KEG Super Nova 4000

Archived manufacturer manual | March 2014 edition

Historical reference - confirm your unit before use
This is a dated manufacturer manual, not confirmation of a current setup or approval for a particular unit. The original KEG pages follow without changes. Match the model, serial number and fitted equipment with JPS before using configuration-dependent procedures.

Model reference: 0020 0400 kit (200400-C in this manual)
Original edition: Version 3, March 2014

Known differences to confirm

Pipe range and flow rating. The manual lists a 6-20 inch base range and 130 GPM maximum. The current catalog lists a 6-16 inch base range and 150 GPM maximum. **The newer catalog does not authorize raising an older unit's flow rating.** Confirm the actual configuration and rating.

Rear insert layout. The 2014 parts tables list five propulsion/rear inserts. The current catalog specifies four rear and eight rotating inserts. Match the insert layout and jetting to the actual unit.

Expansion and pulling device. The manual describes the pulling device as an alternative in larger-pipe work. **The current catalog requires a pulling device for 32-48 inch expansion setups**, together with the correct expansion kits and prerequisites.

Get the setup checked

Send the model/serial number, photos of the unit and fitted parts, machine GPM and working PSI, hose inside diameter and length, pipe size, and expansion equipment. Confirm the exact unit and setup before operation.

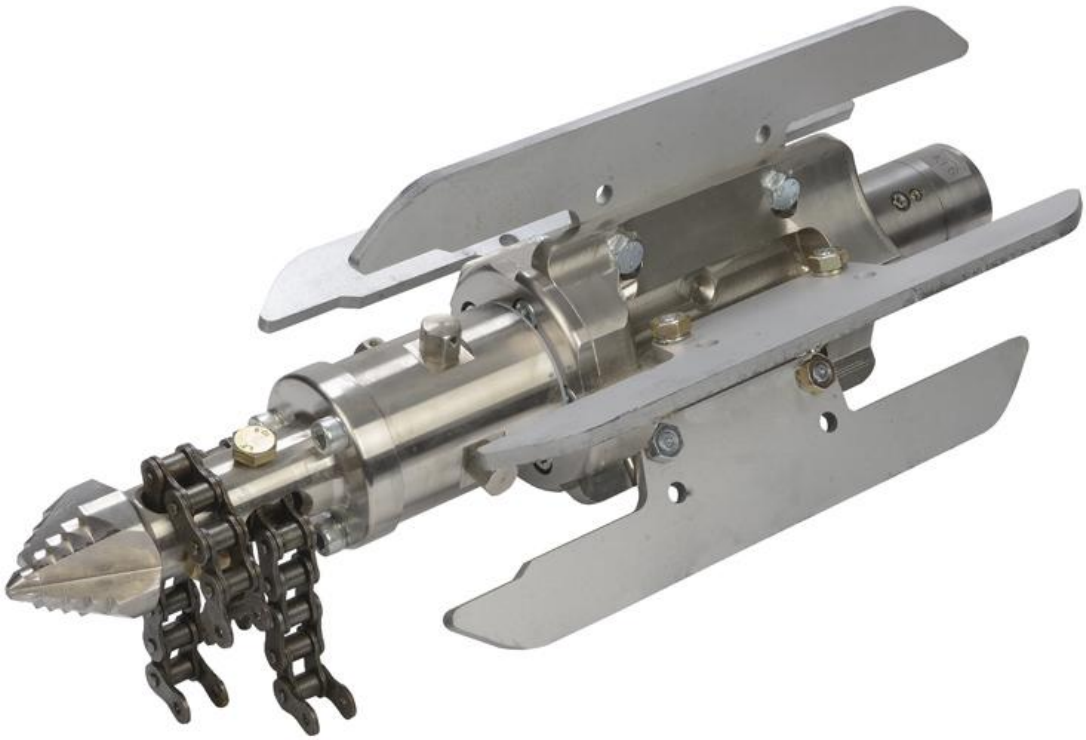
Contact JPS: jetterprosupply.com/pages/contact

Historical warranty statements and kit contents in the manufacturer manual do not establish the supplied demo/used package or JPS sale terms.

Technical comparison: SBK-F26, printed page 48; original manual, pages 12, 17 and 23. The source dates and product specifications do not establish a serial-specific revision match.

Member

KEG Technologies, Inc. Super Nova 4000 Chain Cutter Manual



The Difference Is Performance!

Version 3
March 2014

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MISSION STATEMENT

KEG Technologies' commitment is to our customers and our industry by providing quality products supported through continuous education and technology improvement.

SCOPE

This manual is intended to provide the user with a comprehensive description of, and safe operation instructions and maintenance instructions for, sewer maintenance tools in the KEG Chain Cutter Family of products.

INTRODUCTION

You have purchased a high quality tool that can be used for removing deposits, scale and/or roots in pipes and sewers of all kinds. Careful use per these guidelines should afford accident free operation, efficient performance and long service life.

WARRANTY

Warranty Overview

- KEG offers a Limited Lifetime Warranty against Manufacturing Defects,
- Five (5) Years on all Ceramic Inserts,
- Three (3) Years on all Tool Bodies (Nozzles, Floor Cleaners, Chain Cutter/Running Axles) with replaceable inserts,
- Two (2) Years on Distance Plate Fin and Tube Assemblies. (Chain Cutter),
- Two (2) Years on Rotating Bodies (Chain Cutter/Rotor Nozzles),
- One (1) Year on Chain Cutter Skids and Distance Plates,
- One (1) Year on Swivels. (When shipped with Original Tool),
- One (1) Year on Tier 1 Nozzle, Steel Inserts and Holders,
- One Hundred Eighty (180) Days on Remanufactured Tools,
- Ninety (90) Days on NEW Replacement Warranty Items,
- **All KEG chain cutters shipped after January 1, 2007 are accompanied by a "birth certificate" that indicates the user and seller information, configuration details, serial number, etc.**

Wear Items – Not Under Warranty

- Nuts, Bolts and Washers
- Cross Cutters
- Rotating Nozzles
- Cutting Chains (Both Roller & Link)
- Chain Breakers
- Grease Guns
- Hand Tools
- Seals and/or Spacers

KEG Technologies offers a limited lifetime warranty on tools and items manufactured by KEG. This warranty applies against manufacturing defects. Limited warranties exist on all additional bodies, inserts and components. KEG Technologies will not warranty items against loss, failure and/or damaged due to: improper set-up, improper assembly, abnormal wear (e.g. dragging the tool), improper use (INCLUDING FAILURE TO CLEAN AND VIDEO BEFORE EACH USE OF THESE TOOLS), use outside of the design parameters of these tools, unauthorized modification of these tools, or failure to perform recommended maintenance.

SAFETY

Safe usage and operation of a KEG Chain Cutter is the main focus of this manual. Improper set-up, improper use, and use of the tool outside its intended design purposes **WILL** result in damage to the tool and/or injury to the operator(s) of the equipment.

Federal, State & Local Regulations

Safe work practices, environmental guidelines and standard operating practices must be adhered to at all times. Always use these tools in accordance with Federal, State, and Local regulations (e.g. OSHA and EPA regulations, traffic control and signage, local ordinances and safe work practices).

Signage

Always observe and follow the signage found on the tool box in which the unit is stored. At any time, should the signage become worn, faded, damaged or otherwise unreadable please contact KEG Technologies, Inc. for replacement decals. *Below, please find the safety signage found on the outside of the toolbox.*



Figure 1 - Clean and Video label



Figure 2 - Warning label

Design

The KEG chain cutter family incorporates both high rotational speeds and high rotational torque. The devices' combination of speed and torque gives these units the edge over other style cutters/scrapers. As many sewer equipment operators have not had extensive experience with this type of cutting device, proper care and use of the unit, plus adequate training in setup, maintenance, and operation of these tools is paramount to the safe use and life of the tool(s).

Modification and OEM Parts

Modification of the tool **WILL** result in operator, tool and/or infrastructure damage. Modification of the tool by persons other than KEG employees VOIDS the manufacturer's warranty. Use of non-OEM parts, without KEG Technologies' consent, will damage the unit or infrastructure, and void the manufacturer's warranty. Use of link style chain, without the consent and training by KEG Technologies' personnel, will damage the tool and infrastructure. Use of additional items (knockers) affixed to the ends of the roller chain, without the consent and training by KEG Technologies' personnel will damage the tool and infrastructure. ***Improper use of the tool in any of the above described way(s) relieves KEG of any and all liability or any other responsibility, both legal and monetary, for damage to infrastructure, equipment, or physical harm to any person operating or otherwise involved in the use of these tools.***

Cleaning and Inspection

Cleaning and visual inspection (specifically, by use a CCTV crawler or other types of sewer inspection camera systems) of the infrastructure prior to the use of a KEG chain cutter **is required** for multiple reasons.

