

# Operating instructions for nitrogen cylinders < 1 litre



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(English translation of the original German text).

**Responsible for content**

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**Operating instructions for nitrogen cylinders < 1 litre**

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Changes to the design and product that serve to improve the product remain reserved.

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## 1.1 Preface

Dear technical supervisor,

You are facing the task of operating nitrogen cylinders. These operating instructions will assist you in performing this responsible job.

**Please read these operating instructions carefully and pay particular attention to the safety instructions!**

If you have questions about this product, our employees are available to assist you.

Your STEINEL Normalien AG

## 1.2 Product identification/product information

### Validity

The descriptions contained in these operating instructions solely apply to nitrogen cylinders with a nitrogen volume of less than 1 litre as they are described here and as they were developed and built by the manufacturer.

### Storage

These operating instructions must be kept accessible so that they are available to the operator at any time.

## 1.3 Obligations of the personnel

Only trained specialist personnel may be tasked with working on the nitrogen cylinders (⇒ *OI, 2.3 Authorised personnel*). Please also observe the notes of the repair instructions regarding nitrogen cylinders. The repair instructions can be found under:

**[www.steinell.com](http://www.steinell.com) » Service » Operating instructions**

In the interest of everybody involved, please observe the following instructions:

- Refrain from engaging in any manner of working that could be considered unsafe!
- Observe all hazard and warning notices contained in these operating instructions!
- In addition to this documentation, observe general, legal and otherwise binding regulations regarding occupational safety and accident prevention as well as environmental protection!
- Wear the appropriate protective clothing corresponding to the work that needs to be performed!
- Do not wear long hair open, loose-fitting clothing or jewellery!
- Only perform those tasks for which you have been sufficiently trained and instructed!

## 1.4 Warranty and liability

For the use of the nitrogen cylinders, our "General Terms and Conditions" always apply.

The "General Terms and Conditions" are accessible via our homepage.

Warranty or liability claims in case of damage to persons or property are precluded if they were the result of one or several of the following causes:

- handling in a non-intended manner
- improper assembly, commissioning, operation, maintenance and inspection
- non-observance of the notes contained in these operating instructions regarding safety, putting into service, operation, maintenance and inspection
- unauthorised structural alterations
- insufficient monitoring and maintenance
- external elements or force majeure
- performance of maintenance work (repairs)

In order to maintain functional reliability, only original spare parts, tools and appliances of the manufacturer may be used.

## 1.5 Symbols in these operating instructions

### 1.5.1 Danger warning levels

Various signal words and colours are used depending on the level of risk.



#### **DANGER**

**DANGER** indicates danger which, if not avoided, has a high chance of resulting in death or serious injury.



#### **WARNING**

**WARNING** indicates danger which, if not avoided, has a medium chance of resulting in death or serious injury.



#### **CAUTION**

**CAUTION** indicates danger which, if not avoided, has a low chance of resulting in minor or moderate injury.

#### **ATTENTION**

**Obligation to specific conduct or a task for the safe handling of the nitrogen cylinders in order to avoid property damage.**



This symbol points to texts that contain important instructions/comments and tips.

## 1.5.2 Danger symbols



Warns of dangers leading to serious (irreversible) injuries and possibly death!



Warns of hand injuries



Warns of hot surfaces

## 1.5.3 General symbols



This arrow identifies the descriptions of tasks that you must perform.



This square identifies enumerations.



This arrow identifies cross references.

If cross references to other chapters occur within the text, notations are abbreviated for reasons of clarity.

Example:     (⇒ *OI, 2 Safety*)

This means:   Refer to operating instructions, Chapter 2 Safety

If the cross reference refers to a page, figure or position number, then this information will be added at the end of the cross reference.

Example:     (⇒ *Fig. 4 - 4, pos. 1*)

This means:   Refer to (in chapter 4 of this manual, position number 1 of figure 4).



Numbers in a square with a red frame refer to positions in the figures.

## 2.1 Safety measures

Improper handling of the nitrogen cylinders may lead to various dangers during assembly and putting into service, as well as during daily use.



