

OPERATING/INSTALLATION INSTRUCTIONS

(Translation)



Container cleaning device
Spate cleaner TANKO®CR40

Armaturenwerk Hötensleben GmbH

Schulstr. 5-6

39393 Hötensleben, Germany

Telephone: +49 39405 92-0

Fax: +49 39405 92-111

E-Mail: info@awh.eu

Homepage: <http://www.awh.eu>

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NOTE



These instructions are an essential part of the device and must be available to operating and maintenance personnel at all times throughout its entire life cycle.
The safety precautions contained therein must be observed.
If the device is resold, the instructions must always be transferred to the new owner.

Translation

The operating instructions must be written in an official European Community language acceptable to the manufacturer of the machinery in which the partly completed machinery will be assembled, or to his authorized representative. If any discrepancies arise in the translated text, the original operating instructions (German) must be consulted for clarification, or the manufacturer must be contacted.

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Abbreviations and Units

Abbreviations

Pic.	Picture
AISI	American Iron and Steel Institute
ASME	American Society of Mechanical Engineers
ATEX	AT mosphère EX plosible; Synonym for the ATEX Directive of the European Union; comprises measures for explosion protection for explosive atmospheres
AWH	Armaturenwerk Hötensleben GmbH
BetrSichV	Betriebssicherheitsverordnung (German industrial safety ordinance); ordinance concerning health and safety when using work equipment; German implementation of Directive 2009/104/EC of the European Parliament concerning the minimum safety and health requirements for the use of work equipment by workers at work
or	or
approx.	approximately
CR	Modell range "CR" Splate cleaner
DN	DIN-Nennweite (DIN nominal width)
DIN	Deutsches Institut für Normung e.V.; is a national standards organization in the Federal Republic of Germany; The standards of this organization are referred to as DIN standards.
DP	Downpipe In the context of these instructions, this colloquial term describes a line or connection in cleaning technology between a media connection [MC] and a cleaning head or cleaning device. This line is generally used to establish the process connection [PC] for connection of the device to the container.
EN	European Standard
EPDM	ethylene-propylene-diene rubber
if necessary	if necessary
ISO	International Organization for Standardization
L _{EX,8h}	Level of daily exposure to sound, e.g. maximum permissible exposure value of 85 dB(A)
L _{PA}	Emission sound pressure level at the workplace
MA	Media connection In the context of these instructions, this colloquial term describes the interface used in cleaning technology for supplying cleaning agent from the supply line to the device.
max.	maximum
min.	minimum
TECAPEEK	Trade name for polyetheretherketone
Ra	Roughness (surface)
SI	Système international d'unités; the most widely used international system of units for physical variables
Tab.	Table
V _{eff}	effective vibration velocity

Units of Measure



The following indicated factors are intended for orientation and the conversion of the SI units to common units of measure for the American market.

bar	Unit of measure for pressure p [bar] All pressure [bar] specifications stand for positive pressure [bar _g], unless expressly described otherwise. Conversion: 1 bar = 14.50376 psi [pound-force per square inch]
°C	Unit of measure for temperature T [degrees Celsius] Conversion from Celsius to Fahrenheit: °C × 1.8 + 32 = °F [degrees Fahrenheit]
min	Unit of measure for time t [minute]
h	Unit of measure for time t [hour]
kg	Unit of measure for mass m [kilograms] Conversion: 1 kg = 2.20462 ... lb [Latin libra; pound]
l/min	Unit of measure for volume flow rate V [liters per minute] Conversion: 1 l / min = 0.06 m ³ / h [cubic meters per hour] 1 l / min = 0.26417 ... gpm (US) [gallons per minute (US)] 1 m ³ / h = 4.40286... gpm (US) [gallons per minute (US)]
lx	Unit of measure for illuminance E _v [Lux]
m	Unit of measure for length l [meters] Conversion: 1 m = 3.28083... ft [feet]
mm	Unit of measure for length l [millimeters] Conversion: 1 mm = 1 / 25.40005 in [inches] = 0.03937 in [inches]
Nm	Unit of measure for moment/torque M [newton meters] Conversion: 1 Nm = 0.737 lbft [pound-force + feet]
rpm	Unit of measure for speed n [revolutions per minute] Conversion: 1 U / min = 1 rpm [revolutions per minute]
µm	Unit of measure for length l [micrometers]

1 Introduction

These operating/installation instructions (referred to hereinafter as the instructions) are a component part of the device. They provide you with all the information required for smooth operation of the TANKO-CR splate cleaner (referred to hereinafter as the device).

The instructions must be read, understood, and applied by all persons employed to carry out installation and assembly, commissioning, maintenance, cleaning and troubleshooting on the device. This applies in particular to the listed safety instructions.

After studying the manual, you will be able to

- Assemble, install and operate the device safely
- Clean and service the device correctly
- Take the correct measures if a fault occurs.

In addition to these instructions, generally applicable, statutory and other binding regulations in regard of the prevention of accidents and in regard of environmental protection in the country of use must also be observed.

The instructions must be kept at the location of use of the device so that they are available in legible condition at all times. If the device is resold, the instructions must always be transferred to the new owner.

If necessary, download the manual from the <http://www.awh.eu/de/downloads> Internet page.

1.1 Means of Presentation

1.1.1 Explanation of Signal Words

The warnings are introduced with a signal word which describes the extent of the hazard. The meaning and their classification in case of hazardous situations are explained in the following overview.

Signal Word	Meaning	Consequences of Failure to Observe
⚠ DANGER	Hazard with a high level of risk	Death or severe physical injury
⚠ WARNING	Hazard with a medium level of risk	Death or severe physical injury
⚠ CAUTION	Hazard with a low level of risk	Minor or moderate physical injury
NOTE	Hazard with a low risk	Risk of material damage

Table 1.1-1: Overview of Signal Words

1.1.2 Explanation of the Warnings

Section-related Warnings

The section-related warnings apply not only to one particular action, but rather to all actions within a section. In addition, the pictograms and symbols indicate a general or specific danger.



DANGER

This warning warns of a hazard with a high level of risk.

Failure to observe it can lead to death or severe physical injury.

- Measure(s) to prevent the danger



WARNING

This warning warns of a hazard with a medium level of risk.

Failure to observe it can lead to death or severe physical injury.

- Measure(s) to prevent the danger



CAUTION

This warning warns of a hazard with a low level of risk.

Failure to observe it can lead to minor or moderate injury.

- Measure(s) to prevent the danger

NOTE

This warning warns of a hazard with a minor level of risk.

Failure to observe it can lead to material damage.

- Measure(s) to prevent the danger

Embedded Warnings

The embedded warnings apply to specific actions and are integrated directly into the action before the specific action step.

The embedded warnings are structured as follows.

⚠ SIGNAL WORD Type and source of danger

Possible consequences in case of failure to observe

- Measure(s) to prevent the danger

Further Means of Presentation



The “Info” symbol provides useful information, additional tips and recommendations.

- Texts which follow this mark are bulleted lists.
 - Texts which follow this mark describe measures for prevention of the danger.
 - 1. Texts which follow this numbering describe the first step of a task, followed by further numbered steps which have to be performed in the specified order.
 - (1) Numbers in brackets reflect the item numbers in illustrations or parts lists.
 - “ “ Texts in quotation marks are (direct) quotes from documents (e.g. directives or standards) or words, word groups and parts of a text with a special meaning.
- Important, significant information is shown with additional **bold type**, *in italics* or CAPITAL LETTERS for emphasis of individual words or phrases.

1.1.3 Pictograms and Symbols

The following pictograms and symbols are used as a supplementary measure in these instructions to clarify the sources of dangers and measures. They can appear at all levels of danger.



Warning about electrical voltage



Warning about explosive atmosphere



Warning about hand injuries



Warning about a hot surface



Warning about corrosive substances



Warning about substances which are a water hazard



Unauthorized access prohibited



Wear protective work clothing



Wear safety shoes



Wear protective gloves



Wear safety goggles



Wear a hard hat



Wear hearing protection



Wear a welding mask



Isolate from voltage before work



Obey instructions



Protective grounding connection required



Secure against power being switched back on



Return for recycling

1.2 Warranty and Liability

The commitments agreed in the contract of supply and delivery, the general terms and conditions and the terms of delivery of Armaturenwerk Hötensleben GmbH (referred to hereinafter as AWH) and the statutory regulations valid at the time the contract was concluded shall apply.

Warranty and liability claims in case of personal injury and damage to property shall be excluded, in particular if these can be attributed to one or more of the following causes:

- Improper or incorrect use of the device
- Improper assembly and installation, commissioning, operation and maintenance of the device
- Failure to observe the instructions in the instructions regarding assembly and installation, commissioning, operation and maintenance of the device
- Constructional modifications to the device (conversions or other modifications to the device must not be made without previous written approval from AWH. In case of infringement, the device will lose its EC conformity and the operating authorization)
- Use of spare parts that do not comply with the specified technical requirements,
- Improperly performed repairs,
- Disasters, the effects of foreign objects and force majeure.

Disclaimer

AWH reserves the right to make alterations to this document at any time and without prior notice. AWH provides no guarantee (neither expressed nor implied) with regard to all information in this document, including but not limited to the implied warranty of merchantability and suitability for a particular purpose. Furthermore, AWH does not guarantee the correctness or completeness of information, text, graphics or other parts in this document.

1.3 Product Names and Trademarks

The product names and trademarks included in these instructions are brands or registered trademarks of the respective owners.

TANKO® and AWH® are registered trademarks of Armaturenwerk Hötensleben GmbH.

1.4 Related Documents

The following documents may contain supplementary information for these instructions:

- Manufacturer's declaration and/or certificates of conformity
- Certificates
- Additional documents for any attached or upstream components, e.g. Drawings, technical data, information on accessories etc.
- Supplements to these instructions (e.g. special versions)
- AWH catalog, product data sheet

2 Safety

The device has been built in accordance with state-of-the-art technology and the recognized rules of safety. Nevertheless, use of the device may represent a danger to the life and limb of the user and third parties or a risk of impairments to the device and other objects of material value as a result of its function.

The following basic safety instructions are intended to prevent injury to personnel and material damage. The operating company must ensure that the basic safety instructions are observed and adhered to.

