fault	Cause	Remedy
Manure belt slips.	Tension of the manure belt is too low.	Adjust the pressure roller at the manure belt drive.
Drive roller slips.	Too much manure on the manure belt.	Pull at both sides of the manure belt at the manure belt drive until it starts running independently. Increase the number of manure removals, if necessary.
	Pressure roller has not contact.	Re-tighten the pressure roller.
	Pressure roller is wet.	Keep the pressure roller and the manure belt dry.
Idler roller is stuck.	Manure and dust at the idler roller.	Clean the idler roller and the idler scraper.
	Idler roller and scraper are stuck.	Find out why the idler roller and the scraper are stuck and eliminate the cause.
Manure belt drive is not running.	Power supply interrupted.	Replace the fuse.
	Roller chain at the manure belt drive too loose.	Re-tighten the roller chain.

10 Glossary

Aerosol:

(a made-up word from the Latin *aer* "air" and *solutio* "solution") is a colloid of suspended particles in a gas. It can consist of finely dispersed solid (dust) or liquid (fog) particles suspended in the air.

MPF drive ccw:

is the drive which drives the feed chain counter-clockwise (ccw).

Arthropods:

form the phylum Arthropoda (from the Greek *arthron* "joint" and *podos* "foot") and include different animals such as insects, myriapods (e.g. millipedes), crustaceans (e.g. crabs, barnacles) and arachnids (e.g. spiders, scorpions, mites).

Perching:

is the sitting or settling of large fowl on a higher or elevated location, e.g. on a branch.

Supervisor:

is a reliable person who is familiar with the work and authorized to issue instructions. He ensures that the work is performed safely. He must have sufficient technical knowledge.

Rearing of chicks and pullets:

is the keeping of young birds of the species *Gallus gallus* to produce eggs later.

Designated use:

is the correct use of product in accordance with its intended purpose.

Disinfection (hygiene):

is the targeted partial reduction of the germ number, especially on surfaces (decrease in germ number).

End set:

is the start or end area of a system row. Drives (e.g. MPF drive, manure belt drive), supply units (e.g. water wall, feed column) are usually accommodated in the end set.

Intermittent lighting program:

is a lighting program designed specifically for the first days of the life of chicks (until day 10). Light and dark phases alternate regularly. For example: A 4-hour light phase is followed by a 2-hour dark phase, followed by another 4-hour light phase, and so on.

Manure belt system:

is a system with automatic manure collection via a manure belt. The manure belt is driven by a manure belt drive and is reversed in the manure belt idler unit. One is located in one end set of a system, the other in the other end set (manure belt drive end set; MB idler end set).

Manure collection:

is the totality of components that are required for the removal of manure from the system (e.g. manure belt drive, manure belt idler, manure belt).

Laying phase:

is the period in which hens lay eggs.

Running meter:

(abbreviation: r.m.) is a measuring unit which is used to measure goods which can be purchased as merchandise, yard goods or roll goods and which dispose of an even cross section, or length indications for invariant elements independent of their other measures.

Left/right-hand side (relating to the transport direction):

in the description of a part, indicates the position of the part in relation to the transport direction of the corresponding belt. The left and right side is determined in relation to the transport direction of the manure belt (from the manure belt idler in the direction of the manure belt drive).

Nominal capacity:

is a capacity determined under specific standardised conditions.

Parts per million:

(abbreviated as ppm) is the figure 10^{-6} and is used in science and engineering for 1 part per 1 million parts, similar to percent (%) for "per hundred", i.e. 1 part per 1 hundred parts or 10^{-2} .

Room loads:

are factors which can damage buildings or be harmful to health and which must therefore be exhausted by means of a ventilation system. In the summer, heat is a room load, while in the winter, water vapour and carbon dioxide are room loads. Room loads also include harmful gases such as ammonia and hydrogen sulphide.

Restriction:

is a measure taken to prevent something from exceeding a certain quantity or extent.

Scratching area:

is the area between system rows in which the birds are free to move when the house is open.

State of the art:

represents the technical possibilities at a certain point in time, based on validated scientific and technical knowledge.

11 Checklist key points summary

i NOTICE!

Important! Please remember to cut this page and the following pages along the line from this manual and keep them safe as **blank** master copies!

Date		Name

i NOTICE!

Check the following points **before moving the birds in:**

Key points:		Result	Comments
<input type="checkbox"/>	System clean, dry and disinfected?		
<input type="checkbox"/>	System pre-heated?		
<input type="checkbox"/>	Feeding system, water supply, ventilation, lighting, mechanism to extend/fold down perches functioning?		
<input type="checkbox"/>	System prepared? Distribute chick paper, feed in troughs and on the chick paper		
<input type="checkbox"/>	Length of the feed circuit calculated? Running time and number of feedings per day set?		
<input type="checkbox"/>	Lighting program and light intensity set?		
<input type="checkbox"/>	Drinker lines and drip cups clean? Flush the nipple pipes thoroughly after cleaning and disinfection.		
<input type="checkbox"/>	Distribution of the number of birds per section calculated?		
<input type="checkbox"/>	Chicks placed behind the feed trough/between feed trough and nipple drinker?		

Also refer to chapter 5.2.1 "Before moving-in".

Date		Name

 NOTICE!

Technical check during operation:

Daily check of the feeding system

Key points:		Result	Comments
<input type="checkbox"/>	Entire feeding system functioning? (at least once per day)		
<input type="checkbox"/>	Troughs, corners, drives and feed column free from dirt? Remove immediately, if necessary.		
<input type="checkbox"/>	Keep the protective cover of the MPF drive closed during operation!		
<input type="checkbox"/>	Feed level at the feed level slide?		
<input type="checkbox"/>	Does the chain run through the MPF drive in a straight manner? Check MPF drive, reversible drive gear and guide shoe.		