### WARNING

The following notices serve to recognise and avoid dangers in order to ensure a handling of nitrogen cylinders that is as safe as possible.

Compliance with the safety instructions is a prerequisite for safe operation of the nitrogen cylinders. The safety instructions must be posted visibly on the device and must be accessible at all times for the operating personnel.

During the operation of the nitrogen cylinders, country-specific safety measures and accident prevention regulations must be observed and additionally applied.



Read and observe all notices and commands within these operating instructions. Non-observance of safety instructions and commands can result in very serious injury. Keep the operating instructions in a safe place and supply them to the operator.

## 2.2 Dangers when handling the nitrogen cylinders



### DANGER

Danger of injury due to uncontrolled moving parts!

- Always vent the nitrogen cylinders before disassembly.
- Only use the suitable discharging screw.
- Always wear safety goggles during all work carried out.
- Make sure that no other people are put at risk.



### WARNING

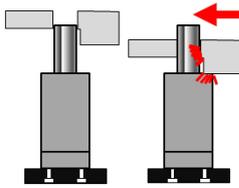
Danger of injury, particularly crushing of the hands!



### CAUTION

Danger of hearing damage due to loud, high-frequency noises when the gas escapes!

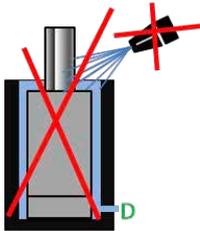
- Vent the nitrogen cylinders in a careful and controlled manner.
- Always wear ear protection during all work carried out.



The nitrogen cylinders must not be damaged by moving parts in the tool.

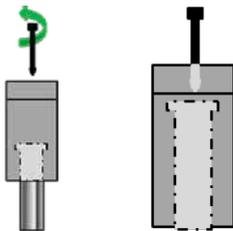
If the nitrogen cylinders are prevented from an even return stroke by jamming parts, a sudden decompression could lead to damage to or failure of the nitrogen cylinders.

Protect the piston rod from contact with liquids.

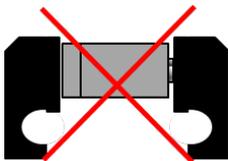


The maximum filling pressure specified on the nitrogen cylinders may not be exceeded (reference temperature: 20 °C). Only use nitrogen N<sub>2</sub> (class 2.8) for filling!

The permissible operating temperature of 5 °C to 80 °C on the nitrogen cylinders must not be fallen below or exceeded.



Prior to dispatch, used nitrogen cylinders must be emptied with the designated discharging screw. During emptying, hold the nitrogen cylinders in an upright position with the piston rod facing downwards. To make sure that the nitrogen cylinders are fully decompressed, completely push the piston in by hand.



Repairs and the opening of the nitrogen cylinders may only be performed by trained professionals. Please also observe the notes of the repair instructions regarding nitrogen cylinders.



For clamping of the nitrogen cylinders, always use an appropriate fixture (three-jaw chuck).

Nitrogen cylinders with signs of damage may not be used.

The tool must be checked if a safety system was triggered at the nitrogen cylinders. The affected nitrogen cylinders may not be used any more.



Do not machine nitrogen cylinders mechanically or thermally.

### 2.3 Authorised personnel

Only specialist personnel trained by the STEINEL Normalien AG in the handling of nitrogen cylinders (expert, commissioned and trained personnel) may disassemble, assemble and fill the nitrogen cylinders.

Learn more about STEINEL Normalien AG's training opportunities. "Trained expert personnel" refers to persons that, based on their training, experience and manufacturer training, as well as their knowledge of relevant standards, can evaluate the tasks assigned to them and recognise potential dangers.

These persons must be authorised (by the person in charge of the safety of the device) and able to perform the respectively required tasks and to recognise and avoid potential dangers while doing so.

All persons involved in the assembly, putting into service, operation, inspection, maintenance and decommissioning of the nitrogen cylinders must have read and understood these operating instructions as well as the nitrogen cylinder repair instructions. The repair instructions can be found under:

**[www.steinell.com](http://www.steinell.com) » Service » Operating instructions**

A copy of the repair and operating instructions must be readily available at the device.

