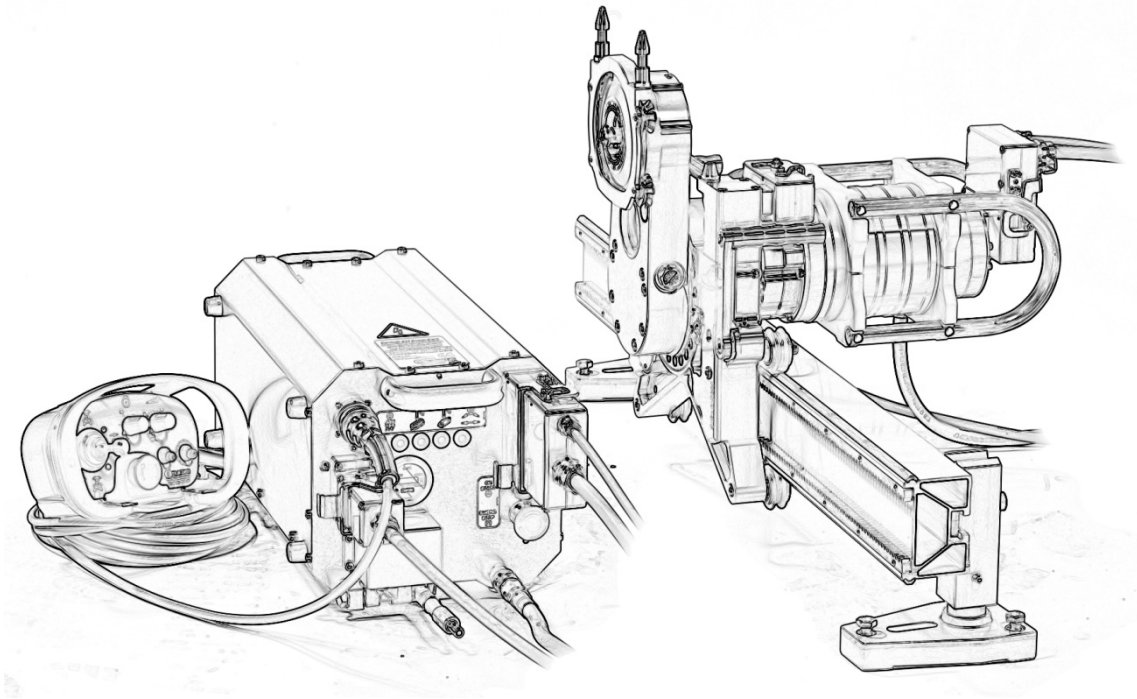
Operator's manual

Pentruder® HF-wall saw

Pentpak® High frequency power pack



Pentruder®

CONCRETE CUTTING SYSTEMS

Operator's manual for Pentruder® high frequency wall saws and Pentpak® high frequency power pack

Pentruder® CONCRETE CUTTING SYSTEMS

Version: 2.1 Date: 2019-05-17
Support & Service document
Original instructions

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Appendix for Wireless Remote Control: Hectronic User's Manual

1 Introduction

Thank you very much for your confidence in our product! You have chosen to invest in a product which will give you many years of efficient and profitable production. The Pentruder high frequency (HF-) wall saws has been developed based on more than 25 years of experience in this specialised field. With correct handling it offers outstanding performance, safety and reliability.


It is essential that all personnel working with or in close proximity of the machine have read and understood the contents of this manual before commencing operations. Please take careful note of the Safety Precautions.

The operator's manual should be kept where the machine is.

To avoid serious or even fatal injury to the operator and persons in close proximity of the machine, it is important that the machine always is operated by trained, responsible personnel.

By reading and understanding the manual the operator will be able to take advantage of the many features and benefits of the Pentruder HF-wall saws.

We are confident that your investment in this equipment and its many design features will enhance your competitive edge and profitability!

1.1 Validity of this operator's manual

This operator's manual is only valid for the Pentruder HF wall saw as described in Chapter 2 Description of the machine.
Tractive AB always strives to improve the products. Therefore we reserve the right to make technical changes without previous information.

In the following operator's manual, "the machine", "wall saw" , "Pentruder HF-wall saw","Pentruder 8-20iQ", "Pentruder 8-20HF", "Pentruder CBK", "Pentruder 6-12HF" or "Pentruder 6-10HF" is used to refer to the complete machine as listed in 2 Description of the machine.

Should questions arise, please contact our sales distributor. The address can be found at www.pentruder.com.

Product	**Description**	**Serial number**
Category:	High Frequency Wall Saw	
Make and type:	Pentruder 8-20iQ / 8-20HF / CBK / 6-12HF / 6-10 HF	_____
Drive system:	Pentpak High Frequency Power Pack	
Type of drive system:	427 / 422 / 418 / 222 / 218 / 200	_____
Drive motor:	HF-motor	
Type of drive motor:	15, 18, 22, 27 kW / 20, 24, 30, 37 HP HF-motor	_____
Accessories:	As stated in Chapter 2	
Remote control:	Cable or Wireless Remote Control	_____

Manufacturer:
Tractive AB
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Sweden

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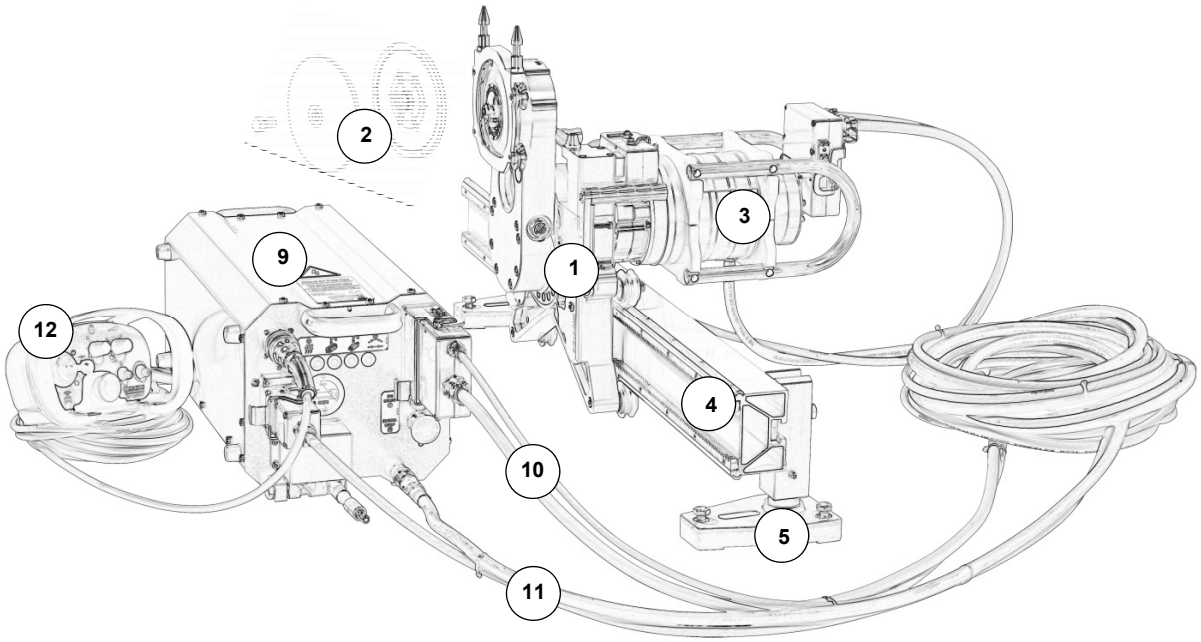
Pentruder Distributor

2 Description of the machine

The Pentruder HF-wall saws represent a very modern and safe type of concrete wall saw. It is developed and manufactured by **Tractive AB** in Sweden in a process where safety awareness, performance and reliability were the most important design parameters.

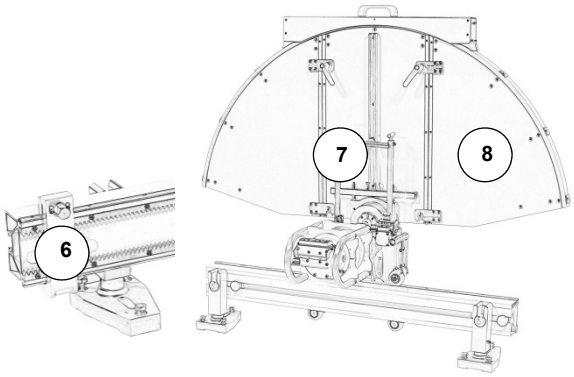
The Pentruder HF wall saws offer outstanding quality. It is the culmination of exacting goals for quality and safety set at every stage from concept to finished product.

2.1 List of complete machine



A complete Pentruder HF-wall saw is comprised of at least

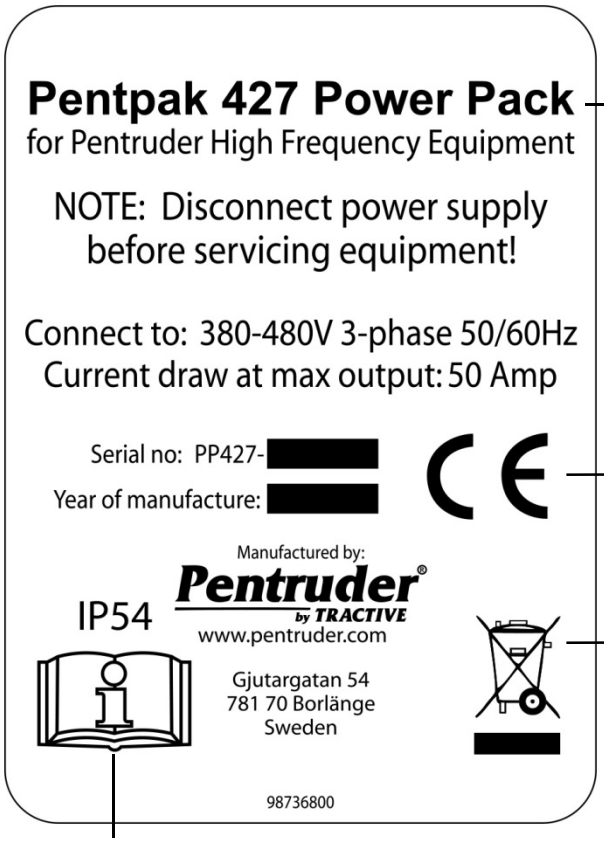
1. A Pentruder HF-saw head:
2. A Blade flange assembly or Flush cutting flange
3. An HF-motor
4. One TS Track
5. Two TF2S Track feet
6. One TP3 track stop
7. A Blade guard guide
8. A Blade guard
9. A Pentpak high frequency power pack
10. A High voltage cable
11. A Low voltage cable with water hose
12. A Remote control
13. Pentruder HF wall saw Operator's manual (not pictured)
14. Appendix for Wireless Remote Control: Hectronic User's Manual (not pictured)



as described in this Operator's manual and on our website www.pentruder.com. Please note that a Pentruder HF wall saw is not complete without the modules and accessories listed in this paragraph.

For accessories, see www.pentruder.com.

2.2 Signs and data plates on the machine

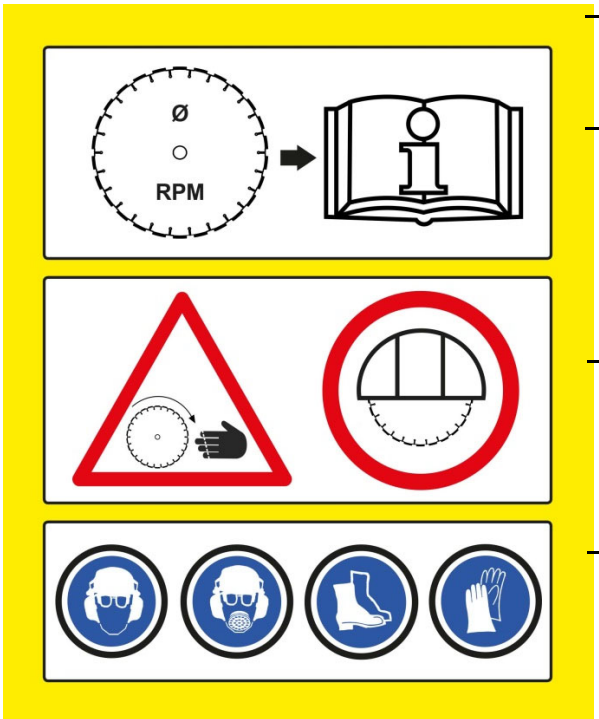


This sign is placed on the Pentpak and gives information about the complete machine as described in Chapter 2 Description of the machine.

This product is in accordance with applicable EC-directives.

The trash bin symbol is an environmental marking and indicates that this machine contains electrical/electronical equipment which should be recycled.
Please contact your Pentruder Distributor for more information.

It is essential that all personnel working with, or in close proximity of the machine have read and understood the contents of this manual before commencing operations. Please take careful note of the Safety Precautions.



This sign is placed on the Pentpak and blade guards and gives information about the complete machine as described in Chapter 2 Description of the machine.

The curved arrow shows the direction of rotation of the saw blade.
Please refer to the Operator's manual for peripheral speed with different sizes of diamond saw blade.

Caution, risk of cutting!
Always use the blade guard on the machine.

All persons working with, or in the proximity of the machine should wear safety equipment, i.e. protection helmet, protection shoes, gloves, eye and ear protectors.
Find out what material is cut and wear appropriate dust mask or respiratory protection if necessary.

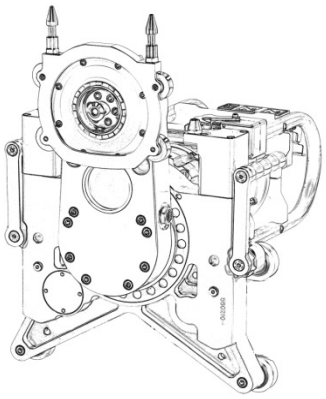
2.3 Pentruder HF saws overview

The Pentruder HF wall saws offers many features to make your work safer, easier and more efficient.

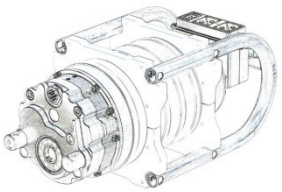
- Low weight for the saw head without HF-motor.
- Quick release coupling for the HF-motor on the saw head. To put the motor on the saw head or to remove it takes just a few seconds.
- For optimum accessibility the saw arm can be rotated through 360 degrees in either direction.
- Quick release mechanism of saw head to and from track. The upper roller are fitted on eccentric shafts, opened and locked by turning the lifting handles which allows the saw head to be fitted and removed from the track with ease.
- Superior blade mounting system by patented quick release coupling.
- See technical data for detailed information on each wall saw model.

Pentruder HF-wall saw	8-20iQ	8-20HF	CBK	6-12HF	6-10HF
Saw blade ø max:	2000 mm	2000 mm	1600 mm	1200 mm	1200 mm
	79"	79"	63"	48"	48"
Cutting depth max:	915 mm	915 mm	715 mm	515 mm	515 mm
	36"	36"	30"	20.3"	20.3"
Start blade max ø:	1000 mm	1000 mm	925 mm	800 mm	800 mm
	39.4"	39.4"	36"	31.5"	31.5"
Gearbox:	4-speed	4-speed	1-speed	2-speed	1-speed
Variable electronic spindle speed:	Yes	Yes	Yes	Yes	Yes
Max size HF-motor:	27 kW	22 kW	27 kW	18 kW	18 kW
	37 HP	30 HP	30 HP	24 HP	24 HP
Quick change blade coupling:	Yes	Yes	Yes	Yes	Yes
Detachable HF-motor:	Yes	Yes	Yes	Yes	Yes
Weight saw head:	28.5 kg	28.5 kg	24.5 kg	21 kg	20 kg
	56 lbs	56 lbs	54 lbs	46 lbs	44 lbs
Recommended HF-motors:	22 (27*) kW	22 kW	22 kW	18 kW	15 kW
Weight rec. HF-motor:	18 (18) kg	18 kg	18 kg	16.5 kg	13 kg
	40 lbs	40 lbs	40 lbs	40 lbs	29 lbs
Weight incl. rec. HF-motor:	46.5 kg	46.5 kg	42.5 kg	39 kg	33 kg
	96 lbs	96 lbs	94 lbs	86 lbs	73 lbs

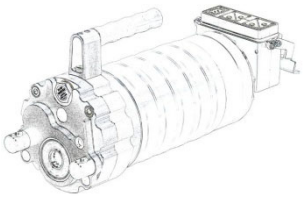
The 27 kW / 37 HP is not recommended first mainly due to the higher amperage draw.



Pentruder HF wall saw head with HF-motor



HFR427, HFR422, HFR418 HFR222, HRF218 HF-motor



HFR415, HFR215 HF-motor

3 Safety instructions

3.1 Safety instructions which are used in this operator's manual

⇨	**Note!**	This sign indicates technical specifics and methods which will facilitate the job.

!	**Important!**	Here we inform about risks connected with use of the machine, and, if the safety precautions are not respected, can result in damage to property and persons in close proximity of the machine.

