Fransgård

Manual

GB

WOODCHIPPER
PELLET CHIPPER

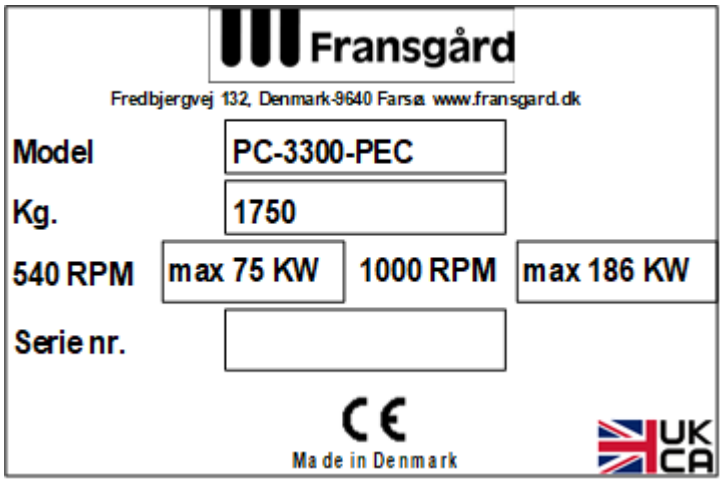
PC-3300-SEC &
PC-3300-SIC
PC-3300-PEC &
PC-3300-PIC

SAFETY AND USER MANUAL

FOR WOODCHIPPERS
PC-3300-SEC and PC-3300-SIC

AND PELLET CHIPPERS
PC-3300-PEC and PC-3300-PIC

Serial number:_____



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Congratulations on your new chipper.

In this user manual, you will find the chipper's specifications, operating conditions, safety precautions and how to maintain it.

This safety and user manual only applies to the standard PC-3300-SEC and PC-3300-SIC woodchippers and the PC-3300-PEC and PC-3300-PIC pellet chippers with an integrated TOTALSYSTEM and must be read before use.

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Please note that the illustrations in this manual do not necessarily correspond exactly to the chipper: Some drawings and sketches are therefore labelled to make them easier to understand.

Yours sincerely,

Fransgård Maskinfabrik A/S

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1 Specifications

This section provides an overview of the chipper and PTO axle's operating data and specifications.

1.1 Chipper

Type		**PC-3300-SEC**	**PC-3300-SIC**	**PC-3300-PEC**	**PC-3300-PIC**
Chopping system		STANDARD	STANDARD	TOTALSYSTEM	TOTALSYSTEM
Feeding type		Can only be loaded with a crane			
Hydraulic supply		Tractor	Internal	Tractor	Internal
Tree diameter, max.	cm	33			
Weight	kg	1,750	1,850	1,750	1,850
Power, max. at 540 rpm	Hp (kW)	100 (134)			
Power, max. at 1,000 rpm	Hp (kW)	186 (250)			
Revolutions, PTO	rpm	540/1,000			
Oil pressure, max. permissible (*)	bar	155			
Oil flow, max. permissible	litres/min.	52			
Torque from the infeed rollers	Nm	Up to 2130			
Minimum operating temperature	°C	-10			
Number of chipping blades	pcs.	4	4	4	4
Number of blades for the TOTALSYSTEM	pcs.	-	-	4	4
Rotor weight (total)	kg	530		380	
Sound pressure, L_{WA}	Sound pressure dB	118	118	123	123
Blade height (chopping height)	mm	8 - 35		3 - 20	
Capacity (**)	m^3/hour	75 - 150		50 - 100	
Spline on the main axle		1 ¾'' x Z6			

(*) The maximum allowable pressure that can occur during operation (i.e. when feeding wood into the machine) - this is NOT the idle pressure!

(**) Capacity depends on factors such as available HP, blade height, wood type, screen hole size, infeed speed, etc.

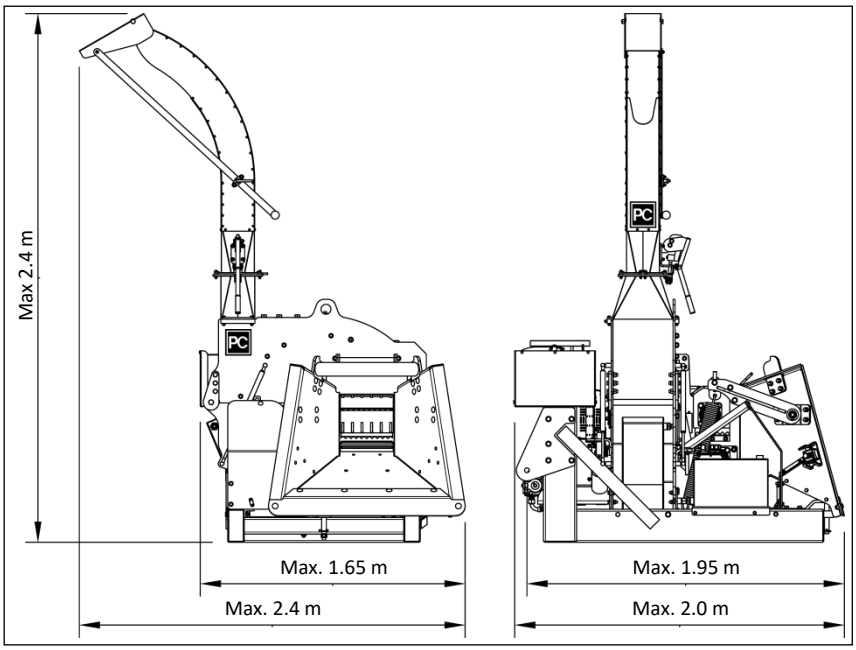


Figure 1- Main dimensions of the chipper

1.2 PTO axle

If the chipper comes with a PTO axle, it is assumed that this is used with the chipper.

If you choose to find a PTO axle yourself or if you need to replace a worn-out one, choose an axle that complies with the following:

Type:	PTO axle with idling and a slip clutch on the chipper side.
Mounting:	1 3/4" x Z6 internal groove spline (chipper side).
Length:	The axle length must be adapted to the tractor on which the chipper is to be mounted, taking into account that it can telescope. In addition, the requirements for length, overlap between the two axle parts, etc., specified by the axle manufacturer must be observed.
Nominal performance:	The nominal performance of the axle is adapted to the chipper's specifications (see Section 1.1 for this information). Note that fewer kW may be transferred at 540 rpm than at 1000 rpm.

Furthermore, read the manual that comes with the selected PTO axle and follow all instructions in it to ensure proper use and maintenance, as well as safety regulations.

2 Preparing the chipper for operation

2.1 Mounting a chipper on a tractor

The chipper must be mounted on the tractor's 3-point hitch with hitch pins. For safety reasons, it is important that the chipper is correctly secured in all 3 places. This applies even if the chipper is to be used stationary.

2.2 Mounting the PTO axle

1. The PTO axle is first mounted on the end of the chipper's main axle and tightened.
2. The SFT guard (plastic guard) is mounted on the chipper side to cover the coupling on the PTO axle.
3. The other end of the PTO axle is mounted and locked onto the tractor's PTO.
4. Fit the guard over the tractor's PTO.
5. Attach the PTO axle chains to the chipper and tractor, respectively, so that the plastic guard on the PTO axle does not rotate with the axle during operation.

IMPORTANT: It is important to check that the PTO axle is not too long before lifting or starting the chipper. If the axle is too long, there is no room for it between the tractor and the chipper when the chipper is lifted in the tractor's lift. This can cause a breakdown of the PTO axle and, in the worst case, damage the chipper and tractor.

If the PTO axle is too long, it needs to be shortened. Read how to do this in the manual that comes with the PTO axle.

WARNING: ***Do NOT start the chipper unless the chipper is correctly mounted on the tractor's 3-point linkage and the PTO axle is mounted and secured to both the chipper and tractor.***

2.3 Fitting hydraulic hoses (PC-3300-PEC and PC-3300-SEC only)

On machines supplied with hydraulics from the tractor, the two hydraulic hoses from the chipper must be connected to the tractor's hydraulic outlet.

Pressure hose without a one-way valve.
Return hose with a one-way valve fitted.

Note that a one-way valve is fitted on the return hose (see Figure 2) to avoid unintentionally pressurising the wrong hose.

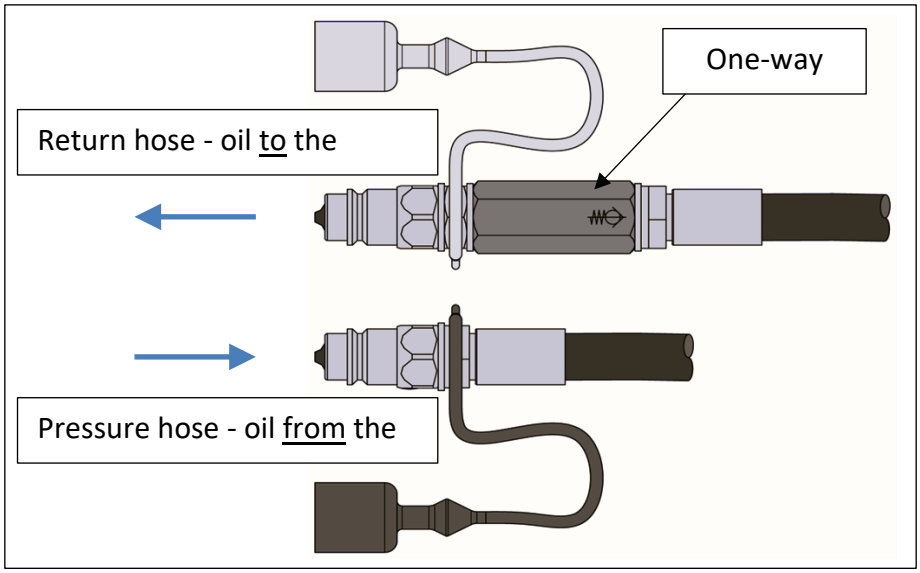


Figure 2- Quick couplings on hydraulic hoses for fitting to the tractor

If the return hose was accidentally pressurised, pressure may have built up between the non-return valve and the quick-acting coupling, preventing the oil from flowing freely. It may therefore be necessary to loosen the quick-acting coupling to release the pressure. This can cause a small splash of hydraulic oil, so wear protective goggles and perform this over a bucket or similar to collect the oil. Both hoses must be removed from the tractor's hydraulic connector when doing this! After removing the pressure, remember to tighten the quick-acting coupling again.

IMPORTANT: ***It is important that the return hose in particular is installed correctly on the tractor. If the machine cannot get rid of the hydraulic oil, pressure will build up in the hydraulic system, corresponding to the maximum pressure that the tractor can provide. This pressure is usually significantly higher than the pressure that the seals in the hydraulic motors can withstand, and there is therefore a high probability that they will leak. If possible, it is recommended that the return hose is fitted as free return.***

IMPORTANT: ***Every time the chipper is started, the hydraulics are pressurised, and the rollers are started, check that the pressure in the hydraulic system does not increase dramatically. The pressure in the hydraulic system can be read on the pressure gauge on the control panel. Under no circumstances should the pressure exceed the permitted 155 bar at any time during operation.***

2.4 The first hours of operation

During the first hours of operation, it is important to pay extra attention to the chipper. Should something unexpected happen or unexpected noises occur, stop the machine and tractor immediately to avoid further problems.

If the problem cannot be immediately identified and resolved, please contact the dealer/manufacturer who will assist you with a solution.

3 Chipper operation

Before starting the chipper, it is extremely important to be 100% sure that there are no bolts, nuts or other metal objects inside the machine, as these could be thrown out and damage the machine when it is started. It is strongly recommended not to use the hopper to store tools, etc., while transporting the chipper, as this can draw them into the machine when it is started.

It is recommended that the points in Chapter 2 are reviewed before start-up to ensure a long operational life.

WARNING: Chippers with crane hoppers should not be hand-fed as it can be extremely dangerous.

WARNING: The chipper must be correctly mounted on the tractor's 3-point hitch before it is started.

WARNING: The upper and lower parts of the chipper's rotor housing must be bolted together, and all guards must be correctly fitted before the chipper can be started.

3.1 Starting and stopping chippers

The chipper is started by switching on the tractor and then engaging the PTO, after which the rotor (chipping disc) will start. The hand throttle is then applied until the desired rmp is reached.

To stop the chipper, switch off the PTO and the rotor will slowly slow down and stop on its own.

3.2 Controlling the infeed

The infeed is controlled using the supplied remote control.

A detailed description of the remote control can be found in Appendix 2.

3.3 Speed monitor (no-stress system)

The speed monitor, located on the control panel (see Figure 3), ensures that the chipper's cutting disc has sufficient revolutions to chop wood into chips. The speed monitor can be adjusted to the tractor on which the chipper is mounted so that the chipper runs optimally in relation to the amount of horsepower you have available and how many revolutions you want to run with on the tractor's output axle.

Note that when the speed monitor is switched on, the infeed rollers start rotating only when the chipper's rotor disc has reached a sufficient number of revolutions (this number can be set).

You can read a detailed description of the speed monitor and how it works and is set in Appendix 1.

3.4 Control panel

There is a control panel on the chipper's chassis (see Figure 3) that provides important information about the chipper's operation.

3.4.1 Speed monitor (display unit).

- The speed monitor ensures that the chipper's rotor disc always has enough revolutions to chop the wood into chips without the tractor stalling. You can read a detailed description of the speed monitor and its settings in Appendix 1.

Good to know:

- The speed monitor's display normally shows the current rpm of the chipper's rotor disc.
- If the chipper is running at over 1,100 rpm, the numbers in the display will flash, the speed monitor will beep, and the infeed rollers will stop. This is a safety feature to prevent overloading the chipper. Infeeding starts automatically when the rpm fall below 1,100again.
- If the chipper is running at less than 400 rpm, the numbers will flash, and the speed monitor will beep to warn that there are too few rpm.

3.4.2 Pressure gauge

- This shows the current pressure in the hydraulic system.
- The harder the machine works, the higher the pressure shown on the pressure gauge. When idling (i.e. without wood in the machine), the pressure gauge should not display more than around 50 bar.
- If the pressure remains constant at 155 bar without fluctuations, it indicates that the feed rollers are at a standstill, for example, when a heavy branch is crossed or the trunk diameter exceeds 33 cm. In this case, the infeed can no longer perform, and you must either try to turn or branch the trunk. If the trunk is too large, it is necessary to cut off parts that exceed the maximum possible diameter.
- If the pressure exceeds 155 bar, a safety valve will limit the pressure.
- Should the pressure still exceed 155 bar, it is important to reduce the permitted pressure in the safety valve in the manoeuvring valve (see Figure 4 for the location). The hydraulic motors cannot handle a higher pressure and the seals in them will eventually leak.

Good to know:

- Next to 155 bar, in the bracket on which the pressure gauge is mounted, there is a triangular "notch" (see Figure 3) that indicates the maximum permissible pressure (155 bar). The pointer on the pressure gauge must not pass this notch at any time! If it does, the permissible pressure must be adjusted downwards in the safety valve in the manoeuvring valve (see Figure 4 for the location).

3.4.3 Warning light (only available on PC-3300-PIC and PC-3300-SIC)

- If this light is on, the infeed rollers will stop automatically and cannot be restarted until the cause of the fault has been corrected.
- This light is lit if either:
  1. The oil level in the hydraulic tank is too low.
  2. The oil temperature in the tank exceeds 70°C.

- If this light is illuminated, the chipper must be stopped, and the cause of the alarm must be investigated:
  • If, for example, the hydraulic system is leaking, this must be repaired and hydraulic oil must be topped up
  before restarting the machine.
  • If the oil temperature is too high, the machine must cool down before it can start again. Note
  that an elevated oil temperature may indicate a problem in the hydraulic system.
- The machine cannot be started until sufficient oil has been refilled (*) and/or the oil temperature has fallen below 70°C.

(*) Note that if, for example, the cooling coil has been drained of oil (e.g. during an oil change), the oil level in the hydraulic tank will drop when the chipper is started up until the cooling coil and the rest of the hydraulic system is filled with oil again. It may therefore be necessary to top up the oil in the tank a few times until the system is completely full again. Until this is done, the level gauge may switch off the hydraulic system several times as oil is drawn from the tank to meet the system's needs.

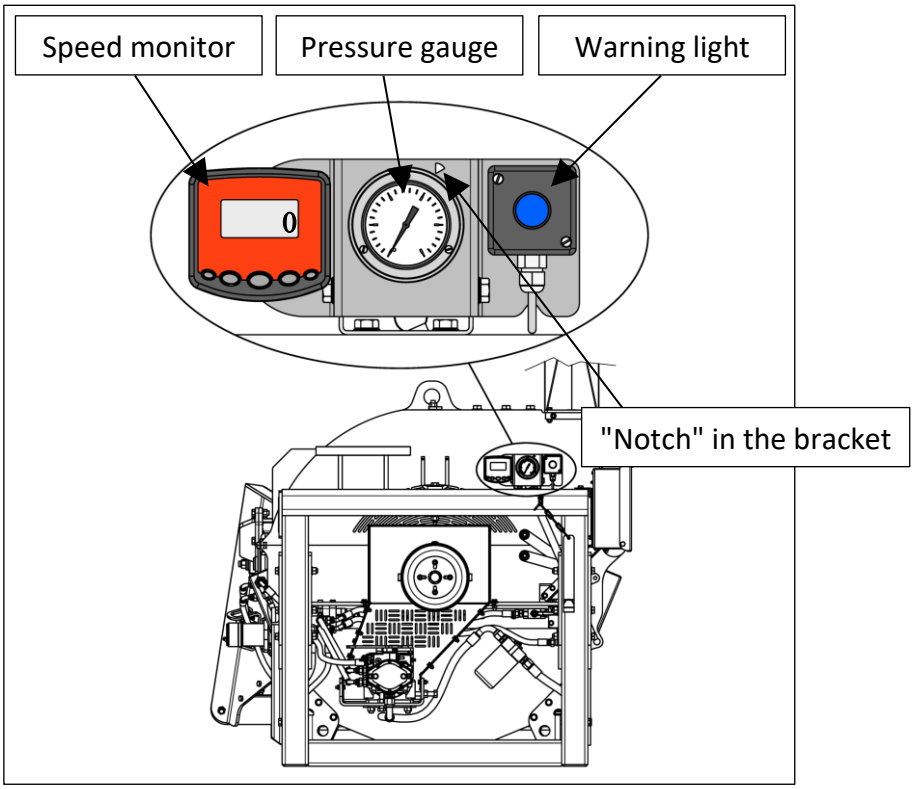


Figure 3- Control panel

3.5 Complete manoeuvring valve

On PC-3300 models, a complete control valve is fitted, in which the speed monitor's solenoid valve, the electric control valve, the flow control, and the safety valve are combined into one unit (see Figure 4).

The speed monitor's solenoid valve is connected to the system and opens and closes in response to the chipper rotor's revolutions. See Section 3.3and Appendix 1 for more information about the speed monitor's functions.
For safety reasons, it is not possible to "bypass" the speed monitor's solenoid valve, as this can lead to unintentionally dangerous situations.

The safety valve, also known as the pressure relief valve, is integrated into the complete unit and is preset by the manufacturer and it is not possible to change the pressure for safety reasons.

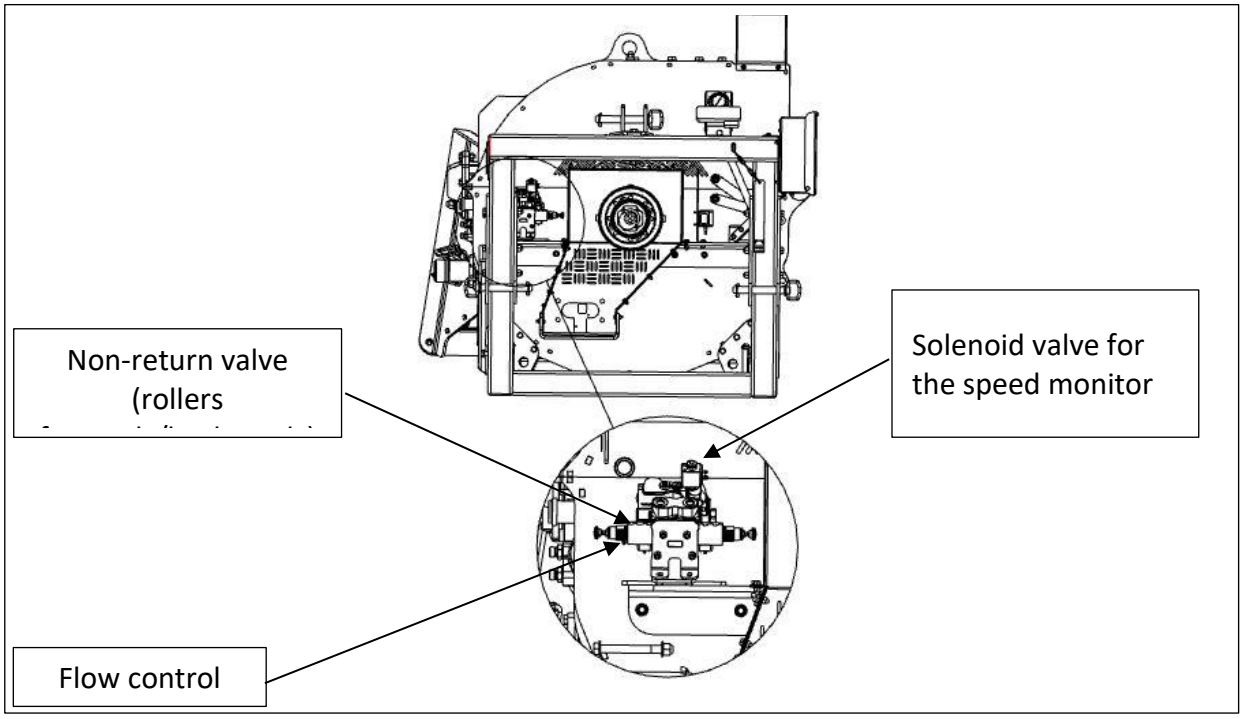


Figure 4- Valves and ball valve

3.6 Setting the infeed rate

The feed speed, i.e. the speed at which the wood is fed into the chipper, can be adjusted as needed.

It is important that the infeed speed roughly matches the chip size the machine is set to chop. The larger the chips (high blade setting), the faster the wood must be fed in. This means that if the blades are set to chop 20 mm of wood, the wood must be fed in faster than if the blades are set to chop 5 mm of wood.

Optimally, the log hits the rotor disc at the same moment as the chipping blade comes out to cut. This way, the blade height is utilised, and the log doesn't put unnecessary pressure on the rotor while "waiting" for a blade.

If the feed speed is too low, the blade height is not utilised, and the chipper makes smaller chips than the blades are set for.

If the feed rate is too high, the log will press on the rotor and unnecessarily slow it down until the blades come in to chop.

3.6.1 Setting the feed speed for PC-3300-PIC and PC-3300-SIC

The feed speed for machines with internal hydraulics is set on the handle of the hydrostat (pump) located under the chipper's output axle. See Figure 5.

To adjust the infeed speed, move the lever on the hydrostat in the direction of the arrow (see Figure 5) until the desired infeed speed is reached.

Then insert the pin into the hole on the handle that best matches the hole in the bracket under the handle.

