OPERATING/INSTALLATION INSTRUCTIONS

(Translation)

Container cleaning devices

Spate cleaner TANKO® EX-S

Type series

TANKO-EX-S20

TANKO-EX-S30

TANKO-EX-S40

TANKO-EX-S50

Ex II 1 GD c T(X)

Spray cleaner TANKO® EX-RB

Type series

TANKO-EX-RB30

TANKO-EX-RB40

TANKO-EX-RB64

TANKO-EX-RB90

Ex II 1 GD c T(X)

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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

ATEX	**AT**mosphère **EX**plosible; Synonym for the ATEX Directive of the European Union; comprises measures for explosion protection for explosive atmospheres
approx.	approximately
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
CIP	Cleaning in Place; a local (automated) cleaning process without dismantling plant parts. Denotes a procedure for cleaning processing plants, predominantly in sectors with particularly critical hygiene requirements, such as the pharmaceutical industry, food and beverage industry or biofuel plants.
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.
DK	Head diameter
EN	European Standard
ISO	International Organization for Standardization
L	Length
$L_{EX,8h}$	Daily noise exposition level
L_{PA}	Emission noise pressure level at 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
or	or
PA	Process connection In the context of these instructions, this colloquial term describes the interface used in cleaning technology for the connection to the process from the device to the container.
SI	Système international d'unités; the most widely used international system of units for physical variables
SN	Serial number
SW	Width across flats [wrench size]
TRBS	"Technische Regeln für Betriebssicherheit" (German technical rules for operational reliability and safety); these rules put the "Betriebssicherheitsverordnung" (BetrSichV) into concrete terms with regard to the identification and assessment of hazards and the derivation of suitable measures.

TRGS	“Technische Regel für Gefahrstoffe” (German technical rules for hazardous materials); these rules reflect the state of the art, occupational medicine and occupational hygiene as well as other sound scientific knowledge for activities involving hazardous materials, including their classification and labeling.
up / down	Spray template up / down
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] [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]
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®EX-S/TANKO®EX-RB cleaning system (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.

Download the instructions if necessary 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
NOTE ON EXPLOSION PROTECTION	Important note on explosion protection	Loss of explosion protection and resulting hazards.

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*

NOTE ON EXPLOSION PROTECTION

This note contains instructions regarding explosion protection.

Non-compliance results in the explosion protection being removed, thus leading to hazards.

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

Operating equipment for Ex zone

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 principles 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.

2.1 Intended Use

DANGER

Risk of injuries from fire/explosion when using the device in an explosive atmosphere.

Use of the device in an Ex area (potentially explosive atmosphere) is PROHIBITED, UNLESS the device is expressly intended for said purpose.

There is a risk of death or severe physical injury.

- *Adhere to the **type plate** of the device 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-EX-S is a cleaning device without an external actuator and is a member of the spate cleaners group. The TANKO-EX-RB is a cleaning device without an external actuator and is a member of the spray cleaners group. The device is driven by the cleaning agent. 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, depressurized** tanks, silos, barrels, containers, pipes, etc., which are provided with an outlet that ensures a free outward flow of the supplied cleaning fluid.

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

Operation may also be carried out if an explosive dust or gas atmosphere is present, or can develop, inside the tank that is to be cleaned.

The TANKO-EX-S or TANKO-EX-RB device is suitable for use in explosion protection areas classified as Zone 0 (in which an explosive gas atmosphere is continuously present or present for prolonged periods; can also be caused by the cleaning agent used) or Zone 20 (in which an explosive dust atmosphere is continuously present or present for prolonged periods).

The use of devices in device group II, category 1G is enforced for Zone 0.

The use of devices in device group II, category 1D is enforced for Zone 20.

Please note the additional information on the type plate for the Ex labeling (see *Section 2.5.3 Labeling for Explosion Protection*).

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

NOTE ON EXPLOSION PROTECTION

The area of application of the device must always be adjusted to the relevant operating conditions and the materials in contact with the product. These materials must be selected to ensure that they do not react with the cleaning agent or the substances in the container to be cleaned in any way that could impair the explosion protection.

Non-compliance can result in the loss of the explosion protection.

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).
- The device is designed for fixed pipe installation only. Installation on a hose is PROHIBITED.
- Use a suitable filter system in the supply line for the cleaning agent.
- Operate the device only within the approved parameters, e.g. pressure and temperature (see *section 3.3 Technical Data*).
- Only cleaning agents which are compatible with the materials of the device (see *section 3.4 Cleaning Agents*).

- The preferred installation position for the device is vertical with the cleaning head pointing downwards. Other installation positions are possible.
- 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 **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 holes may become blocked. The free movement of the actuator may be obstructed.
- The device should NOT be used to blow dry air, gases or vapors over containers or over the device itself, as the cleaning agent is used for lubrication of the bearings.

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 Spare Parts, Replacement Parts and Accessories

WARNING

Risk of damage, malfunction or complete failure of the device!

Incorrect or faulty spare/replacement parts and accessories put the functional safety and reliability of the device at risk.

There is a risk of death or severe physical injury.

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

- *Use only the manufacturer's original spare parts.*

We expressly draw attention to the fact that spare parts and accessories NOT supplied by AWH have NOT been checked or approved by AWH. The installation and/or use of such products could therefore, under certain circumstances, result in changes with negative results to the properties of the device specified by its design and the higher-level plant.

AWH is not liable for any damage arising from the use of non-original parts or non-original accessory parts. Standard parts can be obtained from specialist dealers.

Section 7.5.1 Spare Parts includes a list of spare parts.

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 only allow 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 there is nobody whose ability to react is impaired by drugs, alcohol, medication or similar substances is allowed to work on the device.
- 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.
- The operator must ensure that the permitted operating parameters (see *section 3.3 Technical Data)* are not exceeded.

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 DIN EN ISO 4413 and the pneumatic connections must meet the requirements of DIN EN ISO 4414.

– The grounding measures must be implemented and checked prior to commissioning of the device and the container.

NOTE ON EXPLOSION PROTECTION

Any person working in a hazardous area must be regularly instructed with regard to the necessity of grounding measures and they should also be made aware of typical grounding faults (e.g. subsequent grounding of objects or devices that are already charged)

2.4 Requirements for Personnel

The device must only be operated, maintained and repaired 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 comparable vocational qualification, practical experience in the assembly/disassembly of devices.
  The person must be familiar with the construction, mechanical installation, maintenance and troubleshooting of 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 apprenticeship, knowledge and experience, enabling them to identify and avoid the risks that may arise from working with 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

NOTE ON EXPLOSION PROTECTION

Persons working in potentially explosive atmospheres must not be dangerously charged. The personal protective equipment must satisfy the requirements of explosion protection.

Non-compliance can result in the loss of explosion protection.

