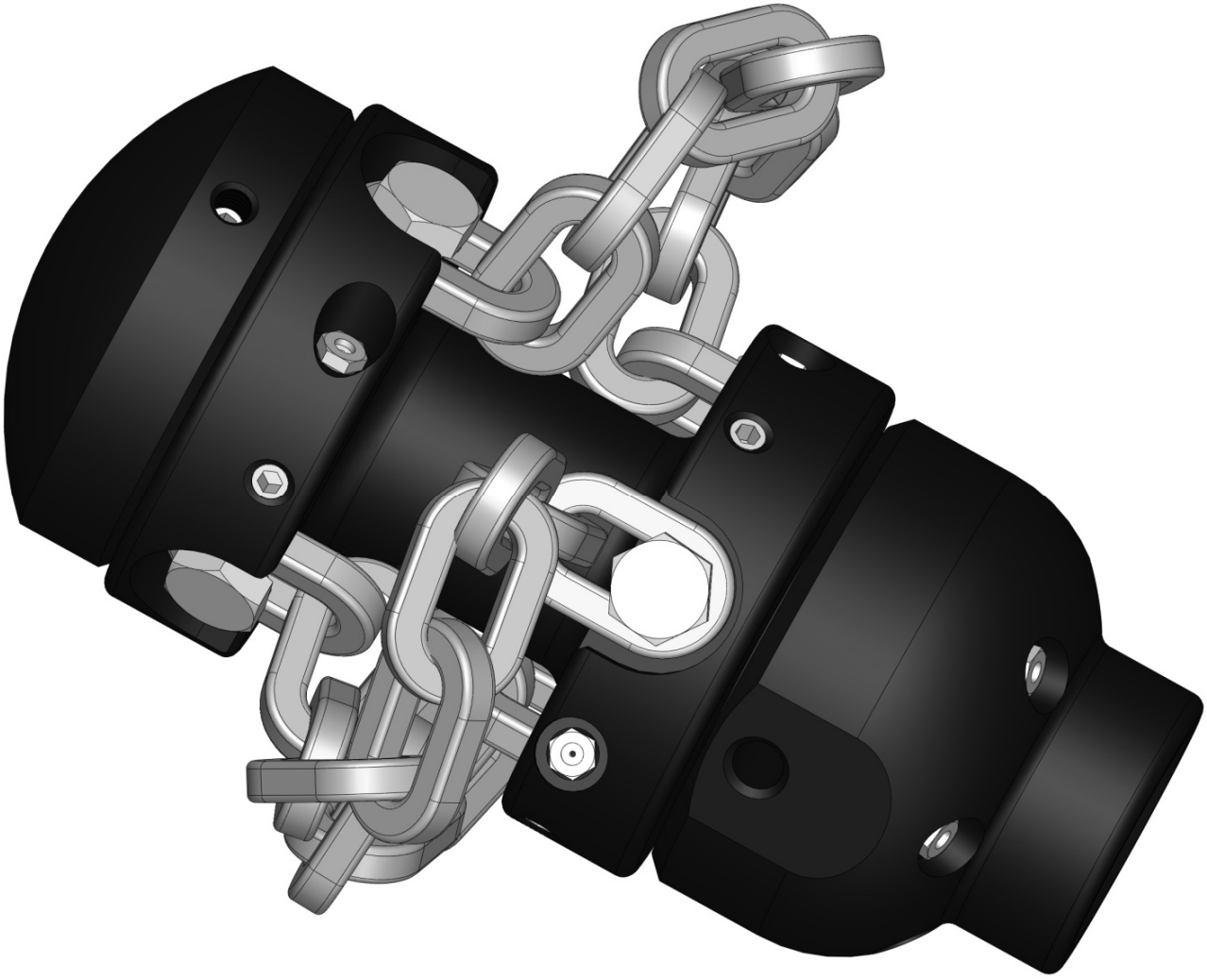

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Introduction

These guidelines are intended to provide the operator with basic information that will allow him to properly use our Nuova Contec (NCT) nozzles. Recommendations inside this manual grant you the achievement of the best performances. All members of the staff, operators as well as responsible, must carefully read and understand the following information.
For further information please call NCT or one of our authorized dealers.