⚠	**WARNING!**	Here we inform about risks connected with use of the machine, and, if the safety precautions are not respected, can result in serious injury and even to fatal injuries to persons in close proximity of the machine.

3.2 Intended use of the machine

It is of paramount importance that the operator has full knowledge and understanding of the Safety instructions.

This wall saw may not be used unless the operator is fully familiar with the contents of this Operator's manual and has been trained in its operation by an authorised distributor of Tractive AB's products. If using a WRC Wireless Remote Control, the operator must also be fully familiar with the contents of the Appendix for Wireless Remote Control: Hetronic User's Manual. The operator is fully responsible for the manner in which the machine is operated. It is the responsibility of the purchaser that the operator has received the information needed to operate and handle the machine in a safe a correct way.

Good working practice should always be used along with common sense. Tractive cannot foresee every possible situation and this manual is not a substitute for professional skills and experience.

A Pentruder HF wall saw is intended to be used together with a Pentpak HF power pack. The Pentruder HF wall saw cannot be used with any other type of power pack. The Pentpak HF-power pack may only be used to power Pentruder HF machines.

The Pentruder HF wall saw may only be used for cutting of

- Concrete
- Stone material
- Masonry

It is our expressed recommendation that the machine may only be used for cutting in these materials.
The track feet must be mounted on a stable structure, not on a mobile device.
Other use is non-intended and therefore to refrain from. For maximum saw blade, see Technical Data.

Always use a diamond blade well suited for the power of the machine. Follow the diamond blade manufacturer's recommendations.

⚠	**WARNING!**	Do not use the machine for cutting other materials than listed or on loose masonry. The safe fastening of the track feet cannot be guaranteed.

!	**Important!**	Please observe that Tractive's responsibility as a manufacturer can only be accepted when the Pentruder saw head is used together with power packs and accessories described in this Operator's manual. If the machine is used with non-original equipment the warranty and Tractive's CE-marking will be void.

3.3 General safety instructions

WARNING - DANGER OF LIFE!

Cutting in a power line which is energized can result in serious injury and even to fatal injuries. The wall saw can get energized. A circuit breaker cannot protect against this danger.

WARNING!

- The machine is state of the art and follows the present regulations. However, incorrect handling of the machine can result in serious or even fatal injury to the operator and persons in proximity of the machine.
- All persons which are operating or in any way working on the machine has to read and understand the whole operator's manual and especially the safety instructions, before any work is commenced. It is the obligation of the employer to make sure that the operator really has received the information necessary to operate and take care of the machine in a correct and safe way.
- Good working practice should always be used along with common sense. Tractive cannot foresee every possible situation and this manual is not a substitute for professional skills and experience.
- The machine may only be operated and serviced by authorized and trained personnel. The personnel should be trained by personnel authorized by Tractive.
- A Pentruder machine used in the correct way is a safe and efficient tool. If the machine is used improperly this can expose the operator and other persons staying in the same area to extreme danger or even risk of fatal injuries.
- The user is liable that the machine is in faultless condition and that all functions are in order before work is commenced.
- To maintain the level of safety inherent in the design of this machine, only Tractive original parts may be fitted. Tractive AB disclaims all responsibility for damages occurring as a result of use of non-original parts.
- Modifications or changes on the machine are not allowed.

- Before any kind of service or mounting on the machine is commenced, the machine must always be disconnected from the electric power supply.
- The machine may not be used in an environment where explosion protected equipment is demanded.
- Tractive AB disclaims all responsibility for damages to persons and / or property resulting from use of the machine, whether they are caused by faulty handling or from damages that have occurred as a consequence of negligent or faulty maintenance, or as a consequence of failure to check and control the machine with regard to damages and / or faults.

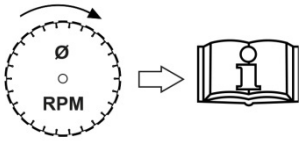
3.4 Safety precautions at site

WARNING!

BEFORE CUTTING

Before cutting is commenced, make sure that;

- There are no power lines, gas or piping which can be damaged by the machine.
- The statics of the building are not compromised because of the cut openings.
- No damage is done on the other side of the concrete when cutting through.
- Check with the foreman responsible that all necessary precautions have been performed before commencing work. Await the approval of the safety precautions and mounting position of the machine from the foreman before work is commenced.
- Safety and health regulations at the work place must be followed.
- No work should be commenced which cannot be judged to be safe. Always use common sense and good working practice.
- Always check that the machine and diamond tool is in faultless condition and that all functions are in order before work is commenced.
- Never use a diamond tool for material which it is not intended for.
- Before cutting is commenced all persons involved must know how the emergency stop buttons are working.
- Make sure the saw blade will not start at and/or cut at a too high speed. See How to choose correct cutting speed.

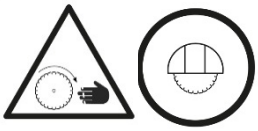


WEAR SAFETY EQUIPMENT

- All persons working with, or in the proximity of the machine should wear safety equipment, i.e. protection helmet, protection shoes, gloves, eye and ear protectors. The noise level at drilling might lead to permanent hearing disorders if not ear guards are worn.
- Find out what material is cut and wear appropriate dust mask or respirator protection if necessary.

MOUNT ACCORDING TO THE INSTRUCTIONS

- Before any kind of service or mounting on the machine is commenced, the machine must always be disconnected from the electric power supply.
- Track feet may only be mounted according to the instructions given in this manual.
- Track stops must always be securely mounted at each end of the track(s) to prevent the saw head from being run off the track unintentionally.
- Make sure a blade guard **always** is fitted during the cutting process.



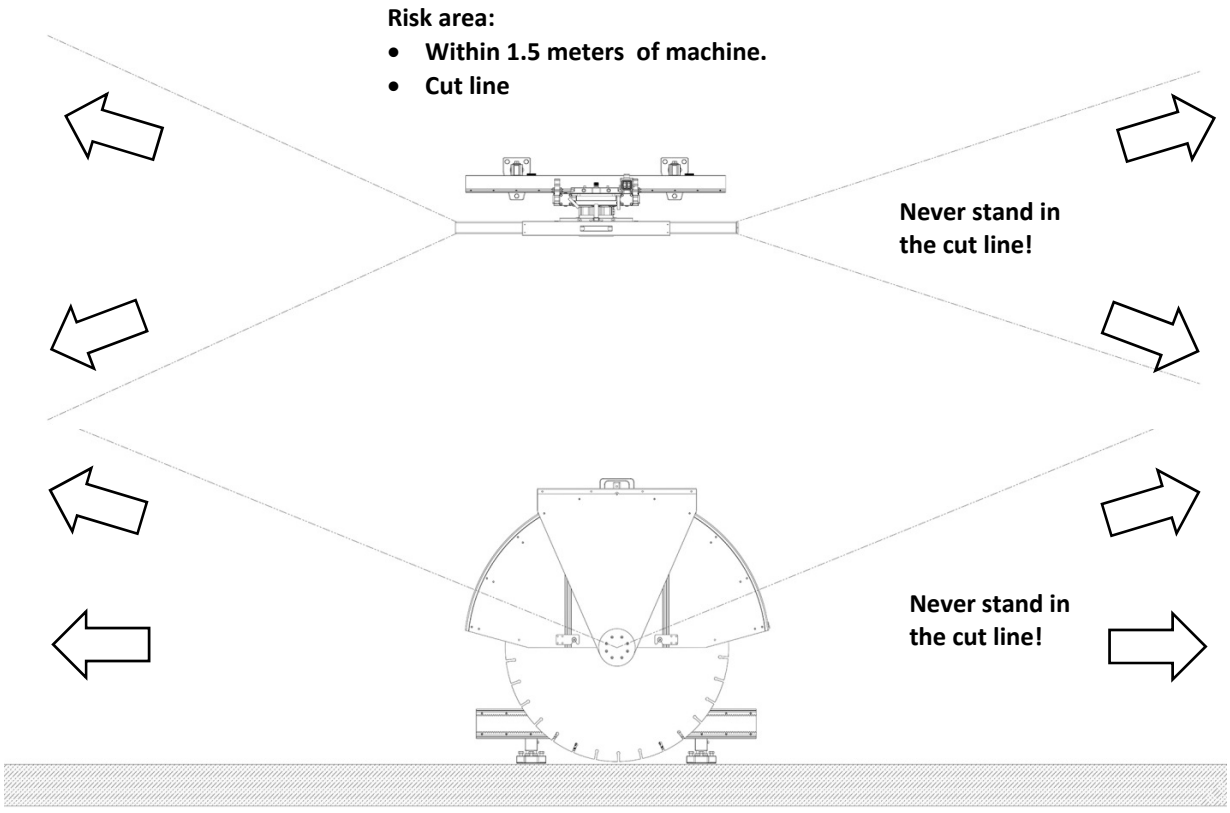
LIFTING AND TRANSPORTING

- Use the lifting handles or place the machine in the transport trolley for safe handling. Make sure the machine modules are secured in the transport trolley and that the transport trolley is placed on a stable surface. If placed on an incline it can become unstable and roll away.
- Always lift the machine ergonomically correct and in a safe way.
- Should the machine need to be lifted with a crane, this should only be done after permission and instructions have been given by a person responsible for safety on the site. Use the lifting handles as described in 4 Preparations and Mounting.

WARNING!

RISK AREA

- The operator shall keep a minimum safety margin of 1.5 m to all working and moving parts during the operation. Should the machine fall down from the wall or ceiling it could cause severe injuries.
- The operator should have good supervision over the machine.
- The risk area must be roped off and the operator must make sure that no unauthorised person entry the risk area.
- Clear the working area and make sure no persons are within the risk area, see drawing below, before the machine is allowed to be started.
- Remember always to cover cut openings so that no person falls down and hurts himself.
- Secure the concrete before starting work to make sure there is no possibility that concrete blocks may fall down causing injury or damage to persons or property.
- Concrete blocks which are cut free may not be allowed to fall freely as this could compromise the safety of the machine and/or diamond tool.



! **Important!**

- The power pack is water cooled and must be drained from water when the ambient temperature is in the proximity of or below 0 degrees Celsius. See 4.6.3 Connection to water supply.
- The water supply may only be connected to the short hose on the water ON/OFF-valve on the power pack. The quick disconnect couplings may not be replaced with couplings that are not fully open when disconnected.
- The transistor power modules in the power pack are water cooled and the water pressure must therefore be limited to max 5 bar.
- The power pack should preferably only be operated when it is put on its back with the warning triangle upwards.
- Connect the HF-power pack only to Pentruder HF-wall saws, Pentruder HF-Wire Saws, HF-drill motors or any Pentruder equipment which has been manufactured or approved by Tractive AB.

4 Preparations and Mounting

4.1 Preparation and mounting of track feet and tracks

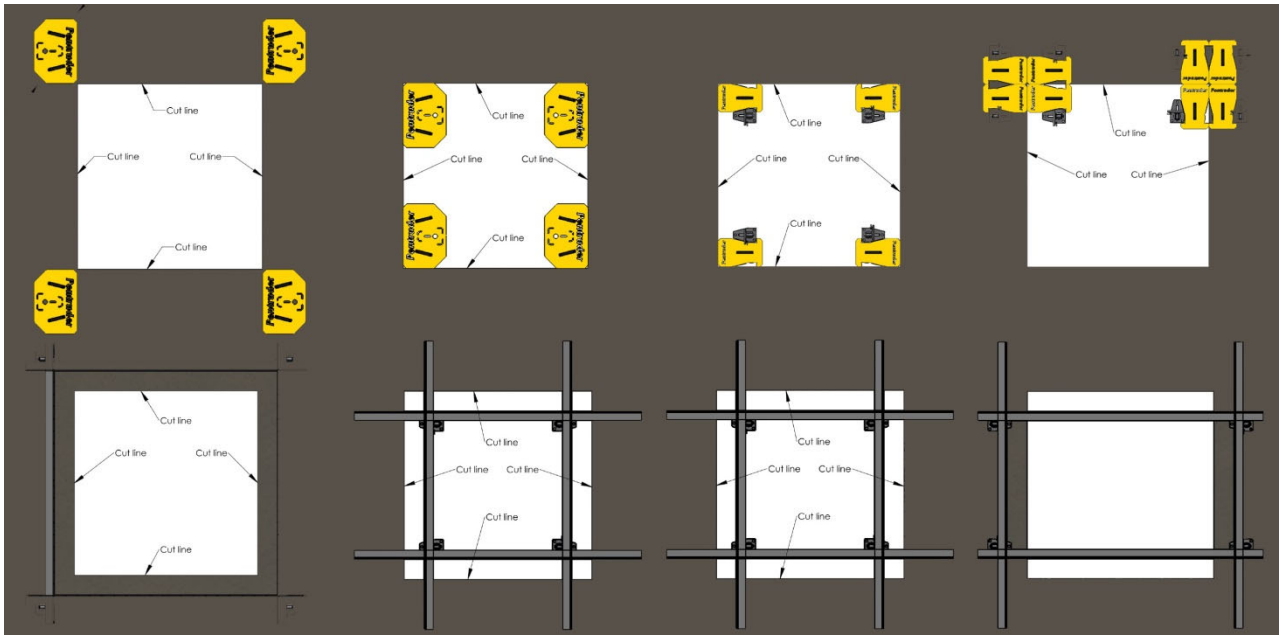
The surface where the track feet are fastened should be stable, free of obstacles and adequately lit. The track feet and the tracks should be mounted in such a way that they cannot become detached when the machine is working, or at sudden changes in load on the anchor bolts.

A minimum of two feet are required to mount one track and the distance between the track feet should not be more than 2 meters (6.5ft). If tracks with only one gear rack are used, make sure all of them are positioned correctly to engage with the travel gear on the wall saw.

When bigger blades than 1200 mm / 48" are used, we recommend setting the track feet closer than 2 meters / 6.5ft.

The track foot can swivel so the track foot only needs to be set up once in each corner when for example cutting a door opening.

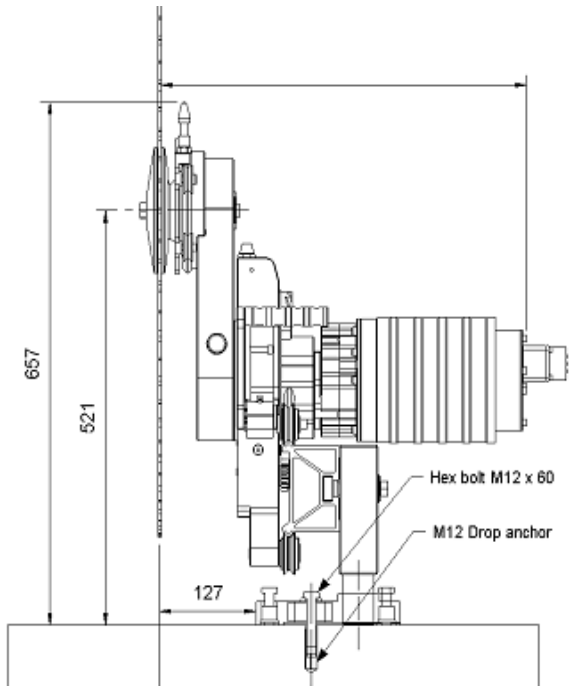
There templates which can be used to simplify set up of the Pentruder wall saw. The template will help position the track feet in the corners so that they don't have to be moved when cutting a square opening.



Setup examples

4.1.1 Fastening of track feet

The feet must be fixed by means of M12 (1/2") screws of 8.8 quality or better of adequate length depending on anchor depth, using a thick washer and anchors of type HKD M12 (1/2") or equivalent. See picture below.



The track feet should preferably be mounted in the position shown in the picture above. In certain circumstances it is impossible to mount the track feet as shown in the picture above. If the track feet must be mounted differently, this will affect the stability of the track. If this is the case, more track feet should be fitted to spread the load on more track feet for increased stability.

The distance from the edge of the feet to the cut line is 127 mm (5"). The distance from anchor bolt to the cut line is 217 +- 25 mm (8.54 +- 1").

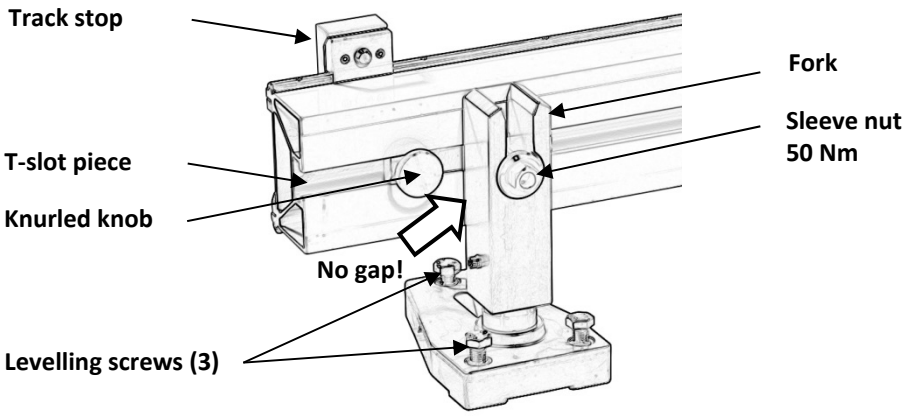
a. Drill anchor holes for each track foot. Follow the manufacturer's instructions for the used anchors.
b. Clean the holes and insert the anchors. Fix them according to the manufacturer's instructions.
c. Place both track feet over the anchor holes and at this point, tighten the bolts loosely.
d. The height of the fork can be adjusted totally 12 mm by turning the fork CW or CCW, to compensate for irregularities on the wall. Adjust if necessary.
e. When the fork is completely turned in, turn the fork about 5 turns counter-clockwise, to make sure the saw arm doesn't touch the concrete.
f. Align and position the first track foot with the help of a template, set square, level or measuring tape. Adjust the levelling screws if necessary and tighten the anchor bolt for the first track foot.

