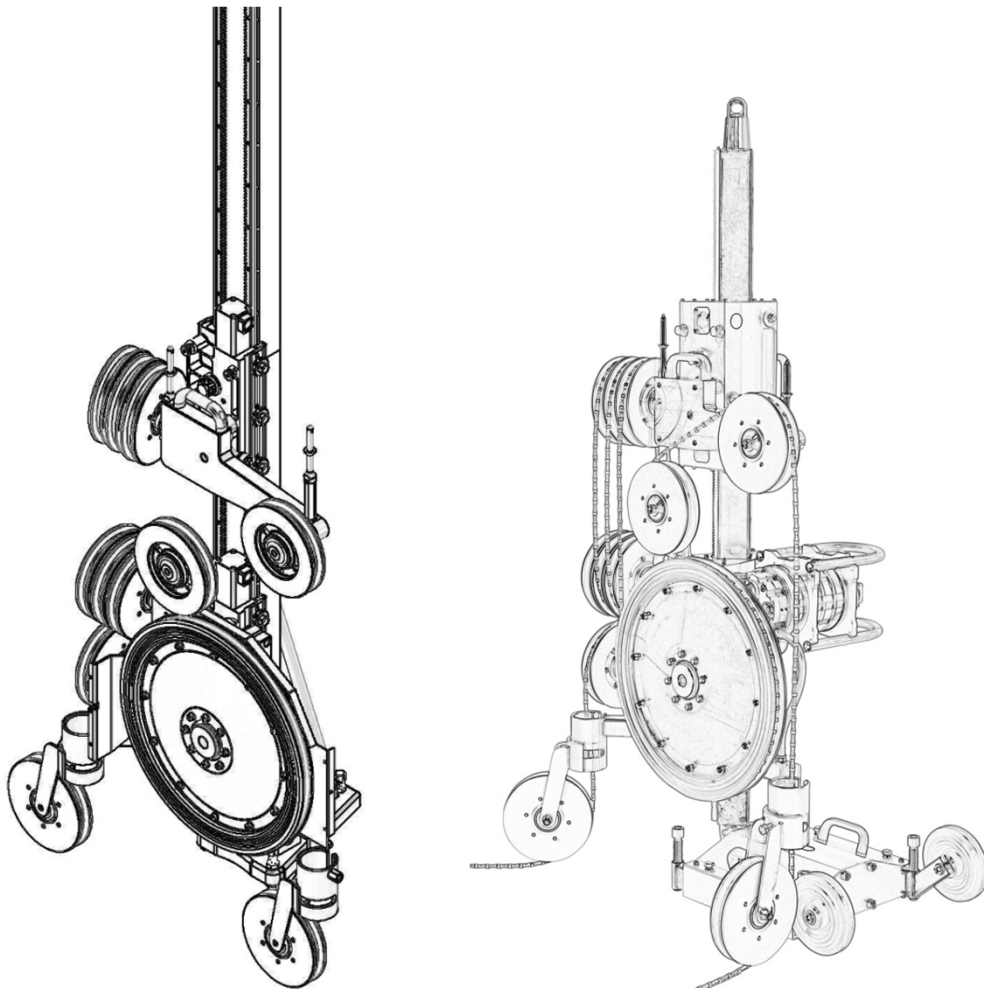


Operator's manual

Pentruder® 3P8 HF-wire saw &
Pentpak® High frequency power pack



Pentruder®

by **TRACTIVE**

Operator's manual for Pentruder® 3P8 High Frequency Wire Saw and Pentpak® high frequency power pack



Version: 2.4 Date: 2012-02-13
Support & Service document
Original instructions



Copyright © 1997-2012 Tractive AB.

Pentruder and Pentpak are registered trademarks belonging to Tractive AB.

Contents

1	Introduction.....	2
2	Description.....	3
2.1	Features	3
2.2	Modules 3P8	5
2.3	Drive motor	7
2.4	Rig for 3P8 wire saw with 70 mm column system	8
2.5	Rig for 3P8 wire saw with saw track (MCCS)	11
2.6	Cutting results and life time of parts.....	13
2.7	Why does the 3P8 use so many rollers in the wire magazine?	14
3	Safety instructions	15
3.1	Safety instructions which are used in this operator's manual.....	15
3.2	Intended use of the 3P8 wire saw	15
3.3	General safety instructions.....	16
3.4	Safety precautions at site.....	17
4	Mounting the Pentruder 3P8 wire saw	18
4.1	Overview Pentruder 3P8 with 70 mm column system.....	18
4.2	How to position the wire saw – 70 mm column system.....	18
4.3.	Standard mounting sequence with 70 mm column system	22
4.4	Overview Pentruder 3P8 with TS track (MCCS)	25
4.5	How to position the wire saw with TS track (MCCS)	26
4.6.	Standard mounting sequence with TS track (MCCS)	28
4.7	Mounting the 3P8 wire saw modules	31
4.8.	Assembly of HF-motor, cords and hoses	33
4.9.	Attach guards	34
5	Guidelines on how to operate the Pentruder 3P8 wire saw.....	35
5.1	Safety when wire sawing.....	35
5.2	Positioning the Pentruder 3P8 Guide rollers	36
5.3	Automatic feed control – power / tension system.....	36
5.4	To prepare before cutting commences.....	37
5.5	Pentpak HF-power pack	38
5.6	Guidelines to follow when commencing a cut	44
5.7	Cutting of soft concrete, or concrete mixed with soft materials.....	45
5.8	Cutting with wire under water	45
6	MAINTENANCE.....	46
7	Technical Data Pentruder Modular Rig System	48
	Declaration of conformity – Pentruder 3P8 Wire Saw	51
	Declaration of conformity – Pentpak HF-power packs	52

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 3P8 Wire Saw System has been developed based on over 30 years of experience in this specialized field. With correct handling it offers outstanding performance, safety and reliability.

The diamond wire cutting technique has been employed advantageously since many years especially for jobs where the objects have been difficult to reach to, or too big to be cut with circular saws, or other methods. Stitch drilling has been popular for many years, but due to its low overall efficiency, wire cutting has more or less taken over from stitch drilling. With wire cutting, one is not limited by depth of cut. The technique can be used to make cuts through huge objects without damaging the adjacent concrete structures. Big sections can be removed reducing cost for splitting block in several pieces. Wire cutting is a relatively quiet method, and very little vibration is produced.

It is essential that all personnel working with or in close proximity to the wire saw have read and understood the contents of this manual before commencing operations. By reading and understanding the manual the operator will be able to take advantage of the many features and benefits of the Pentruder 3P8 Wire Saw System. Should questions arise, please contact our sales agent.

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

Product:

3P8 Wire Saw System - High frequency motor driven.

Power source: directly from Pentpak 418, 422, 427, 222, 218 or 200.

Manufacturer:

Tractive AB

Gjutargatan 54

S-781 70 Borlänge

Sweden

Phone: +46 243 - 22 11 55

Fax: +46 243 - 22 11 80

E-mail: info@tractive.se,

www.tractive.se

2 Description

2.1 Features

- The 3P8 wire saw can be driven by either one of the powerful 18, 22 or 27 kW HF-motors.
- Pentruder 3P8 wire saw can either be built on the wall saw track (MCCS) or on the 70 mm column system.



- Wire tensioning is fully automatic, with some exceptions. The tensioning of the wire is governed by software and a microprocessor / digital servo amplifier driven electric feed motor.
- The cutting speed is continuously variable from 0 to 22 m/second, 4330 sft/min, when driven by the 18, (25HP) and 22 kW (30HP) motors, and up to 25m/s, 4920 sft/min for the 27 kW (37HP) motor.
- The wire magazine stores 8 m of wire per 1 m of stroke of the tensioning carriage (the upper carriage). In the case of the square steel column system, the magazine can store (pull in) over 20 m of wire if the total column length is 3.0 m or more. Any combination of 0.5, 1.2, 1.5 and 2.0 m columns can be used. If the wall saw track version is preferred, the maximum length of track is 2.3 m with an unsupported track, or 3.45 m if the upper end of the track is supported by a brace.
- The wire can be run over all wheels on the machine without opening (cutting) the wire.
- A patent pending system allows the wire to be run also over the adjustable swivelling wheels, without having to cut the wire.
- Fully enclosing guards protects the operator(s) and keeps all expensive parts (reasonably) clean, like the carriages, main pulley drive system, column, etc.

- Normally, corners will NOT have to be broken off or chamfered before commencing a cut. Maximum torque is available from 0 motor speed, and the wire can be started smoothly. Note, a new wire with sharp bead edges is much harder to start over sharp corners than only an ever so slightly used wire. With a new wire, it may be necessary to chamfer edges on the object to be cut.
- The 3P8's design allows for direct cuts to be made, and satellite wheels can mostly be omitted. A direct cut means that the machine is fitted directly on the object to be cut, or very close to it, eliminating the need for extra satellite wheels.
- Due to the high tractive force of the drive system, even big cuts can be done without need for satellite wheels that lifts the wire off from the cut object. The 3P8 is powerful enough to pull the wire with sufficient force also when the wire is contact with the cut object over a long distance.

2.2 Modules 3P8

- 3P8-DP-HF, 3P8 Drive pulley electric
- 3P8-UA, 3P8 Upper assembly
- 3P8-LA, 3P8 Lower assembly

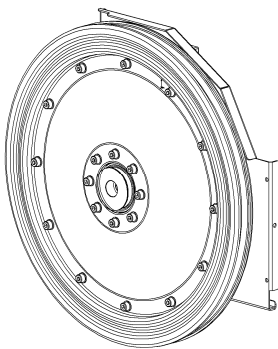
Guards

- 3P8-LMG, 3P8 Telescoping magazine guard
- 3P8-TG, 3P8 Top guard
- 3P8-DPG, 3P8 Drive pulley guard
- 3P8-SSG, 3P8 Slack side telescoping guard

2.2.1 3P8-DP-HF, 3P8 Drive pulley electric

The main drive pulley has a diameter of Ø 500 mm, 20". It has a rubber drive ring with a specially designed type of rubber compound giving very good traction wire to rubber, even when wet. The wire wraps around the main drive pulley over 270°, which gives superb traction.

The main drive pulley is driven by a Gates toothed high torque Carbon cog belt. The belt transmission is hidden behind guards and protected from concrete slurry. The belt can be replaced using only a set of standard 6, 8 and 14 mm Allen keys.



3P8-DP-HF = 3P8 Drive pulley for electric HF-motor

2.2.2 3P8-UA = 3P8 Upper assembly and 3P8-LA = 3P8 Lower assembly

All swivelling wheel assemblies can easily be removed from their holders for easy cleaning and maintenance, by just removing one screw.

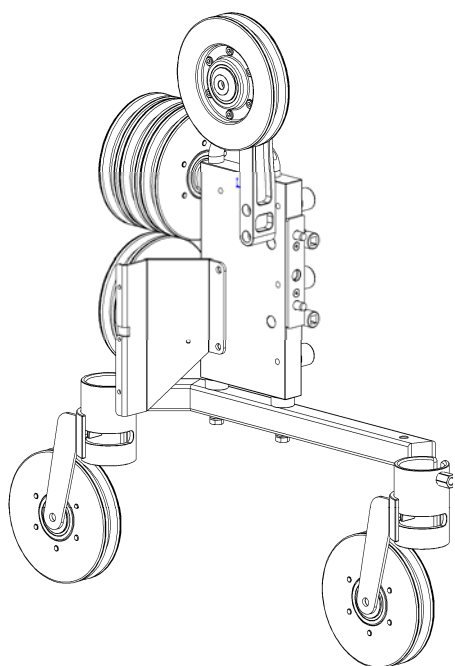
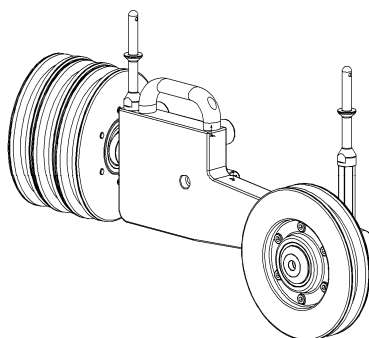
All pulleys can easily be removed from their mountings. All bearings are sealed with external seals.

The magazine and idler wheels are Ø 198 mm O.D., (7,8") and the wire is running on "pitch" Ø 180, (7.1").

The magazine and idler wheels have a rubber rings with a specially designed type of rubber compound giving very good wear resistance. There are totally eleven such wheels on the 3P8, including six wheels in the magazine.

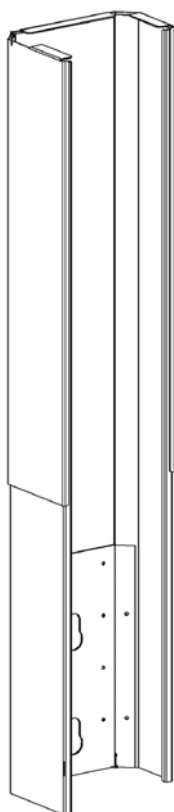
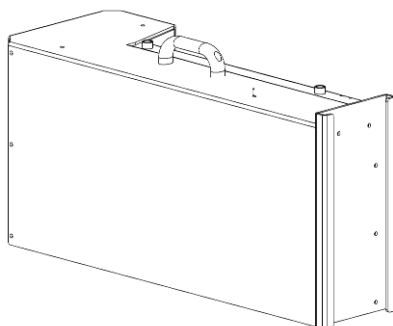
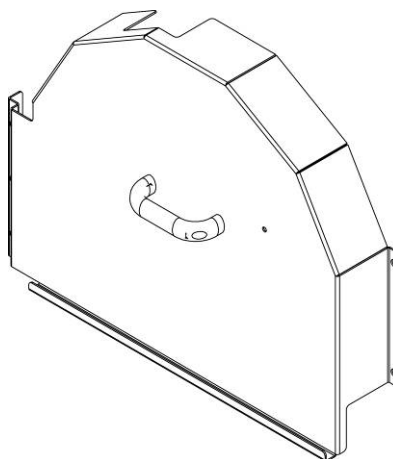
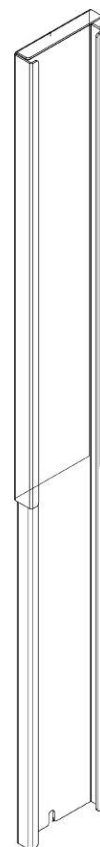
All pulleys are a two piece design, and are bolted together. All rubber liners (rings) can easily be replaced using standard tools.

When the rubber liners / rings are new, the groove width for the wire, in all wheels, is 10 mm, 0,3930", meaning that it's suitable for a Ø 11 mm, 7/16" wire. Ø 8 mm, 5/16" wire also works well

*3P8-UA = 3P8 Upper assembly**3P8-LA = 3P8 Lower assembly*

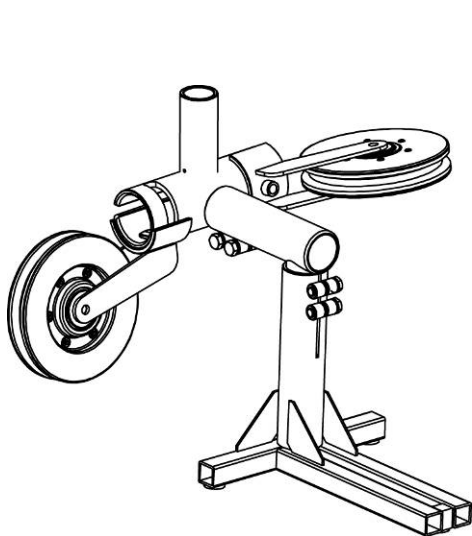
2.2.3 Guards

Fully enclosing and easy to fit guards protects the operator(s) and keeps all expensive parts (reasonably) clean, like the carriages, main pulley drive system, column, etc.

