

Technical Systems

MARKET LEADER IN
FEED CONVEYING

Infini-T™ Recoiling System

Operator's Manual & Installation Guide

Revision 4



Conformité Européenne

The equipment described in this document conforms to
the Essential Requirements of the following EU directives:

Directive 2006/42/EC: Machinery Directive

Directive 2006/95/EC: Low Voltage Directive

This document was originally written in English. All other language versions are translations. Should there be a discrepancy, the original meaning as written in this document shall prevail.

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WARRANTY

Technical Systems extends a 5 (five) year warranty for the Infini-T™ Recoiling system against all defects arising from faulty workmanship or materials during the aforesaid periods, commencing on the date of delivery to the customer.

The warranty does not apply to damage caused by normal wear and tear over time, or for defects and damage arising after the guarantee periods referred to above.

Any attempt to alter, dismantle or change the standard specifications of the product will render this warranty null and void. This warranty does not cover consequential damages and/or loss of or damage to products due to negligence or misuse.

This warranty is made to the original purchaser of the product and is not transferable.

The warranty obligation, including defects liability arising from faulty workmanship, is subject to our standard Terms and Conditions.

Conditions & Limitations

The product must be installed by and operated in accordance with the instructions as provided by the manufacturer or the warranty will be void.

The Warranty will be void if all components of the Infini-T™ Recoiling system are not original equipment supplied by the manufacturer. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance or a failure to comply with the conditions of sale shall not be considered defects under the warranty and will be excluded.

This warranty applies only to systems for the care of poultry, pig and livestock. Any other applications of our products and systems are not covered by this warranty. The warranty for the Infini-T™ Recoiling system applies only when used together with a Technical Systems Infini-T™ Auger mothercoil in terms of the manual, instructions or specifications supplied by Technical Systems. In the event of the mothercoil being used with another recoiling system, this warranty will only cover the mothercoil if such other recoiling system has been approved by a representative of Technical Systems prior to or on installation of the mothercoil and system by the customer.

Technical Systems shall not be liable for any consequential or special damage which any purchaser may suffer or claim to suffer as a result of any defect in the product. Consequential or special damages as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increase overhead, labour and incidental costs and operational inefficiencies.

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SAFETY

Although measures have been taken to reduce safety hazards, the installation, operation and maintenance of the machinery described in this manual can still pose serious safety risks.

PERSONAL PROTECTION EQUIPMENT

Applicable personal protection equipment should be worn at all times when working on or with the machinery including, but not limited to:

- Hearing protection
WARNING: Noise levels during operation of the machinery can reach levels over 65dB. Long term exposure to these noise levels can be detrimental.
- Eye protection
- Hand protection

SAFETY AROUND THE MACHINERY

The machinery has many moving and rotating parts when in operation, therefore:

- The area where the machines are operated should be off limits to all unauthorised personnel. The area around the machinery should be clearly marked as restricted access.
- No loose clothing should be worn when operating the machines as this might catch onto moving/rotating parts.

AUTHORISED AND TRAINED PERSONNEL

Only persons that have been properly trained may operate or work on the machines. Training for operators must include at least all points addressed in this manual, but may be expanded as required.

Of special importance is making operators aware of the following:

- The risk of injury of all uncovered moving and rotating parts.
- Removal of the adjustment spanner for the coiler mandrel.
- Risk of injury when coiler mandrel adjustment nears its limits.
- The risk of injury against the angular uprights of the decoiler.
- The correct placement of the cover on the mothercoil.
- Checking that the steel core of the mothercoil is securely fastened.

For more information on the safety aspects of using these machinery kindly consult this manual.



If an item is marked with this icon it means that this is an important point to consider in terms of personal safety. **Please pay special attention to these notes.**

INTRODUCTION

In support of our world-leading Infini-T auger products, which allow our customers to cut the desired auger lengths at their own premises, Technical Systems also developed the machinery to handle the decoiling, measuring and coiling of the auger, known as the Infini-T Recoiling System.

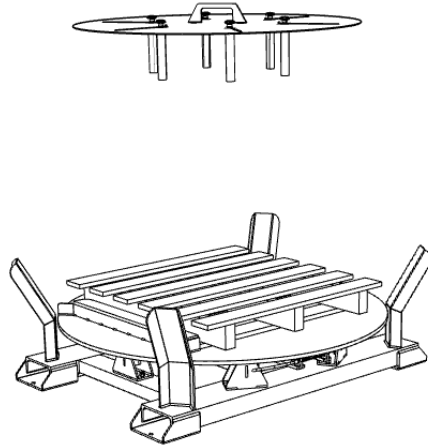
This document serves as a user manual for the Infini-T Recoiling System and aims to provide users with all the information necessary to run the system. However, it is strongly advised that you watch the demonstration video on our website, www.technicalsys.com for more clarity on the operation of the Infini-T Recoiling System.

SYSTEM OVERVIEW

The Infini-T™ Recoiling System consist out of three units and a handling tool namely:

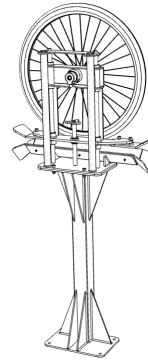
Decoiler

The pallet with the Infini-T mothercoil as ordered from Technical Systems is placed on this machine, which automatically rotates the entire pallet and coil as it is decoiled.



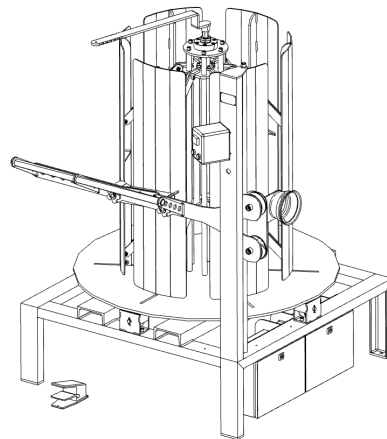
Length counter

This unit is used to measure the length of the auger being coiled to ensure that the correct lengths are consistently produced.



Coiler

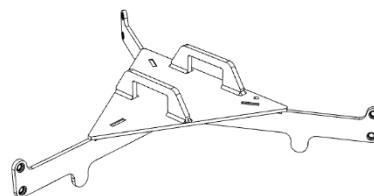
This unit is used to recoil auger into new, shorter auger coils with different coil diameters.



Coil Lifter

This tool is designed for easy handling of auger coils using either a forklift or an overhead crane.

(shown without chains and hooks.)



THE INFINI-T™ MOTHERCOIL

When shipped from Technical Systems the Infini-T mothercoil will be packaged as shown in Figure 1. Since the auger is truly continuous (without any welds or brazing), it has to be layered as it is wound onto a spool.

The first layer is coiled in an upwards direction until the spool is full. Wire is then looped from the inside of the coil to the outside and tightened in six places around the coil (see page 9 for more detail). This layer is then wrapped with a carton sheet before starting the second layer.

The second layer is coiled in a downwards direction until the spool is full and then also fixed with wire and wrapped with carton. This process is repeated for each layer, with the direction of the coiling alternating between the layers.

Hence, when the mothercoil is decoiled, the **six wire loops on each layer should be removed** along with the carton sheeting.

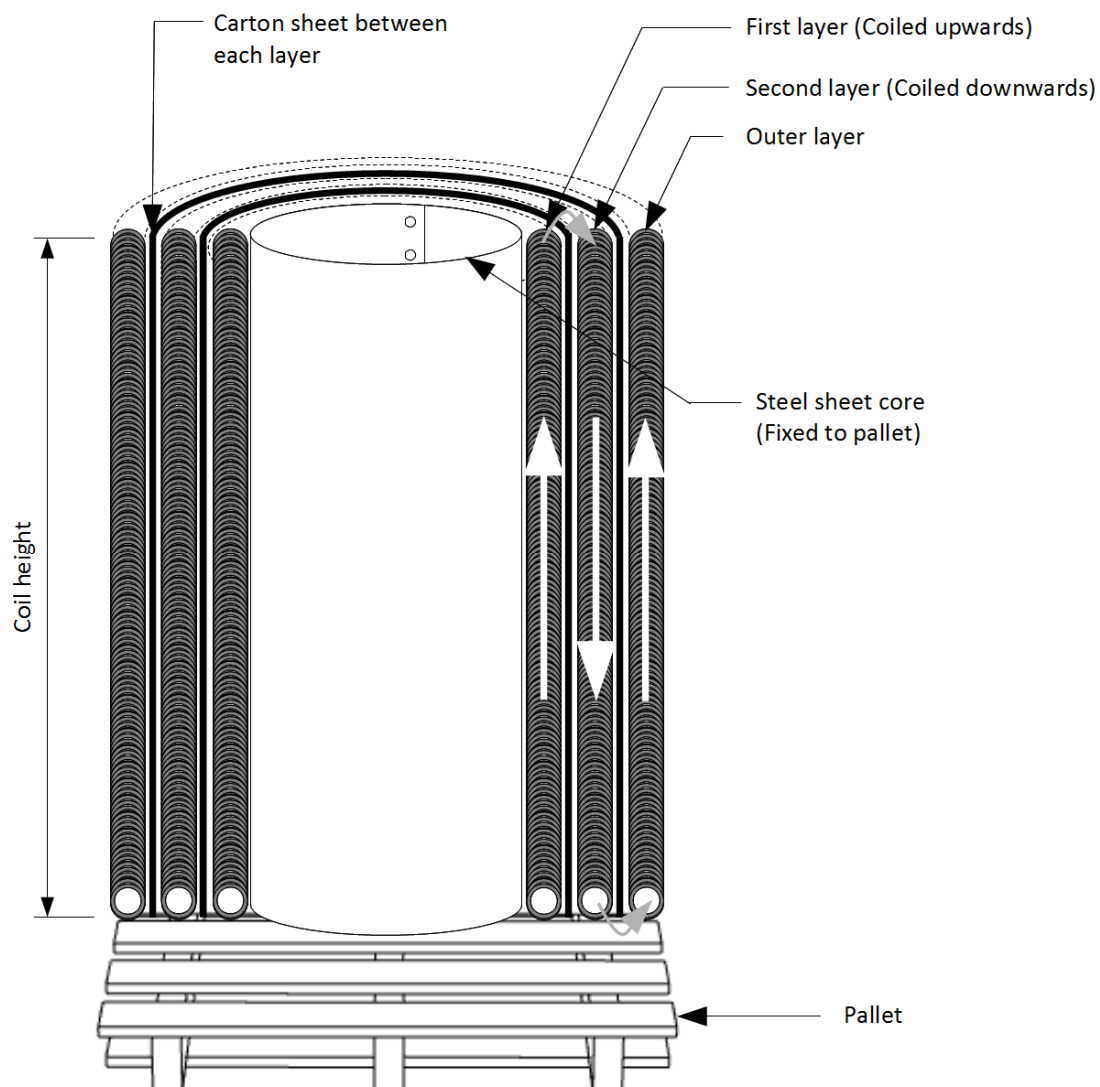


Figure 1: The Mothercoil (Cross-sectional view)

Note that with some layers the auger will uncoil from the bottom up, resulting in some layers sliding down, but this should not be a cause for concern. If decoiling is stopped midway, simply wrap the remaining piece of auger back onto the coil and use wire to secure the loose end to the auger itself.

The mothercoil is shipped with a steel inner core that is strapped to the pallet with **BLUE strapping**. This is to ensure that the coil does not slide off the pallet or falls over. It also serves to maintain the integrity of the coil when uncoiling so that coil does not collapse, especially at the last layers.

Therefore it is extremely important to check that the core is still securely fixed to the pallet with the BLUE strapping when handling or decoiling the mothercoil.

The entire mothercoil will be strapped before shipping with **GREEN strapping**. When removing packaging these GREEN straps should be removed, but take care not to cut the BLUE strapping that fixes the steel core to the pallet.



Take care not to cut the BLUE strapping that keeps the steel core fixed to the pallet when removing packaging!

BASICS OF COILING AUGER

To easily understand the principles of recoiling auger, it is necessary to introduce some basic concepts first. Please take special note of the terminology used in this chapter as these will be used throughout the manual.

An auger, also known as a helicoid or spiral, is made of flat wire and is characterised by its outer diameter (OD), inner diameter (ID) and pitch (see Figure 2 below).

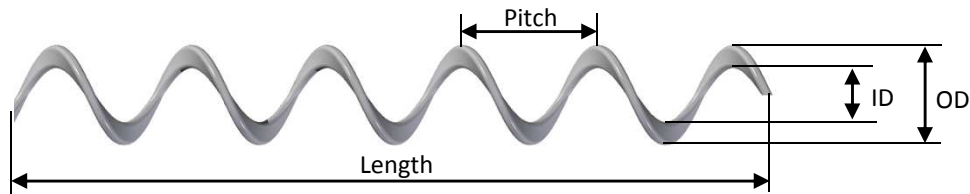


Figure 2: Auger characteristics

When a long length of auger is rolled into a coil for packaging and shipping, this coil is also characterised by a coil ID, a coil OD and a coil height. This is achieved by wrapping the auger around a core/pipe with a diameter equal to the desired coil ID. Each layer of auger is placed on top of the previous layer, forming a coil with a coil height as shown in Figure 3.

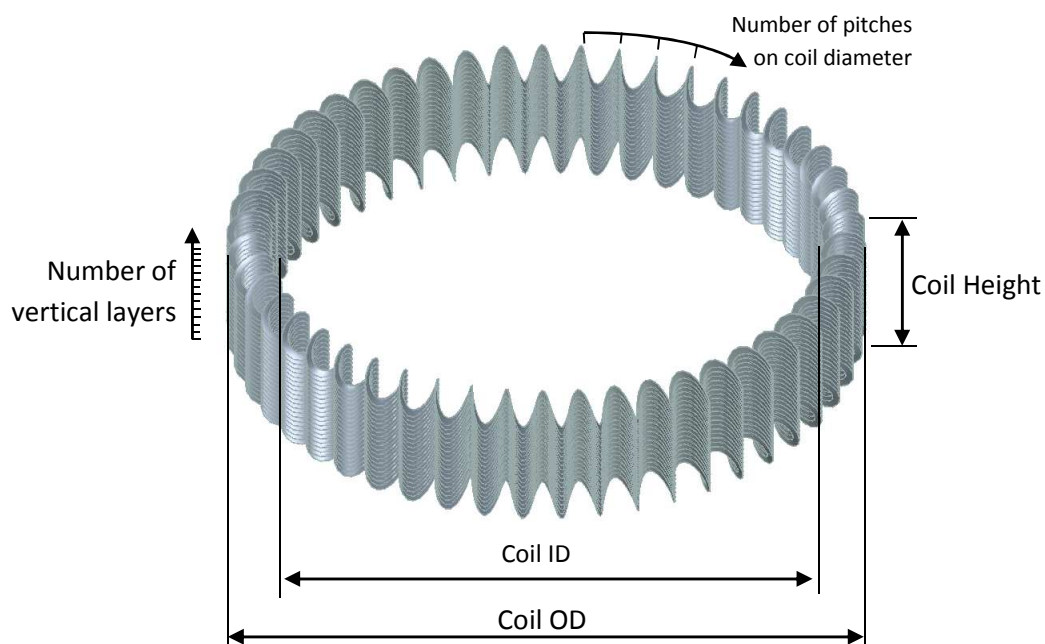


Figure 3: Auger coil characteristics

By having coils with different IDs, smaller coils can be placed inside larger coils to maximise packaging space. The coils can also be stacked on top of each other. This means one can have multiple stacks of coils inside each other on a single pallet, as shown in Figure 4.