These instructions contain basic notes on installation, operation, maintenance and servicing of the device which must be complied with.

Anyone involved in assembly, operation, maintenance and servicing must have read and understood these instructions.

The safety systems and safety instructions described in these instructions must be adhered to.



WARNING



Failure to comply with this manual, incorrectly performed installation and repair work or incorrect operation could lead to malfunctions on the device and to dangerous situations!

There is a risk of death or severe physical injury.

- *All work performed on the device must be carried out only by a specialist and in compliance with
 - *the corresponding detailed operating and installation instruction(s),*
 - *the warning and safety signs on the device,*
 - *the regulations and requirements specific to the plant and*
 - *the national/regional regulations for safety and the prevention of accidents.**
- *Never install damaged devices or components.*



The figures in this manual are intended to provide basic understanding, and are primarily representations of the principals involved. They may differ from the actual design of the device.



For maintenance and repair, we recommend a training course provided by the manufacturer or a person authorized by the manufacturer.



If questions or doubts about handling the cleaning device arise during maintenance, please contact AWH.

2.1 Intended Use



DANGER



***Danger from fire/explosion when using the device in an explosive atmosphere.
Use of the device in an Ex area (potentially explosive atmosphere) is PROHIBITED.***

There is a risk of death or severe physical injury.

- Adhere to the **type plate** of the device (see [section 2.5.2 Type Plate](#)) and the **relevant operating instructions**.



WARNING

Risk of hazardous situations caused by use going beyond intended use and/or other types of use of the device!

There is a risk of death or severe physical injury.

- Only use the device for the intended use.
 - Only ever use the device in accordance with the specifications contained in these instructions and the specifications on the device's type plate.
 - All the specifications in these instructions must be adhered to at all times.
 - Always keep the operating instructions at the location where the device is used.
 - Keep all signs on the device in legible condition.
 - Only use original spare parts.
- Modifications or conversions to the device are NOT permitted.



WARNING

Danger from the incorrect use of materials/agents!

The materials/agents to be used for the intended operation of the device are procured and utilized by the operating company for the device.

If unsuitable materials or agents are selected, strong chemical reactions could lead to fatal injury or severe physical injuries.

- The proper selection and treatment of these materials/agents is solely the responsibility of the operating company.
- When selecting the materials/agents, make sure that the permitted technical parameters of the device are NOT exceeded.
- The cleaning agents and media must be approved for all of the materials of the device (e.g. washers, bushings) and for the substances in the container to be cleaned which come into contact with them.
- Adhere to the specified chemical limitations for use in the material data sheets.
- Adhere to the safety data sheets supplied by the manufacturers of the materials and media, in particular for hazardous substances:
 - Comply with the hazard and disposal instructions.
 - Set out protective measures and compile operating instructions for hazardous substances.
 - This also applies to hazardous substances that may arise during work processes.

Refer to the order confirmation / parts list from AWH for the materials used in the device.

The TANKO-CR is a rotating cleaning device and belongs to the group of spat cleaners. The device is driven by the cleaning medium. The device is used for cleaning the interiors of containers with and without installed equipment.

For the purpose of these instructions, containers refer to **enclosed** tanks, silos, barrels, containers, pipes, etc., which are provided with an outlet that ensures a free outward flow of the supplied cleaning medium.

The device was developed, engineered and built exclusively for industrial and commercial use. It must not be used for private use.

In all cases, operating company must check whether the device is suitable for its application.

The device can be used in containers inside and outside of buildings in compliance with the limitations for use (see [section 3.3 Technical Data](#)).

In the process, the following must always be observed:

- Only operate the device when installed inside an enclosed container.
- Never direct the cleaning jet or torrent from the device at persons.
- Protect the device from freezing (e.g. risk of frost from possible residual water).
- Use a suitable filter system in the supply line for the cleaning medium.
- Operate the device only within the approved parameters, such as pressure and temperature, (see [section 3.3 Technical Data](#)). If necessary, appropriate monitoring and limiting systems (e.g. for pressure and temperature) should be implemented.
- Only cleaning media which are compatible with the materials of the device (see [section 3.4 Cleaning media](#)) may be used.
- The preferred installation position for the device is vertical with the cleaning head pointing downwards. Other installation positions are possible (see [section 5.2.2 Installation Position](#)).
- The device may generate vibrations when cleaning the container. Any vibrations going beyond this must be avoided (see [section 7.4.1 Maintenance Intervals](#)).
- The device is designed for fixed pipe installation only. Installation on a hose is PROHIBITED.

Unintended use

The device is **NOT suitable** for the following applications:

- The device is NOT suitable for private use.
- The device is NOT suitable for use outside of containers.
- Holding the device with your hand during operation is PROHIBITED.
- The device must NOT be immersed in the product of the production process (NOT even partially). This could cause the product to enter into the device. The spray openings may become blocked. The free movement of the actuator may be obstructed.
- The device is NOT suitable for ATEX applications.

The device is intended exclusively for the purpose outlined above. Any other use beyond that described here or alteration of the device without written approval from the manufacturer is considered IMPROPER use.

The manufacturer accepts NO liability for damage arising from such use. The operating company is solely responsible for the risk.

The device must not be put into operation until it has been assured that all the safety devices are fully functional and the plant in which the device is installed meets the safety requirements of all relevant European directives (e.g. the Machinery Directive).

2.2 Repairs

The device must be replaced with a new one if worn or damaged. A repair is not possible.

2.3 Duties of the Operating Company

The device is used in the commercial sector. The operating company is thus subject to the legal obligations regarding occupational safety.

In the EEA (European Economic Area), the national implementation of the Framework Directive 89/391/EEC on carrying out measures for improving safety and protecting the health of employees during work, as well as the associated individual directives shall be observed and complied with in their current valid versions.

Of particular importance in this connection is Directive 2009/104/EC on the minimum specifications for safety and health protection of employees using work equipment in their work.

As a basic rule, in Germany the Industrial Safety Regulation (BetrSichV) must be observed.

In other countries, the respective national guidelines, statutes and country-specific regulations regarding occupational safety and accident prevention must be complied with.

At the same time, the following, non-exhaustive instructions apply in particular:

- The operating company must ensure that the device is used only as intended (see [section 2.1 Intended Use](#)).
- The operating company must keep informed of the locally applicable occupational health and safety regulations and, in addition, use a risk assessment to determine the hazards resulting from the specific working conditions at the location of use of the device. This must then be implemented in the form of operating instructions for the operation of the device.
- When using hazardous materials, protective measures must be specified in accordance with the safety data sheets and operating instructions shall be compiled for hazardous materials. Personnel must be briefed accordingly. This also applies to hazardous substances that may arise during work processes.
- A continuous risk assessment must be carried out for workplaces, including temperature conditions for the medium and the place of use (falling). The measures are to be defined in operating instructions. Personnel must be instructed accordingly.
- Supervisors must monitor compliance with the measures specified in the operating instructions.

- Throughout the entire operating period of the device, the operating company must check whether the operating instructions he has compiled reflect current legislation requirements and adapt them as necessary.
- The operating company must clearly regulate and specify the responsibilities of personnel (e.g. for operation, maintenance and cleaning).
- The operating company must allow only sufficiently qualified and authorized personnel to work on the device.
- The operating company must ensure that all employees handling the device have read and understood the instructions.
Furthermore, it must provide personnel with training at regular intervals with certification and inform them of the hazards.
- The operating company must provide sufficient workplace lighting at the plant in accordance with the locally applicable regulations for occupational health and safety, in order to prevent hazards occurring as a result of poor lighting.
- The operating company must provide personnel with personal protective equipment and make sure that this is used (see [section 2.4.1 Personal Protective Equipment](#)).
- The operating company must make sure that the danger area of the higher-level plant in which the device is installed is not accessible to unauthorized persons.
- The operating company must make sure that no one is permitted to work on the device whose ability to react is impaired by drugs, alcohol, medication or similar.
- The operating company must take appropriate measures to inform groups of persons who are not intended to come into direct contact with the device (e.g. visitor groups) about the potential dangers involved.
- The operating company is responsible for making sure that the device is only ever operated in perfect condition.
- Wherever high pneumatic pressures occur, there is a possibility of sudden failure of or damage to the lines and connections. This poses a hazard. The operating company must instruct operating and maintenance personnel at least once a year on the possible hazards.
- The constructor of the overall plant must install the switching and safety devices required for setting up, inspection, shutting down (including emergency shutdown), operation, maintenance, cleaning and repair.
- The operating company must design the disconnection of the energy sources on the higher-level plant technically in such a way that the Switch-off Procedure described in [Section 7.2](#) can be adhered to.
- The operating company must define and adhere to the intervals for inspections and control measures in accordance with the environment and media used.
- The operating company must provide fire safety devices, e.g. the appropriate quantity of suitable hand-held fire extinguishers of the appropriate size, in easily accessible places and provide employees with training in fire safety.
- Warnings in the documentation for externally supplied assembly groups must be adhered to and incorporated into the risk assessments for the specific workplace.

- When installing the device in a plant, the operator must ensure safe access with stairs stages and railings according to EN ISO 14122-1-3.

Connections:

Before operating the machine with the device, the operating company must make sure that the local regulations are observed for assembly, installation and commissioning, if these tasks are performed by the operating company.

- The hydraulic connections must meet the requirements of EN ISO 4413.
- The grounding measures must be implemented and checked prior to commissioning of the device and the container.

2.4 Requirements for Personnel

The device must only be operated and serviced by persons with the appropriate qualifications. These persons must be familiar with this manual and act in accordance with them. The respective authorizations for personnel must be clearly defined.

The following qualifications are designated in the manual for various fields of activity:

Expert/Specialist Personnel

An expert is a person whose professional training, knowledge, and experience and knowledge of the relevant standards and regulations enables them to carry out work on the device and identify and prevent potential risks independently.

Instructed person

An instructed person has been briefed and, if necessary, trained by the operating company or an expert in a briefing on the assigned tasks and possible hazards in the event of improper actions, and instructed on the necessary safety devices and protective measures.

