Bulldog®

40x.030x

Operating Manual
English
June 24| Version 1.0

Table of Content

Table of Content **1**
Preface **3**
Purpose of the document **3**
1 Safety **4**
1.1 Noncompliance with the safety information and its consequences 4
1.2 Target group 4
1.3 User requirements 4
1.4 Explanation of general safety instructions 5
1.5 Information provided in these operating instructions 5
1.6 Intended use 5
1.7 Safety warnings for modifications 6
1.8 Protective equipment for working in manholes, excavations, and sewer lines 6
1.9 General safety instructions 8
2 Legal **10**
2.1 Copyright 10
2.2 Exclusion of liability 10
2.3 Warranty conditions 10
3 Bulldog® **11**
3.1 Introduction 11
3.2 Application 11
3.3 Basic function 11
4 Installation **12**
4.1 Installing the tools 12
4.1.1 Nozzle configuration 12
4.2 Preparatory work 12
4.3 Setting up the work area 13
5 Operation **14**
5.1 Operating the tools 14
5.2 Cleaning pipes with minor damage 15
5.3 After use 15
5.4 Completing work 16
5.5 Troubleshooting 16
5.5.1 The head of the Bulldog® rotating nozzle does not turn 16
5.5.2 The head of the Bulldog® rotating nozzle does not turn or turns slowly 16
6 Maintenance **17**

6.1 Nozzle inserts 17
6.1.1 Replacing the nozzle inserts 17
6.2 Disposal and environmental protection 18
7 Technical specifications 19
8 Accessories 20
9 Index 21
9.1 Figures 21

Version	Revision	Date	Initials
1.0	Created	June 24	bbi

Preface

Dear valued customer,
Thank you for the confidence and trust you've placed in us by purchasing one of our products.
We always appreciate suggestions and new design ideas. Your feedback will help us improve the design of our product and the associated documentation.

If you have any questions or suggestions, please contact our Customer Service Department.

enz® technik ag
Tel. +41 41 676 77 66
info@enz.com

Feedback form
www.enz.com/en/header/feedback

Person responsible for the documentation:
Bryan Bieri (Tech. Support / QM Manager)

We reserve the right to modify and further enhance our products without prior notice as a result of technological advances. Misprints reserved.

Purpose of the document

The purpose of this manual is to instruct you on how to use our product correctly, effectively, safely, and for its intended purpose. The user will be informed about risks, reasonably foreseeable misuse, and residual risks.

Important!
Read carefully before use.
Keep for later reference.

Please read this operating manual thoroughly before using the cleaning tool. Make sure that all employees who work with the product know how to use it correctly.

The operating manual must be available to all operating personnel at all times. It must be kept in an easily accessible place.

If the manual is misplaced or destroyed, a new copy can be requested from your nearest dealer or from the manufacturer directly.

1 Safety

1.1 Noncompliance with the safety information and its consequences

Disregarding these safety instructions may lead to accidents and severe personal injuries, material damage, and damage to the environment.
The manufacturer cannot be held responsible for any damages resulting from non-compliance with these instructions.

1.2 Target group

This manual is intended for all persons who will be involved in the assembly, start-up, and operation of the pipe cleaning tool.

1.3 User requirements

Personnel intending to assemble, start up and operate the tool must...

- Be familiar with the field of sewer maintenance work and possess the appropriate technical knowledge.
- Be trained and instructed appropriately in the use of the product.
- Have read and understood the operating manual, in particular the section on "Safety"

If your personnel do not possess the necessary knowledge, they must be trained and instructed on it. If necessary, the pipe cleaning tool manufacturer can provide this instruction and training.

Only the maintenance and service activities described in this manual may be performed by users who have met the above-listed requirements. Any additional maintenance and service work may be performed only by qualified specialist personnel from the manufacturer.

Please refer to the section on "**Maintenance**".

1.4 Explanation of general safety instructions

The general safety instructions in this section provide information about potential residual risks, which are inherent to the product and may occur unexpectedly, despite the proper usage of the product.
In order to prevent personal injuries, material damage, and damage to the environment, all personnel working with this product must comply with these safety instructions. It is mandatory for said personnel to read and to understand the information provided in this section.

1.5 Information provided in these operating instructions

	**DANGER!** Noncompliance may lead to serious injury or **loss of life**.
	**WARNING!** Noncompliance may lead to serious injury and / or cause a long-term disability.
	**CAUTION!** Noncompliance may lead to injury and considerable material damage, financial loss or damage to the environment.
	Information on the technically correct and efficient use of the product.