- Cleaning removes material that may impede the movement of the unit through the infrastructure,
- Cleaning removes the small particulate material that may damage the unit's rotating element,
- Cleaning removes large materials that may abnormally wear the cutting chains, thus shorting the life expectancy of the chains,
- Visual inspection allows the user to see the real condition of the infrastructure. (e.g. off-set joints, line deformation and/or damage, protruding services, misaligned joints, lateral utility bores, etc.),
- Visual inspection allows the user to see what materials are present in the pipe conduit and that may be removed from the infrastructure,
- Visual inspection allows the user to verify the absence of foreign and/or unknown or undocumented infrastructure(s) passing through the line or lines to be cleared. (e.g. telecommunication cables, other fiber optic cable, gas and water lines, electrical services, etc.).

Warranty Disclaimer – Failure to Clean and Inspect Before Operations

Warning:

Failure to clean and visually inspect the infrastructure with a camera system prior to the operation of the chain cutter may result in damage and/or failure of the tool and/or infrastructure. Failure to follow these precautions may also result in the serious injury or death of the equipment operator as well. Use of the tool prior to cleaning and visual inspection of the pipe conduit will also void all warranties offered by KEG Technologies, Inc.

Set-up

Proper set-up is vital to safe operation of the chain cutter products. Improper setup, for the infrastructure size being worked, will result in damage and/or failure of the tool, and may also damage the infrastructure. Proper set-up of all the chain cutter products is further explained in the Set-Up and Operations section of this manual.

Maintenance

Proper and regular maintenance will further assure the safe operation and long life of the tool. If periodic maintenance is not performed on the unit, this lack of care will result in the tools failure to effectively operate, and shorten the expected life of the tool. *Failure to perform the recommended service/maintenance may void all warranties if it is determined by KEG that the tool(s) in question were not properly maintained.* Proper and recommended maintenance is further explained in the Maintenance Section of this manual.

Prior to Using A KEG Chain Cutter

- Flush the truck or trailer's water system, at full volume capacity (in GPM), without restriction, i.e. with no tool attached, for thirty (30) to sixty (60) seconds before every operation. This initial flushing removes sediment and /or rust that may have accumulated in the tank or hose during inactive periods,
- Visually inspect the chain cutter tool for damage, cracking, excessive wear, etc.,
- Set-up the tool for the diameter of the infrastructure (e.g. an 8" line requires an 8" set-up. ***NOTE: OPERATING A KEG CHAIN CUTTER IN A PIPE DIAMETER LARGER THAN THE MACHINE'S (e.g. 8" setup in 12" pipe, etc.) SETUP WILL ALLOW THE CUTTER TO WOBBLE WITHIN THE PIPE, BECOME UNBALANCED, AND MAY ALLOW THE CUTTER TO TURN SUFFICIENTLY IN THE PIPE TO APPLY TORQUE AGAINST ITSELF. THIS ACTION CAN CAUSE A CATOSTRAUPHIC FAILURE OF THE TOOL, DAMAGE TO SURROUNDING PIPE AND INFRASTUCTURE, VIDOE EQUIPMENT, AND MUST BE AVOIDED,***
- Verify that the rotating nozzles have sufficient clearance (approx. ¼") between the end of the nozzle and inner edge of the skid before engaging the tool under pressure,
- Check and ensure that the chains are of equal length on each side of the chain retainer,
- Check and ensure that the chain ends are the same configuration (i.e. Open/Open link or Closed/Closed link),
- Ensure that the chains do not extend more than three quarters of a link length beyond the skids,
- Check all fasteners' (nuts/bolts/washers, swivels, etc.) "tightness" prior to every usage of the tool,
- Place the tool fully in the pipe (a minimum of two feet inside the manhole) **prior** to engaging the water system. **Never operate the tool(s) at pressure outside the sewer line or in the open area of the manhole**,
- Reset the hose footage counter on the truck or trailer's hose reel prior to usage in a pipeline.

Start-up and Use

- Never operate the tool outside the confines of a pipe or in the open or bench area of the manhole,
- Engage the water system slowly, ensuring that the unit starts to "spin-up" (rotate properly and freely),
- Operate the water system at the recommended pressures prior to moving the tool,
- Do not allow the tool to be stationary while rotating for more that 5 seconds,
- Limit the travel of the tool to not more than two (2) feet per second,
- Engage the debris to be removed slowly,
- Move the tool "back and forth" while engaged in the debris,
- Never retrieve the tool without the water system in use and the chain cutter under power,
- Never allow the tool to exit the confines of the pipe in the "upper manhole", i.e. the next manhole away from the operator's station in the direction in which the tool is traveling in the pipeline,
- Never pass the cutter through an "upper manhole" under power,
- Clean and inspect the tool after each use.

PRODUCTS

Overview

All KEG Chain Cutters "spin" on a thin film of water, between the stator shaft and rotating element. A rotating bushing, inside the rotating element, protects the cutter from galling the stator or rotor due to steel-to-steel contact. *The use of oils or petroleum products to displace the residual water in the tool post usage IS NOT REQUIRED and will damage the cutter's rotational bushings, thus increasing the chance of tool failure. This practice will also void the KEG warranty on the tool.*

All KEG chain cutters are provided as a kit. Basic hand tools and sufficient spare wear items are provided with each cutter kit. This kit provides the user with tools and spares in order to configure/reconfigure the unit in the field, at the workbench, or at the jobsite.

All KEG chain cutters are shipped with fixed or adjustable skid assemblies, depending on the style cutter. In the Micro Cutter or Hummingbird series (½" swivel), the unit is shipped with one (1) fixed skid. In the Mini-Cutter series (½" or ¾" swivel), each unit is shipped with a set of three (3) fixed skids, one each in 4", 6" and 8" diameters. *It should be noted that the 4" skid in the Micro Cutter and Mini Cutter are not interchangeable!* Finally, the Super Cutter Plus 150 series and Super Cutter Plus 200 series are shipped with adjustable skid assemblies depending on the model cutter and the pipe diameter setup(s) purchased. Each unit is designed to pass through infrastructure with a single offset [(1)] of the pipe. *Design and configuration of the cutter skids are based upon the following rule of thumb.*

> ***Pipe / sewer diameter x 0.95 = adjustment diameter of skid assemblies***
> ***(Example: pipe diameter 12" x 0.95 = 11.4" adjustment diameter)***

Micro Chain Cutter

The Micro Chain Cutter, or Hummingbird, is KEG's latest addition to our chain cutter family. The Micro is suitable for ½" applications where light grease, scaling or vegetation is the major problem. As with all KEG cutters, cleaning and video inspection should take place **BEFORE** operating this unit. The Micro is supplied with one (1) 4" fixed skid and can be operated with or without this skid attached. See below for more information.

Mini Chain Cutter

KEG's Mini Chain Cutter is a long time staple of the Chain Cutter family. Our Mini Cutter is available with a ½" swivel or a ¾" swivel. The ¾" unit can also be operated with a 1" expander fitting to operate to flows up to 60 GPM. Mini Cutters are supplied with three fixes skids in the 4", 6", and 8" configurations.

Super Cutter Plus Series

The Super Cutter Plus (SCP) series is suitable for use with a number of different waters systems and hose sizes. The SCP series uses a set of five (5) skid and distance plate assemblies, unlike many other cutters/scrapers found in the marketplace. The use of five individual skid assemblies reduces the tilt angle[(3)], while still maintaining the unit's ability to pass through a single offset[(1)] in the pipe. With the use of special additional items these units can operate in a number of different pipe diameters above the basic kit configurations. This series of cutters also may be configured for operations in Egg-Shaped Pipe[(2)].

Since all sewer hose has a natural twist in its construction, the units are shipped with a high pressure swivel connection. This swivel allows the release of the twist without transferring it to the cutter. Periodic maintenance and inspection of the swivel, including lubrication with the grease gun provided by KEG, is necessary in order to ensure trouble free operations. *Lubricating the swivel is the only lubrication these tools require.*

Table 1 - Chain Cutter Pipe Size and Operating Ranges

Chain Cutter Type	Nominal Pipe Diameter (Inches)														Egg-shaped profile
	2	3	4	6	8	10	12	15	16	19	20	24	36	48	
Micro – Cutter (Hummingbird)	X	X	X												
Mini-Cutter			X	X	X										
Super Cutter Plus 150				X	X	X	X	X	X		X(2)	X(2)			X(2)
Super Cutter Plus 200					X	X	X	X	X	X	X	X(2)	X(2)	X(2)	X(2)
Super Nova 4000				X	X	X	X	X	X		X(2)	X(2)		X(2)	

(1) Single Offset – Infrastructure joint misalignment not greater than an infrastructure's single wall thickness

(2) Additional equipment required

(3) Tilt angle – The included angle measured when a single skid is in contact with the wall and allowed a side to side "rocking" motion

SUPER NOVA 4000

The Super Nova 4000 (SN 4000) series of chain cutters can be operated in nominal pipe diameters ranging from 6" to 48"[(2)]. **The unit also requires a minimum of 60 GPM and 1,700 PSI to a maximum of 130 GPM and maximum 3,000 PSI.** The unit comes with a 1¼" hose connection but is able to also operate on 1" and 1½" water systems with the use of either a reducing bushing or expander coupling. The base unit has an operating pipe diameter range from 6" to 20".