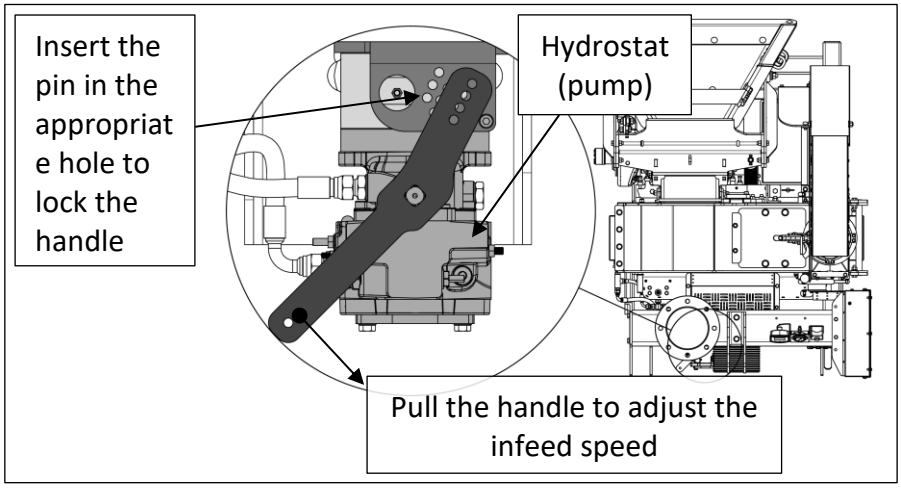


Figure 5- Setting the infeed speed for PC-3300-PIC and PC-3300-SIC

3.6.2 Feed speed setting for PC-3300-PEC and PC-3300-SEC

The feed speed for machines with external hydraulics (tractor hydraulics) is set on the flow control (valve) located on the side of the complete control valve. See Figure 6

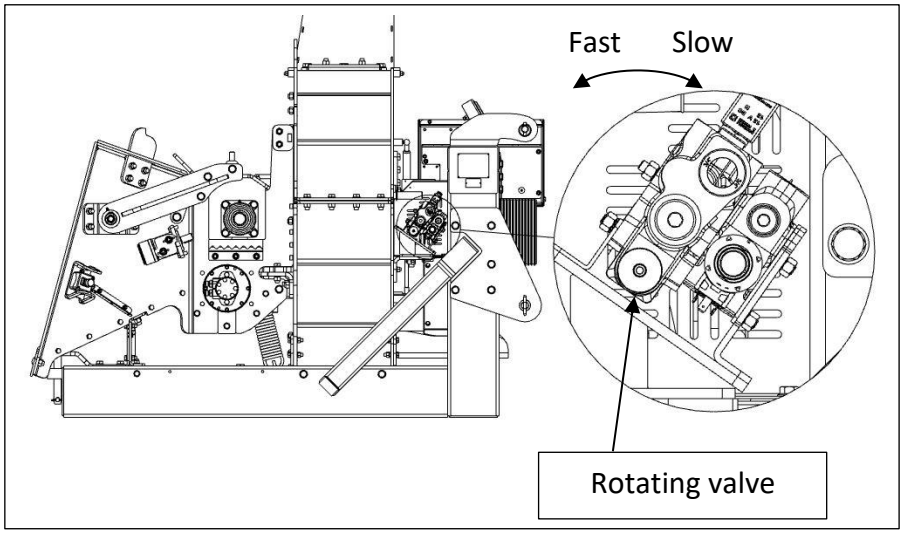


Figure 6- Setting the infeed speed for PC-3300-PIC and PC-3300-SIC

Turn the valve anti-clockwise to increase the feed speed.
Turn the valve clockwise to decrease the feed speed.

As far as possible, it is recommended to open the valve almost as much as you can (e.g. open it 80%), and then adjust the amount of oil the *tractor* delivers downwards until the feed rate is just about right. You can then fine-tune with the valve on the chipper. This approach usually produces the least heat in the hydraulic system.

4 Hydraulic spout

Unless otherwise selected, all PC-3300 models come with a hydraulic spout as standard. This helps to ensure easier and more efficient filling of trolleys or containers.

4.1 Mounting the spout's hydraulic hoses

The hydraulic spout is equipped with four hydraulic hoses that must be connected to the tractor's hydraulic outlet.

The hydraulic hoses are in pairs and must therefore be connected in pairs in two double-acting hydraulic outlets on the tractor.

4.2 The hydraulic spout's working area

The spout has the ability to rotate approximately 260° degrees, which provides good opportunities to fill your trolley or anything else you want to get the chips into, even if the accessibility is not too good.

To rotate the hydraulic spout, use the selected hydraulic outlet on the tractor to which the two hydraulic hoses from the rotary motor are attached.

The spout also has the option to tilt the outer link, so you can control whether the jet from the chips should be thrown far away from the chipper or closer to the chipper.

To tilt the outer link on the spout, use the selected hydraulic outlet from the tractor to which you have attached the two hydraulic hoses coming up from the tilt cylinder on the spout.

IMPORTANT: Before using the functions of the hydraulic spout, it is important to reduce the flow on the tractor's hydraulic outlet so that the hydraulic spout does not operate too quickly.

5 Safety precautions

When using the chipper, there are a number of precautions that must be observed. To avoid accidents, it is vital to take care and observe the safety precautions outlined in this manual when using the chipper.

To further ensure safety, it's also important to maintain the machine and inspect it regularly.

5.1 General precautions

When the chipper is in operation, always pay attention. Wood can be ejected out of the machine, foreign objects (e.g. stones) can be drawn into the machine, or something else unexpected and dangerous can happen.

Therefore, observe the following points:

- Be aware and vigilant.
- **Never** put your fingers into the machine's openings.
- **Never** open the machine during operation - stop the tractor and make sure the rotor is **completely** stopped, and disconnect the PTO axle before opening the chipper.
- **Only** feed wood into the machine with a crane designed for it.
- **Never** hand-feed a chipper with a crane hopper.
- **Never** remove wood or anything else that has become stuck while the machine is running.
- Ensure that **all** bolts are always tightened securely.
- Keep the machine in a **good** maintained condition.
- **Never** use the machine for anything other than what it is intended for.
- Never allow children under the age of 18 to operate or work on the machine.
- **Never** operate the machine without reading and understanding the safety instructions.
- Place the machine on a firm, level surface when chipping wood.
- **Never** use the machine without the guards properly fitted as specified in this manual.
- If something unexpected happens, switch off the machine **immediately**.
- Do **not** use the machine indoors.
- **Never** bypass the safety mechanisms built into the machine.

5.2 Protective equipment

When using the chipper, it is important to wear personal protective equipment. As a minimum, you are required to wear eye protection and hearing protection. It is also recommended that you wear safety footwear, work gloves and suitable work clothes without loose items (laces, etc.).

Warning: Be aware of loose clothing, cords, ropes, etc., that can get caught in the chipper or the wood to be chipped, so that you do not get pulled into the machine in a worst-case scenario.

5.3 Guards

When the chipper is in operation, all guards must be fitted. If the guards have been damaged or cannot be fitted correctly, do not use the chipper until this has been corrected. Figure 7 gives an overview of the guards, all of which must be fitted during operation. In addition to the guards, the spout must also be fitted.

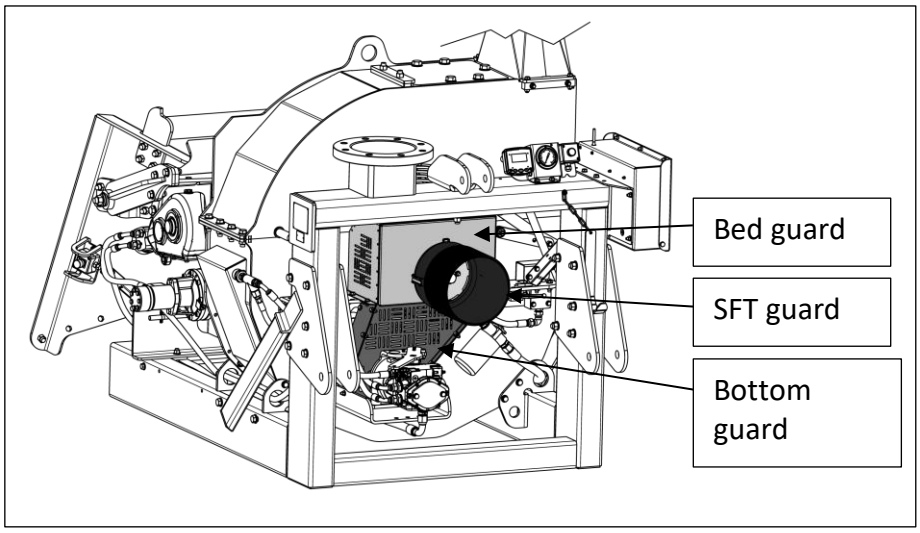


Figure 7 - Guards that must be fitted during operation

5.4 Signage

There are a number of signs on the chipper. These signs are described and shown in this section. To avoid accidents and to operate the chipper in the best possible way, it is important that the signs are observed.

5.4.1 Read the user manual

Meaning:
Before using the machine, the user manual **must** be read and **must** be followed.

5.4.2 Beware

Meaning:
Pay attention when working with or near the chipper.

5.4.3 Eye and ear protection is mandatory

Meaning:
When the chipper is in operation, safety goggles and hearing protection or similar **must** be worn.

5.4.4 Rotating parts

Meaning:
There are rotating parts in the chipper that can cause injury. So, pay attention!

5.4.5 Sharp blade

Meaning:
The chipper has sharp blades that you can cause cuts. So, pay attention!

5.4.6 Revolutions PTO

Meaning:
The rotor can run at either 540 or 1000 rpm max (rpm = revolutions per minute).

5.4.7 Risk of pinching

Meaning:
There is a risk of getting pinched. Therefore, keep your fingers away.

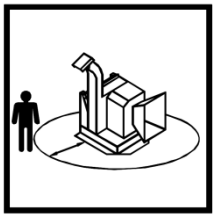
5.4.8 Do not open the rotor housing until the rotor has completely stopped

Meaning:
Do not open the chipper when the rotor is spinning.

5.4.9 Only open the rotor housing when the rotor has completely stopped

Meaning:
The chipper may **only** be opened when the rotor has **completely** stopped and the PTO axle is removed.

5.4.10 Safety distance

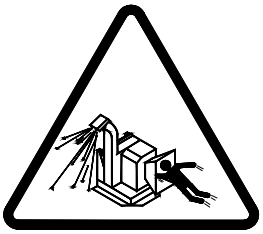


Meaning:
Pay attention and keep a safe distance from the machine as much as possible. This applies in particular to persons who do not work with the machine.

5.4.11 Things can be ejected

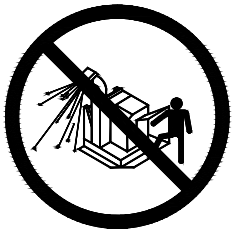
Meaning:
When the machine is in operation, things can be ejected from the machine. So, pay attention!

5.4.12 Risk of being pulled in



Meaning:
When the chipper is in operation, there is a risk of being pulled into it. So, pay attention!

5.4.13 Do not enter the hopper

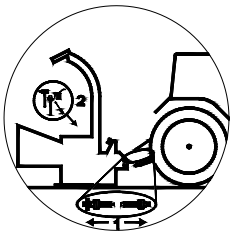


Meaning:
Do not insert body parts into the chipper hopper as this can be extremely dangerous.

5.4.14 Noise level

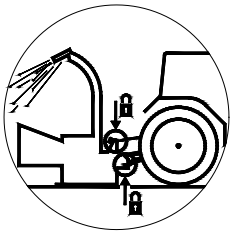
Meaning:
The chipper creates noise up to the sound pressure level shown on the machine.

5.4.15 Remove the PTO axle before maintenance



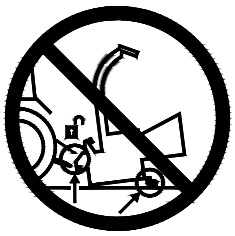
Meaning:
For safety reasons, the PTO axle for the chipper **must be removed** before performing maintenance on the chipper.

5.4.16 Mount the chipper on the 3-point hitch before use



Meaning:
The chipper **must** be **correctly** mounted on the tractor's 3-point hitch before use.

5.4.17 Place the chipper on a flat surface before disconnecting it from the tractor



Meaning:
The chipper **must** be placed on a flat, level surface before it can be disconnected from the tractor.

5.4.18 Do not use a hook

Meaning:
Where this mark is located, do not use a hook to lift the chipper.

5.4.19 Direction of rotation

Meaning:
The direction of rotation of the rotor must follow the arrow shown.

6 Service and maintenance

To minimise the risk of accidents and to ensure a long operational life, the machine must be regularly maintained. In general, pay attention to the machine's sound and other signals and check for and, if necessary, repair damage.

At the end of the season, or periodically depending on usage, it is recommended to thoroughly clean the chipper to ensure an easy start-up the next time it is used. It is also recommended to inspect the chipper, see Chapter 2, before using it again for a new season.

Note:
During all maintenance, the following must be observed:

- The PTO axle between the chipper and the tractor must be dismantled.
- Ensure that there is no pressure in the hydraulic system, i.e. the pressure gauge should read 0 bar.
- The control cable must be disconnected from the tractor so that there is no voltage on the machine.

6.1 Open and close the rotor housing

When servicing the wood chipper, it may be necessary to open the top of the chipper to access the rotor, blades and possibly the screen (PC-3300-PEC and PC-3300-PIC only).

IMPORTANT: Before opening the rotor housing, the chipper must be disconnected from the tractor, and the PTO axle must be removed.

Note:
Before opening the rotor housing, it is important to ensure that there is room for the ejector spout in the direction the machine will be opened. It may also be necessary to turn the spout so that the rocker blade does not hit anything when the rotor housing is lifted.

6.1.1 Opening and closing the rotor housing, PC-3300-SEC and PC-3300-SIC

- Open:
  1. Loosen the four bolts that hold the upper and lower part together
  2. Grasp the handle on the upper part and carefully lift the upper part up
  3. Once the top is at the top, a bolt can be inserted in the scissor stop to keep the top in the top position while working on the machine
  4. Insert the locking bolt (see Section 5.2) in the rotor so that it does not rotate while working

- Close:
  1. Remove the locking bolt from the rotor and replace it on the crossbar (see Section 5.2)
  2. Grab the handle on the top of the rotor housing and remove the bolt in the scissor stop
  3. Carefully lower the upper part of the rotor housing while making sure nothing is trapped
  4. Fit and tighten all four bolts holding the upper and lower parts together

6.1.2 Open and close the rotor housing, PC-3300-PEC and PC-3300-PIC

6.1.2.1 With standard ejector wings fitted

If your PC-3300-PEC or PC-3300-PIC is fitted with standard ejector wings, the machine can be opened or closed by following the instructions in Section 5.1.1.

6.1.2.2 With ejector wings with angled section fitted ("L-wings")

If your PC-3300-PEC or PC-3300-PIC is fitted with an angle section on the ejector wings (so that the overall ejector wing is shaped like an "L") and part of the blade therefore goes over the screen, it is necessary to turn the rotor so that these blades are in a horizontal position (see Figure 8), **otherwise the machine will not open**.

The rotor can be turned by grasping and turning the end of the chipper's main axle until the ejector wings are in a horizontal position.

When the ejector wings are in the horizontal position, the top of the rotor housing can be opened by following the instructions in Section 5.1.1.

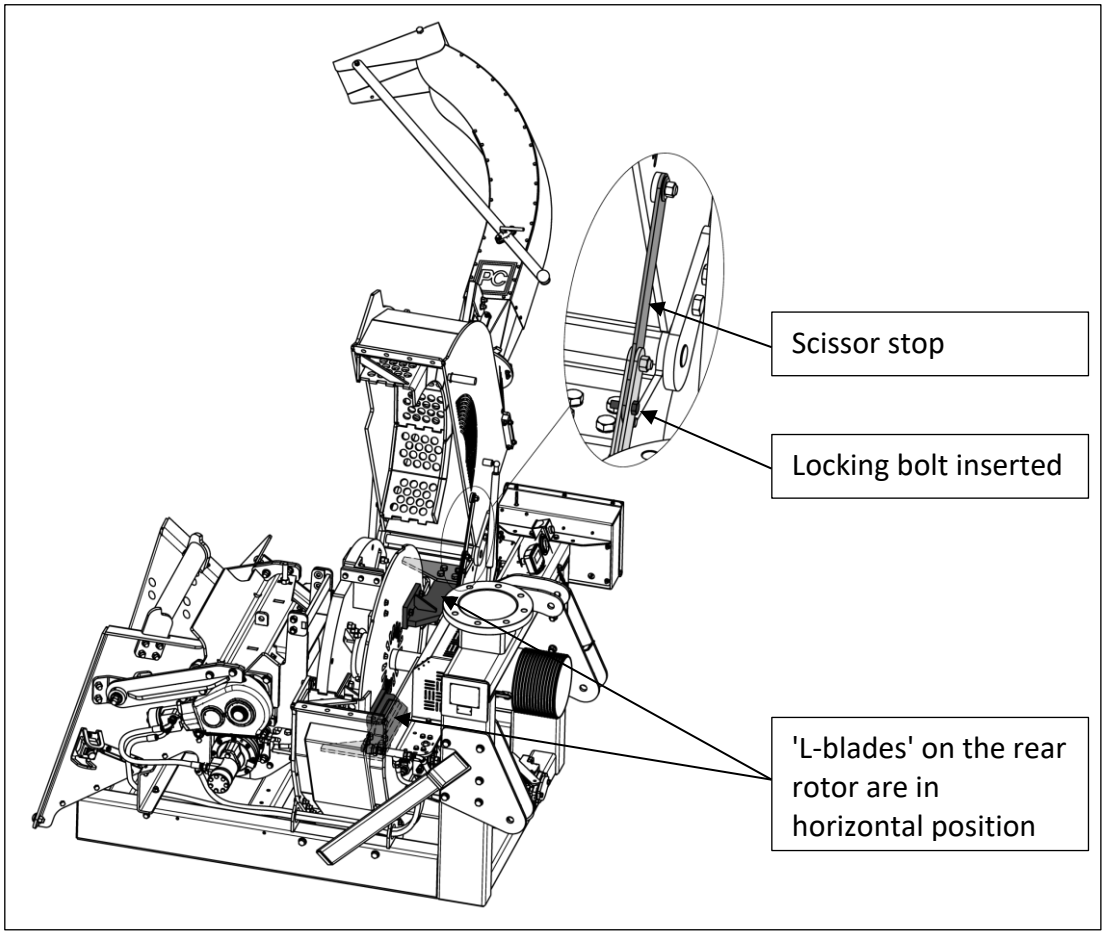


Figure 8- Locking bolt in the "scissor stop"
- and -
Ejector wings must be horizontal before the rotor housing can be opened (only with "L-wings" fitted).

6.2 Locking the rotor (chipping disc)

When the rotor housing is open and the rotor needs to be worked on, for example, when changing blades, the rotor can be locked.

Be aware that when fitting or removing a blade, for example, the rotor is no longer in balance and will therefore start to move on its own if it is not locked.

Once the rotor housing is opened, the rotor is locked by inserting the locking bolt, which is "parked" on the chipper's crossbar, through the bracket on the side of the rotor housing and through one of the four corresponding holes in the rotor. See Figure 9.

There are four holes in the rotor that fit the locking bolt, and the rotor can be locked so that you can safely change all the blades, etc.

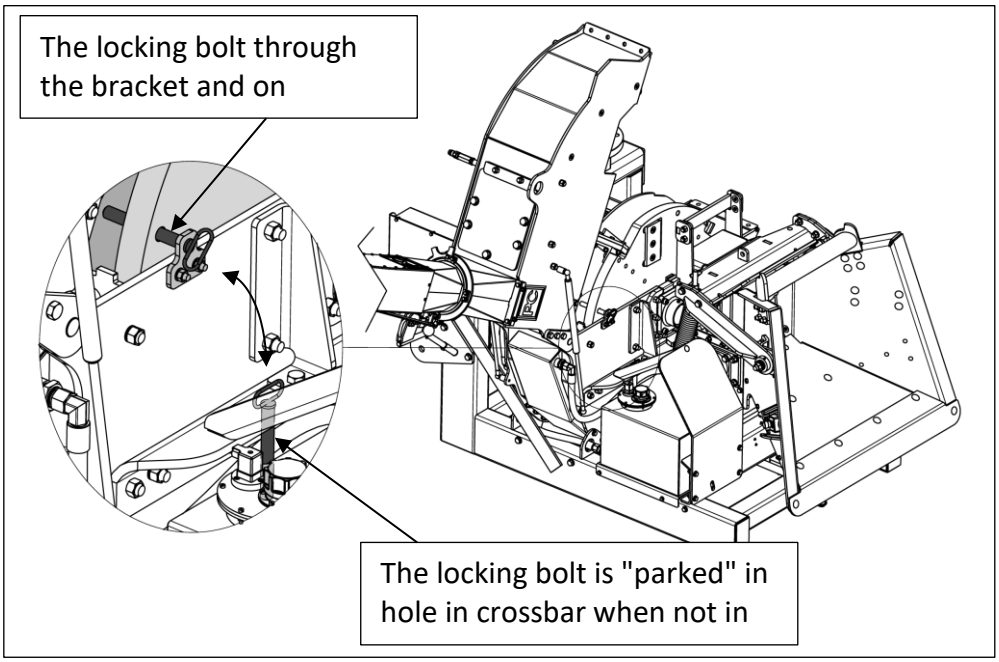


Figure 9- Locking the rotor

6.3 Blades (chipping blades)

The chipping blades are at the centre of the chipper's operation and it's important to inspect them regularly.

To ensure that the tree is cut as efficiently and economically as possible, the blades must be sharp and in good condition, i.e. without large 'nicks' in the blade edge.

If you want to change the blades, you can do this by following the instructions in Section 5.3.1.

If you want to change the chip size, this is done by changing the height of the blades using more or fewer shims, see the instructions in Section 5.3.4ff.

Note: If you have a pellet chipper (PC-3300-PEC or PC-3300-PIC), it may be necessary to change the screen if you change the blade height to benefit from the change.

If you want to sharpen the blades, follow the instructions in Section 5.3.5.

Warning: **Never fit damaged blades. For example, if the blade is broken or cracked, do not install it. Failure to do so can be very dangerous.**

Warning: **Always have all 4 blades fitted with all bolts correctly fitted and tightened during operation. If one or more blades and bolts are left out, the rotor may become unbalanced, which will cause oscillations during operation, and in the worst-case scenario, the rotor could fail.**

Warning: **The rotor is in balance with the four blades attached, and when one or more of these are removed, for example, during maintenance, the rotor is no longer in balance and will start to turn if it is not locked (see Section 5.2 on locking the rotor). Therefore, watch your fingers, etc., and never insert them into the machine.**

Warning: **When the blades are new or newly sharpened, they are very sharp and can cause cuts. Therefore, be careful and wear thick gloves when handling the blades.**

Warning: **Even if the blades are removed because they are dull, there may still be places on the cutting edge where they are sharp. Therefore, be careful and wear thick gloves when handling the blades.**

6.3.1 Changing blades (when?)

When the chipping blades have been sharpened after a long period of use to the point where the edge surface is behind the hole through the rotor (see Figure 10), the chipping blades must be replaced.

If the blades have been damaged (large nicks, breaks, etc.), e.g. if something very hard (e.g. stone or metal) has been in the machine, the blades must also be replaced.

Change worn or damaged chipping blades according to the instructions in Section 5.3.2 for PC-3300-PEC and PC-3300-PIC or Section 5.3.3 for PC300-SEC and PC-3300-SIC.

Warning: **Never run the chipper with damaged blades. This can be extremely dangerous!**

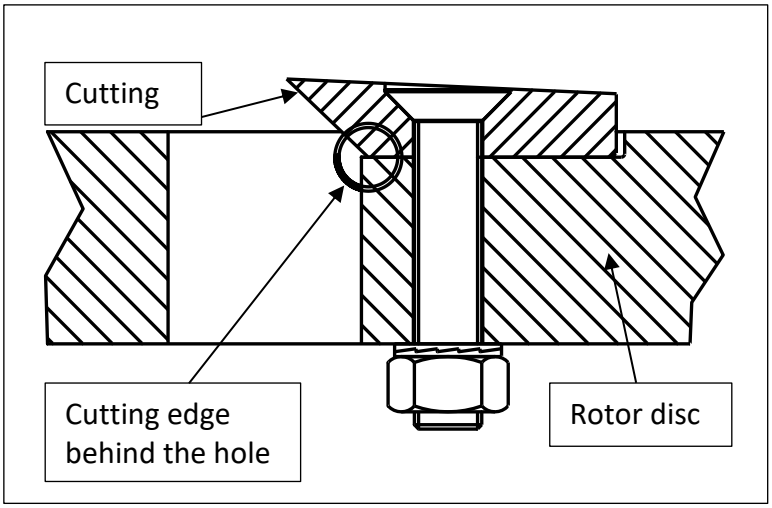


Figure 10- The blade's cutting edge is behind the edge of the hole through the rotor

6.3.2 Changing chipping blades for PC-3300-PEC and PC-3300-PIC (removing/mounting)

Each blade is fitted with:

- 3 pcs. M16 bolts grade 10.9 with a **countersunk head** and internal hexagon (the length of the bolt depends on the thickness of any shims).
- 3 pcs. locknuts for M16 grade 8.8.
- 3 sets of NordLock washers for M16.
- Shims as needed (see Section 5.3.4.1)

6.3.2.1 Removing the chipping blades for PC-3300-PEC and PC-3300-PIC

Removing the blade:

1. Lock the rotor according to Section 5.2 so that the blade you want to change is accessible.
2. Loosen the three bolts in the blade almost completely. You may need to be careful, as the NordLock washers offer a lot of resistance.
3. While carefully holding the blade, unscrew the three bolts completely and remove the blade.