Safety

Nozzle usage can be dangerous if the following safety rules are not applied:

- The nozzle and its jets must never be oriented toward electrical parts or to energy bearing lines.
- The nozzle and its jets must never be oriented towards people or animals. Water jets could result in very serious injuries and even death;
- It is absolutely forbidden to directly expose hands and/or other parts of the body towards the water jet;
- Always choose a nozzle according to the pipeline conditions and on the type of application. A not adequate nozzle could result in irreparable damage of the pipeline and be dangerous to operators and bystanders;
- It is absolutely forbidden to lean towards the inside of the manhole with the nozzle in action;
- Do not exceed the pressure indicated by the manufacturer. Because of the high-pressure jets, some parts of the sediment or conduct may come off suddenly hitting the unwary spectators;
- Any inspection, monitoring, maintenance or repair operation has to be performed with nozzle at rest, and in any case not before having removed completely the pressure from the supply hose.

Usage

NCT nozzles can be used only **TO WASH UNDERGROUND PIPES ABLE TO RESIST TO HIGH PRESSURE WATER JETTING AND/OR MECHANIC ACTION OF ITS MOVING PARTS.**
MAXIMUM WORKING PRESSURE: 250 Bar
Unless there is a specific certification, NCT **nozzles MUST NOT BE USED IN AN EXPLOSIVE ENVIRONMENT.**

Responsibilities

THE MANUFACTURER DISCLAIMS ANY LIABILITY IF THE CLIENT:

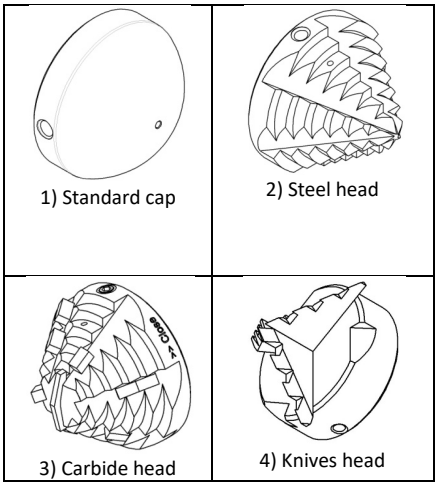
- Does not completely read the following instructions PRIOR to in any way start using the equipment.
- Uses the equipment outside the recommended usages and performances for which it was designed and built.
- Does not regularly perform all maintenance operations.
- Tampers with or willfully or negligently let somebody tamper with the equipment, or rely on inexperienced or unqualified operators.
- Does not adequately instruct all the operators that will use the equipment, on risks that could result from an improper use of the nozzle;
- Omits to define in clear and unequivocal terms the working area in order to prevent outsiders from accessing it.
- Uses non-original spare parts, accessories, tools, or any device that does not guarantee the widest margin of safety, taking into account the maximum pressure reachable by the nozzle in the most demanding working conditions.

Parts

The Heads

The Friuli nozzles can be supplied with 4 head types:

- **Standard cap** (fig.1) to decrease removal or to pass through critical bends
- **Steel head** (fig.2), for light/medium deposits
- **Carbide head** (fig.3), for hard deposits removal such as concrete and limestone encrustations.
- **Knives head** (fig.4) for roots removal

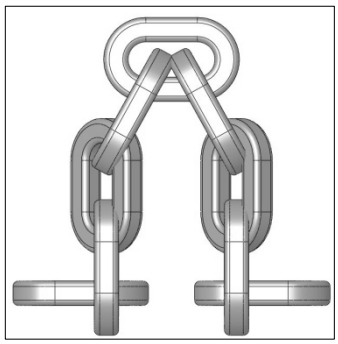


How to Install or Remove a Threaded Head

The head thread must be kept clean, dry and well degreased.
Apply to one single point of the thread the thread locker “Loctite 243” or equivalent.
Screw the head on the rotor watching carefully the left thread; the head is screwed by turning it counterclockwise (the arrow over the head tells the closing direction).
Apply “Loctite 243” or equivalent on the blocking grain and lock. In order to replace the head, remove the blocking grain and unscrew clockwise.