Table 2 – SN 4000 - Basic Kit Contents

Part Number	Qty	Description
		Basic Kit - Set A
00200413	1	Super Nova 4000 - Main Body
00200070	1	Cross Cutter - Stainless Steel
00200007	1	Dismantling Key
00200415	5	Distance Plate 4" x 6" (95mm x 129mm)
00200414	5	Standard Skid – Super Nova 4000
00200425	10	Hex Head Bolt, Nut & Washer – 10mm - Short
00200424	10	Hex Head Bolt, Nut & Washer - 10mm – Long
00200009	2	Hex Head Bolt - 8mm – Short
00210074	8	Hex Head Bolt – 10mm - Long
00200017	4	Rotating Nozzle 16mm - 0.65"
00100134	8	Insert - M6 - Ceramic - Rotation
00200018	4	Rotating Nozzle 30mm – 1.2"
00100130	5	Insert - M14 - Ceramic - Propulsion
00200422	1	Chain - Replacement - 15 ft.(5m)
00800064	1	Chain Breaker
00800013	1	Swivel Joint - HP - 1 1/4" NPT
00800055	1	Bushing - Reducing - 1 1/4" x 1"
00800055	1	Grease Gun
00800057	1	Tool Box 26"
00900029	1	8mm Allen Wrench
00900030	1	6mm Allen Wrench
00900031	1	5mm Allen Wrench
00900032	1	4mm Allen Wrench
00900033	1	3mm Allen Wrench
00900035	1	Loc-Tike, Anti-Seize - 1 oz. Tube
00900034	1	Loc-Tite –Blue, non hardening
9 Pc Wrench Set	1	9 piece wrench set
	1	Operating Instructions

Set-up and Operations

Basics

- A cross cutter will be fitted to the front of the chain retainer. Additional tools may only be used only with the manufacturer approval; otherwise any warranty claims will be rejected,
- In order to prevent the high pressure hose from being twisted/turned, and the chain cutter body rotating in pipe, it should only be used with the high pressure swivel joint fitted at the rear of the cutter.
- Before putting the device into operation, as well as after each use, all screws and screw connections must be checked for tightness and possible damage. Loose and/or damaged items must be retightened or replaced,
- It is more efficient if you work against the direction of flow,
- Use of a Chain Cutter in either high water or underwater conditions cost a lot of power,
- In order to prevent damage to the unit, the chain cutter should never be pulled out of the working area (pipe/sewer) without water pressure being applied; otherwise dirt could penetrate into the unit,
- The units should **NEVER** be allowed remain stationary and laboring upon the debris being removed, a slow back and forth motion is suggested,
- Always have the chain in a balanced condition. Never operate the unit without an equal number of links on each side of the chain retainer. Also, never operated the unit without the chain ends either being "open/open" or "closed/closed". Further details may be found in the chain section of this article,
- Use only the supplied inserts for both the rotational and propulsion nozzle. Use of other inserts or mixing inserts will cause the unit to operate improperly. The calculation of the nozzle sizes needs to be made according to the performance parameters of the pump (water flow per minute, pressure).

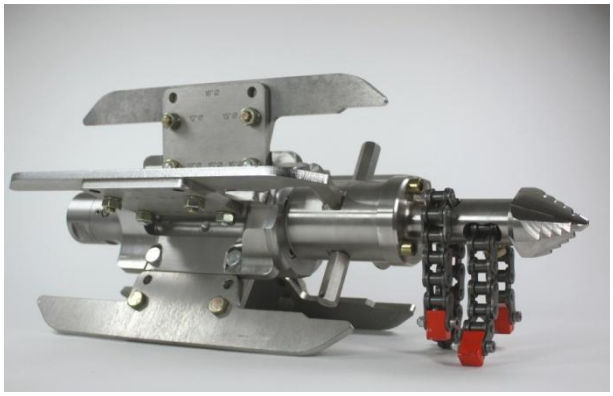


Figure 3 – Super Nova

Use of Hand Tools

- Use the appropriate sized tools for all fasteners (e.g. 15mm wrench fitted to a 15mm bolt head),
- Fully engage all open or closed ended wrenches with the fastener,
- Fully engage the hex-wrench inside the hex sockets of all socket hex-headed cap screws,
- Place the lock washer between the nut and fin/plate assemblies,
- Tighten only the nut when locking a "Nut & Bolt" assembly,
- Do not over tighten fasteners (excessive elongation or "stripping" my occur),
- Use only a "drop" of medium grade "Loc-Tite",
- Apply a light coat when using Anti-seize compounds,
- ever re-use a "flat" lock washer,

Chain Set-up:

Always have the chain in a balanced condition. Never operate the unit without an equal number of links on each side of the chain retainer.

- Never operated the unit without the chain ends either being "open/open" or "closed/closed",
- Check and ensure that the unit's chains do not extended, beyond the unit's centering skid assembly, more than ¾ of a chain link. The type of materials to be removed dictates how to setup the chains.

For removing light roots and deposits the chains should be adjusted with the same length on both sides of the chain retainer, and the rear chains being adjusted with the same number of chain links.



Figure 4 - Setup for light roots

Application for light roots (e.g. hairline or curtain roots in joints and service connections) prior to finishing or reconstruction – **Note: Forward chain is one link smaller.** Set-up also used for "final" pass



Figure 5 - Setup for light deposits

Application to "light" deposits (e.g. grease, hardened silts, mortar, etc) up to a 20% debris load – **Note: Forward chain is one link smaller.** Set-up also used for "final" pass

For removing total root growth and/or hard deposits the chains should have equal lengths on both sides of the chain retainer, and have the lengths varied (short to long) from the front of the chain retainer to the rear, i.e. staggered length.



Figure 6 - Setup for total root blockages



Figure 7 - Setup for blockages with hard deposits

Set-up for total root growth, blockages by rags, paper, wood pulp, and grease – **Note: Chains are in staggered lengths with open/open ends.** A final "finishing" pass may be required prior to reconstruction.

Set-up for blockages with hard deposits (e.g. cement, mortar, granite-like deposits, etc.) – **Note: Chains are staggered length, with ends reinforced.** A final "finishing" pass may be required before reconstruction.

General

The Super Nova 4000 (SN 4000) series basic kit has an operating range of 6" to 16" infrastructures. The SN 4000 series use an adjustable five (5) skid assembly in order to center the unit in the infrastructure. Additional assemblies can be added in order to use the tool in other infrastructures other than that supplied in the basic kit.



Figure 8 - Rotating nozzles 8mm, 16mm, 30mm, 50mm, 100mm

6", 8", & 10" Pipe Operations

Use only the 16mm rotating nozzles for these setups. Install the rotating nozzles using the 17mm wrench and lubricate the threads with a "silver" anti-seize. For the 8" setup the skid is placed in between the twin fin assembly and lined up with the lower set of holes (pictured at left). Position the skids in the upper set of holes for use in the 10" setup. Also, always use the supplied lock washers with the nuts and bolts. Check and ensure that the unit's chains do not extended, beyond the unit's centering skid assembly, more than ¾ of a chain link.

12” to 16” Pipe Operations

Use the 16mm rotating nozzles is recommended for light roots and grease removal, use of the 30mm rotating nozzles is recommended when setup for large masses or scale removal. Install the rotating nozzles using the 17mm wrench and lubricate the threads with a “silver” anti-seize. The use of the distance plate is required for proper assembly. The distance plates are marked corresponding to the nominal pipe diameter (pictured at right). Bolt the distance plate marked 12” to the inside of the dual fin assembly in the upper holes using a “long” 8 mm bolt. The expansion plate should be bolted to the outside of the skid, locating the skids holes with the corresponding 12” holes. Use of the “short” 10mm bolts are required, use of “long” bolts may result in damage to the exposed threads while the unit is in operation. Also, always use the supplied lock washers with the nuts and bolts. Check and ensure that the unit’s chains do not extended, beyond the unit’s centering skid assembly, more than ¾ of a chain link.