6.3.2.2 Mounting chipping blades for PC-3300-PEC and PC-3300-PIC

If you want to change the cutting height of the blades, first select the shims according to the instructions in Section 5.3.4.1. If you change the blades' cutting height, you may need to adjust the screen to benefit from the change. See more about this in Section 5.7.

Before (re)installing the blades, make sure that the bolts, nuts and NordLock washers are in good condition. If this is not the case, they need to be replaced. Please also read Section 5.8.7 regarding the use of NordLock washers.

Fitting the blade:

1. Lock the rotor according to Section 5.2 so that the blade pocket where you want to fit the blade is accessible.
2. Clean the blade pocket thoroughly so that the blade can lie completely flat in it.

3. Hold the blade and the selected shims against the blade pocket.
4. Loosely insert the three bolts for fitting the blade with NordLock washers and locknuts. The two halves of the NordLock washers are fitted so that the "rough" surfaces face each other and ensure that the two halves are evenly distributed over each other when tightening the bolts. See more in Section 5.8.7 on using NordLock washers.
5. Once all three bolts are inserted, torque them evenly to 180 Nm.

See Figure 11 for the sequence.

When all blades are mounted, carefully turn the rotor by 1 turn to ensure the blades do not hit anything, and, if necessary, adjust the anvil, etc.

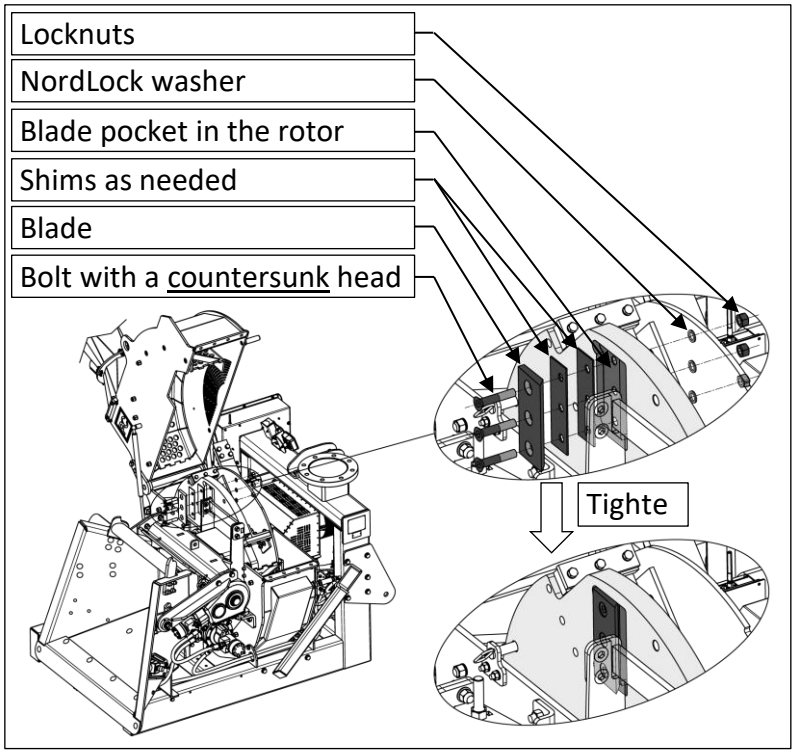


Figure 11- Fitting and adjusting chipping blades with shims,,
PC-3300-PEC and PC-3300-PIC

6.3.3 Changing chipping blades PC-3300-SEC and PC-3300-SIC

Each blade is fitted with:

- 3 pcs. M16 bolts grade 12.9 with a **cylinder head** and internal hexagon (the length of the bolt depends on the thickness of any shims).
- 3 pcs. locknuts for M16 grade 8.8.
- 3 sets of NordLock washers for M16.
- Shims as needed (see Section 5.3.4.2)

6.3.3.1 Removing chipping blades for PC-3300-SEC and PC-3300-SIC

Removing the blade:

1. Lock the rotor according to Section 5.2 so that the blade you want to change is accessible.

2. Loosen the three bolts in the blade almost completely. You may need to be careful, as the NordLock washers offer a lot of resistance.
3. While carefully holding the blade, unscrew the three bolts completely and remove the blade.

6.3.3.2 Fitting chipping blades for PC-3300-SEC and PC-3300-SIC

If you want to change the blade's chopping height, first select the shims according to the instructions in Section 5.3.4.2.

When fitting the blades, make sure that the bolts, nuts and NordLock washers are in good condition. If this is not the case, they need to be replaced. Please also read Section 5.8.7 regarding the use of NordLock washers.

Fitting the blade:

1. Lock the rotor according to Section 5.2 so that the blade pocket where you want to fit the blade is accessible.
2. Clean the blade pocket thoroughly so that the blade can lie completely flat in it.
3. Hold the blade and the selected shims against the blade pocket.
4. Loosely insert the three bolts for fitting the blade with NordLock washers and locknuts. The two halves of the NordLock washers are fitted so that the "rough" surfaces face each other and ensure that the two halves are evenly distributed over each other when tightening the bolts. See more in Section 5.8.7 on using NordLock washers.
5. Once all three bolts are inserted, torque them evenly to 180 Nm.

See Figure 12 for the sequence.

When all blades are mounted, carefully turn the rotor by 1 turn to ensure the blades do not hit anything, and, if necessary, adjust the anvil, etc.

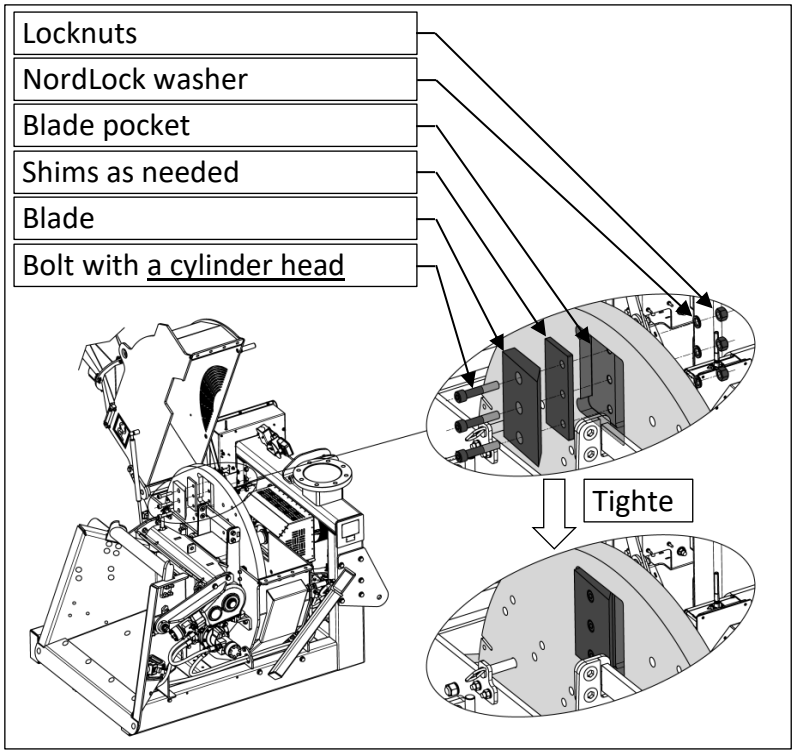


Figure 12Fitting and adjusting chipping blades with shims
PC-3300-SEC and PC-3300-SIC

6.3.4 Cutting height of the blades (setting the chip size)

By using shims under the chipping blade, you can adjust the blade's cutting height and thus, initially, the overall chip size.

It is important to adjust the infeed speed to the blade's cutting height in order to utilise the blade as much as possible. Read Section 3.6ff about setting the infeed speed.

Note: The final size and quality of the chip depend on more things than the cutting height of the blades. Factors such as wood type, wood moisture content, feed speed, screen size (PC-3300-PEC and PC-3300-PIC only), etc., also have an influence.

6.3.4.1 Blade cutting height (chip size), PC-3300-PEC and PC-3300-PIC

The chopping height of the chipping blades can be adjusted from 2 mm (=no shim) up to approx. 20 mm (=18 mm shim). This applies when using standard blades.

If you generally want to produce large woodchips, there are thick blades available, so you need fewer shims. However, the minimum cutting height with these blades is 10 mm.

The shims are available in different thicknesses and can be combined to achieve the desired cutting height.

See how to use the shim in Figure 13.

Important: If the blade height is changed, the bottom and side anvils must be adjusted accordingly. Read more about adjusting the anvil, etc., in Section 5.6.

Note: If you change the cutting height of the blades, you may need to change the screen as well. This is because there must be a certain correspondence between the cutting height of the blades and the size of the screen holes:

- If you have a high cutting height but small screen holes, a large part of the chip will be cut once again in the screen. This costs energy and capacity.
  For example, with a 20 mm blade height and Ø15 mm screen holes, almost all the chip will be chopped again in the screen.
- If you have a small cutting height but large screen holes, relatively large pieces of wood will come out in the chip mass.
  For example, with a 2 mm blade height and 50x50 mm screen holes, the maximum pieces of wood
  that can come out of the machine will be very large, compared to the general chip size of 2 mm.

Read more about the screen, size of screen holes, etc., in Section 5.7.

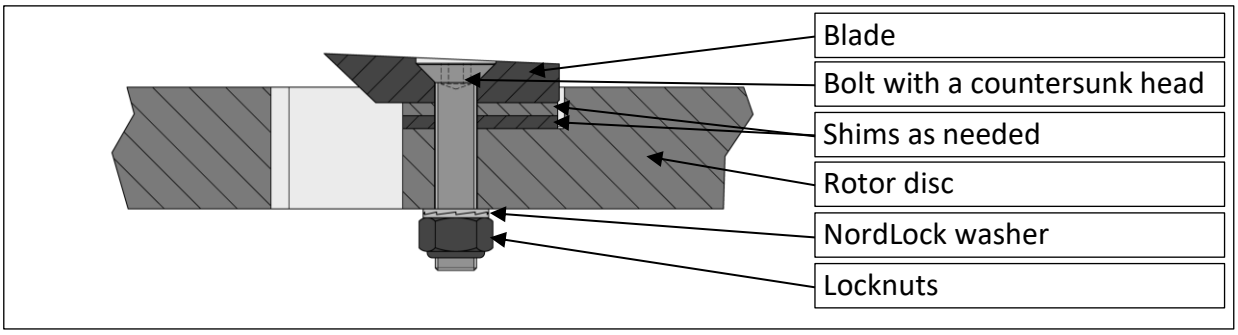


Figure 13Blade cutting height adjustment, PC-3300-PEC and PC-3300-PIC

6.3.4.2 Blade cutting height (chip size), PC-3300-SEC and PC-3300-SIC

The chopping height of the chipping blades can be set from 10 mm (=no shims) up to approx. 30 mm (=20 mm shims).

The shims are available in different thicknesses and can be combined to achieve the desired cutting height.

See how to use the shims in Figure 14.

Important: If the blade height is changed, the bottom and side anvils must be adjusted accordingly. Read more about adjusting the anvil, etc., in Section 5.6.

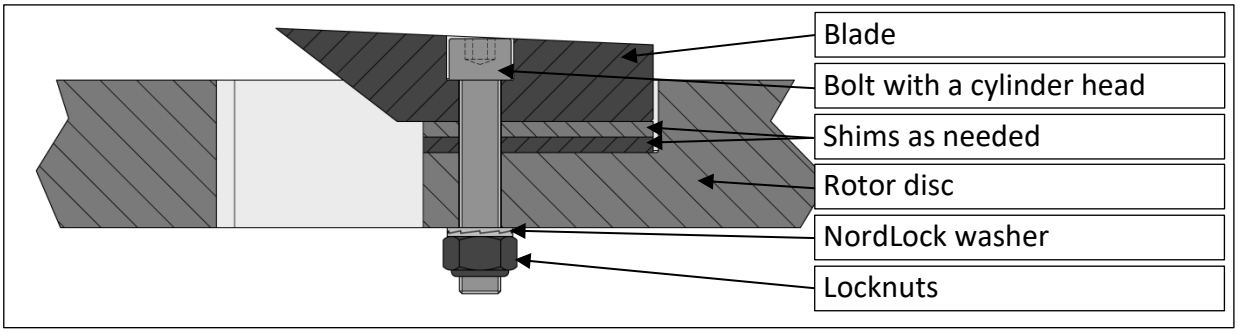


Figure 14Setting the blade's cutting height, PC-3300-SEC and PC-3300-SIC

6.3.5 Sharpening chipping blades

As the chipper is used, the blades become worn and the edge becomes dull over time. It is therefore necessary to sharpen the blades regularly. The sharpening interval depends on the type of wood being fed into the machine and whether soil and pebbles have been dragged along with the wood to the blades.

Signs that the blades need sharpening:

- The chipping quality becomes less consistent.
- The rotor loses rpm faster and more time is spent chipping the wood.

When sharpening the blades, they must first be removed from the machine. Before starting sharpening, assess whether the blades should be replaced instead (see Section 5.3.1). To remove the blades, follow the instructions for this.

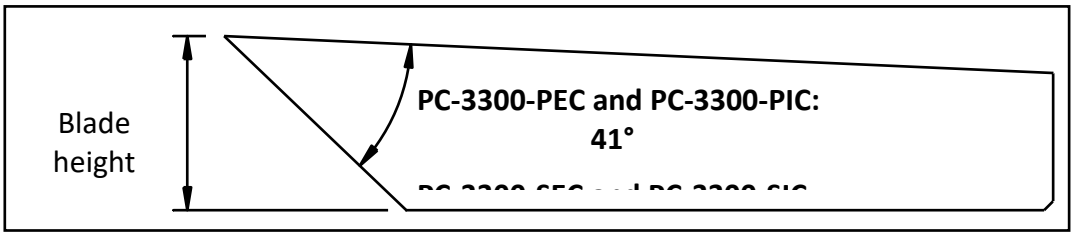


Figure 15Blade sharpening angle

The blades should be sharpened at an angle corresponding to the machine you have (see Figure 15), and it is important to adhere to the specified angle to ensure good chipping.

We recommend using a surface grinder or similar when sharpening the blades. If you are unable to sharpen the blades yourself, there are companies that specialise in this.

Note: When sharpening a blade, it must be done carefully. The blade must not turn blue on the grinding surface/blade edge, as this means that it has lost its hardening.

Warning: Never attempt to sharpen the blades while they are still attached to the rotor. It can be very dangerous.

Warning: When the blades are newly sharpened, they are very sharp and can cause cuts. Therefore, be careful and wear thick gloves when handling the blades.

6.4 Screen blade (PC-3300-PEC and PC-3300-PIC only)

The screen blades break down pieces of wood that are too large to pass through the screen holes by a cutting action between the screen knives and the edges of the screen holes.

Screen blades wear out over time. The blades have 4 cutting edges and can therefore be turned 4 ways before they need to be replaced. The cutting edges can be sharpened slightly, but to ensure proper chip quality, it is recommended to replace the screen blades before they wear down too far. The minimum width of the screen blades is 47 mm!

Warning: If a screen blade is cracked or has large pieces broken off, it must be replaced for safety reasons.

6.4.1 Changing screen blades (PC-3300-PEC and PC-3300-PIC only)

Each blade is fitted with:

- 1 pc. M12x55 bolt grade 8.8.
- 2 pcs. M12x65 bolts grade 8.8.
- 3 pcs. locknuts for M12 grade 8.8.
- 6 sets of NordLock washers for M12.

Fit the screen blades as shown in Figure 16.

Remember to lock the rotor according to Section 5.2 when working with the blades.

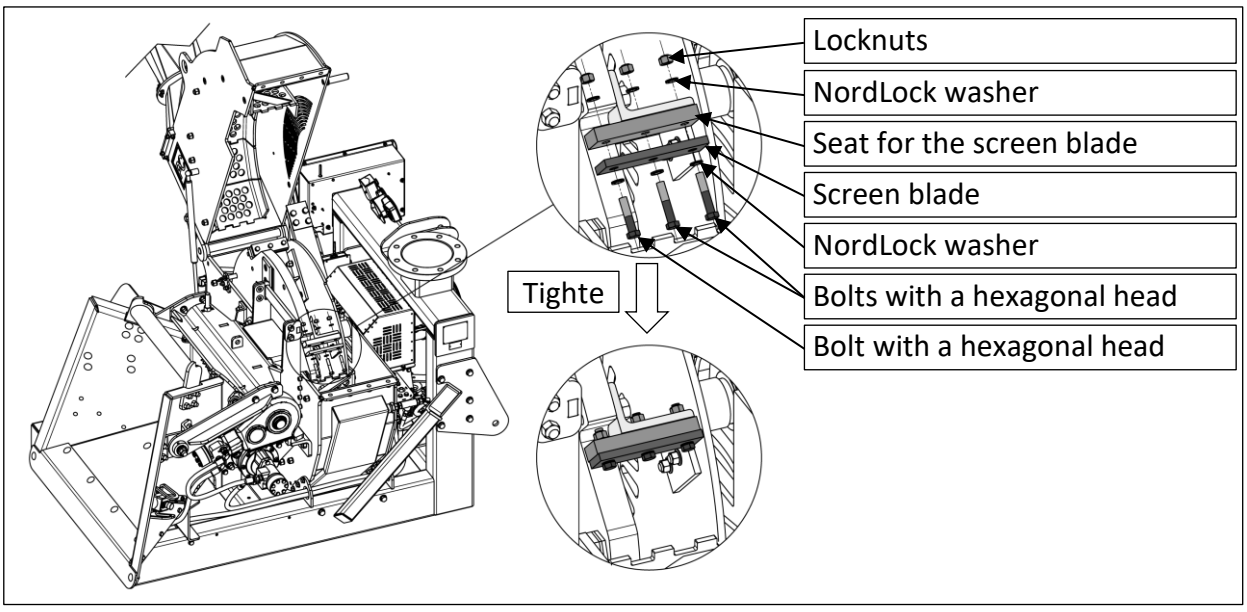


Figure 16Changing screen blades (PC-3300-PEC and PC-3300-PIC only)

6.5 Edge cutter (PC-3300-SEC and PC-3300-SIC only)

On the periphery of the chipping disc, there are some edge cutters mounted. These edge cutters consist of two pieces of angle steel.

The purpose of the edge cutters is to break the periphery of the rotor so that no wood gets trapped between the periphery and the rotor housing. If the edge blade is not present, there is a real risk that friction between the rotor edge and a piece of wood can ignite wood in the rotor housing. It is therefore important to have these edge blades fitted!

6.5.1 Changing the edge blades (PC-3300-SEC and PC-3300-SIC only)

The edge blades must be fitted as shown in Figure 17.
An assembled edge blade is two pieces and consists of:
1 x angle steel with a countersunk hole
1 x angle steel with a cylindrical hole
1 x M10 bolt with a countersunk head + NordLock washer + Lock nut.

Fit the edge cutters as shown in Figure 17.

Note: It is important that the angle steel with the countersunk hole is on the same side of the rotor disc as the blades.

Remember to lock the rotor according to Section 5.2 when working with the edge cutters.

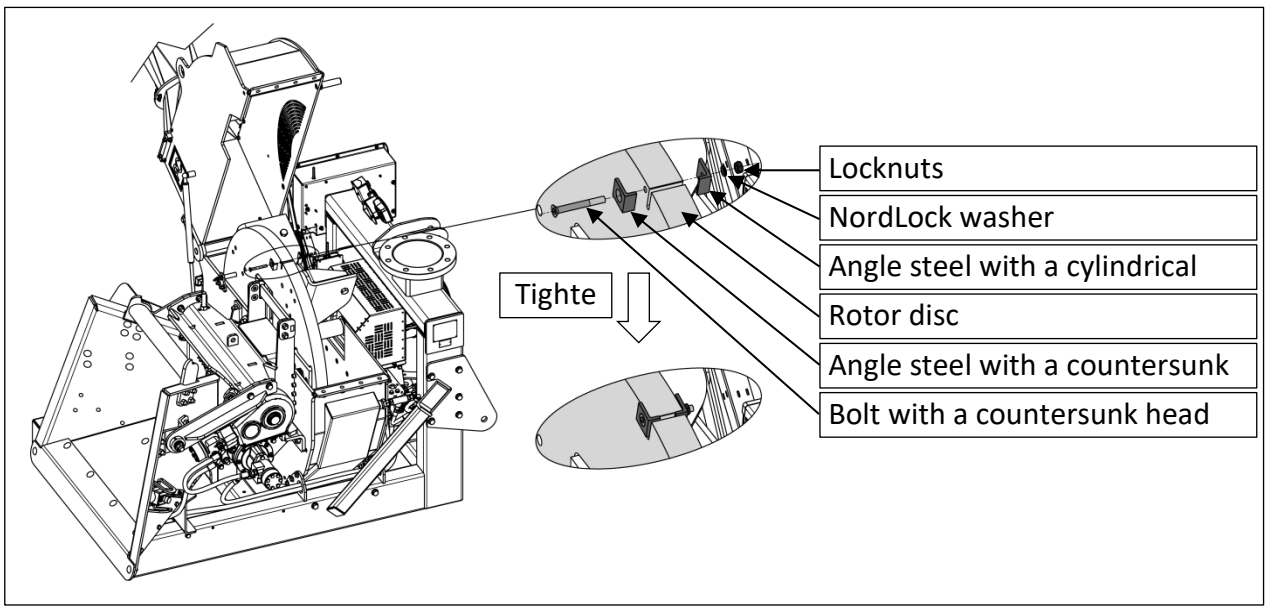


Figure 17Changing the edge cutters (PC-3300-SEC and PC-3300-SIC only)

6.6 Anvil

The anvils ensure that there is a good and effective 'cutting effect' between the anvils and the chipping blades. For the anvils to work as intended, they must be positioned at an appropriate distance from the blade edge.

There are three anvils in total (see Figure 18):
1 bottom anvil
1 side anvil on the left side of the infeed opening
1 side anvil on the right side of the infeed opening

The bottom anvil is on an infinitely adjustable "anvil sled".
The side anvils are adjusted using shims.

It's important to always check and, if necessary, adjust the anvils when:

- The blades are remounted after they have been removed, e.g. for sharpening.
- Fitting new blades
- The rotor has been removed.
- The feeder has been removed.

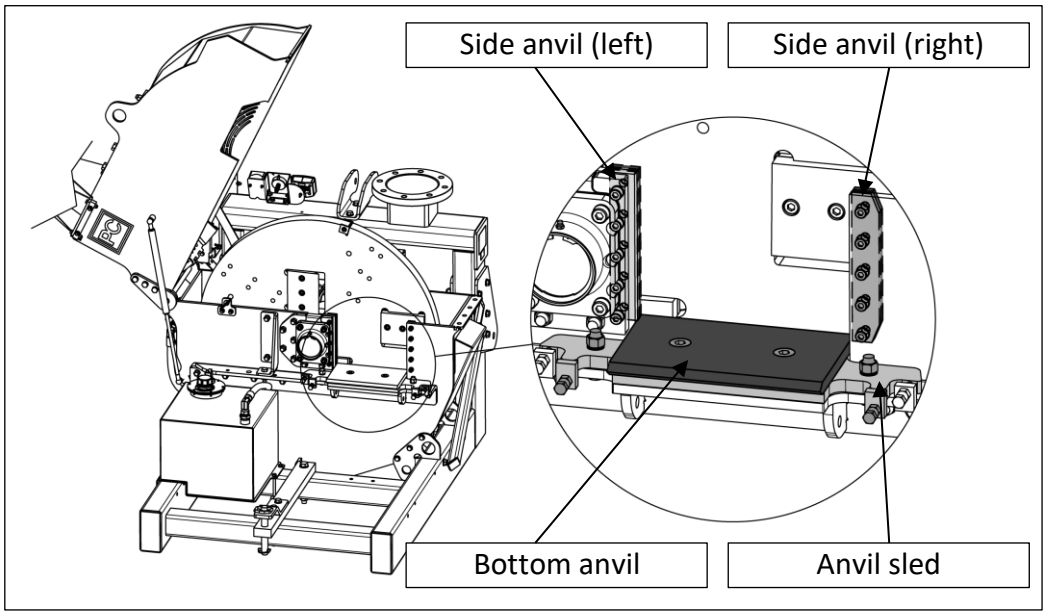


Figure 18The chipper's three anvils

6.6.1 Bottom anvil

The bottom anvil is the primary anvil, so it is important that this anvil is at the correct distance from the chipping blades.