 NOTICE!

Technical check during operation:

Daily check of the water supply system

Key points:		Result	Comments
<input type="checkbox"/>	Daily water consumption?		
<input type="checkbox"/>	Entire drinking system, all connections, couplings and nipples tight? Eliminate leakages immediately!		
<input type="checkbox"/>	System supply pressure OK? (operator is responsible for pressure between 1.6 and 6 bar)		

<input type="checkbox"/>	Pressure regulator functioning? Filter combination? (output pressure max. 3 bar)		
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<input type="checkbox"/>	Water filter clear? Clean manually with clean water from a pressure difference of more than 0.5 bar.		
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<input type="checkbox"/>	Water column height at pressure regulator and at breather hose OK?		
--------------------------	--	--	--

Date		Name

 **NOTICE!**

Technical check during operation:

Weekly check of the feeding system

Key points:	Result	Comments
<input type="checkbox"/> Feed chain tension OK, feed chain running straight?		
<input type="checkbox"/> Wear and tear of MPF drive?		
<input type="checkbox"/> Wear and tear of feed chain corners? Plastic plain bearing, guide rail, guide brackets, bearing bushes, ...		

i NOTICE!

Technical check during operation:

Weekly check of the water supply system

Key points:	Result	Comments
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<input type="checkbox"/>	Water has drinking water quality? => chapter 4.6.2 "Water quality"		
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<input type="checkbox"/>	Nipple pipes flushed? At least once per week, more often during the summer.		
--------------------------	--	--	--

Date	Name
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i NOTICE!

Technical check:

Before manure removal

i NOTICE!

Manure removal only under supervision!

Key points:	Result	Comments
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<input type="checkbox"/>	Manure belts checked for foreign objects? Remove these immediately.		
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<input type="checkbox"/>	Pre-tension of manure belts correct?		
--------------------------	--------------------------------------	--	--

<input type="checkbox"/>	Drive and idler rollers cleaned?		
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<input type="checkbox"/>	Manure belts damaged? Repair immediately.		
--------------------------	--	--	--

<input type="checkbox"/>	Motors clean? Remove dust covers immediately due to possible overheating.		
--------------------------	--	--	--

<input type="checkbox"/>	Roller chains and chain wheels lubricated?		
--------------------------	--	--	--

<input type="checkbox"/>	Pre-tension of roller chains correct?		
--------------------------	---------------------------------------	--	--

 NOTICE!

Daily production data:

Enter the daily production data of each calendar week in this table.

We ek			Number of birds moved in:	
----------	--	--	---------------------------	--

(calendar week)

Initial number of birds:	
--------------------------	--

Feed supplier:	
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Date	Losses	Of which selected	Feed delivery in kg	Water consumption in litres	Vaccination Medication	Comments
Total:						

Final number of birds:	
------------------------	--

i NOTICE!

Check the following points **before moving the birds out:**

Key points:	Result	Comments
<input type="checkbox"/> Appointment with the egg producer made?		
<input type="checkbox"/> Service team ready?		
<input type="checkbox"/> Aisles empty?		
<input type="checkbox"/> Feed troughs emptied by birds?		

i NOTICE!

Note down for each moving-out procedure:

Date	Number plate of lorry	Number of birds	Losses during moving-out	Random sample: Ø bird weight / alternatively weight vehicle	Comments
Total:					

i NOTICE!

Check the following points **before cleaning and disinfection:**

Key points:	Result	Comments
-------------	--------	----------

<input type="checkbox"/>	Movable parts removed from the house?		
<input type="checkbox"/>	Feed columns open and remaining feed removed?		
<input type="checkbox"/>	Remaining feed and litter completely removed from house?		
<input type="checkbox"/>	Silo and feed auger (FlexVey) empty?		
<input type="checkbox"/>	Manure removed from manure belts?		
<input type="checkbox"/>	Manure belt scrapers folded down?		
<input type="checkbox"/>	Area below system cleaned?		
<input type="checkbox"/>	Air duct cleaned (if applicable)?		
<input type="checkbox"/>	House swept with broom?		

 NOTICE!

Check the following points **during wet cleaning**:

Key points:	Result	Comments
<input type="checkbox"/> Inside of the house soaked with protein-solvent agents (approx. 10 to 24 hours before wet cleaning)?		
<input type="checkbox"/> Manure belts running?		
<input type="checkbox"/> Observe correct cleaning process: Clean the house with a high-pressure cleaner From the ceiling via the walls to the floor Sweep water towards the manure cross channel with a broom		

 **NOTICE!**

Check the following points **after wet cleaning**:

Key points:	Result	Comments
<input type="checkbox"/>	House rinsed?	
<input type="checkbox"/>	Parts removed from the house, area in front of the house and outer walls of the house cleaned?	
<input type="checkbox"/>	Entire feeding system, feed silo and concrete areas below silo cleaned?	
<input type="checkbox"/>	Ventilation activated?	
<input type="checkbox"/>	Manure cross channel cleaned? Water pumped from manure cross channel?	
<input type="checkbox"/>	Chain wheels, roller chains and parts susceptible to rust lubricated?	
<input type="checkbox"/>	Necessary repair works carried out?	
<input type="checkbox"/>	Perforations of air ducts checked and cleaned, if necessary?	
<input type="checkbox"/>	Complete and thorough disinfection? Carry out adhesive film tests and take swab samples, if necessary disinfect again.	