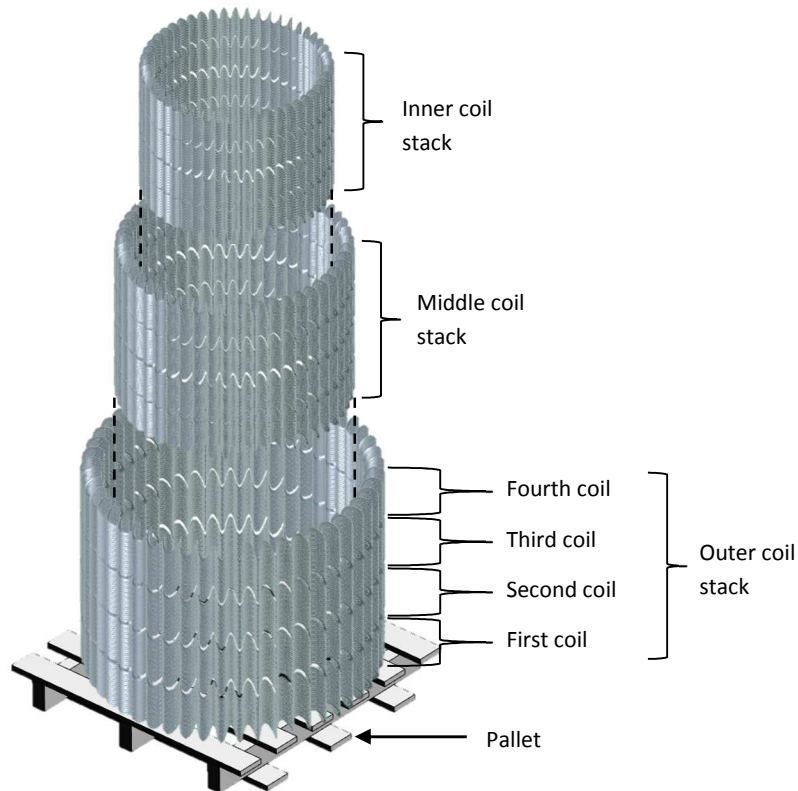


Figure 4: Stacking multiple coils inside each other

DETERMINING A COIL'S LENGTH

When an auger is rolled into a coil, the length of the auger can be calculated by multiplying the following:

$$\begin{aligned}
 \text{Auger length} = & \\
 & (\text{Auger pitch}) \\
 & \times (\text{Number of pitches around diameter of coil}) \\
 & \times (\text{Number of vertical layers on coil})
 \end{aligned}$$

For example, if the auger has a pitch of 50mm and the coil has 62 pitches around the diameter and 20 vertical layers, the length of auger on the coil is:

$$50\text{mm} \times 62 \times 20 = 62000\text{mm} = 62\text{m}$$

SELECTING A COIL'S DIAMETER

Since auger has a fixed pitch, it cannot be wrapped around any diameter. The diameter of the coil has to be calculated in increments of the auger's pitch. To calculate a coil's ID, the following formula should be used:

$$\text{Coil ID} = \frac{n \times \text{Pitch}}{3.14} - \text{Auger OD}$$

In this formula, n is the number of pitches around the coil diameter and can only be a whole number (e.g. 1, 2, 50, 51) and not a fraction of a number (e.g. 1.2, 3.8).

For example, if an auger has a pitch of 50mm, an OD of 69mm and there are 62 pitches around the coils' diameter, the coil ID will be:

$$Coil\ ID = \frac{62 \times 50mm}{3.14} - 69mm = \pm 918mm$$

However, in most cases one would need to know the number of pitches necessary in order for the auger coil to have a certain ID:

$$Number\ of\ pitches = \frac{3.14}{Pitch} \times (Coil\ ID + Auger\ OD)$$

For example, if a coil ID of 750mm is required for the same auger as above (pitch 50mm, OD 69mm), the number of pitches are calculated as:

$$Number\ of\ pitches = \frac{3.14}{50} \times (750 + 69) = 51.433$$

Since a fraction of a pitch cannot be used, the number is rounded up to 52 pitches, ensuring that the coil ID will not be smaller than 750mm. In this case the actual coil ID will be $\pm 759mm$.

Finally, should it be required to calculate the coil OD, the following formula can be used:

$$Coil\ OD = \frac{n \times Pitch}{3.14} + Auger\ OD$$

Table 1 provides a quick summary of the formulas discussed:

Table 1: Summary of auger coil formulas

Coil length	<i>Auger length = (Auger pitch) × (Number of pitches around diameter of coil) × (Number of vertical layers on coil)</i>
Coil ID	$Coil\ ID = \frac{n \times Pitch}{3.14} - Auger\ OD$
Coil OD	$Coil\ OD = \frac{n \times Pitch}{3.14} + Auger\ OD$
Number of pitches on coil diameter	$Number\ of\ pitches = \frac{3.14}{Pitch} \times (Coil\ ID + Auger\ OD)$

WIRING OF A COIL

When a coil has been successfully completed it must be secured with wire to ensure that it does not become undone during handling and shipping. It is suggested that **2mm Black baling wire** is used for this purpose. Firstly, fasten the loose ends of the coil to the coil itself using wire. Then, while the coil is still on the mandrel, add wire loops at six positions on the coil as shown in Figure 5.

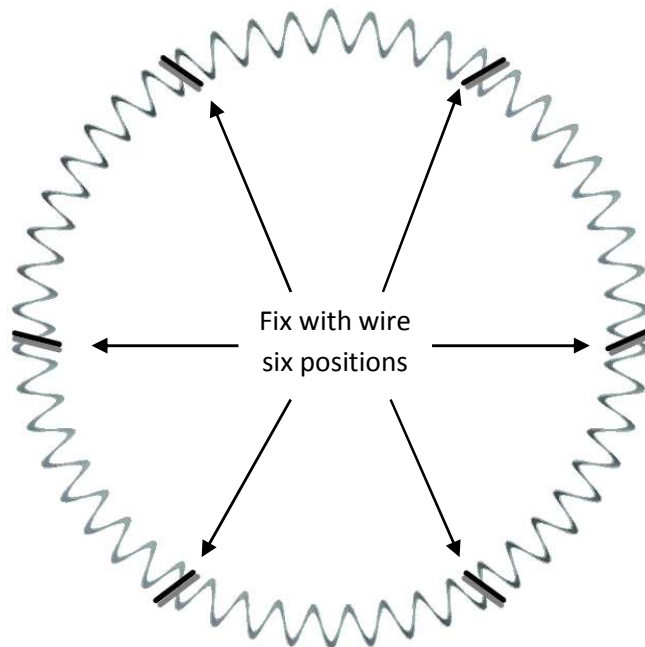


Figure 5: Wire fixing positions

To securely fasten the wire, follow these steps:

1. Cut a piece of wire double the length required for one loop
2. Fold this length in half
3. Now loop the folded wire around the coil as shown in Figure 6.
4. Tie the loose ends of the loop together. At this stage the wire loop will not be very tight.
5. Use the tool supplied to tighten the loop around the coil by grabbing the loop with the hook of the tool and then twisting the wire.
6. Bend all sharp ends of the wire away so that they cannot cause harm.
7. Repeat this at the six positions as shown in Figure 5.

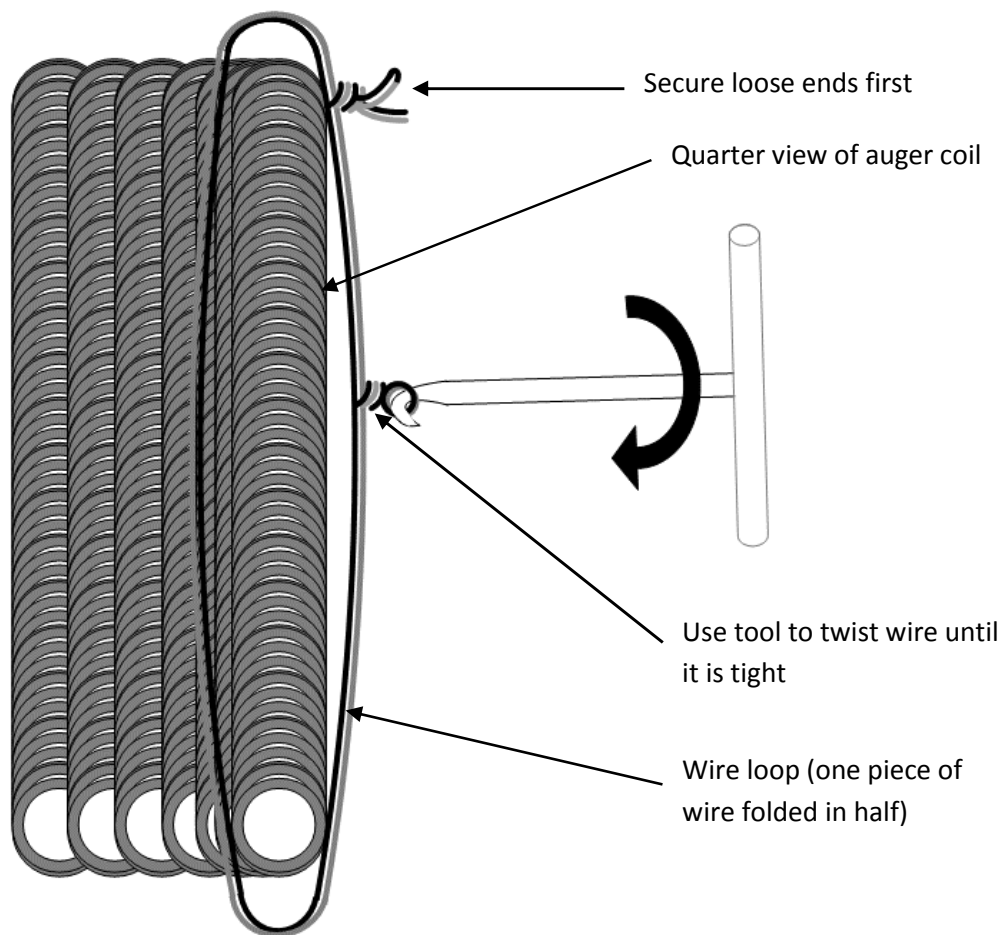


Figure 6: Cross-sectional view of coil with wire loop

MAKING THE AUGER SAFE FOR HANDLING

When the auger is cut, the ends of the flat wire might be very sharp and could be hazardous. It is therefore advised to ensure that the flat wire ends are filed to remove any sharp edges or points.

Furthermore, even if the flat wire ends have been smoothed, it is still advised to fit a small piece of tubing over the wire so that it extends beyond the end of the wire.

DECOILER

SAFETY CHECKS

1. When working on or near the decoiler, the system must be set to **MANUAL** to ensure that it will not start rotating accidentally.
2. Ensure that the core of the mothercoil is still securely fixed to the pallet as this could detach during shipping.
3. Ensure that there is no debris underneath the decoiler that can get caught and/or wound up around the machine.
4. Ensure that there is nothing lying on the turntable (see Figure 8) that can be thrown off when the decoiler spins.
5. Ensure that the pallet is loaded correctly and presses against the back of the rail guides (See: Loading the pallet.)
6. Ensure that the bolts fixing the decoiler to the ground are intact and properly tightened to avoid the machine from sliding or tilting during operation.
7. To avoid risk of injury, ALWAYS ensure that no part of the body is underneath the turntable when it is turning.

RUNNING THE AUTO-DECOILER

The decoiler is motorized to ensure that the mothercoil is decoiled in a controlled manner, keeping the auger from stretching or getting tangled. This is achieved by a control system that controls the speed of both the coiler and decoiler to maintain a slight tension in the auger.

The system can be set to either MANUAL or AUTO (High or Low) using the selector switch as shown in Figure 7. If the system is set to AUTO (High or Low), the decoiler will turn with the coiler. **Please take care to ensure that the system is safe to operate and that no-one can be injured before setting it to AUTO (High or Low).**



Always ensure that the system is set to **MANUAL** before working on the system to avoid accidental/unintended operation and injury.

To operate the decoiler independently, set the system to **MANUAL**. To run the decoiler in MANUAL mode, press the RUN button (see Figure 7). The direction of rotation of the decoiler can be set using the FWD/REV knob for the decoiler.

When the system is in AUTO (High or Low) mode, the decoiler's RUN and FWD/REV buttons are disabled. Also note that when the system is set to AUTO (High or Low), the decoiler will only turn FORWARD, regardless of which direction is selected on the FWD/REV knob.

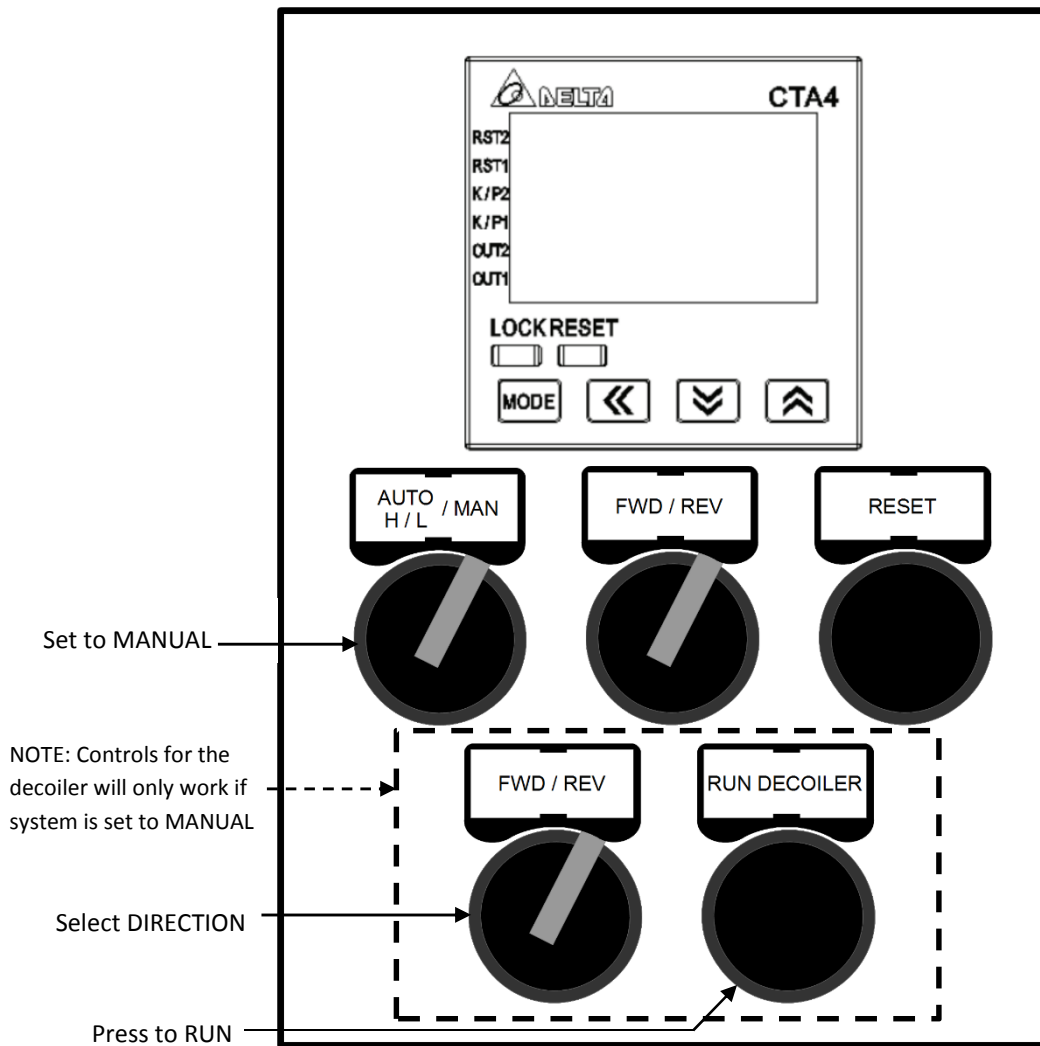


Figure 7: Control panel for decoiler operation

LOADING THE PALLET

When loading the pallet, rotate the decoiler so that the open ends of the pallet guides are facing towards the loading side. This should be done by putting the system in MANUAL mode and then running the decoiler in forward/reverse. Slide the pallet into the pallet guides ensuring that the bottom planks of the pallet are under the pallet guides with the pallet positioned on the turntable. Slide the pallet into the guides until it stops against

the back of the guides. The pallet is now loaded and ready for decoiling. Figure 8 shows the decoiler with the pallet loaded in the correct position.