1.6 Intended use

The product is designed to clean the insides of pipes (sewer pipes). The following points must be followed to ensure proper use of the product:

- ⚠ The cleaning tool may be used only in pipes or pipe-like sewers. The profile to be cleaned must be free of leaks and surrounded by material.
- ⚠ The tool may be used on the following types of pipes:
  - Stoneware pipes
  - Ceramic pipes
  - Clay pipes
  - PVC pipes
  - PE pipes
  - Asbestos pipes
  - Steel pipes
  - Concrete pipes
- ⚠ For use in pipes made of other material, please consult the manufacturer.

- ⚠ The product may be operated only in pipes with correctly installed and defect-free connections.
- ⚠ Cleaning areas (manholes, pipe branches etc.) need to be sufficiently secured during the operation, including during construction and cleaning work.
- ⚠ During the cleaning operation, **no** personnel are allowed inside the pipes or at either end of the pipes.
- ⚠ The maximum pressure indicated on the nozzle may **not** be exceeded.
- ⚠ Wastewater may **not** be drained into watercourses (creeks, rivers etc.).
- ⚠ The product must be inspected to ensure it is in proper working order before every start-up.
- ⚠ Defects must be rectified before start-up.
- ⚠ Use the tool only as intended. (Use only the correct wrench for nuts).
- ⚠ Secure the hose lines in such a way that they cannot become damaged during operation.
- ⚠ Only the accessories provided and approved by **enz® technik ag** may be used.

1.7 Safety warnings for modifications

No other changes or modifications to the pipe cleaning tool may be performed. Only parts authorized by the manufacturer may be used. The manufacturer is not liable for damage resulting from unauthorized changes to the product.

1.8 Protective equipment for working in manholes, excavations, and sewer lines

The employer must provide suitable personal protective equipment and ensure that it is worn by the employees during work.

In the following section, the protective equipment prescribed by Schweizerische Unfallversicherung SUVA (the Swiss Accident Insurance Organization) will be described.

For more information on this, refer to the brochure:
Safe entry and working in manholes, excavations, and sewer lines
(in German, French & Italian)

Order number: 44062.d

Suva
Schweizerische Unfallversicherungsanstalt
Arbeitssicherheit
Postfach, 6002 Lucerne, Switzerland
For information:
Phone +41 41 419 51 11
For orders:
www.suva.ch/waswo
Phone +41 41 419 58 51

Respirators

Self-contained respiratory equipment for spending time in dangerous atmospheres and for use during rescue operations.

Respirators

Self-rescue respiratory equipment (devices with compressed air tanks or regeneration devices) for working in sewers and for first aid for injured persons.

Rescue harness

Rescue harness or protective clothing with a loop sewn into the neck. During rescue, the rescue rope will be attached to the neck loop. Injured persons will be lifted out using a rescue lifting device with a self-actuating load brake.

Suitable working clothing

Leak-proof clothing protects the skin from becoming soiled and from possible infections. Visually conspicuous work clothing makes the employee more visible to traffic.

Appropriate footwear

Safety footwear should, in particular, have good grip and be slip-resistant and leak-proof (e.g. rubber boots).

Gloves

Appropriate gloves will protect you from hand injuries and contact with materials that could impair your health and from untreated water.

Hardhat

The hardhat will protect your head from falling objects and from bumping into fixed components and objects.

Hearing protection

If there is noise that could damage your hearing, you must wear, e.g. earmuffs with built-in headphones and microphone.

Eye protection

Your eyes should be protected against grit, sprayed dangerous substances, etc.

Lighting independent of the power grid

For example, you should carry a waterproof flashlight or wear a flashlight attached to your hardhat.

1.9 General safety instructions

Danger! | High-pressure water jets

Defects in or unintended use of the product could cause hazards due to pressurized water spray. Never remain in the channel during operation. Ensure that the product is in perfect condition before operation. Highly concentrated water jets can cause serious injury and could even sever limbs.

Danger! | Toxic vapours

There can be toxic vapours in sewer lines. Wear the prescribed protective equipment such as gas masks, gas warning devices and rescue harnesses. Inhaling toxic vapours or air that is contaminated with particles could be **fatal** or lead to serious injuries if the particles enter the lungs.

Warning! | Falling objects

Around open manholes, objects can fall down into the manhole and onto the people below. Never remain directly beneath the manhole opening when guiding the products in. Secure the manhole entrance against parts that could fall. Do not throw any tools or objects down into the manhole. Do not enter any manhole where there is a danger of falling. Personnel could become trapped.