Use only the 30mm rotating nozzles for these setups. Install the rotating nozzles using the 17mm wrench and lubricate the threads with a “silver” anti-seize. The use of the distance plate is required for proper assembly. The distance plates are marked corresponding to the nominal pipe diameter. Bolt the distance plate marked 15”/16” to the inside of the dual fin assembly using a “long” 10 mm bolt. The expansion plate should be bolted to the inside of the skid, locating the skids lower holes with the corresponding holes, either 15” or 16”. Use of the “short” 10mm bolts are required, use of “long” bolts may result in damage to the exposed threads while the unit is in operation. Also, always use the supplied lock washers with the nuts and bolts. Check and ensure that the unit’s chains do not extended, beyond the unit’s centering skid assembly, more than ¾ of a chain link.

In order to use the Super Nova 4000 in either the 24”, 32”, & 48” configurations an additional kit is required.

20” & 24” Pipe Operations

Use only the 50mm rotating nozzles for these setups. Install the rotating nozzles using the 17mm wrench and lubricate the threads with a “silver” anti-seize. The use of the distance plates is required for proper assembly. The distance plates are marked corresponding to the nominal pipe diameter. Bolt the distance plate marked 19”/20” to the inside of the dual fin assembly using a “long” 10 mm bolt. The expansion plate should be bolted to the inside of the skid, locating the skids lower holes with the corresponding holes, either 19” or 20”. Use of the “short” 10mm bolts are required, use of “long” bolts may result in damage to the exposed threads while the unit is in operation. Also, always use the supplied lock washers with the nuts and bolts. Check and ensure that the unit’s chains do not extended, beyond the unit’s centering skid assembly, more than ¾ of a chain link.

28" to 32" Pipe Operations

***NOTE: 28" to 32" pipe operations require a minimum of 80 GPM and 2000 PSI*. Also note that a complete set of parts required for this configuration are illustrated in Table 13 below.**



Figure 9 - Super Nova to 32"

Additional longer skids and longer distance plates plus a set of 100mm rotating nozzles are supplied with the expansion kit. Use only the 100mm rotating nozzles for this set-up**.** Install the rotating nozzles using the 17mm wrench and lubricate the threads with a "silver" anti-seize. The single long distance plate is attached to the fin assemblies' between the dual fins using the "long" 8mm fasteners. The longer skid is attached to the inner side of the long distance plate using the "short" 8mm fasteners. Use of "long" bolts when connecting either two plates or a plate and skid may result in damage to the exposed threads while the unit is in operation. The skid must be installed with the "shortest" edge placed towards the chains. Also, always use the supplied lock washers with the nuts and bolts. Check and ensure that the unit's chains do not extended, beyond the unit's centering skid assembly, more than ¾ of a chain link.

36" to 48" Pipe Operations

NOTE: 36" to 48" pipe operations require a minimum of 130 GPM and 3000 PSI.

In able to use the Super Nova 4000 in the 36", 40", 44" or 48" configurations additional kits are required. Additional longer skids, short and long distance plates, an extension tube, additional fin assembly and swivel, plus a set of 100mm rotating nozzles are supplied with the expansion kit. Use only the 100mm rotating nozzles for this set-up. Install the rotating nozzles using the 17mm wrench and lubricate the threads with a "silver" anti-seize. The single long distance plate is attached to the fin assemblies' between the dual fins using the "long" 8mm fasteners. The longer skid is attached to the inner side of the long distance plate using the "short" 8mm fasteners. Use of "long" bolts when connecting either two plates or a plate and skid may result in damage to the exposed threads while the unit is in operation. The skid must be installed with the "shortest" edge placed towards the chains. The extension tube and additional distance plates are added to the rear of the cutter. The skids from the basic unit are used for the extension tube. Also, always use the supplied lock washers with the nuts and bolts. Check and ensure that the unit's chains do not extended, beyond the unit's centering skid assembly, more than ¾ of a chain link. If 130 GPM water is unable to be provided by a single source two trucks can be coupled together using a "Y" adaptor, a pulling device could be used in order to "pull" the unit through the pipe.

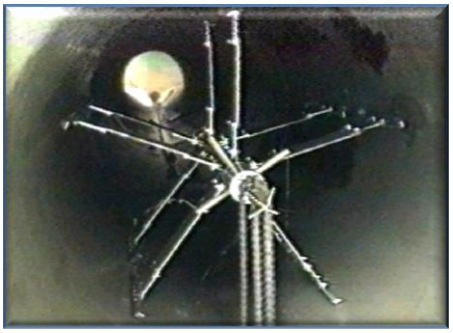


Figure 10 – Super Nova in 48" configuration

Egg-Shaped Pipe Operations

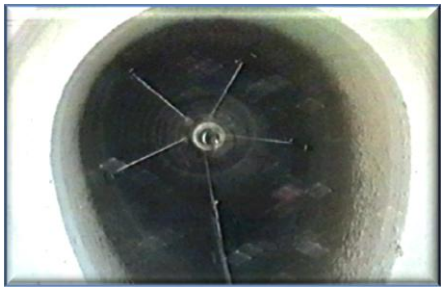


Figure 11 – Super Nova in egg-shaped pipe

The Super Nova 4000 is able to operate in Egg Shaped pipe with the addition of the Egg Shaped Pipe Expansion Kit. The kit may be used with either the basic kit or in conjunction with the 24”/36” or 36”/48” Expansion Kits. Use the recommended rotating nozzle for the nominal pipe size set-up. The cutter’s lowest/longest leg must be extended to engage the “valley” of the pipe. The additional skids should be set to the nominal pipe diameter. Always use the inside/outside mounting configuration for distance plate additions.

Pulling Device Use and Operations

As the name implies, when a means of pulling the unit through the pipe is needed for cleaning the pulling device (pictured at right) should be used. Either a cable reel or winch can be used to pull the unit. The use of the Pulling Device is designed for large diameter chain cutting when lower operating flows are available or when steep grades are encountered. The device is designed for 30” to 48” nominal pipe diameters and flows from 60 GPM. Removal of the chain retainer is required. **Use the 100mm rotating nozzles for these setups**. Install the rotating nozzles using the 17mm wrench and lubricate the threads with a “silver” anti-seize.



Figure 12 – Super Nova with pulling device

Spray Bar Operations

The Super Nova’s rotating nozzles may be replaced with a set of spray bars, thus allowing the unit to be used a large diameter 360^{o} rotating nozzle. Rotational speed of the unit may be controlled by directing the “angle of attack” either facing forward or aft. The spray bars should not be closer than 4” to the wall. When using the spray bars the chains are NOT to be used. Use of chains and spray bars together will damage the cutter and VOID the warranty.



Figure 13 Super Nova with spray bars

Maintenance

General

Any tool that incorporates moving parts must be maintained in some manner. The KEG Chain Cutter family has been designed to require a minimal amount of maintenance. All of the KEG Chain Cutters do not require being "de-watered" with a petroleum or organic based oil. De-watering is completed by holding the tool vertical and allowing the water to drain from the tool. At no time should any oil be used to lubricate the rotating element. ***Use of oil will void the tool warranty.*** Clean the KEG cutters using soap & water or a Bio-degradable de-greaser.

Prior to Initial Use

Verify all parts and tools are present prior to initial use. If parts or tools are missing inform KEG Technologies for immediate replacement. Check the swivel and ensure that it is smooth and feels free of binding. Ensure that no foreign material is present inside the body of the cutter. Check that the internal hose threads of the swivel are free of foreign materials. Check that all inserts are secure in both the body and rotating nozzles.

Set-up

Ensure that all parts are available for the required pipe diameter set-up prior to assembly. Do not use any non-KEG approved spare parts when assembling the tool. Check the skids for cracks or damage. Check the distance plates for cracks or damage also, ensure that the plates are flat and square. Inspect all weld points for cracking or damage prior to use.

Post Use

Wash the tool with clean water removing dirt, grease and foreign materials remaining on the tool. Use of a bio-degradable degreaser may be required to remove grease from the tool. A bio-degradable degreaser may be poured through the tool allowing cleaning the inner sections of the tool. Remove the skids and distance plates when cleaning between the fin assembly and skid/plates.

Clean and remove any material in the internal and exterior threads of all fasteners.

High Pressure Swivel

The high pressure swivel is a vital part of the chain cutter; the swivel allows the sewer hose's natural curl to be relieved without placing the "twist" on the tools body. Proper care will ensure long life. *The swivel is the only part of the tool that requires lubrication.* KEG provides the user with a disposable grease gun in order to lubricate the swivel. The grease gun supplied with the cutter comes loaded with grease. Periods between lubrication are based upon time and number of uses. During general use – two or three times a week- the swivel should be greased at the end of the week when further disassembly, cleaning and inspection periods. Heavy use - when the tool is used daily for long periods of time - the swivel should be greased at least every two days. Additional disassembly, cleaning and inspections will also be necessary.