The bottom anvil is set in the same way and at the same distance from the chipping blades for all chipper models in the PC-3300 series.

Warning: **Beware of the sharp blades when working with anvils.**

6.6.1.1 Adjusting the bottom anvil

To adjust the bottom anvil, first loosen the four bolts that hold the anvil sled clamped to the crossbar on the chipper. You can then adjust the anvil by turning the 2 + 2 adjusting screws located on each side of the anvil sled (see Figure 19).

The distance between the chipping blades' edge and the bottom anvil should be 1-2 mm. See Figure 19

Note: The distance between the chipping blades and the anvil must not be too small, as there may be a risk of the two parts colliding during operation due to vibrations.

When the anvil is satisfactorily adjusted across its entire width, tighten the four bolts that hold the anvil against the crossbar. Then screw all the set screws into the anvil and tighten the lock nuts. This ensures that the anvil is locked in all directions.

Once all the anvil screws are tightened, carefully turn the rotor one revolution by hand so that all blades pass the anvil while checking that the distance between all the chipping blades and the counter steel is satisfactory. If the distance is not appropriate, adjust the anvil again.

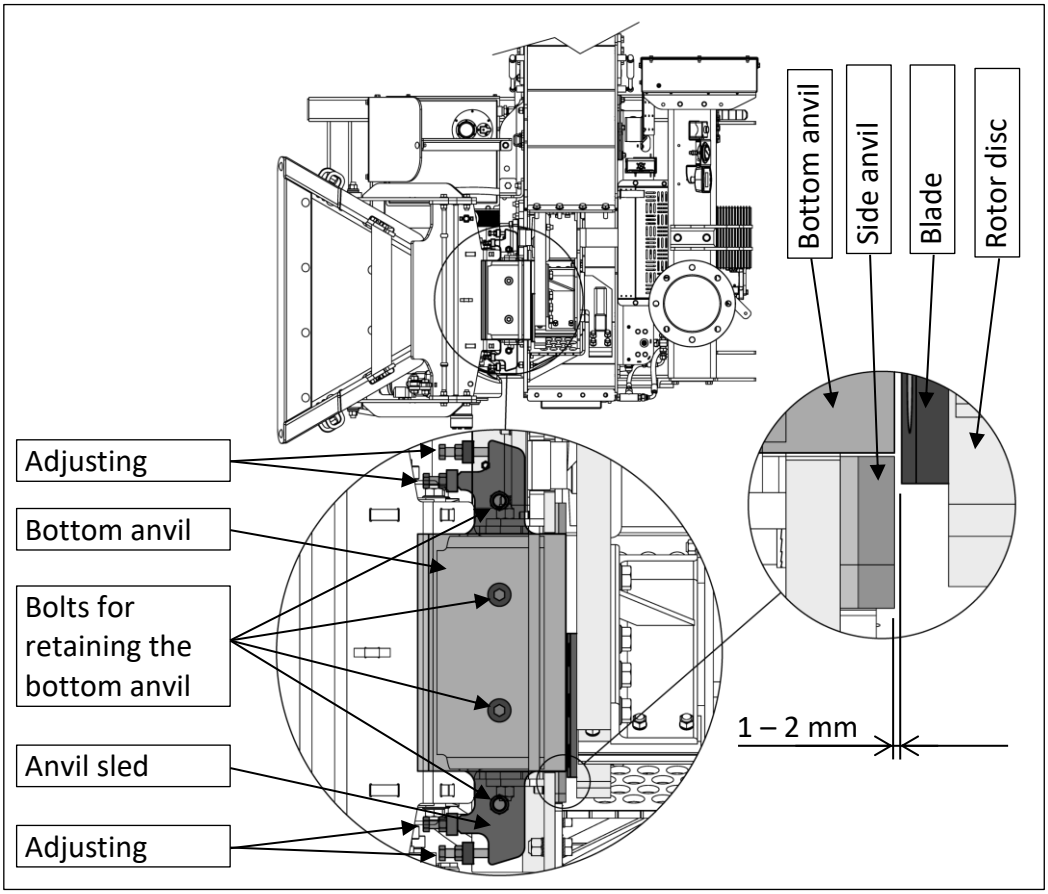


Figure 19Adjusting the bottom anvil

6.6.1.2 Changing the bottom anvil

If the bottom anvil is too worn, i.e. if the edge facing the chipping blades has become too round, the bottom anvil can be changed.

The end of the anvil facing the blades can be sharpened to regain a sharp edge. However, if the anvil is too worn, it can be replaced.

Before removing the anvil, lock the rotor (see Section 5.2) and remove the blades that are in the working area!

To change the anvil, remove the two countersunk bolts that go through the anvil (see Figure 20). Once the two bolts are removed, the anvil can be carefully pulled up.

Place a new or freshly ground anvil on the anvil sled so that the recesses for the bolts face upwards. Refit and tighten the anvil bolts.

Install the anvil with:

- 2 x M16x80 quality 10.9, with countersunk heads
- 2 x NordLock washers for M16
- 2 x Lock nuts for M16

Once fitted, adjust the anvil according to Section 5.6.1.1.

Warning: **Beware of the sharp blades when working with the anvil. Remove the blades before working with the anvil.**

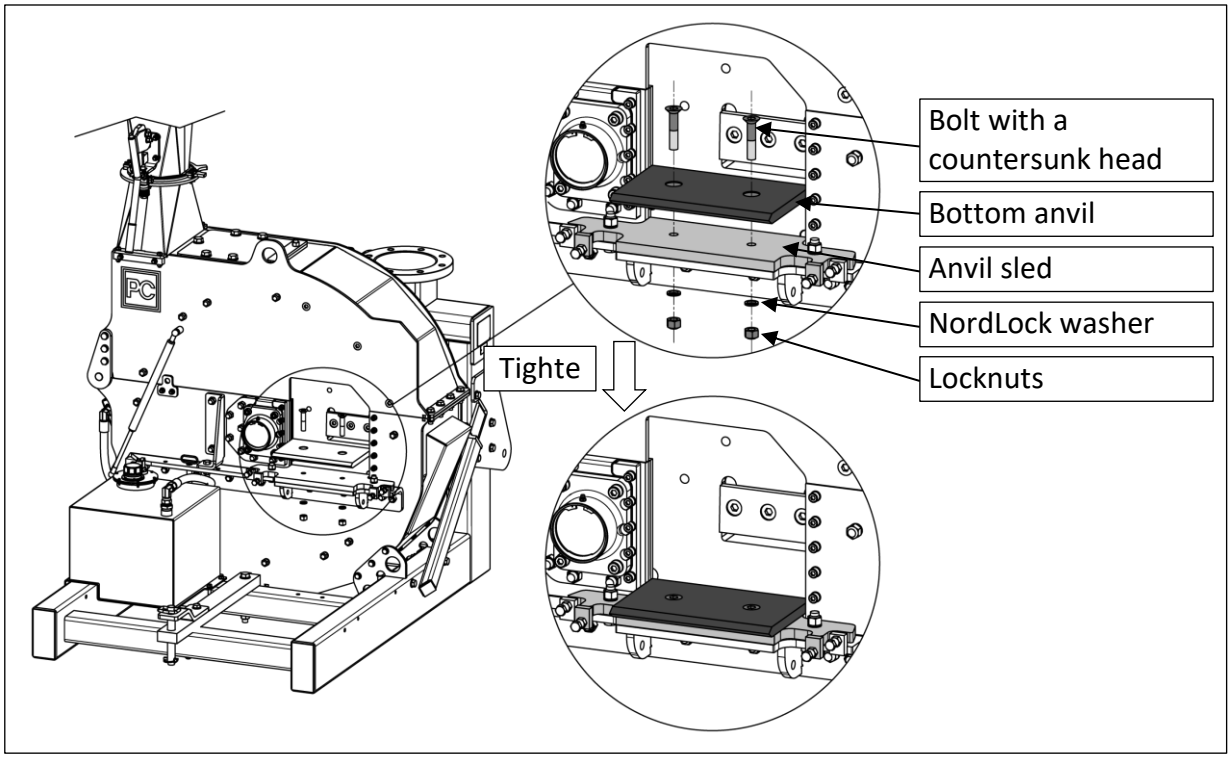


Figure 20Changing the bottom anvil (the feed unit is not shown for clarity)

6.6.2 Side anvil

The side anvils ensure a good cutting effect with the blades along the sides of the infeed hole. It is important that the side anvils are positioned at the correct distance from the chipping blades and not too close.

The side anvils are set in the same way and at the same distance from the chipping blades for all chipper models in the PC-3300 series.

Note that there is a difference between the right and left side anvils. The left side anvil is rectangular, while the right side anvil steel has two bevelled corners (see Figure 21).

Warning: **Beware of the sharp blades when working with anvils. Remove the blades before working with the anvils.**

6.6.2.1 Setting and changing the side anvils

Before setting or changing the anvils, lock the rotor (see Section 5.2) and remove the blades that are in the work area!

The side anvils are set using no or more shims between the anvil and the side plate of the chipper's body. The shims must be selected to ensure a suitable distance between the side anvils and the chipping blade edges.

The distance between the chipping blade edges and the side anvils must be *at least* 1-2 mm. See Figure 19.

Each side anvil is fitted with:

- Shims in a total thickness as needed.
- 5 x M12 bolts, grade 8.8 with cylinder heads and hexagon socket. The length depends on the number of shims.
- 5 x NordLock washers for M12.

Note that the side anvils do not necessarily need to have the same shims on both sides to achieve the same distance to the cutting edge of the chipping blades.

The order in which the parts must be fitted is shown in Figure 21.

EXTREMELY IMPORTANT: The left side anvil, closest to the main bearing, **must** be installed during operation as it contributes to the retention of the main bearing. **Failure to do so can be extremely dangerous!**

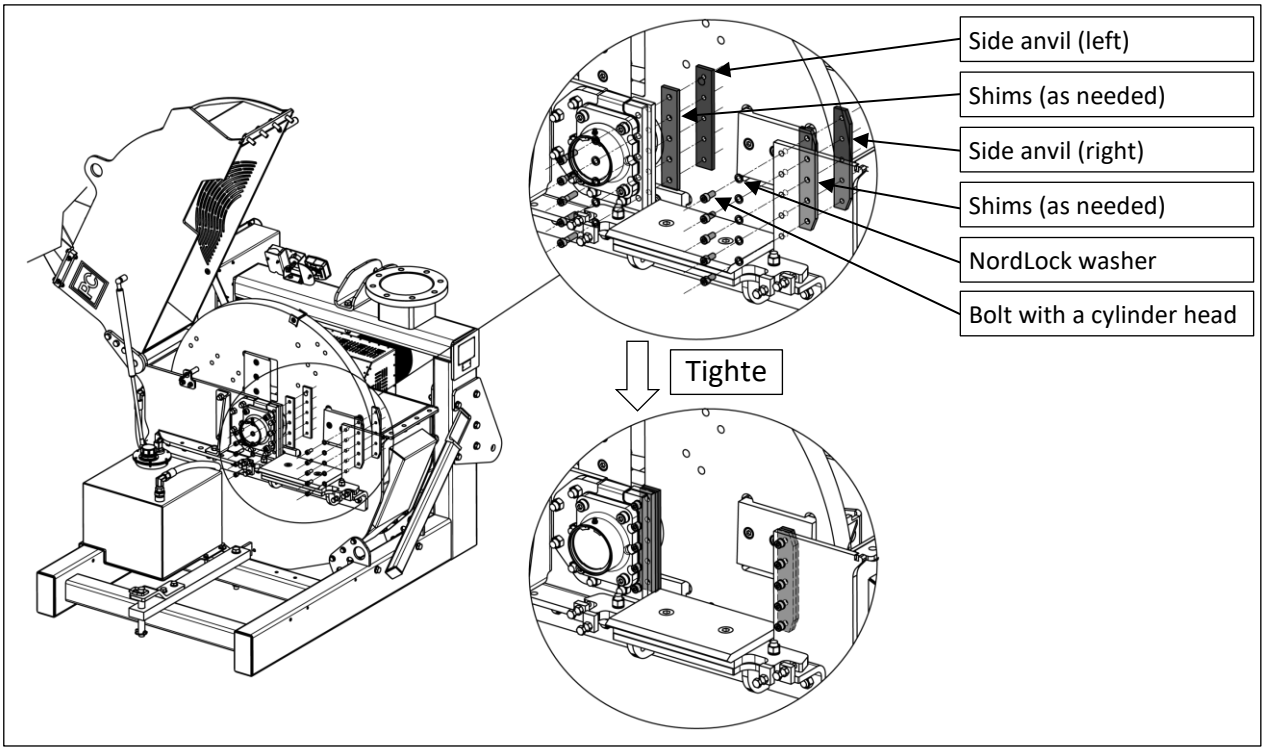


Figure 21Changing the side anvil (the infeed unit is not shown for clarity)

Use bolts of the correct length to mount the side anvil. If you change the anvil's setting, it is **important** to choose new bolts of the correct length. The ends of the bolts must not be too short and must not protrude through the anvil. Do not use ordinary washers as shims to limit bolt protrusion! Also see Figure 22.

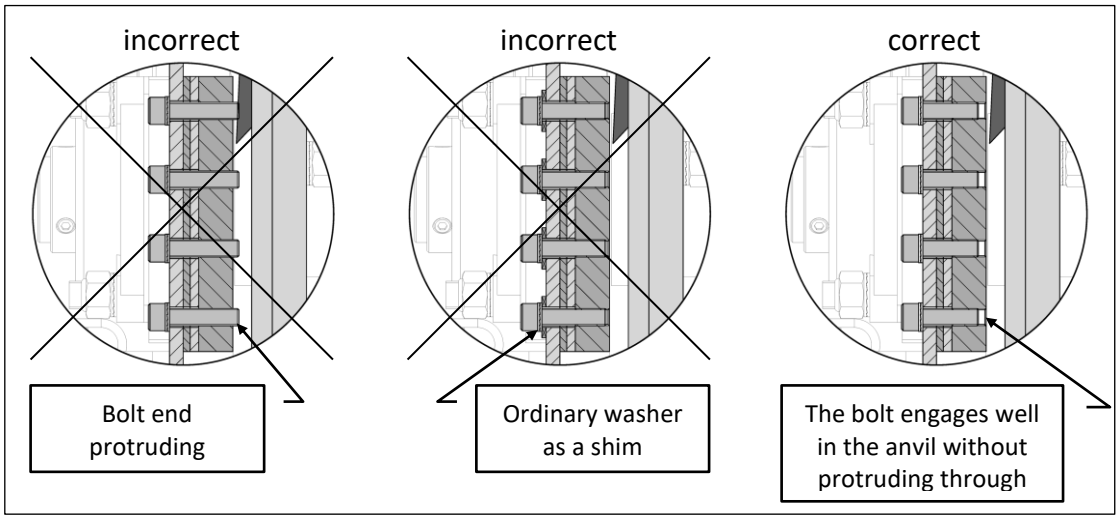


Figure 22Correct installation of the side anvil

Note: The distance between the cutting edge of the chipping blades and the anvil must not be too small, as there may be a risk of the two parts colliding during operation due to vibrations.

When all the bolts of the side anvil are tightened, carefully turn the rotor one turn by hand so that all blades pass the anvil, while checking that the distance between all the chipping blades and the side anvil is satisfactory. If the distance is not appropriate, readjust the side anvil.

6.7 Screen (PC-3300-PEC and PC-3300-PIC only)

The screen ensures that there is a limit to how large pieces of wood can come out of the chipper. With the right choice of screen hole size, you can customise your chip quality to your needs and avoid unwanted sticks and lumps.

The size of the screen holes ultimately has little impact on the overall chip size. The chipping blades do most of the work, so the screen only handles the pieces of wood that are too big. This is the most energy-efficient approach. Therefore, it's important to choose a screen with a hole size that matches the blade height to get the most out of your pellet chipper.

- If you have a highe blade height but small screen holes, a large part of the wood chips will be chopped back into the screen. The bigger the difference, the more chips the screen has to handle.
- If you have a low blade height but large screen holes, almost no wood chips will be chopped back into the screen. The bigger the difference, the less wood chips the screen will handle.

Basically, it is recommended that you only replace the screen with one that has a different hole size if you have a good reason to do so. If you can use the chip with a screen hole of, for example, 30 mm, then there is no need to reduce the hole size. If you can accept a larger maximum chip size than 30 mm, you can probably increase the hole size to increase capacity.

Screens are available in many sizes; from Ø15 mm and up. But the most common screen sizes are: Ø15, Ø23, Ø30 and 52x52 mm.

6.7.1 Blade height in relation to a given screen size (PC-3300-PEC and PC-3300-PIC only)

Experience shows that there are a number of combinations of blade height and size that fit together in terms of chip application and energy consumption.

The table below shows examples of some combinations that have worked well in our experience. Other combinations are also options as needed.

Blade height in mm	Screen holes	Examples of use
2 → 7	Ø15 mm	Animal bedding, raw material for pressing wood pellets
8 → 12	Ø23 mm	Fuel in stoker/pellet boilers, (garden chips)
13 → 16	Ø30 mm	Stoker/pellet burner fuel, garden chips
17 →	52x52 mm	Fuel in stoker/pellet boiler, garden chips

If you change the blade height, you may want to change the screen if the combination of blade height and screen hole size falls significantly outside the instructions in the table above. If in doubt, you can do a test run with the screen you have installed before changing it.

6.7.2 Changing the screen (PC-3300-PEC and PC-3300-PIC only)

The screen is typically changed for two reasons:
- Wear and tear: If the hole edges become too rounded, the efficiency of the screen is reduced.
- Hole size: If you want a different size of screen holes.

A complete screen consists of four long and two short screen segments (see Figure 23).

- **Screen segment 1** (long) is mounted with:
  3 pcs. M16x50x**2** grade 10.9, with countersunk heads and internal hexagon
  3 pcs. spring washers M16
  3 pcs. lock nuts for M16
  NB. The spring washer is mounted between the screen segment and nut.
  The bolts are mounted with the nut on the inside of the rotor housing.

- **Screen segments 2 + 3** (short) are each fitted with:
  2 pcs. M16x55x**1.5** grade 8.8
  4 pcs. spring washers for M16
  2 pcs. lock nuts, grade 8.8
  NB. The spring washer is mounted between the bolt head and side plate, and between the nut and
  screen segment.
  NB. The spring washer is mounted between the screen segment and nut.
  The bolts are mounted with the nut on the inside of the rotor housing.

- **Screen segments 4 + 5 + 6** (long) are each fitted with:
  3 pcs. M16x55x**1.5** grade 8.8
  6 pcs. spring washers for M16
  3 pcs. lock nuts grade 8.8
  NB. The spring washer is mounted between the bolt head and side plate, and between the nut and
  screen segment.
  The bolts are mounted with the nut on the outside of the rotor housing.

Two people are needed to install screen segments.
It's easiest to **start** with **screen segment 5**. Use a ratchet spanner with a long extension and a 24" socket so you can reach under the screen. Once all three bolts are loosely inserted (remember spring washers on both sides), tighten the bolts to the correct torque (see the diagram in Section 7.1). Then fit the remaining screen segments one by one.

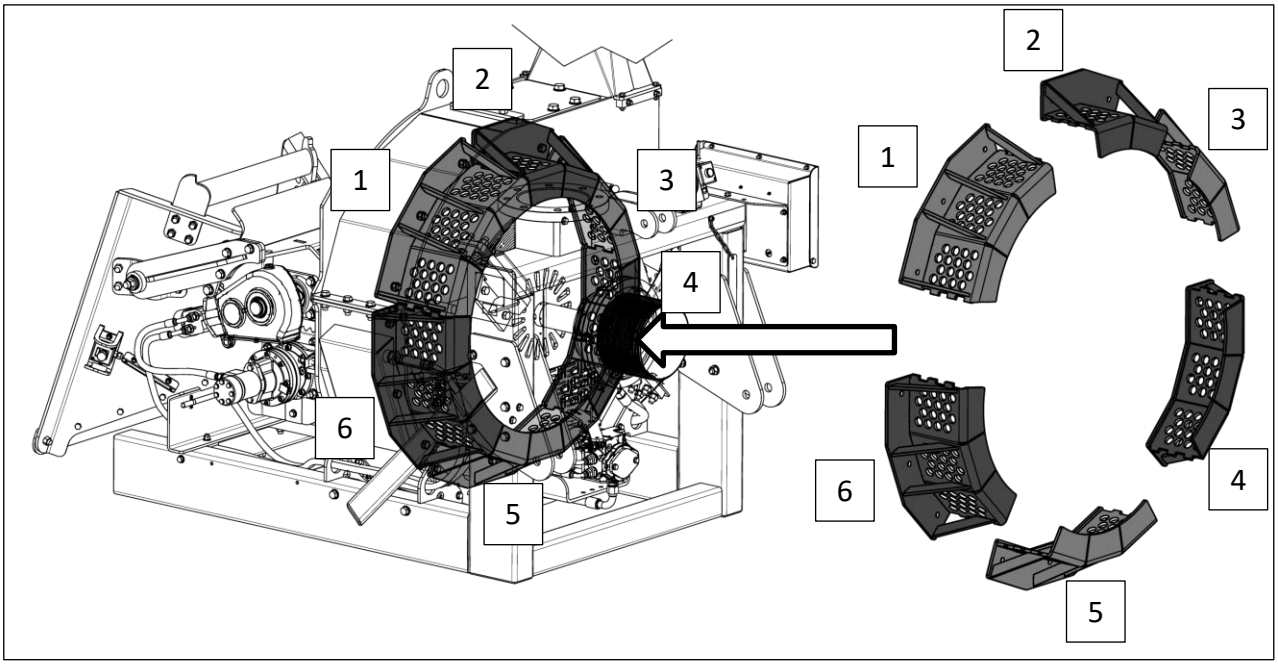


Figure 23 Location of screen segments (PC-3300-PEC and PC-3300-PIC only)

Once the screen is installed, close the rotor housing and gently turn the rotor one turn by hand to make sure nothing is sticking. Even if everything is satisfactory, it is recommended to start the machine carefully the first time.

6.8 General service

To ensure a long service life and reliability, it is important to regularly service the chipper.

It is important to understand that all instructions are indicative, as the need for service depends on how and how much the machine is used.

6.8.1 Service intervals

Main inspection: Annually (*).
Cleaning: As needed, but especially when the season ends.
Lubrication of main bearings: 1-2 times a year.
Lubrication of hinge arms: Once a for 8 hours of daily operation.
Lubrication of the rocker blade on the spout Once a for 8 hours of daily operation.
Hydraulic oil change (PC-3300-PIC and PC-3300-SIC only): When the oil becomes cloudy or every two years during normal operation.
Change the oil filter (PC-3300-PIC and PC-3300-SIC only): When changing the hydraulic oil.
Changing gear oil: For every 500 operating hours
Sharpening blades: As needed.
Check the screen (PC-3300-PIC and PC-3300-SIC only): At least every 50 operating hours.

(*) The main inspection includes:

- Checking the oil level in the hydraulic tank (PC-3300-PIC and PC-3300-SIC only).
- Checking the oil quality in the hydraulic tank (PC-3300-PIC and PC-3300-SIC only).
- Check hydraulic hoses; look for leaks and if the rubber has perished or damaged.

- Checking the gear oil in the two gearboxes for the top and bottom rollers.
- Checking the emergency stop; 2 on the feed hopper + 1 on the remote control.
- Check all remote control functions.
- Check the cables; they must be intact and not hanging loose.
- Check bolts and change and/or tighten them if necessary.
- Check the blades; look for cracks, etc.
- Check the screen; check for cracks (PC-3300-PEC and PC-3300-PIC only).
- Checking the rotor and its parts (e.g. ejector wings, etc.,) for cracks.

6.8.2 Lubrication points

To ensure a long operational life, bearings should be lubricated regularly.

If the machine is used 8 hours a day, the bearing manufacturer recommends lubricating the bearings once or twice a year with a lithium soap-based grease with a minimum viscosity of 68 mm^2s^{-1}.

For lubricating bearings and hinge arms, use a grease gun that fits the grease nipples at all lubrication points. The location of the bearings and grease nipples can be found in Figure 24.