### 2.4 Control of the nitrogen cylinder



#### WARNING

**Danger of injury due to defective nitrogen cylinders or improper operation!**

- **The nitrogen cylinder's safe condition with regard to accidents and operation is to be checked by suitably qualified personnel before use, as well as after all work on the nitrogen cylinder.**
- **The nitrogen cylinders may only be operated by expert, authorised and appropriately trained personnel.**

The following checks must be carried out:

- Read before putting into service (⇒ *OI, 7 Operation*).
- Does the nitrogen cylinder show signs of damage?
- Has it been properly installed and fixed?
- Has it been ensured that the nitrogen cylinder will not become damaged through operation?

### 2.5 Intended use

Nitrogen cylinders are used to absorb forces in cutting and bending tools for repeated work, e. g. for

- the holding of sheet metal during bending
- pushing bent parts out of the tool
- the retrieval of slide pieces

Observe all information in the operating instructions as well as the separate repair instructions. Comply with the inspection and maintenance cycles and use only original parts.

The application field and ambient conditions for the nitrogen cylinders are defined in the technical data (⇒ *OI, 4 Technical data*).

The manufacturer shall be expressly excluded from any liability for consequential damage resulting from wrongful use of the nitrogen cylinders.

### 2.6 Foreseeable misuse

- incorrect or no fixing of the nitrogen cylinders
- manipulation of the nitrogen cylinders
- overfilling the nitrogen cylinders
- absorption of liquids due to lack of liquid discharge lines
- introduction of lateral forces
- insertion into liquid baths
- use in environments where the nitrogen cylinders are suddenly decompressed
- testing through hammer blows or chucking in a vice
- use or storage in environments that cause corrosion

## 3.1 Labelling of the nitrogen cylinder



1 mounting surface

2 labelling

3 piston rod pressure surface

4 part number

5 production date - order number - serial number

6 customer order number - position number

7 initial force

8 filling pressure

9 operating temperature, operating medium

10 code for the IATA transport regulation

11 note regarding the spare part/burst screw used for this nitrogen cylinder

12 nitrogen cylinder burst pressure with burst protection



If there is no labelling or it is illegible, please dispose of the nitrogen cylinder (⇒ OI, 10.2 Final shutdown/decommissioning).

## 3 Product overview for nitrogen cylinder **STEINEL®**

### 3.2 Composite tube system

Nitrogen cylinders with diameters of at least 38 mm can also be equipped with a composite base. As a result, the structural length of the nitrogen cylinders is increased. Springs intended for composite systems do not have valves and are unfilled.

### 3.3 Composite plate system

Composite plate systems consist of multiple nitrogen cylinders and a control panel, which are connected to one another via boreholes in the lower plate. As with tube composite systems, this ensures uniform system pressure and a larger nitrogen volume, resulting in a flatter force curve.

The technical data of the nitrogen cylinders and their accessories can be found in the current STEINEL Normalien AG catalogue.

### **Application field**

- minimum operating temperature 5 °C
- maximum operating temperature 80 °C
- operation in punching and bending tools

### **Ambient conditions**

In areas with a relative humidity from 50 % to 70 %, the nitrogen cylinders should be used within a temperature range from 5 °C to 50 °C.



The operating temperature must not exceed 80 °C. High stroke frequencies also lead to the self-heating of the nitrogen cylinders in the ambient temperature. Therefore, during high stroke frequencies, keep the ambient temperature as low as possible to ensure a long life time for the nitrogen cylinders.

## 5.1 Transportation information

The nitrogen cylinders undergo a test for flawless functioning before they are delivered. Transportation is carried out in suitable transport packaging.

For shipping within the EU and worldwide, the classification of filled nitrogen cylinders must be observed in accordance with the hazard categories under the guidelines of the "Globally Harmonized System of Classification and Labelling of Chemicals" (GHS) and the regulation (EG) no. 1272/2008 (CLP).

## 5.2 Road transportation

The European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) contains special provisions for road transportation with regard to packaging, load security and the identification of dangerous goods.