WARNING!

- If HKD anchors or other high quality expansion anchors cannot be fixed securely, the track feet must be securely fixed with through bolts and large washers to achieve the required level of safety.
- Do not use the machine if the track feet cannot be fastened properly.
- Make sure that the fork is not threaded all the way out before the track is mounted. Leave at least one turn from the fully out or in position of the fork.

4.1.2 Mounting the track on to the track feet

a. Slide in the T-slot pieces from both track feet into the t-slot of the track. If you are using tracks with only one gear rack, make sure it is positioned correctly to engage with the travel gear on the wall saw, see 4.2 Mounting the saw head on the track.
b. Tighten the knurled knobs in any position to keep them from falling out.
c. Slide the sleeve nut into the fork of the first track foot in any chosen position longitudinally on the track.
d. Tighten the sleeve nut on the second track foot to 50 Nm (fairly hard) with a 19 mm (3/4") spanner.
e. Slide the sleeve nut into the fork of the second track foot in any chosen position longitudinally on the track. Do not tighten at this point.
f. Adjust the levelling screws on the second track foot so that the track isn't warped due to unevenness of the concrete.
g. Fasten the sleeve nut on the second track foot to 50 Nm. Make sure there is no gap between the track foot fork and the track.
h. Track stops should always be fitted at the end of the track.



WARNING!

- Be careful to position the sleeve nut in the countersink of the fork on the track foot. This countersink is to prevent the track coming off the track foot in case the sleeve nut is not tightened properly.
- If tracks with only one gear rack are used, make sure all of them are positioned correctly to engage with the travel gear on the wall saw.
- Track stops should always be fitted at the end of the track.

Important!

The distance between the track feet should be no more than 2 meters / 6.5ft. When bigger blades than 1200 mm / 48" are used, we recommend setting the track feet closer than 2 meters / 6.5ft.

Note!

Be sure to check that the fork is aligned with the track and that there is no gap which can cause the track to be warped and the blade to cut un-straight.

4.1.3 Joining two or more track tracks together

If tracks are to be joined without a joint block the fork of the track foot should be positioned centrally under the joint. True up the tracks carefully sideways using a spirit level or a straightedge.

When using joint blocks a track foot should be used within 60 cm (2 ft) of the joint Block.

WARNING!

- Joint Blocks are for connecting two tracks together and are not designed to handle the full load of the saw when cutting, therefore one track foot must be mounted within 60 cm (2 ft) of all Joint Blocks).
- If tracks with only one gear rack are used, make sure all of them are positioned correctly to engage with the travel gear on the wall saw.

4.2 Mounting the saw head on the track

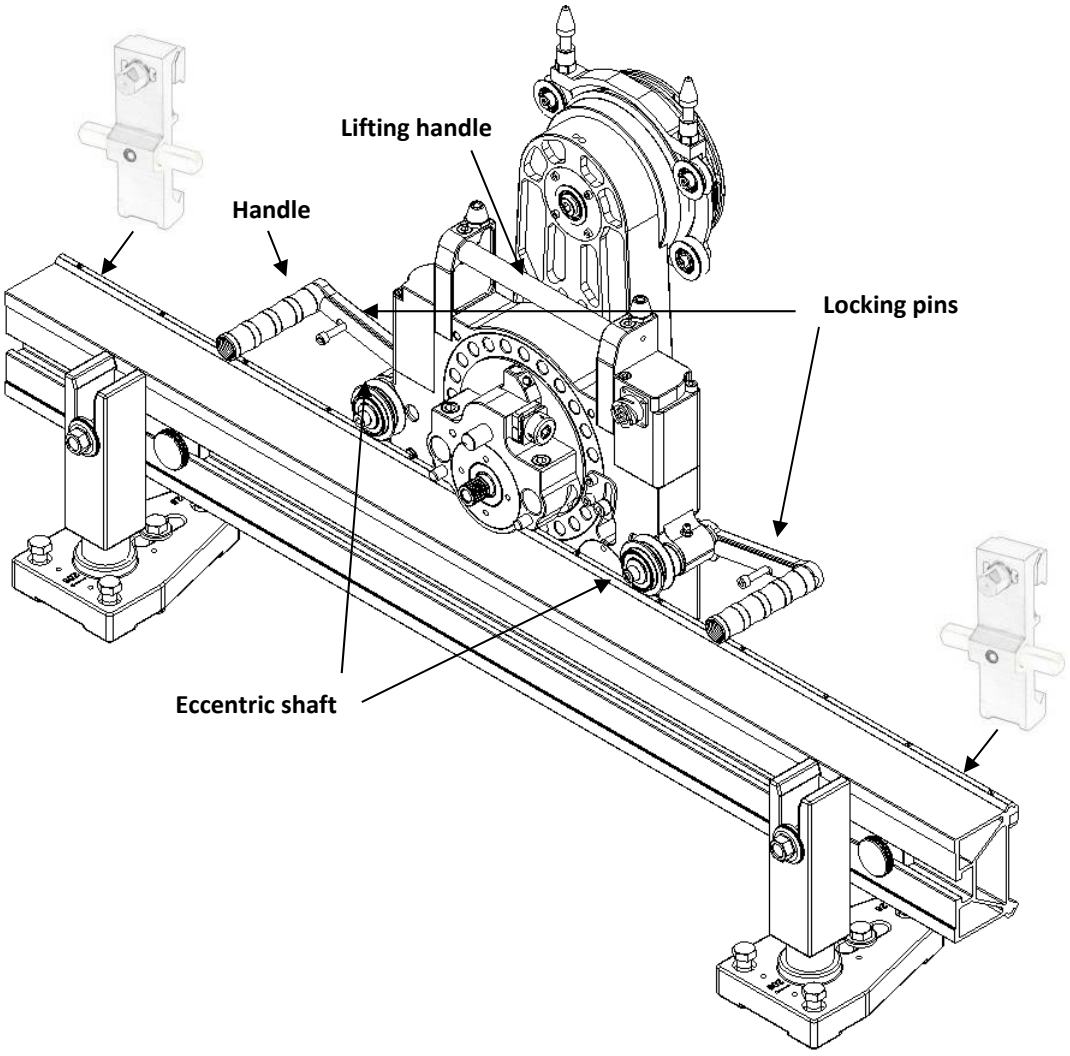
The saw head runs on the track on four track rollers. The upper track rollers are fitted on eccentric shafts, opened and locked by turning the handles.

a. Press in the locking pins and open the handles, release locking pins and open until they lock in open position.
b. Fold the saw onto the track, the bottom track rollers engaged first and second the upper track rollers.
c. Move saw head slightly along the track to engage the travel gear with the gear rack.
d. Press in the locking pins, close the handles slightly, release the locking pins and close the handles until they engage in locked position.

WARNING!

Before the saw is operated, always check that the eccentric shafts are locked in position to prevent the saw from falling off the track.

Note that if a track with only one gear rack is used, it has to be positioned in the right direction to engage with the travel gear on the wall saw.



Pentruder HF- saw head with HF-motor, TS track and TF2S Track feet.
Track stops should be used at both ends of the track.

4.3 Mounting of saw blade

4.3.1 Function principle of Quick disconnect coupling for the saw blade

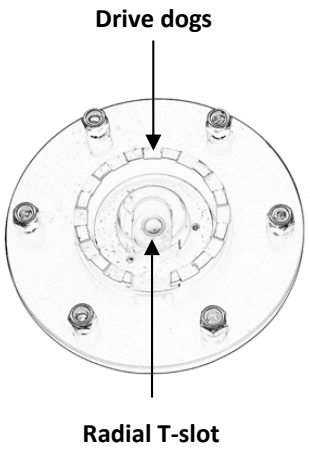
The saw blade is fitted on a blade flange by means of an outer collar and clamped by means of a special centre screw, or, for flush cutting, on a special flush cutting flange by means of 6 countersunk screws and nuts.

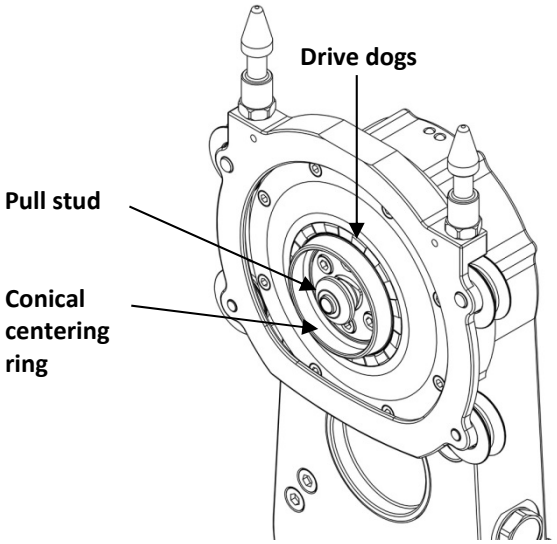
The blade flange, regardless of type, is provided with a radial T-slot to the centre of the flange. The flange, with blade fitted, is mounted on the machine spindle and its pull stud which fits in to the T-slot in the flange. When the coupling is tightened with the locking screw at the rear of the spindle, the flange is clamped towards the machine spindle by the pull stud which then moves inwards.

The flange and the spindle are provided with drive dogs to transmit the torque to the blade. The dogs must always be aligned, in mesh, for the coupling to work properly.

At the same time as the pull stud moves inwards, a conical centering ring moves outwards to centre the flange on the spindle. This ring at the same time interlocks the coupling by blocking the T-slot.

This principle is very safe, as it does not require more than one single operation to be carried out to clamp and interlock the coupling. Even if the coupling is not completely tightened the saw blade cannot fall off the spindle as the conical ring keep the blade on the spindle. It is however very important that the drive dogs are completely in mesh before the coupling is tightened.



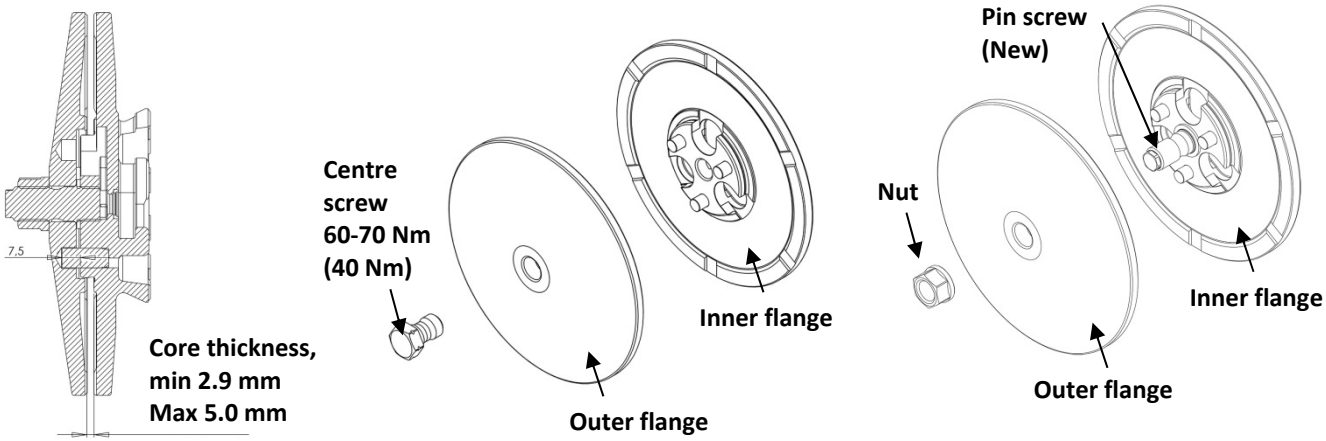


4.3.2 How to fit a saw blade on a standard blade flange:

Centre bore and thickness: The saw blade should have a hole with diameter 60 mm -0 +0.1 mm (or 1-3/8" or 1"), and be free from cracks, dents, burrs and dirt. The thickness of the saw blade core should be 2.9-5.0 mm / 0.12-0.2" to ensure proper clamping.

Transmission of torque: The friction surfaces of both the flange and the blade must be kept dry and free from grease and dirt to be able to securely transmit the torque of the saw blade motor without slippage. Slippage will cause irreparable damage to the flanges.

Clamping: The blade is fitted on the inner flange and is clamped by the outer flange with a special centre bolt or pin screw with nut. Grease the centre bolt and thread regularly.

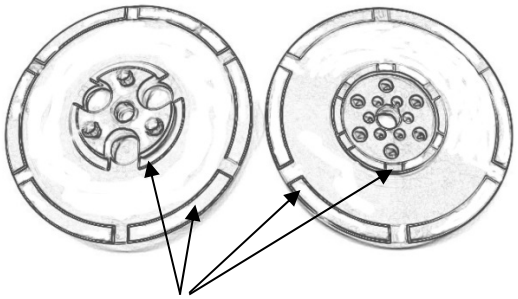


Picture shows QE60

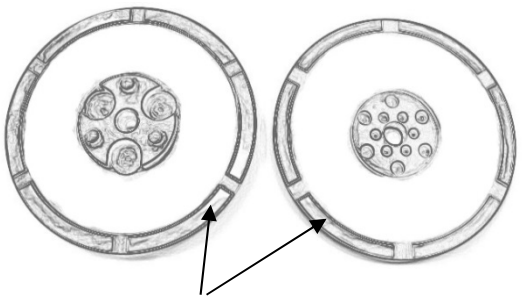
Note!

- The centre screw should be tightened to 60-70 Nm for the version with two friction surfaces and 40 Nm for the version with one friction surface, see picture below for difference. Don't mix the different versions.
- The saw blade core thickness has to be within the specified range to ensure proper clamping.

The blade and flange are now ready to be fitted on to the machine spindle with the quick coupling.



Two friction surfaces:
Tighten with torque wrench to 60-70 Nm
Must be kept clean!



One friction surface (old blade flange version):
Tighten with torque wrench to 40 Nm
Must be kept clean!

WARNING!

- The bolt or the female thread in the blade flange may never start to corrode. Corrosion of the threads or any part of the bolt/pin screw may cause failure of the bolt which can result in serious injury and even fatal injuries to persons in close proximity of the machine.
- The saw blade must always be fitted correctly and a torque wrench must be used to tighten the centre bolt to the correct Nm, to avoid danger. The instructions given above must always be followed to avoid faulty mounting of the blade.

4.3.3 How to fit a saw blade on a flush cutting flange:

Centre bore: The saw blade should have a hole with diameter 60 mm –0 +0.1 mm, and be free from cracks, dents, burrs and dirt.

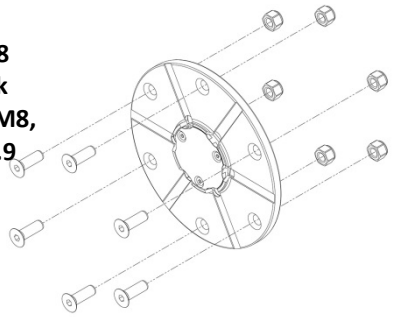
Clamping and bolt circle: The blade is fixed with 6 countersunk screws. The following bolt circles and sizes are available.

- QEF60-130 Flush cutting flange, 60 mm arbor size, 6x M8 P.C.D. 130 mm
- QEF60-110 Flush cutting flange, 60 mm arbor size, 6x M8 P.C.D. 110 mm
- QEF60-108 Flush cutting flange, 60 mm arbor size, 6x M10 P.C.D. 108 mm
- QEF60-110-130 Flush cutting flange, 60 mm arbor size, 6x M10 P.C.D. 110 mm / 6x M8 P.C.D. 130 mm
- QEF1-4-1/4" Flush cutting flange, 1" arbor size, 6x M10 P.C.D. 4-1/4"
- QEF138-4-1/4" Flush cutting flange, 1-3/8" arbor size, 6x M10 P.C.D. 4-1/4"

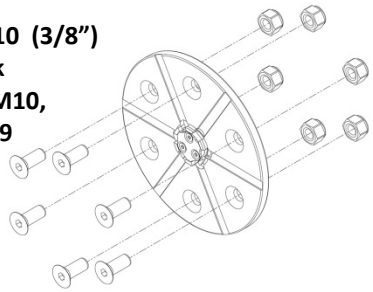
Screw and nut quality: The blade must be clamped with countersunk screws from Unbrako and be of quality 10.9. The nuts must be of type "Nyloc".

Torquing of screws: The fasteners must be torqued with a torque wrench to 35 Nm for M8 screws and to 50 Nm for M10 and 3/8" screws. The threads must be lubricated with grease or oil.