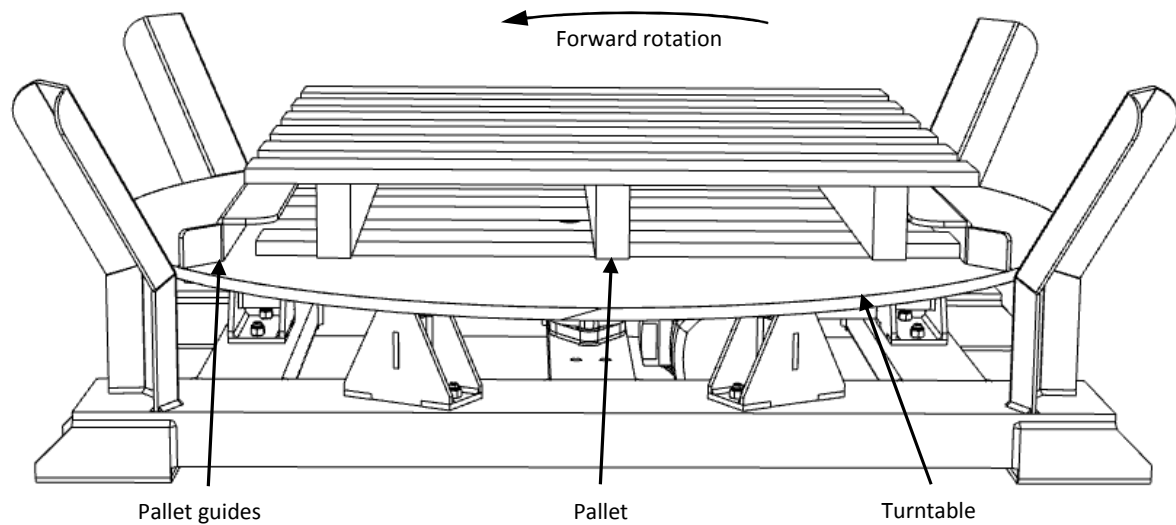


Figure 8: Pallet position on decoiler

POSITIONING THE COVER

The cover is an integral part of the decoiler as it prevents the mothercoil's ID from collapsing and prohibits the auger from "climbing over" the coil during decoiling. It is important that the cover is placed in position BEFORE starting the decoiling operation.

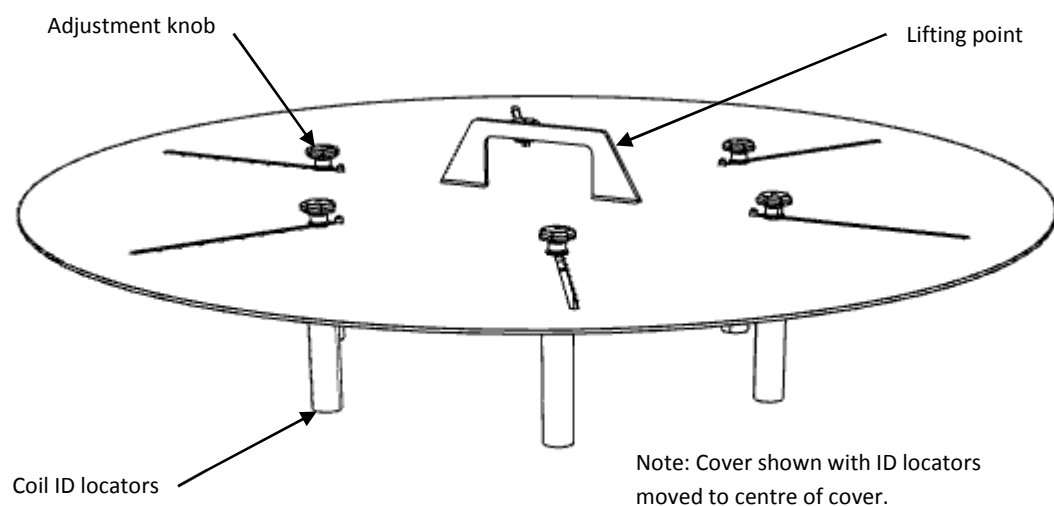


Figure 9: Decoiler cover



Before positioning the cover on the mothercoil, check that the steel core of the mothercoil is still securely fixed to the pallet. There is a risk that the core can become detached from the pallet during shipping. If the core is not securely fixed to the pallet, the mothercoil may fall over during the uncoiling process!

To correctly position the cover on the mothercoil, all the coil ID locators should first be moved to the centre of the cover by loosening the adjustment knobs (see Figure 9) until the locator can slide into its groove. Slide the locator towards the centre of the cover and fasten the adjustment knobs. Using a forklift or an overhead crane, position the cover on top of the mothercoil. The lifting point on the cover is designed to fit a single fork of the forklift. Try and position the cover as close as possible to the centre of the mothercoil.

Once the cover is in position, on top of the mothercoil, readjust the ID locators by sliding them outwards until they all touch the inside edges of the mothercoil. All ID locators should ideally be located an equal distance apart, which indicates that the cover is positioned in the middle of the mothercoil.



ALWAYS ensure that the cover is correctly positioned and that the ID locators are pressed against the mothercoil's ID. As the cover is not fixed to the mothercoil, incorrect placement can cause the cover to fall off during operation.

NEVER transport or move the coil with the cover on. Remove the cover before moving the mothercoil.

UNCOILING THE MOTHERCOIL

The auger mothercoil is made up of layers of auger wound over each other. Each layer is separated by carton sheets and individually strapped with wire at four points per layer to prevent the mothercoil from collapsing during shipping. It also reduces the risk of the auger becoming tangled when uncoiling. When the mothercoil is being decoiled, the operator should take care to stop the process at the end of each layer to first **remove the carton sheets and the wire strapping**. Failure to do so could result in the mothercoil falling over.

DECOILER MAINTENANCE

Before any maintenance is done ensure that the entire system is completely switched off!

Please refer to Figure 10 for the following points:

- Check all bolts ensuring that they are tight.
- Check main bearing under turntable to ensure it is still functioning properly. This bearing should be greased every 6 to 12 months, depending on usage.
- Check wheels supporting the turntable. Inspect wheel bearings every 6 to 12 months (depending on usage) and replace if needed.
- Check that the drive chain is correctly tensioned. Correct chain tension will ensure longer chain and sprocket life. To adjust the chain tension:
 - Loosen (do not remove completely) the four screws that keep the drive motor bracket in place
 - Slide the bracket forward/backward until desired chain tension is reached.
 - Tighten four screws and check that chain tension is still correct.
- The drive chain should be lubricated with a suitable chain lubricant
- Ensure that airflow over electric motor is not restricted

NOTE: The gearbox is a sealed unit that is “lubricated for life”, therefore the oil need not be replaced or checked. If the gearbox leaks oil please contact Technical Systems.

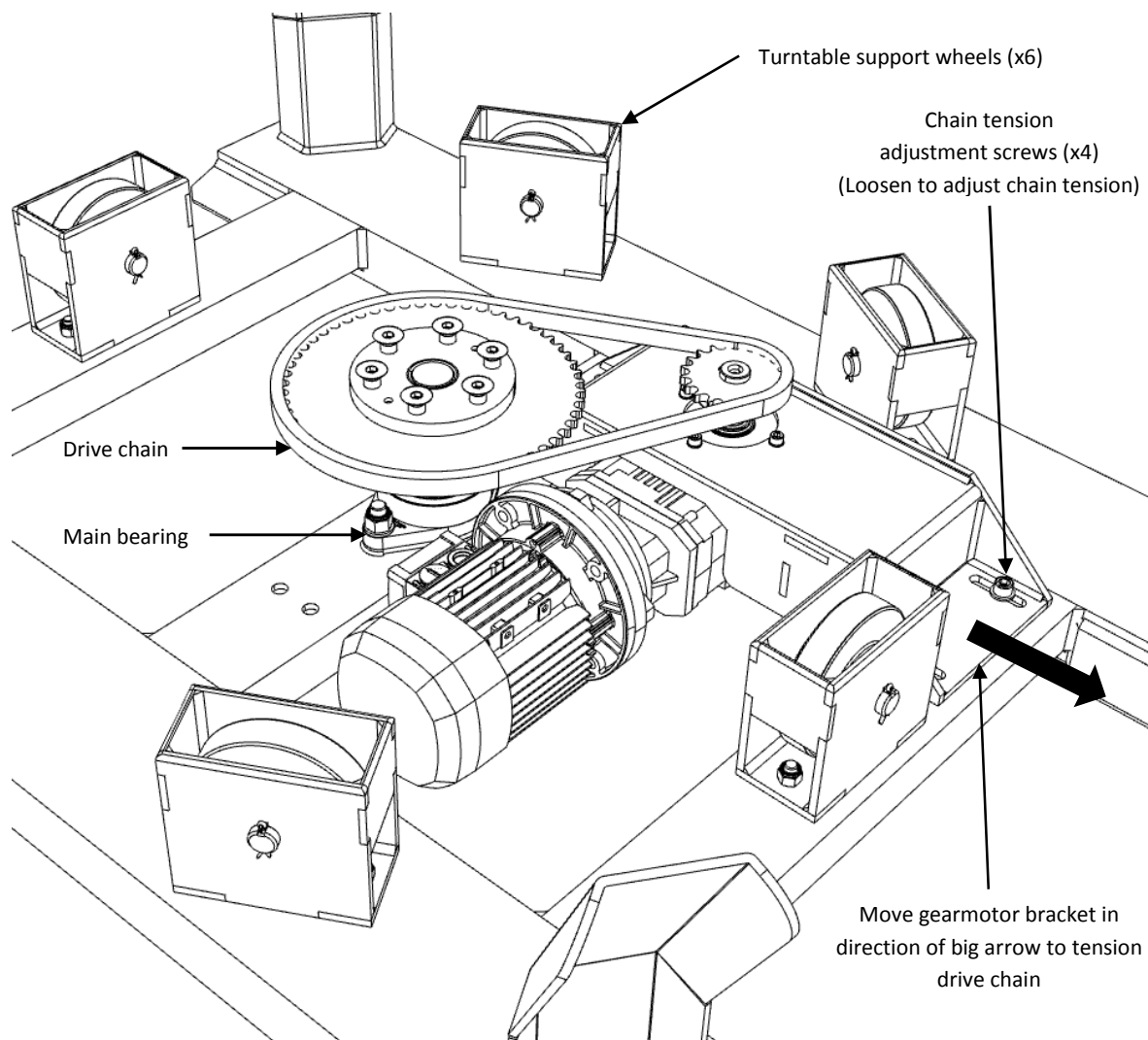


Figure 10: Decoiler maintenance (Turntable removed for clarity)

LENGTH COUNTER

The length counter uses a simple bicycle wheel to run over the auger as it is pulled through the unit. With proper calibration this unit is accurate to within 0.5% of the required length.

SAFETY CHECKS

1. Ensure that there is nothing that can get stuck in the spokes of the wheel.
2. Ensure that the unit is correctly adjusted for the specific auger being measured.
3. Ensure that the wheel is free to move up and down on the slide pillars.
4. Always ensure that no-one is near the unit when in operation to avoid risk of injury. The wheel spokes can cause serious injury when in operation.

ADJUSTING THE OPENING HEIGHT

To ensure that the length counter provides accurate and consistent measurements, it is important that the height of the upper guide shoe is adjusted correctly for each auger type.

To adjust the height, following these steps (Refer to Figure 11):

1. Lift the upper guide shoe by hand and feed the auger through the unit.
2. Turn the height adjustment knob until the shoe is no more than 0.5 mm from the auger.
3. Ensure that the wheel is making contact with the auger.
4. Pull auger through and check that the wheel is turning.

NOTE: If it is too difficult to pull the auger through the length counter, slightly increase the height of the upper guide shoe by turning the knob clockwise. Do not allow the gap to be too big otherwise this will affect the accuracy of the measurement.

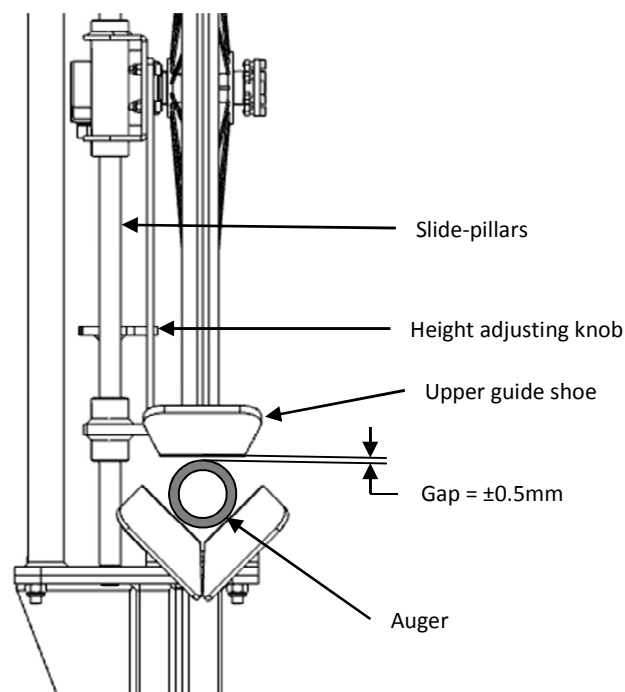


Figure 11: Adjusting upper guide shoe

CALIBRATION

If the unit is not measuring the lengths correctly, it might be necessary to calibrate the length counter. This is done as follows with reference to Figure 12:

1. Take a 12 m long piece of auger, measure exactly 10 m from one end and make a mark on the auger.
2. Feed this auger into the length counter until the end of the auger is in line with the auger's "Zero point".
3. On the control box, press the length reset button until zero is displayed.
4. Pull the auger through the length counter by hand and stop when the 10 m mark reaches the "Zero point". Do not go past the "Zero point" and try to line up the 10 m mark on the auger as close as possible with the "Zero point".
5. Write down the measured length shown on the counter control display (see Figure 13).
6. On the counter control box, press and hold the MODE key for 3 seconds until FUnC is displayed. Now press the MODE key until PSCALE is displayed. Write down the PSCALE value shown on the display. This will now be called the "old" PSCALE value, or $PSCALE_{old}$.
7. Now calculate the new PSCALE value:

$$PSCALE_{new} = PSCALE_{old} \times \frac{10000}{\text{Measured Length}}$$

8. Enter the new PSCALE value on the counter using the Up and Down arrow keys. (**TIP:** The Left key can also be used to move left by one digit, allowing the selected digit to be changed. The digit will flash when selected and can be adjusted using the Up and Down keys.)
9. Press the MODE key to save the new PSCALE value
10. Press and hold the MODE key for 3 seconds to exit the configuration mode
11. Check if calibration is successful by repeating steps 1 to 3. If the measured length is displayed correctly, the calibration was successful.