Only personnel with the following expertise are permitted to perform work on the device:

- **Assembly/disassembly:** Industrial mechanic or similar training, practical experience in the assembly/disassembly of devices
The person must be familiar with the construction, mechanical installation, maintenance of the device and fault clearance on the device and have the following qualifications:
 - Vocational training and final qualification in the field of mechanics (e.g. mechanic or mechatronics technician)
- **Welding work:** Welder qualification in pipeline engineering or similar apprenticeship
- **Electrical work:** Electrician; person with appropriate specialized training, knowledge and experience, enabling them to identify and prevent risks which may be caused by electricity.
The person must be familiar with the electrical installation, commissioning, troubleshooting and repair of the device and have the following qualifications:
 - Vocational training and final qualification in electrical engineering (e.g. electrician, electronics engineer or mechatronics technician)
 - Several years of vocational experience in the field of electrical engineering
- **Cleaning:** Instructed person

Work performed in other areas **transportation, storage, operation and disposal** must be performed exclusively by personnel who have received suitable instruction.

All of the personnel listed above must wear protective clothing in accordance with their respective activities.

2.4.1 Personal Protective Equipment

Personal protective equipment must be used in accordance with the respective task when working on the device in order to minimize health hazards.

**Protective work clothing**

Protective work clothing is tight-fitting work clothing with low resistance to tearing, with close-fitting sleeves and without protruding parts. It is mainly used for protection against becoming entangled in moving components. Do not wear any rings, necklaces or other jewelry.

**Safety shoes**

Wear slip-resistant safety shoes for protection against heavy, falling objects or for protection against slipping on slippery surfaces.

**Protective gloves**

Wear protective gloves to protect your hands against friction, grazes, getting pricked or deep cuts and for protection against coming into contact with hot surfaces or chemical substances.

**Protective goggles**

Wear protective goggles for protection against media escaping at high pressure and against flying objects.

**Hardhat**

Wear a hardhat for protection against falling or flying objects.

**Hearing protection**

Wear hearing protection to protect yourself from an increased noise pressure level (≥ 85 dB(A)).

**Welding hood**

Wear a welding mask to protect against damage to the eyes or skin caused by the welding arc and to protect against burns caused by flying particles during welding.

Personal protective equipment must be provided by the operating company in accordance with the valid requirements.

Furthermore, both the national regulations and, if necessary, the internal instructions from the operating company, must be observed.

2.5 Labeling

2.5.1 Type Designation

Example: Spate cleaner

1) Brand of the cleaning devices:

TANKO

2) Model range:

CR

3) Type:

40

4) Spray angle:

360°

Downward 180°

5) Connection: Thread Type

BSP

6) Connection size:

1/2"

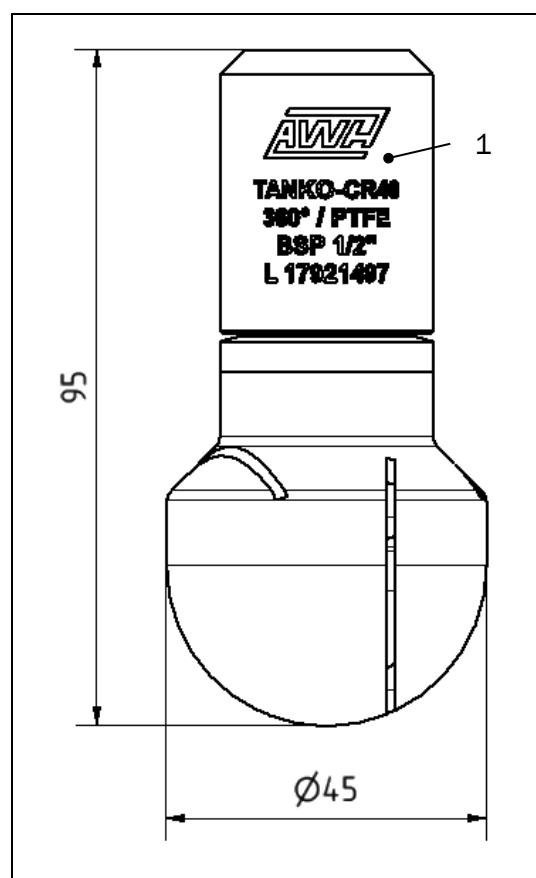
TANKO - CR40-360° BSP 1/2"

2.5.2 Type Plate



The specifications only apply to devices with types indicated on the title page of these instructions.

The marking is applied to the device according to the following illustration.



1 Device type plate

In case of inquiries, the data on the type plate of the device are important for proper and speedy processing:

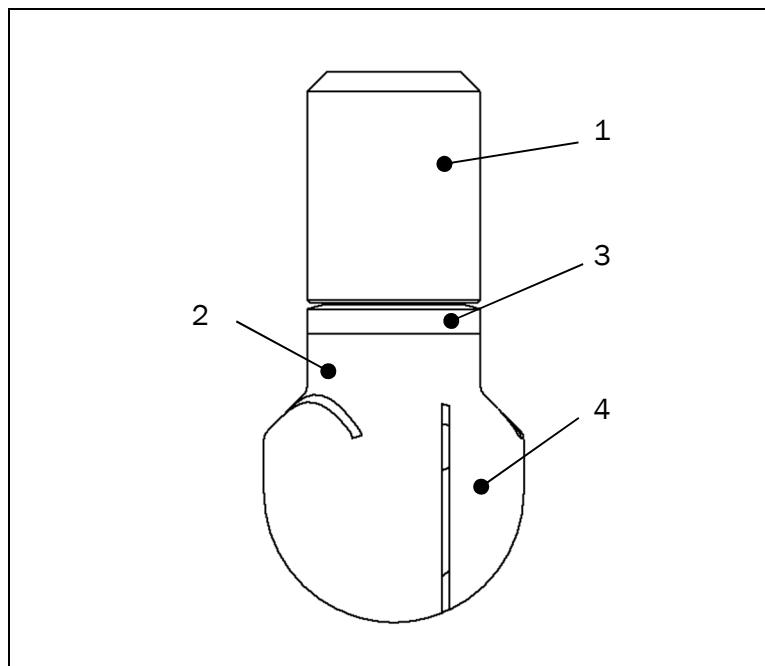
- Manufacturer
- Type designation
- Spray Angle / Material
- Connection
- Serial no. [SN]

Picture 2.5-1: Type Plate Position

3 Construction and Function

3.1 Structure

The Container Cleaning Device comprises the following Main Components:



- 1 Connection fitting
- 2 Bearing shaft (interior, not visible)
- 3 Bearing plate
- 4 Spray head

Picture 3.1-1: Overview

3.2 General Function Description

TANKO-CR type cleaners are compact axially rotating cleaning devices and they are driven by the flow of the cleaning agent ejected through slots in the spray head. The emitting spray impacts the inner surfaces of the container removing contamination and cleaning the vessel. Whilst the normal mounting position is vertically downward the device will work at any other angle. The cleaning ability of the device may vary according to the mounting angle.

To enhance the efficiency of the cleaner the TANKO-CR range has a cleaning angle of 360° or 180° downwards. The 360° variant has the advantage of being self-cleaning, as cleaning medium is also directed towards the supply line.

The TANKO-CR cleaner is constructed from highly chemically resistant PTFE and PTFE derivatives. This also eliminates the need for additional lubrication beyond that of the cleaning medium.

3.3 Technical Data

Designation	TANKO-CR
Range:	
- Cleaning radius	2 m
- Wetting radius	2.7 m
Operating pressure:	
- Cleaning medium	1.5 – 5 bar
- Optimum pressure range	2 - 4 bar
Operating temperature (permitted):	
- Cleaning medium	+5 °C (+41 °F) to +95 °C (+203 °F)
Ambient temperature (permitted):	
- Inside the container	+5 °C (+41 °F) to +150 °C (+302 °F)
Volume flow rate / flow:	See diagram Picture 3.3-1
Media connection [MA]	1/2" BSP
Sound pressure level:	Dependent on the properties of the container!
- Outside the container	It is not to be expected that the noise pressure level will exceed the maximum permitted exposure value of $LE_{x,8h} = 85 \text{ dB(A)}$ during operation (see section 6.1).
Surface roughness:	$R_a \leq 1.2 \text{ } \mu\text{m}$ (48 μin)
Materials:	PTFE (modified)
Weight:	0.16 kg
Installation opening:	See Section 5.2.1
Installation Position:	See Section 5.2.2

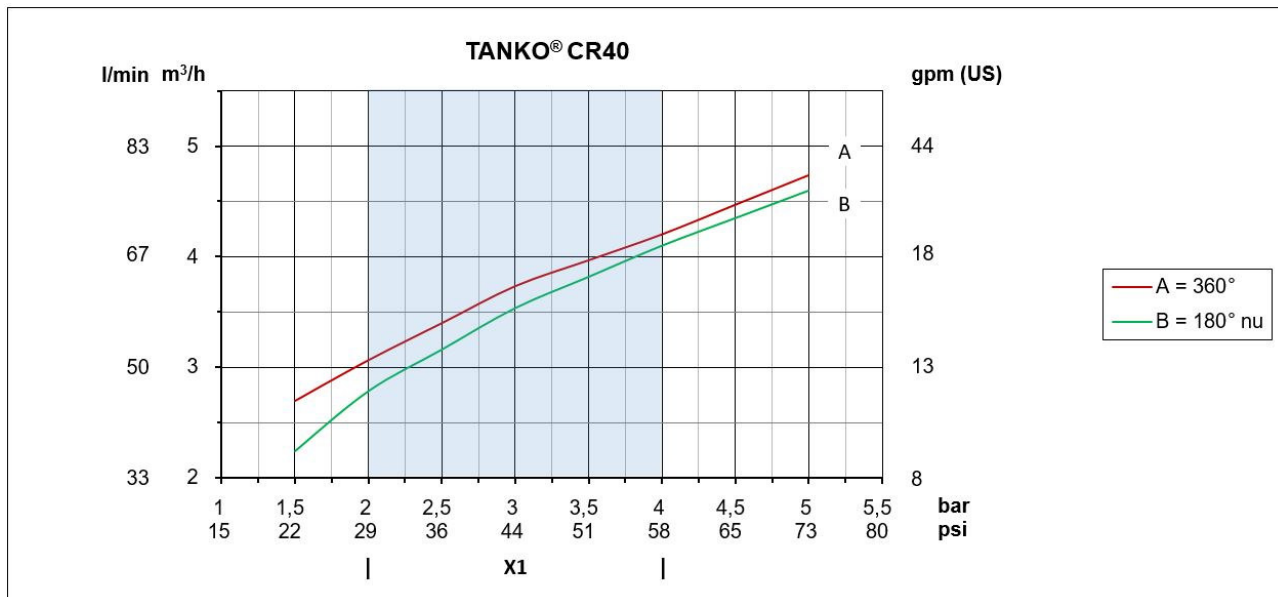
Table 3.3-1: Technical Data of the Device

Consumption Data

The specified values for consumption and rotation speed are average values, and may deviate by approx. $\pm 10\%$ during normal operation.