35 Nm -> M8 Countersunk screws, 6 x M8, Unbrako 10.9 Nyloc nuts



50 Nm -> M10 (3/8") Countersunk screws, 6 x M10, Unbrako 10.9 Nyloc nuts



Blade guard: When flush cutting, the blade guard does not protect properly for the danger of ejection of parts like bits and cutting debris. Therefore a protection should be built up around the saw blade to protect the operator and all other persons in the proximity of the wall saw.

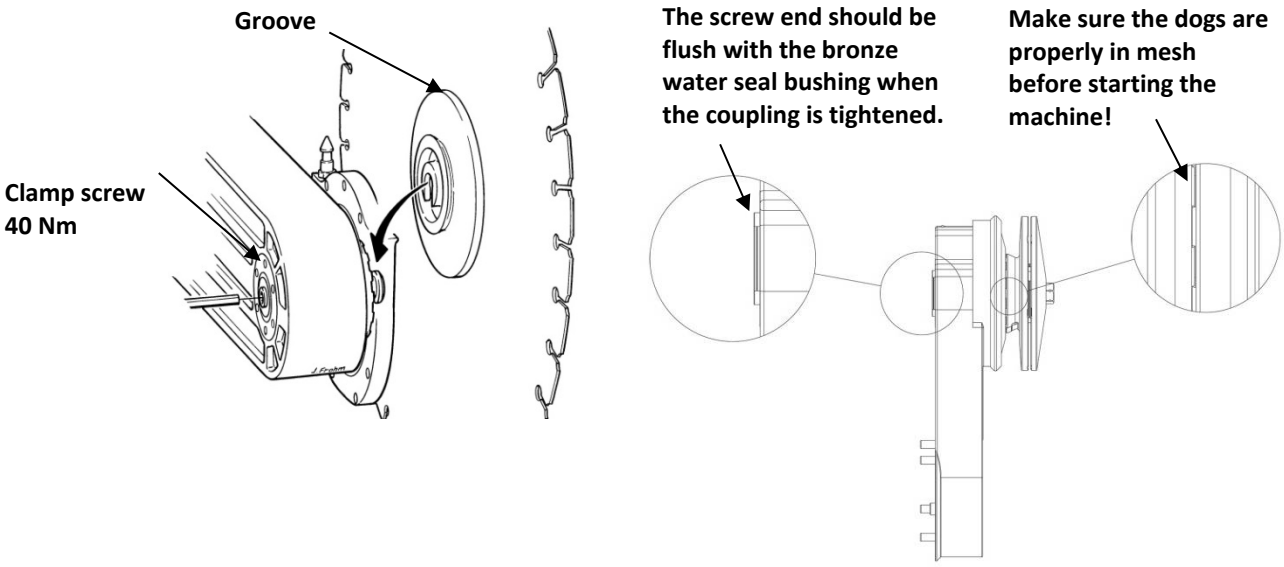
WARNING!

- The saw blade must always be fitted correctly to avoid danger. The instructions given above must always be followed to avoid faulty mounting of the blade, which can result in serious injury and even to fatal injuries to persons in close proximity of the machine.
- It is important to be aware of the fact that when a flush cutting blade is used, the blade is clamped merely by the six countersunk screws, nothing else.
- When flush cutting the operator should be aware that the level of safety never can be comparable to normal cutting with a full blade guard. Flush cutting is a potentially dangerous method and should be treated likewise. A protection should be built up around the saw blade.
- The blade must have a bolt circle where the holes are spaced on an even and exact pitch (P.C.D.) to prevent unequal load distribution on the screws, blade and flange. Look out for cracks around the counter sunk holes in the blade. Some blades are prone to crack and if that happens, it is potentially a very dangerous situation which can lead to fatal accidents.
- A faulty saw blade with cracks, dents, burrs or loose segments must never be used.
- The bolt or the female thread in the blade flange may never start to corrode. Corrosion of the threads or any part of the bolt may cause failure of the bolt which can result in serious injury and even to fatal injuries to persons in close proximity of the machine.

4.3.4 Mounting the saw blade with flange on the machine spindle

If the procedure described above is followed, the blade and flange are now ready to be fitted on to the machine spindle with the quick coupling.

1. The blade flange is provided with a radial T-slot to the centre of the flange. On the opposite side of the T-slot, there is a groove and this groove should be positioned upwards when the blade flange is mounted on the saw head spindle / pull stud.
2. Turn the blade a little until the dogs on the blade flange and saw head spindle are in mesh, "click".
3. Use a ½" torque wrench to tighten the clamp bolt on the rear side of the spindle. Tighten to about 40 Nm. Do not over tighten the coupling clamp screw!
4. The screw should be flush with the bronze water seal bushing when the coupling is tightened.



WARNING!

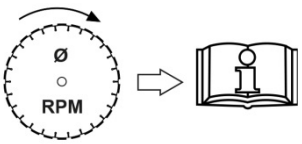
- Always keep all part of the coupling clean and lubricated! The safe operation of the coupling depends on cleanliness of all coupling parts on the machine, and the blade flange!
- Do not use the machine if any part of the quick disconnect coupling is corroded. This can result in serious injury and even to fatal injuries to the operator or persons in close proximity of the machine.
- Failure to follow the assembly instructions above may result in coupling overload and a failure can result in serious injury and even to fatal injuries to the operator or persons in close proximity of the machine.
- Before any kind of service or mounting on the machine is commenced, the machine must always be disconnected from the electric power supply.

4.3.5 Diamond saw blade

Always use a diamond blade well suited for the power of the machine and the material to be cut (concrete, stone material or masonry). Do not use a higher spindle speed than the saw blade is intended for. Follow the diamond blade manufacturer's recommendations.

For best cutting performance, check that the correct rotation direction is used. The cutting direction of the Pentruder HF-wall saws is clockwise.

WARNING!



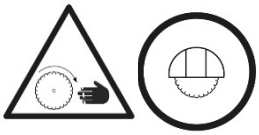
- A faulty saw blade with cracks, dents, burrs or loose segments must never be used.
- Never run the saw blade at a higher speed than it is made for.

4.4 Mounting the blade guard

The blade guard must be mounted at all times when the blade is rotating under power. Failure to follow this instruction can result in serious injury and even to fatal injuries to persons in close proximity of the machine.
The blade guard will protect the operator and the surrounding area from:

- Water and loose material which is cut away by the blade and thrown out of the cut.
- Accidental injury in a situation when the operator or someone else accidentally falls against the machine.
- Injury by a cracked or faulty blade, loose segments which are thrown out of the cut or by a blade which is not properly fitted.

WARNING!

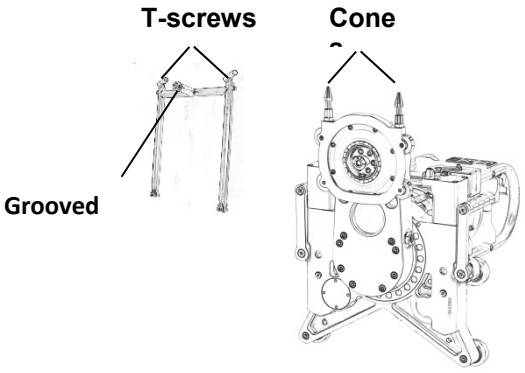


- The blade guard must be mounted at all times when the blade is rotating under power. Failure to follow this instruction can result in serious injury and even to fatal injuries to persons in close proximity of the machine.
- When flush cutting, the blade guard does not protect properly for the danger of ejection of parts like bits and cutting debris. Therefore a protection should be built up around the saw blade to protect the operator and all other persons in the proximity of the wall saw. This is also valid for situations where a side piece of the blade guards has to be taken off.
- The blade guard may not be fitted or removed before the two power cords are disconnected from the saw. This rule must always be followed to eliminate that the blade motor is started by accident or the arm or chassis moved when the operator is working on the saw head. Failure to follow this instruction can result in serious injury and even to fatal injuries to persons in close proximity of the machine.

4.4.1 Mounting of GS, GSE and GSF blade guards

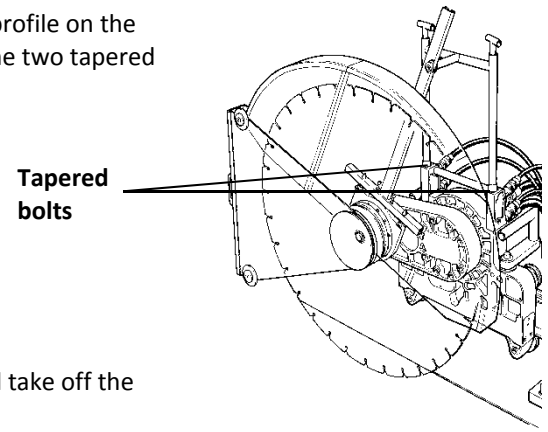
Mounting the guard guide:

1. Fit the GH-SW1 Frame for all swing type guards on the two cones on the saw head with the grooved bushing pointing to the blade side of the machine.
2. Tighten the two T-screws firmly.



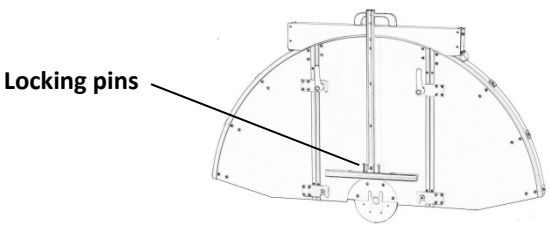
Mounting the guard:

3. Put the guard on to the grooved bushing into the C-profile on the guard. Slide the T-bar with the two holes in it onto the two tapered bolts on the saw arm until it locks into position.



Removing the guard:

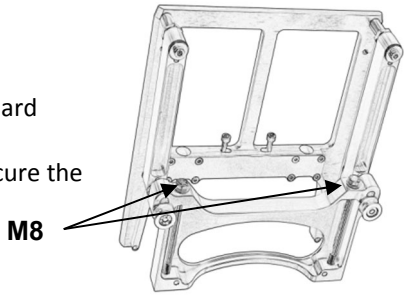
1. Press the two locking pins on the guard together and take off the guard.



4.4.2 Mounting of GP and GPE parallel blade guards

Mounting the guard guide:

a. Fit the GH-PCBK Parallel guard guide on the two cones on the saw head and at the same time slide the moving frame onto the tapered bolts on the saw arm until they click into a locked position. See picture be

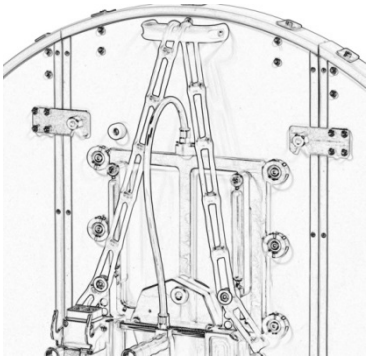


Mounting the guard:

b. Slide the guard rollers on to the tapered sides of the moving frame of the guard guide.
c. Attach the rubber strap between the blade guard and the guard guide to secure the blade guard. See picture below

Removing the guard:

a. Loosen the rubber strap and pull off the guard.



4.5 Quick disconnect coupling for HF-motor on saw head

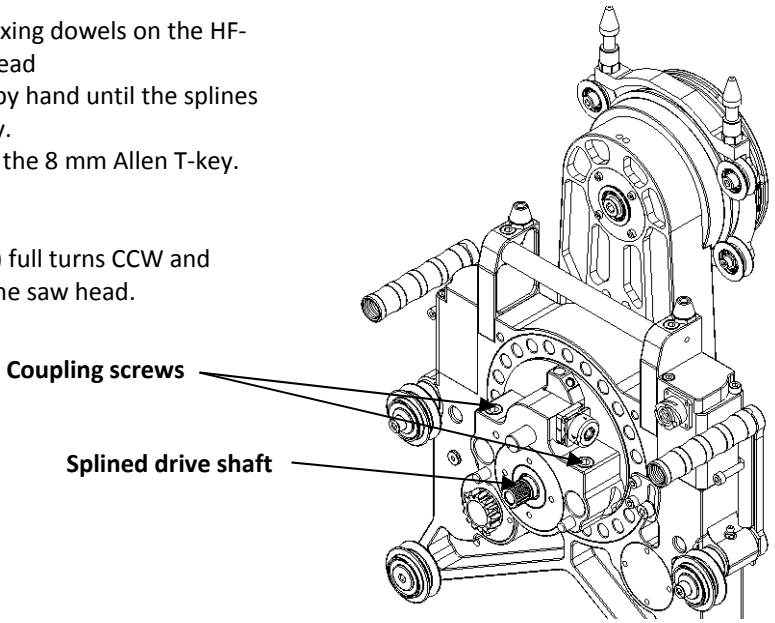
To reduce the weight of the parts that must be handled by the operator, the saw head is basically divided in the saw head unit and the drive motor. The HF-motor is easily fitted on the saw head with a simple and reliable quick coupling. Two coupling screws hold the HF-motor securely in place while the machine is working.

To fit the HF-motor:

a. Align the splined drive shaft and fixing dowels on the HF-motor with the holes in the saw head
b. Rotate the saw blade very slowly by hand until the splines mesh up and motor seats properly.
c. Tighten the coupling screws using the 8 mm Allen T-key.

To remove the HF-motor:

a. Turn the coupling screws three (3) full turns CCW and
b. Pull the motor straight out from the saw head.



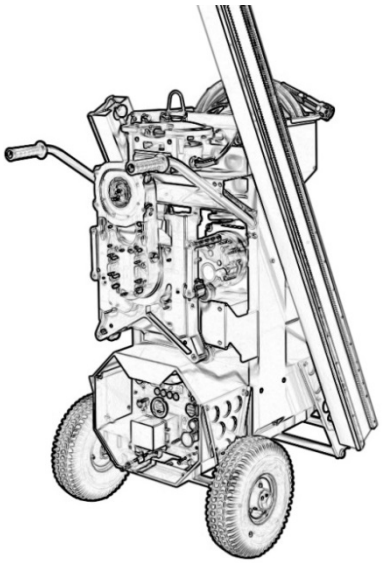
WARNING!

To avoid any possibility of injuries as a consequence of an unintentionally started HF-motor, the power cord between the Pentpak HF-power pack and the HF-motor **must be disconnected** when the HF-motor is fitted to or removed from the saw head.

4.6 Preparing the power pack

4.6.1 Positioning

The power pack should be positioned away from where the sawing takes place **and should be kept dry at all times**. It should preferably be placed on a flat surface. We recommend using the transport trolley, see picture below.



Transport trolley fitted with Pentpak, wall saw, HF-motor, cable remote control, cables, track feet and two tracks.

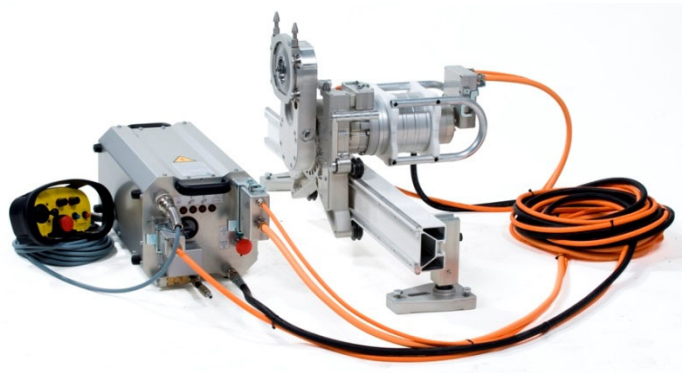
! Important!

- Do **NOT** leave the power pack outside in the rain. The unit is sealed but not watertight over time. To prevent possible damage to electronic components we recommend that it is kept dry to prevent excessive condensation forming.
- The transport trolley should be placed on a flat surface. If placed in an incline it can get unstable.

4.6.2 High voltage, low voltage and water connections

Electric power to the HF-motor (high voltage) is supplied by two 9 m (30ft) cables joined together (HF400-9-30, 400V Cable for PP427, PP422 and PP418 / HF200-9-30, 200 V Cable for PP222 and PP200).

The feed and travel motors are supplied by one smaller diameter orange colour 9 m (30 ft) cord (low voltage) packaged together with a 10 mm water hose (LV24-9-30, 24 V Cable with water hose). The water quick disconnect coupling with a 90° elbow should be at the saw head end.



Warning!

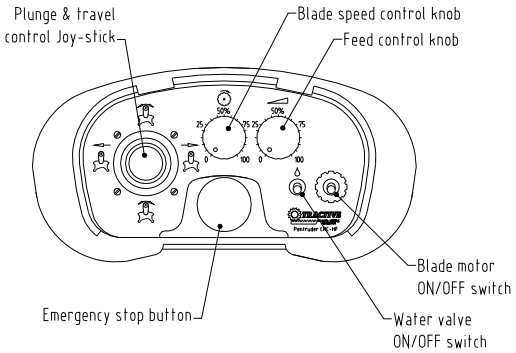
The power pack should not be connected to the electrical supply until all power cords are first connected to the saw and power pack.