- *Observe TRGS 727 "Prevention of ignition hazards due to electrostatic charge" Chapter 7 "Electrostatic charging of persons and personal protective equipment (PPE)".*
- *DIN EN 1149-5 Protective clothing - Electrostatic properties - Part 5: Observe performance requirements for material and design.*

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

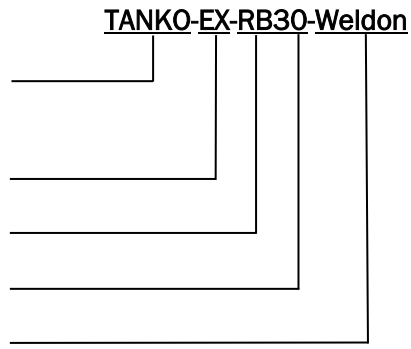
Wear a welding mask to protect against damage to the eyes or skin caused by the welding arc and to protect against burns caused by flying particles during welding.

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: Spray cleaner



1) Brand of the cleaning devices

2) Device meets the explosion protection requirements of Directive 2014/34/EU.

3) Type: RB (rotating ball = rotating spray head)

4) Size: Head diameter 30 mm

5) Connection: Welded connection

Available type series

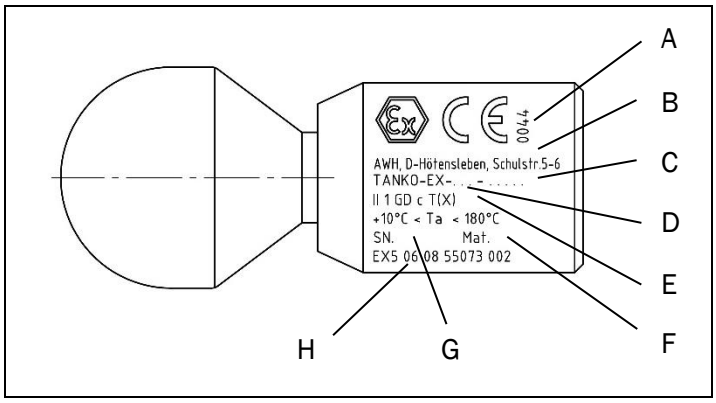
Device	Threaded version	Welded version	Clip-on version
TANKO-EX-S20	X	X	X
TANKO-EX-S30	X	X	X
TANKO-EX-S40	X	X	X
TANKO-EX-S50	X	X	X
TANKO-EX-RB30	X	X	X
TANKO-EX-RB40	X	X	X
TANKO-EX-RB64	X	X	X
TANKO-EX-RB90	X	X	X

Table 2.5-1: Type series

2.5.2 Type Plate

The specifications only apply to devices with types indicated on the cover sheet of these instructions.

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



A) No. of designated body that audits the QA system in AWH
B) Manufacturer
C) Year of manufacture
D) Type
E) Labeling the ignition protection type
F) Material
G) Serial number (internal plant number)
H) No. of the EC type test certificate

Figure 2.5-1: Type Plate Position

2.5.3 Labeling for Explosion Protection

The labeling of spate and spray cleaners in explosion-proof design is made by specifying the device group, category, ignition protection type and temperature class on the type plate. A CE and Ex mark confirms compliance of the device with European Directive 2014/34 / EU.

NOTE ON EXPLOSION PROTECTION

The ATEX spate cleaner type TANKO-EX-S and the ATEX spray cleaner

Type TANKO-EX-RB devices are in device group II and are approved for the following application:

- Zone 0 (explosive gas atmosphere that exists permanently or over an extended period)
- Zone 20 (explosive dust atmosphere that exists permanently or over an extended period)

The use of devices in device group II, category 1G is enforced for Zone 0.
The use of devices of at least device group II, category 2G is enforced for Zone 1.
The use of devices of at least device group II, category 3G is enforced for Zone 2.

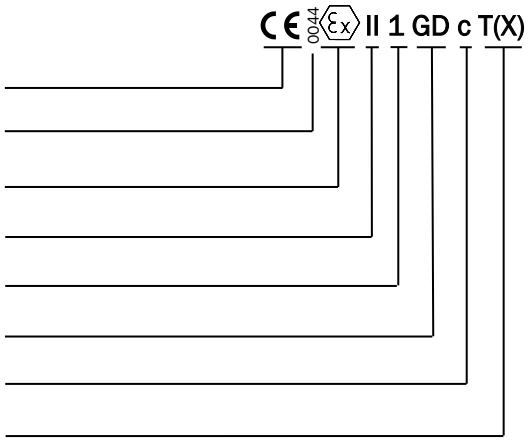
The use of devices in device group II, category 1D is enforced for Zone 20.
The use of devices of at least device group II, category 2D is enforced for Zone 21.
The use of devices of at least device group II, category 3D is enforced for Zone 22.

The operator is responsible for division into zones.

The type plate on the device also contains the information required for operation in a potentially explosive atmosphere according to the ATEX directive:

- Labeling the ignition protection type
- Number of the EC type test certificate

Labeling according to ATEX directive:



1) CE mark (labeling of compliance)
2) ID number of the designated body
3) Device labeling “ATEX”
4) Device group II
5) Device category 1
6) Potentially explosive “gas” and “dust” atmospheres
7) Protection type “Designed safety”
8) Temperature class T(X) (+10 °C – max. +180 °C)
   (+50 °F – max. +356 °F)

The “X” symbol means that the safe use of the device depends on specific operating conditions specified in the operating instructions.

The maximum surface temperature of the device (Zone 0 interior) is determined by the ambient temperature in the container to be cleaned and/or the temperature of the cleaning agent.
This temperature can increase to max. +180 °C (+356 °F).