Chains

How to Choose and Replace Chains



Catena

In order to replace the chains it is advisable to use only original spare parts supplied by Nuova ConTec srl, since only our original chains are treated in order to resist to strong wearing. They are integrated in the nozzle as one product.

The length of the chains has to be properly chosen, sized according to the pipeline to be cleaned. The table at the end of this document provides you with the optimal relationship between length and diameter of the pipeline.
If the chains are wrongly sized the nozzle may damage the pipeline or not work properly. Due to the shape of the nozzle it is always advisable to choose the chains with an odd number of rings so that they can work correctly as shown in the picture.
When mounting the chains, it is advisable to use Loctite 243 or equivalent in order to avoid eventual unscrewing due to vibration.
Mind that: Using a too rigid glue can make it difficult to replace the chain, while not using it may cause unscrewing of the mounting screw.
It is also advisable to check regularly the fixing of the chain during usage.

How to Calibrate/Remove the Jets

Chain nozzles are sold with already mounted inserts; if necessary for replacement or recalibration, please follow this procedure:

1. Remove the old inserts (you may need to warm up the inserts in order to soften the thread locker, then unscrew them being careful not to damage the seat of the key.)
2. Place new inserts by applying a layer of “Loctite 243” or similar over the threaded surfaces properly degreased.

Let it dry for at least 2 hours prior to reuse.

Operating instructions

Preliminary operations

Before restarting the washing system the operator must check that:

- The nozzle (with centralizer) is tightly screwed to the high pressure hose.
- All parts of the nozzle are in perfect conditions and all screws are properly locked.
- All inserts are clean and free from debris and cloggings.
- That the high pressure hose does not have any clear sign of wear and tear and that all fittings are in perfect conditions.
- That all necessary protections have been installed.

Besides pressure adjustment, no other operation has to be performed while the system is working (e.g. locking a high pressure hose, checking out the tightness of various hose fittings, etc.).
Prior to performing these activities drop down the pressure in the HP hose and turn off the pump.
Any anomalous or doubtful functioning prior and/or during the job must be checked only by competent personnel.
In these cases the pressure has to be removed immediately and the high pressure system stopped.

Before using a chain nozzle it is advisable to clean the pipe by using a washing nozzle and cctv inspection, in order to verify the pipe conditions. In case of breaks, detached or off-axis joints, using a chain nozzle is not a good choice. The rotation of the chains can furtherly damage the condition of the pipe. In case of normal condition never let the nozzle rest in a given position for more than 30 seconds.

When and Where to Use the Chain Nozzle

Rotating chain nozzles are an ideal instrument to achieve good cleaning of pipelines with roots or average resistant deposits. It is not advisable to use chain nozzles in plastic pipes or in seriously damaged pipes.

Operation

It is advisable not to use this nozzle with pressures above 150 bar. A greater pressure does not give any functional advantage to the nozzle, on the other hand it sensibly increases the tear and wear condition.

We advise to use the nozzle with the provided centralizers in order to increase the cleaning action. Chain nozzles, without centralizer, being heavier than traditional nozzles, tend to stay on the bottom of the pipe so that the chains are not free to rotate and to perform their cleaning job.
The nozzle must be tightly screwed over the guide or over the pipe junction. ALWAYS CHECK THE FASTENING.