ADR counterparts for other modes of transportation:

- RID for rail transportation
- IATA DGR for air
- IMDG code for ocean transportation
- ADN for the use of inland waterways

## 5.3 Transportation by air



### WARNING

#### Danger during transportation in aeroplanes!

- ➔ Nitrogen cylinders may be transported by aeroplane in a filled state when the IATA special regulation A114 UN3164 and the packaging instruction 208 have been fulfilled and complied with.
- ➔ Otherwise, nitrogen cylinders must be emptied before being transported by aeroplane.

## 5.4 Rail transportation

See road transportation. Counterpart to the ADR for rail transportation: RID (applicable in the EU and up to the Middle East).

## 5.5 Transportation by waterway

See road transportation. Counterpart to the ADR for ocean transportation – IMDG code (internationally applicable). Counterpart to the ADR for the use of inland waterways – ADN (applicable in ECE states).

## 6.1 Safety instructions



### DANGER

When removing pre-loaded nitrogen cylinders from defective tools, the customer-specific installation situation and the pertinent safety instructions must be observed. The owner is responsible for ensuring that his tools are safe.



### WARNING

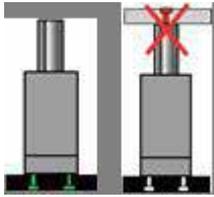
**Danger of injury due to incorrect installation!**

- If the labelling of the nitrogen cylinders does not exist or cannot be read, take the nitrogen cylinders out of operation.
- High pressure up to 600 bar in operation! Protect nitrogen cylinders from damage. Rule out incorrect installation.
- Arbitrary changing of the nitrogen cylinders is prohibited.
- Do not carry out any machining or non-machining changes at the nitrogen cylinders.
- Protect the piston rod from dirt and damage.
- The filling pressure specified on the nitrogen cylinders may not be exceeded.
- The maximum permissible stroke of the nitrogen cylinders must not be exceeded.
- The operating temperature of 5 °C to 80 °C must not be fallen below or exceeded.
- Heed the installation and danger information for the removal of pre-loaded nitrogen cylinders, particularly in the event of defective tools.

The torque for each fixing screw (quality classification 8.8, unlubricated) must be in accordance with VDI 2230. Also observe VDI 2230 Sheet 2 "Systematic calculation of highly-stressed screw connections".

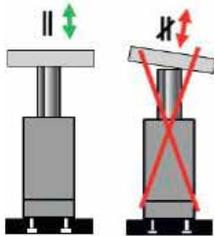
- Before installation, read and heed (⇒ *OI, 2 Safety*).

## 6.2 Installation instructions



Nitrogen cylinders must be screwed via the mounting threads on the housing base, and never on the piston.

The thread in the piston surface is only meant for nitrogen cylinder assembly and no other parts may be screwed on to it.

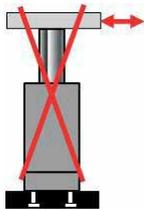


The nitrogen cylinders must be installed coaxial to the acting force.

The piston rod surface must be completely impinged. The contact surface should be suitably hardened.

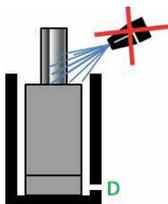
The screw-on surface must be flat and parallel to the pressure surface.

The nitrogen cylinders must not be preloaded in the tool. If preloaded nitrogen cylinders are installed in a tool, the nitrogen cylinders must not be preloaded more than 0.2 mm. In this case, an appropriate warning sign must be posted at the installation site.

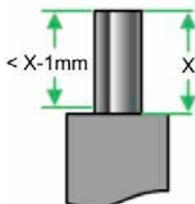


Lateral forces should be avoided.

Transverse forces on the piston rod can damage the nitrogen cylinders.



When installed in counterbores, the nitrogen cylinders must be provided with a circumferential gap of at least 1.5 mm between the nitrogen cylinder and the walls. The release of liquid by means of a drainage bore (D) must be possible. The piston rod must be protected from contact with liquids and mechanical damage.



A stroke reserve of at least 1 mm must be provided.