3 Construction and Function

3.1 Structure

Designs

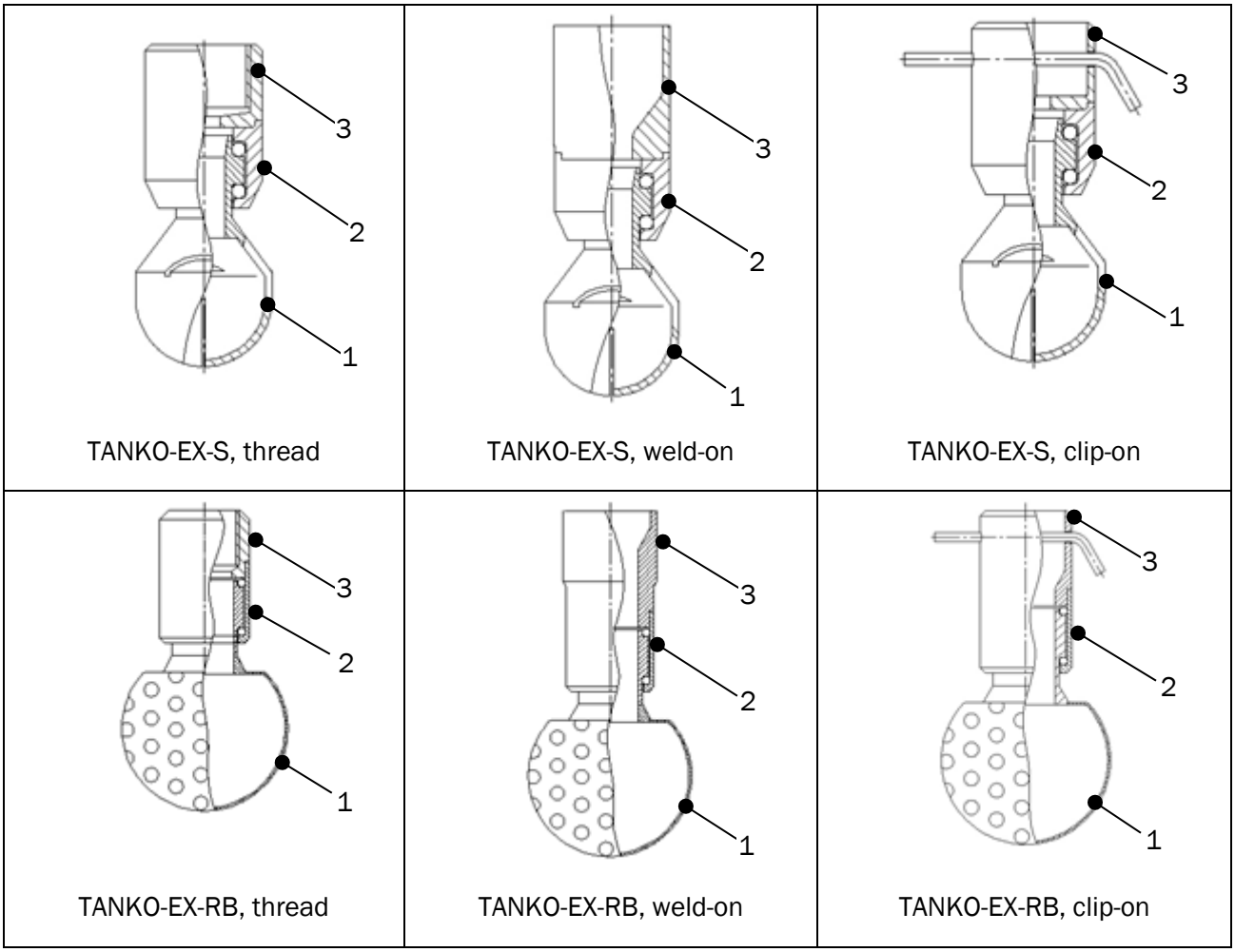


Figure 3.1-1: Overview of designs

The TANKO-EX-S and TANKO-EX-RB series consist of the following main components:

1 Rotating head

2 Actuator

3 Connection

3.2 General Function Description

The TANKO-EX-S/RB type series are compact, axially rotating cleaning devices.

They have no electrical equipment and are powered by the cleaning agent flowing through them.

In the case of the TANKO-EX-S type, this is achieved via asymmetrical slots. In the case of the TANKO-EX-RB type, via internal paddle wheels. The type TANKO-EX-RB features a rotating spray ball which can output a larger volume of cleaning agent in a shorter space of time (area of low pressure).

The rotating movement of the devices ensures that the cleaning jet (torrent) is able to reach and clean every part of the inner wall over the course of time.

The different types of cleaner are made of stainless steel. Several versions (sizes) of the TANKO-EX-S and TANKO-EX-RB series are available for different applications and container dimensions.

The shafts of both TANKO-EX type series are supported in double ball bearings and can be operated in all installation positions.

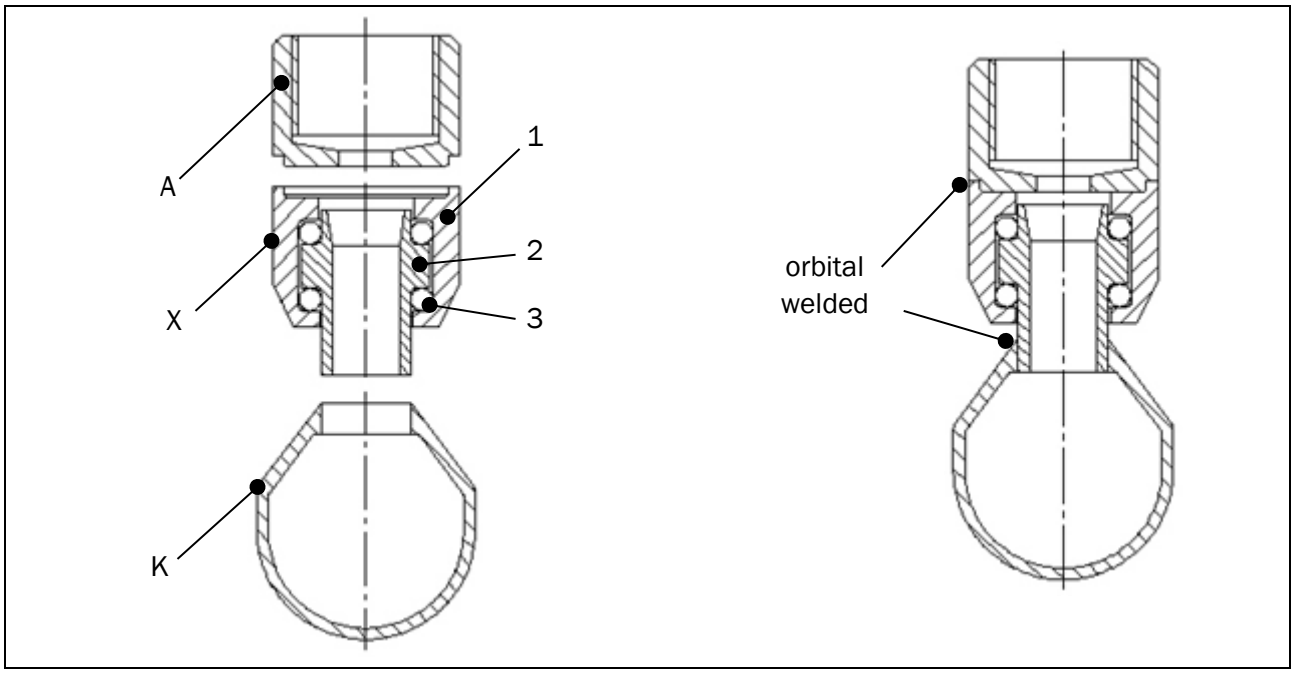


Figure 3.2-1: Actuator structure (example TANKO-S)

A	Connection
K	Head
X	Labeling of the device and warning for clip-on locking pin
1 – 3	Components of the actuator
	1 Housing
	2 Shaft
	3 Balls

Cleaning times:

The time for one cleaning cycle depends on several factors, and must be defined individually by the owner.