Lubrication points:

Marking	Location	Quantity	Amount
A	Hinge arm	2	3 pump strokes
B	Main bearing (rotor)	2	3 pump strokes
C	Bearing for the top roller	2	1½ pump stroke
D	Bearing for bottom roller	1	1½ pump stroke
E	Rocker blade	2	3 pump strokes

IMPORTANT: The specified amount of grease must not be exceeded, as this will cause the bearings to overheat during start-up. Therefore, please note that the bearings should not be filled with grease. Also, be careful not to press too much grease into the bearings, as this can push the packing box out of the bearing.

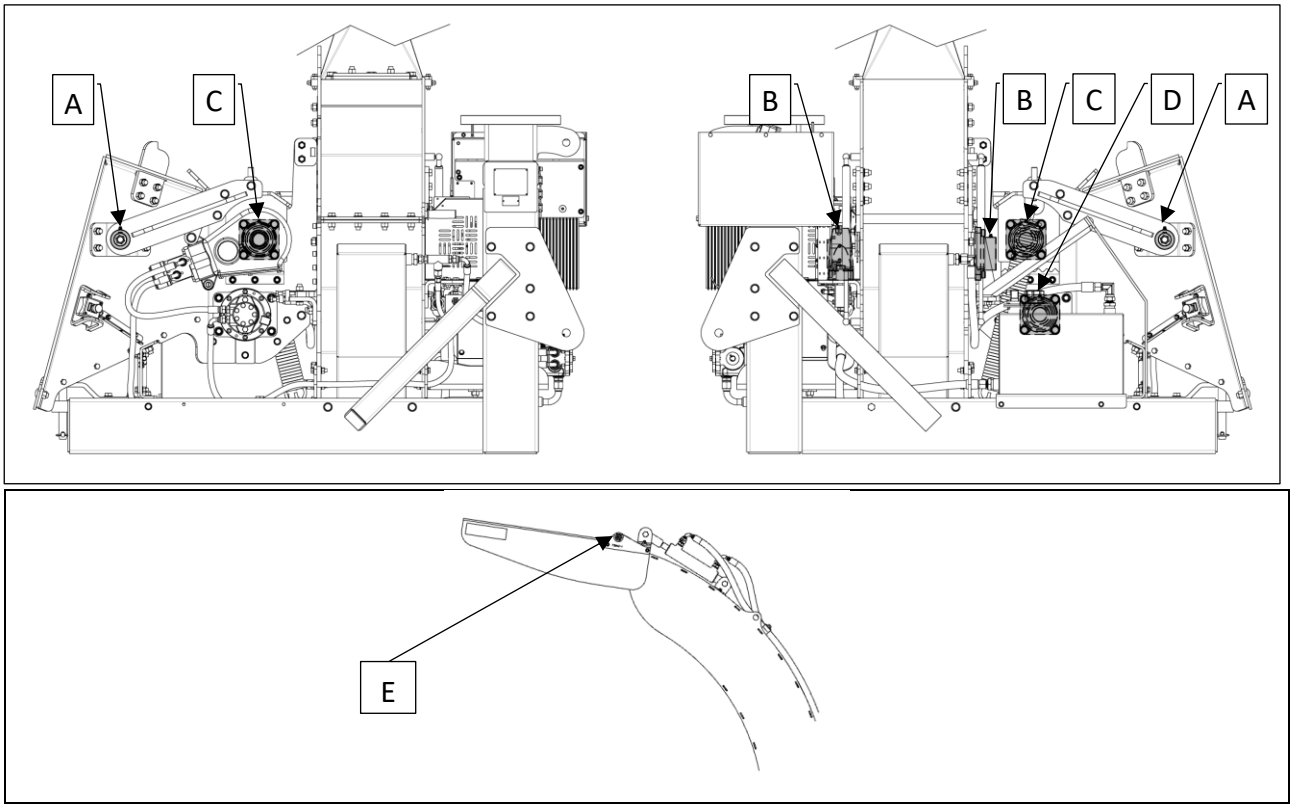


Figure 24The chipper's lubrication points

6.8.3 Changing the hydraulic oil (PC-3300-PIC and PC-3300-SIC only)

The hydraulic oil should be changed if the oil becomes cloudy or approximately every two years.

6.8.3.1 Draining the oil (PC-3300-PIC and PC-3300-SIC only)

There are two drain nozzles on the machine (see Figure 25):

1. At the bottom of the cooling coil
2. At the bottom of the hydraulic tank

There are screwable pipe plugs in the connectors. When refitting the plugs, they must be wrapped with PTFE packing tape.

You can also loosen several hoses to drain the oil from these as well.

When the oil is drained, it is collected and must be disposed of properly!

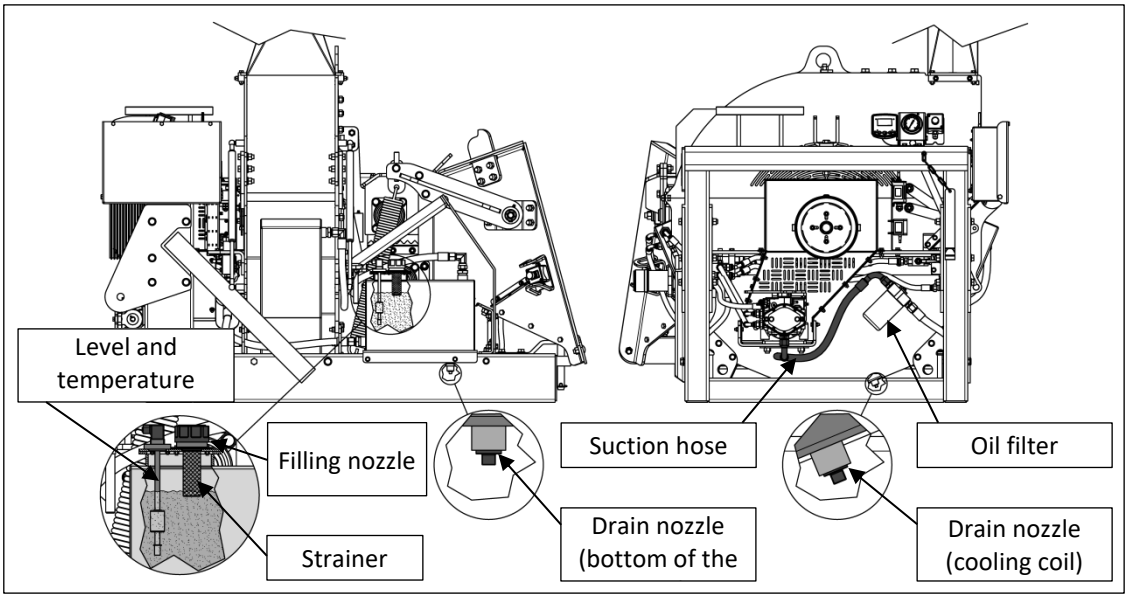


Figure 25 Hydraulics

6.8.3.2 Filling oil (PC-3300-PIC and PC-3300-SIC only)

Before filling the chipper with hydraulic oil, first make sure that all hoses are tightened and that the plugs for the two drain nozzles are packed and tightened.

The entire hydraulic system can hold approximately 70 litres of hydraulic oil.
Recommended hydraulic oil: HV32.

Only add oil to the system through the filler nozzle in the tank, so that all the oil runs through the strainer located under the lid (see Figure 25). *However, the suction hose between the filter and pump **must** also be filled with oil. Do not run the pump without an oil supply, as this will cause it to break down!*

When the chipper is started, the pump draws oil from the tank into the system. Therefore, the oil level in the tank will drop and the oil must be topped up a few times until the level is stable. Until this happens, the level gauge can switch off the hydraulic system several times if the oil level in the tank drops too much. After topping up with more oil, simply start the feeder again on the remote control.

When the system is filled with oil, the oil should be so high in the tank that it can just be seen at the bottom of the strainer located under the filler nozzle lid.

6.8.4 Changing the oil filter (PC-3300-PIC and PC-3300-SIC only)

It is recommended that the oil filter (see Figure 25) is changed at least every oil change.

When changing the filter, place a tray underneath to collect the oil. Be aware that oil may leak out of the hoses when the filter is changed, and it is a good idea to change the filter while the oil is drained from the system.

Filter elements are available from the chipper manufacturer/supplier.

6.8.5 Changing gear oil

There are two gears on the chipper: One for the upper infeed roller and one for the lower feed roller.

In normal operation, the gear oil should be changed approximately every two years.

Recommended gear oil: SAE: 10W30
Oil quantity:
- Top gear: approx. 3 litres
- Lower gear: approx. 0.5 litres

6.8.6 Changing hydraulic hoses

If a hydraulic hose has been damaged, e.g. if a hose has burst, it must be replaced.

When purchasing and installing a new hose, it is important that it meets the following specifications:

Hose standard	: EN857 2SC
Type:	: 60° BSP
Pressure stage (min)	: 275 bar
Temperature range	: -40 to 100°C
Hose dimensions used	: ¼", ½", ¾".

Additionally, pressurised hoses must be placed in a "sock" to prevent oil splashing if the hose springs a leak.

Tighten the hydraulic hoses according to the supplier's instructions.

6.8.7 NordLock washers

NordLock washers are special washers designed for use in places where extra safety is needed to prevent bolts and nuts from rattling loose, for example, when fitting the blades on the rotor.

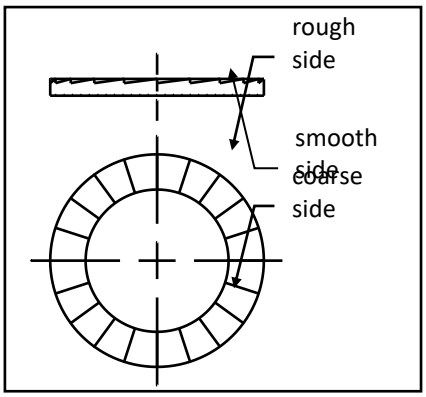


Figure 26 NordLock washer

NordLock washers are always fitted in pairs, with the rough surfaces (see Figure 26) facing each other to work properly (see example Figure 27). If the bolt has a hexagonal or cylindrical head, NordLock washers must also be fitted between the head and the item being tightened.

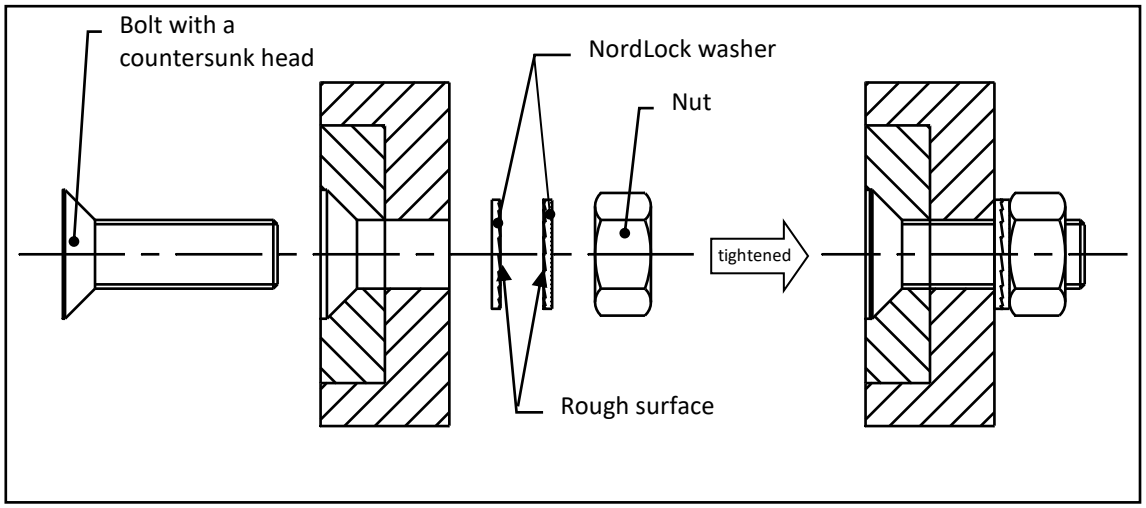


Figure 27Example of using NordLock washers

When tightening the bolt or nut, make sure the NordLock washers are centred over each other to ensure they work properly.

Note: If the NordLock washers are tightened against a bolt or nut up to grade 8.8, the washers can be reused up to 5 times. If the grade of the bolt or nut is 10.9 or higher, the washers must be changed every time the bolt or nut is removed!

The bolt grade is on the bolt head or on the nut.

7 Troubleshooting

7.1 The rollers won't turn round

Possible causes:

- **Rollers not activated on remote control**
  → Activate the remote control and flip up the roller start switch on the remote control.
- **Rollers blocked**
  → Try reversing the roller and see if the blockage is released.
  → Stop the chipper, switch off the tractor and check where something is stuck and fix it.
- **Emergency stop activated.**
  → Check if one or more emergency stops are activated.
- **Rotor speed too slow.** The rollers will only start turning when the rotor speed exceeds the selected operating speed (e.g. 900 rpm)
  → Adjust the rotor speed with the tractor's hand throttle.
  → If necessary, adjust the speed monitor to match the number of revolutions you want to run at.
- **Rotor speed too fast.** If the rotor speed exceeds 1,100 rpm, the rollers will stop. This is a safety measure against overloading.
  → Reduce the rotor speed to below 1,100 rpm.
- **Problem with the hydraulic supply.**
  → Check that the hydraulic supply is activated and that there is power to the speed monitor and remote control.
  If there are still problems, contact the supplier or manufacturer.
- **Hydraulic supply from the tractor is not switched on (PC-3300-PEC and PC-3300-SEC only)**
  → Activate the hydraulics from the tractor.
- **Hydraulic flow not turned up**
  → PC-3300-PIC and PC-3300-SIC: Adjust the flow rate on the handle of the hydrostat (hydraulic pump). See Section 3.6.1.
  → PC-3300-PEC and PC-3300-SEC: Adjust the flow rate on the valve. See Section 3.6.2.
- **Level gauge activated (PC-3300-PIC and PC-3300-SIC only)**
  This error can be detected by the blue light in the control panel (see Figure 3) being lit.
  This error occurs if the oil level in the tank is too low (or if the oil temperature is too high - see the point below)
  → Top up the oil in the tank. See Section 5.8.3.2.
- **Temperature gauge activated (PC-3300-PIC and PC-3300-SIC only)**
  This error can be detected by the blue light in the control panel (see Figure 3) being lit.
  This error occurs if the oil temperature in the tank is too high (or if the oil level in the tank is too low - see the point above)
  → Investigate the reason for the oil temperature being too high and correct it if necessary
  →
  Allow the machine to cool down before continuing with the machine.
- Hydrostat (hydraulic pump - PC-3300-PIC and PC-3300-SIC only) defective
  → Contact supplier/manufacturer for a solution.

7.2 There is no light in the speed monitor's display

Read Appendix 1 for setting the speed monitor.
Possible causes:

- **Supply error**
  → Check if the supply cable is plugged into the socket in the tractor and that there is voltage on the tractor.
  → Check fuses in the tractor.
  → Check if the connector on the cable connecting the display unit to the junction box is correctly assembled.
  → Check the supply cable. If necessary, open the lid of the grey junction box for the speed monitor and check for loose connections.
  → Check the fuse located inside the connector on the supply cable for the control unit that is plugged into the tractor.
- **Device error**
  → Speed monitor defective. Contact the supplier/manufacturer for a solution.

7.3 The speed monitor does not work as intended

Read Appendix 1 for setting the speed monitor.

- **The display on the speed monitor does not show the current number of revolutions**
  When the machine is running, the LED at the end of the magnetic sensor should flash. During operation, a magnetic bolt will pass the sensor and it will flash. Each flash corresponds to one revolution
  → Check if the wires in the junction box are loose →
  Check if the distance between the sensor and bolt is correct (there should be 2-3 mm distance when the
  two parts are next to each other) →
  Defective sensor. Contact the supplier/manufacturer for a solution.
- **Display reads "ΣEρ"**
  A service is required!
  → Reset the time for a service when a service has been performed:
  1. Press the large centre button on the speed monitor until the arrow at the bottom of the display points to the service icon (fork spanner icon).
  2. Press the reset button for five seconds and the time for service is reset.

7.4 Remote control does not work

See Section 9 for the key diagram.
Remember: Before the remote control can be used, contact must be made with the chipper by holding down the grey 'Fn' button for a few seconds.

- **The remote control will not make contact with the chipper**
  → The remote control may be out of range. Move closer and try again
  → The remote control may have run out of power. Charge the remote control with its charger.
  → No power on the controller. Check if the power cable to the controller is plugged in correctly.
- **When a button on the remote control is pressed, there is no reaction on the chipper**
  When the remote control is first activated, a green light should flash slowly. If the light does not flash, the problem is probably related to the remote control.
  → **The tractor cannot deliver enough current** (Amps). Even if you can measure sufficient voltage (Volts), a poor ground connection on the tractor, for example, will limit the available current. The problem is typically a misaligned or otherwise poor ground connection on the tractor.
  → **Problem with the control unit**. Contact the manufacturer or dealer.

8 Additional information

8.1 Tightening torques

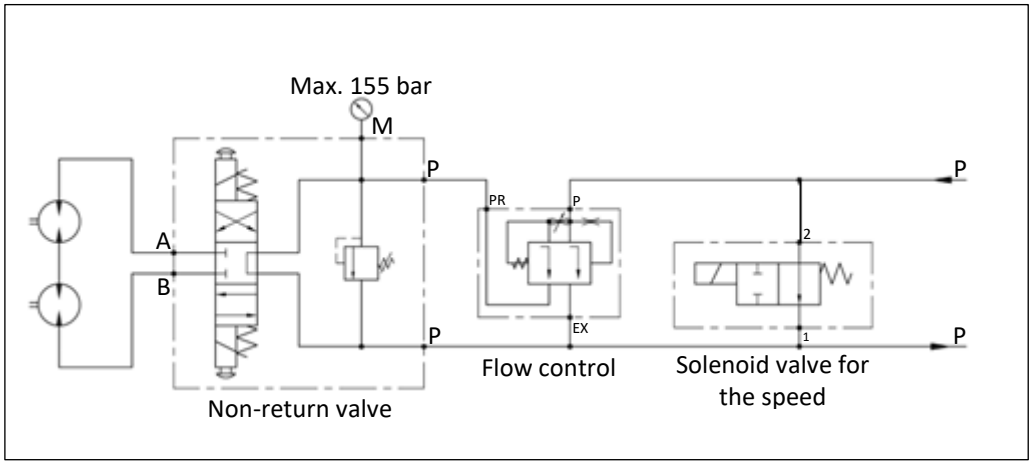
When tightening the bolts on the chipper, do so with torque. If the bolts are not tightened enough, they will not hold together sufficiently. If they are too tight, you risk fatigue and fractures.

	Tightening torque (Nm)	
	Quality / Strength class	
Thread size	**8.8**	**10.9**
M8	20	25
M10	39	49
M12	70	87
M16	180	220
M20	350	440

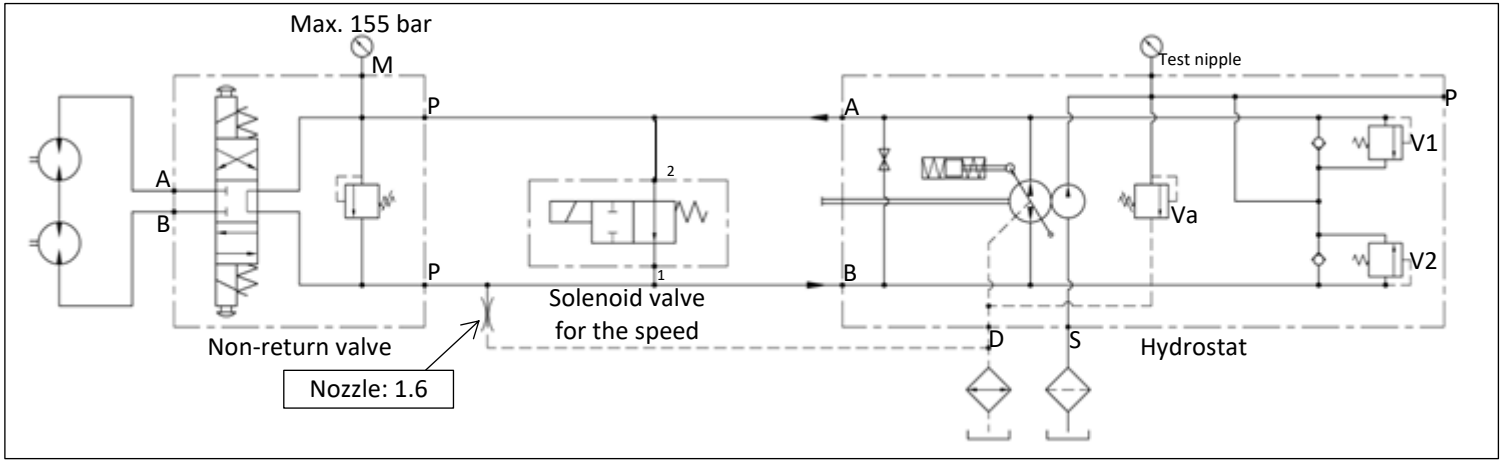
The bolt grade is on the bolt head.