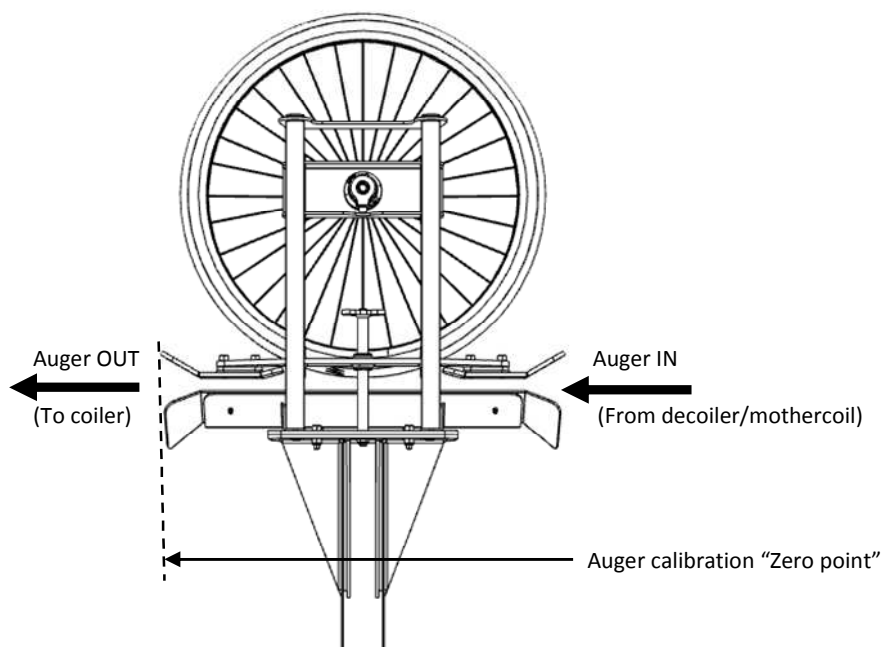


Figure 12: Zero point for calibration purposes

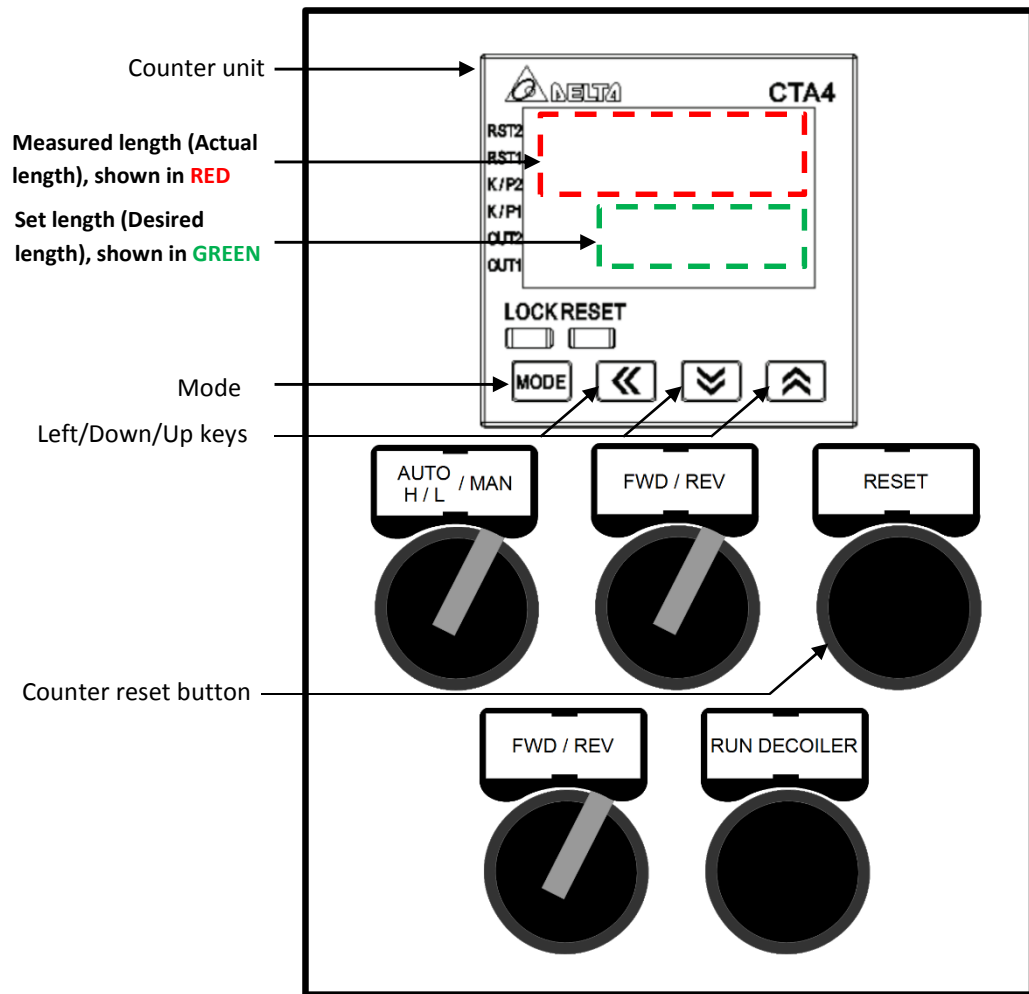


Figure 13: Length counter unit control box

LENGTH COUNTER MAINTENANCE

This unit requires little maintenance. However, periodic checks are advisable to ensure that:

Refer to Figure 14 for following points:

- The wheel spins freely
- The up/down movement of the wheel is smooth and easy. Lubricate if necessary.
- All bolts are still securely fastened.
- The tyre surface is not worn
- The steel wearplates are not worn
- Inspect wheel bearings every 6 to 12 months (depending on usage) and replace if necessary (Figure 15)

Should the unit not function properly, check that all the parameters of the DELTA CTA4 counter are still set correctly. Details on these parameters can be found in Appendix B.

For more information and the manual on the DELTA CTA4 unit, please refer to their website:

<http://www.deltaww.com/>

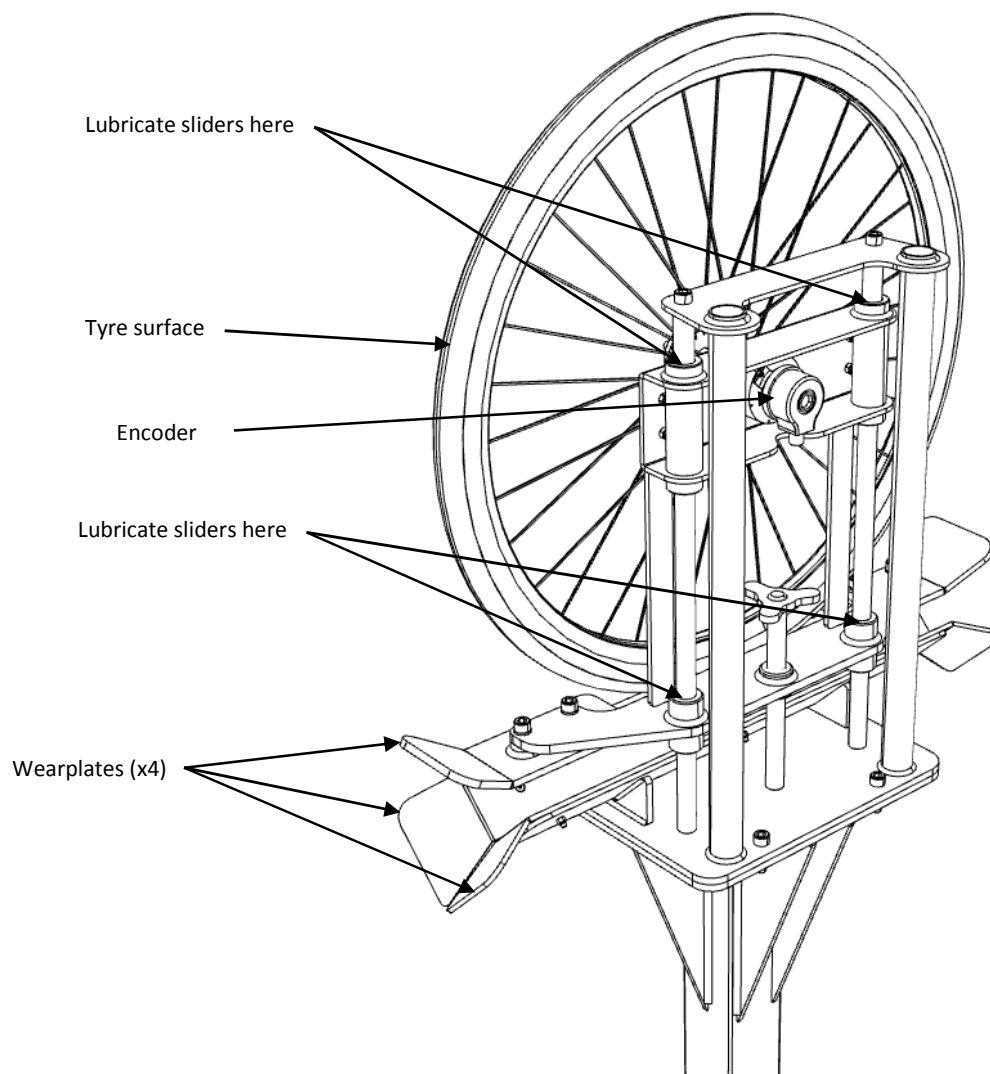
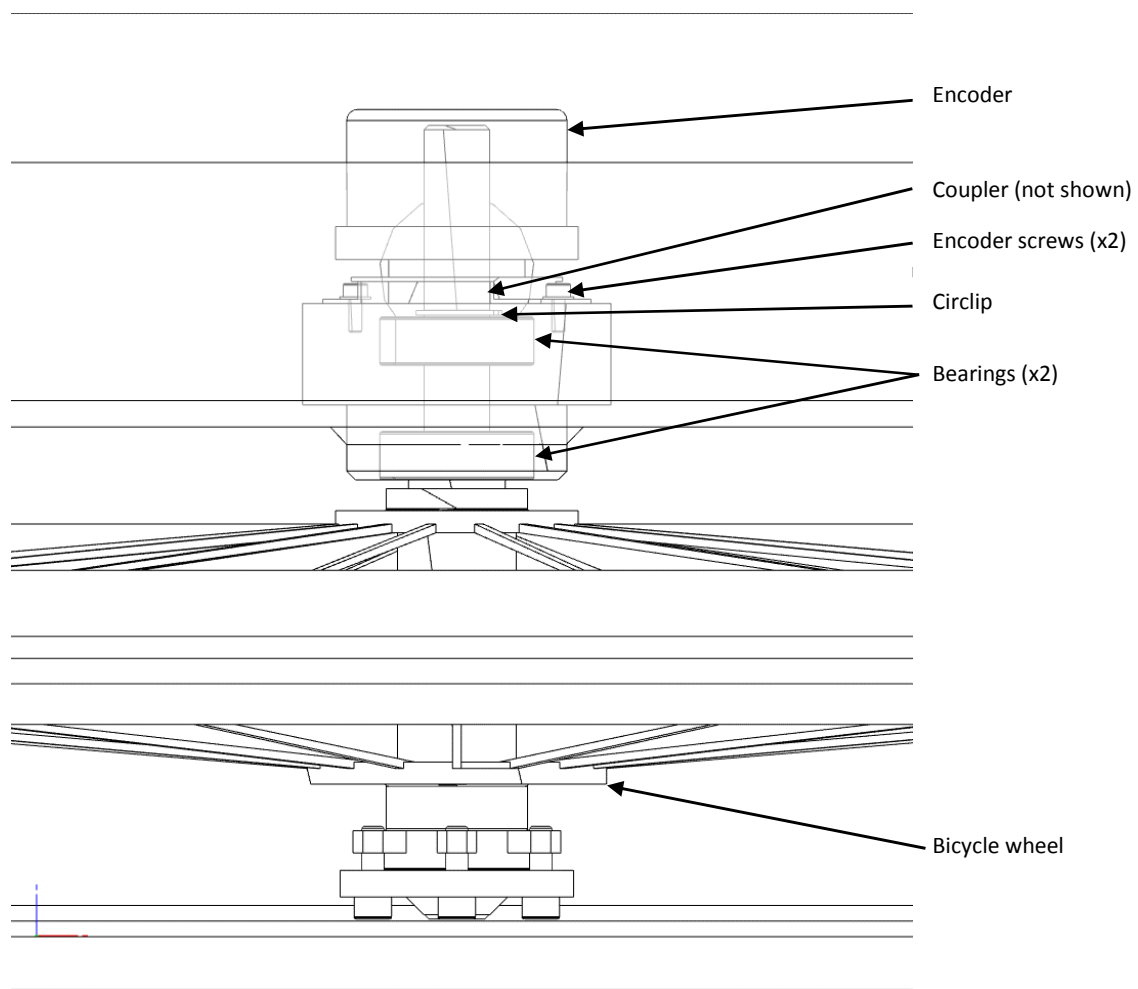


Figure 14: Length counter maintenance



Counter wheel removal instructions:

1. Release encoder coupler
2. Remove Encoder screws
3. Remove Encoder
4. Remove Circlip
5. Remove entire wheel and shaft assembly

Figure 15: Length counter wheel removal instructions

COILER

OVERVIEW

SPECIAL NOTICE: THE COILER IS A POWERFUL MACHINE THAT CAN CAUSE SERIOUS BODILY HARM IF NOT OPERATED CORRECTLY.

The operator of this machine must at all times adhere to the guidelines stated in this manual. To avoid harm to others always ensure that no-one except the operator is near the machine when it is operated. Since this machine is the driving force of the entire recoiling line, special care should be taken to ensure that all other parts of the recoiling line (decoiler and length counter) are safe to operate before starting the coiler.