	**Warning! | Chemical burns** There may be unidentified, corrosive, or otherwise harmful substances in the sewer line. Put on appropriate protective clothing. Use the protective equipment prescribed. Otherwise, you could suffer from chemical burns to your skin and eyes or become infected with pathogens.
	**Warning! | Falls from height** Open manholes are to be expected in the area where you will be working with the product. You must warn people about open manholes. Pay attention to where you are walking.
	**Warning! | Hand injuries** In case of tampering with the product, there is a risk of hand injury due to getting caught or abrasion. Wear gloves during work. Pay attention to where you grip the product. Always have sufficient people carry heavy or over-sized, equipment. Consequences can include crushing injuries, abrasions or even the loss of a limb.
	**Caution! | Sharp objects** If the product is tampered with, there is a risk of hand injuries due to sharp edges. Wear gloves during work. Pay attention to where you grip the product. Consequences can include cutting injuries to your hands or other parts of your body.
	**Caution! | Trip hazards** Lines and other objects are to be expected on the ground in the area around where the product is being used. Pay attention to where you are walking. Keep the area of use tidy. Tripping and falling could cause serious injuries.

2 Legal

2.1 Copyright

This manual shall not be duplicated partially or in its entirety without the prior written permission of **enz® technik ag**. It shall not be photocopied, reproduced, translated, or converted into an electronic or machine-readable format.

2.2 Exclusion of liability

The manufacturer is not liable for damage that:

- Is caused as a result of unauthorized changes to the product.
- Is caused by not following the safety instructions.

2.3 Warranty conditions

In accordance with our sales and delivery conditions, we offer a warranty. However, the warranty is voided if:

- The product is used under conditions that are not permitted by us.
- Replacement and accessory parts that are not original replacement and accessory parts from **enz® technik ag** are used.
- If there is damage due to:
    - Improper use
    - Not following the operating manual
    - Unsuitable operating equipment
    - Incorrect or improper routing of the hose or pipelines
    - Unauthorized changes or modifications to or conversions of the product.

3 Bulldog®

3.1 Introduction

The enz® Bulldog® rotating nozzle is designed for operation with recycled water and fresh water. The sealed bearing system enables the use of any water quality. An integrated magnetic braking system ensures wear-free operation at a controlled speed, resulting in the most efficient and economical cleaning performance possible.

3.2 Application

Bulldog® nozzles are designed for removing grease, roots, and harder deposits. They are perfect for comprehensive cleaning before inspection with a camera.

3.3 Basic function

The head of the Bulldog® rotating nozzle rotates clockwise during operation (viewed from the front). The water jets are offset from the center (a.) to generate a rotational force. This rotational force keeps the head rotating steadily. The water jets are also responsible for the thrust, which pulls the nozzle and hose into the pipe. Regulation via a magnetic brake ensures a constant speed. The brake is integrated into the nozzle body and increases in force as the speed increases.

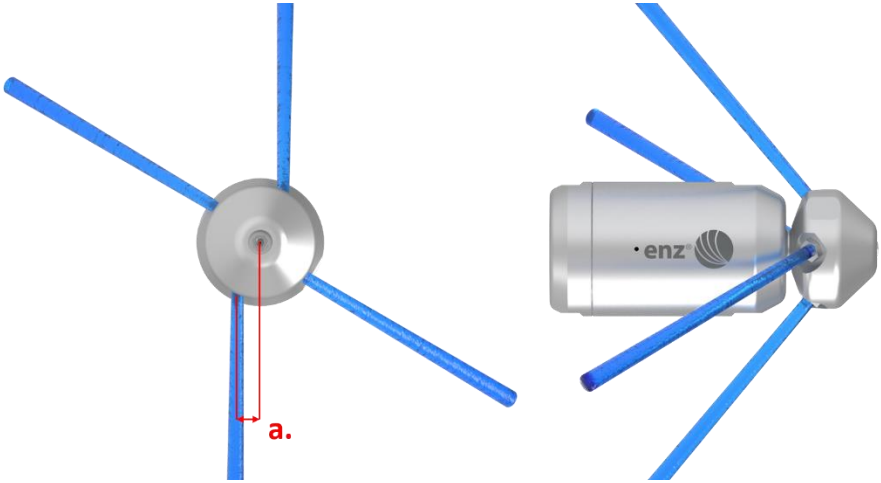

Figure 1 ***Basic function of the Bulldog® 30***

4 Installation

4.1 Installing the tools

The tools are supplied ready for use. After unpacking, check the delivery for completeness.