Figure 14 - Disposable grease gun

Disassembly



Figure 15 - SCP200 disassembled

Disassembly and cleaning of the tool may be needed in the field. The tool should first be cleaned with water and if necessary cleaned with a bio-degradable degreaser. It is advisable to always handle the cross cutter with gloved hands in order to lessen the chance of injury to the user. Use the cross cutter dismantling key to remove the cross-cutter. Insert the removal tool through the hole in the cross cutter; this depresses the locking pin on the chain retainer. The cross cutter should first be removed in order to prevent cuts and/or other injuries. **Note: a rubber hammer or such tool may be necessary to gently remove the cross cutter from the chain retainer.**

The chain retainer and rotating element may be removed by:

- Removing the chain retaining screws from the chain retainer (19mm wrench required),
- Remove all cutting chain(s),
- Remove the M10 x 30mm socket hex cap screws (3 each) holding the chain retainer to the rotating element (as pictured right),
- Using a 17mm wrench, remove the rotating nozzles (4 each) from the rotating element,
- Remove the M8 x 30mm socket hex cap screws (2 each) holding the bearing plate and spacer to the stator axle,
- Remove the rotating element from the running axle,
- Remove the Teflon spacer ring,
- Clean and inspect all parts,
- Inspect the running axle and booby for surface cracks and/or galling.



Figure 16 – Super Nova removal of chain retainer

at

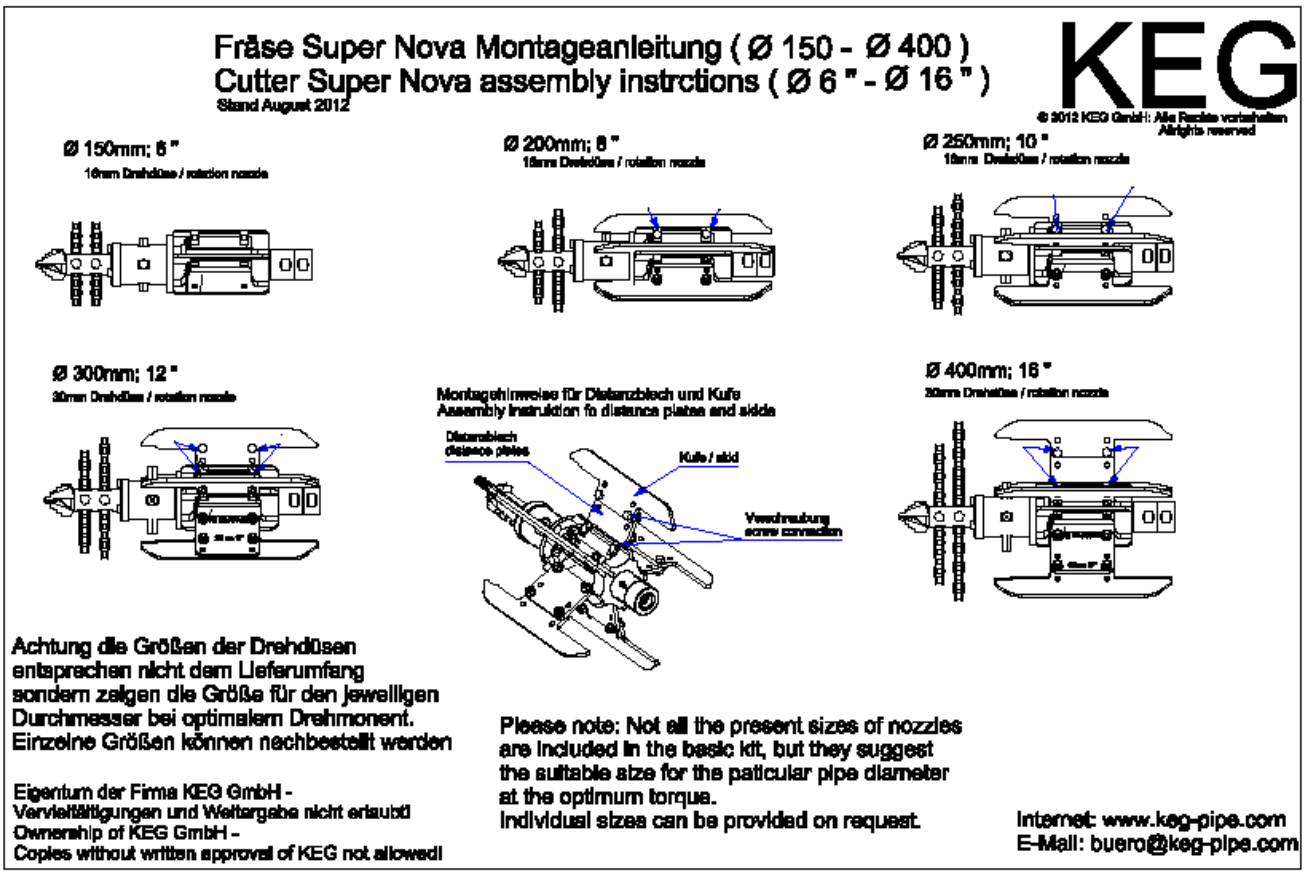
If the removal of the propulsion inserts are necessary, use an open end 14mm wrench.

Reassembly

Clean all remnants of Loc-Tite from the internal and external threads. During reassembly, use only a drop of Loc-Tite on the screw threads. Place the smoothest "by touch" side of the Teflon spacer ring next to rotating element. Replace the rotating element ensuring that the three threaded holes are facing forward. Apply a thin amount of "silver" anti-seize to the threads of the rotating nozzles prior to reassembly. **Note: the nozzles may be positioned within 20^{o} of perpendicular to the rotating element.** All rotating nozzles should only be "man" tight. **Do not over torque.** Over torque will cause damage to the rotating nozzle's threads. **DO NOT** use Loc-Tite on the chain retaining screws.