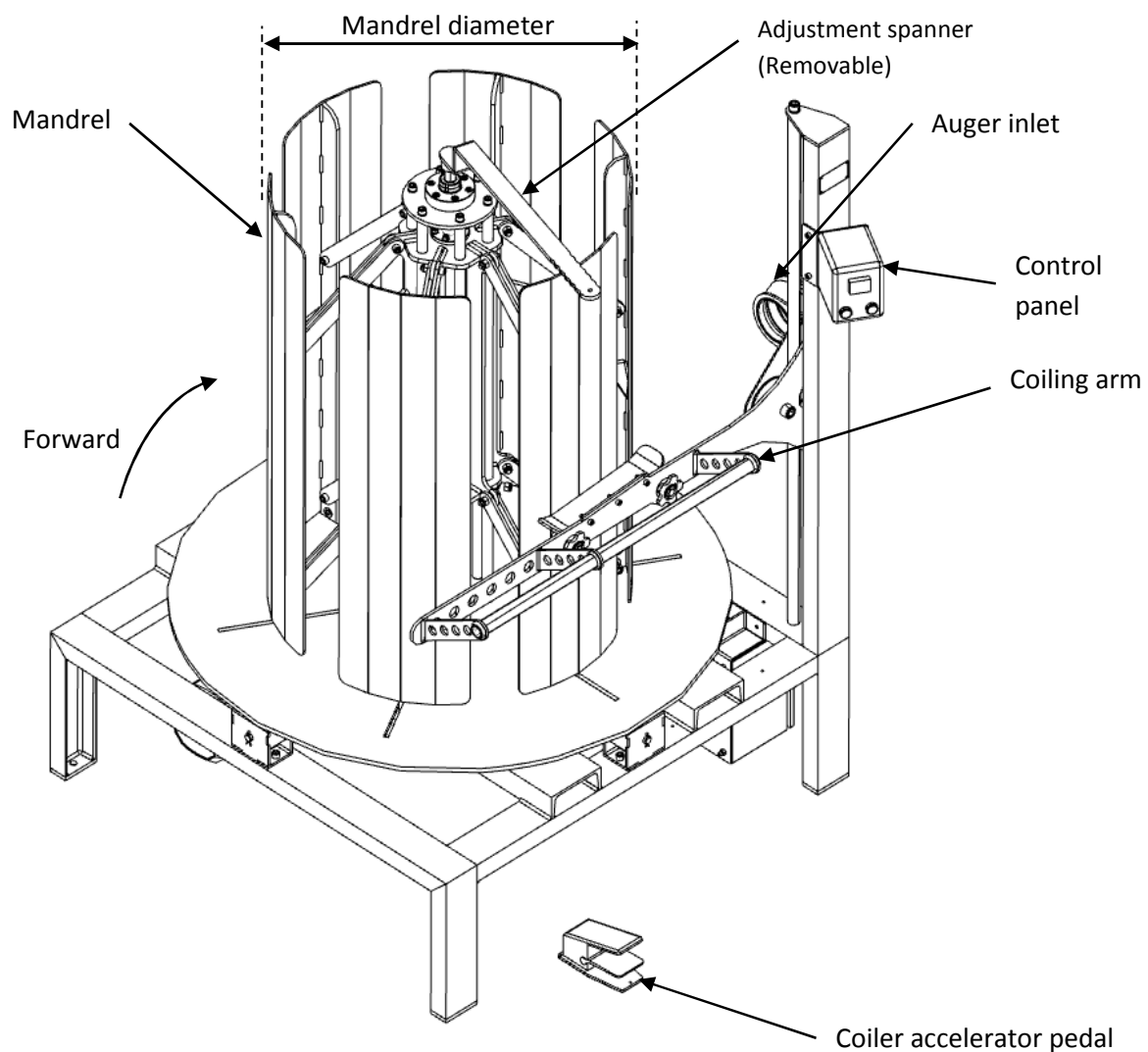


Figure 16: Coiler

SAFETY CHECKS

1. Is the decoiler ready for operation?
2. Is the length counter ready for operation?
3. Has the adjustment spanner been removed?
4. Check that there is nothing on the machine that can become undone or fall off during operation.
5. Has the correct direction been selected?
6. Ensure that the bolts fixing the coiler to the ground are intact and properly tightened to prevent the machine from sliding or tilting during operation.
7. To avoid risk of injury, ALWAYS ensure that no part of the body is underneath the turntable when it is turning.

RUNNING THE COILER

The system is designed to maintain a slight tension in the auger when running, to ensure that the auger does not tangle on the decoiler. This is achieved by a control system that controls the speed of both the coiler and decoiler.

The control system is activated when the system is set to AUTOMATIC (HIGH or LOW) mode (see Figure 17). Therefore, if the system is set to AUTOMATIC MODE THE DECOILER WILL ALSO ROTATE when the COILER is run! **Take special care to ensure it is safe to run the ENTIRE system before running in AUTOMATIC (HIGH or LOW) mode.**



Take care as to whether the system is set to AUTOMATIC or MANUAL before running the coiler!
Failure to check this can cause unintentional rotation of the DECOILER!

AUTOMATIC MODE (HIGH OR LOW)

When the operator wants to coil auger, the system should be in AUTOMATIC MODE. In automatic mode the system will always run FORWARD, regardless of how any of the direction selector switches are set. Therefore, automatic mode should only be used for coiling auger. All other procedures must be completed while the system is in manual mode.

There are two automatic modes:

Automatic Low: This mode is used for smaller auger models (20-, 45-, 75-Series). This mode should always be used first before trying to use Automatic High.

Automatic High: If there is difficulty in coiling auger in Automatic Low mode then Automatic High can be used. Note that Automatic High will cause smaller auger models to stretch and get damaged. It is advised to only use Automatic High on larger auger models (90-Series) when there is difficulty coiling. In all other cases Automatic Low is preferable.

When the operator is ready and all safety checks has been done, press the accelerator pedal (see Figure 16) to start turning the coiler in the selected direction. The coiler is programmed to start slowly and then increase steadily to its maximum speed. This has been deliberately programmed into the motor drive to avoid personal injuries or damage to the machines.

Note that the system will slow down and then stop when the preset length on the counter is reached.

MANUAL MODE

In MANUAL mode the coiler can be run independently by pressing the accelerator pedal. The direction of rotation will be determined by the coiler's FWD/REV selector switch (see Figure 17). In manual mode the coiler will also run slower than automatic mode. DO NOT switch between FORWARD and BACKWARD while the coiler is turning, always wait for the coiler to come to a complete standstill before changing direction.

Even if the system is in MANUAL mode, the counter will still stop the system when a preset length has been reached. Therefore, should the system run very slow or completely stop when working in manual mode, check that the counter has not reached its set length. To overcome this, press the RESET button to reset the length counter, this will allow the system to run again.

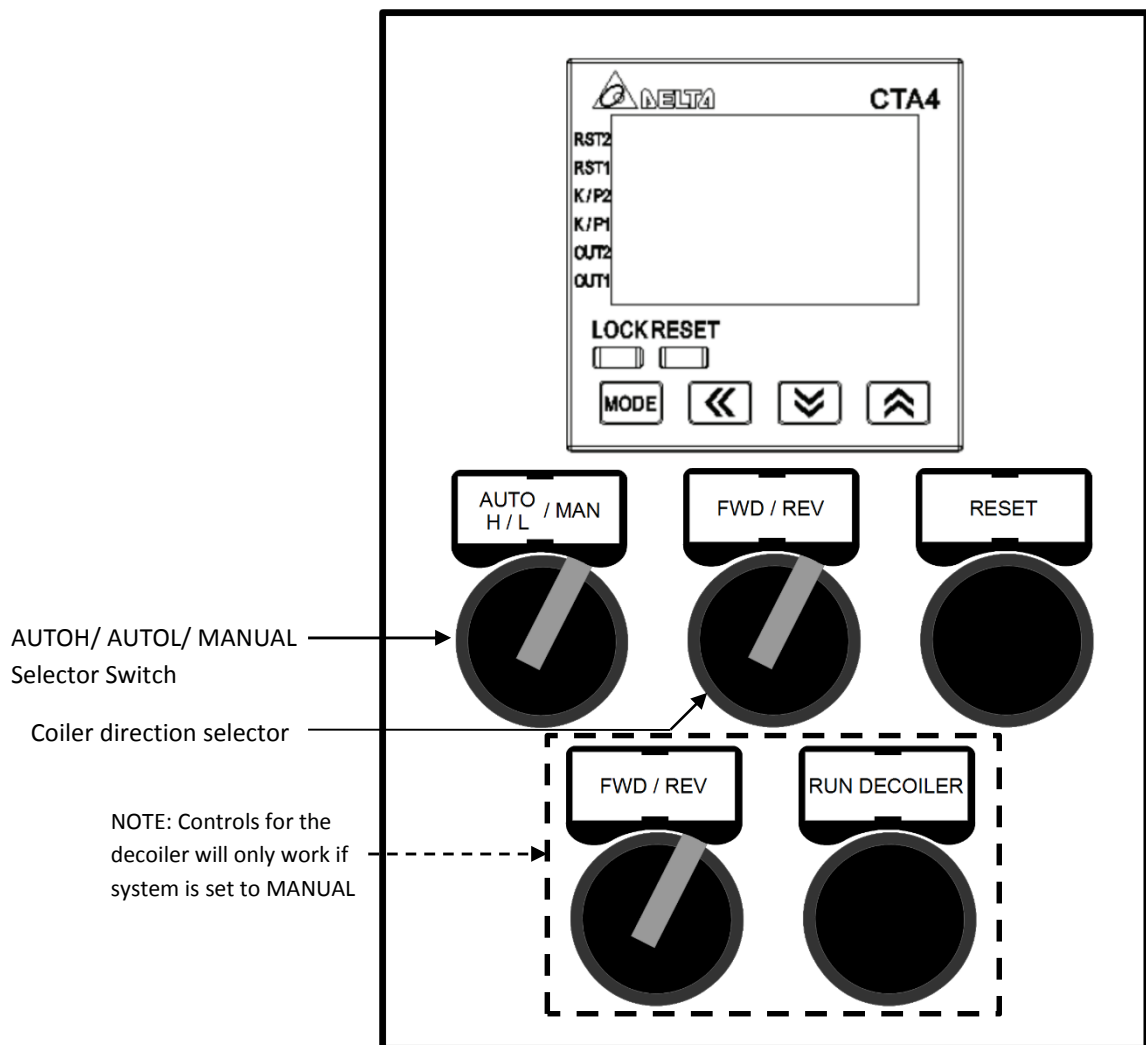


Figure 17: Control panel with coiler controls

COILING THE AUGER

The process of coiling the auger is described below with reference to sections later in the chapter. Some of the steps are explained on the assumption that all the previous sections have been read:

1. Set the system to MANUAL mode
2. Adjust the mandrel (page 26) to a smaller diameter than the required coil diameter. (For details on selecting the coil diameter, please refer to page 7)
3. After the decoiler has been properly set up and the length counter is ready and calibrated, feed the auger through the inlet (Figure 18).
4. Enter the desired length on the control box. (see page 25)
5. Keep the end of the auger at the cut-off point and then reset the length counter to zero by pressing the RESET button.
6. Continue to pull the auger through the inlet and wrap around the mandrel as shown in Figure 18.
7. Count the number of pitches around the mandrel and fix the auger to itself at the preselected number of pitches.
8. Now slowly increase the mandrel diameter (see page 26) until the auger starts turning with the mandrel, then stop immediately.
9. **Remove the adjustment spanner from the coiler mandrel**
10. Place the coiler arm in position (page 27)
11. Set the system to AUTO (High or Low) mode
12. Start the coiling process (page 26)
13. During coiling, take care to stop in time to remove the packaging and wiring between layers on the mothercoil (see page 14).
14. The coiler will stop automatically once the set length is reached. The coiling arm can be removed at this stage.
15. Set the system to MANUAL mode
16. Cut the auger at the cut-off point and fix the loose end to the coil.
17. Now increase the mandrel diameter to tighten the coil. This will ensure that the coil meshes neatly and evenly. Do not overtighten the coil!
18. Use wire to strap and tighten the coil at six positions. (see page 9.)
19. Decrease the mandrel diameter so that the coil can be removed easily (page 26)
20. You can now remove the coil using the coil lifter. (see page 31)

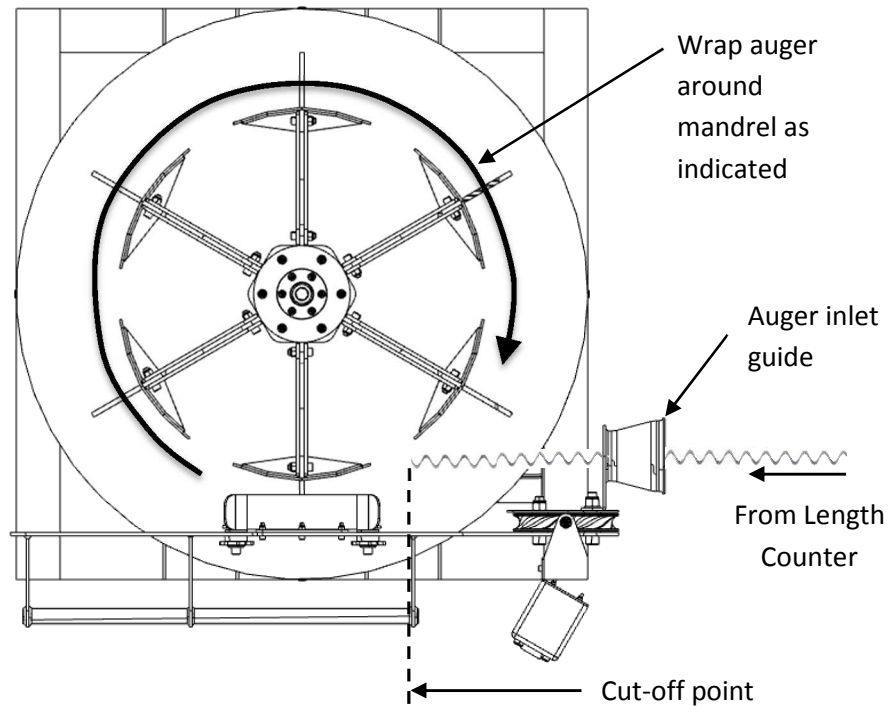


Figure 18: Setting up the coiler

SETTING DESIRED LENGTH

The length counter is programmed to stop the coiler once a certain length has been reached. It is also programmed to slow down the coiler before stopping to reduce the risk of an overrun.

To enter a length, use the UP and DOWN keys. (**TIP:** The Left key can be used to move left by one digit, allowing the selected digit to be changed. The digit will flash when selected and can be adjusted using the Up and Down keys.)

Before starting the coiling process, the operator should first enter the desired length as follows:

1. Press the Mode key until SET2 is shown on the display.
2. Enter the desired length. (The coiler will stop at this length.)
3. Press the Mode key until SET1 is shown on the display.
4. Enter the desired length MINUS 1 meter. (The coiler will start to slow down at this length.)