They apply to operation with clear water as the cleaning medium at a temperature of + 25 °C / + 77 °F. The values may differ with a different cleaning agent and if the medium temperature is different.

The consumption of cleaning fluid is dependent on several factors; increasing the pressure leads to increased consumption (throughput). The permitted range for the operating pressure of the cleaning medium must be adhered to.



X1 – Optimum pressure range

Picture 3.3-1: Diagram - Consumption Data

3.4 Cleaning media

Due to the wide variety of practical cases of application and use for the cleaning device, it is NOT possible for AWH to recommend specific cleaning media for the operating company.

The operating company holds sole responsibility for the type of cleaning media, their use and handling.

For this reason, AWH can provide the owner with **a few reference points and notes** (for a device in a container) **but only as a precautionary measure**, which must be observed and integrated into the owner's risk assessments.



DANGER



Danger of explosion as a result of the formation of an explosive atmosphere!

By spraying or spraying false liquids to clean the container, an explosive atmosphere can form.

There is a risk of death or severe physical injury.

- The following cleaning media are **PROHIBITED**:
 - Fluids which may form a dangerous explosive atmosphere or an explosive mixture when splashed or sprayed.
 - Fluids which cause a chemical reaction with the substance to be cleaned that could form a dangerous explosive atmosphere or an explosive mixture.
 - Corrosive, flammable or explosive fluids (e.g. acids, thinners, etc.).

**WARNING*****Danger due to corrosive and irritant cleaning medium!***

When handling the cleaning medium, it is **IMPOSSIBLE TO EXCLUDE** the risk of inhalation, swallowing, contact with the skin, eyes and mucous membranes.

There is a risk of death or severe physical injury.

- Adhere to the regulations and specifications in the safety data sheets for the cleaning media (e.g. vapors or hazardous substances).

The following limitations for cleaning media are derived from the durability of the materials used in the device.

**CAUTION*****Danger as a result of use of incorrect cleaning media!***

Due to their material resistance, the materials used in the device impose certain limitations on the cleaning media used.

Failure to comply can result in property damage and consequential damage as a result of component failure or malfunction of the device.

- The cleaning media must be approved for all of the materials of the device (e.g. seals, bushings) and for the substances to be cleaned in the container that come into contact with it.
- The following cleaning media are **PROHIBITED**:
 - Cleaning media containing solids or liquids with solid particles or solid content (e.g. abrasives) which can lead to increased wear and/or blockages of the spray holes.
 - Cleaning media containing substances which may cause exothermic reactions with the materials of the cleaning device, the container of the plant, e.g.: fluorine compounds.

NOTE***Risk of damage to the device from the cleaning medium!***

Soiling or foreign objects in the cleaning medium can have a negative effect on the function of the device.

There is a risk of material damage and consequential damages.

- Use a suitable filter system in the cleaning medium supply line. The use of a filter with a filtration effect corresponding to a mesh width of 50µm is recommended.
- Adhere to the instructions on the supply and return lines in the [Section 5.2 Installation](#)

NOTE***Operation of the device with steam or gases!***

The conveyance of steam or gases through the device (e.g. for sterilization) leads to greater wear and shortens the product service life.

The following Agents are permitted for use for Container Cleaning:

Only clean, sprayable fluids may be used.

The process of spraying and jet cleaning with fluids always requires individual consideration by the operating company.

- Water
- aqueous solutions (e.g. water with alkali cleaning additives and similar).

Substances used in the container during the process

Basically, the modified PTFE material offers a broad range of chemical resistances which are similar to those of unmodified virgin PTFE. However, the durability must be checked in advance for the respective application.

Very strong oxidizing agents such as solutions of alkali metals in liquid ammonia or very strong oxidizing agents such as elemental fluorine are excluded.

4 Transportation and Storage

AWH products are checked carefully before they are dispatched, and are packaged in accordance with the respective transportation and storage conditions. However, it is NOT possible to rule out the possibility of damage during transportation completely.



CAUTION



Risk from protruding sharp edges on the device!

Depending on the design, the device may have protruding sharp edges which can be dangerous when handling it.

There is a risk of minor cuts.

- *Wear protective gloves when working on the device.*
- *When handling, e.g. unpacking, transportation without packaging, assembly/disassembly and maintenance work, beware of protruding sharp edges.*

In the event of damage (including cases involving spare parts) please contact AWH immediately with a damage report.

Scope of Delivery

- Container cleaning device
- Operating and installation instructions
- Technical documents in accordance with the order (e.g. certificates and reports)

The scope of delivery ends at the interfaces of the device (see [section 5.2.1 Interfaces](#)).



Refer to the delivery note and the order confirmation for full details of the scope of delivery.

Inspection on Receipt of Goods:

- Immediately check the delivery against the delivery note and the order confirmation on receipt to make sure that it is complete.
- Check the delivery for any transport damage (visual inspection).

Claims:

- Register claims for damaged and/or incomplete deliveries with the transport company immediately.
- Keep the packaging for a possible inspection by the transport company or for return delivery.

Return Delivery:

In the event of a possible return delivery, pack the device parts so that they cannot become damaged during transportation. If possible, use the original packaging and the original packaging material. If neither is available anymore, request a packaging company with specialist personnel.

- Consult AWH if you have any questions regarding packaging and transport safety.

4.1 Packaging

The device is supplied fully assembled. The packaging is selected to suit the conditions of transportation. Required accessories, spare parts, operating or installation instructions and technical documents are packaged separately and enclosed with the delivery.

The packaging should protect the device up until the time of installation against transport damage, corrosion and other damage. Therefore, do not remove the packaging until shortly before installation.

NOTE



Danger due to improper disposal!

Packaging materials are valuable raw materials and can often be re-used or usefully processed and recycled.

Improper disposal can cause environmental damage.



- *Dispose of packaging materials in an environmentally friendly manner and recycle them.*
- *Adhere to the locally valid disposal regulations.*

4.2 Transport

NOTE Improper transportation can cause damage to the device.

The functional safety and reliability of the device may be compromised.

- Adhere to the symbols and instructions on the packaging.
- Always transport the device in a dry condition.
- The device must be protected from impacts.
- If possible, use the original packaging for transportation.
- Proceed with care when unloading the device and when transporting it on your premises.
- Do not remove the packaging until shortly before installation.

4.3 Storage

The packaging of the device, the components and the spare parts is designed for a storage period of 3 months.

NOTE Risk of damage to the device as a result of incorrect storage!

Incorrect storage can cause damage to the device and its components and lead to premature aging (e.g. plastic parts).

The failure of components or a device malfunction can cause material damage and consequential damages.

- Adhere to the following storage conditions:
 - Store the device in the original packaging wherever possible.
 - Store the device in a clean and dry place (e.g. enclosed, dust-free room).
 - Store the device in stable environmental conditions.
 - Prevent major temperature fluctuations so that condensation does not form.
 - Prevent dirt and moisture from entering into the device.
 - Protect the device from the elements (e.g. formation of condensation in the device, sunlight).
 - Protect unpacked devices or components with dust-proof covers. Condensation must not be allowed to form beneath the covering.

Parameters for Storage (recommended):

- Room temperature + 10 °C to + 45 °C / + 50 °F to + 113 °F
- Relative humidity max. 60% (non-condensing)
- Temperature fluctuations max. 10 °C / 18 °F per day
- Occurrence of oscillations $v_{eff} < 0.2 \text{ mm / s}$

5 Installation

5.1 Safety Instructions for Installation

WARNING



Danger as a result of static charge!

Containers may become statically charged during cleaning operation. There is a risk of electric shock or electrical irritation in case of contact with the hand, which could cause a startled reaction.

There is a risk of death or severe physical injury.

- Only allow work on the device to be performed by experts.
- Make sure that an electrostatic charge is prevented. To do so, ground the device and the container using equipotential bonding.
- The grounding must always **be implemented** before commissioning of the device.

WARNING



Risk of falling when working at heights!

When carrying out assembly/disassembly work on parts of the plant at heights, there is a risk of falling.

There is a risk of death or severe physical injury.



- Do not perform any work at heights except with a safety platform with cage or suitable fall protection (e.g. safety rope and safety harness).
- If you are using a harness as fall protection, it is imperative that the rescue concept is observed for a person in the harness.
- A person must not remain suspended in the harness for longer than 15 min as there is otherwise a risk of shock or even death.
- Wear protective work clothing, safety shoes, protective gloves and a hard hat for work at heights.

**CAUTION*****Risk of accidents as a result of improper installation!***

Incorrect installation, falling components or failure to comply with the indicated safety notes can result in accidents or damage to property.



There is a risk of minor or moderate injuries.



- Allow only experts to perform work on the device.
- Before starting work, **observe the working steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)). Also refer to relevant Material Safety Data Sheets.



- Wear protective work clothing, protective gloves and safety shoes when performing work.
- Do not work on the device unless it is depressurized and in a cool state.
- Maintain a safe distance when working on the device. We recommend that you provide 1 m of space for free movement around the device and container.

**CAUTION*****Insufficient lighting in the working environment!***

The device DOES NOT have illumination. Insufficient lighting when working on the device can cause accidents.

There is a risk of minor or moderate injuries.

- Make sure that there is sufficient and even lighting in all areas of the plant in which the devices is used when work is performed on the device.
- In Germany, the technical rules for workplaces (ASR A3.4) apply. An illumination level of **300 lx (lux)** is recommended (maintenance value).