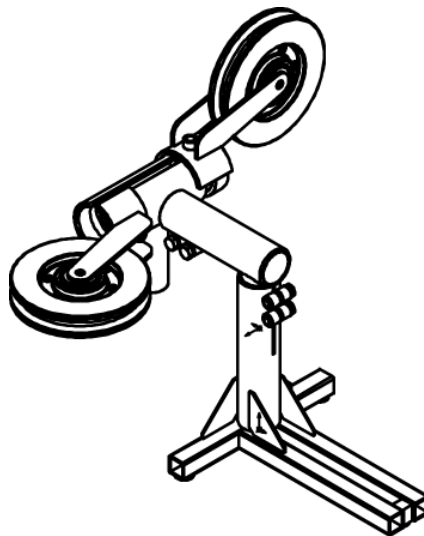
*3P8-LMG**3P8-TG**3P8-DPG**3P8-SSG*

2.2.3 Accessories, wire sawing

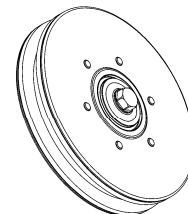
In some setups it can be useful to use satellite pulleys. We offer three versions. WSP2-90, a 2-link satellite pulley with 90°, WSP2-180, a 2-link satellite pulley with 180° and WSP2-180, a single satellite pulley.



WSP2-90



WSP2-180

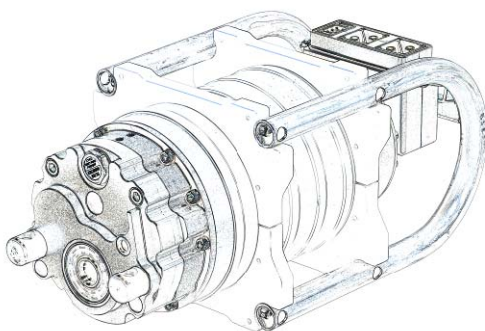


WSP2-180

2.3 Drive motor

- HFR418, 18 kW HF-motor, 400 V
- HFR422, 22 kW HF-motor, 400 V
- HFR427, 27 kW HF-motor, 400 V
- HFR218, 18 kW HF-motor, 200 V
- HFR222, 22 kW HF-motor, 200 V

The same HF-motor is used for both wire sawing and wall sawing. We recommend the HFR422, 22 kW HF-motor but the 18 kW and 27 kW HF-motors are also suitable for wire sawing.



HFR418, HFR422, HFR427

2.4 Rig for 3P8 wire saw with 70 mm column system

- CE1-70-3P8, Carriage CE1 for 3P8
- FE1, Friction brake for carriage
- CE1-70, Carriage CE1 for 70 mm columns
- PT-3P8, Electric feed unit 3P8 (100:1)
- CN 2.0-3P8, Column Female / plastic cap, 2 m (only extendable at the bottom)
- CN F/M, Columns F/M-70 Female / Male coupling, extendable, 0.5 / 1.2 / 1.5 m
- CN F/J, Columns F/J-70 Female / Jack screw, 0.5 / 1.2 / 1.5 m
- ET70, Eccentric bolt for TTFF and JTFF/JTFM tracks
- BE1, Base plate fixed quick disconnect coupling
- BETC, Base plate w top mount fixed quick disconnect coupling

2.4.1 CE1-70/3P8 Carriages, FE1 Friction brake and PT-3P8 Electric feed unit

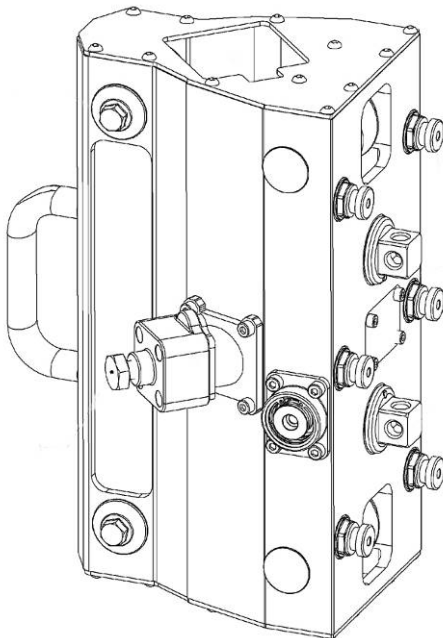
The lower carriage, CE1-70, doesn't move during operation of the wire saw. The friction brake prevents it from moving on the column during normal operation.



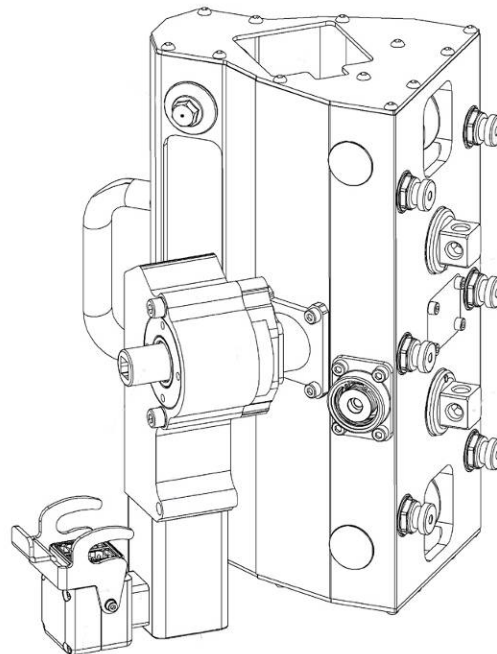
Note! Do not over tighten the friction brake.

The friction brake should be only moderately tightened so it will allow the carriage to slide upwards in the event of an abrupt jamming of the wire. The normal pulling force in the wire is about 100 kg's for a 22 kW HF-motor. Due to the amplifying effect of the forces, through the 3 loops in the magazine, the force applied on the carriages is 6 fold and can be in excess of 1000 kg during an abrupt jamming of the wire.

The Electric feed unit, PT-3P8, is fitted on the upper carriage, CE1-70-3P8. The electric feed unit moves the upper carriage upwards as the cutting advances. The feed rate is automatically controlled through software in the Pentpak HF-power pack and movement up and down is operated from the remote control.



CE1-70 with FE1



CE1-70-3P8

2.4.2 CN Columns and ET70 eccentric bolt

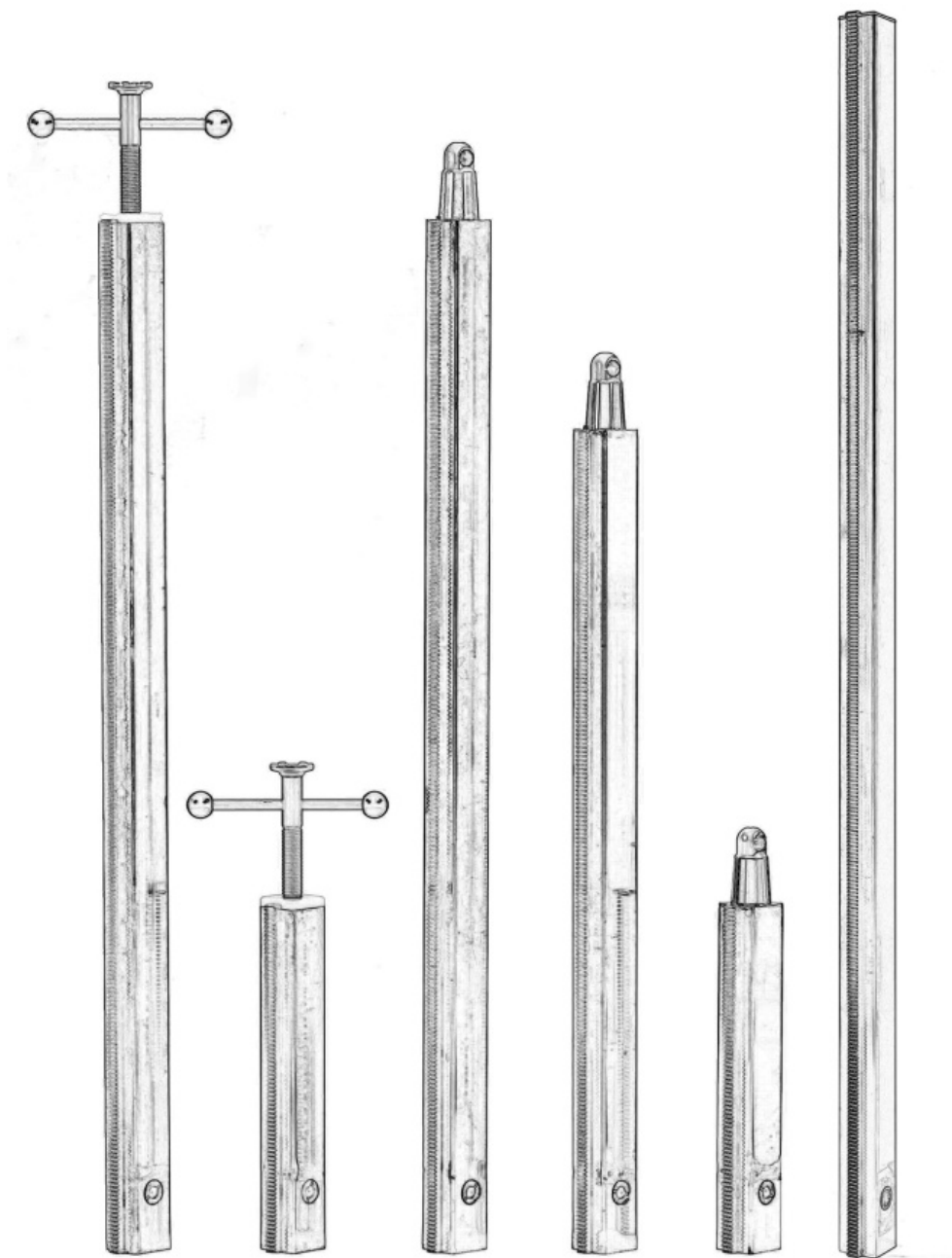
There are three types of 70 mm columns. Extendable columns CN F/M-70 with a female / male configuration, meaning that each column is fitted with a female conical quick release coupling at one end, and a male coupling at the other end.

Columns CN F/J-70 with a Jack Screw in one end, where the male coupling sits on an extendable column, are used to jack the machine against ceiling or wall.

There is also a column CN-3P8 with a female coupling in one end and a blanking plug in the other end. This column is 2.0 meters and mostly used for the Pentruder 3P8 wire saw.

The CN F/M and CN F/J columns are available in three lengths, 0.5 m, 1.2 m and 1.5 m.

The ET70 eccentric bolt is used to fasten the track to the base plate or to fit two columns to each other.



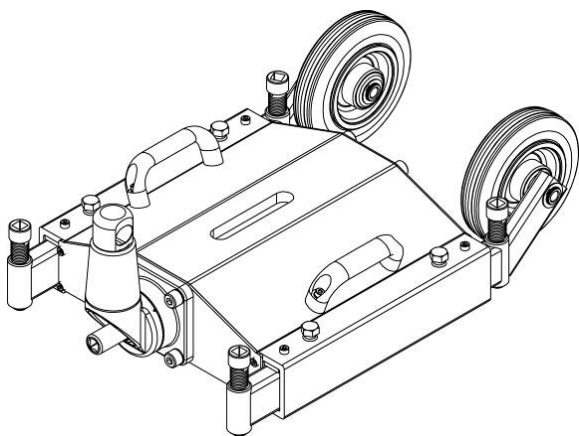
CN 1.5 F/J-70 / CN 0.5 F/J-70 / CN 1.5 F/M-70 / CN 1.2 F/M-70 / CN 0.5 F/M-70 / CN 2.0-3P8

2.4.3 BE1 and BETC base plates

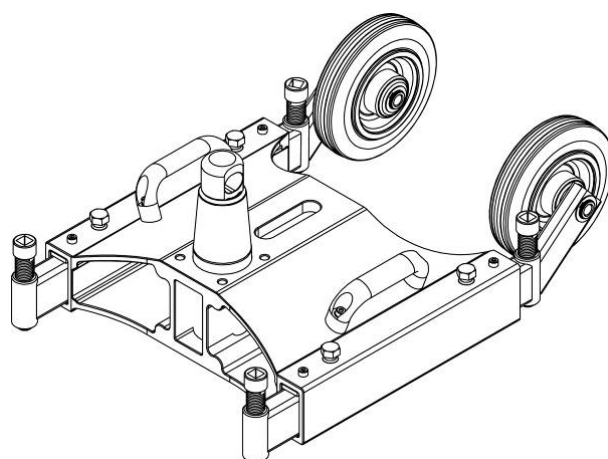
The BE1, BE2 and BETC base plates are used with CN columns, TTFF or JTFF tracks (see MCCS-rig). The conical quick coupling on BE1 is fixed. There is also a BE2 base plate where the conical quick coupling can be swiveled sideways in increments of 5°, but we don't recommend this base plate for wire sawing.

The base plate BETC has a top mounted fixed conical quick coupling.

The columns fitted on the conical quick release coupling can be swiveled around its own axis, and great flexibility is offered to simplify set-up.



BE1



BETC

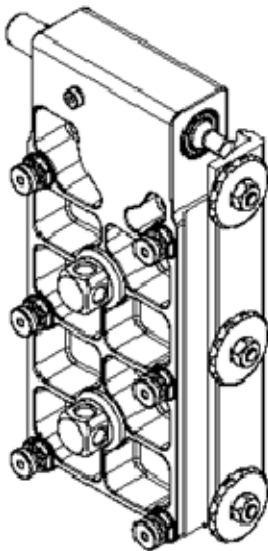
2.5 Rig for 3P8 wire saw with saw track (MCCS)

- CEG-M25 Carriage, gliding, 3P8, drilling, chain sawing, manual, gear ratio 25:1
- CEG-E-3P8 Carriage, gliding, 3P8, electric, total gear ratio 5000:1. Max feed speed 0.4 m/min.
- TS, T-slot type track, 0.85 / 1.15 / 1.7 / 2.0 / 2.3 / 3.45 m
- BTS4, Base plate for TS type tracks, rectangular, 220 x 320 mm

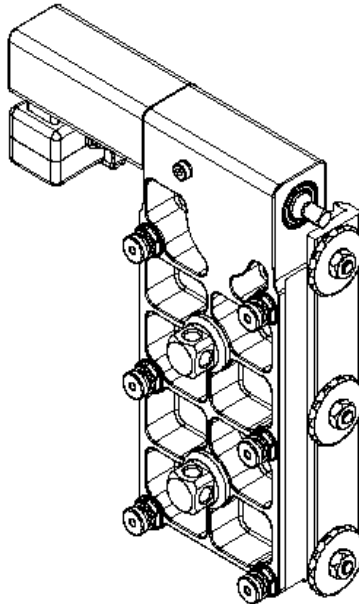
2.5.1 CEG Carriages - MCCS

The lower carriage, CEG-M25 doesn't move during normal operation.

The upper carriage, CEG-E-3P8 has a built in electric feed unit. The electric feed unit moves the upper carriage upwards as the cutting advances. The Electric feed unit, PT-3P8, is fitted on the upper carriage, CE1-70-3P8. The electric feed unit moves the upper carriage upwards as the cutting advances. The feed rate is automatically controlled through software in the Pentpak HF-powerpack and movement up and down is operated from the remote control.



CEG-M25

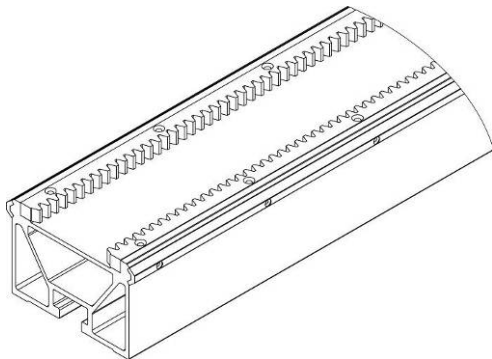


CEG-E-3P8

2.5.3 TS T-slot type track - MCCS

The Modular Concrete Cutting System (MCCS) is based on the t-slot type track which has been used for the Pentruder wall saw since 1997. The TS track is very light weight, yet offers great stiffness and stability to the system.