4.1.1 Nozzle configuration

Every Bulldog® rotating nozzle is optimized to the specific cleaning truck before delivery. enz® technik ag needs the following parameters upon order placement for optimization:

• Pump capacity:	L/min	US gpm
• Pump pressure:	bar	psi
• Hose diameter:	mm	inch
• Hose length:	m	feet
• Hose material:	Plastic	Rubber

If the parameters of the cleaning truck are changed, the parameters of the Bulldog® should be checked. See **Section 6.1** on **page 17**.

4.2 Preparatory work

It is best to clarify some points before use. Knowledge of the following is helpful during preparation and when selecting the tool:

- Layout of the pipes.
- Inner diameter of the sewer where work will be performed.
- Material of the sewer where work will be performed.
- Type of foreign material in the pipe.
- Planned flushing direction. → We recommend working against the direction of flow.
- Slopes in the sewer where work will be performed.
- Sewer access points.

4.3 Setting up the work area

Observe the following before working with Bulldog® rotating nozzles:

- Set up barriers and safety equipment (warning signs, safety barriers, etc.).
- Block off and secure the work area such that there is no risk of falling or of danger from traffic.
- Obtain information regarding the wastewater entering the manhole (chemicals, gas, vapors, etc.).
- Measuring instruments such as explosive gas meters, oxygen meters, and gas detectors must be readily available.
- Ensure that the appropriate nozzle sizes for cleaning the pipes are available. See “Technical specifications” on **page 19** for the application range of the nozzle.
- The layout of the lines (sewer maps) must be known before starting work to prevent the nozzle from emerging at a pipe end. Support personnel must monitor possible emerging points.

Figure 2 ***Cordoned-off & identified work area***

5 Operation

5.1 Operating the tools

1. Use a standard nozzle to flush loose debris from the pipe before work. Loose debris can interfere with the process.
2. Screw the Bulldog® nozzle onto the hose of the cleaning truck.
3. Insert the nozzle into the pipe to be cleaned. Work against the direction of flow if possible.
4. Increase the nozzle pressure to 100 bar (note the pressure loss in the hose).
5. Observe for forward movement when unrolling the hose. The insertion and retraction speed should be 10 – 20 meters per minute. Note whether operational noise can be heard. If you notice irregularities, refer to “Troubleshooting” – see **Section 5.5** on **page 16**.
6. Keep the water running while retracting the nozzle. This prevents wastewater from entering the nozzle.
7. Close all manhole covers after work.

The nozzle turns clockwise during use. Turn the nozzle counterclockwise to remove it from the connecting thread. This ensures that the nozzle won’t self-loosen during operation.

DANGER

Never exceed the maximum working pressure, which presents a risk to life. Observe the “Technical specifications” section on **page 19**. If a nozzle bursts, fragments can penetrate the pipe wall, and airborne parts can travel at high speed.

DANGER

The tool can turn around in large pipes. To prevent death or serious injury, use a safetyliner.

Continually monitor cleaning progress with a camera.

Retract the tool at regular intervals when cleaning heavily soiled pipes. This prevents blockages behind the tool.

Continue running the water at low pressure when retracting the tool. This prevents wastewater from entering the tool via the nozzle inserts, which could lead to failure of the Bulldog® rotating nozzle.

5.2 Cleaning pipes with minor damage

Minor damage is usually considered to be cracks in the pipe wall. Inform the customer or the appropriate authorities if you find cracks in the pipe wall.

Use extreme caution when working in pipes with minor damage. Use the tool at your own risk. enz® technik ag waives all liability.

CAUTION

Washing out cracks can cause pipe fragments to break off and the material surrounding the pipe to be washed out. Do not use the rotating nozzle if you are unsure whether this could occur. The sewer could collapse, which can lead to injury.

CAUTION

Excessive cleaning jet pressure can damage or penetrate the pipe wall. This could cause interruptions to work or material damage.

5.3 After use

Figure 3 ***OIL SPRAY BIO, 500 mL***

1. Check whether the nozzle inserts are clogged. This is easiest when the tool is on the hose. Check whether water leaks from any nozzle insert.
2. Rinse the tool with fresh water and allow it to dry. Do not blow the nozzle inserts out with compressed air.
3. Check the tool for wear. Replace defective parts.
4. Spray OIL SPRAY BIO (Art. No. C191) on the entire tool. Turn the rotor by hand several times.