5.2 Installation

The safety notes in [Section 5.1 Safety Instructions for Installation](#) must be adhered to before installation of the device in the container.



CAUTION

Failure due to incorrect installation position/location of the device!

Installation of the device which is NOT performed properly can cause damage to the device which puts the functional safety and reliability at risk when it is commissioned.

This can result in hazards.

There is a risk of minor or moderate injuries.

- When selecting the installation position of the device, make sure
 - that a safe distance from the inner wall of the container and from surrounding components is maintained, so as to prevent scraping or knocking during vibration.
 - It is imperative to prevent collisions while the cleaning head and surrounding components (e.g. agitators) are moving simultaneously.
- Only fixed pipe installation is permitted. Installation with a hose can cause the installed cleaning device to thump/whip.
- Install the device free of mechanical strain.
- See the [Picture 5.2-2: Dimensions](#) for the installation dimensions.



CAUTION

Risk of a fault as a result of soiling, foreign objects or damage to the device!

Foreign objects such as scale, burrs, chips, etc. can restrict flow or get into the piping system and cause malfunctions or damage to components, including seals. This can result in hazards that endanger the functional safety of the device.

There is a risk of minor or moderate injuries.

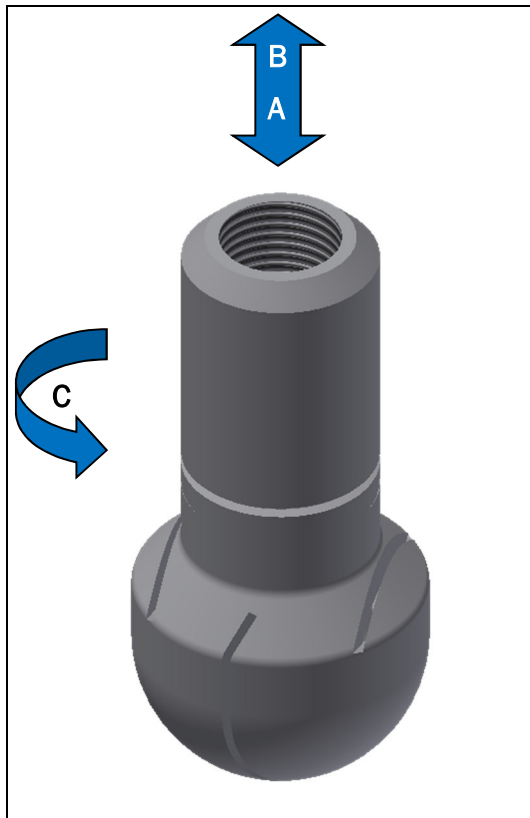
The following measures must be observed before installing the device for the first time, and also when installing it after retooling work on the plant in which the device is installed:

- All supply and return lines for the cleaning medium must be rinsed with clear water in order to remove any contamination, foreign objects or residue in the supply line (e.g. scale, chippings, welding particles etc.).
- Take suitable measures to prevent soiling and foreign objects from entering via the interfaces of the device. Install a filter upstream of the media connection [MC] in the supply line for the cleaning media (see [section 3.4 Cleaning media](#)).
- Paint must not be applied to the surface of the device



*The operating company is solely responsible for fastening the device to the container.
The vessel connector must be securely sealed.*

5.2.1 Interfaces



A Actuator / Energy Supply

Media connection [MC]

(Connection of the downpipe [PC] to the device)

B Device / Container

Process connection [PC]

(Connection of the downpipe [DP] to the container)

C Space for Movement / Installation Space

Cleaning head with spray openings for the cleaning agent

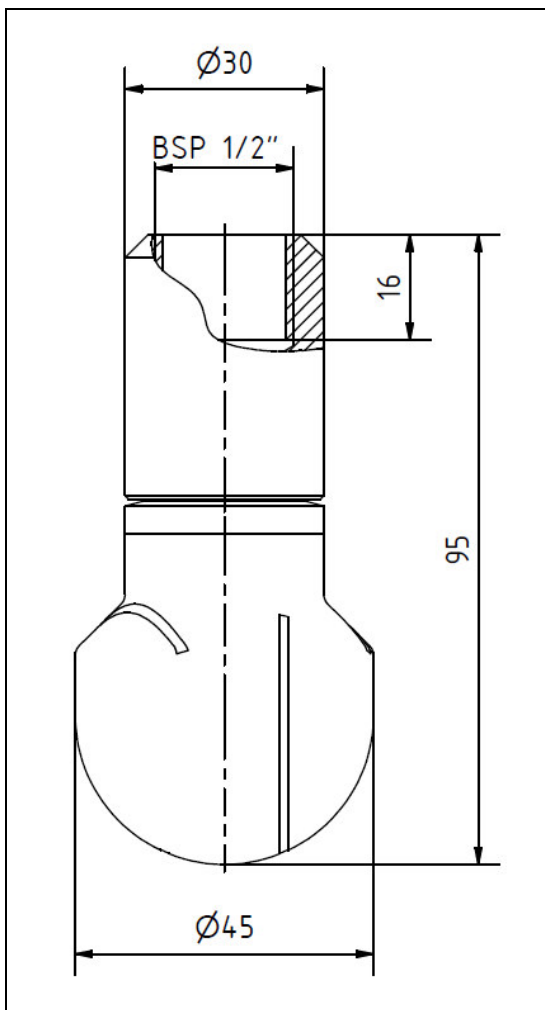
Picture 5.2-1: Device Interfaces

Assignment of the Connections

For the connection of the TANKO-CR, we recommend the use of the TANKO-AN weld-on nipple, size 1/2" BSP.

The exact item description can be found in the current AWH cleaning technology catalog.

Dimensions



Picture 5.2-2: Dimensions

5.2.2 Installation Position

The device is designed for vertical installation, hanging downwards, as the preferred position. It can, however, also be installed in any position. In the event of a different installation position, be aware of the following:

- In any installation position that deviates from the vertical down, self-emptying of the device is not always completely guaranteed
- The running performance may be compromised.
- The service life of the bearing elements may be shortened as a result of the increased strain.
- Maintenance intervals should be shortened, if necessary (see [section 7.4.1 Maintenance Intervals](#)).

5.2.3 Installing the Device

NOTE Risk of dirt and foreign objects in the device!

Functional safety and reliability may be compromised.

- During assembly, make sure and check that there is no dirt or foreign objects in the device (e.g. small particles, sealing material).

NOTE Non-compliance with the dimensions for media connection (see [Picture 5.2-2: Dimensions](#))

Problems with the fastening of the device to the downpipe could be the result.

1. Screw the device onto the downpipe with weld-on nipple as far as it will go and tighten to 15 Nm or slightly more than normal manual force. For this purpose, a strap wrench or a non-slip glove should be used.
2. Check whether the spray head can rotate freely.

6 Commissioning

Before the device is commissioned in Germany, the operating company of the plant must adhere to the Industrial Safety Ordinance (BetrSichV).

In other countries, the respective national guidelines, statutes and country-specific regulations regarding occupational safety and accident prevention must be complied with.



WARNING

Hazardous situations as a result of incorrect installation of the device!

If the device is not installed properly, unpredictable situations may arise during commissioning or operation.

There is a risk of death or severe physical injury.

- *As a basic rule, commissioning of the device (with cleaning medium) must not be performed until the following has been checked:*
 - *Correct mechanical installation of the device on / in the container*
 - *The safe and reliable functioning of the device*

6.1 Safety Notes for Commissioning

Before the device is commissioned, the operating company must ensure that local regulations are observed during commissioning.



We recommend that you document the commissioning in a report.



WARNING



Danger due to hot surfaces!

The device may heat up significantly as a result of the cleaning medium or the heat transfer from the container. Contact with the device can cause burns on the skin.

There is a risk of burns from the cleaning medium at temperatures of more than + 60 °C / + 140 °F.

- *Secure hot surfaces with a guard or barriers.*
- *Put up warning signs in the direct vicinity of the hot surfaces.*
- *Use protective work clothing and protective gloves when working.*

**WARNING*****Danger resulting from negative pressure/vacuum in the container!***

A cold cleaning process in hot enclosed containers can generate negative pressure, which may lead to damage to the container.

There is a risk of death or severe physical injury.

- *Take precautions to allow gases or vapors to escape during operation (e.g. install devices for ventilation).*

As a result of the variety of practical applications and uses for the cleaning device, AWH CANNOT specify a noise level for the device under load, i.e. installed in the container and operating with cleaning fluid.

For this reason that the manufacturer can offer the operating company, **solely as a precautionary measure, a few points of reference and some notes** to be observed and to be integrated into the operating company's hazard assessments.

**CAUTION*****Risk of hearing damage as a result of an increased noise level!***

The device emits a noise pressure level of $L_{pA} < 70 \text{ dB(A)}$.

When the device is operated in a container, the noise level may exceed the maximum permitted exposure value of $L_{EX,8h} = 85 \text{ dB(A)}$ and varies depending on the properties of the container in the plant and the existing operating conditions of the device.

Hearing damage could be incurred as a result.

- *The plant noise level must always be measured and documented by the operating company.*
- *Keep the plant noise level within the legal range:*
 - *Perform noise reduction measures (e.g. sound insulation).*
 - *Delimit and mark the noise area (e.g. with mandatory sign "Wear hearing protection").*
 - *Use effective hearing protection (e.g. ear muffs or ear plugs).*

Comply with the technical health and safety rules relating to noise and vibration (TRLV Lärm in Germany). State-of-the-art technology must be used to implement the measures to provide protection from exposure to noise based on the risk assessment. In this case, noise emissions must be prevented at source, or reduced as far as possible.

**CAUTION*****Insufficient lighting in the working environment!***

The device DOES NOT have illumination. Insufficient lighting when working on the device can cause accidents.

There is a risk of minor or moderate injury.

- *Make sure that there is sufficient and even lighting in all areas of the plant in which the devices is used when work is performed on the device.*
- *In Germany, the technical rules for workplaces (ASR A3.4) apply. An illumination level of **300 lx (Lux)** is recommended (maintenance value).*

6.2 Functional Check / Trial Run

All the screw connections on the device are firmly tightened in the factory. Nevertheless, a trial run should be carried out to check that the device functions safely and reliably, and that it is leak-tight once installed.