The TS tracks are available in the lengths 0.85, 1.15, 2, 2.3 and 3.45 m and the weight is 6.95 kg per meter.



TS0.85 / TS1.15 / TS1.7 / TS2.0 / TS2.3 / TS3.45

2.5.2 Base plate BTS4 - MCCS



BTS4 Base plate

2.6 Cutting results and life time of parts

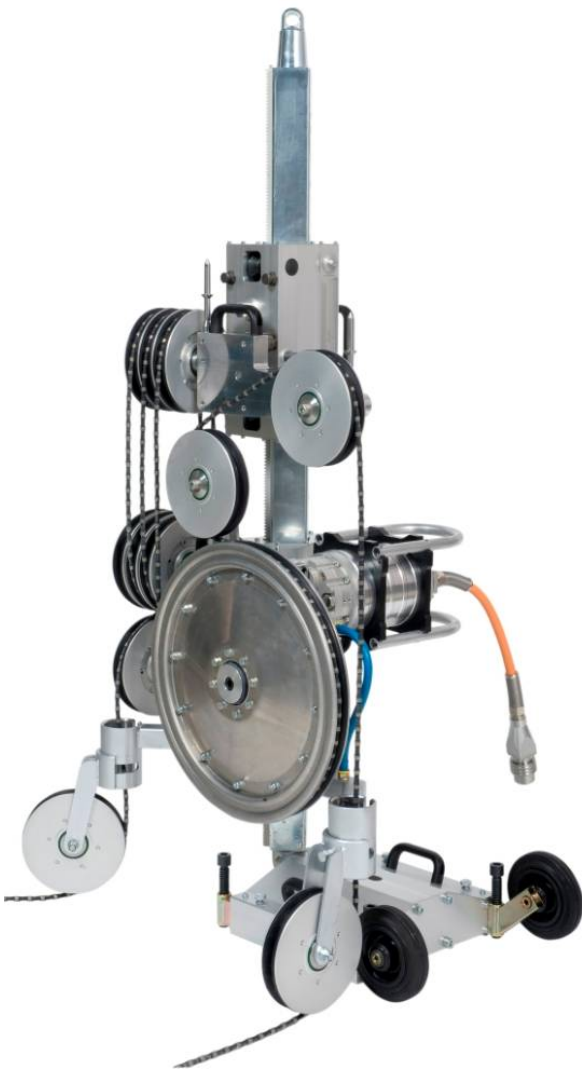
Normal results in concrete, using a wire that is well adapted to the high power of the 3P8 wire saw:

- Expect to cut between 3 – 6 m² (32 – 64 sq ft) per hour in reinforced concrete containing “normal” aggregate.
- Expect to cut between 1.5 – 3 m², (16 – 32 sq ft) per hour in reinforced concrete containing flint or river gravel aggregate.
- Lifetime of wire: 1.5 – 3 m² / meter of wire, (5 to 10 sq ft per linear ft) of wire depending on type of aggregate, content of steel, cutting speed, and quality of wire.
- Lifetime of bearings and rubber rings in magazine and idler rollers: 200 – 400 m², (2200 – 4400 sq ft). The magazine rollers closest to the main drive pulley are the ones that is exposed to the highest stress, and will need replacement of rubber rings more frequently than all other rollers.
- Lifetime of cog belt: 200 - 400 m², (2200 – 4400 sq ft).
- Lifetime of cog belt pulleys: 200 - 600 m², 2200 – 6600 sq ft.

2.7 Why does the 3P8 use so many rollers in the wire magazine?

There are four loops of wire being tensioned, three in the magazine, and one on the return or slack side, this means that if the upper carriage moves 1.0 meter, you have stored 8 meters in the magazine. Objects 2.2 x 10 m, (7,2 x 33 ft.), has been cut without shortening the wire, and then the carriage was moved over 2.5 meters, 8.2 ft up, taking in over 20 meters, 65 ft. of wire!

All 3 + 3 rollers in the magazine are used, always. The feed regulation parameters are based on the resistance and force needed to tension the wire when it runs over all rollers.



Pentruder 3P8 HF-wire saw on rig with 70 mm column system



Pentruder 3P8 HF-wire saw on rig with saw track (MCCS)

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 to the machine.

**WARNING!**

In these 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 to the machine.

3.2 Intended use of the 3P8 wire saw

**WARNING!**

The wire saw may only be used for wire sawing in concrete, masonry or similar materials. Other use is non-intended and therefore to refrain from.

The wire saw may not be used on loose masonry as the anchors may come loose.

**WARNING!**

Before the wire sawing is commenced, make sure that;

- there are no power lines, gas or oil pipes that would be cut by the wire.
- the statics of the building are not imperiled because of cut.

Tractive AB is not responsible for damage on property or persons whether they originate from incorrect handling or deficient maintenance or as a consequence from not checking the machine for damage and/or defects before taking it into use.

The following safety instructions are important to know and follow.

3.3 General safety instructions

WARNING - DANGER OF LIFE!



It is potentially fatal to wire saw a power line which is energized. The wire saw can get energized.

A residual-current device doesn't protect against this danger.



WARNING!

- The wire saw is state of the art and follows the present regulations. However, incorrect handling of the machine can lead to serious or even fatal injury to the operator and persons in proximity to the machine.
 - To maintain the level of safety inherent in the design of this machine, only Tractive original spare parts may be fitted. Tractive AB disclaims all responsibility for damages occurring as a result of use of non original parts. All warranty claims are void if non original spare parts are used.
 - All persons which are operating or in any way working on the wire saw 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 buyer 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.
 - Before sawing is commenced all persons involved must know how the emergency stop buttons are working.
 - The wire saw may only be operated and serviced by authorized and trained personnel. This personnel should be trained by personnel which is authorized by the manufacturer.
 - No work should be commenced which cannot be judged to be safe.
 - The operator is obligated to immediately inform about changes on the wire saw which can impair the safety of the machine.
 - The user is liable that the wire saw is in faultless condition and that all functions are in order before work is commenced.
 - Modifications or changes on the wire saw which might impair the safety of the machine are not allowed.
 - Tractive AB is not responsible for damage on property or persons whether they originate from incorrect handling or deficient maintenance or as a consequence from not checking the machine for damage and/or defects before taking it into use.
 - The wire saw may not be used in an environment where explosion protected equipment is demanded.
-

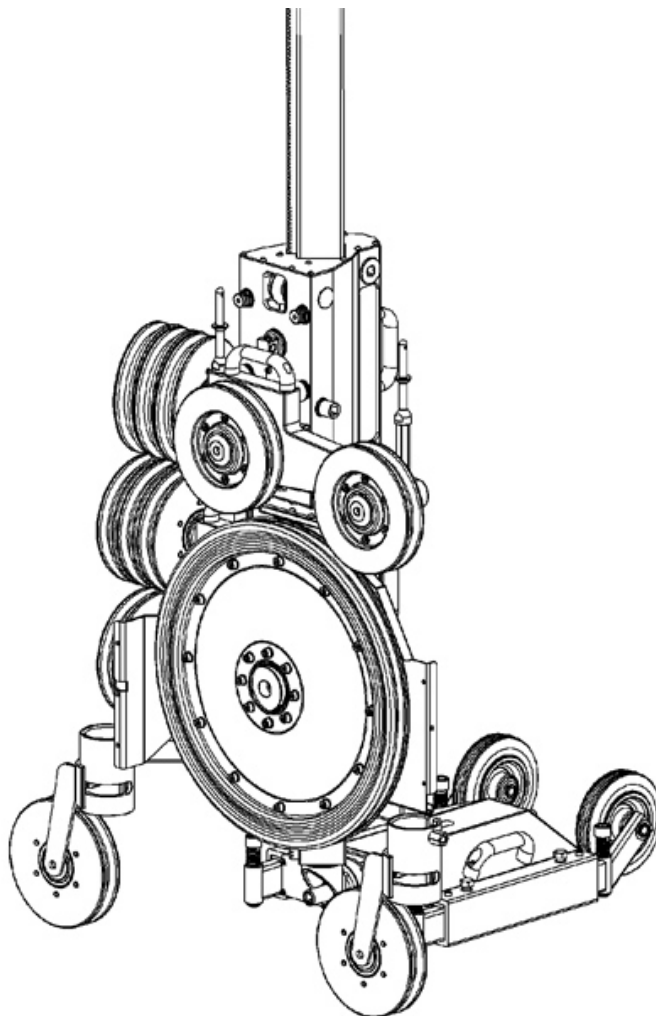
3.4 Safety precautions at site

**WARNING!**

- Always check that the equipment is in faultless condition and that all functions are in order before work is commenced.
- No mounting, for instance change wire, may be performed on the wire saw unless it is disconnected electrically from the mains.
- Safety regulations at the work place must be followed.
- All persons working with, or in the proximity to the wire saw should wear safety equipment, i.e. protection helmet, protection shoes, gloves, eye and ear protectors. Other safety regulations at the work place must be followed. The noise level at drilling might lead to permanent hearing disorders if not ear guards are worn.
- The operator should have good supervision over the wire saw and inform passing persons about possible risks.
- Unauthorized persons shall not be within the risk area (the area around the wire saw and wire).
- The power pack must always be switched off and the 32 (red) or 63 (blue) Amp plug and cable disconnected from the power pack before any kind of service is commenced.
- The power pack must be disconnected from the power supply by removing the 32 (red) or 63 (blue) Amp plug and cable from the power pack before any kind of service is commenced.
- Mounting and dismounting of the wire saw may only take place when the power to the main pulley drive motor is disconnected from the power pack by removing the electric connector to the HF-motor or on the power pack.
- The power pack must only be operated when it is standing on its rubber feet.
- 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.
- The electric motor of the power pack is water cooled and the water pressure must therefore be limited to max 5 bar or 70 PSI. The incoming water supply may only be connected to the lower connection on the power pack. The quick disconnect couplings may not be replaced with couplings that are not fully open when disconnected.
- Always lift the wire saw modules ergonomically correct. The Pentpak is not provided with hooks for lifting. Should this unit 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. Contact your sales agent for instructions on how the lifting can be done in the best way.
- The base plate must always be securely anchored to perform safe wire sawing.
- Never run the wire saw without water cooling to the power pack and HF-motor. Should the cooling water seize to function, stop the machine immediately.
- Only connect the Pentpak power pack to the Pentruder wire saw and Pentruder HF-motor or such equipment which has been manufactured or approved by Tractive AB.

4 Mounting the Pentruder 3P8 wire saw

4.1 Overview Pentruder 3P8 with 70 mm column system



4.2 How to position the wire saw – 70 mm column system

1. Be observant on what material the base plate will be mounted on. For safety reasons it is very important that the base plate is properly fastened. If mounted on brick or porous concrete the base plate must be bolted down with M16 / 5/8" through bolts.



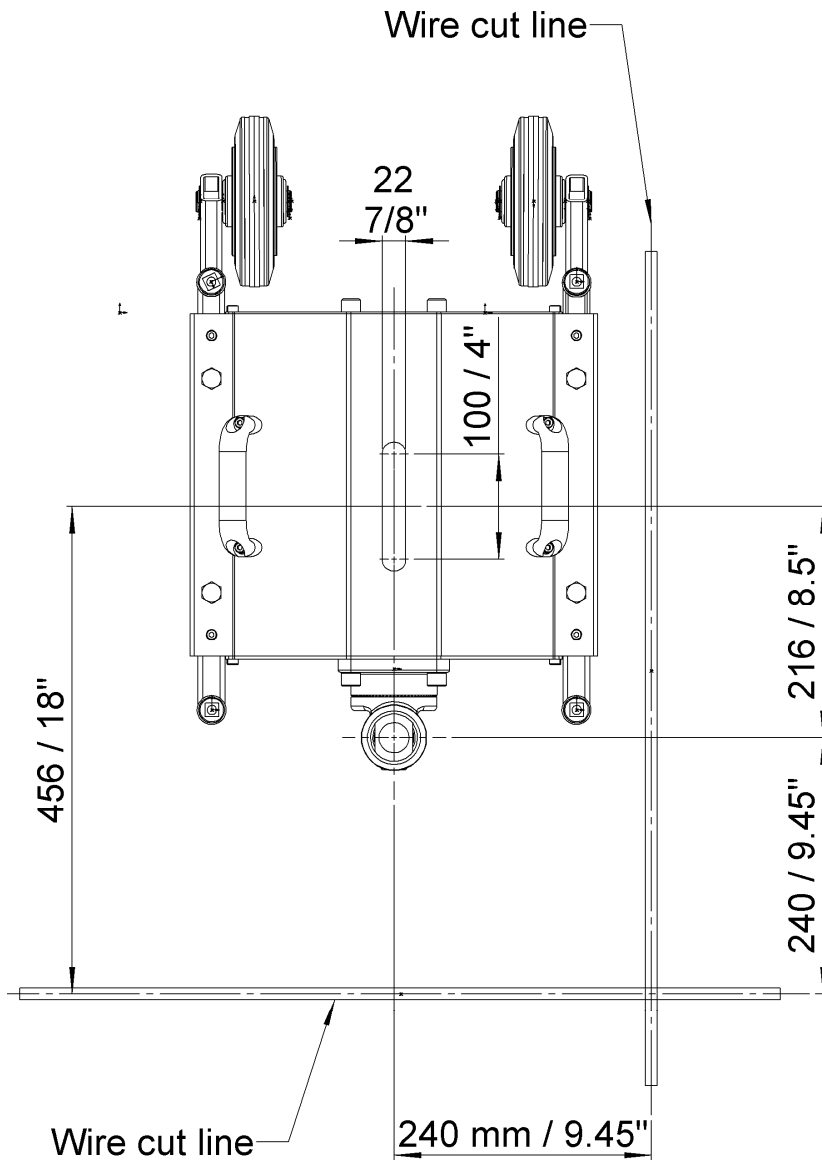
WARNING!

If the base plate is not securely fastened to a solid foundation, the very high forces applied on the wire by the tractive power will cause instability and will lead to unforeseen events that can lead to serious or fatal injury.

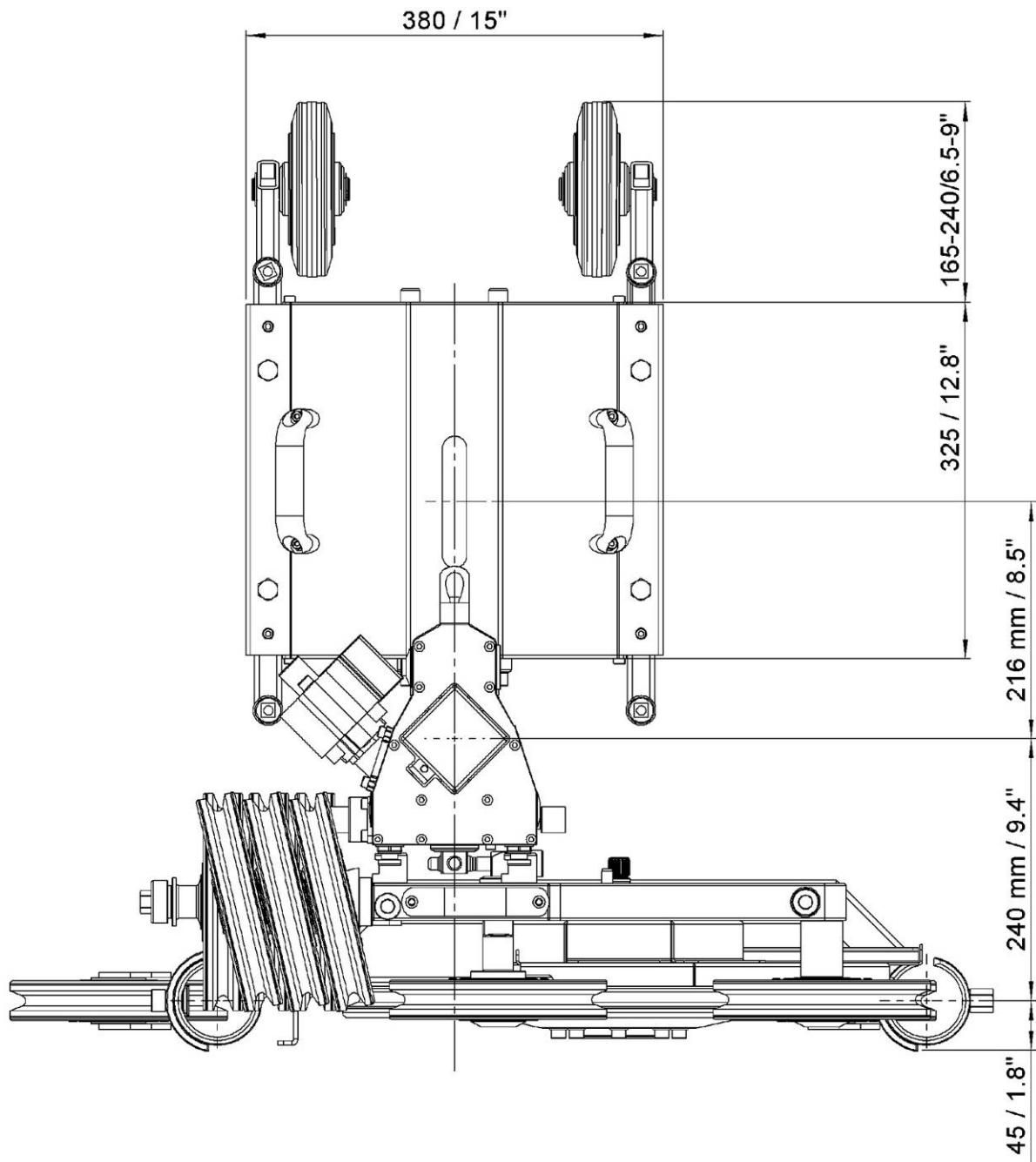
2. The wire cut line will be as shown in the drawing below.