NOTE that the length counter uses millimetres (mm). (For example, if an auger length of 52.5 m is required, the length should be set at 52 500 mm.)

Since there is a 0.5% accuracy on the length counter, it is advised to accommodate for this error when coiling the auger to a required minimum length.

For example: If the minimum length of the auger should be 100m, set the desired length (SET2) to 100.5m (100m + 0.5%). This means that the SET1 parameter should be set to 99.5m (100.5m - 1m).

ADJUSTING THE MANDREL

When an auger is to be coiled to a specified internal diameter (ID), the mandrel should first be set to a smaller diameter than said ID. This will ease the initial wrapping of the auger around the mandrel to the correct diameter. Follow these steps to adjust the mandrel:

1. Set the system to MANUAL mode
2. Insert the adjustment spanner onto the hexagonal shaft on top of the mandrel



NOTE: Take special care when the adjustment spanner is used to adjust the mandrel. If the spanner is not held stationary while the mandrel is turning, it will turn with the mandrel and can cause serious bodily harm.

NEVER leave the spanner attached to the mandrel without holding on to the spanner!

3. To **decrease** the mandrel's diameter, keep the spanner stationary and run the coiler **backward**.
To **increase** the mandrel's diameter, run the coiler **forward** while keeping the spanner stationary.
(Refer to page 23 on how to manually run the coiler.)
4. When the desired diameter is reached, stop the coiler and remove the spanner.
NEVER attempt to insert or remove the spanner into the mandrel socket while the mandrel is turning!

To protect the machine and the operator from harm, take special care when adjusting the mandrel to its maximum or minimum diameter. If the maximum or minimum diameter is reached, the spanner will turn with the mandrel, potentially causing harm.

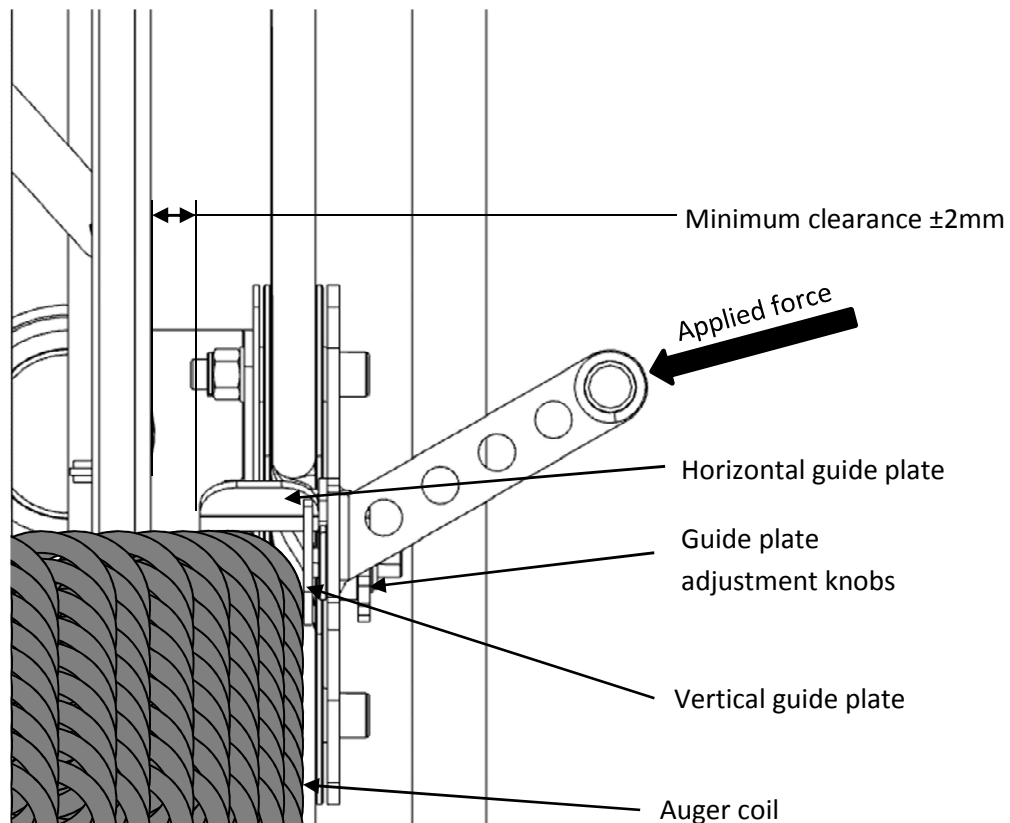


Figure 19: Coiler arm operation

OPERATING THE COILER ARM

The coiler arm is used to help wrap the auger tightly and neatly around the mandrel while the mandrel is turning. Before coiling commences, the coiler arm should be adjusted to fit correctly over the auger being coiled. When smaller augers are being coiled, the vertical guide plate should be adjusted to allow a ± 2 mm clearance between the edge of the coiling arm and the mandrel (see Figure 19). It can be adjusted by turning the two knobs on the arm. Always ensure that the side guide plate is adjusted evenly and that it remains parallel with the coiler arm. An uneven guide plate will impair the coiling performance.

When the auger is wrapped around the mandrel and the operator is ready to commence with coiling, place the arm onto the auger as shown in Figure 19. By applying a steady force on the arm at the position and in the direction as shown, the auger should mesh into itself neatly. When coiling is completed, the arm can be removed by pulling it towards the operator and then steadily lowering it downwards.

COILER MAINTENANCE

- Lubrication
 - The main bearing under the turntable should be greased every 6 months through the grease nipple (Figure 21)
 - The drive chain should be lubricated with a suitable chain lubricant (Figure 21)
 - The scroll shaft (see Figure 20) in the centre of the mandrel should be lubricated with a moly grease
 - The slide shafts (see Figure 20) should be lubricated with grease
- Check the following for excessive wear and tear and replace if necessary:
 - Top bearing (Figure 22Figure 20) – Every 6 to 12 months, depending on usage
 - Main bearing (Figure 21) – Every 6 to 12 months, depending on usage
 - Castor wheels under turntable (Figure 21)
 - Guide plates on coiling arm (Figure 19)
 - Auger inlet guide (Figure 18)
- Check drive chain tension.
 - To adjust chain tension, loosen (do not remove completely) the four chain tension adjustment bolts (Figure 21).
 - Slide the gearmotor in the direction of the big arrow shown in the figure.
 - Now tighten the four chain adjustment bolts again.
- All bolts should be checked for tightness.

NOTE that the linkage bolts on the mandrel (Figure 20) should not be overtightened as this will impair the operation of the mandrel.

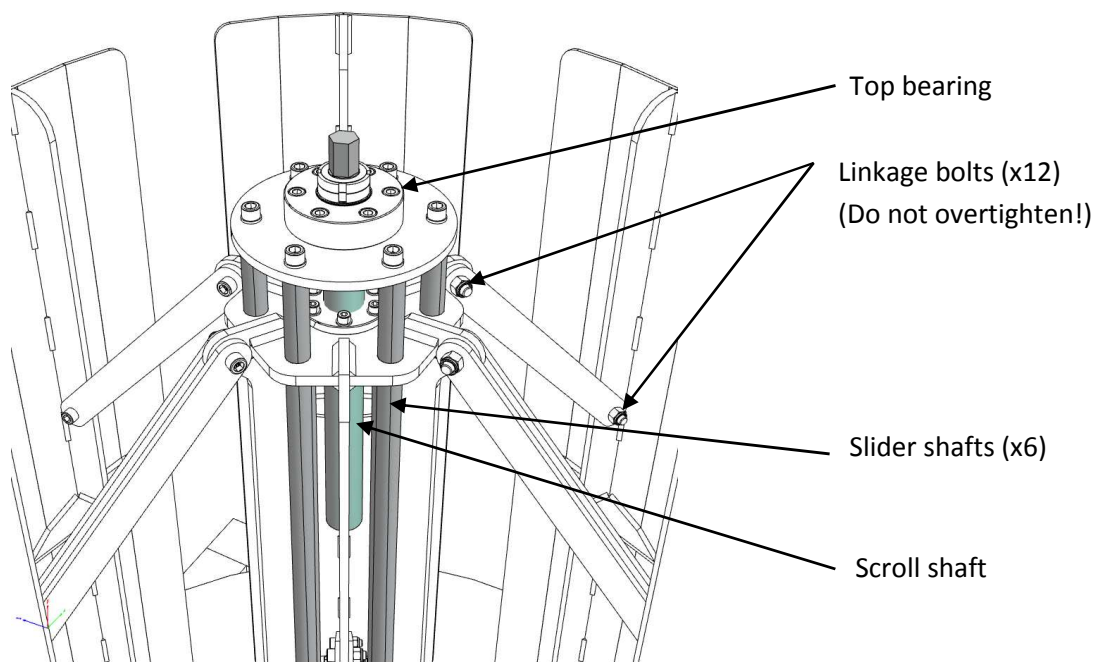


Figure 20: Coiler mandrel

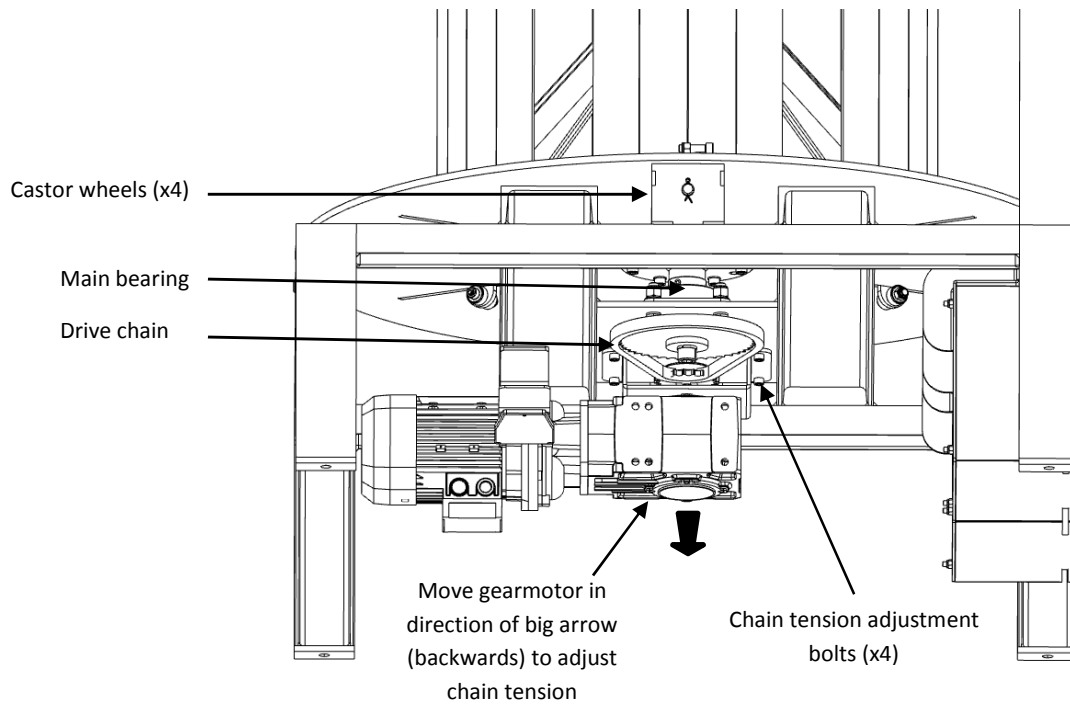


Figure 21: Coiler underside

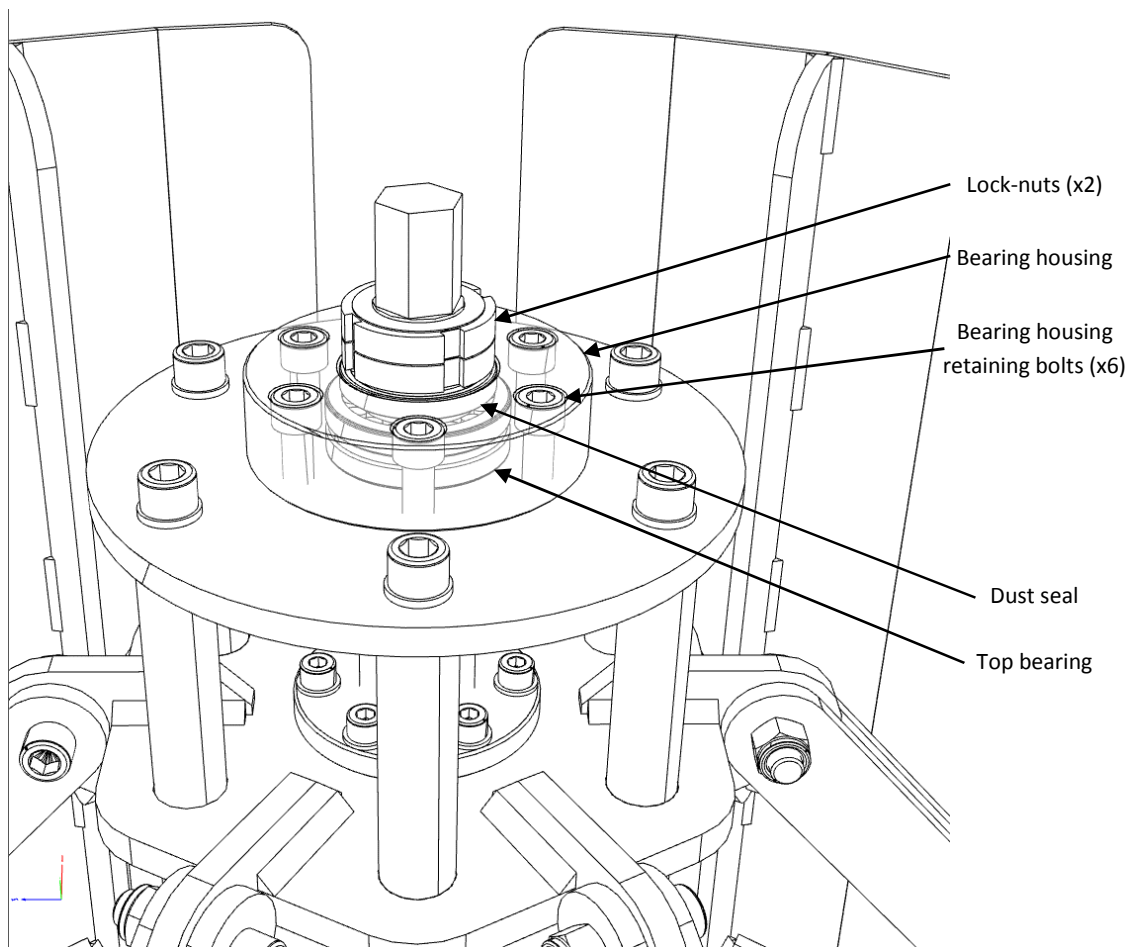


Figure 22: Top bearing housing assembly

COIL LIFTER

The coil lifter is used to securely remove an auger coil from the coiler without damaging the coil. The coil lifter can either be used with a forklift or with an overhead crane with different mounting holes on the coil lifter depending on the application as shown in Figure 23.