Do not operate the device unless it is in perfect condition.

The container to be cleaned must be run empty and depressurized.

⚠ WARNING Persons in the container.

A person may be struck by the jets from the cleaning head!

There is a risk of death or severe physical injury.

- Do NOT start cleaning operation while there are persons in the container.
1. Securely close all of the openings on the container (e.g. inspection openings).
 2. Switch off all moving parts in the container (e.g. agitators) and secure them to prevent them from being inadvertently switched back on or set in motion.
 3. Check to ensure that there is a safe distance around the container and the surrounding components.
 4. Switch on the device (see [section 6.3 Switch-on procedure](#)).
 5. Check the interfaces on the device for leaks.
 6. **NOTE** Danger of collisions with moving parts!
Observe the following steps if components in the container are required to rotate during the cleaning process:
 - Start up the surrounding components (e.g. agitators) step by step.
 - Carefully check that the cleaning head and surrounding components (e.g. agitators) do NOT collide while moving simultaneously.
 7. Make sure that there are no unusual vibrations.
 8. Check the device to make sure that it runs quietly and smoothly.
 9. Switch off the device (see [section 7.2 Switch-off Procedure](#)).

6.3 Switch-on procedure

In accordance with the type of device activation and how it is integrated (e.g. manual or automatic) on the cleaning plant, the switch-on procedure must be integrated and the following instructions must be observed when switching on.



WARNING

Risk from sudden, unforeseeable or unauthorized activation of the device (e.g. triggering of a start command as a result of incorrect operation of a start-up control device)!

There is a risk of death or severe physical injury.

*When commissioning the device, it is imperative to perform the following **working steps** in the specified sequence.*

Switch-on procedure

1. *Securely close all of the openings on the container (e.g. inspection openings).*
2. *Switch on the cleaning medium supply (e.g. slowly open the shut-off valve or ball cock).*
3. *Check that the supply of cleaning medium is NOT interrupted and the media pressure on the device is established.*
4. *Take suitable measures to secure the supply of cleaning agent to prevent it from switching off suddenly, unexpectedly or without authorization.*

NOTE

Risk of breakage due to material overload!

Pressure surges when switching the cleaning medium on or off, in particular pressure surges which exceed the operating pressure, and gas components in the cleaning agent may cause hammering in the cleaning device.

There is a risk of material damage or destruction of plant parts, (e.g. leakage in the pipe system or on connected devices).

- *Prevent pressure surges ("water hammers") and gas components in the cleaning medium, e.g. caused by:*
 - *Installing a water hammer arrester or pressure relief valve in the supply line*
 - *Starting up/stopping the pump slowly*
 - *opening/closing the shut-off fitting slowly (e.g. valve or ball cock).*

The term "water hammer" denotes a pressure surge in a fluid line which is generated by opening/closing a shut-off fitting (e.g. valve or ball cock) quickly at the end of a pipeline.

Pressure hammers/pressure surges can also be provoked by quick changes in the flow rate (pressure increase or pressure drop), or by sudden changes in direction of the flow of fluids. This effect is particularly common in pump systems with long pipelines when starting up, stopping or changing the speed of pumps.

6.4 Operation

Once it has been commissioned and inspected, the device can be put into operation, observing the following instructions.



WARNING



Risk when using outdoors!

If the device is used outdoors, there is a risk of a lightning strike in case of a storm.

There is a risk of death or severe physical injury.

- The devices are usually operated in an enclosed factory hall and are thus protected from the **risk of lightning**.
- In case of use outdoors and in case of storms or the risk of lightning strikes, stop work immediately.



WARNING



Risk if the operating/working area is accessed by unauthorized persons!

Unauthorized persons ARE NOT familiar with the hazards in the working area, as described in these instructions.

There is a risk of death or severe physical injury.

- Permit only authorized specialist personnel who are qualified and trained for the operation to operate the cleaning device.
- Keep unauthorized persons away from the working area of the plant/machine in which the device is installed.
If in doubt, address these persons direct them to exit the working area.
- Stop the work for as long as there are unauthorized persons in the working area.



WARNING



Risk of chemical burns and burns when opening the container!

The supply line is pressurized. The person may be struck by cleaning jets or come into contact with residual fluid from the supply line and device. There may also be hot vapors in the container.

There is a risk of death or severe physical injury.



- **DO NOT open the container** during the cleaning process.
- Before starting work, adhere to the **work steps of the switch off procedure** (see [section 7.2 Switch-off Procedure](#)).
- Before opening the container, observe the **cooling and draining time**.
- Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles).

**WARNING*****Danger due to hot surfaces!***

The device may heat up significantly as a result of the cleaning medium or the heat transfer from the container. Contact with the device can cause burns on the skin.

There is a risk of death or severe physical injury.

- *Comply with the warning signs and DO NOT touch the indicated areas.*
- *Do NOT remove insulation from protected hot surfaces.*
- *Maintain safety clearance of existing protective equipment or barriers.*
- *Use protective equipment (e.g. protective gloves; cloths) to provide protection from the hot surface.*
- *Do not touch the device until after a sufficient cooling time.*

NOTE***Operation of the device with steam or gases!***

The conveyance of steam or gases through the device (e.g. for sterilization) leads to greater wear of the bearing surfaces.

The safety systems and safety instructions in the operating instructions for the higher-level plant/machine must be adhered to.

The area around the plant/machine and the operator work stations at the plant/machine must be kept free of objects during operation so that unobstructed access is possible at all times.

In order to ensure fault-free operation, the device must be treated with care at all times.

When operating the device, adhere to the following additional instructions:**⚠ WARNING** Persons in the container.

A person may be struck by the jets from the cleaning head!

There is a risk of death or severe physical injury.

- Do NOT start cleaning operation while there are persons in the container.
- NEVER direct the cleaning jet or torrent at persons.

⚠ WARNING Incorrect operation of the device!

There is a risk of death or severe physical injury.

- Only operate the device when it is in perfect condition.
- Allow only experts to operate the device.
- Do not operate the device unless it is installed inside an enclosed container.
- Drain and depressurize the container that needs to be cleaned.
- Securely close all of the openings on the container (e.g. inspection openings).
- When operating the device, **adhere to the switch-on and switch-off procedures** (see [section 6.3 Switch-on](#) procedure and [7.2 Switch-off Procedure](#)).

- There is no need for the device to be run in.
- The following operating states of the device are NOT permitted:
 - Operation of the device without cleaning medium.
 - Immersing the device in the product of the production process.
 - Operation of the device outside the permitted parameters (see [section 3.3 Technical Data](#)).
- Immediately stop operation in the event of leaks outside the container.
- Refrain from any type of work which compromises the safe and reliable function of the device.
- Immediately inform the operating company of any changes to the device or the plant that may impair its safety.

If you notice vibrations on the plant that are NOT generated by the device while commissioning the device, these must be prevented with suitable measures so that the vibrations CANNOT be transmitted to the device.

If this is NOT possible, the maintenance intervals in [section 7.4.1 Maintenance Intervals](#) must be shortened accordingly.

During normal operation of the device, you must make sure that the mixture of supplied cleaning medium and dislodged substances can flow freely from the container.

NOTE Clogging in the drain of the container is to be eliminated at once so that:

- No large quantities of dirt can accumulate in the container
- There is NO impermissible filling of the container with cleaning medium
- The device DOES NOT become immersed as the fluid level rises

For cleaning media in circulation:

Run the final cleaning step with clean water to remove any suspended matter which may have been introduced.

7 Maintenance

The following safety instructions apply to all work on the device that is listed and described in this chapter, and must be observed at all times.

A **functional check** must be performed after every repair (see [section 6.2 Functional Check / Trial Run](#)).

7.1 Safety Instructions for Maintenance



DANGER



Danger to life from exciting components!

Activated electrical components are live with dangerous electrical voltage and may perform uncontrolled movements. When in contact, there may be an electric shock. There is a risk of death or severe physical injury.

- Allow only **qualified electricians** to perform work on the electrical system.
- Before starting work, observe **the working steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)).
- Cover adjacent live parts to prevent contact.
- Beware of the hazards caused by electrical current (e.g. warnings).



WARNING

Risk of accident caused by incorrectly performed maintenance and repair work!

Improper maintenance, falling components or failure to adhere to the listed safety instructions can lead to accidents.

There is a risk of death or severe physical injury.

- Only allow **experts** to perform work on the device.
- Do not work on the device unless it is insulated from electrical voltage, depressurized and in a cool state.
- Maintain a safe distance when working on the device.

We recommend that you provide 1 m of space for free movement around the device and container.

WARNING



Risk of chemical burns and burns when opening the container!

The supply line is pressurized. The person may be struck by cleaning jets or come into contact with residual fluid from the supply line and device. There may also be hot vapors in the container.



There is a risk of death or severe physical injury.



- **DO NOT open the container** during the cleaning process.
- Before starting work, observe **the working steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)).
- Before opening the container, observe the **cooling and draining time**.
- Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles).



WARNING



Danger due to hot surfaces!

The device may heat up significantly as a result of the cleaning medium or the heat transfer from the container. Contact with the device can cause burns on the skin.



There is a risk of death or severe physical injury.

There is a risk of burns from the cleaning medium at temperatures of more than + 60 °C / + 140 °F.

- Do not remove the devices unless they are in a cool state.
- Allow the device to cool down before starting work.
- Beware of hot surfaces (e.g. warning signs).
- Use safety clothing and equipment (e.g. protective gloves, cloths) to provide protection against the hot surface.

WARNING



Risk of crushing when carrying out maintenance, cleaning and repair work!

The container and the interfaces of the device (e.g. media connections) may be pressurized.



There is a risk of death or severe physical injury.

- Before starting work, depressurize the container and all lines.
- Switch off all moving parts in the container and secure them to prevent them from being inadvertently switched back on or set in motion.
- Do not remove the device unless it has been depressurized.
- Wear protective gloves.

7.2 Switch-off Procedure

In accordance with the type of device activation and how it is integrated (e.g. manual or automatic) on the cleaning plant, the switch-off procedure has to be integrated and the following instructions have to be observed when switching off.