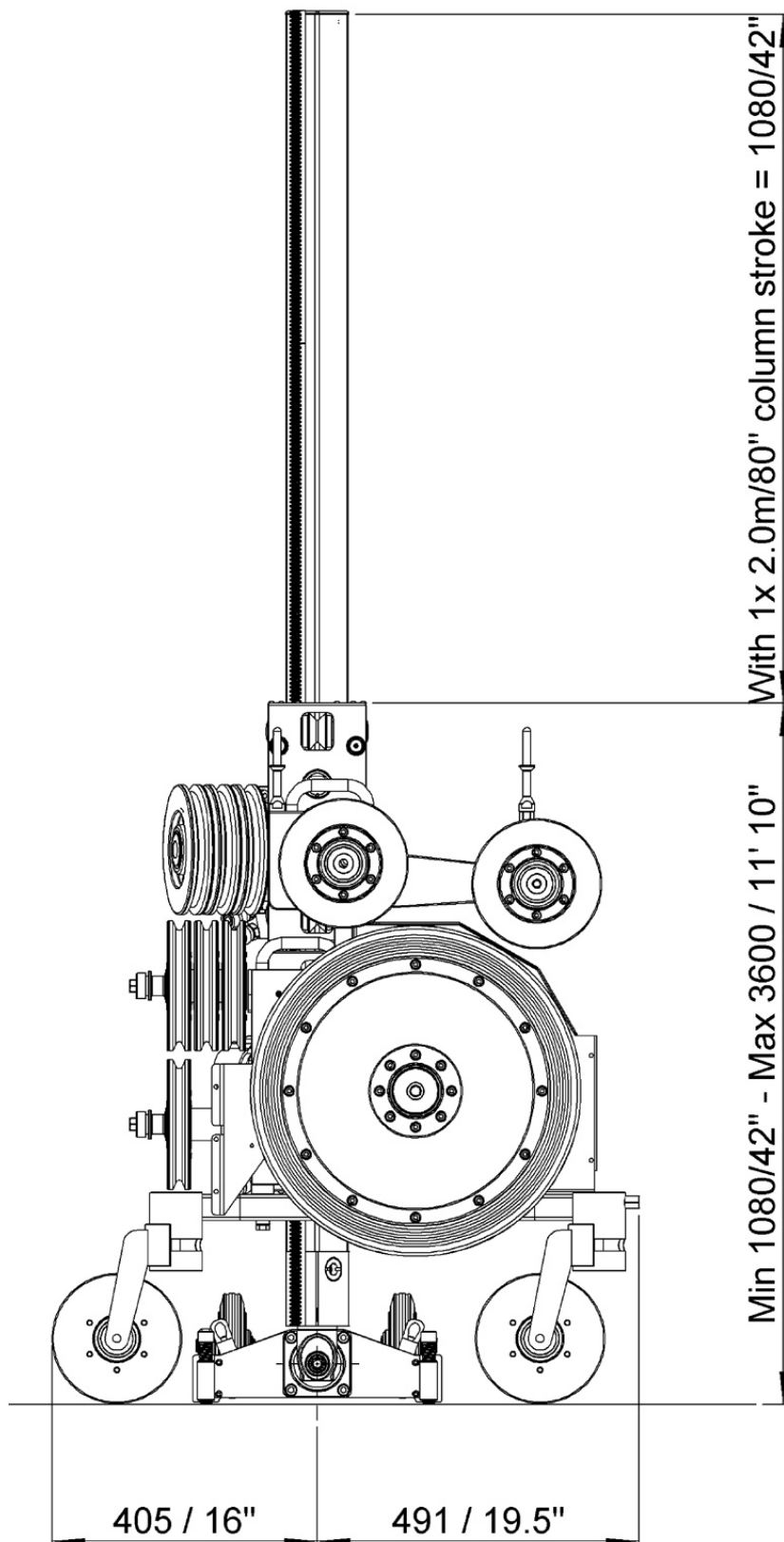
Note: The column can rotate around its own axis, and be locked in any position. Therefore you may prefer to measure your anchor position from the center of the column.

4.2.1 Measurements for positioning of wire saw – 70 mm column system

Measurements for positioning of wire saw – 70 mm column system



Measurements – view from top



Stroke of carriage - Measurements

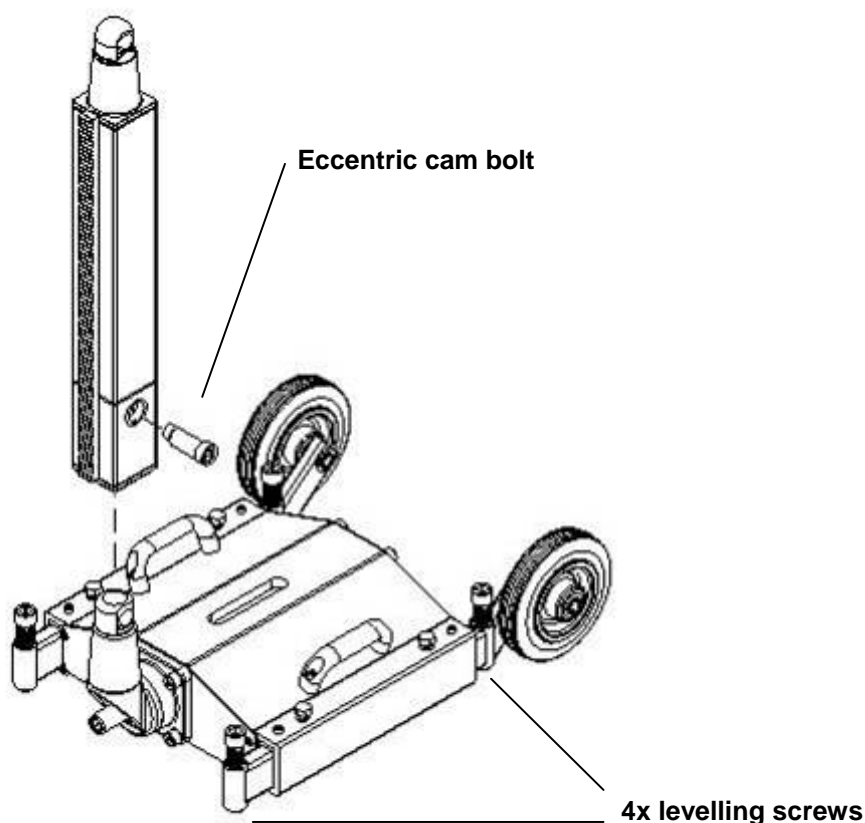
4.3. Standard mounting sequence with 70 mm column system

1. Base plate
2. Column or columns
3. Lower carriage
4. Upper carriage

4.3.1 Mounting the base plate and column

1. Mount the base plate

Bolt the base plate to a solid object using an M16 / 5/8" anchor bolt. Use only high quality anchors and bolts. Adjust the support legs (see fig.). Level the base plate using the four leveling screws.



BE2 and column-CN 0.5 F/M-70.

2. Mount the columns or columns

The column is locked by turning the eccentric bolt Clockwise.

To release the column, the eccentric is turned Counter Clockwise until it lifts from the cone. To remove the eccentric bolt, turn it slightly Clockwise again until the load on the bolt is gone, and then pull out the bolt, and then the column can be removed.



Important! Do not insert your fingers in the bolt hole.

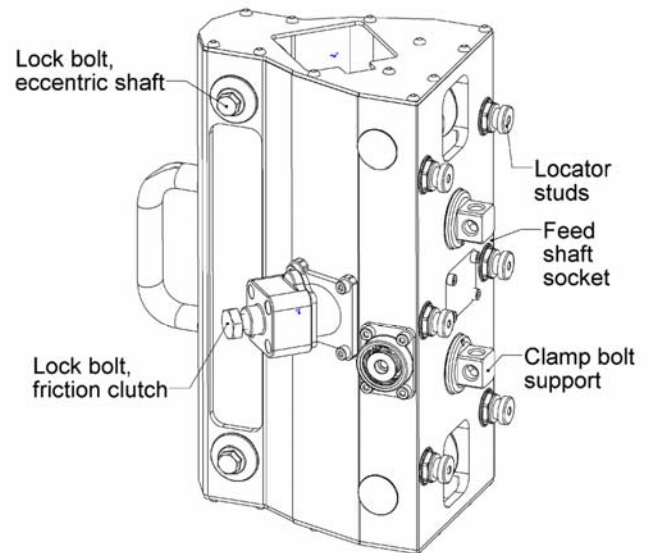
4.3.2 Mount the lower carriage on the column

1. Loosen the socket on the friction clutch one turn. (19 mm / 3/4" spanner)
2. Slide the carriage over the column
3. Adjust the height of the carriage by turning the feed shaft socket with a ratchet or knuckle bar.
4. Tighten the friction clutch socket.



Note! Tighten moderately, do not over tighten!

The friction brake should be only moderately tightened so it will allow the carriage to slide upwards in the event of an abrupt jamming of the wire. The normal pulling force in the wire is about 100 kg's for a 22 kW HF-motor. Due to the amplifying effect of the forces, through the 3 loops in the magazine, the force applied on the carriages is 6 fold and can be in excess of 1000 kg during an abrupt jamming of the wire.

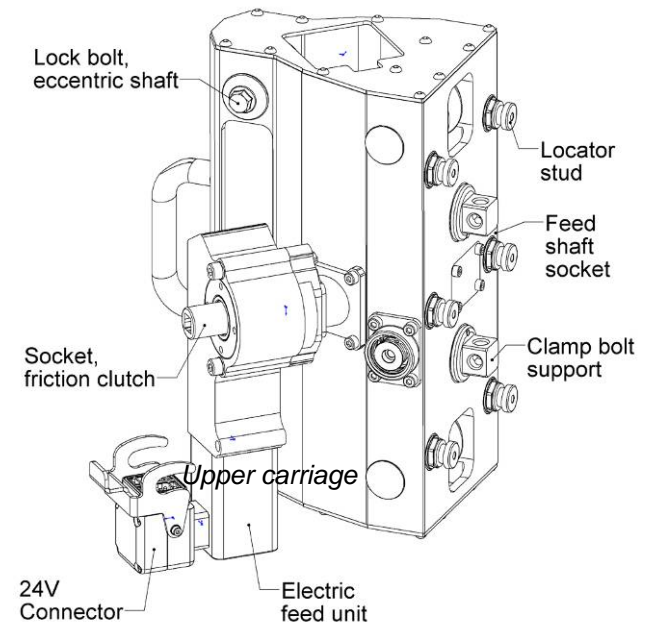


4.3.3 Mount the upper carriage on the column

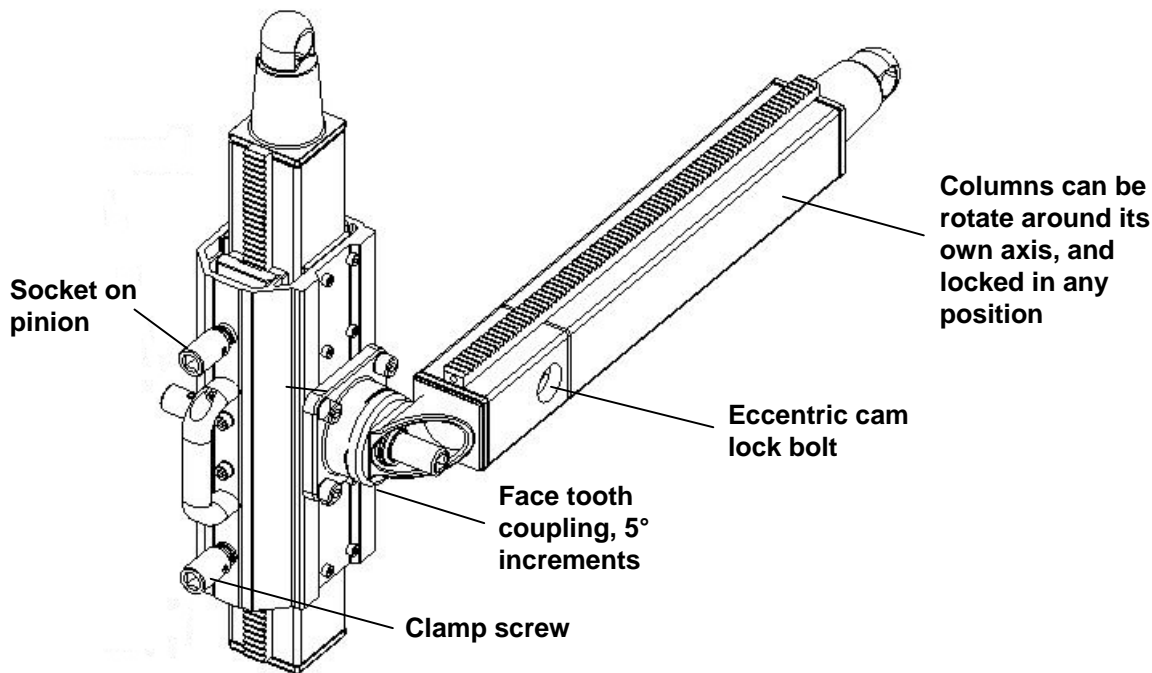
1. Loosen the socket on the friction clutch one turn.
2. Slide the carriage over the column
3. Adjust the height of the carriage by turning the feed shaft socket with a ratchet or knuckle bar.
4. Tighten the friction clutch socket.



Note! Tighten firmly, but do not over tighten!



4.3.4 Mount a Pivoting head - PD1 (accessory)



Pivoting head-PD1 with column.

In many cases an universal pivoting head can be used to simplify set-up and to add versatility to the system. The Pivoting Head can for example be fitted on a vertical column and a horizontal column fitted to the Pivoting Head conical quick coupling.

To use the pivoting head

1. Mount the pivoting head on the column
2. Adjust height and tighten the clamp screws slightly.
3. Use a ratchet or knuckle bar to move the pivoting head to the desired position on the column.
4. Lock the pivoting head with the clamp screws.
5. To mount the second column on the pivoting head, align bolt hole with pull stud hole in the male conical coupling, insert an eccentric bolt and tighten hard, clockwise, with a ½" knuckle bar or ratchet.
6. Now you can mount the carriages on the horizontal column, see mounting of carriage.