X = maximum stroke

## 7.1 Measures before operation

**WARNING**

**Danger of injury due to improper operation!**

- The filling pressure must be within the permissible range. The respective permissible maximum filling pressure can be read from the cylinder housing.
- Only fill the nitrogen cylinders with the intended filling device. The parts can be found in the current STEINEL Normalien AG catalogue.
- The fixing screws must be tightened (torque unlubricated, 8.8 in accordance with VDI 2230).
- Check the nitrogen cylinders for damage. In the event of visible damage, replace and depressurise them immediately.
- Before operation, carry out a functional check of the nitrogen cylinders.
- Fill nitrogen cylinders with nitrogen N<sub>2</sub> only (class 2.8).

Before use and after fault-related or planned stops, check the operational readiness of the nitrogen cylinders.

## 7.2 Filling the nitrogen cylinders

SZ7066.2, SZ7080.2, SZ8060.2, SZ8065.2, SZ8066.2, SZ8080.2

**ATTENTION**

**Only use nitrogen N<sub>2</sub> (class 2.8) for filling! Be mindful of filling pressure specifications (⇒ OI, 7.3 Nitrogen filling pressure table) With nitrogen cylinders with a higher filling pressure, use appropriate nitrogen bottles (Manufacturer's recommendation: 300 bar nitrogen bottles).**



1. Chuck the filling unit into a vice.



2. Connect the charging tubing to the nitrogen bottle pressure reducer.



3. Connect the charging tubing to the filling unit. The filling unit entry valve must be closed!



4. Carefully open nitrogen bottle. Be mindful of leakages. Set the filling pressure of the nitrogen cylinders with the pressure reducer.



5. Slowly open the filling unit entry valve until the predetermined filling pressure has been reached. Then close that valve. Prior to unscrewing the nitrogen cylinders, release the pressure out of the filling unit through the ventilation valve on the side!



6. Following a functionality and tightness test, the nitrogen cylinders can be used in the tool again.

To check the tightness, place the nitrogen cylinders in a water bath. For the functionality test, **STEINEL Normalien AG** provides a force measuring device. (⇒ *STEINEL Normalien AG . Winkelstraße 7 . 78056 Villingen-Schwenningen Phone +49 7720 6928-918 . Fax +49 7720 6928-8918 . sales@steinel.com*)

## 7.3 Nitrogen filling pressure table

|                        | SZ7066.1<br>SZ7080.1    | SZ7066.2<br>SZ7080.2 | SZ8060.1<br>SZ8060.2 | SZ8063.1 | SZ8065.1 | SZ8065.2 | SZ8066.1<br>SZ8080.1 | SZ8066.2<br>SZ8080.2 |
|------------------------|-------------------------|----------------------|----------------------|----------|----------|----------|----------------------|----------------------|
| Nominal diameter<br>mm | Filling pressure<br>bar |                      |                      |          |          |          |                      |                      |
| Ø 19                   | 191                     | 158                  | –                    | 179      | 191      | 158      | 128                  | 105                  |
| Ø 25                   | 195                     | 195                  | 157                  | 195      | 196      | 196      | 129                  | 129                  |
| Ø 32                   | 196                     | 196                  | 155                  | 196      | 197      | 196      | 137                  | 137                  |
| Ø 38                   | 197                     | 197                  | 162                  | 197      | 205      | 205      | 131                  | 131                  |
| Ø 50                   | 212                     | 212                  | 159                  | 212      | 209      | 209      | 141                  | 141                  |
| Ø 63                   | 196                     | 176                  | 153                  | 176      | 189      | 189      | 147                  | 132                  |
| Ø 75                   | 189                     | 189                  | 142                  | 189      | 203      | 203      | 157                  | 157                  |
| Ø 95                   | 189                     | 210                  | 158                  | 210      | 182      | 182      | 151                  | 168                  |
| Ø 120                  | –                       | –                    | 141                  | –        | –        | –        | 147                  | 147                  |