WARNING



Risk from sudden, unforeseeable or unauthorized reactivation of the device

(e.g. triggering of a start command as a result of incorrect operation of a start-up control device)!

There is a risk of death or severe physical injury.

Before performing any disassembly, maintenance, repair or cleaning work on the device, it is imperative to carry out the following **working steps** in the specified sequence:

Switch-off Procedure

1. Stop the supply of cleaning medium (e.g. slowly close the shut-off valve or ball cock).
2. Check that the supply of cleaning medium is stopped and there is not media pressure on the device.
3. Safeguard the supply of cleaning media to prevent sudden, unforeseeable or unauthorized reactivation (e.g. lockable switch/shut-off elements).
4. Make sure that the cleaning device and supply line for cleaning agent has been completely drained (e.g. by waiting before opening the container).

NOTE

Risk of breakage due to material overload!

Pressure surges when switching the cleaning media on or off, in particular pressure surges which exceed the operating pressure, and gas components in the cleaning agent may cause hammering in the cleaning device.

There is a risk of material damage, e.g. leakage in the pipe system or on connected devices.

- Prevent pressure surges ("water hammers") and gas components in the cleaning media, e.g. caused by:
 - Installing a water hammer arrester or pressure relief valve in the supply line
 - Starting up/stopping the pump slowly
 - opening/closing the shut-off fitting slowly (e.g. valve or ball cock).

7.3 Removal

The safety instructions in [section 7.1 Safety Instructions for Maintenance](#) must be adhered to before removing the device from the container.



WARNING



Risk of chemical burns and burns when opening the container!

The supply line is pressurized. The person may be struck by cleaning jets or come into contact with residual fluid from the supply line and device. There may also be hot vapors in the container.



There is a risk of death or severe physical injury.



- **DO NOT open the container** during the cleaning process.
- Before starting work, observe **the working steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)).
- Before opening the container **observe the cooling and draining time**.
- Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles).



CAUTION

Risk of a fault as a result of soiling, foreign objects or damage to the device!

Foreign objects such as scale, burrs, chips, etc. can restrict flow or get into the piping system and cause malfunctions or damage to components, including seals. This can result in hazards that endanger the functional safety of the device.

There is a risk of minor or moderate injuries.

- Implement suitable measures to prevent soiling and foreign objects from entering via the interfaces of the device.
- Before starting work, make sure that all necessary tools, auxiliary materials and information are available and observe the instructions for the interfaces.
- When lifting the device out of the container, maintain a distance from the inner wall of the container and surrounding components (e.g. agitators), to avoid scraping or knocking.
- Set the device down on a stable surface after removing it.

7.3.1 Removing the Device

⚠ WARNING Risk of the device falling accidentally!

The device may strike personnel when falling.

There is a risk of minor or moderate injuries.

- Hold the device firmly when installing/removing it.
- There must be nobody beneath the device when installing/removing it.

NOTE The device could fall down!

The device could become damaged by impact effects.

- When unscrewing the parts, take care to ensure that the housing CAN NOT fall down (e.g. by holding it with one hand).

Using a strap wrench or non-slip gloves, carefully unscrew the device from the supply line.

7.4 Maintenance

To ensure the trouble-free operation, high operational safety and long service life of the cleaning device, it is imperative to have it cleaned and maintained at regular intervals.



We recommend that you document the maintenance work in a report.

Check and log the volume flow rate at regular intervals.



If the volume flow rate deviates by more than 15% from the values specified in these instructions, then that is a sign of wear or blockage of the flow, and both the cleaning device and the supply line must be checked. An inspection is recommended.

The safety notes in [section 7.1 Safety Instructions for Maintenance](#) must be adhered to when carrying out cleaning, maintenance and repair work.

7.4.1 Maintenance Intervals

NOTE

Component failure due to vibration damage!

During operation, vibration can cause screw and clamp connections to work loose or the device to be subjected to severe strain, thus possibly leading to component failure.

The failure of components or a device malfunction can cause material damage and consequential damages.

- *Check the installed device for loose connections at regular intervals.*
- *Watch out for vibration damage during maintenance and checking.*
- *Adapt the maintenance intervals according to the operating conditions of the plant.*
After commissioning, start with short maintenance intervals at first.
If no damage occurs, the maintenance intervals can be adapted incrementally until the intervals specified in the instructions are reached.



The design of the device requires a low amount of maintenance.

An inspection is recommended after each 250 operating hours (h_B) and maintenance no later than after 500 operating hours (h_B).

Inspection

The purpose of the inspection is to determine the orderly condition of the device. An inspection should be carried out as follows:

⚠ CAUTION Risk of chemical burns and burns when opening the container!

The supply line is pressurized. The person may be struck by cleaning jets or come into contact with cleaning agent. There may also be hot vapors in the container.

There is a risk of minor or moderate injuries.

- Use only clear water with a maximum temperature of + 40 °C (+ 104 °F) for inspection purposes.
 - Before opening the container observe the cooling and draining time.
 - Before opening the container, make sure that the container is NOT pressurized.
 - Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles)
1. Set the water pressure to 0.3 bar (4.35 psi).
 2. Open the flap on the container.
 3. Check the rotation of the device and the spreading of the liquid at the outlet openings.
 4. For maintenance work, remove the device as necessary (see [section 7.3 Removal](#)). Before starting work, observe the **work steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)).

Maintenance Intervals and Methods



Shorten the maintenance intervals by 30% in the event of:

- Deviation from the preferred installation position of the device
(see [section 5.2.2 Installation Position](#))
- Vibrations that occur in the plant which are NOT caused by the device and CANNOT be prevented.

If the device is NOT operated for a long period, we recommend that you check the device completely before re-commissioning to make sure that it is fully functional
(see [section 6.2 Functional Check / Trial Run](#)).



The specified times of the maintenance intervals are based on single-shift operation (8 hours per working day, 12 months per year) of the device and operation with:

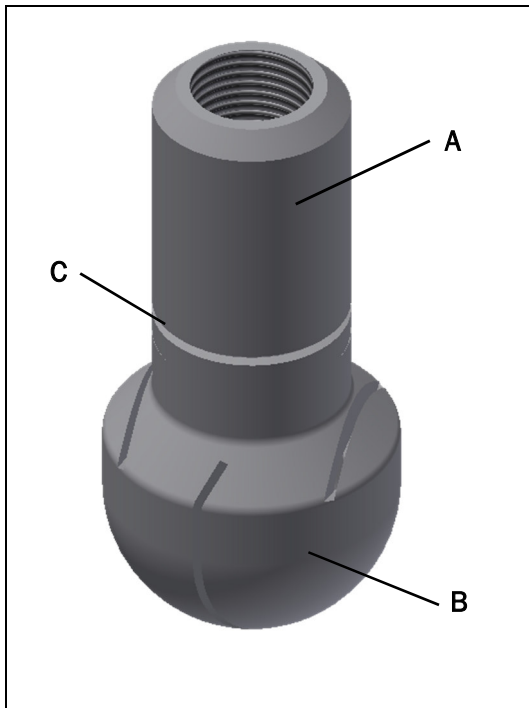
Cleaning media:	Water
Media pressure:	2 bar (29 psi)
Media temperature:	+ 25 °C (+ 77 °F)

Interval: h_0 = operating hours of the device

Method: S = visual inspection
 F = functional check
 M = measurement
 R = cleaning*

*The cleaning intervals are to be defined by the operating company in accordance with operating conditions.

Overview of Maintenance Points



A Media connection [MA]

B Spray head

C Bearing point

Picture 7.4-1: Maintenance Points

Point	Inspection and Maintenance Work	Interval	Method
A	Check inlet openings for the cleaning medium and running surfaces for contaminations, wear and damage. <ul style="list-style-type: none"> • Clean in the event of contamination • Replace device in the event of wear or damage 	500 h _B	S/F/R
B	Check whether the spray head rotates freely. Check outlet openings for the cleaning media for contaminations, wear and damage. <ul style="list-style-type: none"> • Clean in the event of contamination • Replace device in the event of wear or damage 	500 h _B	S/F/R
C	Check running surfaces for contaminations, wear and damage. <ul style="list-style-type: none"> • Clean in the event of contamination • Replace device in the event of wear or damage 	500 h _B	S/F/R

Table 7.4-1: Inspection and Maintenance Work



For cleaning, an ultrasonic bath with a suitable cleaning solution is recommended.

7.4.2 Tools and Tightening Torque Values

Use only proper tools which are required for performing the required work and approved for use.

Standard workshop equipment and the special tools listed are sufficient for performing mechanical tasks on the device. The following tools are required:

- Strap wrench
- Non-slip gloves

The tightening torque is 15 Nm and the equivalent of slightly higher than normal manual force. In any case, the device must be completely screwed onto the media pipe.

All the screw connections on the device are firmly tightened in the factory with a corresponding tightening torque. This ensures that the required clamping force between the components to be joined is also present during the time of maximum application of operating forces.

7.4.3 Notes on Cleaning

It is recommended for the device to be cleaned during maintenance.

Comply with the following safety instructions prior to cleaning.



WARNING



Hazard from corrosive or irritant cleaning agents!

When cleaning the device, contact with the detergent cannot, in principle, be ruled out. There is a risk of death or severe physical injury.



- Adhere to the regulations and specifications in the safety data sheets for the cleaning agents (e.g. vapors or hazardous substances).
- Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles).
- Avoid excessively strong concentration of the cleaning agent.
- Use only clean and chlorine-free water as a diluting agent.
- Rinse the device with plenty of clean water after cleaning.
- Store cleaning agent in accordance with the applicable safety guidelines.

NOTE

Risk of damage to the device during cleaning!

The use of incorrect cleaning agent or sharp objects can damage the device.

The functional safety and reliability of the device may be compromised.

- The cleaning agents must be approved for all materials on the device (e.g. gaskets, bushings).
- Do not use sharp objects (e.g. knives) or tools.

NOTE

Formation of hydrochloric acid when cleaning the device!

No dry adhesions or deposits of cleaning agent should be left behind in the device. This could cause the cleaning agent to salt out or form crusts. If the cleaning agent contains volatile solvents containing chloride, then hydrochloric acid could arise when rinsing with clear water.