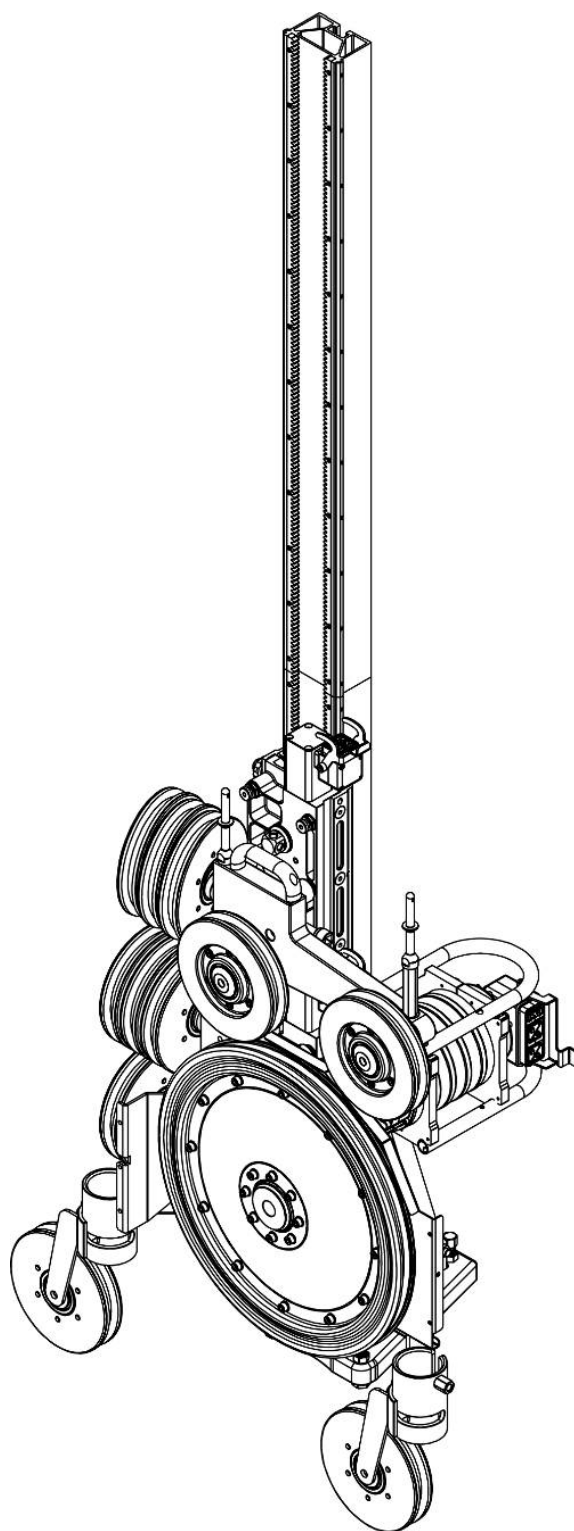
The column quick coupling is of the same type as on Base Plate BE2, with a swiveling face tooth coupling allowing for adjustment of drill angle in 5° increments.



Important:

- Be observant so that the eccentric bolt doesn't slip out of the column when the column is mounted on the conical coupling on the pivoting head. It **MUST** be completely flush with the column side face.
 - Before tightening the adjustable male-coupling please make sure the face teeth are correctly in mesh.
 - When the eccentric bolt is removed, do **NOT** put your fingers in the bolt hole.
 - When the pivoting head is mounted, be sure that the locking screws are tightened to give enough friction between column and pivoting head, to keep the pivoting head from sliding down the column in an uncontrolled way.
-

4.4 Overview Pentruder 3P8 with TS track (MCCS)



4.5 How to position the wire saw with TS track (MCCS)

1. Be observant on what material the base plate will be mounted on. For safety reasons it is very important that the base plate is properly fastened. If mounted on brick or porous concrete we recommend fastening the base plate with M16 / 5/8" through bolts.

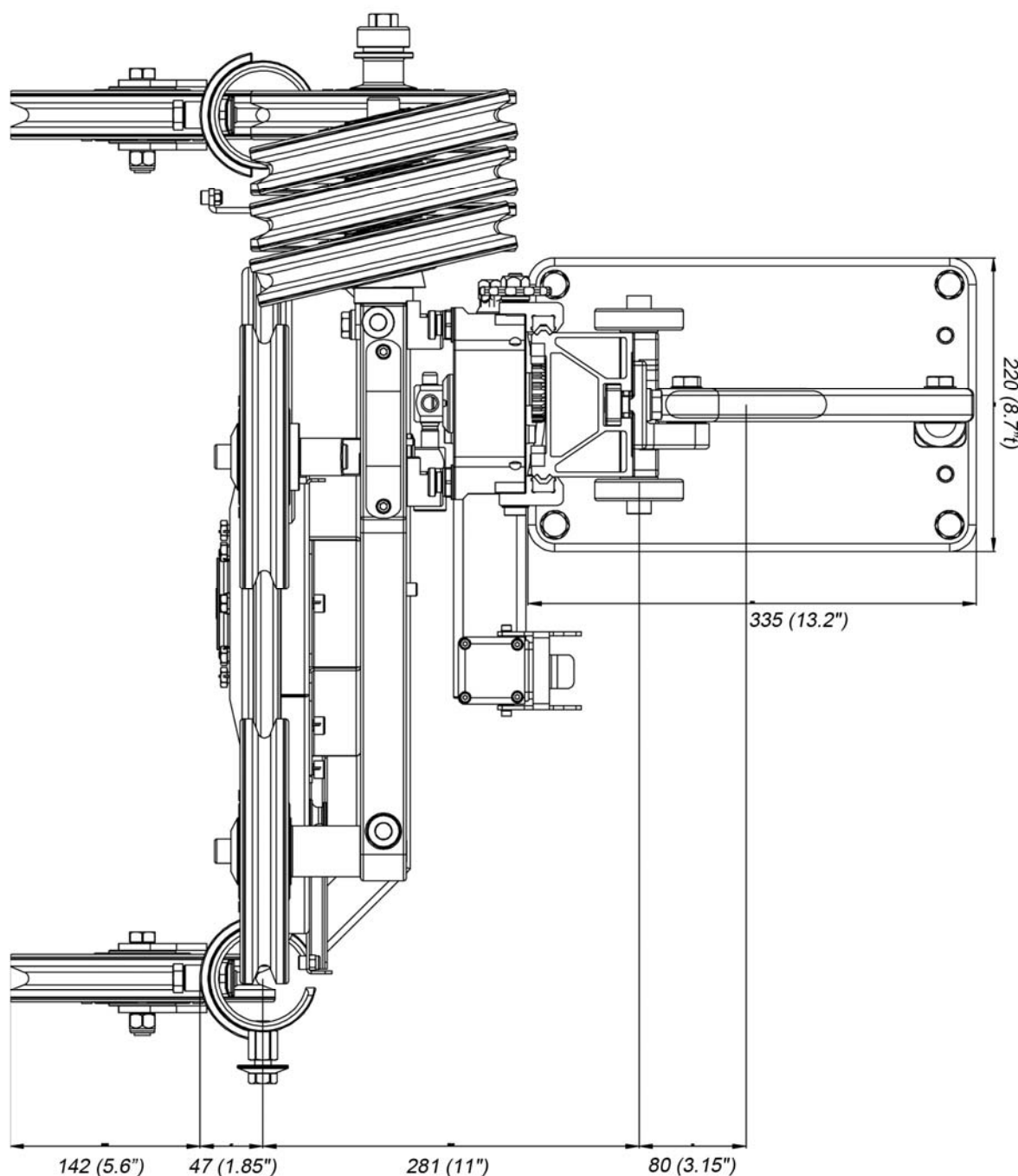


WARNING!

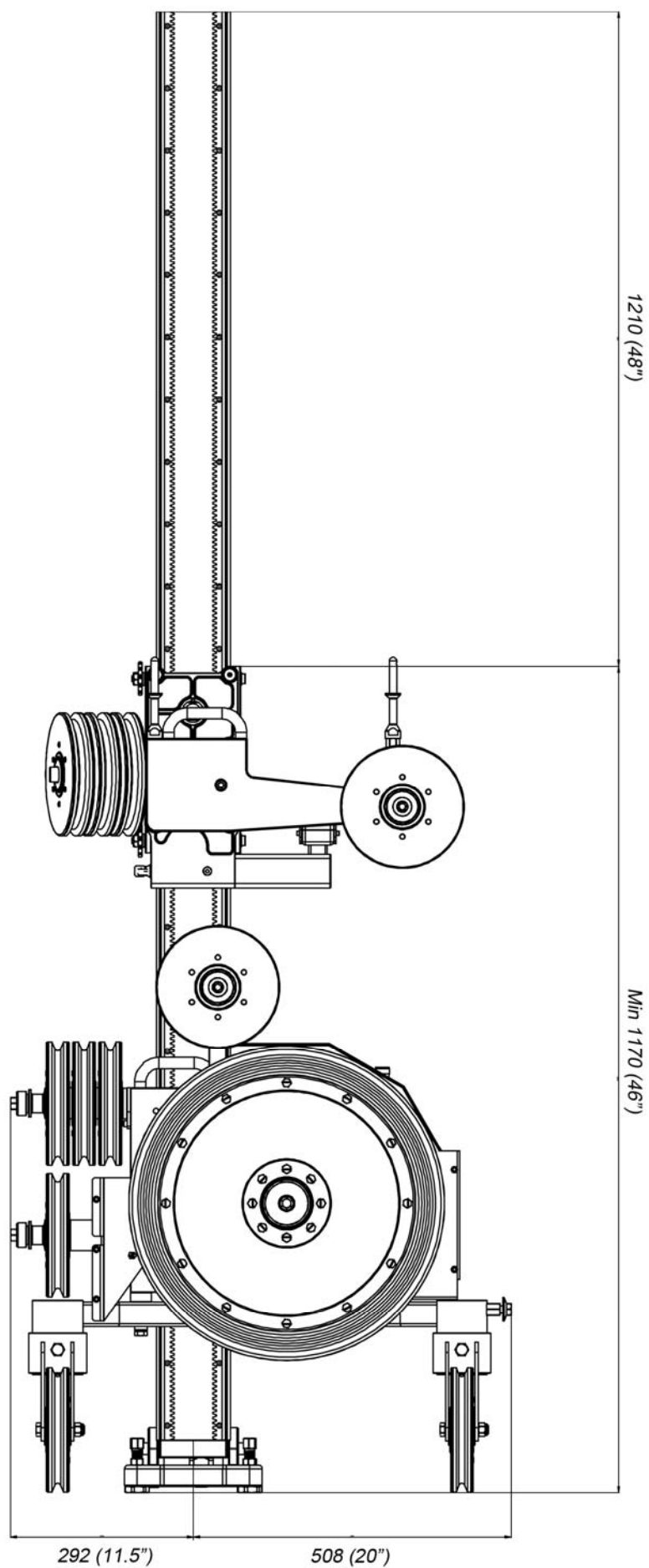
If the base plate is not securely fastened to a solid foundation, the very high forces applied on the wire by the tractive power will cause instability and will lead to unforeseen events that can lead to serious or fatal injury.

2. The wire cut line will be as shown in the drawing below.

4.5.1 Measurements for positioning of wire saw – TS Track (MCCS)



Measurements for positioning of wire saw – 70 mm column system



Stroke of carriage – Measurements – TS Track (MCCS)

4.6. Standard mounting sequence with TS track (MCCS)

1. Track on base plate
2. Track
3. Lower carriage
4. Upper carriage

4.6.1 Mounting the track on the base plate

We recommend to assemble the base plate on the track first, and then fastening the assembled rig on the concrete.



a. Slide the upper clamp in to the track. Older tracks with only one rack can be used. In this case make sure the rack is on the left side seen from the rack side of the track.

b. Slide the lower clamp in to the track.



c. Tighten the two bolts on the lower clamp.



d. Tighten the upper bolt loosely.



e. When the track is in the right position, tighten the bolt properly.



f. Next tighten the upper bolt on the back brace.



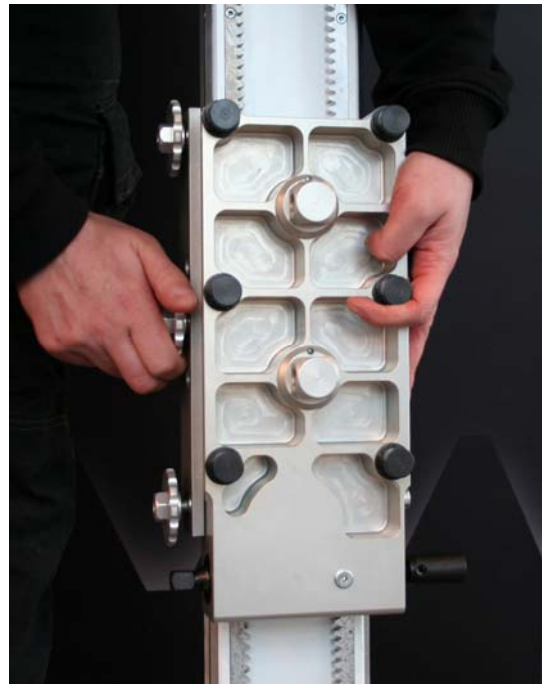
g. Tighten the lower bolt on the back brace.

4.6.2. Mount the lower carriage CEG-M25 on the track

1. Open the three clamp nuts.
2. Put the carriage on the track as shown in the picture and align the feed gear with the rack on the track.
3. Tighten all three clamp nuts firmly first by hand and then with a 19 mm spanner to be firmly tightened, but not solid.



Note! Tighten firmly, but do not over tighten!



4.6.3. Mount the upper carriage CEG-E-3P8 on the track

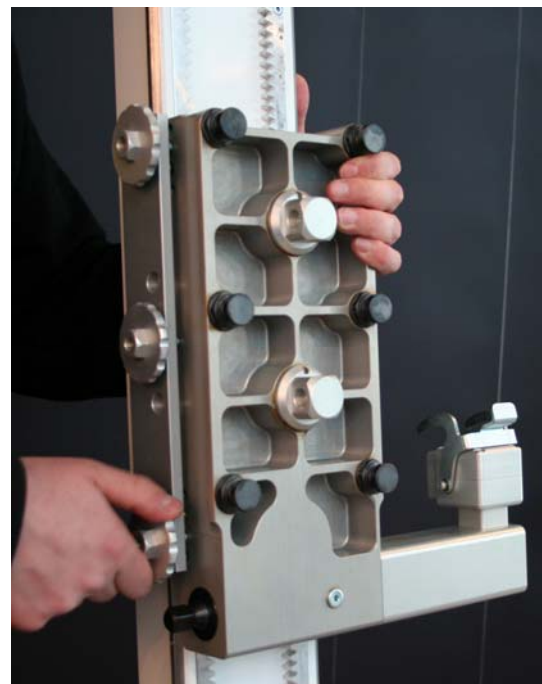
1. Open the three clamp nuts.
2. Put the carriage on the track as shown in the picture and align the feed gear with the rack on the track.
3. Tighten all three clamp nuts firmly first by hand and then with a 19 mm spanner to be firmly tightened, but not solid.



Note! Tighten firmly, but do not over tighten! It must be possible for the upper carriage to glide upwards during cutting.



Note! The liners on the track and the green plastic liners in the upper carriage must be clean before starting to cut. Please also smear the green liners in the upper carriage lightly with some grease or oil.