4.6.3 Connection to water supply

The power pack is water cooled and needs a minimum of 4 litres (1 gallon) of cool water per minute at full power output. The water pressure should be at least 1 bar (15 PSI) and maximum 5 bar (72.5 PSI). The water supply may only be connected to the short hose on the power pack water valve.

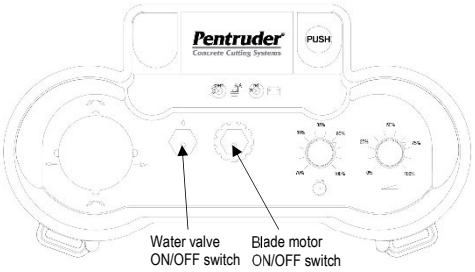
In sub-zero temperatures the remaining water inside the power pack cooling circuit must be blown out with compressed air.

1. Disconnect the water couplings.
2. Switch the Blade motor ON.
3. Switch the water valve ON.
4. Blow out the using compressed air or an air pump.



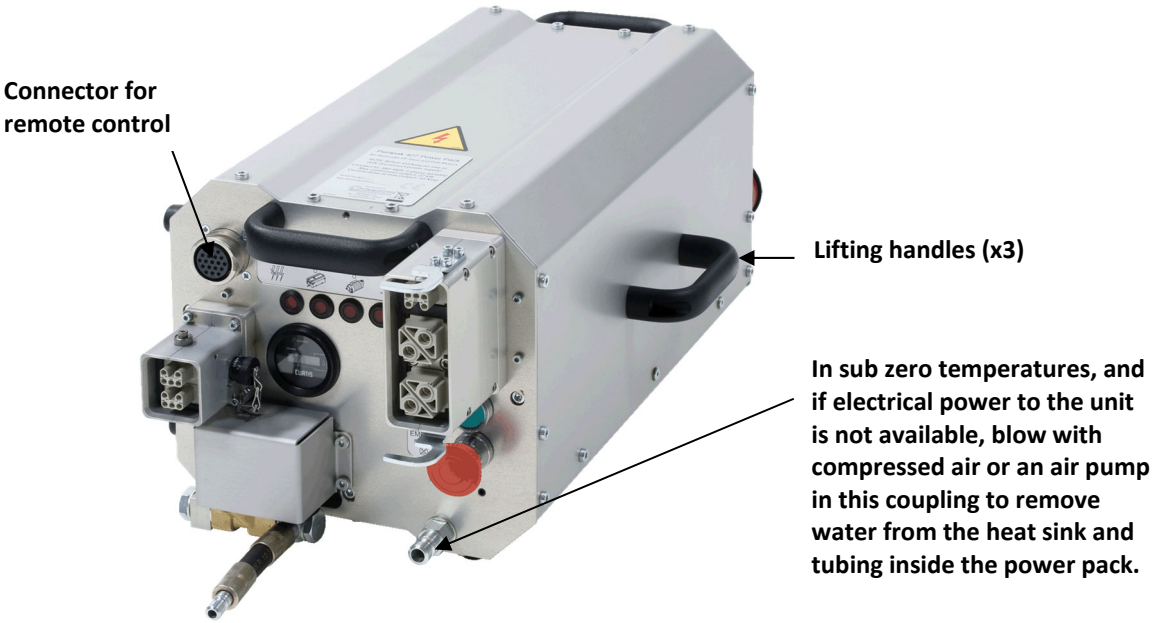
Alternatively, if no electric power is available

1. Disconnect the water couplings.
2. Blow backwards with compressed air or an air pump in the coupling going to the saw head. The water ON/OFF-valve will then open.
3. The remaining water in the power pack can then be blown out. See picture below.



! **Important!**

- Leaving water in the Pentpak in sub-zero temperatures will destroy components in the power pack and potentially cause a complete failure of all electronic equipment inside the box.



4.6.4 Connecting remote control

Cable remote control:
The cable remote control connects to the connector for remote control on the Pentpak. See picture on previous page. The connector for remote control must be in the correct position with the notch pointing upwards for the clamping ring to close.

Wireless remote control (Hetronic Nova XL):
The receiver is fitted either on the transport trolley or directly on top of the Pentpak, see pictures below. The receiver connects to the connector for remote control on the Pentpak. See picture on previous page. The connector for remote control must be in the correct position with the notch pointing upwards for the clamping ring to close.

Receiver on transport trolley

Connector for remote control *Receiver on top of Pentpak*

The Wireless Remote Control and Receiver are pre-installed (paired together). Any new pairing of a WRC Wireless Remote Control, Hetronic, type Nova XL and Receiver type RX14-HL for use with a Pentruder machine has to be done by a workshop authorized by Pentruder and a new Installation Certificate must be filled out. See Installation Certificate on page 47.

There is a start/activating key on the side of the Wireless remote control unit (transmitter) which is used for power on/off and activation. See picture to the right.
The receiver is automatically activated waiting for the transmitter to be started.

If the use of a wireless remote control is not allowed on the worksite, the wireless remote control can be used with a cable (accessory).

More details about the wireless remote control can be found in the Appendix for Wireless Remote Control: Hetronic User's Manual.


Start/Activation key

!	**Important!**	Pull the start/activation key out of the wireless remote control when the machine is not in use, to make sure unauthorized persons cannot unintentionally start the machine.

Batteries for wireless remote control

The batteries should be fully charged before work is commenced.
Use only original Hetronic rechargeable batteries or three Alkaline AA batteries. Do not use Zinc carbon batteries.
The working voltage of the transmitter (wireless remote control unit) is constantly controlled. Should the battery fall below a certain state of charge, an intermittent buzzer will be heard for about 30 seconds before the system automatically shuts down.

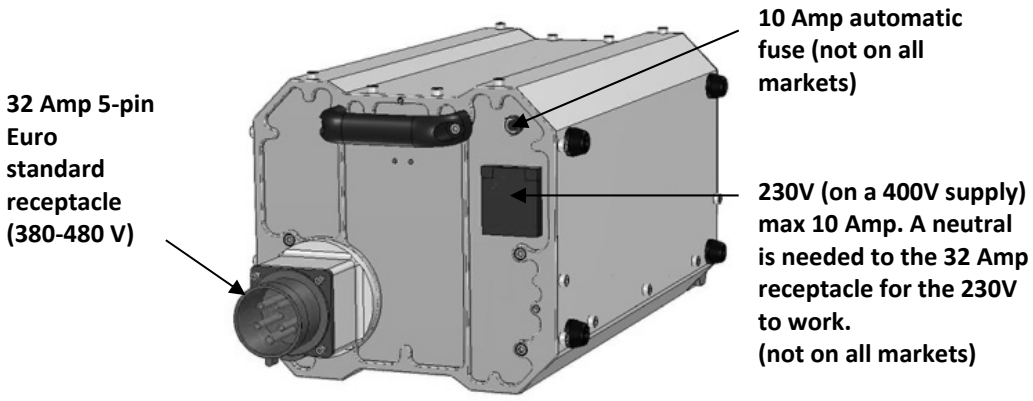
Changing and charging re-chargeable batteries:

1. Remove the battery from the transmitter.
2. Replace the battery with a new charged battery or with the cassette fitted with 3 normal AA batteries.
3. Place the charging unit on a clean and dry surface. Insert the run-down battery into the charger. Check that the battery charger is powered with the lighting up of the yellow LED on the outside. The ready green LED will start blinking as soon as the battery is charged. This typically takes 4 hours. There is also a fast charge mode to charge in about half the time (approx. 2 hours). If you press the fast charge button the yellow LED and the red LED will light up. The lifetime of the battery will be shortened if fast charge is used often. A sophisticated control system of the battery being charged means that the battery under charge can be left for as long as desired.

4.6.5 Power supply and connection to mains

Pentpak 427, Pentpak 422, Pentpak 418:
Connect the Pentpak power pack to a 5-pin 380 - 480 V 3-phase supply with minimum 16 Amp fuses.
A neutral is NOT needed other than for the 230V single phase supply.

The power pack is equipped with a 32 Amp receptacle. To use other sizes than 32 Amp plugs an adapter must be fitted.



Pentpak 222, Pentpak 218, Pentpak 200:
Connect the Pentpak power pack to a 4-pin 200 - 230 V 3-phase supply with minimum 40 Amp fuses.

The power pack is equipped with a 63 Amp receptacle. To use other sizes than 63 Amp plugs an adapter must be fitted.

5 Cutting

5.1 Preparations before starting to cut

When all the instructions in **Chapter 3 and Chapter** 4 **Preparations and Mounting** have been followed, you are ready to start cutting concrete with the machine.

The machine should be cleaned, properly lubricated and all functions checked before cutting is commenced. See the instructions in **Chapter 7 Maintenance.**

Warning!

- Before cutting with the machine, it is essential that all personnel working with or in close proximity of the machine have read and understood the contents of this operator's manual and that the instructions are followed.
- If the safety precautions are not respected, this can result in serious injury and even to fatal injuries to persons in close proximity of the machine.

5.1.1 Equipment needed for cutting

In addition to the modules of a complete machine the operator should have the following material at hand:

- Hammer drill: Used to drill holes to secure the track feet.
- Hammer: Securing anchors.
- Anchors and bolts: Mounting the track feet. See Preparations and Mounting
- Preparation and mounting of track feet and tracks
- Tools for mounting: Tool set
- Level: To mount the track correctly at set up.
- Set square: To make sure the blade is 90° to the concrete.
- Measuring tape: Positioning of track feet in relation cut line.
- Industrial vacuum cleaner: Collection of concrete slurry and water retention.
- Equipment for securing the cut concrete slabs
- Helmet, eye- and ear protection, dust guards in dusty environments, protective clothes, shoes and gloves.

5.2 Peripheral cutting speed and spindle speeds

The peripheral cutting speed should be adjusted on the remote control before cutting is started. There are two principal reasons for the peripheral cutting speed to be adjusted:

- The blades are of different diameter for different requirements on cutting depth. The peripheral cutting speed should be approximately the same regardless of diameter. A larger diameter blade will rotate at a lower speed than a small one and vice versa.
- Concrete can be very different depending on the aggregates used, how much steel reinforcement is used etc. Therefore it can be necessary to adapt the peripheral cutting speed to the quality of the concrete, all depending on the type, quality and condition of the saw blade. A rule of thumb is that harder concrete and/or high content of steel is more easily cut with lower speeds than normal, and vice versa.

The frequency from the inverter is continuously variable to achieve a useful speed range from approximately 600 to 1000 RPM.

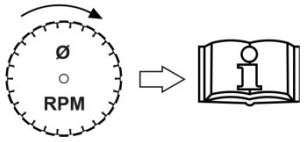
5.2.1 How to choose correct cutting speed

Depending on what size of blade you are using, you achieve a suitable peripheral cutting speed by setting the potentiometer for blade speed control. Suitable cutting speed is normally between 40 and 55 metres per second. For special conditions like concrete with very hard aggregate and/or high content of steel the cutting speed should usually be lower.

Use the blade speed potentiometer to adjust the speed continuously within the range of each gear (alteration of the frequency - Hz to the motor).

The Pentruder 6-12HF is equipped with a 2-speed gearbox and the Pentruder 8-20iQ and 8-20HF are equipped with a 4-speed gearbox gearbox to give optimum power for different conditions and size of blade.

Warning!



- The peripheral cutting speed may not exceed approximately 56 metres / second as this can cause the blade to fail. In the worst case segments can come loose and be thrown with high velocity. For very hard aggregate the peripheral cutting speed should not exceed 30 metres /second.
- If the wrong potentiometer setting is used the blade can rotate with a too high peripheral speed, which can cause the blade to fail and lead to fatal injury.
- When using big blades the potentiometer for blade speed control may not be set at a too high % when starting cutting. See the charts below.

5.2.2 Spindle speed in rpm and m/second with Pentruder 8-20HF with 15 / 18 / 22 kW HF-motor

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters, with blade speed potentiometer setting at 80%, which corresponds to 350Hz:

Gear	***Ø 600***	***Ø 800***	***Ø 1000***	***Ø 1200***	***Ø 1600***	***Ø 2000***
1 = 405 rpm	*12,8*	*17*	*21,3*	*25,5*	34,1	42,6
2 = 590 rpm	*18,4*	*24,5*	*30,6*	36,7	49	Not permitted
3 = 735 rpm	*23,1*	*30,8*	38,5	46,2	Not permitted	Not permitted
4 = 925 rpm	*29,1*	38,8	48,5	Not permitted	Not permitted	Not permitted

Pentruder 8-20HF with 15 / 18 / 22 kW HF-motor and potentiometer setting at 80%.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters, with blade speed potentiometer setting at 90%, which corresponds to 400Hz:

Gear	***Ø 600***	***Ø 800***	***Ø 1000***	***Ø 1200***	***Ø 1600***	***Ø 2000***
1 = 460 rpm	14,6	19,5	24,4	29,2	39,0	48.8
2 = 670 rpm	21,0	28,0	35,0	42,0	56,0	Not permitted
3 = 840 rpm	26,5	35,3	44,1	52,9	Not permitted	Not permitted
4 = 1055 rpm	33,3	44,4	55,4	Not permitted	Not permitted	Not permitted

Pentruder 8-20HF with 15 / 18 / 22 kW HF-motor and potentiometer setting at 90%.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters, with blade speed potentiometer setting at 100%, which corresponds to 440Hz:

Gear	***Ø 600***	***Ø 800***	***Ø 1000***	***Ø 1200***	***Ø 1600***	***Ø 2000***
1 = 510 rpm	16	21,5	26,5	32	42,5	53,5
2 = 735 rpm	23	31	38,5	46	Not permitted	Not permitted
3 = 925 rpm	29	39	48,5	Not permitted	Not permitted	Not permitted
4 = 1165 rpm	36,5	49	Not permitted	Not permitted	Not permitted	Not permitted

Pentruder 8-20HF with 15 / 18 / 22 kW HF-motor and potentiometer setting at 100%.

5.2.3 Spindle speed in rpm and m/second Pentruder 8-20iQ with 15, 18, 22, (27) kW HF-motor

It is only with the 27 kW HF-motor that the cutting speed differs between the different HF-motors. The values for the 27 kW HF-motor are in paranthesis in the tables below.
Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters, with blade speed potentiometer setting at 80%:

Gear	***Ø 600***	***Ø 800***	***Ø 1000***	***Ø 1200***	***Ø 1600***	***Ø 2000***
1 = 360 (415) rpm	11,5 (13)	15 (17)	19 (22)	23 (26)	30,5 (35)	38 (43,5)
2 = 520 (600) rpm	16,5 (19)	22 (25)	27,5 (31,5)	33 (38)	44 (50)	55 (Not permitted)
3 = 660 (755) rpm	20,5 (23)	27 (31)	34,5 (39,5)	41,5 (47,5)	55 (Not permitted)	Not permitted
4 = 830 (945) rpm	26 (30)	35 (40)	43,5 (50)	52 (Not permitted)	Not permitted	Not permitted

Pentruder 8-20iQ with 15 / 18 / 22 / (27) kW HF-motor and potentiometer setting at 80%.The values for the 27kW HF-motor are in paranthesis.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters, with blade speed potentiometer setting at 90%.

Gear	***Ø 600***	***Ø 800***	***Ø 1000***	***Ø 1200***	***Ø 1600***	***Ø 2000***
1 = 415 (470) rpm	13 (15)	17 (19)	22 (24,5)	26 (29,5)	35 (39)	43,5 (49)
2 = 600 (670) rpm	19 (21)	25 (28)	31,5 (35)	38 (42)	50 (56)	55 (Not permitted)
3 = 755 (845) rpm	23 (27)	31 (36)	39,5 (44)	47,5 (53)	Not permitted	Not permitted
4 = 945 (1065) rpm	30 (33)	40 (45)	50 (56)	Not permitted	Not permitted	Not permitted

Pentruder 8-20iQ with 15 / 18 / 22 / (27) kW HF-motor and potentiometer setting at 90%.The values for the 27kW HF-motor are in paranthesis.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters, with blade speed potentiometer setting at 100%,

Gear	***Ø 600***	***Ø 800***	***Ø 1000***	***Ø 1200***	***Ø 1600***	***Ø 2000***
1 = 455 (520) rpm	15 (16)	19 (22)	24,5 (27)	29,5 (33)	39 (43,5)	49 (54,5)
2 = 655 (745) rpm	21 (23)	28 (31)	35 (39)	42 (47)	56 (Not permitted)	Not permitted
3 = 830 (940) rpm	27 (30)	36 (39)	44 (49)	53 (39)	Not permitted	Not permitted
4 = 1040 (1185) rpm	33	45	56	Not permitted	Not permitted	Not permitted

Pentruder 8-20iQ with 15 / 18 / 22 / (27) kW HF-motor and potentiometer setting at 100%.The values for the 27kW HF-motor are in paranthesis.