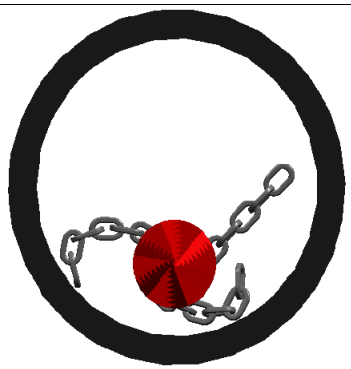


Figure 1: Chain Nozzle without centralizer

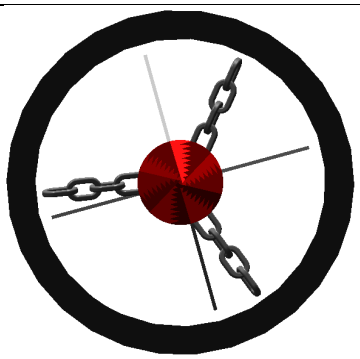


Figure 2:Chain nozzle with centralizer properly placed

Before proceeding to pressurize the hose to which the nozzle is connected, please check all above stated conditions in GENERAL SAFETY NORMS.

Highlight the supply hose with waterproof tape at about 1-2 mt from the joint. In this way it can be seen when the nozzle during the recovery phase is coming out from the pipeline.

Completely insert the nozzle inside the pipe, then place it at least at 1 mt inside by using the supply hose. If possible the chain nozzle should always work in opposite direction to the flow of the pipeline so that the deposits are transported to the manhole where the operators are working.
Start the nozzle at low pressure (do not exceed 100 bar) for a couple of meters so that the jet thrust (rear) gradually move the debris - the operator must always be in a safe position - proceed then to the setting of the normal working pressure, that should never exceed 200 bar.

Should the rotor block itself against an obstacle, it will be necessary to recover the supply hose until the nozzle is again free to rotate, then let it go slowly forward so that it can remove the obstacles and if necessary repeat several times the forward-backward action.

If after some minutes the nozzle does not enter the obstruction, do not further insist. It could be due to a problem inside the pipeline such as a branch, a misalignment, a collapse etc. In these cases proceed with a cctv inspection in order to choose how to proceed (another cleaning method or a pipeline rehabilitation system).

Every 2/5 mt of forward cleaning recover the nozzle so to clean the pipe from already loosened sediments. While recovering the nozzle is always in action but at a reduced pressure, once the signed point is reached, stop the pump in order to avoid the still working nozzle to be dropped down inside the manhole due to a wrong maneuvering.

During all cleaning operations always combine the working forward of the nozzle with the hose reel to avoid that the nozzle crashes over an obstacle or on a pipe curve so damaging it or itself.