4.7 Mounting the 3P8 wire saw modules

4.7.1 Attach the lower magazine and swivel roller assembly

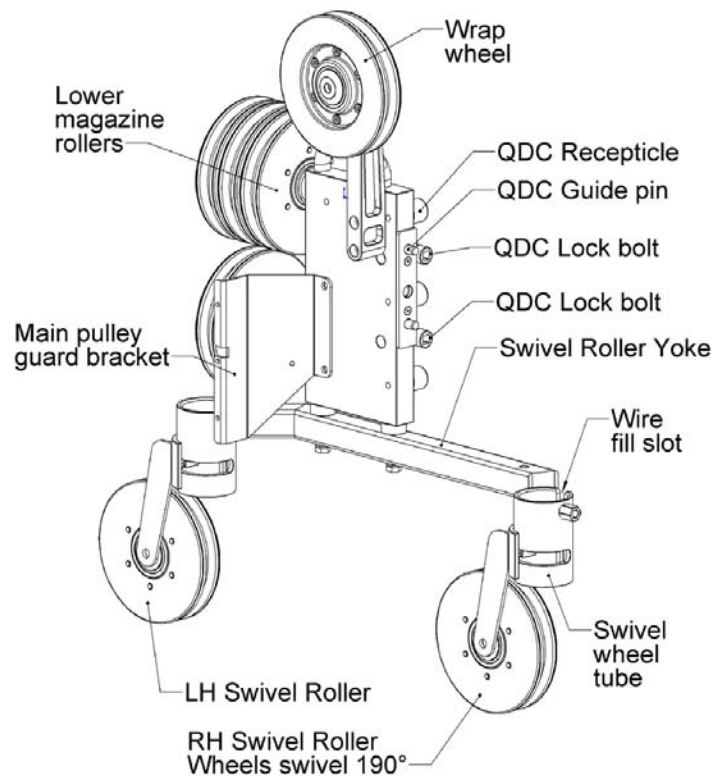
- 1 Normally the lower assembly unit is mounted on the carriage with the swiveling rollers pointing towards the surface the base plate is mounted on.



WARNING!

Be careful after having mounted the carriages on the column.

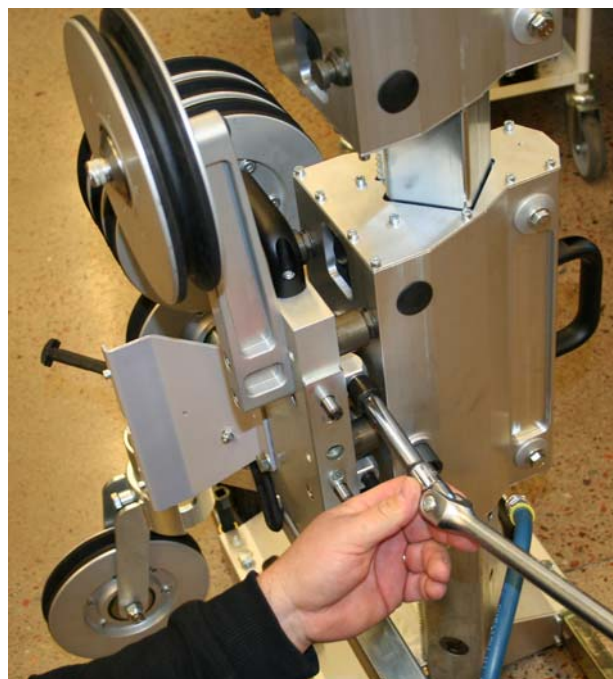
- 2 Make sure the friction couplings / clamp nuts are tightened to avoid injuries, this applies to both carriages.
- 3 Do not over tighten the clamp socket!
- 4 Slide the complete lower assembly sideways with the Quick Disconnect Coupling (QDC) receptacles engaging with the locator studs on the carriage. See picture below, "Fitting the lower assembly".



Note! Tighten the QDC lock bolts firmly, but do NOT over tighten! See picture below,



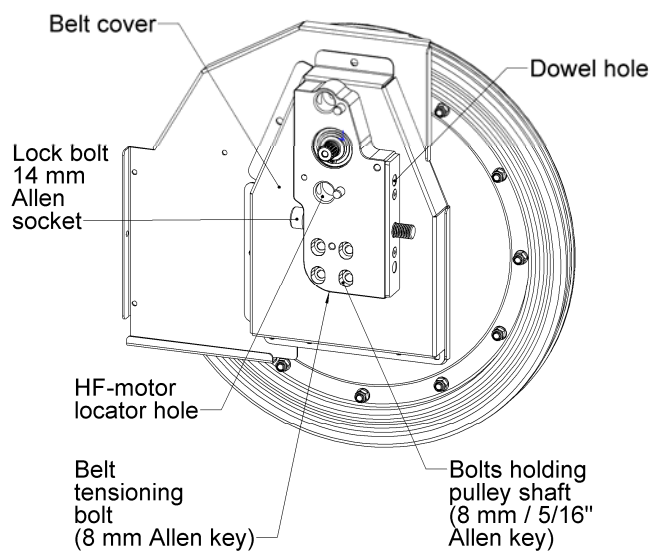
Fitting the lower assembly



Fastening the lower assembly

4.7.2 Attach the main drive pulley assembly

- 1 Attach the main drive pulley assembly on the lower magazine assembly by mating the two dowel pins to the dowel holes in the magazine plate.
- 2 Tighten the lock bolt with a 14 mm Allen key socket and a long ½" extension.



Main drive pulley assembly



Fitting of main drive pulley assembly

4.7.3. Attach the main drive HF-motor to the pulley assembly

Attach the HF-motor to the pulley assembly by entering the locator dowels in to the holes in the pulley assembly plate. Tighten the lock screws with an 8 mm allen key / 5/16". Rock the main drive pulley slightly back and forth to make the spline shaft mesh with the HF-motor.

4.7.4. Attach the upper magazine assembly

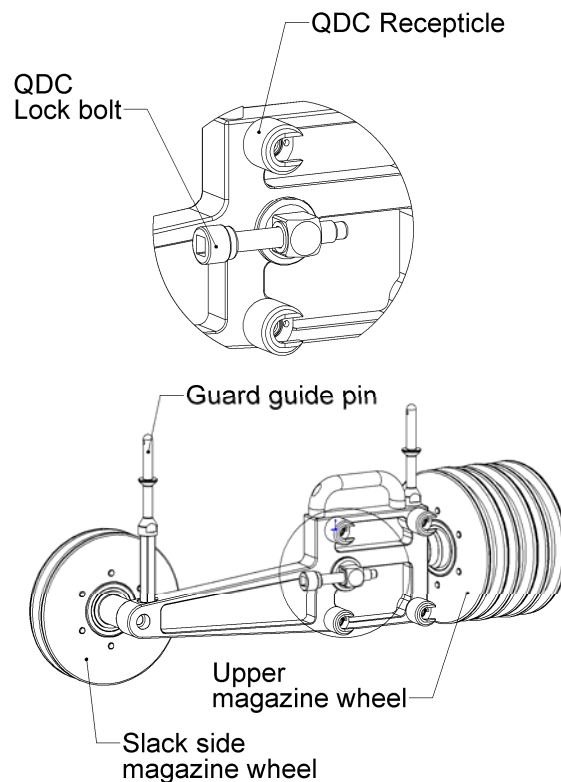
Attach the upper magazine assembly by sliding the assembly sideways onto the locator studs on the upper carriage. Use the lower four studs.



Note! Tighten the QDC lock bolts firmly, but do NOT over tighten!



Assembly of upper magazine assembly



Quick disconnect coupling and upper magazine assembly

4.8. Assembly of HF-motor, cords and hoses

4.8.1 Attach HF-motor cord and the 24V feed motor cord

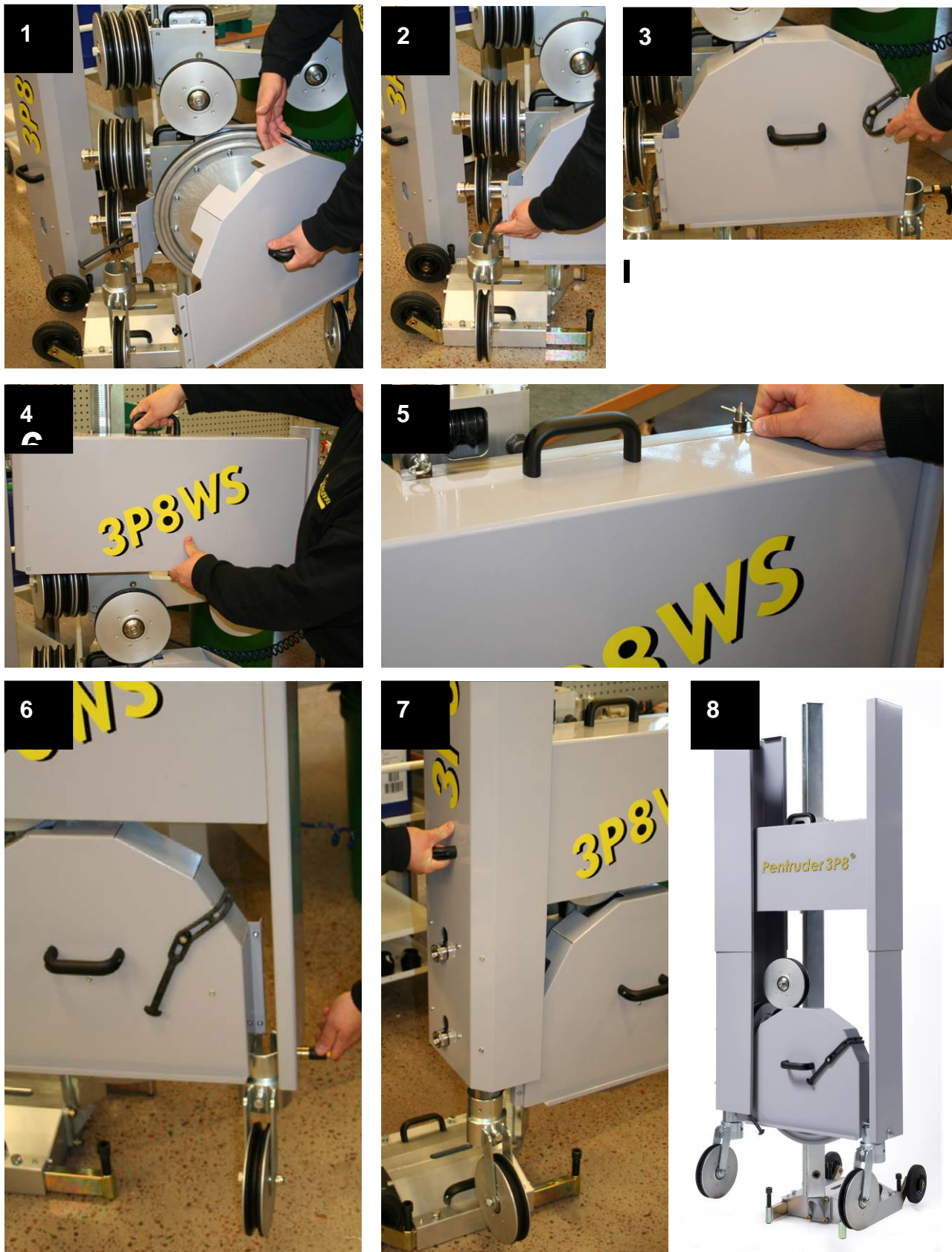
Attach the main drive HF-motor cord, and the 24V feed motor cord.

4.8.2 Attach water hoses

Attach the water hoses to the power pack, the HF-motor and connect the hose from the motor bracket plate to the swivel wheel yoke.

4.9. Attach guards

After the wire has been started, very slowly, and has cut a shallow groove, the guards can be fitted. The start up procedure is described in paragraph 5.6.



Fitting of guard on Pentruder 3P8 wire saw.

5 Guidelines on how to operate the Pentruder 3P8 wire saw.

First of all you have to accept you may need some time to get used to the machine. It is a little like driving a car for the first time. The systems controlling the 3P8 wire saw are automated and well refined, but some functions cannot be completely automated, and in some circumstances you have to trust your ear, and help the control a little, to get the best result.

Once the safety issues have been dealt with, and the operator has understood that these requirements must be respected and the instructions followed, he can start enjoying the extraordinary qualities of the Pentruder 3P8 wire saw. He will notice that the bigger the object is, the better the 3P8 will perform. Not even heavily reinforced objects represent a problem.

5.1 Safety when wire sawing



WARNING!

- Wire sawing can be a very dangerous exercise! All possible safety precautions must be taken to avoid accidents from happening.
- All guards must be fitted on the machine while it is running, and the wire must be protected over its whole free length, as well as from and to the cut object.
- The wire can break at any time, and it is rather impossible to predict when it will break.
- When it breaks, it will most likely be in the worst possible way, and a bead may be torn off the core wire and thrown off the wire trajectory at enormous speed.
- When the wire breaks, the wire speed will most likely be much higher than the wire speed used when cutting, as it is compounded by the whip lash effect and can reach speeds over 100 m/second. Such a "bead bullet" can kill anyone that is hit by this bullet, so all possible safety precautions must be taken to prevent a bead from flying freely around in the air.
- Be sure to lock all guards, cover the wire where it is free, and cover the cut left after the wire.
- Never stand in line with the cut line.
- Wear all safety equipment as stipulated by the authorities.
- The power or force applied on the wire in the 3P8 is higher than on any other commercially available electrically driven compact (non quarry type) wire saw. Therefore it is important to splice the wire carefully.
- Unauthorized persons shall not be within the risk area (the area around the wire saw and wire).
- When there is a risk that concrete block may fall down or fall over and cause damage on goods or even put people in risk, the concrete has to be properly secured. The risk area has to be roped off and be kept under supervision by suitable personnel.

5.2 Positioning the Pentruder 3P8 Guide rollers

- When setting up the base plate, pay attention to the positioning of the wire going out from and back to the machine. Try to plan the set-up so that satellite wheels are not needed.
- The 3P8 can most often be mounted directly on the cut object. If this is possible, it is called a direct cut. A direct cut is preferable as extra satellite pulleys steal power. The high start up torque, and the high traction between wire and main drive pulley rubber drive ring allow start up over several corners, without use of extra satellite wheels to lift the wire off the cut object.
- Naturally, in some instances satellite wheels must be used. If this is the case, try to avoid using satellite on the slack side. This is where the wire goes out from the machine and where the RH swivel wheel is. The RH side if you stand in front of the main drive pulley.
- Try to position the base plate so that the wire goes back in to the concrete or the cut object with the wire running over the RH swivel wheel when cutting starts.
- What we are after with these recommendations is to create as little friction as possible on the slack side. Then the cutting will go faster and the feed regulation will work best.

5.3 Automatic feed control – power / tension system

- To use all the power which is available, the control tries to maintain a tension in the wire that creates the resistance needed to use the power requirement set on the Remote Control Unit (RCU).
- The power consumption the "feed control" or rather "power / tension system" tries to achieve is set on the right hand potentiometer on the RCU.
- If the required (or desired) power is set to 100%, the control tries to use all the 27, 22 or 18 kW available from the HF-motor.



- **Note!** If it is a small object, with a short contact length for the wire, a setting of 100% power means that the wire must be tensioned very hard to use all the power as very few beads are in contact with the cut object, (which doesn't create enough friction) This means high wire wear and risk for premature wire joint failure. This is why the power setting should be turned down by smaller objects.
- If the wire is working over many meters contact length with the cut object, many beads are in contact with the cut object, and the wire tension will be less, to create the friction needed, and then the power can be turned up to 100% and the wire life will still be good.



- **Note!** This means the smaller the cut object is, the harder it is to use all the power, and to achieve high cutting rates, or cut square metres per hour.
- It also means the bigger the object is, (up to a certain size, of course) the easier it is to use all the power, and to achieve high cutting rates, or cut square metres per hour.