Application examples for spate cleaner TANKO-EX-S and ATEX spray cleaner TANKO-EX-RB

Tanks, silos, barrels, containers, pipes, dryers, centrifuges, agitators, vacuum tanks, spray towers, container washing plants, fermenters, filters, mixing containers and horizontal dryers.

3.3 Technical Data

The estimated safe service life of the device is 10 years with single-shift operation and the use of drinking water.

Prerequisite for this: the device must be maintained properly at the intervals specified in the *section 7.4 Maintenance*.

Aggressive agents can reduce the service life of the device.

NOTE ON EXPLOSION PROTECTION

Restriction on the operating parameters of the device!

The maximum permitted operating parameters such as container size, operating pressure and flow rate depend on the electrostatic charge build-up when handling fluids.

Non-compliance can result in the loss of explosion protection.

- *Comply with the notes in section 3.4 Cleaning Agents before commissioning or recommissioning the device.*

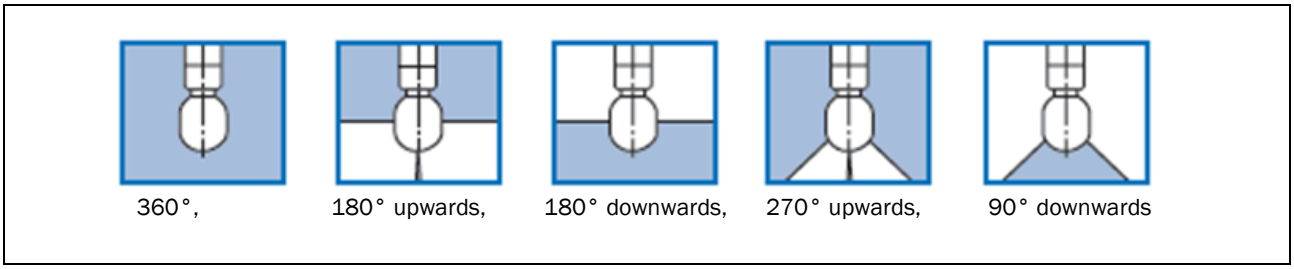


Figure 3.3-1: Spray pattern

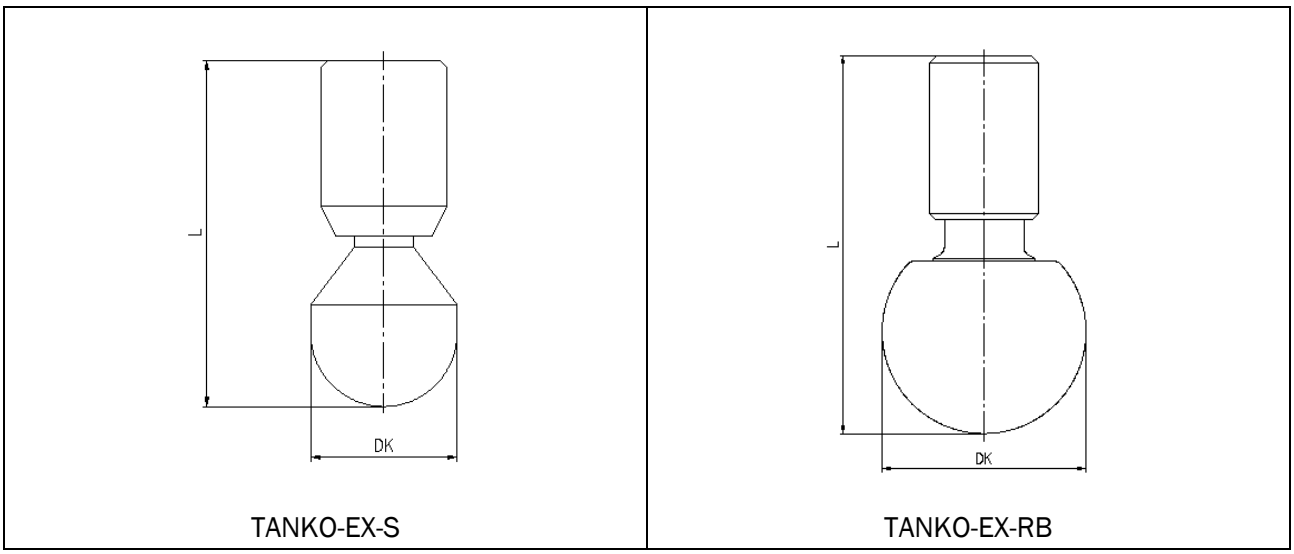


Figure 3.3-2: External dimensions

Device type	TANKO-EX-S20	TANKO-EX-S30 Threaded and welded version	TANKO-EX-S30 Clip-on version	TANKO-EX-S40 Threaded and welded version	TANKO-EX-S40 Clip-on version	TANKO-EX-S50 Threaded and welded version	TANKO-EX-S50 Clip-on version
Range: - Cleaning radius	0.75 m (2.5 ft)	1.0 m (3.3 ft)		2.0 m (6.6 ft)		1.5 m (4.9 ft)	
Operating temperature (permitted): – Cleaning agent	max. 180 °C (max. +356 °F)						
Ambient temperature (permitted): – Inside the container	+10 °C – max. 180 °C (+50 °F – max. +356 °F)						
Operating pressure: – Cleaning agent	< 1 – 7 bar (14.5 – 101.5 psi)	< 1 – 12 bar (14.5 - 174 psi)	< 1 – 10 bar (14.5 – 145 psi)	< 1 – 12 bar (14.5 - 174 psi)	< 1 – 7 bar (14.5 – 101.5 psi)	< 1 – 12 bar (14.5 - 174 psi)	< 1 – 7 bar (14.5 – 101.5 psi)
Optimum pressure: – Cleaning agent	approx. 3 bar (43.5 psi)						
Volume flow rate:	0 –35 l/min	0 -120 l/min	0 -120 l/min	0 -240 l/min	0 -240 l/min	0 -680 l/min	0 -680 l/min
Installation opening min.:	1), 2)	1)	2)	1)	2)	1)	2)
Media connection [MA]:	For the relevant technical data, please refer to the product pages of the current AWH “Stainless steel cleaning equipment” catalog.						
Length [L]"	43 – 69 mm (1.69 – 2.72 in)	60 – 86 mm (2.36 – 3.39 in)		93 -109 mm (3.66 – 4.29 in)		158 -181 mm (6.22 – 7.13 in)	
Head diameter [DK]"	17 mm (0.67 in)	25 mm (0.98 in)		39 mm (1.54 in)		70 mm (2.76 in)	
Weight	26 – 47 g	81 – 132 g		248 – 323 g		1650 – 1780 g	
Spray pattern:	90° down / 180° down / 180° up / 270° up / 360°			180° down / 180° up / 270° up / 360°			
Rotation speed: – with water	1000 – 3000 U/min (depending on the device and pressure):						
Installation Position:	Vertically suspended Others possible, although with shorter service life of the plain bearings						
Materials:	see *Table 3.3-3; Table 3.3-4 and Appendix 2: Corrosion resistance of the materials*						
Noise pressure level - Outside the container	Dependent on the properties of the container! The noise pressure level can exceed the maximum permissible Exposition value of $L_{EX,8h}$ = 85 dB (A).						