5.2.4 Spindle speed in rpm and m/second with Pentruder CBK with 22 HF-motor

Peripheral cutting speed and spindle speed in metres / second for different blade diameters, @ 300Hz:
Set blade speed potentiometer at 70%=min setting:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**	**Ø 1600**
600 rpm	18.8 m/s	25 m/s	25 m/s	28.2 m/s	31.3 m/s	37.6 m/s	50.1 m/s

Pentruder CBK with 22 kW HF-motor and potentiometer setting at 70% = min setting

Peripheral cutting speed and spindle speed in metres / second for different blade diameters, @ 350Hz:
Set blade speed potentiometer at 80%:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**	**Ø 1600**
697 rpm	21.9 m/s	25.6 m/s	29.2 m/s	32.9 m/s	36.5 m/s	43.8 m/s	Not allowed

Pentruder CBK with 22 kW HF-motor and potentiometer setting at 80%

Peripheral cutting speed and spindle speed in metres / second for different blade diameters, @ 400Hz:
Set blade speed potentiometer at 90%:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**	**Ø 1600**
797 rpm	25 m/s	29.2 m/s	33.4 m/s	37.6 m/s	41.7 m/s	50.1 m/s	Not allowed

Pentruder CBK with 22 kW HF-motor and potentiometer setting at 90%

Peripheral cutting speed and spindle speed in metres / second for different blade diameters, @ 500Hz:
Set blade speed potentiometer at 100%:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**	**Ø 1600**
996 rpm	31.3 m/s	36.5 m/s	41.7 m/s	46.9 m/s	52.2 m/s	Not allowed	Not allowed

Pentruder CBK with 22 kW HF-motor and potentiometer setting at 100% = max setting

5.2.5 Spindle speed in rpm and m/second with Pentruder 6-12 with 15 / 18 HF-motor

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 350 Hz,
Set blade speed potentiometer at 80%:

Gear = spindle speed	Ø 600	Ø 700	Ø 800	Ø 900	Ø 1000	Ø 1200
1 = 640 rpm	20.2 m/s	23.5 m/s	26.9 m/s	30.2 m/s	33.6 m/s	40.3 m/s
2 = 940 rpm	30.0 m/s	35.1 m/s	40.1 m/s	45.1 m/s	*Not permitted*	*Not permitted*

Pentruder 6-12HF with 15 / 18 kW HF-motor and potentiometer setting at 80%.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 400 Hz,
Set blade speed potentiometer at 90%:

Gear = spindle speed	Ø 600	Ø 700	Ø 800	Ø 900	Ø 1000	Ø 1200
1 = 720 rpm	22.7 m/s	26.5 m/s	30.2 m/s	34.0 m/s	37.8 m/s	45.4 m/s
2 = 1075 rpm	33.8 m/s	39.4 m/s	45.1 m/s	50.7 m/s	*Not permitted*	*Not permitted*

Pentruder 6-12HF with 15 / 18 kW HF-motor and potentiometer setting at 90%.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 440 Hz,
Set blade speed potentiometer at 100%:

Gear = spindle speed	Ø 600	Ø 700	Ø 800	Ø 900	Ø 1000	Ø 1200
1 = 800 rpm	25.2 m/s	29.4 m/s	33.6 m/s	37.8 m/s	42.0 m/s	50.4 m/s
2 = 1200 rpm	37.6 m/s	43.8 m/s	50.1 m/s	*Not permitted*	*Not permitted*	*Not permitted*

Pentruder 6-12HF with 15 / 18 kW HF-motor and potentiometer setting at 100%.

5.2.6 Spindle speed in rpm and m/second with Pentruder 6-10 with 15 / 18 HF-motor

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 300 Hz,
Set blade speed potentiometer at 70%=min setting:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**
815 rpm	25.6	29.9	34.1	38.4	42.7	51.2

Pentruder 6-10HF with 15 / 18 kW HF-motor and potentiometer setting at 70% = min setting.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 350 Hz,
Set blade speed potentiometer at 80%:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**
940 rpm	30.0	35.1	40.1	45.1	*Not permitted*	*Not permitted*

Pentruder 6-10HF with 15 / 18 kW HF-motor and potentiometer setting at 80%.

Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 400 Hz,
Set blade speed potentiometer at 90%:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**
1075 rpm	33.8	39.4	45.1	50.7	*Not permitted*	*Not permitted*

Pentruder 6-10HF with 15 / 18 kW HF-motor and potentiometer setting at 90%.

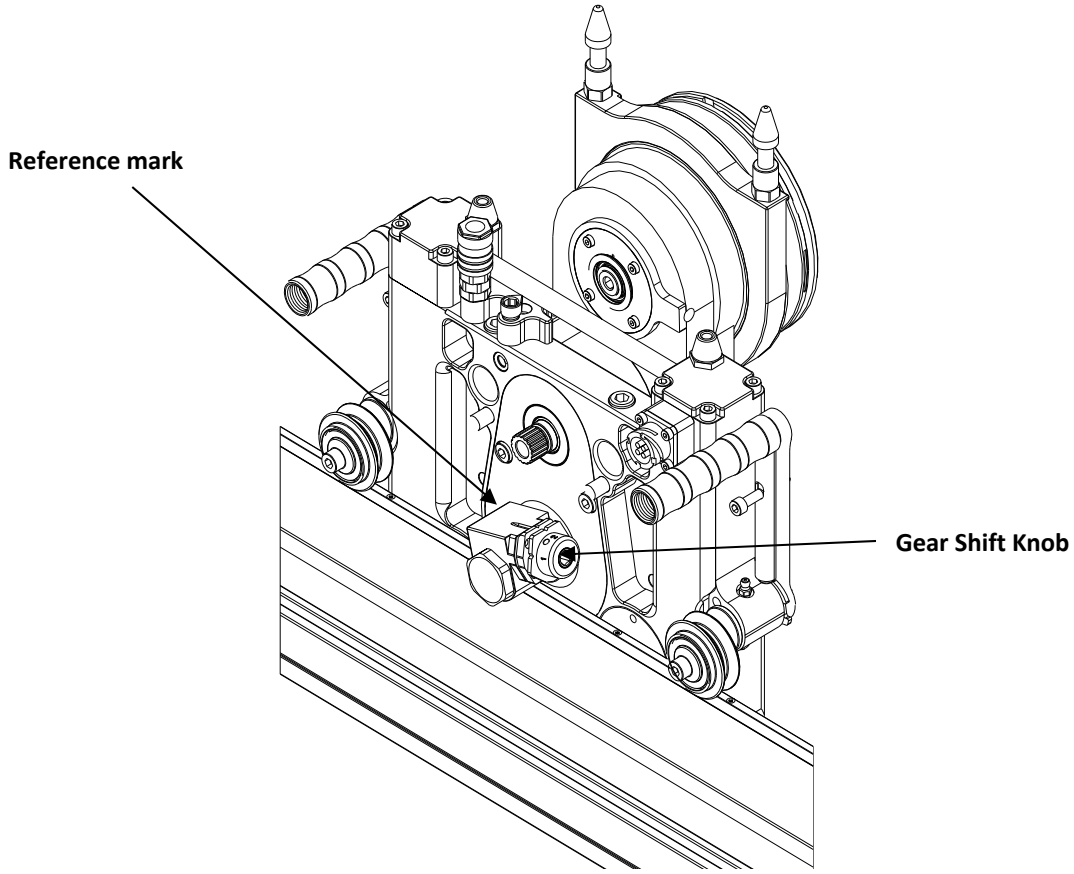
Spindle speed in rpm and peripheral cutting speed in metres / second for different blade diameters at 440 Hz,
Set blade speed potentiometer at 100%:

Spindle speed	**Ø 600**	**Ø 700**	**Ø 800**	**Ø 900**	**Ø 1000**	**Ø 1200**
1200 rpm	37,6	43,8	50,1	*56.3*	*Not permitted*	*Not permitted*

Pentruder 6-10HF with 15 / 18 kW HF-motor and potentiometer setting at 100%.

5.2.7 Gearshift - how to change gear on the Pentruder 6-12HF, 8-20iQ and 8-20HF:

a. Rotate the saw arm to be perpendicular out from the wall.
b. The gear selection knob, placed between the HF-motor and the saw head gearbox housing, is numbered from 1 to 2 (6-12HF) or 1 to 4 (8-20HF and 8-20iQ). 1 is for low speed and 2 or 4 for high speed. Push in the knob by hand or with an 8 mm (5/16") T-key and turn the blade slightly back and forth while turning the knob to the required position.
c. Release the button again to lock the selector knob in position.

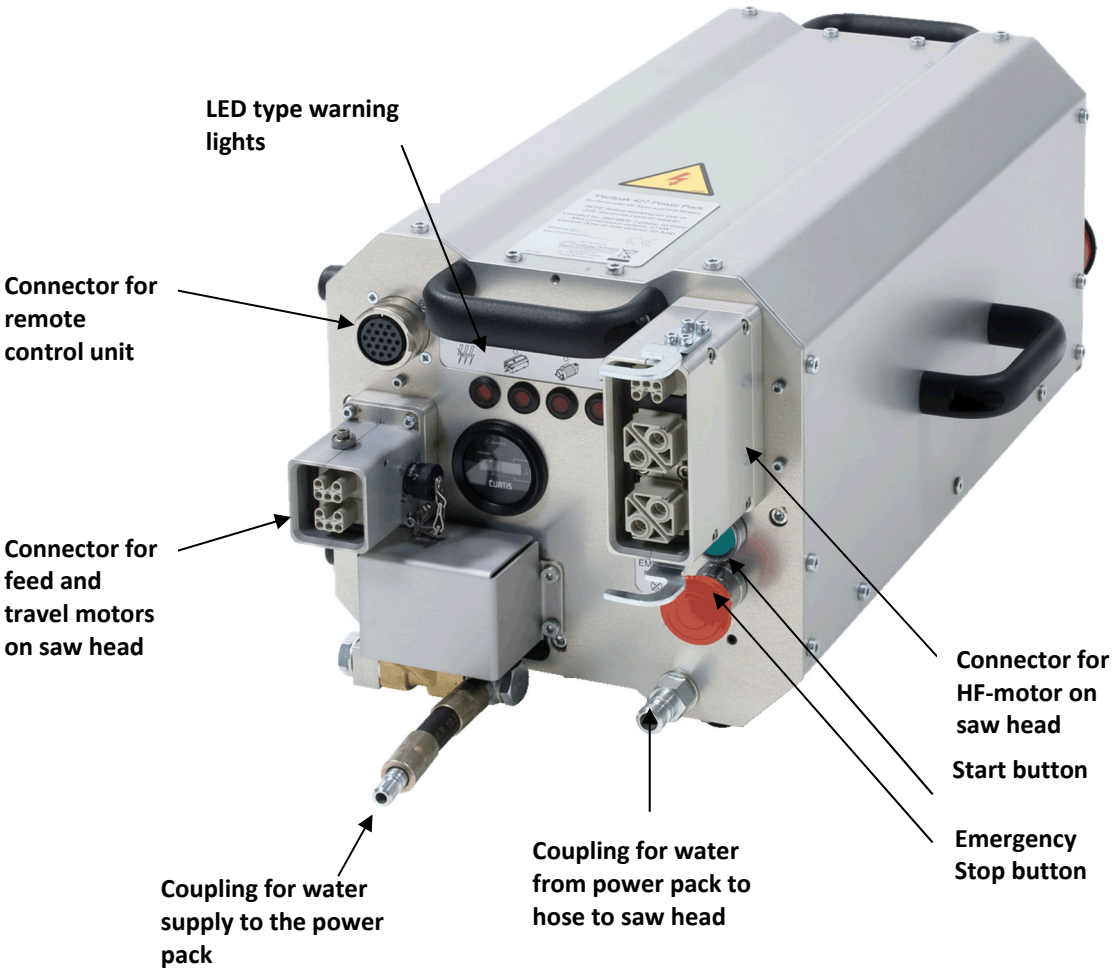


Picture shows Pentruder 6-12HF

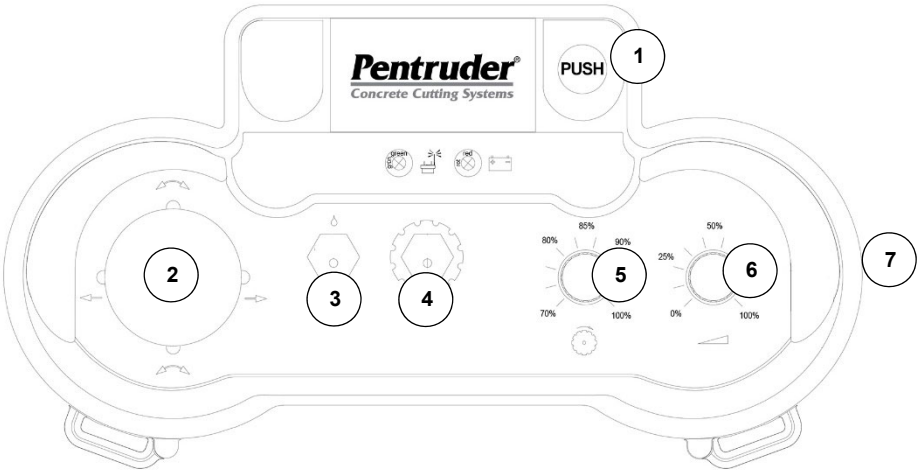
! Important!	• Do <u>not</u> use a ratchet to shift gears. The gear selection mechanism may then be damaged. • The 2-speed gearbox will be seriously damaged if the gear selection knob is in an incorrect position.

Warning!	• The gear selection knob may not be operated before first disconnecting the machine from the electric power supply.

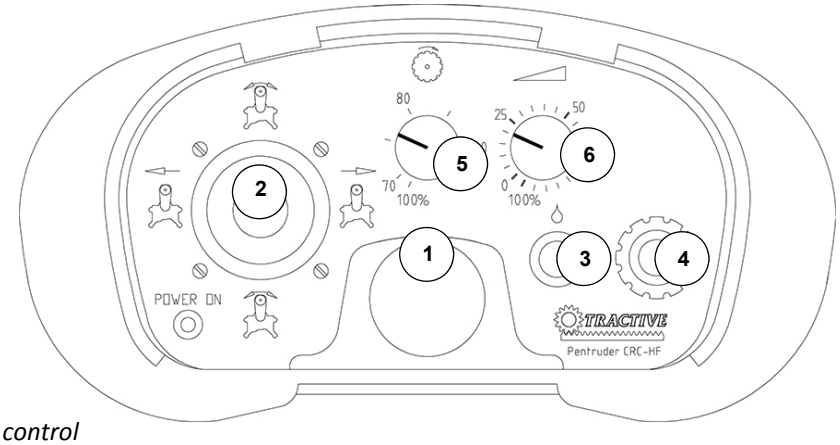
5.3 Starting the HF-machine



Pentpak HF-power pack



WRC Wireless remote control



CRC Cable remote control

1. Emergency stop button
2. Plunge and travel control joystick
3. Water valve ON/OFF switch
4. Blade motor ON/OFF switch
5. Blade speed control knob/potentiometer
6. Feed control knob/potentiometer
7. Start key

It is not possible to control any functions on the machine unless a remote control is connected to the power pack, either via cable or the wireless remote control.

5.3.1 Start the saw blade

a. Make sure the emergency stop button on the remote control is out (released position).
b. Turn the start key on the Wireless remote control to pos "1". Two short beeps will follow and the green LED on the Wireless remote control will start flashing. The wireless remote control is now on but not yet activated.
c. To activate, turn the start key from pos "1" to the next position (like starting a car) and release.
Step b and c are not necessary when using the cable remote control.
d. Push the green start button on the Pentpak and check that the green light comes on.
e. Turn the Blade speed control knob/potentiometer and the Feed control knob/potentiometer to zero and put the joystick in neutral position.
f. Push the Switch for Water valve ON/OFF forward and hold, then within 5 seconds, push the Blade motor ON/OFF switch forward, and then let go of both switches to start the blade. The blade will start rotating CW (clock wise) seen from the blade side.
g. Adjust the rpm by turning the Blade speed control knob. See below and also 5.2.1 How to choose correct cutting speed.
h. The water flow will be switched on automatically when the blade is started.

5.3.2 Stop the blade

To stop the blade, push the Blade motor ON/OFF switch forward once again.

5.3.3 Switch for water valve:

Move the switch forward to start and stop the water flow through the machine. The water flow will be switched on automatically when the blade is started. The water will be left running when the blade motor is stopped and the water must be switched off by pushing the Water valve ON/OFF switch once again.

! **Important!**

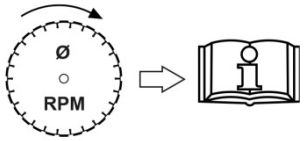
- To avoid overheating, the motor will be switched off automatically if the motor winding temperature is over 140°C (284°F). The coolant water should then be left running through the power pack and HF motor to avoid terminal overheating.
- If the water is turned off immediately after the motor has been switched off automatically, for instance due to overload and the warning light is on, terminal damage to the motor windings may occur.

5.3.4 Starting to cut - Blade speed control knob

Turn the left potentiometer (Blade speed control knob) to desired cutting speed and make sure the correct gear is chosen (if applicable). Refer to the charts on page 27 - 31.

The minimum speed is set at 70% of the maximum speed. Full power is available when the Blade speed control knob is set at between 85 % and 100 % on the potentiometer scale.

Warning!