5.4 To prepare before cutting commences

5.4.1 Apart from the 3P8 machine itself, the operator should have the following material at hand:

- Safety equipment as helmet, eye- and ear protection, dust extraction equipment sensitive environments, protective clothes, shoes and gloves.
- An 18 (25 HP), 22 (30HP) or 27 kW (37 HP) Pentruder HF-motor.
- A suitable power pack, PP418, PP422, PP427, PP222, PP218 or PP200 with cables and Remote Control Unit.
- Electrical plugs, 32 or 63 Amp, when needed, extension cables for the power pack
- Hammer drill to drill holes to secure the base plate.
- M16 HKD type or other anchors and anchor bolts to fasten the base plate.
- Hammer and mandrel for setting HKD type anchors.
- Measuring tape for positioning of base plate in relation to wire cut line.
- 7 meters, 23ft, of wire, plus what is needed to reach around the object to cut.
- Several high quality steel crimp sleeves, for the wire. Universal joints don't work well with this machine.
- Hydraulic crimp tool for steel crimp sleeves.
- Water hoses and extensions for power pack and soft thin hose for supplying water to one or several positions along the wire trajectory. Soft, flexible garden hose, 1/2" inside works well.
- T-manifolds to split water flow to several hoses.
- Industrial vacuum cleaner for collection of concrete slurry and water retention.
- Some thin spray on oil or WD40 to spray on the machine before cutting starts.

5.4.2 Tools normally used to set up and operate the 3P8:

- 1/2" knuckle bar or 1/2" ratchet
- 19 mm x 1/2" socket
- mm allen key (for belt change)
- mm x 1/2" Allen key
- 14 mm x 1/2" Allen key
- 1 x long 1/2" extension (or two short ones)

5.4.3 Jobsite spare parts

- 2x Spare cog belts. Use only a Gates Polychain GT Carbon belt 720-8M GT2. Tractive Part No 378107202108.
- 2 x 15090100 Lock nut, guard, 3P8

5.5 Pentpak HF-power pack

5.5.1 Positioning the power pack



Important! 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.



Important! Do NOT leave the power pack outside in the rain. The unit is ventilated but to prevent possible damage to electronic components we recommend that it is kept dry to prevent excessive condensation forming

5.5.2 Power connections

Electric power to the blade motor is supplied by one 18 mm diameter orange colour 9 m (30 ft) cord. The feed and travel motors are supplied by one smaller diameter orange colour 9 m (30 ft) cord packaged together with a 10 mm water hose. The water quick disconnect coupling with a 90° elbow should be at the saw head end.

5.5.3 Connection to water supply:



Note! 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 (45 PSI) and maximum 5 bar (70 PSI). The water supply may only be connected to the short hose on the power pack water valve.

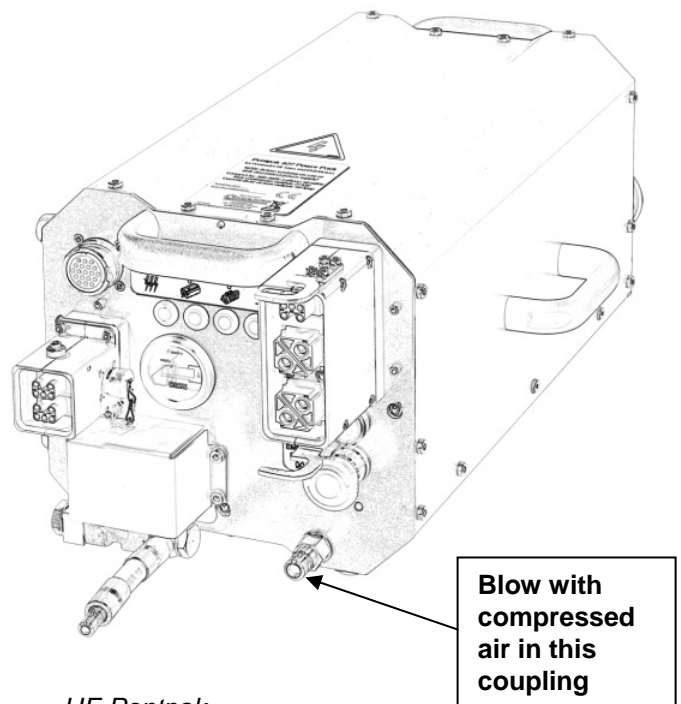


Important! In sub zero temperatures the remaining water inside the power pack cooling circuit must be blown out with compressed air.

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

The power must be switched ON, the water valve must be switched ON, the water couplings must be disconnected, and then the water can be blown out using compressed air.

Alternatively, if no electric power is available, blow backwards with compressed air in the coupling going to the saw head. The check valve in the water ON/OFF-valve will then open and the remaining water in the power pack can then be blown out.



HF-Pentpak

5.5.4 Connecting to remote control:

The multi pin connector must be in the correct position with the notch pointing upwards for the clamping ring to close.

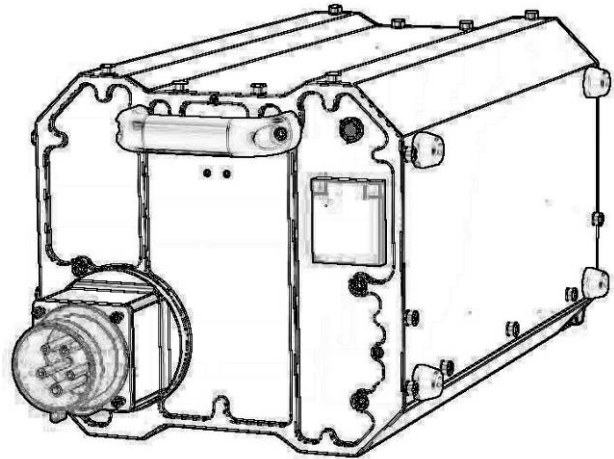
5.5.5 Power supply and connecting to mains



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.

The power pack must be connected 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.

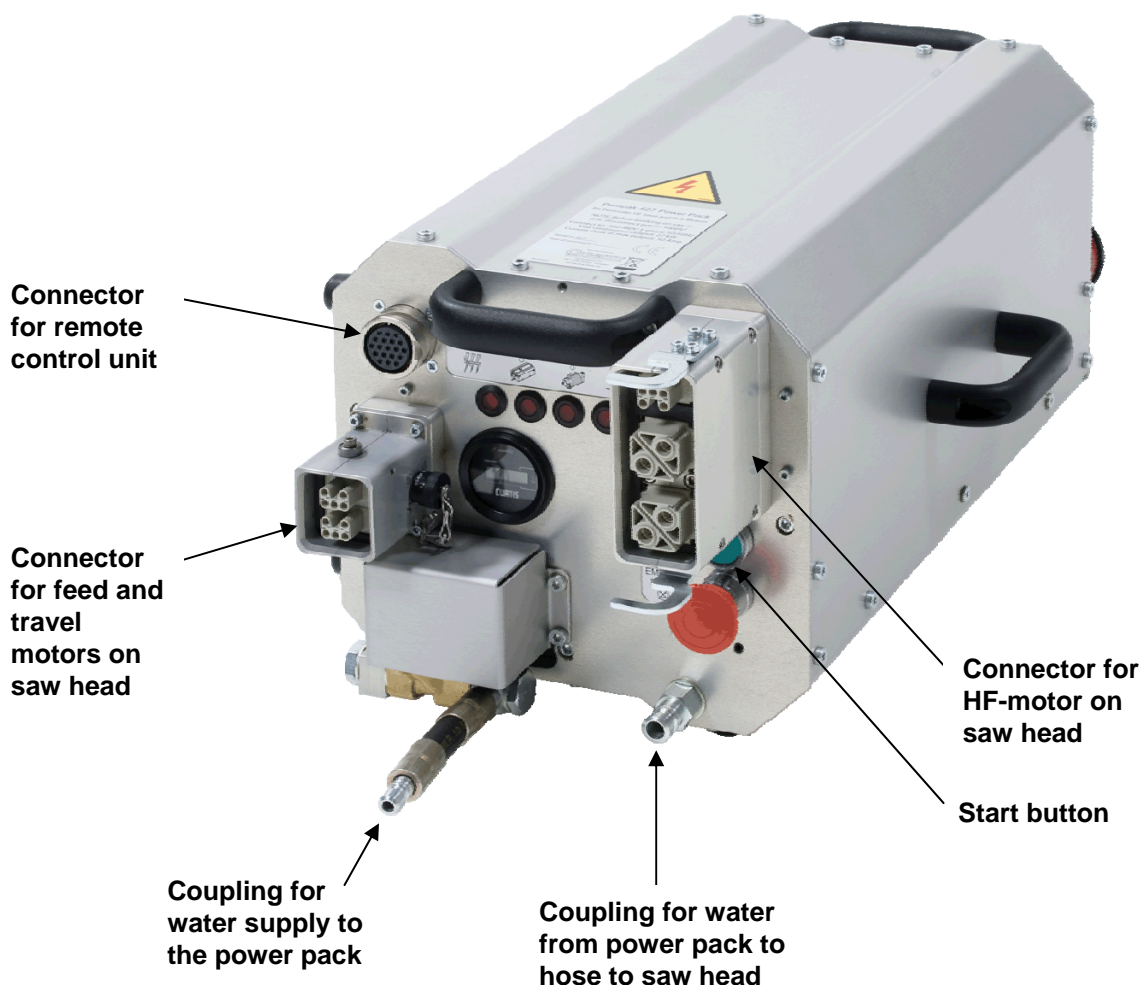
The power pack is equipped with a 32 Amp receptacle. To use other sizes than 32 Amp plugs an adaptor must be fitted.



HF-Pentpak, receptacle side

5.5.6 Starting the power pack

Connect all cords, big diameter orange colour cord to HF-motor, small diameter orange colour cord to feed and travel motors, grey remote control cord to the power pack and lastly a 380-480V 3-phase cord to the mains. Then press the green push button. A green light in the button should then come on.



5.5.7 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.

LED for indication of loss of one or more phases

One blink:



Loss of phase on mains. Loss of one power supply phase line can be caused by a blown fuse, faulty cords, faulty plugs or receptacles, or other problems. If the light is on, check fuses, input voltage, cords etc.

Two blinks:



Too low incoming voltage. Can be caused by too long and/or 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, feeding may work, but the blade will not rotate.

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.



Note! To allow capacitors in the inverter to discharge, at least one minute must elapse after the emergency stop button is pressed and the green start button is pressed.

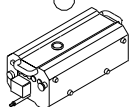
LED indicating status for the power pack

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 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 unit must be checked by a technician trained on this equipment.

Four blinks:

Frequency inverter alarm. Must be checked by a technician trained on this equipment.

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.

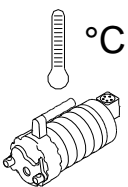
LED indicating status for the HF-motor

- 1) Pentpak is powered, but the green start button on the Pentpak button has not yet been pressed. A test is made for the can-bus to the HF-motor and the chassis.

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 to Pentpak and disconnect 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 chassis-ID is wrong. Nothing is broken, but the HF-motor is incompatible with the Pentpak or the machine. Pentpak software update needed.

Two blinks: HF-motor temperature sensor in windings is not working correctly.

Three blinks: HF-motor or motor cable is not working correctly. Short or open circuit.

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 power pack doesn't find a motor, 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.**
- 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.

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 can-bus to the HF-motor and the chassis.

Three blinks:

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

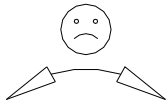
- a) Disconnect 24V cable from Pentpak. If the alarm disappears, go on to b). If the alarm remains the same the Pentpak is faulty.
- b) Connect 24V cable to Pentpak and disconnect saw head. If the alarm disappears, go on to c). If the alarm appears when connecting, the cable is faulty.
- c) Connect 24V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

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

One blink:

Short circuit in the feed cable, saw head or any of the feed motors.

Two blinks:



24V under voltage alarm. The voltage has dropped below 18V.

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. Software update needed in Pentpak.

Four blinks:

No digital servo found. Digital servo is defective.

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 saw head is connected or that the power pack doesn't find the saw head, e.g. damaged chassis-ID chip or 24V cable.

To reset the alarm, press the emergency stop button and wait until the alarm lamp goes out. Then press the green start button to start the power pack again.

5.5.8 Remote control unit

The remote control unit is connected to unless the remote control is connected to the power pack through a Cannon connector. It is not possible to control any functions on the power pack unless the remote control is connected to the power pack.

Available functions:

Switch for Blade

Motor ON/OFF:

First push forward and hold the switch for Water ON/OFF and then push the Blade ON / OFF switch forward to start the blade. To stop the blade, push the Blade ON / OFF switch forward once again.

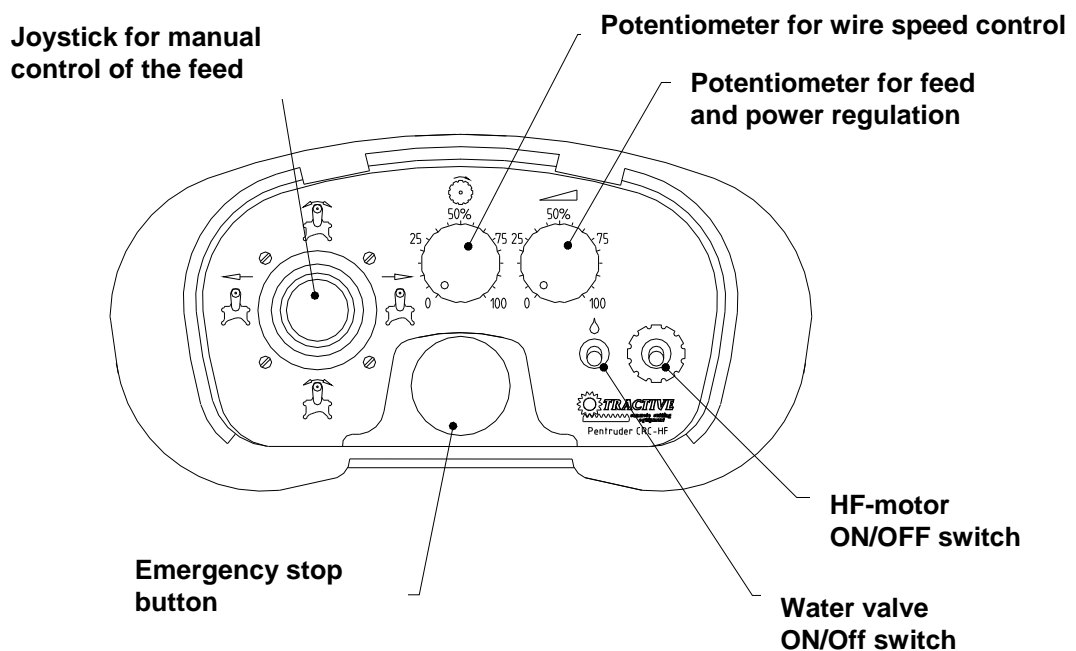
Switch for water valve: Move the switch forward to start and stop the water flow through the machine. The water flow will be switched on automatically when the HF-motor is started. The water must be switched off manually.

Potentiometer for wire speed control

Potentiometer for feed and power regulation

Joystick for manual control of the feed:

Click the joystick up to manually take care of slack in some situations.



5.6 Guidelines to follow when commencing a cut

- 1 Check that both swivelling guide wheels are tight (19 mm socket). Check their alignment with the desired cut line.
- 2 With the wire on the machine, and no guards mounted, and water nozzles or hoses adjusted, please pay attention to the wire tension. On the slack side there should be some slack before attempting to start the wire. Check that the wire is run over all wheels correct and has not jumped off during the set-up procedure.

Test the tension by hand by moving the wire on the slack side, that is the RH side when standing in front of the main drive pulley, HF-motor pointing away from you. You should be able to move the wire sideways 10 cm or so.

- 3 Turn both potentiometers on the RCU back to their Zero position.
- 4 With the speed potentiometer, the LH one, at Zero, start the main drive motor by holding the blue switch forward and at the same time pressing the red switch forward. The water will start to flow and the wire will be started. (We have chosen to let the cooling water from the HF-motor clean the wire before it goes into the magazine, as traction is improved when the wire is as clean as possible.)
- 5 If needed, the direction the wire is running in can be reversed during start up. Flick the blue switch forward once, and the direction will be reversed. Flick it again and it will go the other (correct) way again. This feature is there to make it easier to cut a shallow groove on the slack side, before the real cutting starts. This function is disabled over 5% wire speed.
- 6 As the initial cutting progresses, and if you see slack, (not enough tension in the wire, please move Joystick UPWARDS manually, some short movements at a time, to "override" the automatic tensioning by the software.