Table 3.3-1: Operating parameters of the device TANKO-EX-S

1) The installation opening of the threaded and welded connection variants must be 2 mm larger than the head exterior diameter of the device.

2) The installation opening of the clip-on connection variant must be 2 mm larger than the installed connection element.

Device type	TANKO-EX-RB30	TANKO-EX-RB40	TANKO-EX-RB64 Threaded and welded version	TANKO-EX-RB64 Clip-on version	TANKO-EX-RB90 Threaded and welded version	TANKO-EX-RB90 Clip-on version
Range: - Cleaning radius	0.75 m (2.5 ft)	1.25 m (4.1 ft)	1.5 m (4.9 ft)		2.5 m (8.2 ft)	
Operating temperature (permitted): – Cleaning agent	max. 180 °C (max. +356 °F)					
Ambient temperature (permitted): – Inside the container	+10 °C – max. 180 °C (+50 °F – max. +356 °F)					
Operating pressure: – Cleaning agent	< 1 – 5 bar (14.5 - 72.5 psi)	< 1 – 5 bar (14.5 - 72.5 psi)	< 1 – 7 bar (14.5 - 72.5 psi)	< 1 – 5 bar (14.5 - 72.5 psi)	< 1 – 7 bar (14.5 – 101.5 psi)	< 1 – 5 bar (14.5 - 72.5 psi)
Optimum pressure: – Cleaning agent	approx. 3 bar (43.5 psi)					
Volume flow rate:	0 – 60 l/min	0 – 200 l/min	0 – 400 l/min		0 – 590 l/min	
Installation opening min.:	1), 2)	1), 2)	1)	2)	1)	2)
Media connection [MA]:	For the relevant technical data, please refer to the product pages of the current AWH “Stainless steel cleaning equipment” catalog.					
Length [L]	70 – 90 mm (2.76 – 3.54 in)	80 – 102 mm (3.15 – 4.02 in)	120 – 140 mm (4.72 – 5.51 in)		160 – 185 mm (6.30 – 7.28 in)	
Head diameter [DK]	30 mm (1.18 in)	40 mm (1.57 in)	64 mm (2.52 in)		90 mm (3.53 in)	
Weight	160 g	190 g	370 g		470 – 690 g	
Spray pattern:	180° down / 180° up / 360°	180° down / 180° up / 270° up / 360°				
Speed of rotation: – with water	1000 – 3000 U/min (depending on the device and pressure):					
Installation Position:	Vertically suspended Others possible, although with shorter service life of the plain bearings					
Materials:	see *Table 3.3-3; Table 3.3-4 and Appendix 2: Corrosion resistance of the materials*					
Noise pressure level - Outside the container	Dependent on the properties of the container! The noise pressure level can exceed the maximum permissible Exposition value of $L_{EX,8h}$ = 85 dB (A).					

Table 3.3-2: Operating parameters of the device TANKO-EX-RB

1) The installation opening of the threaded and welded connection variants must be 2 mm larger than the head exterior diameter of the device.

2) The installation opening of the clip-on connection variant must be 2 mm larger than the installed connection element.

Material combinations

		TANKO-EX-S/RB body				
		1.4404	1.4435	1.4571	2.4610 (HC4)	2.4602 (HC22)
Balls	1.4401	S	S	S	–	–
	2.4610 (HC4)	X	X	X	S	–
	2.4602 (HC22)	X	X	X	–	S
S = Standard X = optional						

Table 3.3-3: Material combinations body - balls

		Locking pin material							
		1.4435	1.4430	1.4571	1.4576	2.4602 (HC22)	2.4607	2.4610 (HC4)	2.4819
Device material	1.4404	X	X	S	X	X	X	X	X
	1.4435	X	X	S	X	X	X	X	X
	1.4571	X	X	S	X	X	X	X	X
	2.4602 (HC22)	–	–	–	–	S [1)]	X	X	X
	2.4610 (HC4)	–	–	–	–	X	S	X	X
S = Standard X = Optional [1)] = can be changed due to delivery shortages caused by the suppliers									

Table 3.3-4: Material pairings device - locking pin (examples)

Consumption Data

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

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

For additional technical data please refer to the product pages of the current AWH "Stainless steel cleaning equipment" catalog.