- The peripheral cutting speed may not exceed approximately 56 metres / second as this can cause the blade to fail. In the worst case segments can come loose and be thrown with high velocity.
- For very hard aggregate the peripheral cutting speed should not exceed 30 metres /second.
- If the wrong potentiometer setting is used the blade can rotate with a too high peripheral speed, which can cause the blade to fail and lead to fatal injury.
- When using big blades the potentiometer for blade speed control may not be set at a too high % when starting cutting.

5.3.5 Feed and power regulation – Feed control knob

As long as the blade is spinning in the air, the potentiometer is used only to control rapid feed of the machine. From the moment the blade touches the concrete and a pre-set amperage draw is exceeded, the potentiometer changes its function and is then used to control the power used to drive the blade.

The Feed control knob can usually be set at 100%.

If the potentiometer is turned below 80% the power output will be reduced correspondingly. This can be useful if the fuse or power source is not big enough or the saw blade is not cutting well with the full power of the machine.

5.3.6 Plunge and travel

Flick the Joystick for plunge and travel up or down to rotate the radial arm. Flick the joystick left or right to move the saw head along the track.

A pre-cut not deeper than approximately 5 cm is always recommended to avoid that the saw blade cuts un-straight.

5.3.7 In case of a jammed saw blade

The power pack has an automatic function for resetting the frequency inverter if the blade is jammed. Move the blade out of the cut, or at least to a position where it can be started without too much resistance, and press the blade ON/OFF switch forward once, then it takes approx. 15 seconds for it to reset. Certain reset procedures are activated depending on how sudden the stop was.

If the blade is jammed very, very abrupt, the reset procedure might not be enough. In this case you need to unplug the unit from the power supply, wait for minimum 30 seconds and plug it in again.

Note!

If one of the emergency stop buttons are pressed or the unit has been unplugged from the power supply, both the blade speed and the feed and travel potentiometers must be returned to zero before the machine is operational again.

6 Troubleshooting

6.1 Check list

6.1.1 The Pentpak or HF-motor doesn't start or the feed and/or travel doesn't work

a. Check the LED's on the Pentpak. See 6.2 LED type warning lights on the power pack.
b. Check that the fuses are ok.
c. Check that the incoming voltage is not too high or low. See 4.6.5 Power supply and connection to mains.
d. Check that cables and connectors are not damaged.
e. Reset the power pack. Disconnect the power supply and wait 1 minute, re-connect power supply. Then press the green start button to start the power pack again.
f. If the power supply is equipped with an earth leakage circuit breaker that trips, the problem can be caused by the sum of the earth leakage from all equipment which is connected to the same power supply. It is not always the last machine connected (the one which causes the earth leakage circuit breaker to trip) which is the sole cause of the problem. It can be any of the connected machines or the combination.

6.1.2 The green start button on the Pentpak is ON, no indications on the LED warning lights but the machine doesn't respond to any command from the remote control.

This is one of the few cases which cannot be indicated on the LED warning lights. If possible, try another remote control. The remote control needs to be checked by the authorized Pentruder service workshop.

6.1.3 The saw blade doesn't cut straight

a. Check if anything of the following applies.
b. The track is not correctly mounted on the track feet. See 4.1 Preparation and mounting of track feet and tracks.
c. The conical rollers that run on the track are not correctly adjusted. See Every day / week maintenance for instruction.
d. There is too much play in the spindle bearings. The spindle bearings always has a little play, but too much play means the saw head has to be sent to your Pentruder authorized service company to have the bearing replaced.
e. The saw blade is damaged and/or badly balanced. Check that it is straight with a big set square. It is important that the blade is held upright in a vertical position when checking that it is straight.

6.1.4 The saw stopped working

a. Please refer to the Troubleshooting Table in the Appendix for Wireless Remote Control: Hetronic User's Manual.
b. Check if the battery is completely run down.
d. If you have a CRC cable remote control available, try using the saw with the CRC remote.
e. If you have the accessory cable for the WRC wireless remote control, check if the saw works when used with the accessory cable.

6.2 LED type warning lights on the power pack

There are four red warning LED:s on the Pentpak. Below is an explanation of the respective functions.

6.2.1 LED for indication of loss of one or more phases

One blink: - - - - - - - - - - - - - -

Loss of phase from power supply. This can be caused by a blown fuse, faulty cords, faulty plugs or receptacles, or other problems. Check fuses, input voltage, cords etc.

Two blinks: -- -- -- -- -- -- -- -- --

Too low incoming voltage. Can be caused by too long and/or too small extension cables. Check voltage, connectors, cords and generator if applicable.

Three blinks: --- --- --- --- --- --- --- ---

Too high incoming voltage. Connect only to 3-phase 380 – 480V. Check voltage, connectors, cords and generator if applicable.

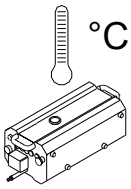
With one phase missing from the power supply, feed and travel may work, but the blade will not start.

General advice to eliminate any of the above fault conditions: Eliminate the cause of the problem, i.e. replace blown fuses, repair cords, repair or replace plugs and receptacles. If possible, test with replacing the cable.

Note!

A voltage meter doesn't always show a voltage drop in one of the phase lines because this cannot be measured without electrical load applied. A voltage meter can show normal voltage even though there are voltage losses when the machine is running.

6.2.2 LED indicating status for the Pentpak



One blink: - - - - - - - - - - - - - -

Overcurrent alarm. May occur if the blade is jammed in the cut,
Press start blade switch to reset or unplug the unit for 60 seconds.

Two blinks: -- -- -- -- -- -- -- -- --

Unknown device connected to Pentpak. Software update needed in Pentpak.

Three blinks : --- --- --- --- --- --- --- ---

Other internal alarm for frequency inverter. Unplug the unit from the power supply, wait at least one minute and plug it in again. If the alarm has gone away you can proceed as normal.
If the alarm doesn't go away, the Pentpak needs to be checked by the authorized Pentruder service workshop.

Four blinks : ---- ---- ---- ---- ---- ---- ----

Frequency inverter alarm. The Pentpak needs to be checked by the authorized Pentruder service workshop.

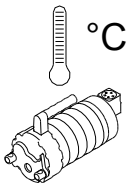
Quick blinks: ----------

Temperature in the frequency inverter has risen to a too high level. Protect from direct sunlight, increase water flow.

Continuously on: ——————————

The Pentpak is shut off due to over temperature.

6.2.3 LED indicating status for the HF-motor



1) **Pentpak is powered, but the green start button on the Pentpak has not yet been pressed.** A test is made for the digital communication to the HF-motor and the machine.

One blink: - - - - - - - - - - - - - - -

Short circuit in the digital communication system. The fault can be in the HF-motor, motor cable or inside the Pentpak.

a) Disconnect motor cable from Pentpak. If the alarm disappears, go on to b). If the alarm remains the same the Pentpak is faulty.
b) Connect motor cable again to Pentpak and now disconnect the motor cable from HF-motor. If the alarm disappears, go on to c).
   If the alarm appears when connecting, the cable is faulty.
c) Connect motor cable to Pentpak and HF-motor. If the alarm appears when connecting, the connector on the HF-motor is faulty.

2) **Pentpak is powered, and the green start button on the Pentpak button has been pressed**.

One blink: - - - - - - - - - - - - - - -

The HF-motor ID is wrong. Nothing is broken, but the HF-motor is incompatible with the Pentpak or the machine. For example trying to use a 22 kW HF-motor with a Pentruder 6-12HF saw head (invalid combination). Another example would be that a newer model of HF-motor is introduced that didn't exist when the Pentpak was delivered. If this is the case, a software update is required.

Two blinks: -- -- -- -- -- -- -- -- --

HF-motor temperature sensor in windings is not working correctly. Repair is required.

Three blinks: --- --- --- --- --- --- --- ---

HF-motor or motor cable is not working correctly. Short circuit or open circuit. If possible, try another motor cable and/or HF-motor. If the problem remains, a repair is required.

Quick blinks: ----------

HF-motor temperature is high, output power is automatically reduced. Increase water flow.

Continuously on: ———————————

HF-motor has been shut off due to over temperature.
This can also indicate that no HF-motor is connected or that the powerpack doesn't find a motor on the digital bus, e.g. damaged motor-ID chip or motor cable.

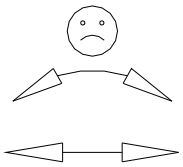
! **Important!**

- The motor will be switched off automatically when the motor winding temperature is over 140°C (284°F). The coolant water should then be left running through the power pack and HF motor to avoid terminal overheating.
- If the water is turned off after the motor has been switched off automatically, and when the warning light is on, terminal damage to the motor windings may occur.

⇨ **Note!**

- The outside temperature of the motor is no indication of the inside temperature of the motor. The temperature sensor is placed inside the motor windings and does not monitor the outside temperature of the motor. The windings can be working at a high temperature even if the motor is cold on the outside.
- The warning light will be off when the temperature has gone down to a temperature below 110°C. The motor cannot be restarted until the warning light goes off.

6.2.4 LED indicating status for the feed and travel drive system



1) **Pentpak is powered, but the green start button on the Pentpak button has not yet been pressed.** A test is made for the digital communication to the HF-motor and the machine.

Three blinks: - - - - - - - - - - - - - - - - - - - - - - - -

Short circuit in the digital communication system. The fault can be in the machine, 24V cable or inside the Pentpak.

a) Disconnect 24V cable from Pentpak. If the alarm disappears, go on to b). If the alarm remains the same, the Pentpak is faulty.
b) Connect 24V cable to Pentpak and disconnect machine. If the alarm disappears, go on to c).
   If the alarm appears when connecting, the cable is faulty.
c) Connect 24V cable to Pentpak and machine. If the alarm appears when connecting, the connector on the machine needs repair.

2) **Pentpak is powered, and the green start button on the Pentpak button has been pressed.**

One blink: - - - - - - - - - - - - - - -

Short circuit in the 24V cable, machine or any of the feed motors in the machine.

Two blinks: - - - - - - - - - - - - - - - - - -

24V under voltage alarm. The voltage has dropped below 18V (internally in the Pentpak). Repair at an authorized Pentruder service workshop is required.

Three blinks: - - - - - - - - - - - - - - - - - - - - - - - -

Automatic identification of machine type not working correctly.
The chassis-ID is wrong. Nothing is broken, but the HF-motor is incompatible with the Pentpak or the machine. For example trying to use a 22 kW HF-motor with a Pentruder 6-12HF saw head (invalid combination). Another example would be that a newer model /type of machine is introduced that didn't exist when the Pentpak was delivered. If this is the case, a software update is required.

Four blinks: - - - - - - - - - - - - - - - - - - - - - - - - - - - -

No digital servo found. Digital servo is defective. Repair at an authorized Pentruder service workshop is required.

Continuously on: ———————————————

The digital servo has shut off due to over temperature.
Push the emergency stop button to reset.

This can also indicate that no machine is connected or that the powerpack doesn't find a machine on the digital bus, e.g. damaged chassis-ID chip or 24V cable.

7 Maintenance

For the machine to remain in a condition which is safe for operation at all times, certain maintenance is needed. Please also see 7.3 for storage of the machine.

The maintenance in chapter 7.1 Every day / week maintenance should be performed by the operator or a service technician.

The maintenance in chapter 7.2 Maintenance which should be performed by Pentruder authorized technician, should be performed every 80 running hours or at least once per year. Follow the recommendations of your Pentruder authorized sales and service company.

If you plan to perform some of the maintenance yourself, please contact your Pentruder authorized sales and service company to get spare parts lists and more instructions.

WARNING! No service or maintenance may be performed on the machine unless it is disconnected electrically from the mains.

7.1 Every day / week maintenance

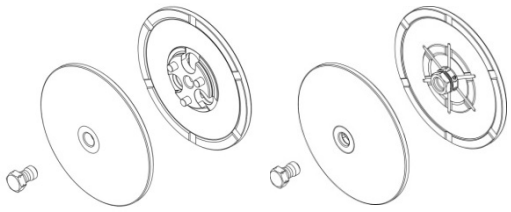
7.1.1 Cleaning the machine, grease and lubricate and check all functions

The machine should be carefully cleaned and all functions checked and found normal before use of the machine. If a high pressure cleaner is used, the nozzle may NOT be pointed at any of the rotating parts or connectors on the machine. Tractive recommends using a water hose with a brush and to use covers on the electrical connectors or keep the mating connector connected when cleaning to prevent water and dirt to get into the connectors.

Parts on the machine which are extra important to keep clean, lubricated and check the function of are:

7.1.2 Blade flange and centre screw

The threads on the centre screw and the female thread on the blade flange should be clean and well lubricated with grease. Use a brass brush to clean.
The friction surfaces of both the flange and the blade must be kept dry and free from grease and dirt to be able to securely transmit the torque of the saw blade motor without slippage.
Slippage will cause irreparable damage to the flanges. The bolt and the female thread in the blade flange may never start to corrode.

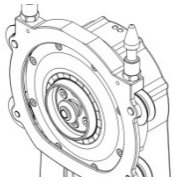


7.1.3 Bolts for flush cutting flange

Always replace worn, corroded or damaged bolts with new of correct length and quality, M8 x 25 10.9 or M10 x 25 10.9, see How to fit a saw blade on a flush cutting flange.

7.1.4 Quick disconnect coupling for blade

The quick disconnect coupling is provided with drive dogs to transmit the torque to the blade and a centering cone to align the flange to the spindle. See Mounting of saw blade. Clean the dogs and the centering cone on the outside and inside regularly with a brass brush to allow the flange to always be aligned and properly in mesh. If they are not clean, the coupling may be damaged beyond repair and the blade may not run true.

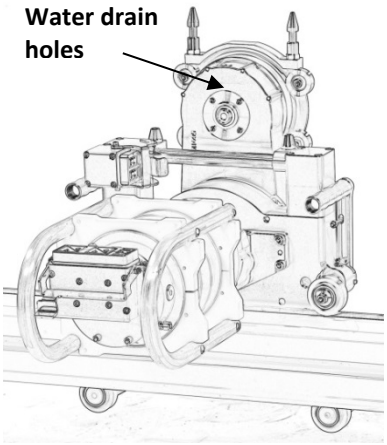


Warning!

- Corrosion of the threads or any part mentioned above may cause failure of the bolt which can result in serious injury and even to fatal injuries to persons in close proximity of the machine.
- Always keep all part of the coupling clean and lubricated! The safe operation of the coupling depends on cleanliness of all coupling parts on the machine, and the blade flange!

7.1.5 Water seal assembly in saw head

The water drain holes should be checked every day.



If water comes out of the Water Drain Holes, while the water is switched on, this is an indication that the water seal assembly must be replaced.
We recommend replacing the complete water seal assembly.
Contact your Pentruder authorized sales and service company if you want to replace only parts in the water seal assembly.

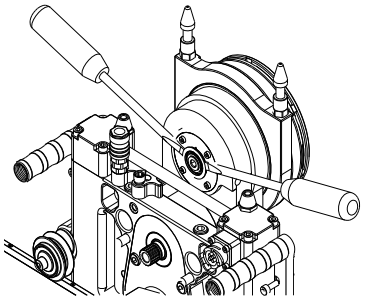
If oil comes out of the Water Drain Holes, contact your Pentruder authorized sales and service company for repair.

!	**Important!**	If the water seals and/or wear sleeve in the water seal assembly are not replaced in time, water may enter the saw arm transmission and gearbox, which may cause the transmission to seize or cause irreparable damages.

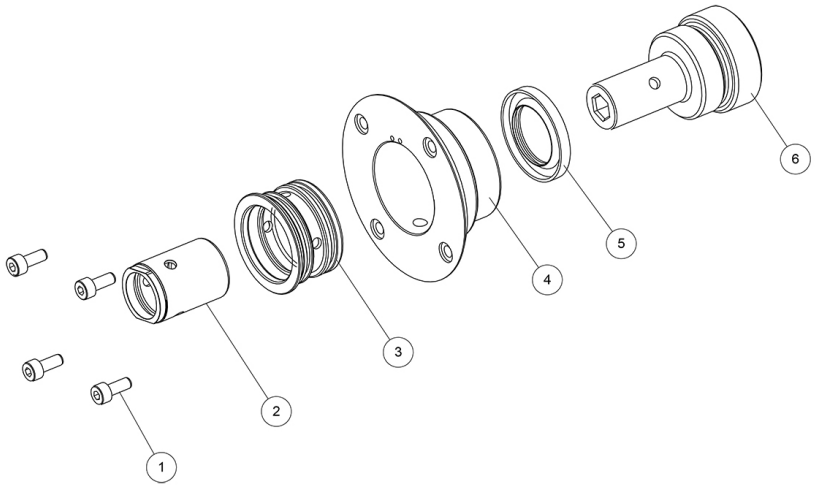
There are previous versions of the water seal assembly. If your water seal assembly looks different, please contact your Pentruder authorized sales and service company for instructions.