- DO NOT rinse with clear water if the cleaning agent includes volatile solvents containing chloride.



The following must be observed when blowing out the device with air:

- fix the head in place in such a way that it cannot rotate while being blown out
- use filtered, oil-free compressed air
- Time of the dry-blowing 5 – 10 min (longer is technically possible but not necessary under normal circumstances)

Cleaning in Assembled State:

As a basic rule, cleaning the device parts that are located in the **interior of the device** is NOT necessary. Self-cleaning takes place during the cleaning process.

Cleaning is carried out by simply rinsing the surfaces that come into contact with media (CIP cleaning).

Cleaning in Disassembled State:

Prior to cleaning, the device must have been removed from the container by an **expert**. The safety instructions in [section 7.1 Safety Instructions for Maintenance](#) must be observed.

Cleaning of the device may be carried out by **instructed persons**. After cleaning, the device must be assembled, checked and reinstalled in the container by an **expert** (see [section 5.2 Installation](#)).

NOTE

**Danger due to improper disposal!**

Cleaning agents, consumables and lubricants must NOT be allowed to get into the groundwater, waterways or sewer system.

Improper disposal can cause environmental damage.

- Dispose of any cleaning agents, lubricants and consumables (e.g. brushes and cloths) which have been used for cleaning in accordance with the local regulations and in accordance with the information in the manufacturer's safety data sheets.
- Dispose of packaging materials in an environmentally friendly manner and recycle them.

7.5 Customer Service



Subject to technical modifications in the interest of further development and improvement to the properties of the device. The Article No., dimensions or materials may differ from those of the supplied device.

The following details are important for questions:

Device

- Type
- Serial number

Customer Service



For technical questions or spare part requests, you can contact the Customer Service department as follows:

Armaturenwerk Hötensleben GmbH

Schulstraße 5 – 6

D-39393 Hötensleben, Germany

Telephone: +49 39405 92-0

Fax +49 39405 92-111

E-mail info@awh.eu

Internet <http://www.awh.eu>

8 Faults

8.1 Safety Instructions for Troubleshooting

Before clearing a fault, the following safety notes must always be adhered to:



WARNING



Risk of chemical burns and burns when opening the container!

The supply line is pressurized. The person may be struck by cleaning jets or come into contact with residual fluid from the supply line and device. There may also be hot vapors in the container.



There is a risk of death or severe physical injury.



- **DO NOT open the container** during the cleaning process.
- Before starting work, observe **the working steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)).
- Before opening the container, observe the **cooling and draining time**.
- Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles).



WARNING

Hazardous situations caused by performing work on the device incorrectly!

There is a risk of death or severe physical injury.

- Repairs and fault clearance work must be performed only by qualified experts who have knowledge of the "Technische Regeln für Betriebssicherheit (TRBS)" (German technical rules for operational reliability and safety).
- Before eliminating any malfunction, comply with the safety notes in [chapter 7 Maintenance](#).
- In case of any uncertainty or doubt, contact AWH.

8.2 Faults and Remedial Action

Fault	Cause	Remedy
Effectiveness of the cleaning process is inadequate	Pressure for the cleaning media is insufficient or no cleaning fluid pressure.	Check the pressure of the cleaning agent
		Check the filter and clean it if necessary
		Check the outlet opening on the device and clean it if necessary
	Pressure of the cleaning agent too high, cleaning agent turns into mist	Check the pressure of the cleaning agent and reduce pressure if necessary
Spray head does not rotate	Holes blocked	Clean holes
	Holes deformed	Replace the device
	Sliding surfaces soiled	Clean the device
	Device is worn	Replace the device

Table 8.2-1: Operating Faults – Cause and Remedy

If the specified measures are NOT successful, please contact AWH.



In the event of return shipment (e.g. repair / servicing / return), a hazardous substance declaration must be enclosed with the device in accordance with the German Ordinance on Hazardous Substances (GefStoffV).

Request the form for the hazardous substance declaration from AWH.

8.3 What to Do in Case of an Emergency

If a hazardous situation occurs, or if you need to avert a potential danger, quickly set the device to a safe state.

The type of EMERGENCY STOP circuit used for the device is to be determined depending on the hazards and operating conditions and is the sole responsibility of the operating company.

It is for this reason that AWH can offer the operating company, solely as a precautionary measure, a few points of reference and notes to be observed and to be integrated into the operating company's hazard assessments.

- The working steps listed in [section 7.2 Switch-off](#) Procedure must be adhered to when switching off the device.
- The EMERGENCY STOP circuit must be designed in such a way that the machine or system operator can actuate it immediately in the event of an emergency.
- Switching off with the "EMERGENCY STOP" in case of emergency is designed to disconnect the entire machine from the supply voltage without delay in order to eradicate the risks caused by electrical voltage immediately.
- Shutting down in case of emergency using the "EMERGENCY STOP" is intended to prevent risks which cause hazardous movements as soon as possible.
- The EMERGENCY STOP must have priority over all other functions and actuations in all operating modes.
- Resetting must not cause the plant/machine to start up again.



Source:

- DIN EN 60204-1 / VDE 0113-1 "Safety of machinery – Electrical equipment of machines – Part 1: General requirements"
- EN ISO 13850: "Safety of machinery - Emergency stop - Principles for design"

In Case of Emergency:

Trigger the EMERGENCY STOP function on the higher-level plant/machine.

- Actuate the **EMERGENCY STOP** switch
- Interrupt actuating energy supply!
 - Interrupt electricity supply (e.g. electrical actuator)
 - Switch off higher-level main switch
 - Pull out power plug
 - Close the compressed air shut-off valve (e.g. pneumatic actuator)
- Interrupt the supply of cleaning media (actuator energy)
 - Close the shut-off valve

9 Decommissioning

Once the device has reached the end of its service life, it must be removed from the container, dismantled and disposed of in an environmentally friendly manner. Disposal must be performed in accordance with the respective valid local, national and international regulations.



WARNING



Danger due to improper removal from operation/disposal!

There is a risk of intoxication or chemical burns when using harmful or toxic media, or media which is hazardous in any other way.



There is a risk of death or severe physical injury.



- Only an expert should perform the work.
- Before starting work, observe **the working steps of the switch-off procedure** (see [section 7.2 Switch-off Procedure](#)).
- Use protective work clothing, protective gloves and safety goggles when carrying out the tasks.
- In case of any uncertainty or doubt, contact AWH.

Removal

Only experts are permitted to uninstall the device from the container and dispose of it. For information on removing the device and its interfaces, see [section 7.3 Removal](#). The safety instructions in [section 7.1 Safety Instructions for Maintenance](#) must be observed.

9.1 Disposal



CAUTION



Danger of injuries from harmful liquids which are a health hazard!

When performing disposal, there is a risk of injury from contact with harmful liquids.

There is a risk of minor or moderate injuries.



- Use personal protective equipment (e.g. protective gloves, safety shoes, safety goggles).

NOTE



The cleaning device is made of plastic. Plastic is a valuable raw material and can easily be recycled.

After removal the entire device should be professionally cleaned before disposal (see [section 7.4.3 Notes on Cleaning](#)).

Unless other arrangements have been made for return or disposal, disassembled components should be recycled:

- Scrap any parts made of metal
- Recycle any parts made of plastic

If necessary, contact a specialist company to arrange for disposal.

Comply with locally applicable health, safety, disposal and environmental protection regulations.

NOTE***Danger due to improper disposal!***

Cleaning agents, consumables and lubricants must NOT be allowed to get into the groundwater, waterways or sewer system.

Improper disposal can cause environmental damage.

- *Dispose of any cleaning agents, lubricants and consumables (e.g. brushes and cloths) which have been used for cleaning in accordance with the local regulations and in accordance with the information in the manufacturer's safety data sheets.*
- *Dispose of packaging materials in an environmentally friendly manner and recycle them.*

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Appendix 1: Declaration (Translation)

Armaturenwerk Hötensleben GmbH

Schulstraße 5 - 6

39393 Hötensleben, Germany

Phone +49 39405 92-0

Fax +49 39405 92-111

E-Mail info@awh.eu

Homepage <http://www.awh.eu>

Declaration for incorporation as per

- EC Directive - Machinery 2006/42/EC, Annex II B

We hereby declare that the container cleaning device

Name: Spate cleaner

Type: TANKO-CR40

Year of manufacture: See type plate on the device

Serial number: See type plate on the device

is consistent with the following essential health and safety requirements of directive 2006/42/EC:

1.1.2 - 1.1.7, 1.3, 1.5.2 - 1.5.9, 1.5.15, 1.5.16, 1.6, 1.7.1 - 1.7.3, 1.7.4, 1.7.4.1, 1.7.4.2, 1.7.4.3.

The specific technical documents were compiled in accordance with directive 2006/42/EC, Annex VII, Part B.

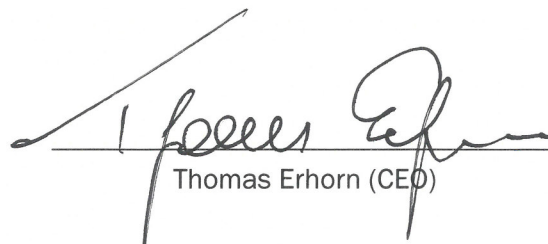
The supplied version of the device is consistent with the following directives and standards:

Directive / Standard	Title	Version	Comments
2006/42/EC	EC Machinery Directive	2006	
DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction	2011-03	Harmonized standard
	Correction to DIN EN ISO 12100:2011-03	2013-08	

If any modifications are made to the device without our consent, this declaration shall lose its validity.

Commissioning is prohibited until it is determined that the overall system fulfills the provisions of the directives.

Hötensleben, Germany, 17. September 2019



Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:

Armaturenwerk Hötensleben GmbH, Mr. A. Burgdorf; Schulstr. 5 - 6; 39393 Hötensleben, German

Notes

Armaturenwerk Hötensleben GmbH

Schulstr. 5 – 6

D-39393 Hötensleben

Telefon +49 39405 92-0

Telefax +49 39405 92-111

E-Mail info@awh.eu

Homepage <http://www.awh.eu>

NEUMO-Ehrenberg-Gruppe