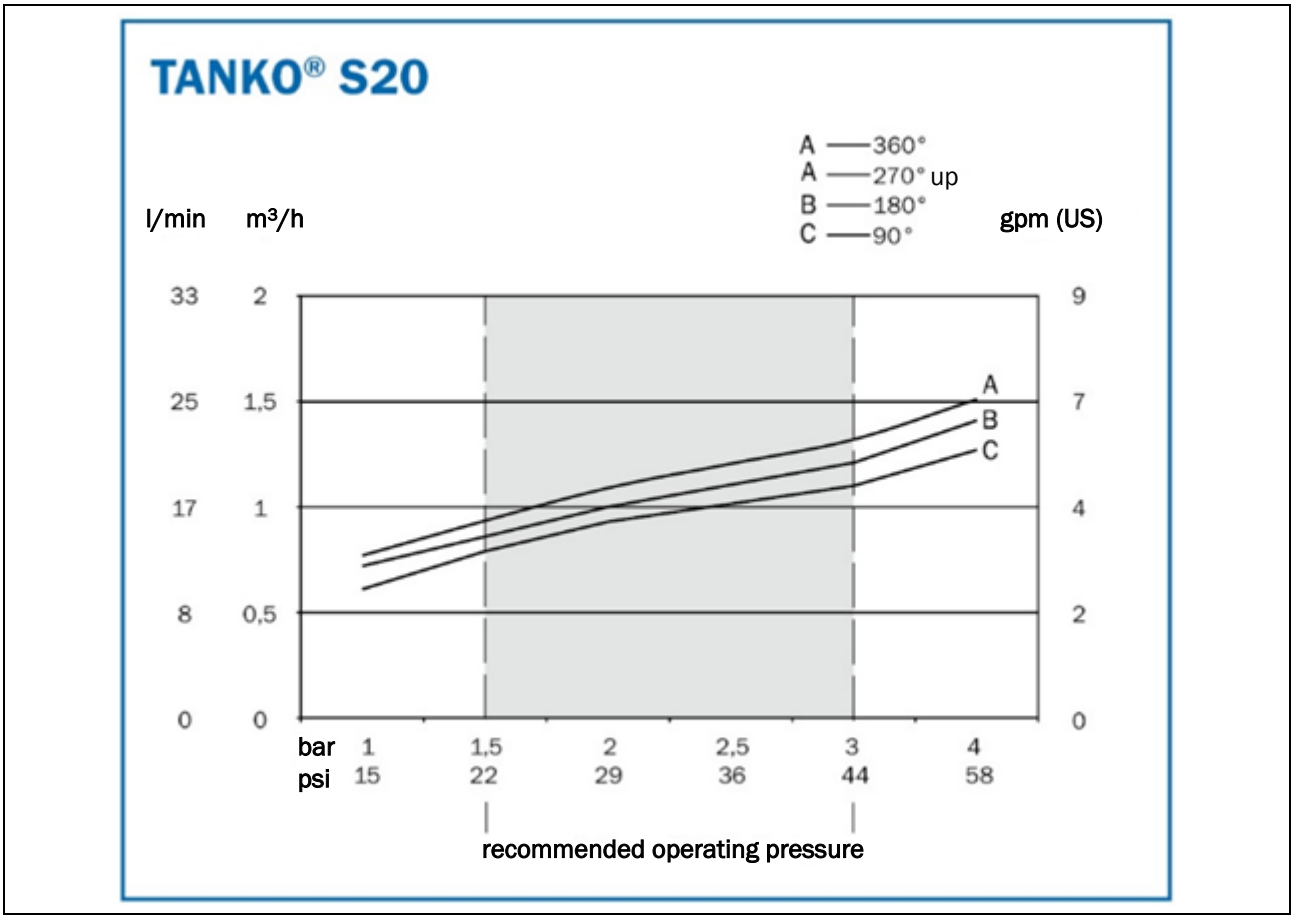


Figure 3.3-3: Consumption data S20

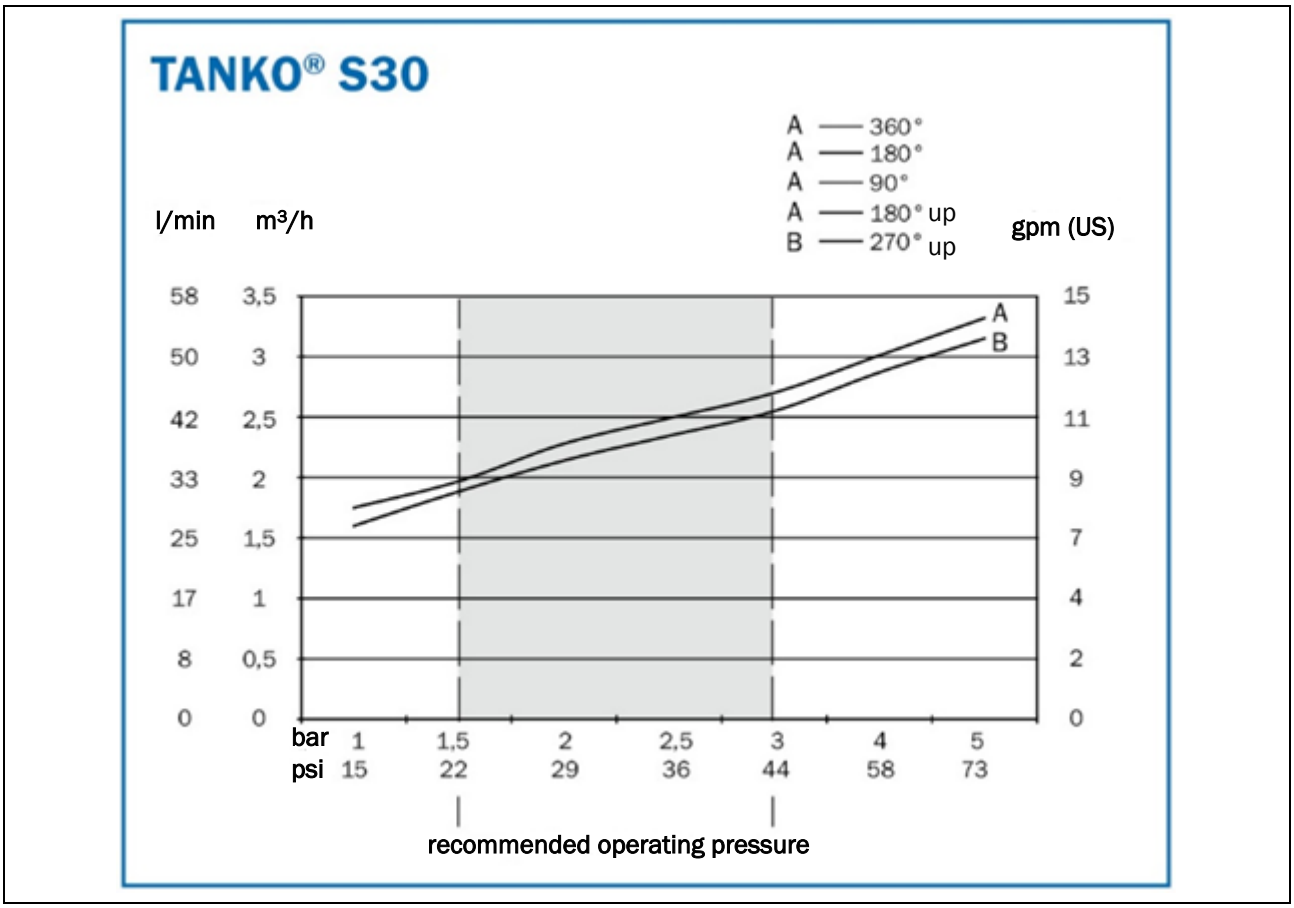


Figure 3.3-4: Consumption data S30

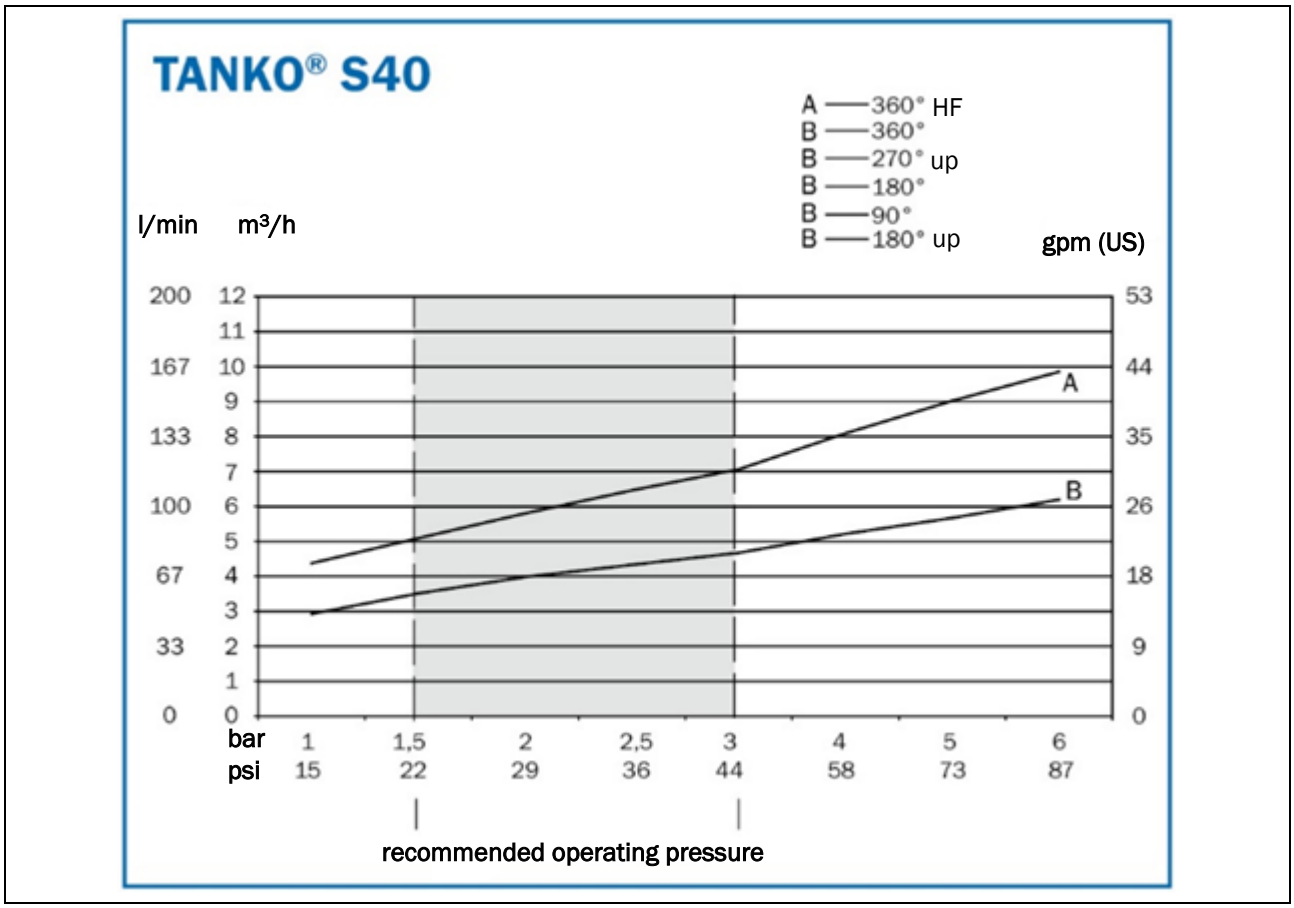


Figure 3.3-5: Consumption data S40

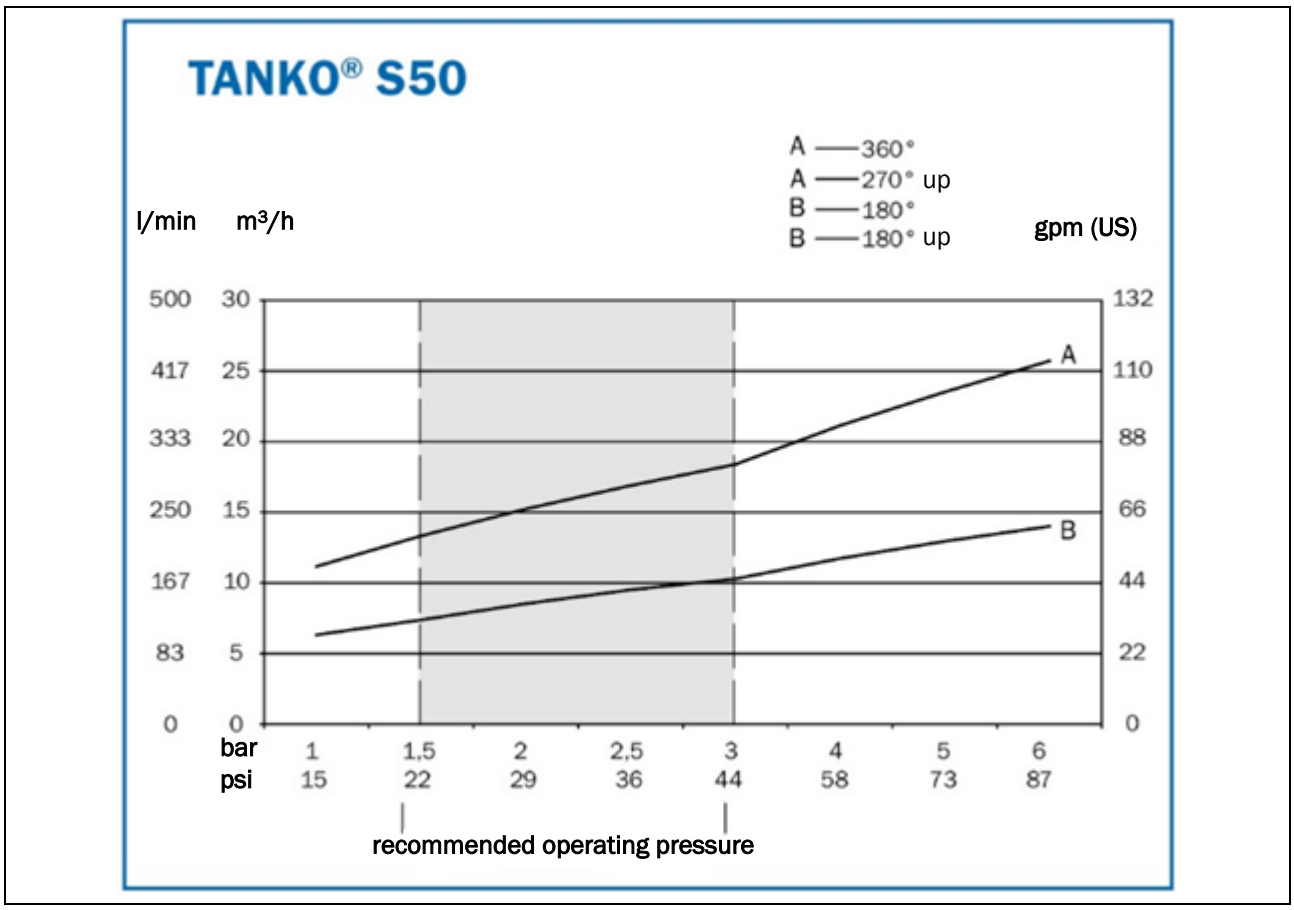


Figure 3.3-6: Consumption data S50

3.4 Cleaning Agents

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 agents 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**, **but only as a precautionary measure** (for a device in a container), which must be observed and integrated into the owner's risk assessments.