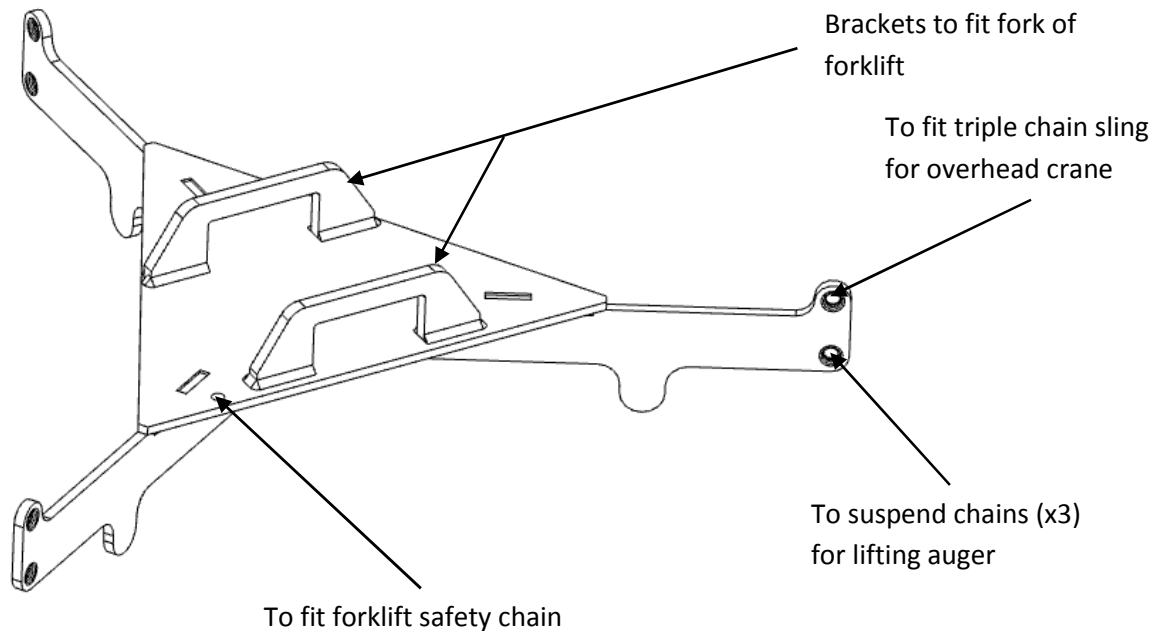


Figure 23: The coil lifter

ATTACHING COIL LIFTER TO AN OVERHEAD CRANE

To attach the coil lifter to an overhead crane, a triple chain sling with the required load rating should be attached as shown in Figure 24.

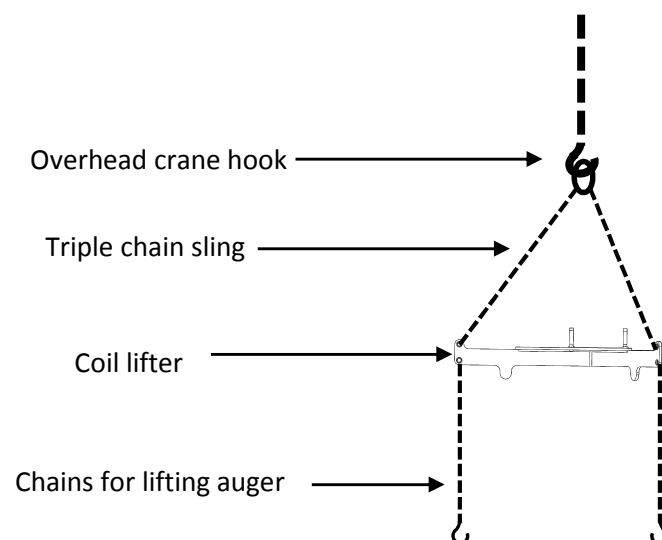


Figure 24: Attaching to an overhead crane

ATTACHING COIL LIFTER TO A FORKLIFT

The coil lifter can also be used with a forklift. The lifting point is designed to fit a single fork of the forklift. To prevent the coil lifter from sliding off the fork, it is imperative that the safety chain is securely attached to the backrest of the forklift as shown in Figure 25.

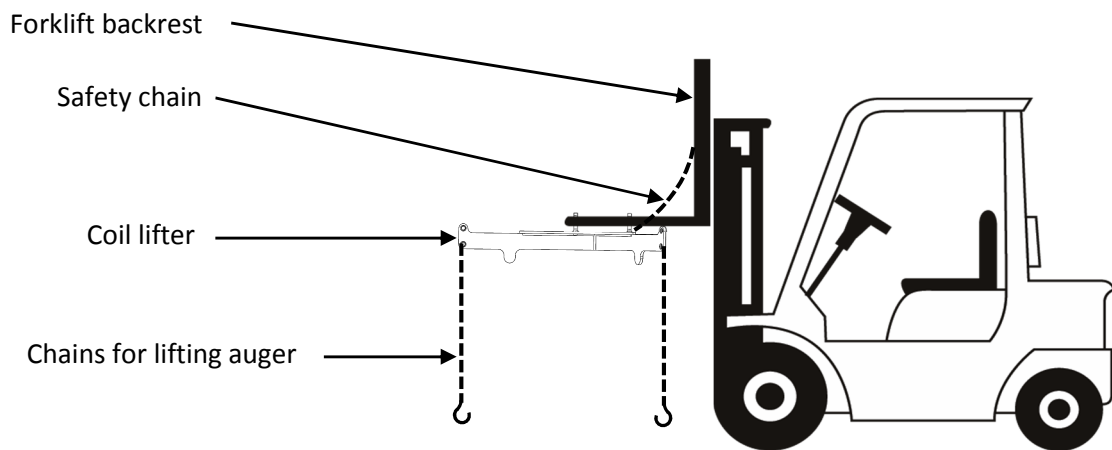


Figure 25: Attaching the coil lifter to a forklift

USING THE COIL LIFTER

Before a coil is removed from the coiler ensure that the ends of the auger are fastened to the coil using wire. The coil itself should also be securely fastened with wire as described on page 9 (Wiring of a coil).

Next, reduce the diameter of the coiler mandrel just enough so that the coil can be easily pulled off the mandrel. Position the coil lifter over the coil with the three chains hanging over the outside of the coil. Hook the chains to the underside of the coil, then lift the coil lifter slightly to put tension on the chains. Now check that all three hooks have hooked onto the coil securely before proceeding with lifting the coil off the mandrel. Take special care to try and keep the coil lifter over the centre of the mandrel. If the coil lifter is off-centre, the coil will start swaying as it leaves the top of the mandrel.

Always ensure that the chains are the same length and that the coil is lifted evenly. Failure to do so could result in the coil falling from the coil lifter and possibly causing serious harm.

SYSTEM INSTALLATION

FLOOR PLAN LAYOUT AND FIXING POINTS

Shown in Figure 26 is the floor plan of the system once installed. Note that the auger should ideally run in a straight line from the decoiler, through the length counter and then through the coiler inlet. The system will still function even if these three elements are not completely aligned, but the layout shown below would yield optimum results.

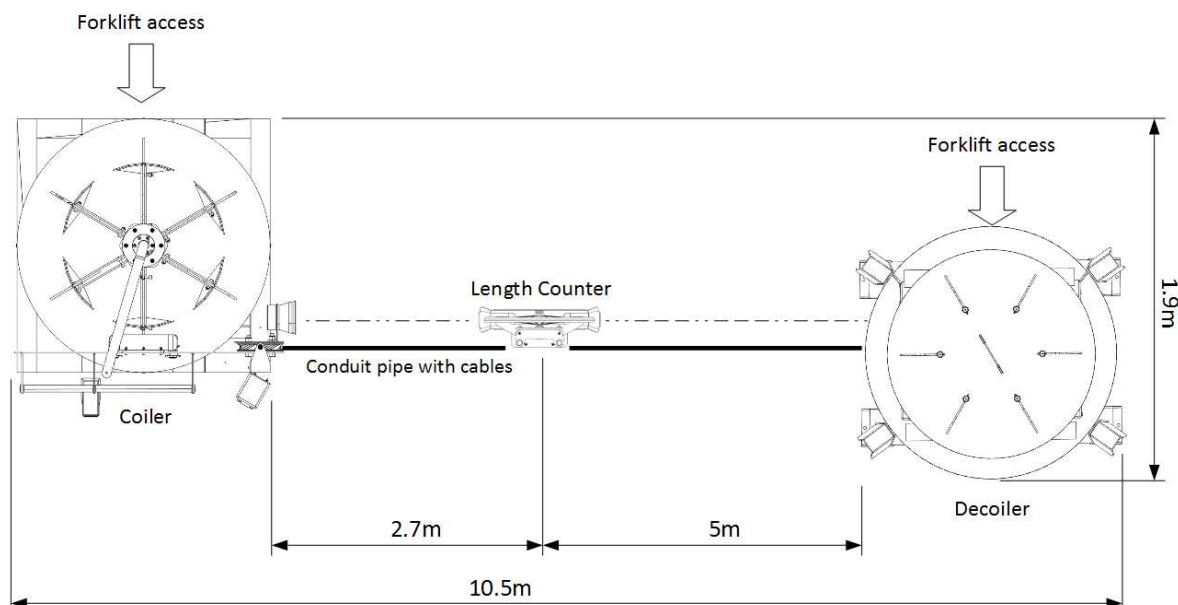


Figure 26: Floor plan

Please note the following when allocating an area for installing the recoiling line:

- The floor layout in Figure 26 does not account for space for the operator to move around the units. It is advised that there should be at least 800mm space around the units for ease of access and maintenance.
- Take note of the orientation of the decoiler when doing the floor layout since the decoiler can be accessed by forklift from two opposing sides only.
- To be able to remove the auger coils from the coiler, the height of the ceiling above the coiler should be a minimum of 6 m.
- The system is designed to be installed on a concrete floor. All three units must be securely bolted to the floor using the anchor bolts supplied with the machines.
- The conduit pipes should also be fixed to the floor using the saddles provided to protect the cables and to prevent the risk of somebody tripping over the loose cables.

ELECTRICAL CONNECTIONS



NOTE: All electrical connections and commissioning should be done by a qualified electrician as per the regulations of the country concerned.

The machine is shipped with all the internal wiring in place. The only remaining connections that need to be done on-site is for the power supply, the length counter and the decoiler motor. On the coiler there are two

electrical boxes. The box on the left contains all the terminal blocks and all electrical connections need only be done in this box. The box on the right contains the drives and other electrical equipment. No wiring need to be changed/connected in the right box.

CONNECTING THE POWER SUPPLY

The system has to be connected to the power supply inside the electrical panel box which is situated underneath the coiler. On the side of the panel there is an unused compressions lug which can be used to feed the power supply cable into the box where it can be connected. Please refer to the wiring diagrams in Appendix A when connecting the power cable.

CONNECTING THE LENGTH COUNTER

The cable that should be connected to the length counter is rolled up and tied to the coiler during shipping. During installation this cable should be threaded through the conduit pipe that leads to the length counter and then connected to the encoder on the wheel shaft.

When routing the cable, remember to leave sufficient slack (see Figure 27) where it connects to the encoder to allow the wheel to move up and down without putting tension on the cable.

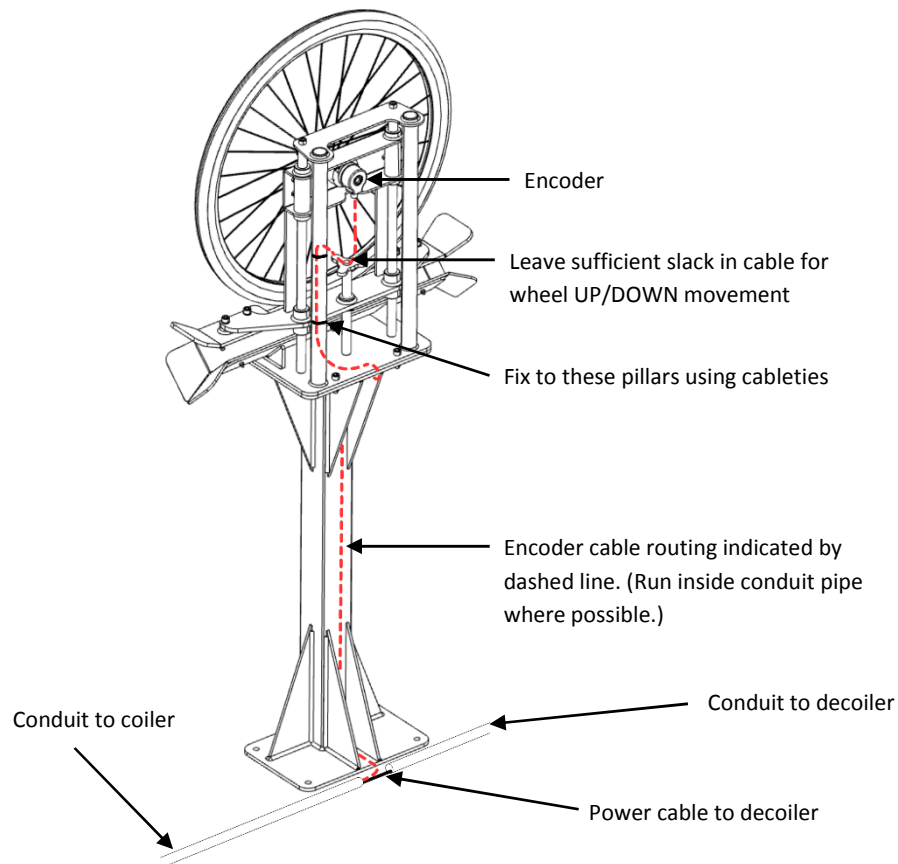
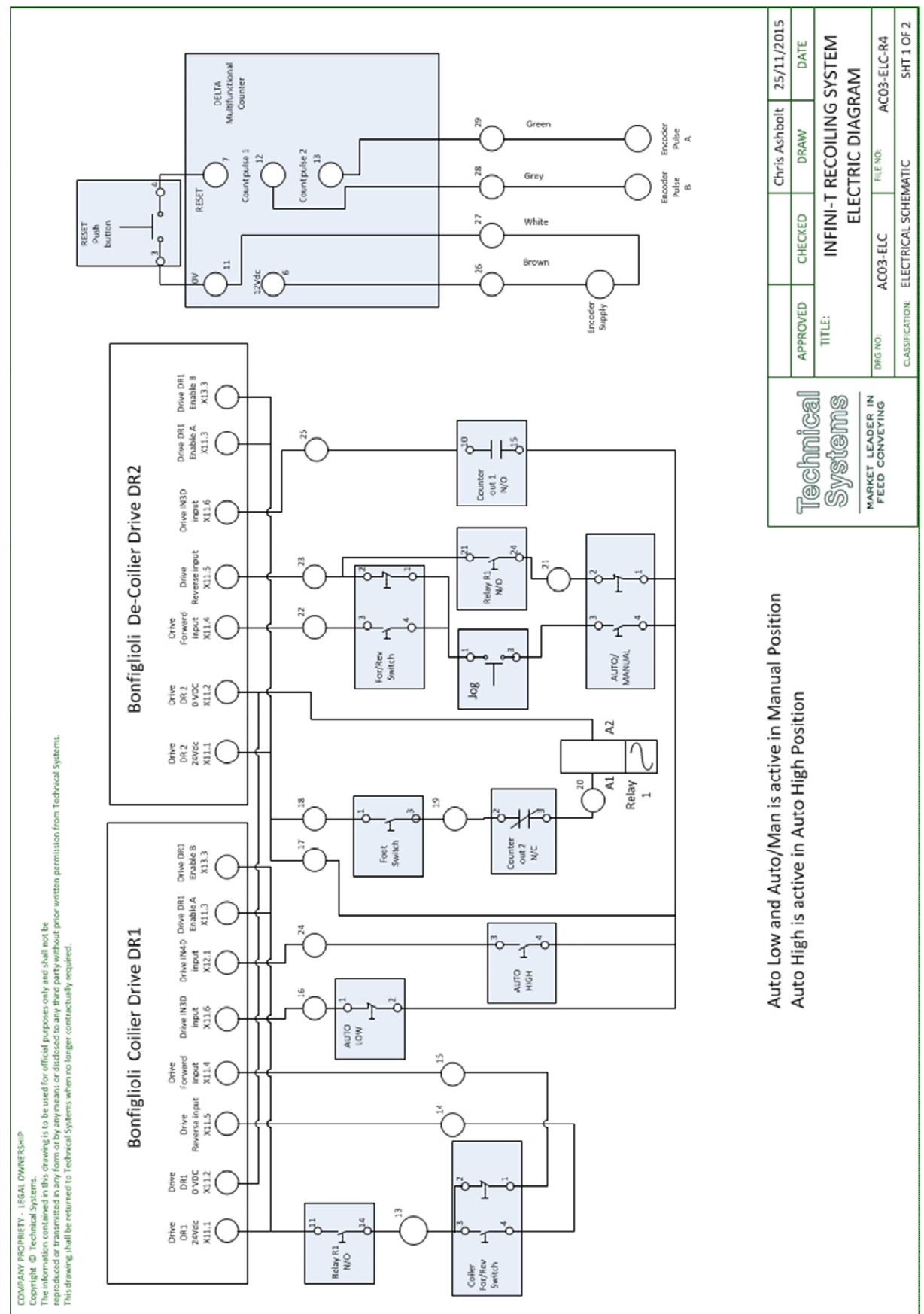


