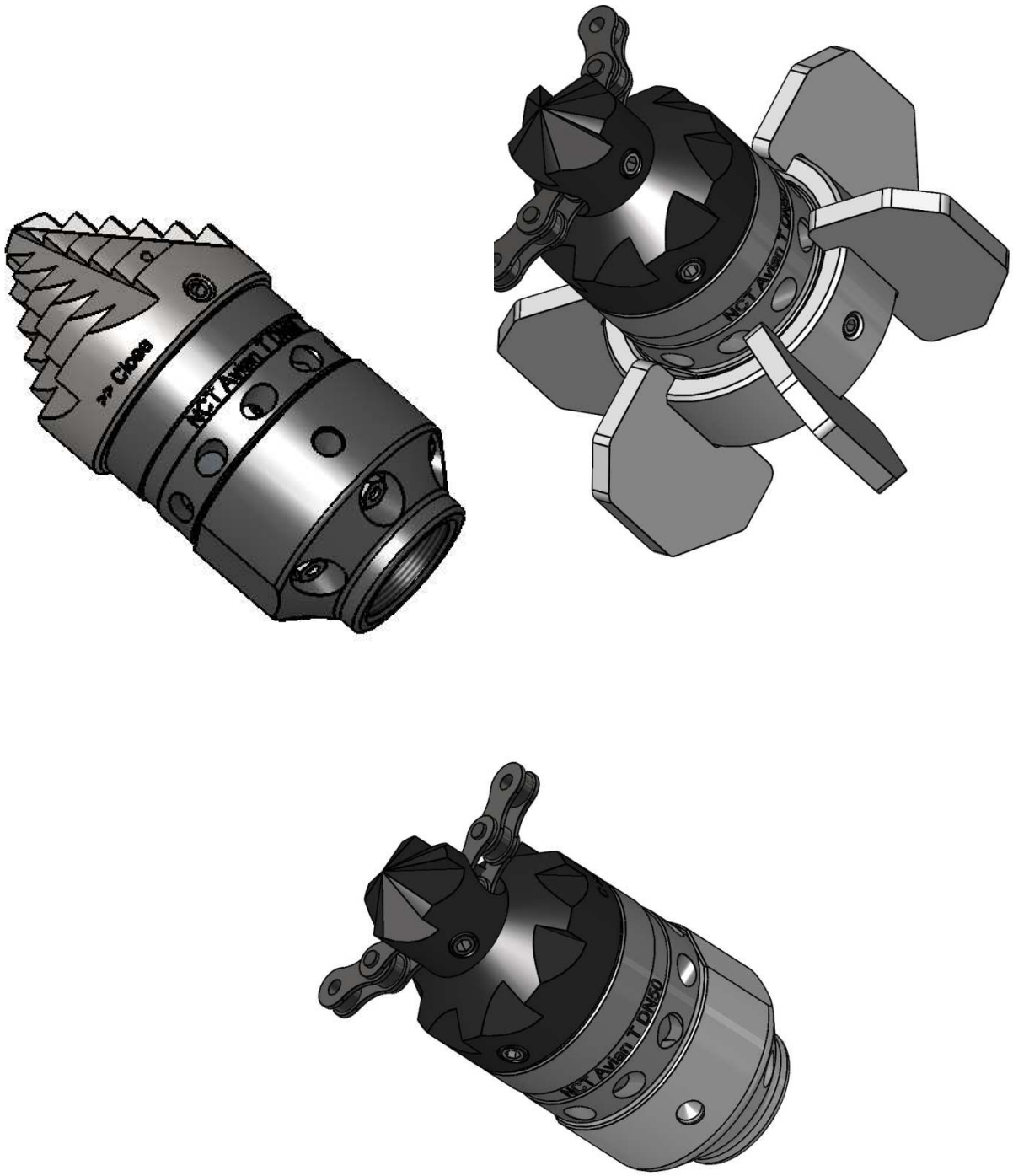
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NCT Avian T DN50