5.4 Completing work

If possible, use a camera to inspect the cleaned pipes. Look in particular for damage and for liquids escaping into the environment.

5.5 Troubleshooting

5.5.1 The head of the Bulldog® rotating nozzle does not turn

The Bulldog® makes a characteristic noise during operation. This noise indicates that the head is rotating. Perform the following if the head is stationary:

1. Decrease the pressure to about 5 bar.
2. Keep the water running while retracting the Bulldog® to prevent wastewater from entering the nozzle through the nozzle inserts.
3. Check whether the head turns freely. Check whether all nozzle inserts are free of material. If the head rotates and the nozzle inserts are free of material, try operation again.
4. If the head still doesn't turn, contact your distributor and send the nozzle in for repair.

The recommended working pressure of the nozzle is 100 bar. Note the pressure loss in the hose system. If the working pressure at the nozzle is lower, the head will not always rotate.

5.5.2 The head of the Bulldog® rotating nozzle does not turn or turns slowly

Every enz® nozzle is specifically coordinated to the cleaning truck. Changing the truck or the dimensions of the rinsing hose can affect the head's rotation. If any parameter of the rinsing system changes, contact your dealer or go to my.enz.com and recalculate your nozzle parameters. Replace the nozzle inserts per the calculation from MyEnz.

CAUTION

Observe the values and warnings of the nozzle calculation program at my.enz.com. The nozzle can be destroyed if it is improperly equipped.

6 Maintenance

The maintenance and service activities described in this manual may only be performed by users who have the required knowledge.

6.1 Nozzle inserts

Regularly inspect the nozzle inserts. Wear depends on the degree of contamination of the water used. If recycled water is used, inspect the nozzle inserts **daily** and clean them if necessary.

CAUTION

Worn nozzle inserts impair cleaning results and increase risk when working with high pressure. Inspect the nozzle inserts daily if recycled water is used.

Use the nozzle calculation program at my.enz.com to determine the diameter of the nozzle inserts if you do not know it.

6.1.1 Replacing the nozzle inserts

1. Remove the defective nozzle inserts.
2. Clean the internal threads of the nozzle and the external threads of the new inserts. All threads must be free of lubricant.
3. Coat the external threads of the nozzle inserts with Loctite 243 (Art. No. C192).
4. Immediately screw the nozzle inserts into the tool body as far as they will go. Use a socket wrench to lightly tighten the inserts.
5. The compound must cure for at least 24 hours.

CAUTION

Only replace damaged nozzle inserts with identical nozzle inserts of the same diameter. If the tool is not correctly outfitted, the tool can be destroyed.

If the tool will not be used for an extended period, spray the nozzle openings and the connecting threads with OIL SPRAY BIO (Art. No. C191).

6.2 Disposal and environmental protection

The tools do not require any special disposal procedure, and they can be disposed of with other scrap metal.

Only clean pipes for which the composition of the wastewater is known (industrial wastewater in particular). Never allow chemicals or other toxic substances to enter the environment via defective pipes.
Report defective pipes or leaking substances to the supervisory body or appropriate authorities.

Do not use excessive water. This helps conserve natural resources.

7 Technical specifications

Figure 4 ***Bulldog® 400.030***

Article number		**400.030**	
	Connecting thread	BSPP	3/8” & 1/4”
		NPT	3/8” & 1/4”
	Rotating nozzles	4 x M6	
	Thrust nozzles	-	
	Can use recycled water	YES	
	Weight	0.35 kg 0.8 lbs	
	Application range	35 – 80 mm 1.4 – 3.1 inch	
ØxL	Dimensions	31.5 x 77 mm 1.2 x 3 inch	
	Min. flow rate at 100 bar (1450 psi)	25 L/min 6.6 US gpm	
max	Maximum working pressure	350 bar 5000 psi	

8 Accessories

Figure	Name	Article number
	Loctite 243, 50 mL	C192
	OIL SPRAY BIO, 500 mL	C191

9 Index

9.1 Figures

Figure 1 ***Basic function of the Bulldog® 30*** *11*
Figure 2 ***Cordoned-off & identified work area*** *13*
Figure 3 ***OIL SPRAY BIO, 500 mL*** *15*
Figure 4 ***Bulldog® 400.030*** *19*

Notes

enz® technik ag
Schwerzbachstrasse 10
6074 Giswil, Switzerland
Phone +41 41 676 77 66
info@enz.com
www.enz.com