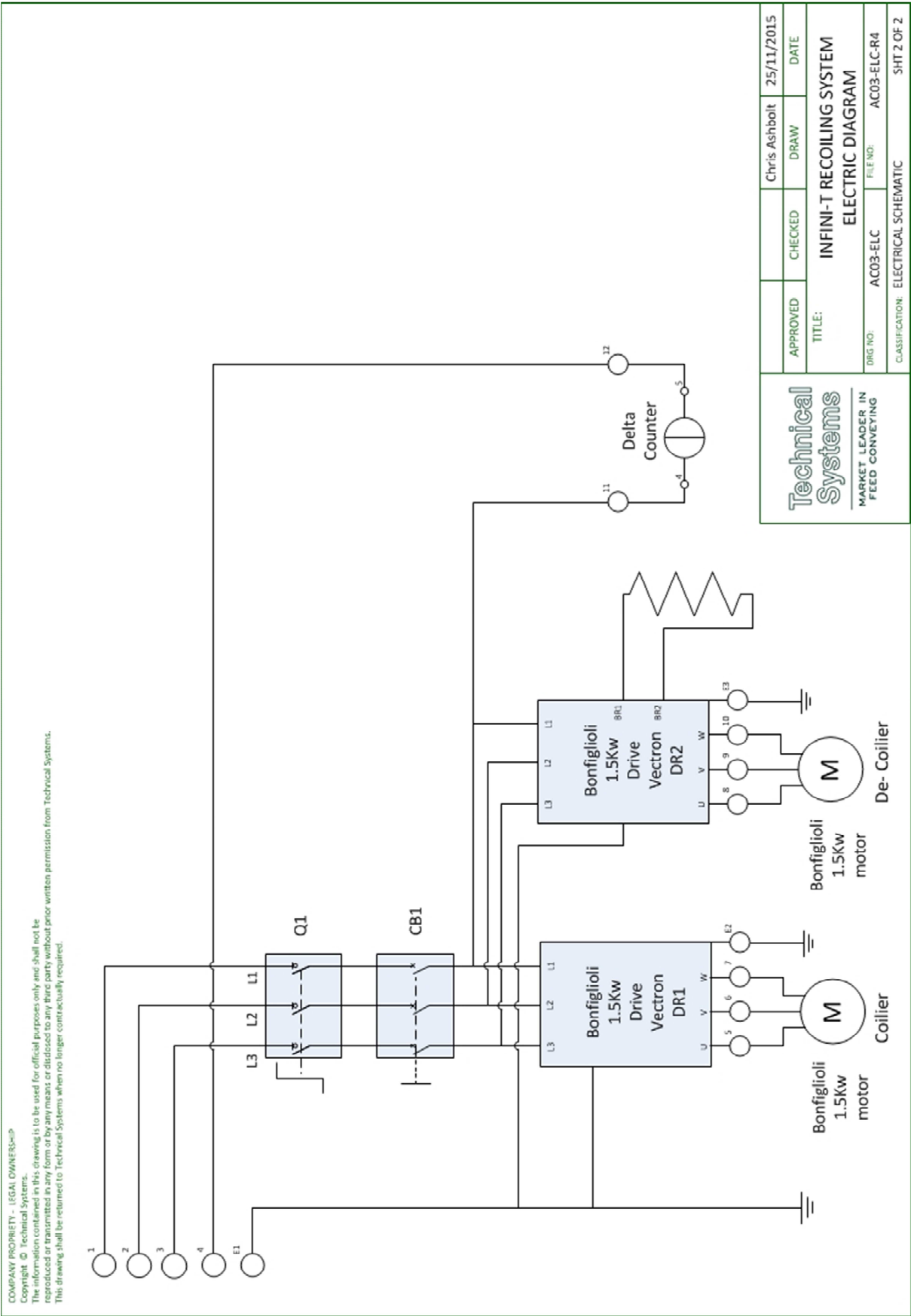
Figure 27: Encoder cable installation

CONNECTING THE DECOILER CABLE

The decoiler's power cable will ship already connected to the decoiler-motor, leaving only the connection to the coiler to be completed at installation. This power cable must be fed through the conduit tube to the coiler and connected in to the terminal blocks as shown in the wiring diagrams in Appendix A.

APPENDIX A: WIRING DIAGRAM





APPENDIX B: LENGTH COUNTER PARAMETERS

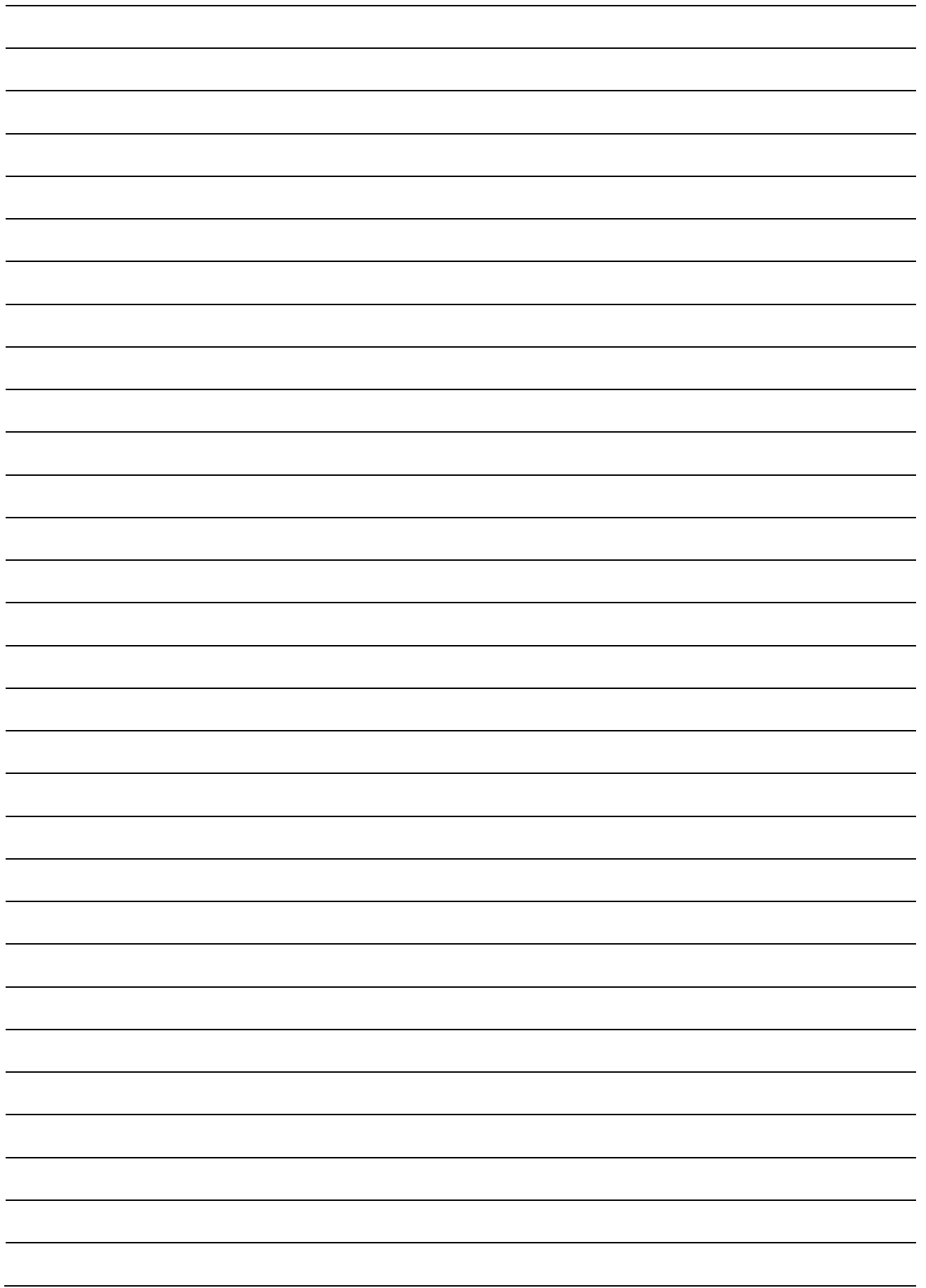
The length counter is shipped with the correct parameters loaded. However, should these parameters be deleted or changed Table 2 below shows the correct settings:

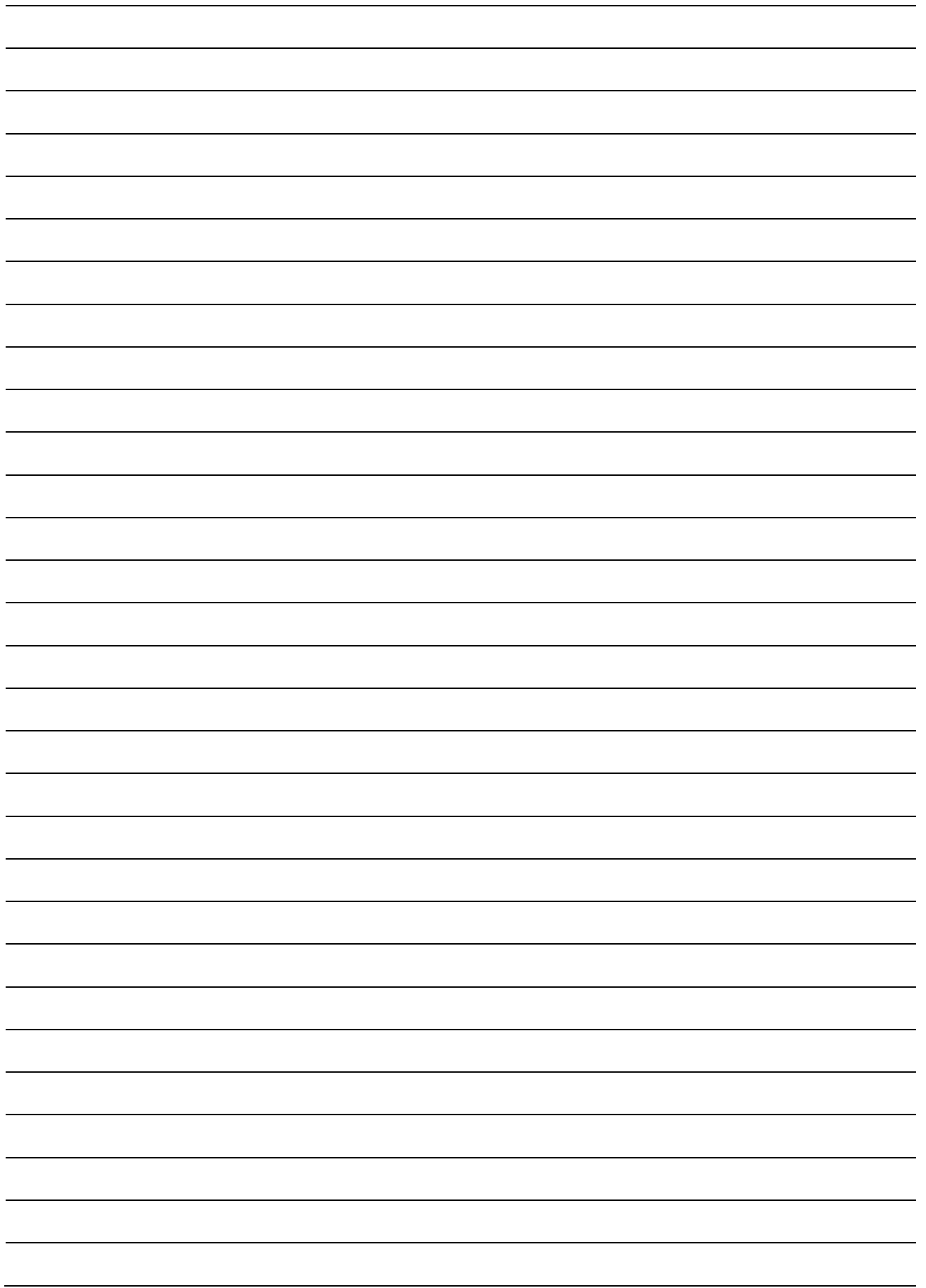
Table 2: Length Counter Parameters

Parameter	Description	Setting
	Function	
	Counting Mode	
	Counter input mode	
	Counter output mode	
	Counting Speed	
	Output 1 pulse width	26.08
	Decimal point	
	Pre-scale value	21.440 (Or as calibrated)
	Save data?	
	Reset min. pulse width	
	Input type	

For more information and instructions on how to set these parameters on the DELTA CTA4 unit, please refer to their website for the instruction manual: <http://www.deltaww.com/>

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Technical Systems

MARKET LEADER IN
FEED CONVEYING

Technical Systems (Pty) Ltd
Ampere Street, Stikland
PO Box 757, Sanlamhof, 7532
Cape Town

Tel: +27 21 949 9191

Fax: +27 21 949 9195

E-mail: info@technicalsys.com

Website: www.technicalsys.com