9 Hydraulic diagrams

9.1 Hydraulic diagram PC-3300-PEC and PC-3300-SEC

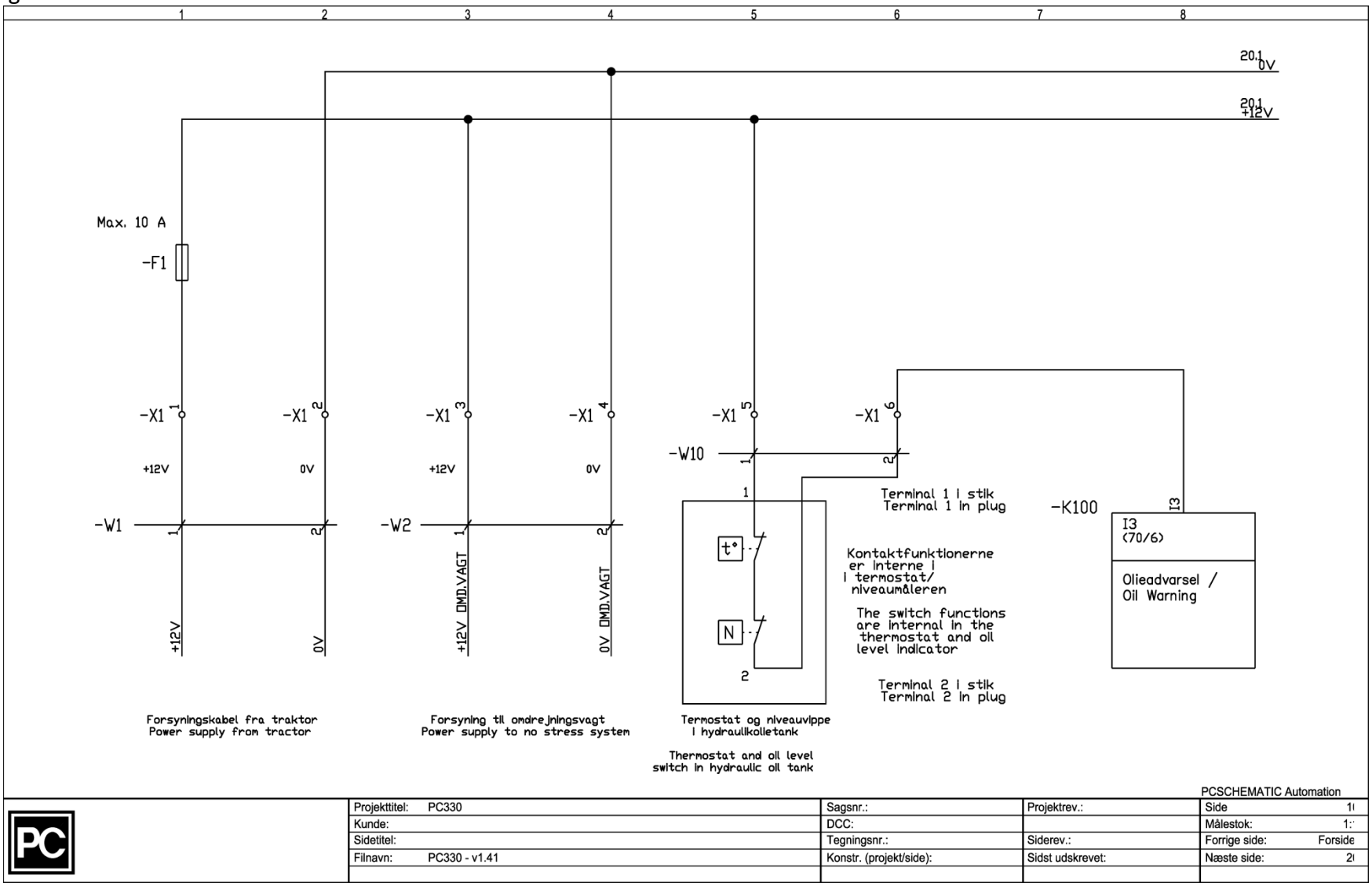


9.2 Hydraulic diagram PC-3300-PIC and PC-3300-SIC

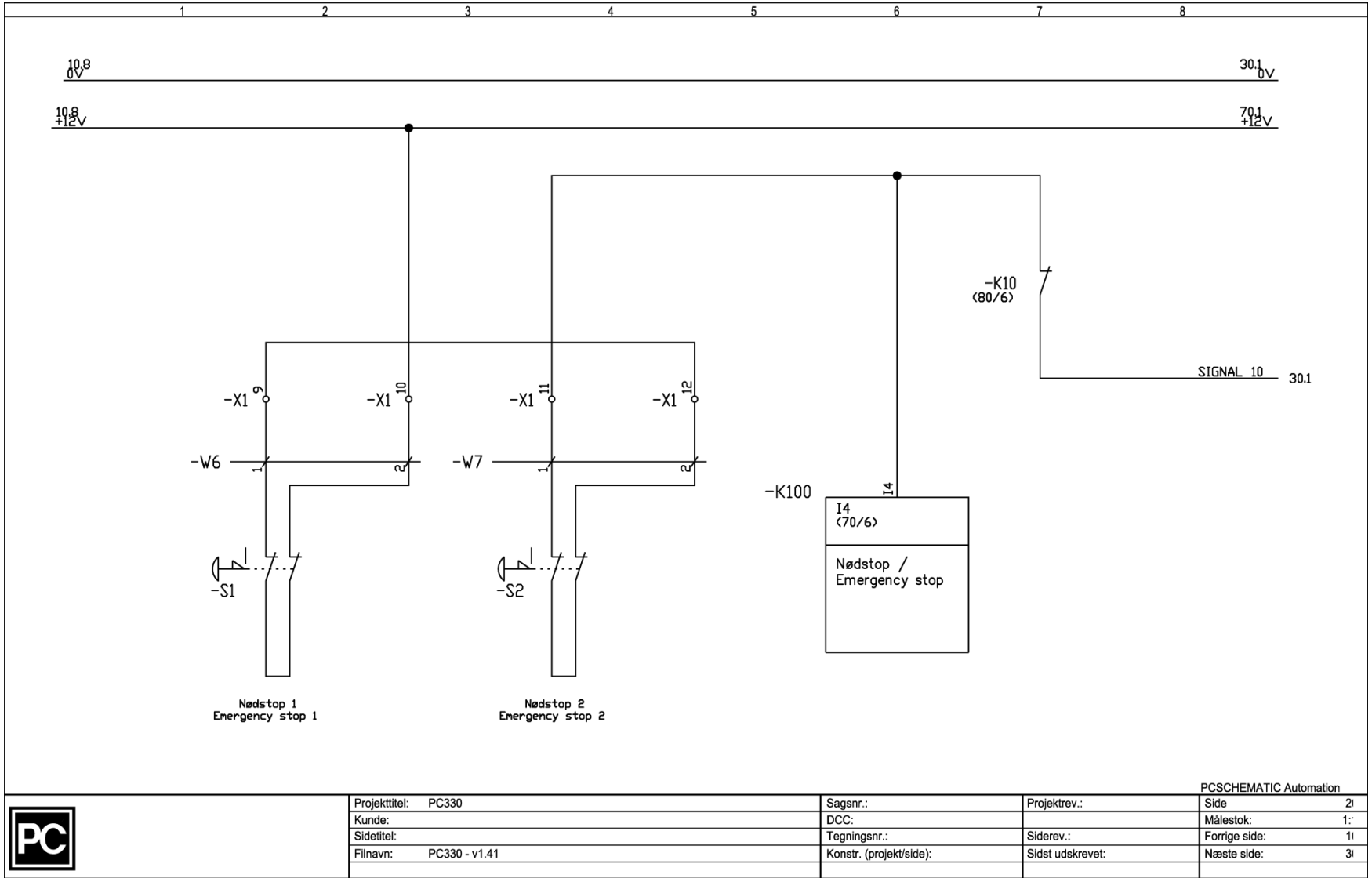


10 Key diagram PC-3300-PIC and PC-3300-SIC

Page 1 of 12



Page 2 of 12


1
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3
4
5
6
7
8
10.8
0V
30.1
0V
10.8
+12V
70.1
+12V
-K10
(80/6)
SIGNAL 10
30.1
-X1
9
-X1
10
-X1
11
-X1
12
-W6
1
2
-W7
1
2
-K100
I4
I4
(70/6)
Nødstop /
Emergency stop
-S1
-S2
Nødstop 1
Emergency stop 1
Nødstop 2
Emergency stop 2
PCSCHEMATIC Automation
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Sagsnr.:
Projektrev.:
Side 2
Kunde:
DCC:
Målestok: 1:
Sidetitel:
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Filnavn: PC330 - v1.41
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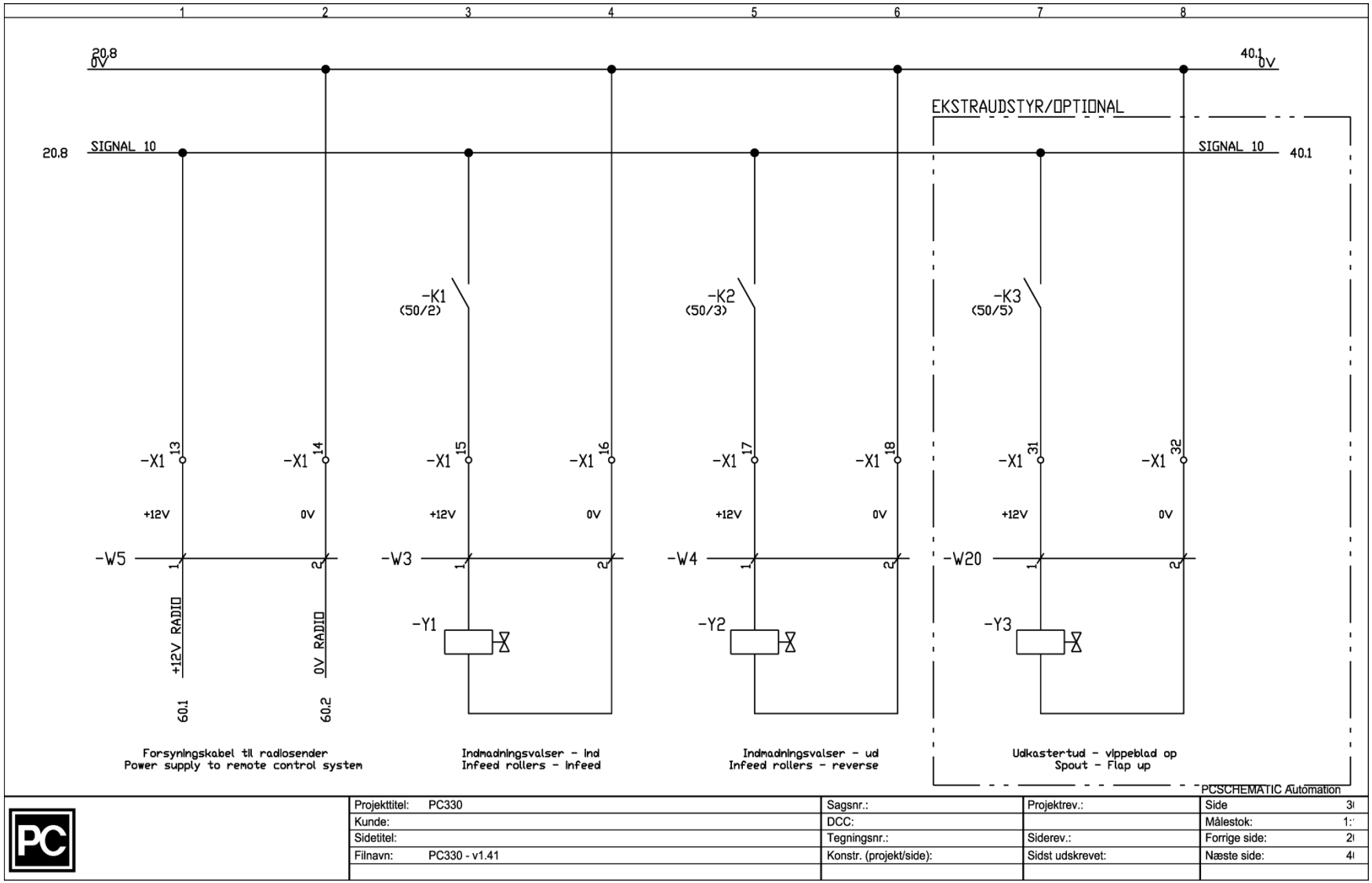
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0V
40.1
0V
EKSTRAUDSTYR/OPTIONAL
20.8
SIGNAL 10
SIGNAL 10
40.1
-K1
(50/2)
-K2
(50/3)
-K3
(50/5)
-X1 13
-X1 14
-X1 15
-X1 16
-X1 17
-X1 18
-X1 31
-X1 32
+12V
0V
+12V
0V
+12V
0V
+12V
0V
-W5
-W3
-W4
-W20
+12V RADIO
0V RADIO
-Y1
-Y2
-Y3
60.1
60.2
Forsyningskabel til radiosender
Power supply to remote control system
Indmadningsvalser - ind
Infeed rollers - infeed
Indmadningsvalser - ud
Infeed rollers - reverse
Udkastertud - vippeblad op
Spout - flap up
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
Konstr. (projekt/side):
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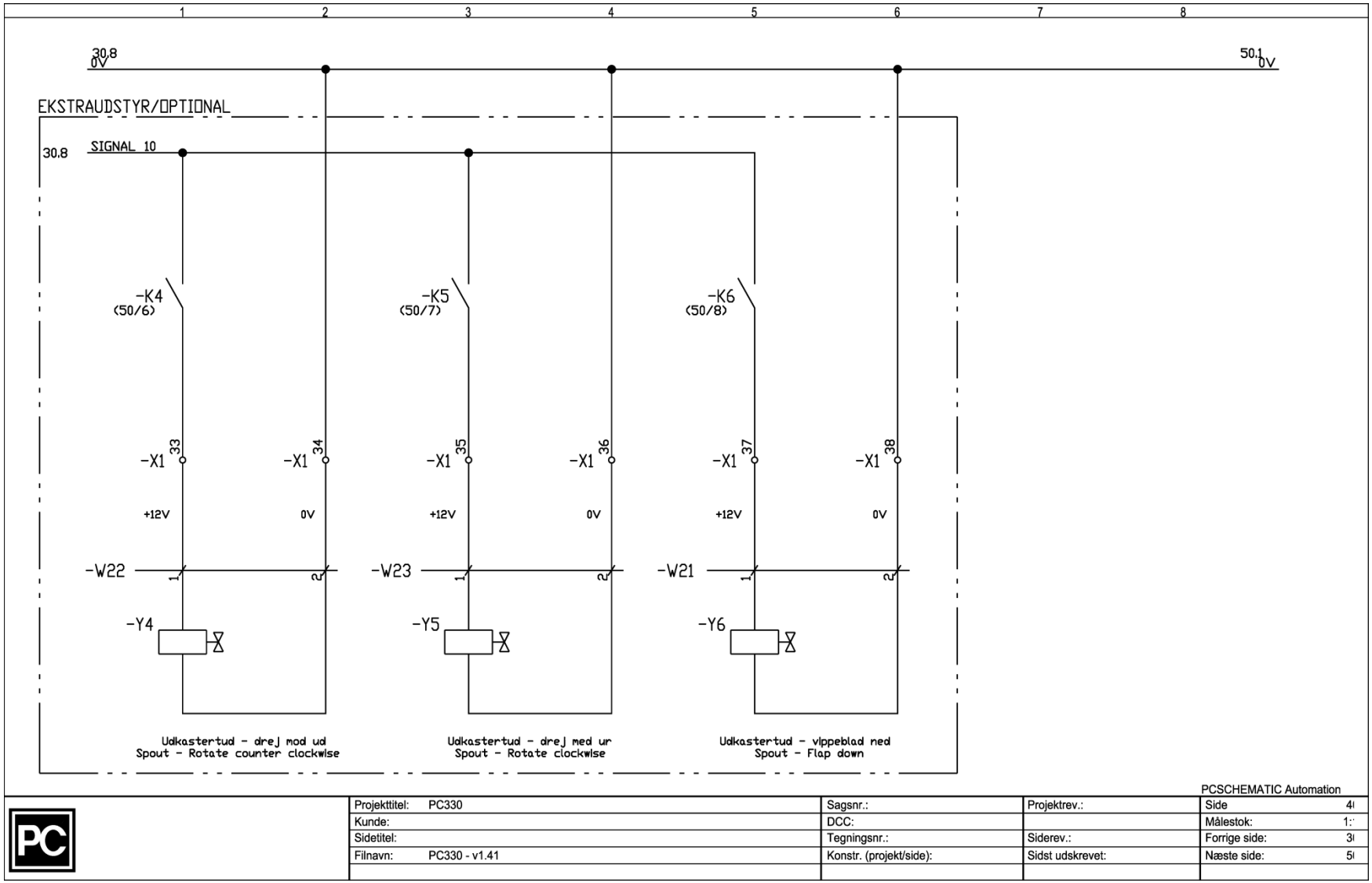
Siderev.:
Sidst udskrevet:
Side 3
Målestok: 1:
Forrige side: 2
Næste side: 4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30.8
0V
50.1
0V
EKSTRAUDSTYR/OPTIONAL
30.8
SIGNAL 10
-K4
(50/6)
-K5
(50/7)
-K6
(50/8)
-X1 33
-X1 34
-X1 35
-X1 36
-X1 37
-X1 38
+12V
0V
+12V
0V
+12V
0V
-W22
-W23
-W21
-Y4
-Y5
-Y6
Udkastertud - drej mod ud
Spout - Rotate counter clockwise
Udkastertud - drej med ur
Spout - Rotate clockwise
Udkastertud - vippeblad ned
Spout - Flap down
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
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Målestok: 1:
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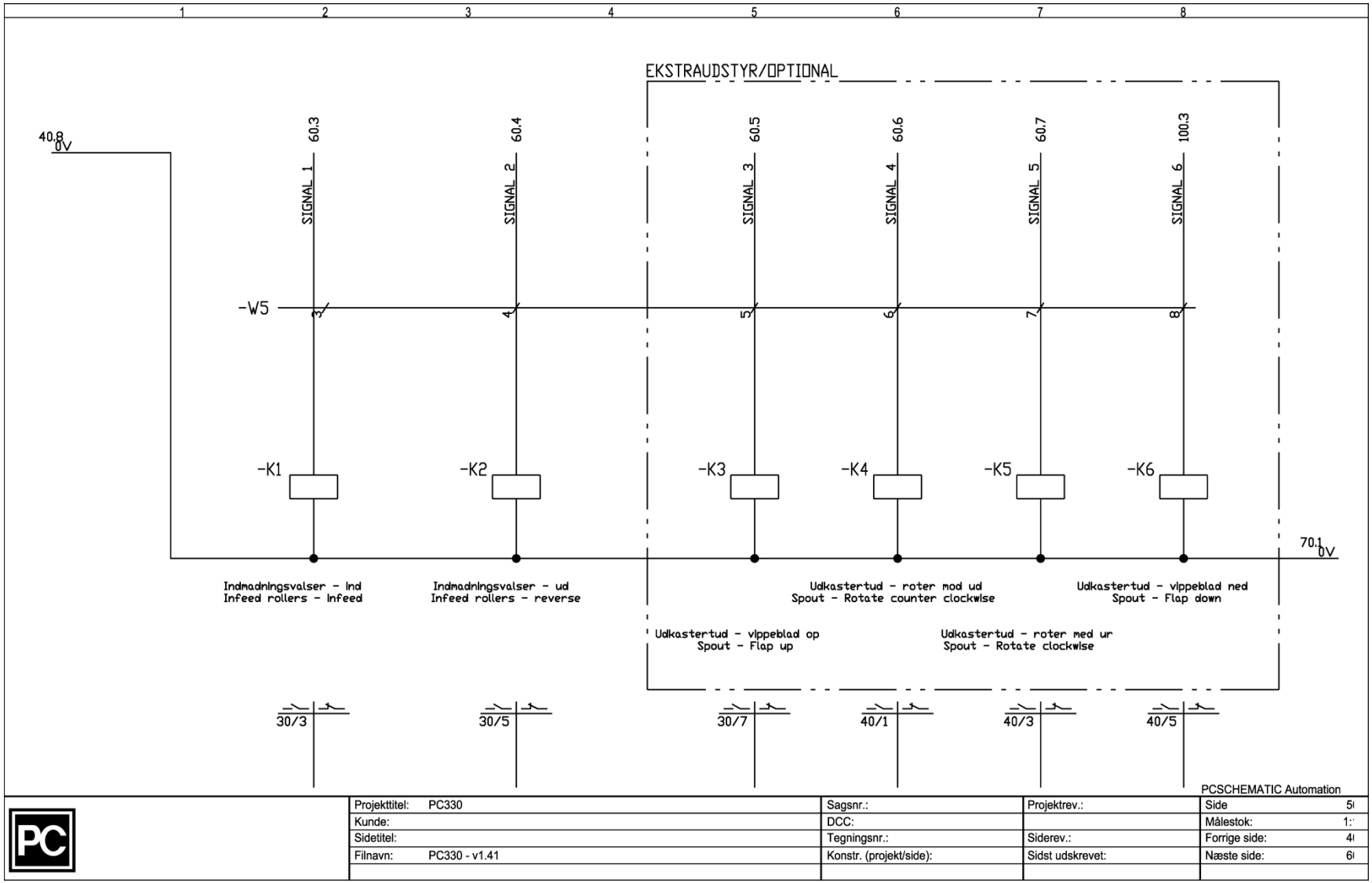
Næste side: 5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60.4
60.5
60.6
60.7
100.3
SIGNAL 1
SIGNAL 2
SIGNAL 3
SIGNAL 4
SIGNAL 5
SIGNAL 6
-W5
3
4
5
6
7
8
-K1
-K2
-K3
-K4
-K5
-K6
70.1
0V
Indmadningsvalser - ind
Infeed rollers - infeed
Indmadningsvalser - ud
Infeed rollers - reverse
Udkastertud - roter mod ud
Spout - Rotate counter clockwise
Udkastertud - vippeblad ned
Spout - Flap down
Udkastertud - vippeblad op
Spout - Flap up
Udkastertud - roter med ur
Spout - Rotate clockwise
30/3
30/5
30/7
40/1
40/3
40/5
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
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DCC:
Tegningsnr.:
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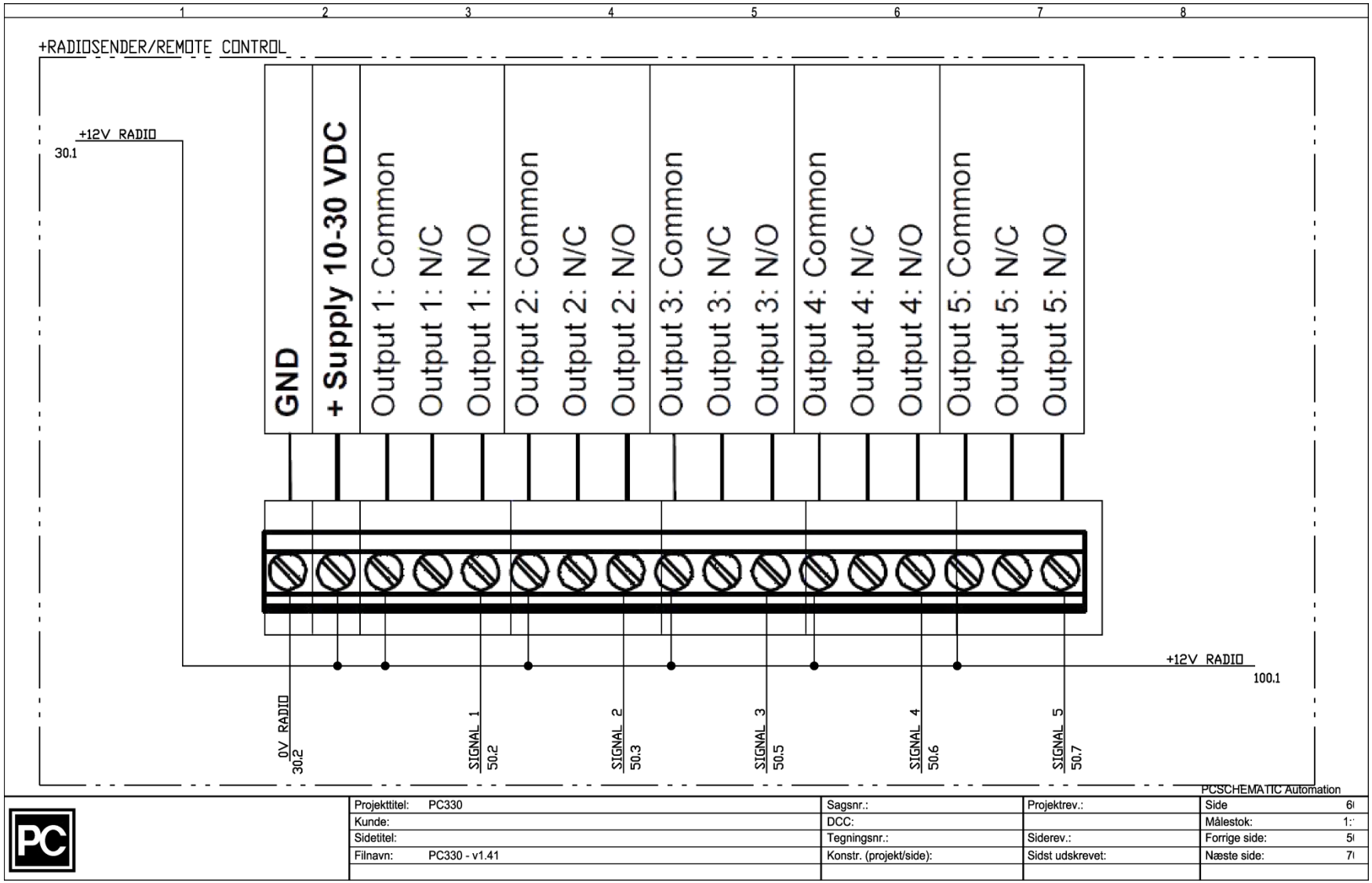
Målestok: 1:
Forrige side: 4
Næste side: 6