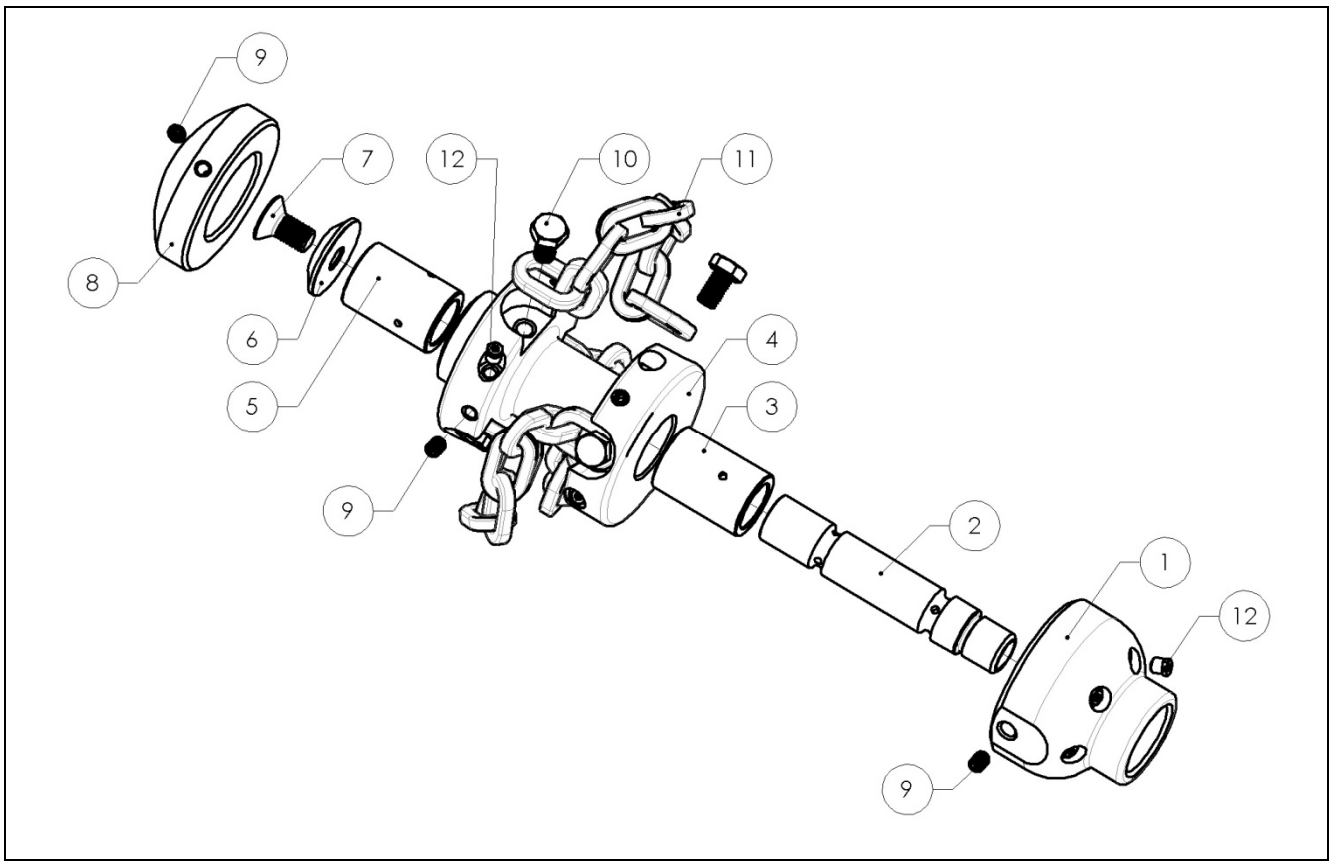
Maintenance at the end of a job

1. At the end of the work to prevent early wear of parts, blow water out of the nozzle by blowing air into it
2. Visually inspect all parts of the nozzle to ensure it is trouble free. Check that all screws are tightened and, if necessary, retighten them using medium thread-lock.
3. Check all jet orifices for blockage, if necessary they can be cleaned with the optional cleaning kit. High pressure causes natural wear to the orifices of the jets, which results in the enlargement of the size of the orifice. When this happens, the jets should be replaced.
4. Lubricate all accessible parts with anti-corrosion and water-repellent spray like “WD40” or equivalent. Do not immerge in oil, it would emulsify with the water, and it could cause malfunction of the nozzle.
5. Check the wear condition of the chains and fixing screws and replace with original spare parts if necessary.

Problem solving

Problem	Cause	Solution
The nozzle has not enough thrust.	• Wrong nozzle calibration • Problems on the pump • Not adequate supply hose	• Inserts replacement • Check pump performances • Check supply hose diameter and length
The system does not reach the required pressure.	• Wrong nozzle calibration • Problems on the pump • Not adequate supply hose	• Inserts replacement • Check pump performances • Check supply hose diameter and lenght
The chains wear or break too quickly.	• You are using the nozzle without a centralizer • The chains are not adequate	• Use a centralizer • Replace chains
The chains detach themselves from the head.	• Loosen or missing screw • The chains are not the right ones	• Use NCT original spare parts
The nozzle does not rotate.	• Rotor needs lubrication • Obstructed jets • Broken bushing	• Lubricate the rotor. • Clean the jets. • NCT maintenance center
The nozzle does not rotate regularly.	• Ovalized bushing	• NCT maintenance center