Tolerance filling -10%

## 7.4 Operating the nitrogen cylinders

**WARNING**

**Danger of injury due to improper operation!**

- maximum piston speed 18 m/min
- danger of burning on the nitrogen cylinders
- operating temperature 5 °C to 80 °C
- replace damaged nitrogen cylinders immediately
- If the labelling is not legible, take the nitrogen cylinder out of operation.
- danger of injury, particularly crushing of the hands

The piston rod is dually guided through the running surface in the DS fixture or the guide rings in the housing and on the piston. The supply of the piston rod with lubricant is ensured via a lubricant reservoir in the DS fixture or the housing head. The interior area of the cylinder is also filled with a specific quantity of lubricating oil. The oil is sprayed through the piston movement and the interior pressure, and also lubricates the piston ring running surfaces and, depending on the design, the gas seal too. The scraper prevents the penetration of solid particles.

When operating the nitrogen cylinders, ensure that a maximum piston speed of 18 m/min is not exceeded.



The operating temperature must not exceed 80 °C. High stroke frequencies also lead to the self-heating of the nitrogen cylinders in the ambient temperature. Therefore, during high stroke frequencies, keep the ambient temperature as low as possible to ensure a long life time for the nitrogen cylinders.

## 8.1 Safety instructions



### DANGER

When removing pre-loaded nitrogen cylinders from defective tools, the customer-specific installation situation and the pertinent safety instructions must be observed. The owner is responsible for ensuring that his tools are safe.



### WARNING

Danger of injury due to improper troubleshooting and repair!

→ When the piston rod is fixed, vent the nitrogen cylinders before loosening. If venting is not possible, this means that the nitrogen cylinders are defective and can no longer be repaired. Proceed as described in (⇒ *OI, 11.2 Disposing of defective nitrogen cylinders*).



→ danger of burning on the nitrogen cylinders

→ operating temperature up to 80 °C



→ secure moving machine parts before troubleshooting

→ danger of injury, particularly crushing of the hands

## 8.2 Possible fault causes

| Fault                      | Cause                                     | Remedial measure                               |
|----------------------------|---|--|
| spring force not achieved  | filling pressure incorrect, pressure loss | check filling pressure and correct if required |
| pressure loss              | gas seal defective                        | replace seal                                   |
|                            | valve defective                           | replace valve                                  |
|                            | O-ring in housing base defective          | replace O-ring                                 |
|                            | part cracked or damaged                   | replace nitrogen cylinder                      |
| piston rod unstable        | guide units defective                     | replace with guide elements from repair kit    |
| piston rod sits tightly    | piston seizure                            | replace nitrogen cylinder                      |
| nitrogen cylinder breakage | overloading                               | replace nitrogen cylinder                      |

## 9.1 Safety instructions



### WARNING

**Danger of injury due to improper inspection and maintenance!**



→ Inspection and maintenance may only be carried out by appropriately trained specialist personnel.

→ danger of burning on the nitrogen cylinders, operating temperature up to 80 °C

→ Inspection and maintenance of the nitrogen cylinders must only be carried out by trained specialist personnel using original STEINEL Normalien AG spare parts.

→ Adhere to the mandatory inspection, maintenance and cleaning intervals.

→ In the event of unusual noises and malfunctions, shut down the nitrogen cylinders immediately, identify the cause immediately and carry out proper repairs in order to prevent serious damage (⇒ *for separate repair instructions, see: [www.steinel.com](http://www.steinel.com) » Service » Operating instructions*).

→ Repair work must always be carried out in an unpressurised state and on secured systems.