+RADIOSENDER/REMOTE CONTROL
+12V RADIO
30.1
GND
+ Supply 10-30 VDC
Output 1: Common
Output 1: N/C
Output 1: N/O
Output 2: Common
Output 2: N/C
Output 2: N/O
Output 3: Common
Output 3: N/C
Output 3: N/O
Output 4: Common
Output 4: N/C
Output 4: N/O
Output 5: Common
Output 5: N/C
Output 5: N/O
+12V RADIO
100.1
0V RADIO
30.2
SIGNAL 1
50.2
SIGNAL 2
50.3
SIGNAL 3
50.5
SIGNAL 4
50.6
SIGNAL 5
50.7
PCSCHEMATIC Automation
Projekttitel: PC330
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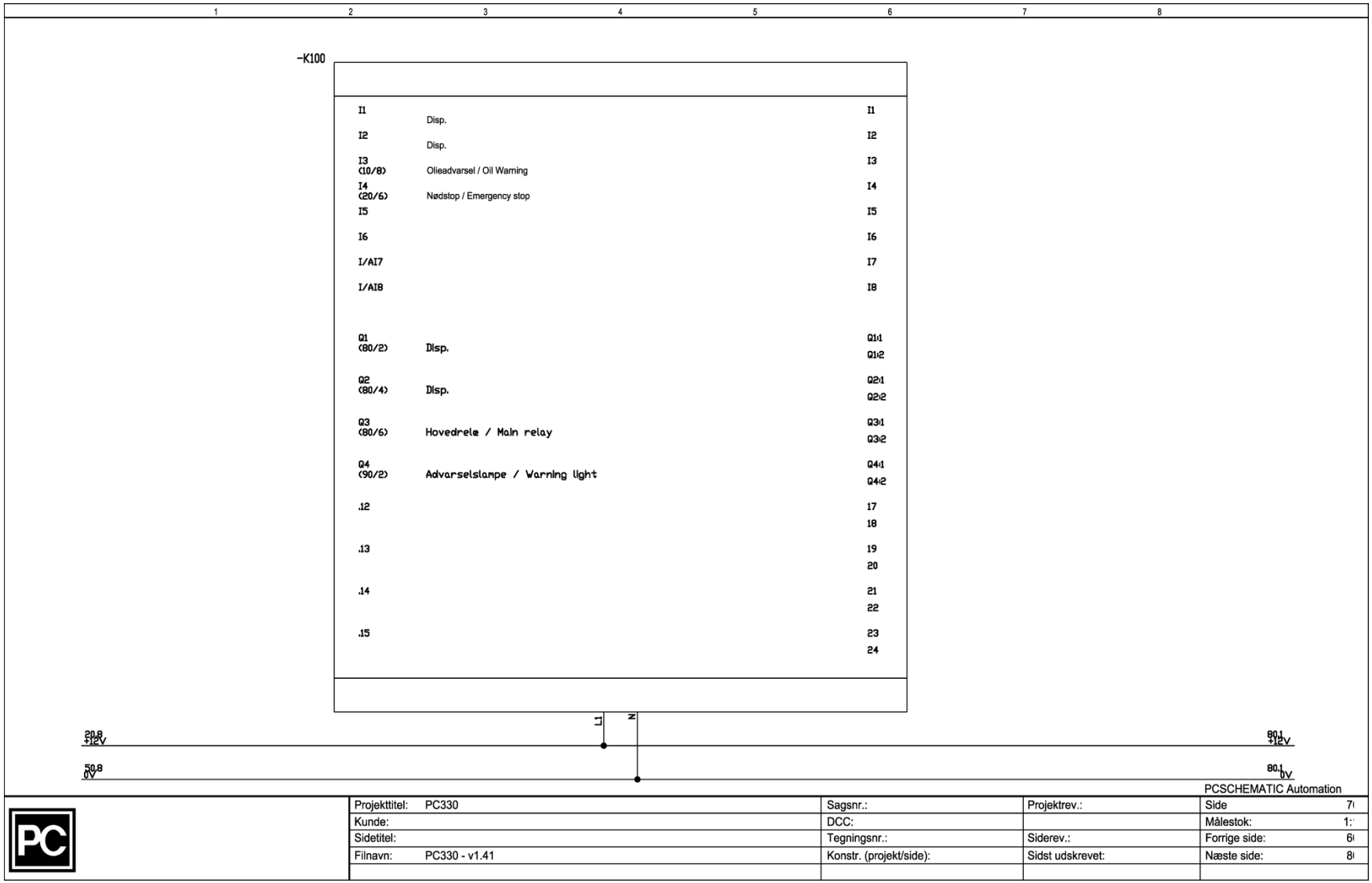
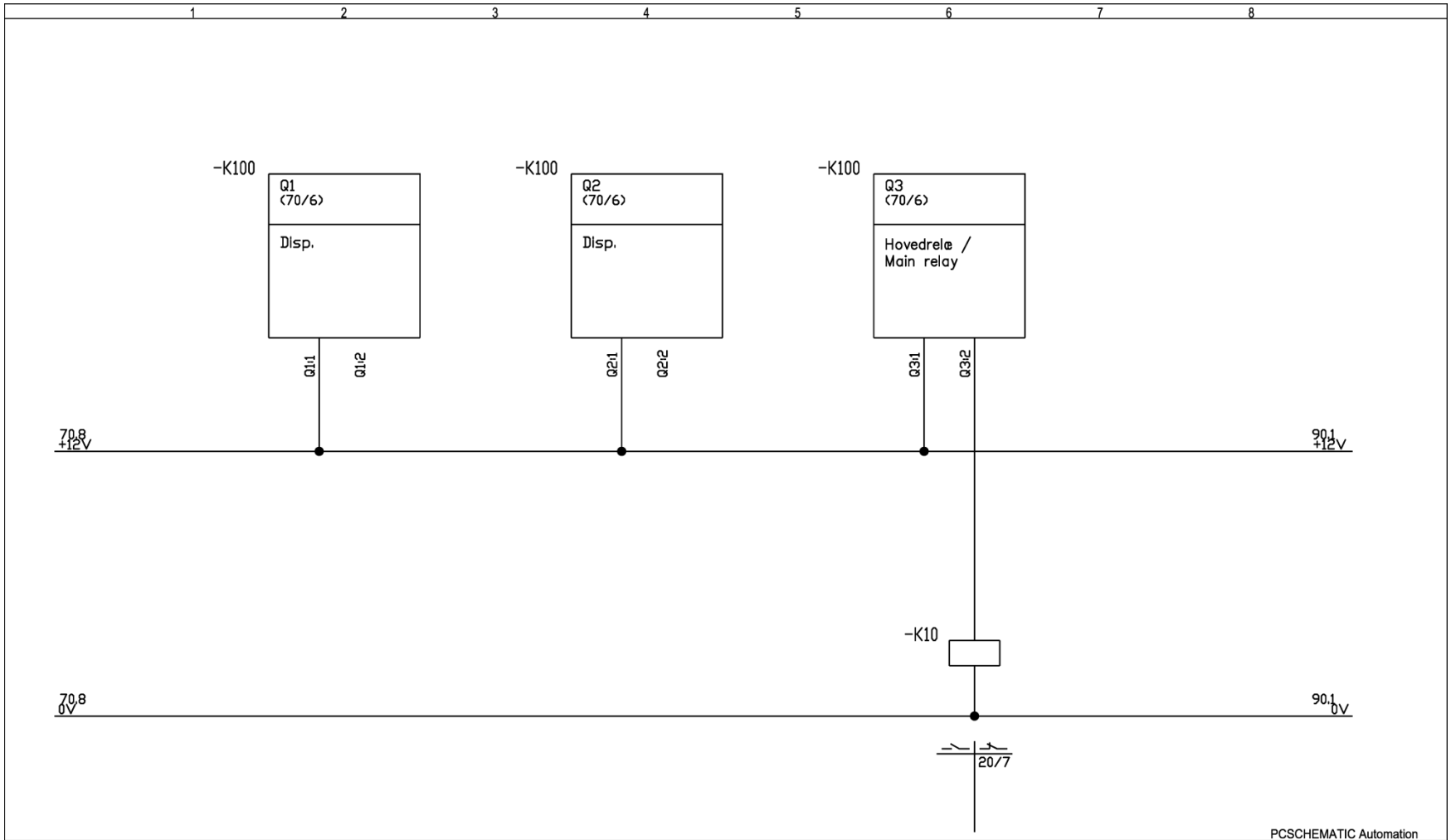
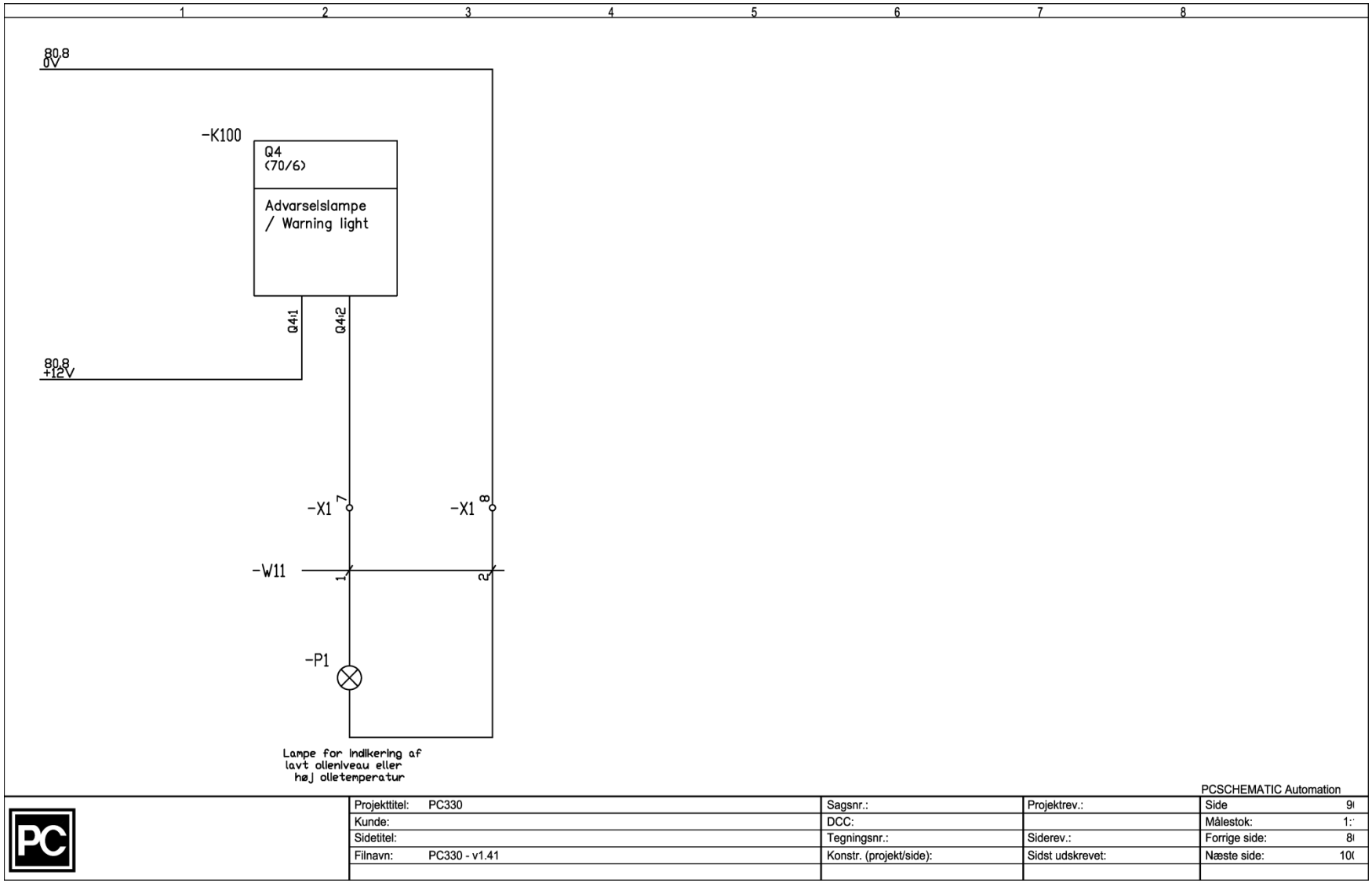
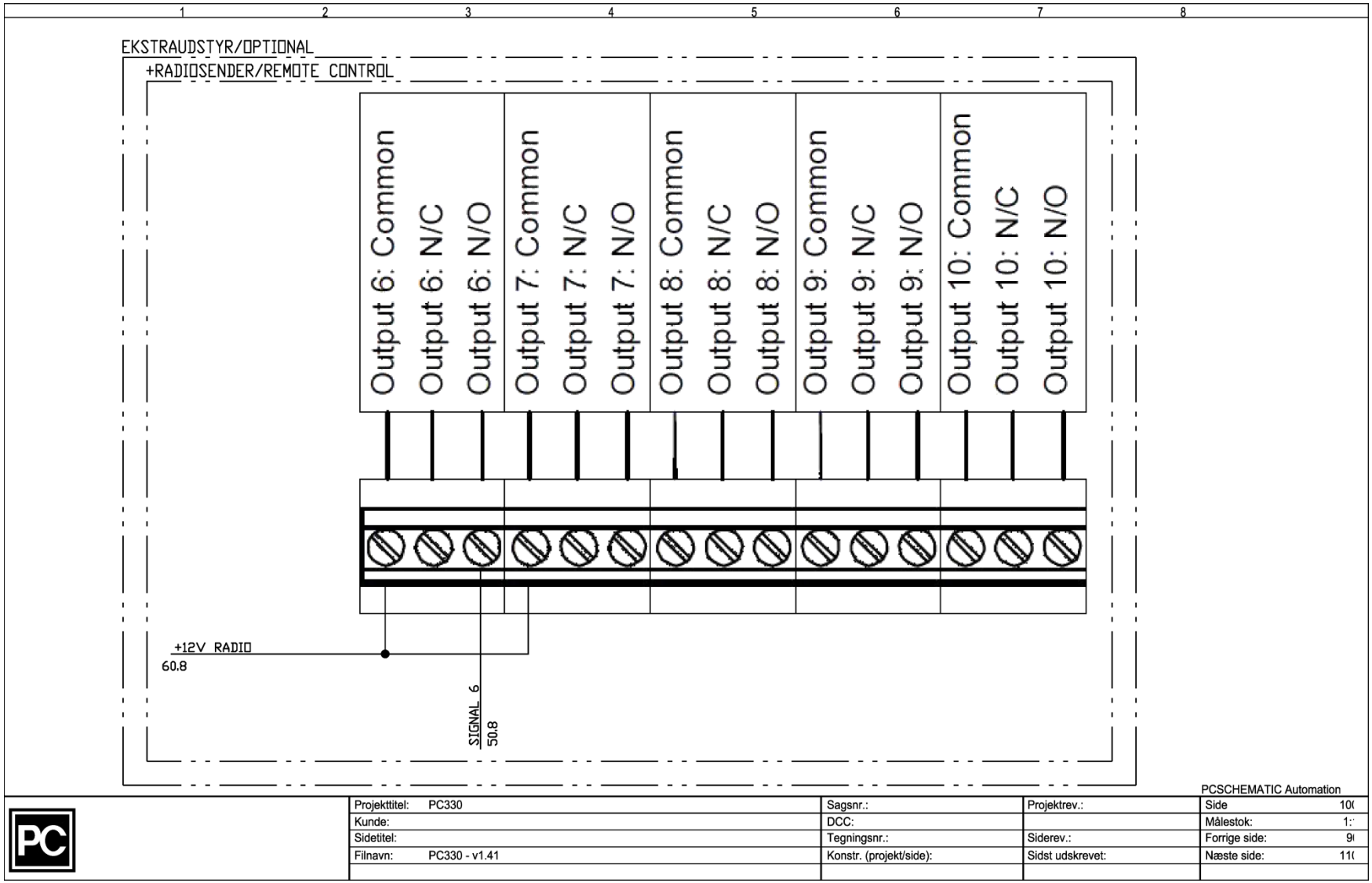
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
Konstr. (projekt/side):
Projektrev.:
Siderev.:
Sidst udskrevet:
Side 6
Målestok: 1:
Forrige side: 5
Næste side: 7


1
2
3
4
5
6
7
8
-K100
I1
Disp.
I2
Disp.
I3
(10/8)
Olieadvarsel / Oil Warning
I4
(20/6)
Nødstop / Emergency stop
I5
I6
I/AI7
I/AI8
Q1
(80/2)
Disp.
Q2
(80/4)
Disp.
Q3
(80/6)
Hovedrele / Main relay
Q4
(90/2)
Advarselslampe / Warning light
.12
.13
.14
.15
I1
I2
I3
I4
I5
I6
I7
I8
Q1:1
Q1:2
Q2:1
Q2:2
Q3:1
Q3:2
Q4:1
Q4:2
17
18
19
20
21
22
23
24
L1
N
20.8
+12V
50.8
0V
80.1
+12V
80.1
0V
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
Konstr. (projekt/side):
Projektrev.:
Siderev.:
Sidst udskrevet:
Side 7
Målestok: 1:
Forrige side: 6
Næste side: 8


1
2
3
4
5
6
7
8
-K100
Q1
(70/6)
Disp.
-K100
Q2
(70/6)
Disp.
-K100
Q3
(70/6)
Hovedrelæ /
Main relay
Q1:1
Q1:2
Q2:1
Q2:2
Q3:1
Q3:2
70.8
+12V
90.1
+12V
-K10
70.8
0V
90.1
0V
20/7
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
Konstr. (projekt/side):
Projektrev.:
Siderev.:
Sidst udskrevet:
Side 8
Målestok: 1:
Forrige side: 7
Næste side: 9


1
2
3
4
5
6
7
8
80.8
0V
-K100
Q4
(70/6)
Advarselslampe
/ Warning light
Q4:1
Q4:2
80.8
+12V
-X1
7
-X1
8
-W11
1
2
-P1
Lampe for indikering af
lavt olieniveau eller
høj olietemperatur
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
Konstr. (projekt/side):
Projektrev.:
Siderev.:
Sidst udskrevet:
Side 9
Målestok: 1:
Forrige side: 8
Næste side: 10


1
2
3
4
5
6
7
8
EKSTRAUDSTYR/OPTIONAL
+RADIOSENDER/REMOTE CONTROL
Output 6: Common
Output 6: N/C
Output 6: N/O
Output 7: Common
Output 7: N/C
Output 7: N/O
Output 8: Common
Output 8: N/C
Output 8: N/O
Output 9: Common
Output 9: N/C
Output 9: N/O
Output 10: Common
Output 10: N/C
Output 10: N/O
+12V RADIO
60.8
SIGNAL 6
50.8
PCSCHEMATIC Automation
Projekttitel: PC330
Kunde:
Sidetitel:
Filnavn: PC330 - v1.41
Sagsnr.:
DCC:
Tegningsnr.:
Konstr. (projekt/side):
Projektrev.:
Siderev.:
Sidst udskrevet:
Side 10(
Målestok: 1:
Forrige side: 9(
Næste side: 11(

Pos.	Fra			Kabel			Til			Type
1	-X1	1	10/1	-W1	1		-K7	1	10/8	3G1,5 - Forsyning fra traktor
2	-X1	2	10/2		2		-X1	4	10/4	---
3										
4	-X1	3	10/3	-W2	1					3G0,75 - Forsyning til omdrejningsvagt
5	-X1	4	10/4		2					---
6										
7	-X1	15	30/3	-W3	1		-Y1	1	30/3	3G0,75 - Indmadningsvalser ind
8	-X1	16	30/4		2		-Y1	2	30/3	---
9										
10	-X1	17	30/5	-W4	1		-Y2	1	30/5	3G0,75 - Indmadningsvalser ud
11	-X1	18	30/6		2		-Y2	2	30/5	---
12										
13	-X1	13	30/1	-W5	1					12G0,75 - Kabel til radiosender
14	-X1	14	30/2		2					---
15					3					
16					4		-K2	A1	50/3	
17					5	EKSTRAUDSTYR	-K3	A1	50/5	
18					6	EKSTRAUDSTYR	-K4	A1	50/6	
19					7	EKSTRAUDSTYR	-K5	A1	50/7	
20					8	EKSTRAUDSTYR	-K6	A1	50/8	
21										
22	-X1	9	20/2	-W6	1		-S1	1	20/2	3G0,75 - Nødstop 1
23	-X1	10	20/3		2		-S1	3	20/2	---
24										
25	-X1	11	20/4	-W7	1		-S2	1	20/4	3G0,75 - Nødstop 2
26	-X1	12	20/5		2		-S2	3	20/4	---
27										
28										

PCSCHEMATIC Automation

Projekttitel:	PC330	Sagsnr.:	Projektrev.:	Side	11(
Kunde:		DCC:		Målestok:	1:
Sidetitel:	Kabelliste	Tegningsnr.:	Siderev.:	Forrige side:	10(
Filnavn:	PC330 - v1.41	Konstr. (projekt/side):	Sidst udskrevet:	Næste side:	12(

Pos.		Fra				Kabel			Til			Type
29		-X1	5	10/5		-W10	1			1	10/5	3G0,75 - Termostat og niveauvippe
30		-X1	6	10/6			2			2	10/5	---
31												
32		-X1	7	90/2		-W11	1		-P1	1	90/2	3G0,75 - Oliefejllampe
33		-X1	8	90/3			2		-P1	2	90/2	---
34												
35	EKSTRAUDSTYR	-X1	31	30/7	EKSTRAUDSTYR	-W20	1	EKSTRAUDSTYR	-Y3	1	30/7	3G0,75 - Udkastertud - vippeblad op
36	EKSTRAUDSTYR	-X1	32	30/8	---		2	EKSTRAUDSTYR	-Y3	2	30/7	---
37												
38	EKSTRAUDSTYR	-X1	37	40/5	---	-W21	1	EKSTRAUDSTYR	-Y6	1	40/5	3G0,75 - Udkastertud - vippeblad ned
39	EKSTRAUDSTYR	-X1	38	40/6	---		2	EKSTRAUDSTYR	-Y6	2	40/5	---
40												
41	EKSTRAUDSTYR	-X1	33	40/1	---	-W22	1	EKSTRAUDSTYR	-Y4	1	40/1	3G0,75 - Udkastertud - drej mod ur
42	EKSTRAUDSTYR	-X1	34	40/2	---		2	EKSTRAUDSTYR	-Y4	2	40/1	---
43												
44	EKSTRAUDSTYR	-X1	35	40/3	---	-W23	1	EKSTRAUDSTYR	-Y5	1	40/3	3G0,75 - Udkastertud - drej med ur
45	EKSTRAUDSTYR	-X1	36	40/4	---		2	EKSTRAUDSTYR	-Y5	2	40/3	---
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												

PCSCHEMATIC Automation

Projekttitel:	PC330	Sagsnr.:	Projektrev.:	Side	12(
Kunde:		DCC:		Målestok:	1:
Sidetitel:	Kabelliste	Tegningsnr.:	Siderev.:	Forrige side:	11(
Filnavn:	PC330 - v1.41	Konstr. (projekt/side):	Sidst udskrevet:	Næste side:	

Appendix 1 - Speed monitor manual

Manual for the

Speed monitor (no-stress system)

Rev 1

11 Speed monitor (no-stress system)

The speed monitor constantly measures the rotor rotation speed, and if it falls below a predetermined number, it's a sign that the tractor is running out of power and can no longer keep up. Therefore, the speed monitor stops the feed rollers to give the tractor time to get the rotor back up to speed, after which the feed rollers start again. It all happens automatically.

11.1 The speed monitor's default setting

On delivery, the speed monitor is set to **start** the feed rollers when the rotor speed exceeds 950 rpm, and stop the feed rollers when the rotor speed falls below 750 rpm.

Of course, this does not apply if it has been agreed that the speed monitor will be delivered with a different setting.

11.2 Overall operation

The Fransgård PC-Chipper allows for rotation monitoring of the rotor and infeed rollers, as well as alarm signalling when both low and high limit values are exceeded.

If used according to the guidelines in this manual, the monitor will be a useful and reliable tool for many years to come.

11.2.1 Different features and displays

The following features are included in the computer:


Programmable tachometer (revolutions per minute). Used with a rotor speed sensor.


Programmable tachometer with a visual alarm (revolutions per minute). Use with a roller speed sensor.


Working hours (hours/minutes)


Total working hours (hours/minutes)

Type Selecting the machine type

The features are further elaborated on in the following Chapter 2.

11.2.2 Overview of the monitor

Marker
Display marker (vertical or horizontal) on the left side of the display indicates which function is currently shown in the display.

Display

Controlbuttons
Switch between display views. Initiate changes to the marked value.
Programming in new numerical values and resetting.

Display views
Shows the possible features (values) that can be shown in the display.

Plug
Input for included sensors and possible outputs.

11.2.3 Explanation of the control buttons

 -Buttons

Press the  button to switch between the different displays (indicated in the pane to the left of the end of the display) and thus between the different features of the monitor. Each time the button is pressed, the position of the cursor/display changes by one step. The cursor starts in the top left corner and then moves "downwards".

The button is also used to exit the change menu (see the next section).

 -Buttons

The  button is used for programming (changing/deleting) values in the computer, e.g. entering alarm values for high and low revs.

Use the  button to navigate to the feature/display that you want to change or program. Then press and hold the  button for approx. 1 second until the number flashes. Press  to change or delete the first digit of the value to be programmed. Pressing the  button moves the cursor to the next digit in the value and so on until all digits have been changed/programmed. Finally,

press the ↓↓ button to exit the programming menu and save the programmed value in the memory.

C 0-9 -Buttons

Use the C 0-9 button to change or delete the values that are to be programmed (and which were first made to flash using the SET button).

Also see the examples below.