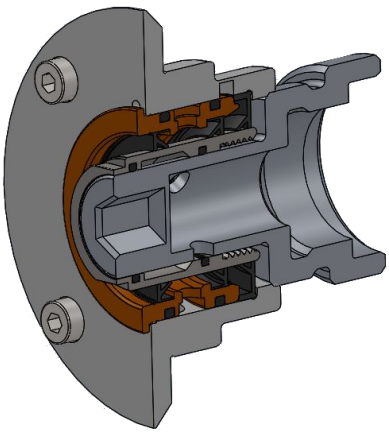
Procedure to replace water seal assembly

1. First remove the wear sleeve pos. 2, using a 19 mm key.
2. Use two screw drivers to pry out the water seal housing with seals, pos 3 as shown in the picture to the right.
3. Use a plastic hammer to lightly tap the water seal assembly, pos 3 in place again.
4. Tighten the wear sleeve pos. 2, using a 19 mm key.



!	**Important!**	Don't use the wear sleeve to fasten the blade flange as this will damage the wear sleeve.





Water seal assembly

7.1.6 Gearbox oil (Arm transmission)

Check the condition of the gearbox oil (arm transmission) every week. To check, clean thoroughly around the plug and blow with compressed air before the plug is removed. If dirt is allowed to enter, the gearbox may seize and the warranty is not valid.

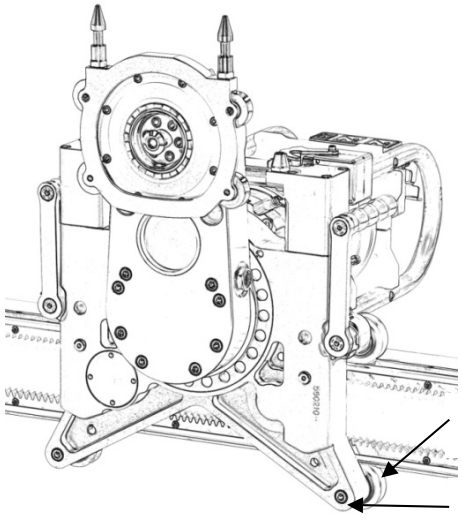
If the oil seems to contain water, it needs to be replaced.

Please contact your Pentruder authorized workshop for service.

!	**Important!**	Failure to follow the recommendations above may lead to failure of the transmission or cause irreparable damages.

7.1.7 Track rollers

- Adjust the track rollers correctly on the track. Use a 6 mm allen key for loosening the locking screw, use another 6 mm allen key from the track roller side to adjust the lower eccentric shafts on which the rollers are fitted, until tight. There should be a little resistance when turning the handles to lock the saw on the track.



- Check that the track rollers on the saw head can move freely without too much friction. A certain amount of friction is always present as the bearings are double sealed with both rubber and steel scraper seals. Contact your Pentruder distributor or service center for replacing bearings and steel scraper seals when worn or if the rollers don't run freely.

7.1.8 Eccentric locking mechanism for handles

If necessary, grease the eccentric locking mechanism for the handles.

7.1.9 Cables and connectors

Check that all cables and connectors are undamaged and in faultless condition.
Make sure all connectors are clean and dry. Do not lubricate the pins and sockets since that will attract more dirt compared to a clean and dry one.

7.1.10 Remote control

Check the remote control for correct function.
For the wireless remote control, refer to the Appendix for Wireless Remote Control: Hetronic User's Manual.

7.1.11 HF-motor Quick disconnect coupling

Check the HF-motor quick disconnect coupling for correct function and cleanliness. See 4.5 Quick disconnect coupling for HF-motor on saw head.
Lubricate screw threads weekly with grease.

7.2 Maintenance which should be performed by Pentruder authorized technician

7.2.1 Oil change

Oil change may only be carried out by a Pentruder authorized technician.
All oil change described below should be performed according to the schedule or at least once per year. Follow the recommendations of your Pentruder authorized sales and service company.

! **Important!** Before attempting to change oil, clean thoroughly around the plug and blow with compressed air before the plug is removed. If dirt is allowed to enter the gearbox, the gearbox may seize and any warranty is void.

Oil quantity and sort /
Recommended oil change intervals

PENTRUDER	**6-10HF**	**6-12HF**	**CBK**	**8-20HF + IQ**
Arm transmission	180 ml Omega 690 *80 hours*	180 ml Omega 690 *80 hours*	325 ml Omega 690 *80 hours*	500 ml Omega 690 *80 hours*
Travel worm gear transmission	60 ml Omega 680 *80 hours*	60 ml Omega 680 *80 hours*	60 ml Omega 680 *80 hours*	60 ml Omega 680 *80 hours*
Arm feed worm gear transmission	60 ml Omega 680 *80 hours*	60 ml Omega 680 *80 hours*	80-100 ml Omega 680 (100 ml in completely dry machine) / *80 hours*	80-100 ml Omega 680 (100 ml in completely dry machine) / *80 hours*
Slip clutch transmission housing	140 ml Omega 690 *200 hours*	140 ml Omega 690 *200 hours*	25 ml Omega 690 80 hours	30 ml Omega 690 *80 hours*
Gear change mechanism		20 ml Omega 690 *200 hours*		
		15 / 18 kW HF-motor	**18 / 22 / 27 kW HF-motor**	**18 / 22 / 27 kW HF-motor**
High speed transmission	235 ml Mobil SHC 626 *80 hours*	235 ml Mobil SHC 626 *80 hours*	235 ml Mobil SHC 626 *80 hours*	235 ml Mobil SHC 626 80 *hours*
Cooling housing at rear of motor	85 ml Mobil SHC 626 *80 hours*	85 ml Mobil SHC 626 *80 hours*	85 ml Mobil SHC 626 *80 hours*	85 ml Mobil SHC 626 *80 hours*

Please use only these oils in Pentruder products.
If other oils than the recommended are used in transmissions, oil should be changed twice as often.

Oil change in the saw head gearbox (arm transmission)

To change oil, unscrew the oil-plug and drain the arm completely. Refill with 0.325 L (0.34 quart) of Omega 690 gearbox oil. Clean the magnetic plug, fit it and tighten again.

Oil change in the travel and arm feed worm gear transmission
The travel worm gear transmission is filled with 60 ml (2 fl oz) and the arm feed worm gear transmission with 80-100 (2.7 – 3.4 fl oz) ml of Omega 680 oil.

Oil change in slip clutch transmission housing
Refill with 25 ml (0.85 fl oz) of Omega 690 oil every 80 hours of operation.

Oil change in the HF-motor high speed transmission
Unscrew the oil-plug and drain the gearbox completely. Refill with 0.235 L (0.248 quart) of **clean and preferably filtered** gearbox oil, preferably Mobil SHC 626. It must be synthetic oil with 75W viscosity. The oil must meet GL5 specifications. Clean the magnetic plug, fit it and tighten again.

Cooling housing at rear of HF-motor
Fill with 85 ml (2.9 fl oz) of Mobil SHC 626 at service.

7.2.2 Overload clutches

If any of the overload clutches have been overloaded or worn out, a Pentruder authorized technician can repair the coupling by replacing the clutch plates.

7.2.3 Digital communication connectors

All parts in the connectors are available (except remote control connector). All wires can be re-installed with standard hand tools (except remote control connector).

7.2.4 Wireless remote control

The wireless remote control should be checked at least once a year. By doing this, the life span of the wireless remote control will be prolonged. See Maintenance in the Appendix for Wireless Remote Control: Hetronic User's Manual.

7.3 Transport and storage of the machine

- Disconnect the cables from the power pack before transporting the machine.
- The saw blade and blade guard should be taken off the saw head before transport.
- Make sure no unauthorized persons can get access to the machine when in transport and storage.
- If there is a risk of freezing, the machine has to be drained from water. Pay extra attention to the power pack. See 4.6.3 Connection to water supply.
- Store the machine in a dry place, preferably above freezing temperature.
- Follow the saw blade manufacturer's instructions for transport and storage of the saw blade.

8 Technical data

Technical details can be subject to change without prior notice.

	8-20iQ	8-20HF	CBK	6-12HF	6-10HF
Saw blade diameter max.:	2000 mm (78")	2000 mm (78")	1600 mm (63")	1200 mm (48")	1200 mm (48")
Max cutting depth with max blade (Blade radius minus 85 mm (3.35"):	915 mm (36")	915 mm (36")	715 mm (28")	515 mm (20.3")	515 mm (16.4")
Max start blade Ø:	1000 mm (39")	1000 mm (39")	925 mm (36")	800 mm (32")	800 mm (32")
HF-motors which can be used with the saw head:	15 / 18 / 22 / 27 kW (22 / 25 / 30 / 37 hp)	15 / 18 / 22 / 27 kW (22 / 25 / 30 / 37 hp)	15 / 18 / 22 / 27 kW (22 / 25 / 30 / 37 hp)	15 / 18 kW (24 / 20 HP)	15 / 18 kW (24 / 20 HP)
Max output power depending on HF-motor size:	27 / 22 / 18 / 15 kW (37 / 30 / 24 / 20 HP)	27 / 22 / 18 / 15 kW (37 / 30 / 24 / 20 HP)	27 / 22 / 18 / 15 kW (37 / 30 / 24 / 20 HP)	18 / 15 kW (24 / 20 HP)	18 / 15 kW (24 / 20 HP)
Max output torque:	22 kW (30 HP) motor: 1: 480 Nm @455 rpm 2: 335 Nm @655 rpm 3: 265 Nm @830 rpm 4: 210 Nm @1040 rpm 27 kW (37HP) motor 1: 480 Nm @520 rpm 2: 335 Nm @750 rpm 3: 265 Nm @940 rpm 4: 210 Nm @1180 rpm	22 kW (30 HP) motor: 1: 430 Nm @510 rpm 2: 300 Nm @735 rpm 3: 240 Nm @925 rpm 4: 190 Nm @1165 rpm	22 kW (30 HP) motor: 275 Nm	18 kW (24 HP) motor: 1: 245 Nm 2: 165 Nm	15 kW (20 HP) motor: 130 Nm
Spindle speed under load:	22 kW (30 HP) motor: 1: 310 - 460 rpm 2: 450 - 660 rpm 3: 565 - 830 rpm 4: 710 - 1040 rpm 27 kW (37HP) motor: 1: 350 - 520 rpm 2: 525 - 745 rpm 3: 660 - 940 rpm 4: 830 - 1185 rpm @ 350 – 500 Hz	22 kW (30 HP) motor: 1: 350 - 510 rpm 2: 500 - 735 rpm 3: 630 - 925 rpm 4: 795 - 1165 rpm @ 300 – 440 Hz	600-996 rpm @ 300 – 500 Hz	1: 640 - 800 rpm 2: 940 - 1200 rpm @350-440Hz	815 – 1200 rpm @350-440Hz
Travel Motor - Max speed:	24V DC - 1.8 m /min		24V DC - 1.8 m /min	24V DC - 1.8 m /min	24V DC - 1.8 m /min
Feed Motor - Max arm rot. Speed:	24V DC - 0.9 rpm		24V DC - 0.9 rpm	24V DC - 0.9 rpm	24V DC - 0.9 rpm
Water feed:	Central through the blade flanges				
Standard blade flange:	- 60 mm arbor size, 156 mm outer diameter - 1" arbor size, 6.1" outer diameter - 1-3/8" arbor size, 6.1" outer diameter				
Flush cutting flanges:	- 60 mm arbor size, 6x M8 P.C.D. 130 mm - 60 mm arbor size, 6x M10 P.C.D. 110 mm - 60 mm arbor size, 6x M10 P.C.D. 108 mm - 60 mm arbor size, 6x M10 P.C.D. 110 mm & 6x M8 P.C.D. 130 mm - 1-3/8" arbor size, 6x 3/8" (M10) P.C.D. 4-1/4" - 1" arbor size, 6x 3/8" (M10) P.C.D. 4-1/4"				

Weight saw head:	25.5 kg (56 lbs)	24.3 kg (54 lbs)	23.5 kg (52 lbs)	21 kg (46 lbs)	20 kg (44 lbs)

	All Pentruder HF-wall saws
Saw blade arbor diameter:	60 mm (1-3/8" and 1" for the U.S. market)
Water feed:	Central through the blade flanges
Standard blade flange:	- 60 mm arbor size, 156 mm outer diameter - 1" arbor size, 6.1" outer diameter - 1-3/8" arbor size, 6.1" outer diameter
Flush cutting flanges:	- 60 mm arbor size, 6x M8 P.C.D. 130 mm - 60 mm arbor size, 6x M10 P.C.D. 110 mm - 60 mm arbor size, 6x M10 P.C.D. 108 mm - 60 mm arbor size, 6x M10 P.C.D. 110 mm & 6x M8 P.C.D. 130 mm - 1-3/8" arbor size, 6x 3/8" (M10) P.C.D. 4-1/4" - 1" arbor size, 6x 3/8" (M10) P.C.D. 4-1/4"
Protection class:	IP66
Sound pressure level[2]:	95 dB(A)

HF-motor / kW (HP)	**27 kW (37 HP)**	**22 kW (30 HP)**	**18 kW (24 HP)**	**15 kW (20 HP)**
Weight:	18 kg (40 lbs)	18 kg (40 lbs)	16.5 kg (36 lbs)	13 kg (28.6 lbs)

HF-power pack	**Pentpak 418 / 422 / 427**	**Pentpak 200* / 218 / 222**
Input voltage:	380 – 480 V	200 – 230 V
Input frequency:	50 – 60 Hz	50 – 60 Hz
Output frequency:	300 – 500 Hz	300 – 500 Hz
Input power maximum:	31 kW (42 hp)	31 kW (42 hp)
Max. continous output power (depending on motor size):	15 / 18 / 22 / 27 kW (22 / 25 / 30 / 37 hp)	
Minimum fuse:**	16 Ampere (25 Ampere for 27 kW)	40 Ampere
Recommended fuse:	40 Ampere	80 Ampere
Current draw at max. output:	56 Ampere (15 – 22 kW)	90 Ampere
Recommended generator size:	45 kVA	
Output voltage to feed and travel motors:	24 VDC	
Height (incl. handles, connectors):	28 cm (11")	
Width (incl. handles connectors etc.):	30 cm (11.8")	
Length:	68 cm (26.8")	
Weight:	26 kg (57.3 lbs)	
Water cooling:	Min. 4 litres (1 gallon) of cool water per minute at full power output. Water pressure: Min 1 bar (15 PSI), Max 5 bar (72.5 PSI)	
Protection class:	IP54	

* 400 Hz

** The power output must be reduced to about 65% by turning the feed rate knob to 65%.

Noise emission	**Sound power level[1]**	**Sound pressure level[2]:**
Sound power level[1]:	112 dB(A)	95 dB(A)

1) Noise emissions in the environment measured as sound power (L_{WA}) in conformity with EN 15027/A1. Measured in accordance with EN ISO 3744:1995.
2) Noise pressure level according to EN 15027/A1. Reported data for noise pressure level has a typical statistical dispersion (standard deviation) of 1.0 dB(A). Measured in accordance with EN ISO 11201:1995.

Declaration of Conformity

According to the Machinery Directive 2006/42/EC, annex A1

The Manufacturer: Tractive AB
Gjutargatan 54
78170 Borlänge
Sweden

Person authorized to compile the technical file:
Anders Johnsen
Gjutargatan 54
78170 Borlänge
Sweden

Hereby declare that the machine:

Category:	High Frequency Wall Saw
Make:	Pentruder
Type	6-10HF/ 6-12HF/CBK/8-20HF/8-20iQ
Drive system:	Pentpak power pack
Type:	427 / 422 / 418 / 222 / 218 / 200
Drive motor:	HF-motor
Type of drive motor:	15, 18, 22, 27 kW HF-motor
Accessories:	As stated in this Operator's manual.

Is in conformity with the provisions of the Machinery Directive 2006/42/EC.
Is in conformity with the provisions of the following other EC-directives:

- Low Voltage Directive 2014/35/EU
- EMC-Directive 2004/108/EC

In accordance with the EC-declaration of conformity, the product must not be modified without the manufacturer's permission. If this occurs, this documented EC-declaration ceases to apply and the modifier is considered to be the manufacturer and must verify and draw up an addendum to the EC-declaration and file technical data for the inspection authority.

Borlänge 21st of February, 2014

A. Johnsen

Anders Johnsen

Technical Director

Installation Certificate

The Manufacturer: Tractive AB
Gjutargatan 54
78170 Borlänge
Sweden

Hereby declare:

- That a WRC Wireless Remote Control is installed according to the regulations in force for the machine.

  Manufactured by: Hetronic

  System number: 20215166371

  - Transmitter: Nova XL, Production No: _____
  - Receiver: RX14-HL, Production No: _____

- That the radio control interface between the machine and the receiver is suitable and has been properly manufactured according to the instructions given by the manufacturer and that all of the necessary tests have been carried out.

Signed for and on behalf of Tractive AB, Borlänge, 2015-08-27

Anders Johnsen
Technical Director

The person responsible for the installation of the WRC Wireless Remote Control:

- Will by connecting the WRC Wireless Remote Control and Receiver to a machine, as described in this Operator's manual, complete the installation described above.
- Hereby declares to have received the Operator's manual and the Appendix for Wireless Remote Control: Hetronic User's Manual and to have understood the contents.

Signature of person responsible for WRC installation

_____

Place, Date

_____

Name (PRINTED), Title

_____