→ do not change nitrogen cylinders arbitrarily

→ danger of injury, particularly crushing of the hands

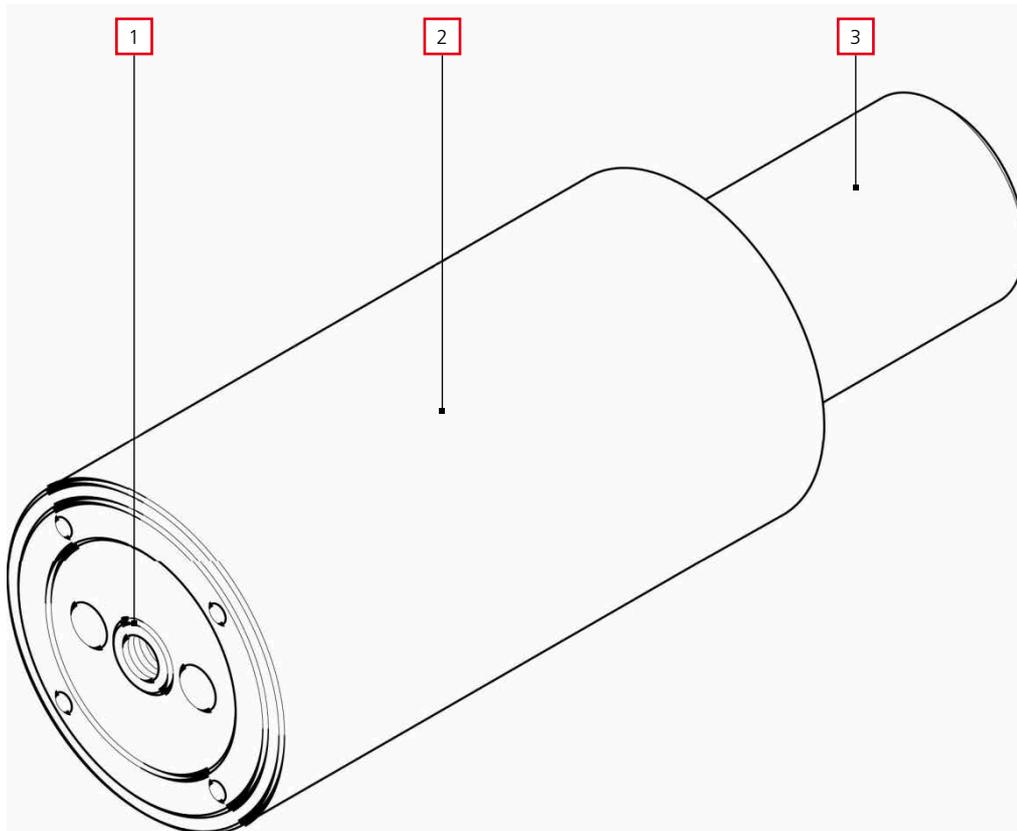


Nitrogen cylinders can be operated practically maintenance-free.

However, a certain amount of maintenance and care of the nitrogen cylinders is required in order to preserve their value and to guarantee the same characteristics throughout a prolonged period of usage.

## 9.2 Maintenance

Areas where regular inspection or maintenance is required:



- 1 filling and venting connection
- 2 housing
- 3 piston rod

## 9.3 Cleaning

Regularly clean the nitrogen cylinders with clean cloths.

| Position  | Designation                    | Activity                                   | Interval                             |
|---|--------------------------------|--|--------------------------------------|
| <span style="border: 1px solid red; padding: 2px;">1</span> | filling and venting connection | clean before filling the nitrogen cylinder | prior to filling                     |
| <span style="border: 1px solid red; padding: 2px;">2</span> | housing                        | clean the housing, check it for damage     | on a weekly basis or before each use |
| <span style="border: 1px solid red; padding: 2px;">3</span> | piston rod                     | clean the piston rod, check it for damage  | on a weekly basis or before each use |

## 9.4 Inspection and maintenance

The regular inspection and maintenance of the nitrogen cylinders is dependent on the operating conditions of the respective owner. The owner is responsible for maintenance and inspection.

## 9.5 Repair

In the event of nitrogen cylinder malfunctions, the cause must be determined immediately and proper repairs must then be carried out (⇒ **for separate repair instructions, see: [www.steinel.com](http://www.steinel.com) » Service » Operating instructions**).

The repair work must only be carried out in an unpressurised state and by qualified and appropriately trained specialist personnel.

## 9.6 Venting of the nitrogen cylinders (all series)



### WARNING

**Danger of injury due to uncontrolled moving parts!**

- Only use the suitable, supplied discharging screw for venting.
- While venting, do not place your head directly over the cylinder.
- Always wear safety goggles during all work carried out.
- Make sure that no other people are put at risk.