Table of contents

Introduction **3**

Safety **3**

Usage **3**

Responsibilities **4**

Parts **4**

Heads ..... **Errore. Il segnalibro non è definito.**

How to install or remove a threaded head 4

Chains **4**

How to choose and replace chains 4

Centralizer **5**

How to mount the centralizer 5

How to calibrate/remove the jets 6

Operating instructions **6**

Preliminary operations 6

When and where to use the Avian chain nozzle 6

Operation 6

Manteinance at the end of a job **7**

Problem solving **8**

Spare parts and exploded views **9**

Avian nozzle 9

Chain head 9

Centralizer for pipes DN125/150 10

Spare inserts turbine 10

Spare inserts thrust rear 10

Generic spare parts 11

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 usage of nozzles with high pressure pumps is a potentially very dangerous operation. This equipment must be used by expert and competent staff. It is absolutely necessary that all the involved staff follows the following rules in order to proceed in safety:

- Nozzles must work absolutely only inside closed or underground pipes;
- 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 bystander;
- 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;
- 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;
- The working area must be identified and demarcated as prescribed by law. Access must be prevented to unauthorized persons and / or strangers.
- Operators should always wear appropriate PPE (Personal Protective Equipment) as per local regulations.
- In case you need the access of the operator inside the manhole, tank or sewer, activity must strictly comply with the laws relating to operations in confined spaces.

Usage

NCT nozzles can be used only **TO WASH UNDERGROUND PIPES, OR 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 the operators.
- 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.

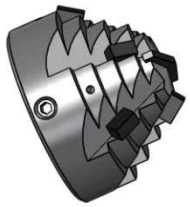
Parts

Heads

The nozzles Avian DN50 can be supplied with 3 head types:

- **Steel head** (fig.1), to light/medium deposits.
- **Carbide head** (fig.2), for hard deposits removal such as concrete and limestone encrustations.
- **Chain head** (fig.3) for roots removal

1) Steel head


2) Carbide head

3) Chain head

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 watching carefully the left thread; the head is screwed by turning it counterclockwise (the arrow over the head tells the closing direction).

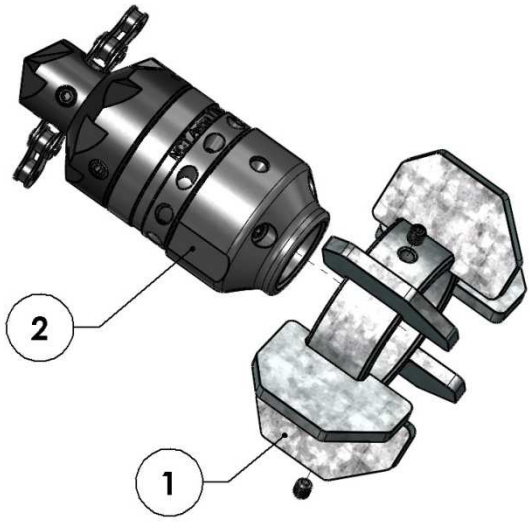
Chains

How to choose and replace chains

In order to replace the chains it is advisable to use only original spare parts supplied by Nuova ConTec. The chains length cannot be arbitrary, but must be calculated according to the pipe size. The following chart shows the length according to the diameter of the pipe to be cleaned. A wrong sizing of chains may lead to pipe damage or malfunctioning.
When mounting the chains, it is advisable to use Loctite 2400 or equivalent in order to avoid eventual unscrewing due to vibration.
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.

Centralizer

How to mount the centralizer



Short centralizers for Avian nozzles are advisable when using the nozzle with the chain head.
Insert the nozzle (2) in the leading ring (1) from the side where the blocking screws are closer to the nozzle edge. Tighten the two locking screws using a straight hexagon 3 mm screwdriver and and blocks with the nut. Check regularly that the two dowels and the nut are not loosened, eventually tighten them using a thread locker like Loctite 243

How to calibrate/remove the jets

Avian nozzles are sold with already mounted inserts; if necessary for replacement or recalibration, please follow this procedure:
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.)
Place new inserts by applying a layer of “Loctite 243” o 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:

- All parts of the nozzle are in perfect conditions and all screws are properly locked.
- All inserts are clean and free from deposits and cloggings.
- The nozzle (with centralizer in case of chains) is tightly screwed to the high pressure hose.
- 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.