Schematic and Parts List

Super Nova 4000 – Basic Setup Schematic



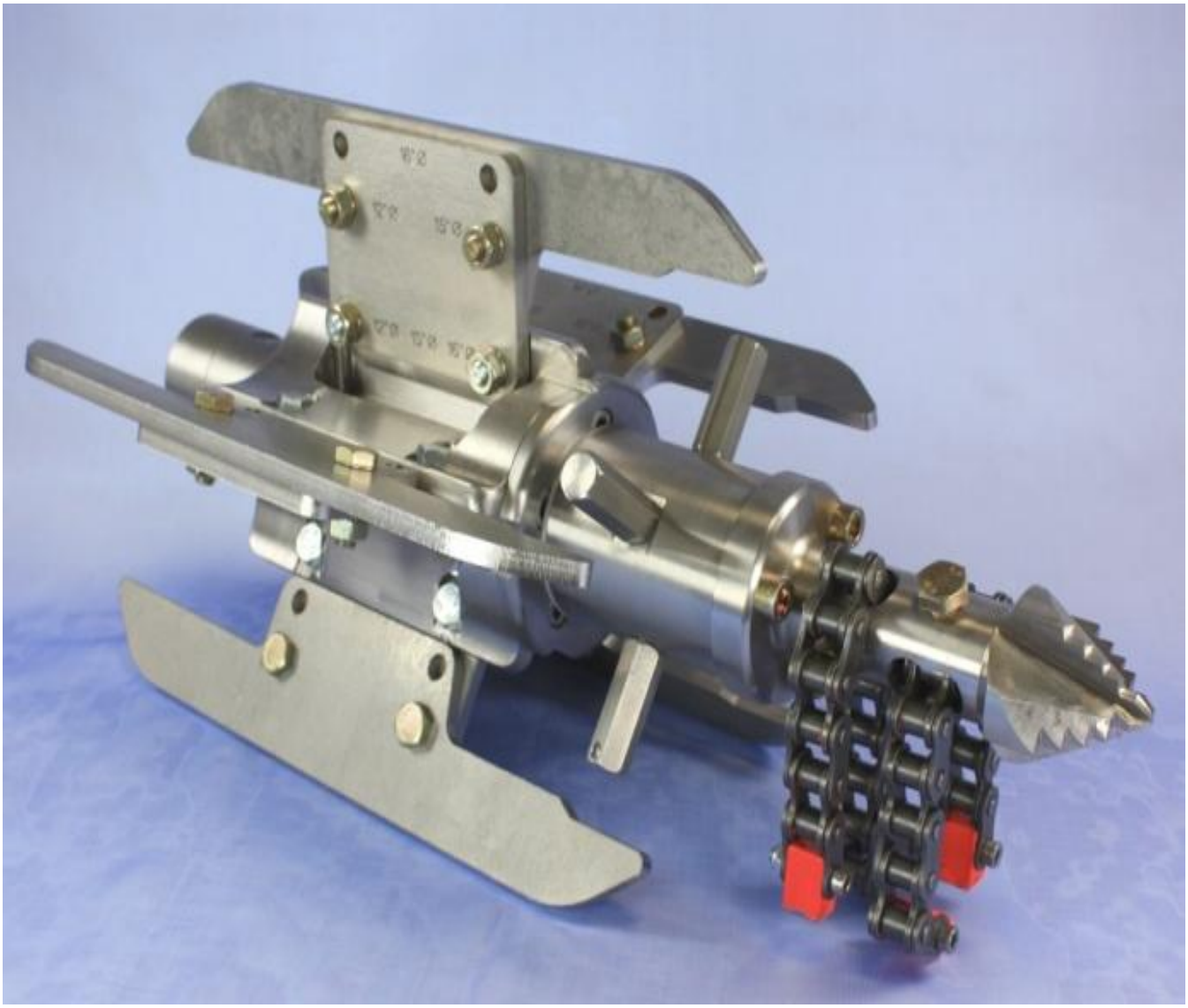


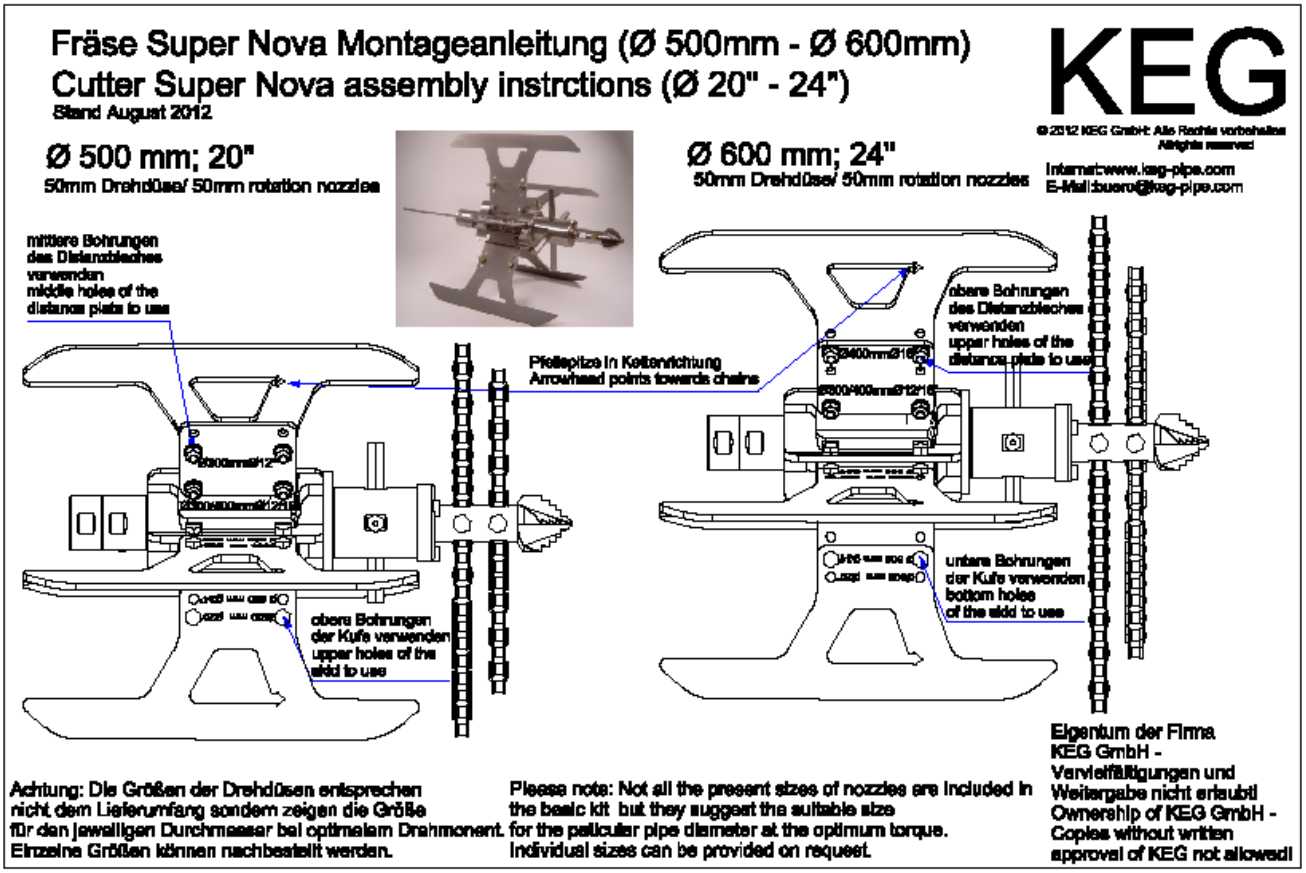
Figure 17 - Super Nova Basic to 16"

Table 3 - Parts List – Super Nova – Basic **- 200400-C**

Position	Description	Part Number	Quantity
1	base body	00200413	1
2	running axle	00200410	1
3	rotating body	00200411	1
4	chain holder	00200412	1
22	skid	00200414	5
23	distance plate 129 x 95	00200415	5
6	rotation nozzle 16 mm	00200017	4
7	rotation nozzle 30 mm	00200018	4
8	nozzle insert M6 for rotation nozzle	00100175	8
5	nozzle insert SW 14	00100174	5
18	bearing plate, bronze plated	00210028	*1*
9	bearing plate	00210026	1
15	Teflon bushing	00200426	2
17	protective ring	00210031	1
16	retaining ring	00210099	2
10	screw for chain	00200423	2
11	socket screw M10x30 complete with nut and washer	00200425	10
24	socket screw M10x30 complete with nut and Washer	00200424	10
19	socket screw M8 x 20	00200009	2
20	socket screw M10 × 30	00210074	8
14	cylinder screw	00210053	5
25	Swivel 11/4"	00800013	1
	alternative: Swivel 11/4"AG / 1"IG	00801141	1
26	screw plug 1 1/4"	00800060	1
	alternative: Screw plug 1”	00800059	1
21	Chain 5m	00200422	1
optional:			
27	Tips per set	00210111	2

Schematic and Parts List

Super Nova – Expansion to 24” Schematic



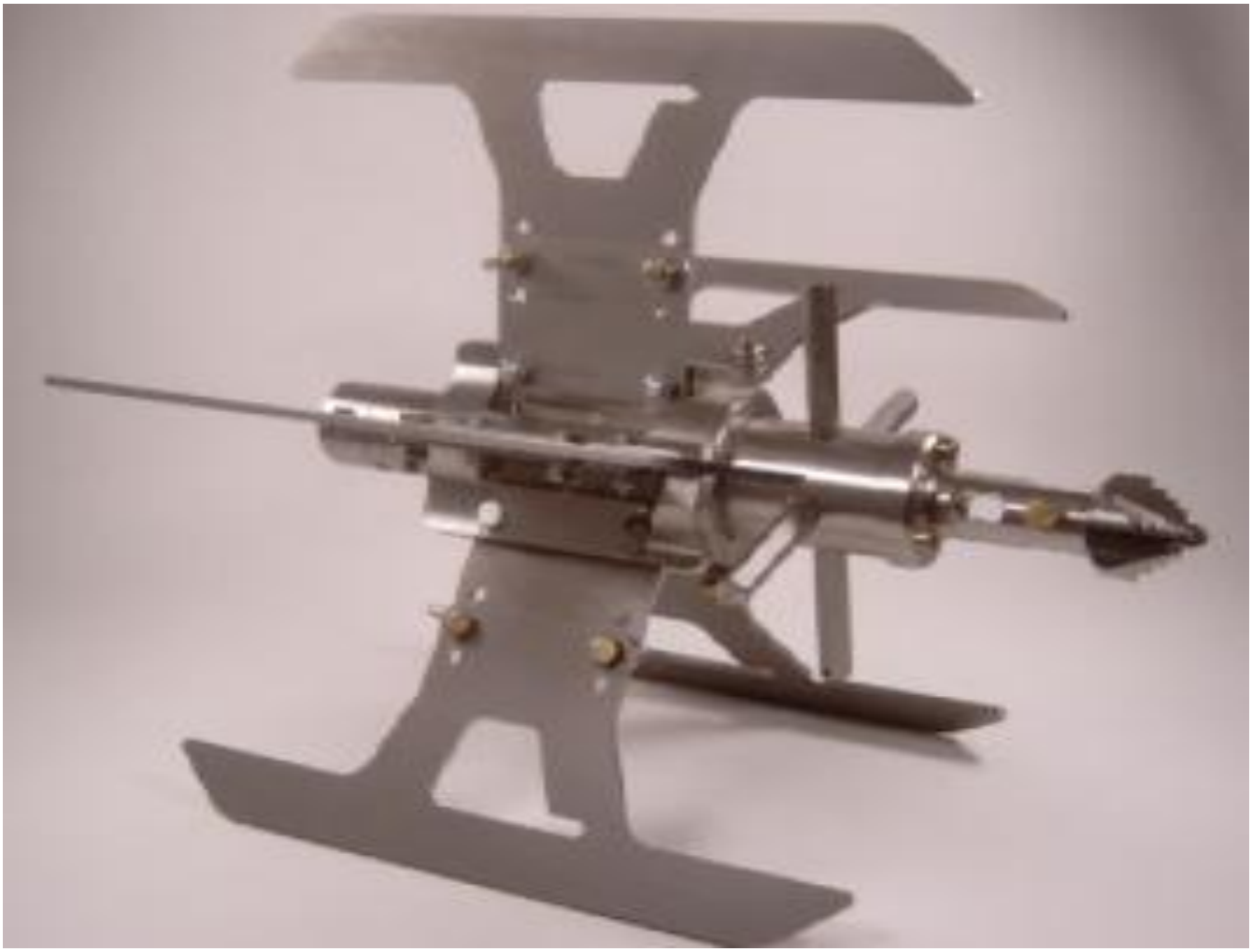


Figure 18 - Super Nova to 24"