### ATTENTION

**As soon as the valve begins to audibly vent, the discharging screw must not be further turned until the venting is complete!**

**If it continues to be turned, this will cause damage to the valve.**



1. To vent, hold the nitrogen cylinders in a vertical position with the piston below. Carefully turn the discharging screw (⇒ *RI, 4.7 Repair and tool kits*) until the release of the nitrogen is audible.



2. Manually check the ventilation of the nitrogen cylinder by completely pushing in the piston. If this is not possible, turn in the discharging screw again.



If venting is not possible, this means that the nitrogen cylinder is defective and can no longer be repaired. Proceed as described in (⇒ *OI, 11.2 Disposing of defective nitrogen cylinders*).

### 9.7 Certification and testing of pressure equipment



The nitrogen cylinders dealt with in these operating instructions are not CE labelled.

With regard to testing prior to putting into service as well as the recurring tests, the country-specific regulations must be observed.

If the country-specific regulations do not contain information on testing prior to putting into service nor the recurring tests, then we recommend to proceed in accordance with the rules of the German operational safety directive and the product safety law.

The owner is responsible for the tests.

## 10.1 Temporary shutdown

### 10.1.1 Short-term (up to a week)

- clean the nitrogen cylinder surfaces (⇒ *OI, 9.3 Cleaning*)

### 10.1.2 Medium-term (up to three months)

- clean and oil the nitrogen cylinder surfaces  
(⇒ *OI, 12 Specification and material safety data sheet of the lubricating oil*)
- depressurise the nitrogen cylinders through venting and insert the piston rod  
(⇒ *OI, 9.3 Cleaning*)

### 10.1.3 Long-term (over three months)

- clean and oil the nitrogen cylinder surfaces  
(⇒ *OI, 12 Specification and material safety data sheet of the lubricating oil*)
- depressurise the nitrogen cylinders through venting and insert the piston rod  
(⇒ *OI, 9.3 Cleaning*)
- package the nitrogen cylinders in an airtight manner in film along with a desiccant bag

## 10.2 Final shutdown/decommissioning

- depressurise the nitrogen cylinders through venting and insert the piston rod (⇒ *OI, 9.3 Cleaning*).

The owner is responsible for the proper disposal of the nitrogen cylinders. Industry-specific and local regulations must be observed when disposing of the various materials.

Only qualified personnel may disassemble and dispose of the nitrogen cylinders (⇒ *OI, 11 Disposal*).

## 11.1 Disposal information

The owner is responsible for the proper disposal of the nitrogen cylinders. Industry-specific and local regulations must be observed when disposing of the various materials.

Only qualified personnel may disassemble and dispose of the nitrogen cylinders.

## 11.2 Disposing of defective nitrogen cylinders



### WARNING

**Danger of injury due to uncontrolled moving parts!**

- Always wear safety goggles during all work carried out.
- While drilling and venting, do not place your head directly over the cylinder.
- Make sure that no other people are put at risk.



1. Chuck the nitrogen cylinder in a jaw chuck.



2. Drill the housing of the nitrogen cylinder for venting at the centre using a spiral drill (bore diameter approx. 4 mm).



3. Then dispose of the nitrogen cylinder.

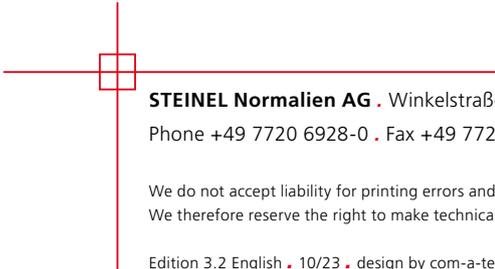
## 12 Specification and material safety data sheet of the lubricating oil

As manufacturer of the nitrogen cylinders, we recommend following version of lubricating oil:

- SZ9852.5 5ml
- SZ9852.6 50 ml

The safety data sheet can be accessed via the following link:

**[www.steinell.com](http://www.steinell.com) » Service » Data sheets**



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