At this point the nozzle is ready to be inserted in the pipe to be cleaned and only after having cleared the area, it is possible to start the system to the suitable pressure regulation.

Any anomalous or doubtful functioning prior and/or during the job must be checked only by competent personnel.
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, misaligned or detached joints using a chain nozzle could be not the correct choice. The mechanical action of the chains could worsen the condition of the pipe. In normal conditions, in order not to damage the pipeline it is not advisable to stand for long time in the same spot with the working rotating nozzle

When and where to use the Avian 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.
If conditions allow always use the centralizer.

Operation

It is advisable not to use this nozzle with pressures above 220 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. All Avian nozzles with chain heads, without centralizer, tend to stay on the bottom of the tube 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.

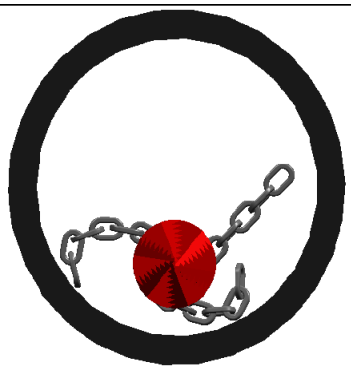


Figura 1: Nozzle without centralizer.

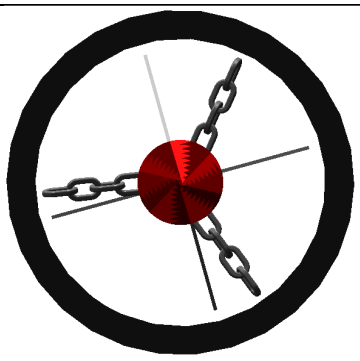


Figura 2: Nozzle with centralizer, properly placed.

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, so that in this way it can be seen when the nozzle in 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 Avian 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.

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 more 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 5/10 mt of forward cleaning or even more (depending from the amount and type of debris) recover the nozzle so to clean the pipe from already loosened sediments.
During the recovering the nozzle is always in action but at a reduced pressure; once the signed point is reached, 1-2 mt from the joint, stop the pump in order to avoid a refalling of the still working nozzle 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.

Manteinance at the end of a job

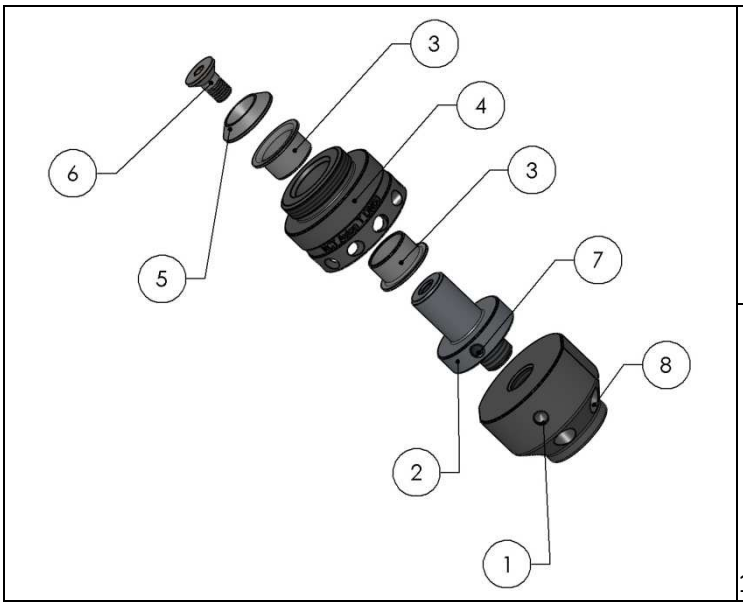
At the end of the job the whole nozzle should be visually checked to be sure that there are no faults, check the tightening of all fixing screws and eventually using a little bit of thread locker such as “Loctite 243”.
Lubricate all accessible parts and also the holes of the jets with a anti corrosion waterproof spray such as “WD40”, or similar. **It is absolutely not advisable** to immerse the nozzle into oil as the oil emulsifying itself with water could cause functioning failures.