Table 20 - Parts List – Super Nova – Expansion to 24" **– 200402-C**

Additional equipment required for pipe diameters 500 up to 600 mm - Art.Nr. 00200402

Position	Description	Part Number	Quantity
	skid 500/600	00200420	5
	rotation nozzle 50 mm	00200419	4
	nozzle insert M6	00100174	4

Schematic and Parts List

SN 4000 – Basic Setup Schematic

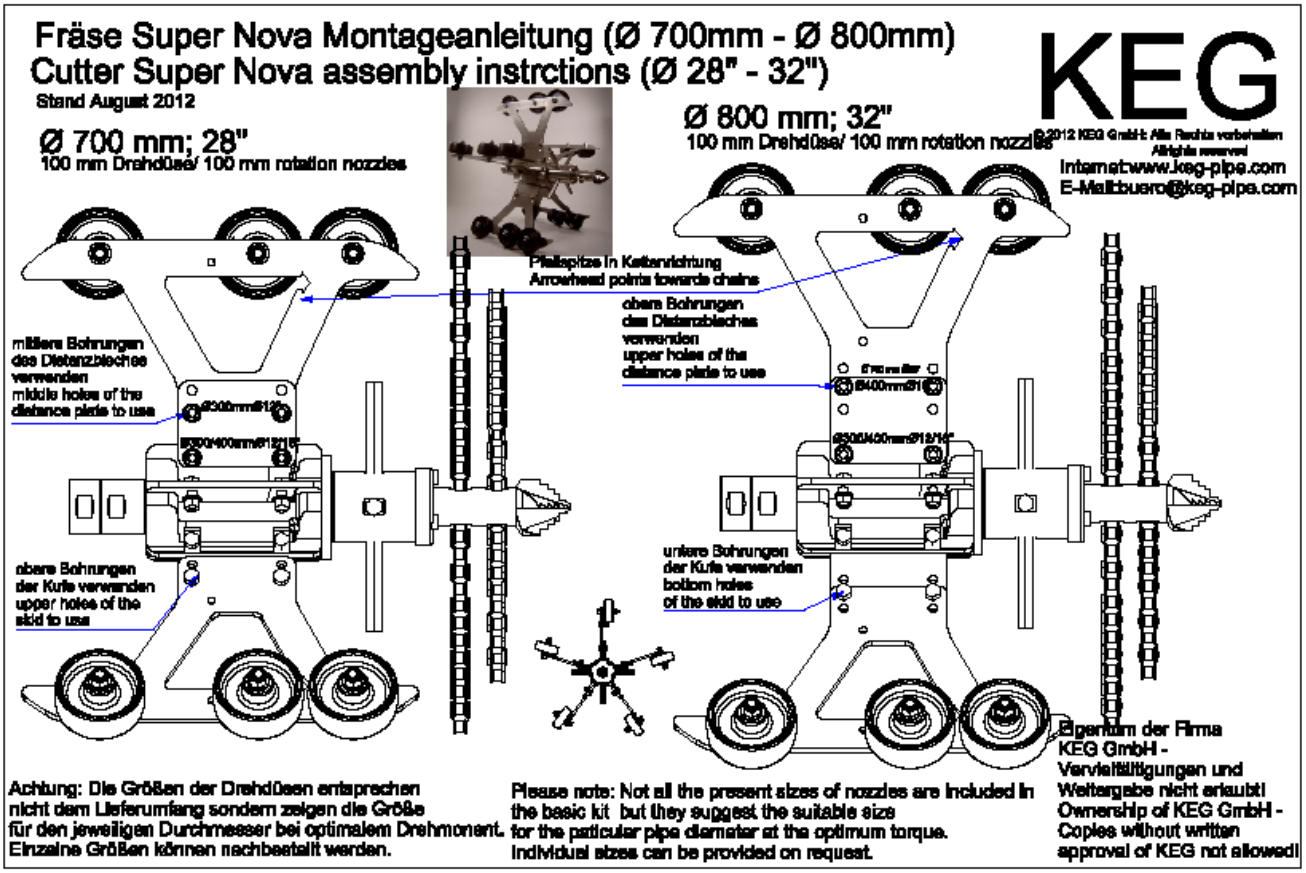




Figure 19 - Super Nova to 32"

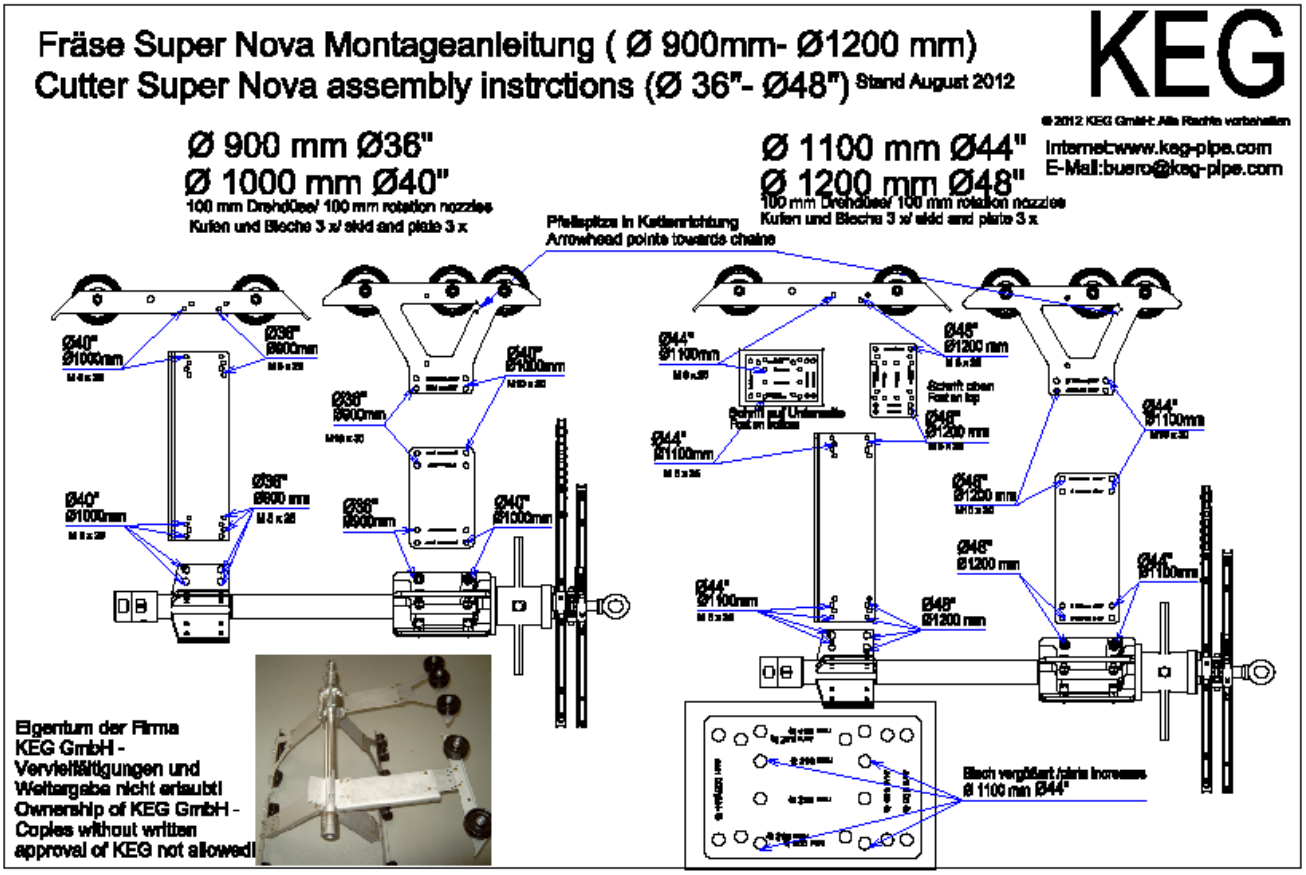
Table 21 - Parts List – Super Nova – Expansion to 32" - **200403 -C**