!

- 7 **Important!** Set the RH pot to 25%, and gradually increase the speed up to just a few %. Let the wire cut a shallow groove in the cut object. If everything goes well, and the wire is running smoothly at VERY slow speed, the machine can be stopped and the guards can be mounted.

!

- 8 **Important!** Mount all guards and lock them with their respective nuts and bolts. The upper guard is held in position with the two R-clips,

- 9 Start the wire again by returning the wire speed potentiometer to ZERO, and push the blue switch forward, hold it there and push the red switch forward. The wire will start again at low speed.

- 10 Now increase RH power pot setting to 80%. Turn the LH potentiometer slowly up to 50%.

- 11 Again, if you see excessive slack on the slack side, move Joystick UPWARDS manually, some short movements at a time, to "override" the automatic tensioning which is controlled by the software.

- 12 When you consider the wire to be running smoothly, set speed and power pots pot to 100%, unless the cut object is small, then you must reduce the setting for the RH pot to 25 % – max 75%.

- 13 Experience from running different types of wires, in different types of aggregate, steel, rock, or whatever you are cutting, will be very helpful to achieve good results. If you knew everything from the start it would be easy but less fun!



- 14 **Note!** Pay attention to water flowing to the wire. If dry smoke appears the wire can overheat and may be damaged after a short while. Readjust the hoses and / or increase water flow. Use soft garden hose and press the free end into the cut groove. Use as many hoses as possible to cool and clean the wire. A good flow of water to the wire is needed for most plastic or rubber injected wires to make them last and feel well.

When a deep section is to be cut, most often pilot holes must be drilled. The pilot holes must then be aligned so that the cutting planes will be tapered, or the block will bind and can not be removed.

Removal of concrete containing contaminated or hazardous materials may require containment of the cooling water.

5.7 Cutting of soft concrete, or concrete mixed with soft materials

Here are some tricks that can be useful in cutting soft material:

- If you see slack, (not enough tension in the wire, please move Joystick UPWARDS manually, some short movements at a time, to "override" the automatic tensioning which normally is done by the software.
- To explain the same thing with other words: If you cut very soft materials, the automatic tensioning of the wire may need some "help" from the operator, to take up excessive slack in the wire. So then you may need to keep control of the wire tensioning manually, by moving the Joystick UPWARDS some short moments at a time. If there is too much slack, you have a risk that the wire will jump off the wheels.
- Use the feed potentiometer, the one to the right on the Remote Control Unit (RCU) to reduce the tension in the wire. If you reduce down to 25% - 50%, it will still cut quickly enough in soft material.
- Most of the time you can run full wire speed, the left hand potentiometer, in soft material, but use your "feeling" also. After some time practising, you will get the "feel" for the machine. The first few days using a new machine are always a bit difficult for the operator.
- If the wire is cutting too quickly, you can have pinching of the wire, it means that the material is removed too fast, and that the wire may jam all the time. Then you must reduce the %-age on the right hand potentiometer on the RCU.
- The automatic control always tries to use the power you set the potentiometer to. Please note, if you use the 22 or 27 kW kW motors, most other compact (non quarry type) wire saws have less than half the power, so you can reduce a lot, to below 50% and still have plenty of power available.

5.8 Cutting with wire under water

- Running the wire in water will cause considerable drag, and that is why a much lower wire speed normally is used under water, unless you have a very powerful machine at hand.
- On the RCU, you can set a lower speed just by turning the LH speed potentiometer down. The torque is the same from 0 rpm's and this is the key to have a good result when cutting under water. We recommend you to use no higher than around 70% of the maximum speed when cutting under water.
- The 3P8 machine has very good traction wire to drive pulley, and this eliminates time consuming under water preparation work to chamfer corners and edges the wire has to run over during start-up.
- Also, the automatic feed control adjusts itself to various conditions, it doesn't care if you run the wire fast or slow. This is a big advantage over air cylinder tension type wire saws, especially when cutting under water.
- To cut with acceptable performance under water, we strongly recommend to use at least an 18 kW (25HP) motor. For best start up and overall performance, we recommend to use the 22 kW (30HP) motor.
- If the cut is far under the water surface, the wire can be run in tubes into which air is blown, to reduce drag. Otherwise the performance will be very poor, as all power is used just to overcome drag.

6 MAINTENANCE

The Pentruder 3P8 wire sawing system must remain in a condition which is safe for operation at all times, and therefore certain maintenance is needed. Please read the instructions below carefully before any service work is commenced.

For safe and uninterrupted operation of the machine, we strongly recommend that the complete machine is brought back to your dealer for service at least once a year. At this service the machine is checked for proper function and all components critical for safe and reliable operation are checked and replaced if necessary.

Please respect the following maintenance instructions:



WARNING!

- No service or maintenance may be performed on the power pack unless it is disconnected electrically from the mains.
 - No service or maintenance may be performed on the HF-motor unless it is disconnected from the power pack.
-



- Wire sawing can be a dirty job! To keep the equipment clean will take a lot of effort, certainly if the machine is running for prolonged periods and cleaning is not possible or allowed due to time pressure.
- Try to clean the machine as well as possible, especially directing your attention to the carriages, their internal taper rollers, and the columns. The machine will not work well if the upper tensioning carriage does not run smoothly on the column/track.
- **Note!** If a high pressure cleaner is used, you must NOT point the nozzle at the seals over the bearings on any of the wheels or the main drive pulley. Water will be injected and the bearings will fail prematurely.
- The cog belt that drives the main drive pulley is a Gates Polychain GT Carbon belt. Its length is 720 mm, width 21 mm, Gates denomination 720-8M GT2.
- The cog belt will last for at least 100 hours, in most cases well over 150 hours. The lifetime will depend greatly on how many times the wire jams in the cut.
- Try to avoid using wires with different sizes of beads. Differently sized beads and sections of wire will cause jamming and will shorten the life of the cog belt.
- The cog belt can be replaced in about 10 minutes, after some practice. Please see the workshop manual for instructions how to replace the belt.
- Preload on rollers: The roller carriage has four conical rollers to guide the carriage on the column without any play at all. Check the preload now and then. The conical rollers do not need a high preload on the column. The rear rollers can be adjusted using a ½" spanner and a 15 mm wrench.
- Do not set the rollers too hard. If set too hard, the result will be premature wear of the column. Hold the eccentric shafts with a 1/2 " tool and tighten lock bolts with a 15 mm wrench. With correct preload on the rollers the carriage will run smoothly and give a very rigid support for the wire saw modules.

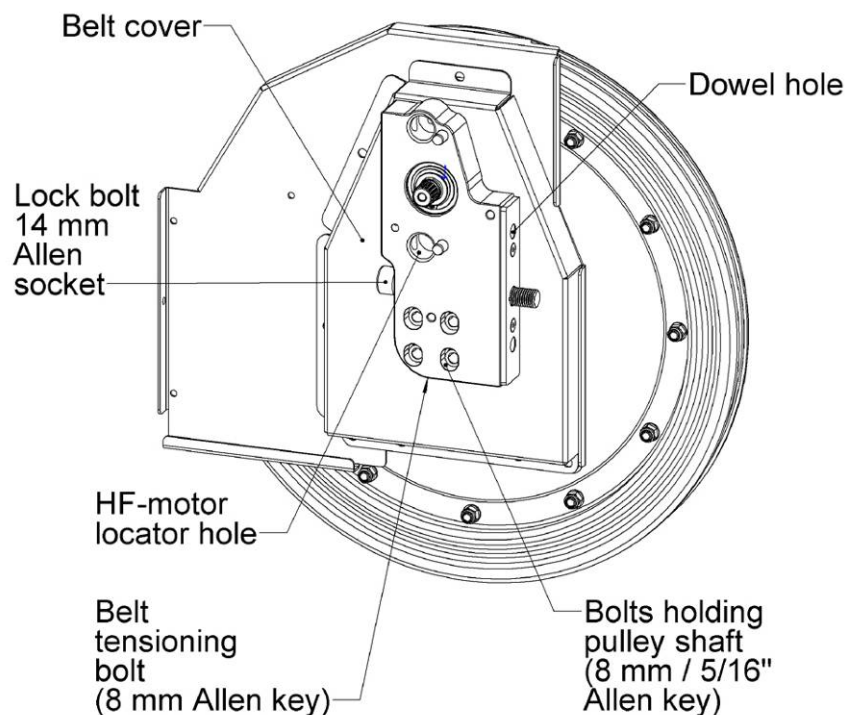
6.1 How to replace the cog belt

Disassembly

- 1 Remove the center bolt holding the pulley. 14 mm allen key.
- 2 Remove bearing cap and seal.
- 3 Remove all M6 bolts holding belt cover to back cover. 5 mm allen key.
- 4 Remove the belt tensioning bolt. 6 mm allen key.
- 5 Loosen the bolts holding pulley shaft. 8 mm or 5/16" allen key
- 6 Lift main drive pulley and slide it off the pulley shaft while holding back the cog belt

Assembly

- 1 Put a new belt on the small cog wheel.
- 2 Slide the main drive pulley on to the pulley shaft while at the same lifting the pulley and putting the belt over the big cog wheel pulley.
- 3 Push the pulley inwards while at the same time turning it to make the belt line up.
- 4 Tighten the pulley shaft bolts slightly.
- 5 Tighten the belt tensioning bolt firmly.
- 6 Tighten the pulley shaft bolts firmly. (60 Nm)
- 7 Fit and tighten bolts holding rear cover to belt cover.



Main drive pulley

7 Technical Data Pentruder Modular Rig System

Wire saw modules, 3P8:

Technical data for Pentruder 3P8 wire saw modules

	3P8-DP-HF Drive pulley el.	3P8-UA Upper assembly	3P8-LA Lower assembly
Weight kg / lbs:	14 / 31	15 / 33	20 / 44
Pulleys O.D. Ø mm/":	500 / 20	198 / 7.8	198 / 7.8
"Pitch Ø mm/":		180, 7.1	180, 7.1
Groove width for wire:	10 mm / 0.3930	10 mm / 0.3930	10 mm / 0.3930
Suits wire Ø mm/":	8-10 / 5/16 – 1/2	8-10 / 5/16 – 1/2	8-10 / 5/16 – 1/2
Number of wheels:	1	4	7
Storage in rollers	6.5 m / 21 ft		
Storage capacity	Maximum approximately 20 m / 65 ft		

Guards, 3P8:

Technical data for Pentruder 3P8 Guards

	3P8-LMG	3P8-TG	3P8-DPG	3P8-SSG
Weight kg / lbs:	10 / 22	10 / 22	5 / 11	7 / 15.4

High frequency motors – HFR:

Technical data for Pentruder HF-motors

	HFR418	HFR422	HFR427	HFR218	HFR222
Weight kg / lbs:	16.5 / 36	18 / 40	18 / 40	16.5 / 36	18 / 40

Carriage – CE – 70 mm column system:*Technical data for Carriage CE1-70-3P8 and CE1-70*

	CE1-70-3P8 Upper carriage (+ PT-3P8 electric feed unit)	CE1-70 Lower carriage (+ FE1 Friction brake)
Width incl ½" socket mm/inch	219 / 8.6	219 / 8.6
Width housing mm / inch:	150 / 5.9	150 / 5.9
Length mm / inch:	376 / 14.8	376 / 14.8
Depth mm / inch	228 / 9	228 / 9
Weight l kg / lbs:	9.3 / 20.5	9.3 / 20.5
Feed:	Electric feed unit, 100:1	Manual, Fixed with friction brake

Columns – CN – 70 mm:*Technical data for column CN.*

	CN 0.5 F/M-70	CN 1.2 F/M-70	CN 1.5 F/M-70	CN 0.5 F/J-70	CN 1.2 F/J-70	CN 1.5 F/J-70	CN 2.0- 3P8
Length mm / inch:	508 / 20	1200 / 47.2	1500 / 59	508 / 20	1200 / 47.2	1500 / 59	2000 / 79
Weight kg / lbs:	6.4 / 14.1	11.9 / 26.2	14.3 / 31.5	6.6 / 14.5	12.1 / 26.6	14.5 / 32	14.5 / 32
Coupling:	Female/Male	Female/Male	Female/Male	Female / Jack screw	Female / Jack screw	Female / Jack screw	Female/ Plastic plug
Extendable:	Yes	Yes	Yes	No	No	No	No
Fits base plates:	BE1, BE2, BETC	BE1, BE2, BETC	BE1, BE2, BETC	BE1, BE2, BETC	BE1, BE2, BETC	BE1, BE2, BETC	BE1, BE2, BETC

Base plates – 70 mm column system:*Technical data for Base plates BE1, BE2 and BETC.*

	BE1	BETC
Width including wheels mm / inch:	492 / 19.4	492 / 19.4
Width less wheels mm / inch:	380 / 15	380 / 15
Length including support legs and wheels mm / inch:	610 / 24 with support legs in	610 / 24 with support legs in
Length less wheels, front and rear legs mm / inch:	426 / 16.7	426 / 16.7
Height not including coupling cone mm / inch:	111 / 4.4	111 / 4.4
Length / width of slot for anchoring mm / inch:	100 x 22 / 4 x 0.9	100 x 22 / 4 x 0.9
Size of wheels mm / inch:	Ø 160 / 6.3	Ø 160 / 6.3
Weight including wheels and support legs kg / lbs:	18.5 / 40.7	14.8 / 32.6
Weight less wheels and support legs kg / lbs:	12.8 / 28.2	9.1 / 20
Coupling	Fixed, front mounted	Fixed, top mounted

Pivoting head - PD1 – 70 mm column system:*Technical data for pivoting head PD1.*

	PD1
Width including coupling and ½" drive socket mm / inch:	236 / 9.3
Width housing mm / inch:	106 / 4.2
Length mm / inch:	320 / 12.6
Depth incl. clamp screws mm / inch:	170 / 6.7
Weight kg / lbs:	7.7 / 17

Carriage – CEG – for TS track (MCCS):*Technical data for Carriage CEG-E-3P8 and CEG-M25*

	CEG-E-3P8 Upper carriage	CEG-M25 Lower carriage
Weight l kg / lbs:	8.1 / 17.8	6.3 / 13.9
Feed:	Electric feed, Total gear ratio 5000:1, Max feed speed 0.4 m/min	Manual, gear ratio 25:1

Tracks TS:*Technical data for track TS*

	TS0.85	TS1.15	TS2.0	TS2.3	TS3.45
Length mm / inch:	850 / 33.5	1150 / 45	2000 / 79	2300 / 90	3450 / 136
Weight kg / lbs:	5.9 / 13	8.0 / 17.6	13.9 / 30,6	16.0 / 35.3	24.0 / 52.9
Fits base plates:	BTS3, BTS4	BTS3, BTS4	BTS3, BTS4	BTS3, BTS4	BTS3, BTS4

Base plate – BTS4 – for TS track (MCCS):*Technical data for base plate BTS4*

	BTS4
Width mm / inch:	492 / 19.4
Length mm / inch:	610 / 24
Weight kg / lbs:	19.5 / 43

Declaration of conformity – Pentruder 3P8 Wire Saw

We, Tractive AB declare that the machine

Manufacturer: Tractive AB
Gjutargatan 54
78170 Borlänge
Sweden

Type: Pentruder 3P8 Wire saw

- 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 2006/95/EC
 - 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 5th of January, 2011-12-13



Anders Johnsen
General Manager

Declaration of conformity – Pentpak HF- power packs

We, Tractive AB declare that the machine

Manufacturer: Tractive AB
Gjutargatan 54
78170 Borlänge
Sweden

Category: High Frequency Power Pack
Make: Pentpak
Type: 427 / 422 / 418 / 222 / 218 / 200

- 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 2006/95/EC
 - 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 5th of January, 2011-12-13



Anders Johnsen
General Manager