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

Spare parts and exploded views

Avian nozzle



10) Steel head

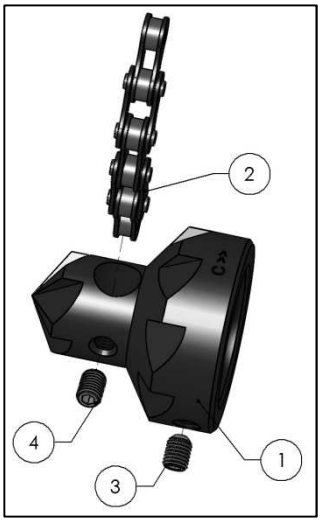
11) Widia head

12) Chain head

Pos.	Codice	Descrizione	Q.tà
1	75511.032-2	Rear 3/4"F DN50 6 jets	1
2	GR.75511.030-2	Shaft DN 18 for turbine	1
3	GLY.PBG182012F	Flanged Ferrule 182012	2
4	75510.151T-4	Turbine DN50 Rotor without bushing	1
5	75513.03B	Avian DN50 washer	1
6	8.06A2M08X016	TSPEI M8x16 ssteel screw	1
7	85993.xx	M6x8 ceramic inserts for turb. (to be calibrated)	3
8	85511.xx	TE M6 ceramic inserts (to be calibrated), thrust	6
9			1
10	75527.26/1	Steel head Avian DN50 M35X1,5 sx	1
11	75527.27B	Widia head Avian DN50 M35X1,5 sx	1
12	75527.27C	Chain head Avian DN50 M35x1,5 sx	1

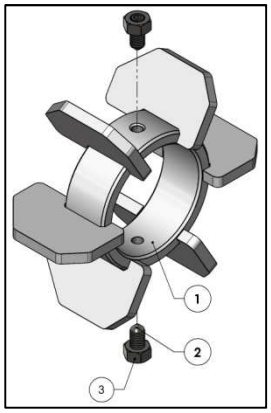
Chain head

Pos.	Codice	Descrizione
1	75527.27C	Chain head Avian DN50 M35x1,5 sx
2	75001.11-5M	Chain 5 sprockets dn100
2	75001.11-9M	Chain 9 sprockets dn125
2	75001.11-13M	Chain 13 sprockets dn150
2	75001.11	Chain (specify lenght)
3	8.11A2M06X006	Grain for head blocking
4	8.12A2M06X010	Grain for chain blocking
	75001.11-K1	Avian chain kit Avian DN50 (chain 5+9+13 sprockets +30 cm of chain plus blocking grain).



Centralizer for pipes DN125/150

Pos.	Codice	Descrizione
1	5305.34°	Centralizer DN125/150 for Avian DN50 complete
2	8.12A2M06X008	Blocking grain for SS M6 nozzle (3 mm)
3	8.16A2M06	M6 SS nut (10 mm)



Spare inserts turbine

Codice	Descrizione	Image
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	Exagonal key 3 mm

Spare inserts thrust rear

Codice	Descrizione	Image
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	Pipe key 6 mm

Generic spare parts

Part number	Description	
LOC.243	Loctite 2400 50cc	
WD.40	Spray for lubrication WD40 200 ml	
85500.512L	"L" male key for inserts replacement 3 mm	
85500.506-03	Double hexagonal tubolar spanner 6 mm	
85500.506-04	Double hexagonal tubolar spanner 10 mm	

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