11.3 Review of features

11.3.1 Specification of features and limit values

Symbol:	Description:	Limit value:
	Speed monitor rotor	1 - 9999 rpm. (in practice, not below 12 rpm)
	Speed monitor rollers with visual alarm (not available)	1 - 9999 rpm. (in practice, not below 12 rpm)
	Working hours	0:0 - 99:59 hours:minutes 9999 full hours
+	Total working hours	0:0 - 99:59 hours:minutes 9999 full hours
Type	Selecting the machine type	1 – 18

The computer has an internal memory that saves all values when power is interrupted.

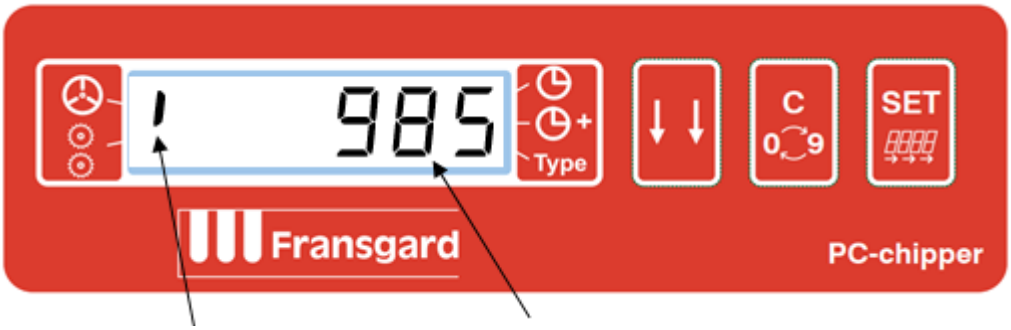
11.3.2 Speed monitor for the rotor and infeed rollers[1] (rpm)

The alarm features of the tachometers are programmable, i.e. it is possible to enter/change the alarm limit values. Both upper and lower limit values are included. Alarms are only given on the infeed rollers. If the rotation speed of the infeed rollers exceeds the entered upper limit value, the display flashes alternately between '0' and '9999'.

11.3.3 Display of the current rotation speed

In this display view, the top vertical cursor (the rotor) is highlighted, as shown in the following figure.

[1] Rpm of the infeed rollers is not available



Display marker at the rotor

Display of current rpm for the rotor

11.3.4 Programming access

To gain access to change values, you need to know a password.

Display feature that requires a password.

Blade RPM
RPM roller
Machine type

11.3.5 Password

1221

11.3.6 Programming alarm limit values

The tachometer is programmable. This makes it possible to instruct the computer to switch off the valve of the infeed rollers if the rotation speed falls below the entered lower limit value 'L' or exceeds the entered upper limit value 'h'.

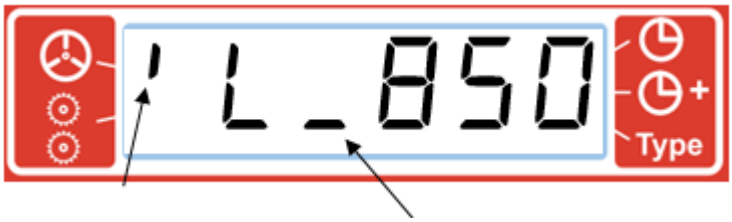
11.3.7 Programming of limit values and low/high rotation speed.

Example of programming limit values on the rotor. Change low value to 850 rpm and high value to 1000 rpm.

Example of changing the low limit value to 850 Rpm and the high limit value to 1000 Rpm		
Press the button:	**The display shows:**	**Explanation:**
↓↓	0	Find the speed monitor for the rotor by repeatedly pressing the button

	c 0 0 0 0	Enter the password as follows:
SET	c x _ _ _	Hold the button for 1 second until "c" lights up on the left and the first digit (out of 4) flashes.
C	c x _ _	Press the button until the digit has the correct value.
SET		Press to set/change the next digit (the second digit will now flash)
↓↓	c xxxx	Press the "arrow" button to continue.
		When the password is entered correctly, the following will appear:
C	L x _ _ _	Press the button until the digit has the correct value. Note that zero (0) cannot be written in this location.
SET	L x _ _	Press to set/change the next digit (the second digit will now flash)
C	L 800	Press the button until the desired digit is correct.
SET	L 800	Press to set/change the next digit (the third digit will now flash)
C	L 850	Press the button until the desired digit is correct.
SET	L 850	Press to set/change the last digit.
C	L 850	Press the button until the desired digit is correct.
↓↓	h x000	Press the "arrow" key and "h" (high) will light up on the left and the first digit (out of four) will flash.
C	h 1000	Press the button until the desired digit is correct.
SET	h 1000	Tap to set/change the next digit (the second digit will now flash).
C	h 1000	Press the button until the desired digit is correct.
SET	h 1000	Press to set/change the next digit (the third digit will now flash).
C	h 1000	Press the button until the desired digit is correct.
SET	h 1000	Press to set/change the last digit.
C	h 1000	Press the button until the desired digit is correct.
↓↓		Exit the programming menu. Or if the Pulse factor and max/High needs to be changed see Section 2.2.4

Below is an illustration of the change menus for the low and high limit value.



Display marker at the rotor

Change low alarm limit 'L' to 850 o/min. på rotoren

Change engagement value 'h' to 1000 rpm.

If the alarm limit values on the rotor are exceeded, the current rotation speed continues to be displayed while the infeed rollers stop. If the rotor has been below the lower limit value, the infeed rollers will start up again when the rotor speed is above the entered upper limit value 'h' (e.g. 1000 rpm).

11.3.8 Programming values for the Pulse factor and max/High 'H' rotation speed.

Example of programming the number of pulses per revolution - factor 'F' - on the rotor (the same principle applies to the infeed rollers) to a value of 3, and the max/high value 'H' on the rotor to a value of 1100 rpm.

Press the button:	The display shows:	Explanation:
	h 1000	Continue after entering h XXXX
SET	c 0 0 0 0	Hold the button for 1 second until the digit "c" flashes. Enter the password as follows:
C	c x _ _ _	Press the button until the digit has the correct value.
SET	c x _ _	Press to set/change the next digit (the second digit will now flash)
SET	c x _ _	Press to set/change the next digit (the second digit will now flash)
		Enter your password
↓↓	c xxxx	Press the "arrow" button to continue.

SET	F x.00	The display shows "F" flashing.
C 0 9	F x0.00	Press the button until the digit has the correct value. Note that zero (0) cannot be written in this location.
SET	F x.00	Press to set the next digit
C 0 9	F 3.00	Press the button until the desired digit is correct.
SET	F 3.00	Press to set the next digit.
C 0 9	F 3.00	Press the button until the desired digit is correct.
SET	F 3.00	Press to set the last digit.
C 0 9	F 3.00	Press the button until the desired digit is correct.
↓↓	H x000	Press the "arrow" key and the digit 'H' will flash.
C 0 9	H 1000	Press the button until the desired digit is correct.
SET	H 1000	Press to set the next digit.
C 0 9	H 1100	Press the button until the desired digit is correct.
SET	H 1100	Press to set the next digit.
C 0 9	H 1100	Press the button until the desired digit is correct.
SET	H 1100	Press to set the last digit.
C 0 9	H 1100	Press the button until the desired digit is correct.
↓↓	0	Exit the programming.

Note: max/High value 'H' can only be set for the rotor.

11.4 Work path on the machine

11.4.1 Displaying the rotation time on the machine

In this display, the top horizontal cursor on the right-hand side is activated. The total rotation time will be shown as illustrated in the following figure.

Operating time in hours and

Displaymarker at working hours

Above 99:59 hours/minutes, only full hours are displayed

11.4.2 Reset the rotation time on the machine

Resetting the rotation time (operating time) of the machine can be done at any time. First press the ↓↓ button until the working time display appears. The following entries are then made:

Press the button:	The display shows:	Explanation:
↓↓	72:57 (example)	Find job hours by repeatedly pressing the button.
SET	72:57	Press and hold the button for 5 seconds until the number flashes.
↓↓	00:00	Press the button to reset the rotation time.

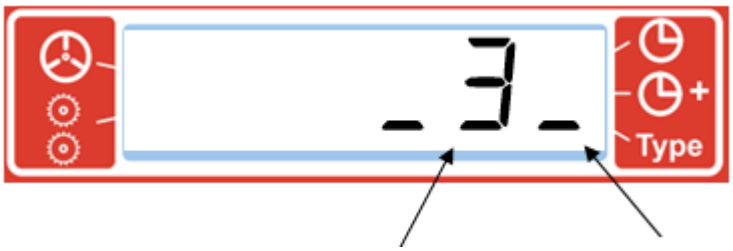
Note: The total hour counter (centre horizontal marker on the right side) cannot be reset. It is used to record the total working time of the machine.

11.5 Programming machine type presets.

Example of changing machine type 3 to machine type 12.

Press the button:	The display shows:	Explanation:
↓↓	_3	Find the machine type by repeatedly pressing the button.
SET	c 0 0 0 0	Hold the button for 1 second until the digit "c" flashes. Enter the password as follows:
C 0 9	c x _ _ _	Press the button until the digit has the correct value.
SET	c x _ _	Press to set/change the next digit (the second digit will now flash)
↓↓	c xxxx	Press the "arrow" button to continue.
SET	x3	Hold the button for 1 second until the line flashes.
C 0 9	13	Press the button until the digit has the correct value. Note that zero (0) cannot be written in this location.
SET	13	
		Press to set the next digit
C 0 9	12	Press the button until the desired digit is correct
↓↓	12	Exit the programming.

Note: When selecting an obsolete machine type, machine type 0 is automatically selected!



Machine type selection display 1 - 18

Display marker for machine type.

11.5.1 Setup table for included machine types.

Model	L Stop value Rotor	h Switch-on value Rotor	H Upper stop value Rotor	Pulses/rpm rotor	Pulses/rmp... roller	Roller flashes. Alarm for roller rpm too high	Machine setup
1	750	910	1100	1	6	31	1
2	800	910	1100	1	6	31	2
3	670	910	1100	1	6	31	3
4	400	500	600	1	6	28	4

11.6 Mounting

11.6.1 Mounting the computer

A plastic rail is supplied with the computer that fits the cut-out at the back of the computer housing. The rail also attaches to rubber mounts on the machine so that the computer avoids the worst shocks and at the same time sits comfortably for the user.

Connect the sensors to the junction box as indicated in the installation diagram (see the later section). The cables are installed in such a way that they are protected against mechanical damage and that they are not exposed to tension (breakage) when the machine is rotating or the hydraulics are operated.

11.6.2 Fitting sensors for rotation measurement

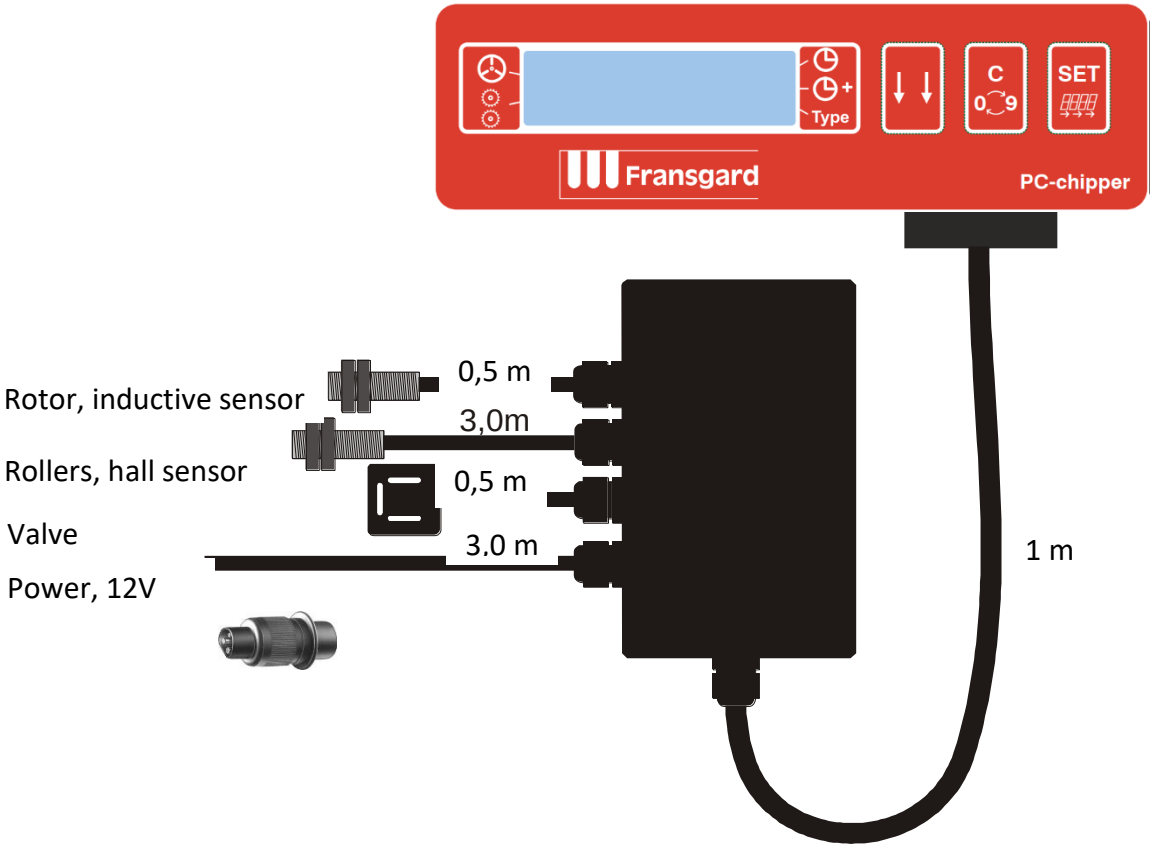
The inductive sensor is positioned so that the rotor's sidepieces/spokes pass the switch's terminal surface at a distance of 2 - 6 mm when rotating.

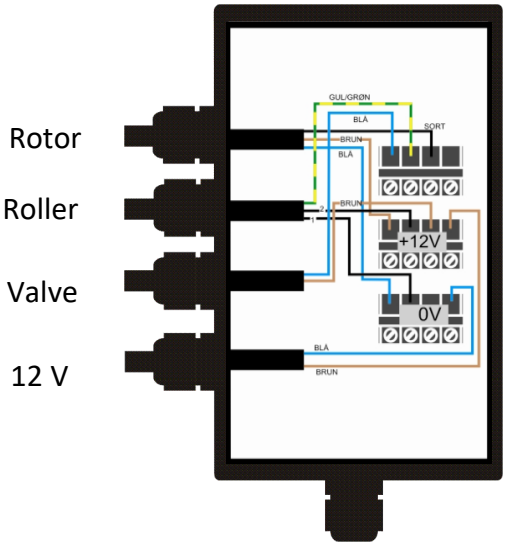
The magnetic ring with six magnets is mounted on the axle at the infeed rollers. The Hall sensor is positioned so that the magnets in the magnetic ring rotate past the switch's terminal surface at a distance of 2-3 mm:

As the electronic sensors (Hall/inductive) use power, the "+V" for these sensors should preferably be connected across the ignition key so that it does not drain the battery of power when the machine is stopped.

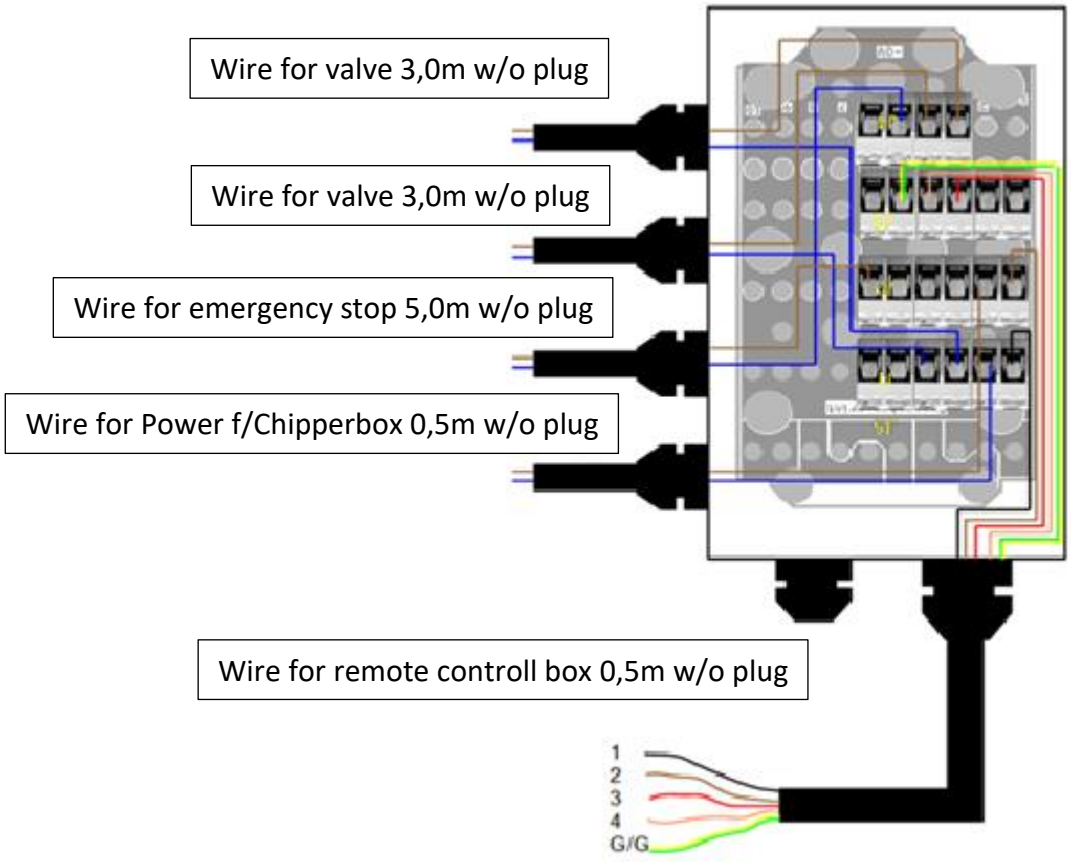
11.6.3 Mechanical setup and mounting diagram

Installation diagram when using electronic sensors (Hall or inductive sensors):





11.6.4 Remote conbox (PEC/PIC models only)



11.7 4. Technical data

Display:	6 digits
Power supply:	12 V
Temperature influences:	The chipper Monitor is fully operational within -10 - 70c^0
Pulse signals from the sensor:	Max. 225 pulses/sec.

11.8 Note

The controller/monitor is designed for use in connection with the described feature. Any other use of the controller/monitor may involve significant risk and relieves the controller supplier of any liability.

Please note that Lykketronic A/S is only responsible for the electronic controller/monitor and not for the overall function of the machine, including the safety aspects.

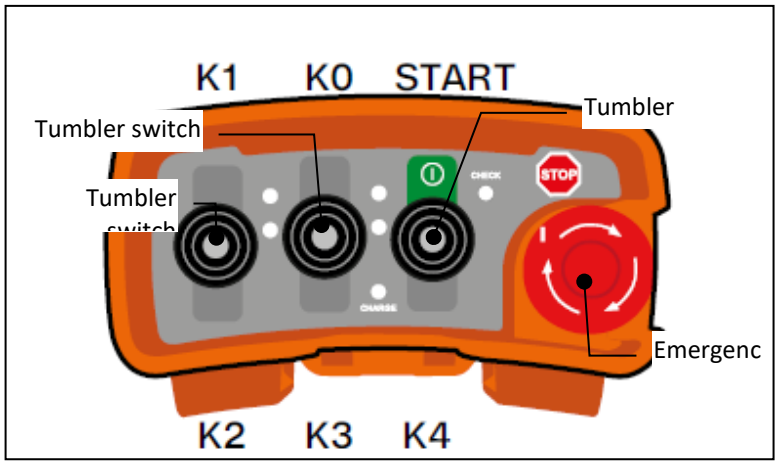
11.9 Important regarding the use of the speed monitor

Note that the feed rollers only start turning when the rotor is running at the **minimum** *operating speed* when the chipper is started.

This means that when the machine is started, you can only start feeding wood into the machine once you have the rotor running at the minimum *operating speed* (default = 950 rpm).

Appendix 2 -
Operating instructions for the Elca remote control on the PC chipper

The feeder is controlled through the remote control (see Figure 3). To activate the control, flip and hold the "Start" tumbler switch until the remote control lights up green. Next, the "Start" tumbler switch is released and the "K0" toggle switch is flipped up and released, followed by the "Start" tumbler switch being flipped up and released again. Next, flip the "Start" tumbler switch up and release it again.

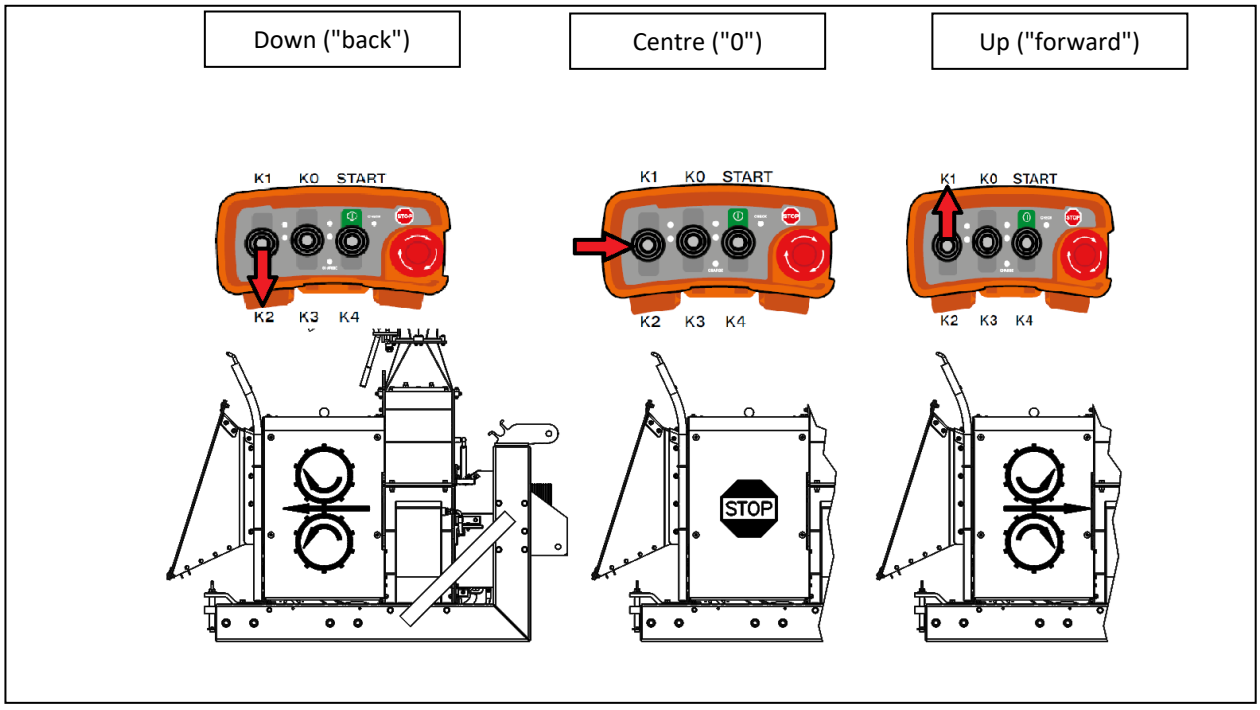


When the controller is activated and connected to the receiver, the "Check" light flashes green with one blink per second. If the power to the control box has been disconnected or the emergency stop has been pressed, the control must be restarted as described above. This prevents unintentional start-up of the feeder when the emergency stop is released.

When the control is activated, the infeed rollers in the feeder can be controlled with the tumbler switch on the left (K1 & K2).

The tumbler switch has 3 positions:

Down ("back"):	The feeder reverses, i.e. pulls the wood out of the chipper.
Centre ("0"):	The feeder stands still.
Up ("forward"):	The feeder draws the wood into the chipper.



It is recommended that the tumbler switch is set to the centre position when starting the chipper if the power to the control box has been disconnected, and that it is also set to this position when the chipper is not in use to avoid accidental starting.

Note: The start and stop button should not be used to control the machine, as this will cause unnecessary wear and tear on the relay in the controller. This will greatly reduce its operational life.

Warning: For safety reasons, it is strongly advised not to bypass or modify the functions of the control box!

Further information about the Remote Control can be found by scanning this QR code

OTHER LANGUAGES

https://qrcode.elcaradio.biz/man/d3ab3e2bcf7e63d25d9c34240ee0ff7a


Fransgård