Additional equipment required for pipe diameters 700 up to 800 mm - Art.Nr. 00200403

	skid 700/800 complete with rolls	00200421	5
	rotation nozzle 100 mm	00200020	4
	Nozzle insert M6	00100175	4

Schematic and Parts List

SN 4000 – Basic Setup Schematic



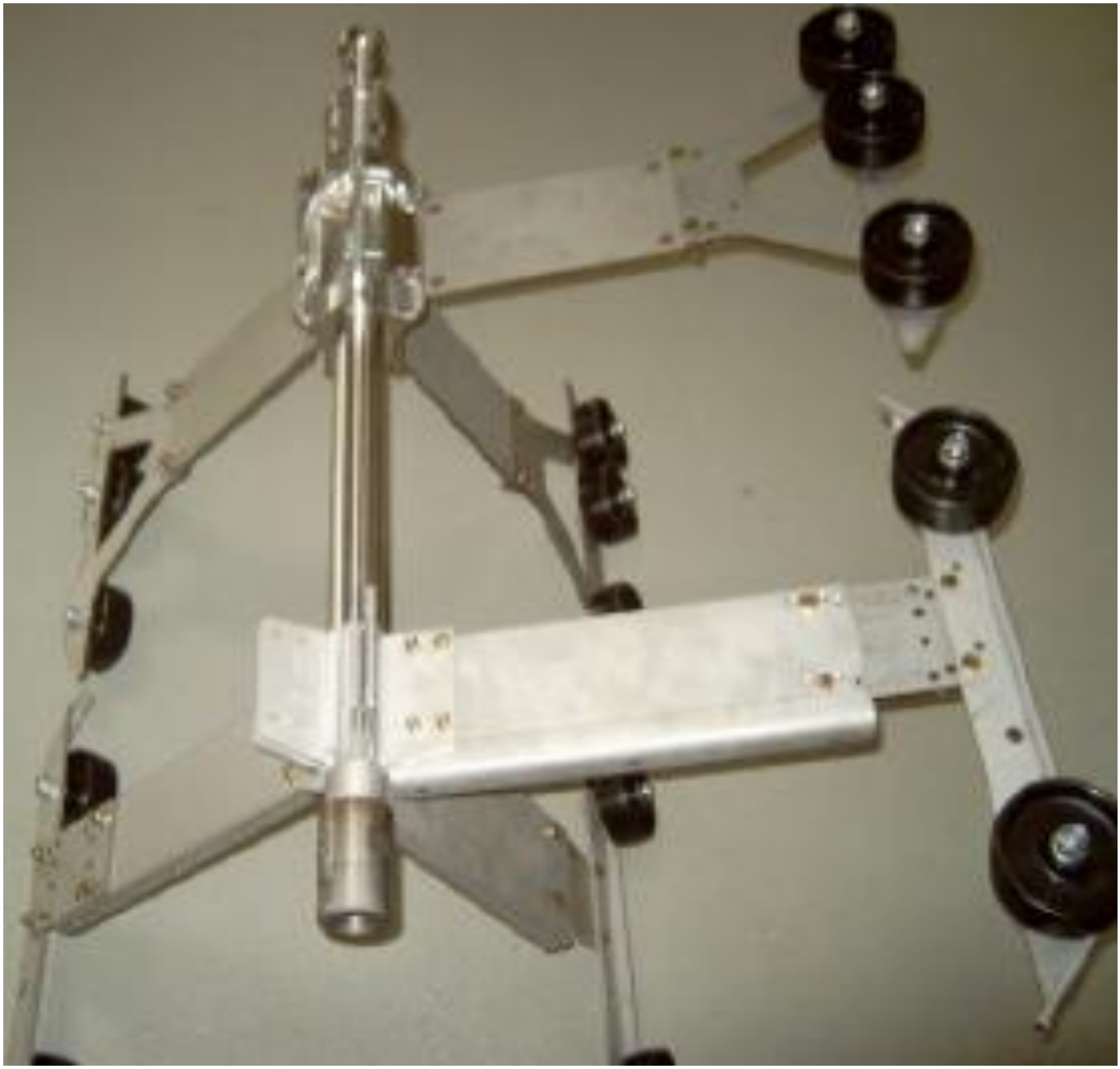


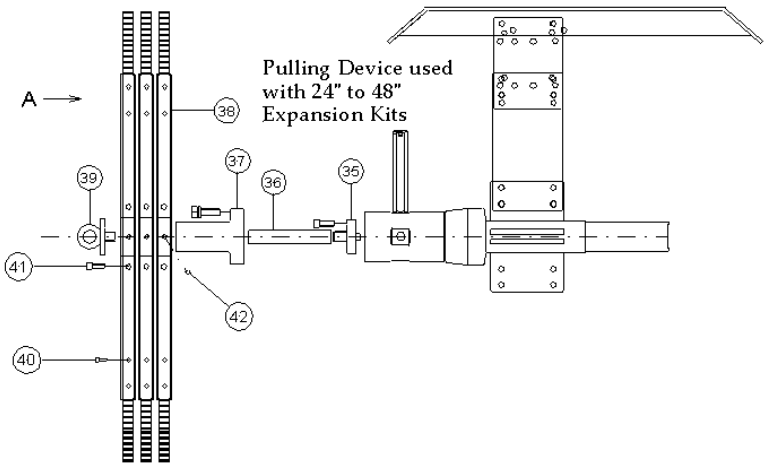
Figure 20 - Expansion Set to 48" Rear set up

Table 21 - Parts List – Super Nova – Expansion to 48” **200404 -C**

Additional equipment required for pipe diameters 900 up to 1200 mm - Art.Nr. 00200404

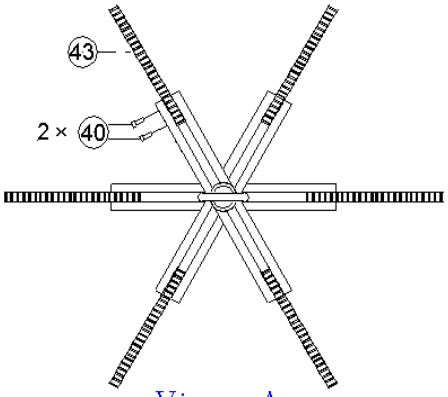
	skid long, completely with 2 rolls	00210002	3
	optional: skid 700/800 completely. with rolls *(not included in the standard delivery – not necessary if additional equipment for SuperNova 700/800 mm pipeØ is available)*	00200421	5
	distance plate 380 x 120 mm with angle	00210001	3
	distance plate 95 ×145	00210014	3
	distance plate 129 × 200	00200416	3
	distance plate 129 × 300	00200417	3
	connection tube	00210025	1
	spacer 300 mm	00200034	1
	hexagon screw M8 × 25	00210082	24
	hexagon nut M8	00210083	24
	spring washer M8	00210084	24
	hexagon screw M10x30 complete with nut and spring washer	00200424	6
	chain 5m	00200422	1

Super Nova - Pulling Device



Super Cutter Plus 200 Pulling Device - Spare Parts

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View - A

Super Cutter Plus 200 Pulling Device

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Table 22 - Parts List – Super Nova – Pulling Device to 24” **200430-C**

Pulling device Super Nova for pipe diameters 200 - 800 mm - Art.Nr. 00200430

Pos.	Description	Order no.	Qty
	chain holder	00210027	1
	protective ring	00200431	1
	holding disk	00200432	1
	body with guide	00200433	1
	pulling eye completely with nut and washer M10	00210204	1
	hexagon screw M 6 x 16	00210085	4
	Teflon bushing	00200049	1

Table 23 - Parts List – Super Nova – Pulling Device to 48” **200210-C**

Pulling device Super Nova for pipe diameters 900 - 1200 mm - Art.Nr. 0021210

Pos.	Description	Order no.	Qty
	Top plate	00210200	1
	Pulling tube	00210201	1
	Chain holder base	00210202	1
	Chain holder	00210203	3
	Pulling eye	00210204	1
	Socket screw m^ x 30	00210205	12
	Spring washer M6	00210206	12
	Washer M6	00210207	12
	Hexagon nut M6	00210208	12
	Socket screw M8 x 30	00210052	6
	Hexagon nut M8	00210083	6
	Screwed pin	00210103	3
	Chain 5 m	00200022	1

Table 24 - Parts List – Super Nova –Spray Bars

Additional equipment Super Nova - for cleaning interior pipe walls

Pos.	Description	Order no.	Qty
	Spray bars	00200041	4
	Nozzle Insert M6	00100175	4
	Tube Extension 50mm	00200076	4
	Tube extension 100mm	00200038	4
	Tube extension 150mm	00200039	4
	Tube Extension 250mm	00200040	4
	Tube extension 400mm	00200077	4

Notes:_____