Exploded View



Pos.	Part Number	Description	Q.ty		
1	75511.072-4	Rear 1"F 6F M6	1		
1	75000.76	Rear 1 1/4"F	1		
2	75000.070	Shaft	1		
3	75512.71-2	Friuli bushing – rear side	1		
4	75000.084/1	Friuli rotor – without bushing	1		
5	75512.71-1	Friuli bushing – head side	1		
6	75513.03	Friuli washer	1		
7	8.06A2M10X020	TSPEI SS screw M10x20	1	8.1) Standard Cap	8.2) Steel head
8.1	75527.28	Friuli Standard Cap	1		
8.2	75527.29B	Friuli Steel head	1		
8.3	75527.30B	Friuli Carbide head	1		
8.4	75000.40	Friuli Knives head	1		
9	8.13A2M06X008	M6x8 SS grain	8		
10	8.01NM08X014	TE M8x14 black screw	6		
11	75001.07-11	Friuli chain for DN200	3		
12	85511.xx	M6x8 ceramic inserts (to be calibrated)	12	8.3) Carbide head	8.4) Knives head
12.1	85993.xx	Inserto M6x8 ceramica foro DN da tarare	10		

Ring Chains Kit with Screws

Part number	Description	Rings (mm)	Picture
75000.075BK	RING CHAIN KIT FOR DN 150 6"	9 (175 mm)	
75000.075K	RING CHAIN KIT FOR DN 200 8"	11 (210 mm)	
75000.076K	RING CHAIN KIT FOR DN 250 10"	13 (250 mm)	
75000.077K	RING CHAIN KIT FOR DN 300 12"	17 (320 mm)	
75000.079K	RING CHAIN KIT FOR DN 350 14"	19 (353 mm)	
75000.078K	RING CHAIN KIT FOR DN 400 16"	21 (393 mm)	
75000.080K	RING CHAIN KIT FOR DN 450 18"	23 (430 mm)	
75000.081K	RING CHAIN KIT FOR DN 500 20"	25 (468 mm)	
75000.083K	RING CHAIN KIT FOR DN 600 24"	29 (540 mm)	
75001.07	SQUARE CHAIN 5,5X20,5X8	(mt)	

Spare Parts (before 2012)

Part number	Description	Picture
85993.06	CERAMIC INSERT GRAIN M6X8 DN 0,6	
85993.08	CERAMIC INSERT GRAIN M6X8 DN 0,8	
85993.10	CERAMIC INSERT GRAIN M6X8 DN 1,0	
85993.12	CERAMIC INSERT GRAIN M6X8 DN 1,2	
85993.14	CERAMIC INSERT GRAIN M6X8 DN 1,4	
85993.16	CERAMIC INSERT GRAIN M6X8 DN 1,6	
85993.18	CERAMIC INSERT GRAIN M6X8 DN 1,8	
85993.20	CERAMIC INSERT GRAIN M6X8 DN 2,0	
85993.22	CERAMIC INSERT GRAIN M6X8 DN 2,2	
85993.24	CERAMIC INSERT GRAIN M6X8 DN 2,4	
85993.26	CERAMIC INSERT GRAIN M6X8 DN 2,6	

Spare Parts 2013

Part number	Description	Picture
85511.06	CERAMIC INSERT TE M6X8 DN 0,6	
85511.08	CERAMIC INSERT TE M6X8 DN 0,8	
85511.10	CERAMIC INSERT TE M6X8 DN 1,0	
85511.12	CERAMIC INSERT TE M6X8 DN 1,2	
85511.14	CERAMIC INSERT TE M6X8 DN 1,4	
85511.16	CERAMIC INSERT TE M6X8 DN 1,6	
85511.18	CERAMIC INSERT TE M6X8 DN 1,8	
85511.20	CERAMIC INSERT TE M6X8 DN 2,0	
85511.22	CERAMIC INSERT TE M6X8 DN 2,2	
85511.24	CERAMIC INSERT TE M6X8 DN 2,4	

Spare Parts

Part number	Description	Picture
LOC.243	LOCTITE 243 50CC	
85500.517L	“L” male key for inserts replacement (6 mm)	
85500.512L	"L" male key for inserts replacement 3 mm	
85500.506-03	Double pipe hexagonal key (6 mm)	
WD.40	Lubricating spray WD40 200 ml	

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