NOTE ON EXPLOSION PROTECTION

Before using the device in an Ex area, the technical rules for avoiding the dangers of explosive atmospheres must be observed.

Non-compliance can result in the loss of explosion protection.

- *TRBS 2152 "Hazardous, potentially explosive atmosphere - General -"*
- *TRGS 727 "Prevention of ignition hazards due to electrostatic charge"*

Excerpt from the **TRGS 727** "Prevention of ignition hazards due to electrostatic charge"

Chapter 4 Electrostatic charges when handling liquids

"When filling and emptying containers with liquids, when recirculating, stirring, mixing and spraying liquids and also when implementing measuring, sampling and cleaning work, the liquids themselves or the interior of the container can be provided with a hazardous charge. The size and intensity of the charge generated depends on the properties of the liquid, its flow rate, the procedure, the size and geometry of the container as well as its material.

- When using water jets to clean metallic containers wetted with hydrocarbons, the container diameter must not exceed 3 m. Larger container diameters can lead to more dangerous charges
- If isolating/hydrocarbonated liquids (e.g. solvents) are used as a cleaning agent, the diameter of the container is limited to 3 m and the proportion of second phase liquid (e.g. water) must not exceed 1%.
- Cleaning agents may only be applied in an enclosed circuit if the level of contamination is kept below 1%. The accumulation of liquid in the container is to be avoided.
- When cleaning metallic containers with solvents containing hydrocarbons, a maximum working pressure of 50 bar must not be exceeded and the liquid flow rate must be less than 60 liters / minute.
- The steam blasting of containers with a volume of > 100 m^3 is not permitted. Larger container volumes can lead to more dangerous charges

DANGER

Explosion hazard due to ignition source!

Existing explosive atmosphere can be ignited.

There is a risk of death or severe physical injury.

- *The cleaning agent and the material to be cleaned may not cause a chemical reaction that might cause an ignition.*
- *Electrostatic charges when handling liquids.*

WARNING

Warning of corrosive and aggressive cleaning agent!

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).*

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

CAUTION

Danger as a result of use of incorrect cleaning agents!

There is a risk of minor or moderate injuries.

- *The cleaning agents 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 items are **PROHIBITED** for use as cleaning agents:*
  - *Cleaning agents 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 agents containing substances which may cause exothermic reactions with the materials of the cleaning agent, the container of the plant, e.g.:*
    - *chlorine and chlorine ions*
    - *substances containing salt (no resistance to seawater)*
    - *medium-concentrated to highly concentrated organic acids*
    - *strong acids, in particular nitric acid and sulfuric acid (with acid content > 65%)*

NOTE

Risk of damage to the device from the cleaning agent!

Soiling or foreign objects in the cleaning agent 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 agent supply line. The use of a filter with a filtration effect which equates to a mesh size of 50 µm is recommended.*
- *Adhere to the instructions on supply and return lines in section 5.2 Installation.*

The following Agents are permitted for use for Container Cleaning:

Clean, sprayable fluids (e.g. water with alkali cleaning additives and similar).

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.

NOTE ON EXPLOSION PROTECTION
Transport and storage of the device in an explosive atmosphere is PROHIBITED!

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

Risk of environmental damage as a result of incorrect disposal of the packaging!

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 ON EXPLOSION PROTECTION

Transport damages can lead to the loss of explosion protection.

- *In the event of discernible damage during transport, DO NOT operate the device!*
- *Contact the manufacturer of the device.*

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

NOTE ON EXPLOSION PROTECTION

Improper storage can lead to the loss of explosion protection.

- *In the event of discernible storage damage, DO NOT operate the device!*
- *Contact the manufacturer of the device.*

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 – +55 °C (+50 °F – +131 °F)
– Relative humidity	max. 60% (non-condensing)
– Temperature fluctuations	max. 10 °C (18 °F) per day
– Occurrence of oscillations v_{eff}	< 0.2 mm/s

5 Installation

5.1 Safety Instructions for Installation

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

DANGER

Danger of ignition in potentially explosive atmosphere due to potential differences!

When filling and emptying containers with liquids, when recirculating, stirring, mixing and spraying liquids and also when implementing measuring, sampling and cleaning work, the liquids themselves or the interior of the container can be provided with a hazardous charge.

Differences in potential (e.g. electrostatic charge) can cause igniting sparks or heat, which can act as an ignition source.

There is a risk of death or severe physical injury.

- *Only clean electrically conductive containers.*
- *Make sure that an electrostatic charge is prevented. Also ensure that all the electrically conductive parts on the device and the container must be grounded for potential equalization to the same potential using grounding cables with a sufficient diameter!*
- *The grounding must always be implemented before commissioning of the device.*
- *Avoid grounding faults (e.g. subsequent grounding of already charged objects or equipment).*
- *Do not secure or seal mechanical connections with electrical insulating materials (such as sealing tape, sealant, adhesive, etc.), if it impairs the grounding of the device on the container.*

Within potentially explosive areas, a potential equalization is required. “All conductive parts of the device and the container must be assembled in such a way that no dangerous potential differences can occur between them. If there is a possibility that insulated metal parts can be recharged and thereby act as an ignition source, earthing connections must be provided” *(Excerpt from DIN EN 13463-1 “Non-electrical equipment intended for use in potentially explosive atmospheres - Part 1 Basic concepts and requirements”, section 6.7.2 Grounding connections for conductive parts).*

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

Danger due to freely rotating components of the device!

When gripping the device, the rotatable mounted spray head can move.

There is a risk of minor cuts.

- *When handling, e.g. unpacking, transportation without packaging, assembly/disassembly and maintenance work, be aware of the freedom of rotation.*
- *Grip the device at the media connection.*
- *Wear protective gloves when working on the device.*

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).*
- *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

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.*

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

Risk of a fault as a result of soiling, foreign objects or damage to 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 agent must be flushed 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 [MA] in the supply line for the cleaning agent (see section 3.4 Cleaning Agents).*
- *Only fixed pipe installation is permitted. Do not install with a hose. Installation with a hose can cause the installed cleaning device to thump/whip.*
- *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.*
- *Longer line lengths can cause vibration in certain operating statuses. In case of heavy vibrations on the plant, the pipe connection to the device may come loose.*
- *In case of vibrations, take additional measures to prevent the connection from coming loose, such as spot welding or gluing (e.g. Loctite).*
- *Install the device free of mechanical strain.*
- *Paint must not be applied to the surface of the device.*
- *The installation dimensions are to be taken from the dimensional drawings in the AWH catalog. Make sure sufficient space is available for operation and maintenance.*

The installation position of the cleaner can be freely selected.

Observe the prescribed installation method (welded, screwed or with locking pin (clip-on)).

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

*The use of Teflon tape or other similar material is **NOT** permitted.*

5.2.1 Interfaces

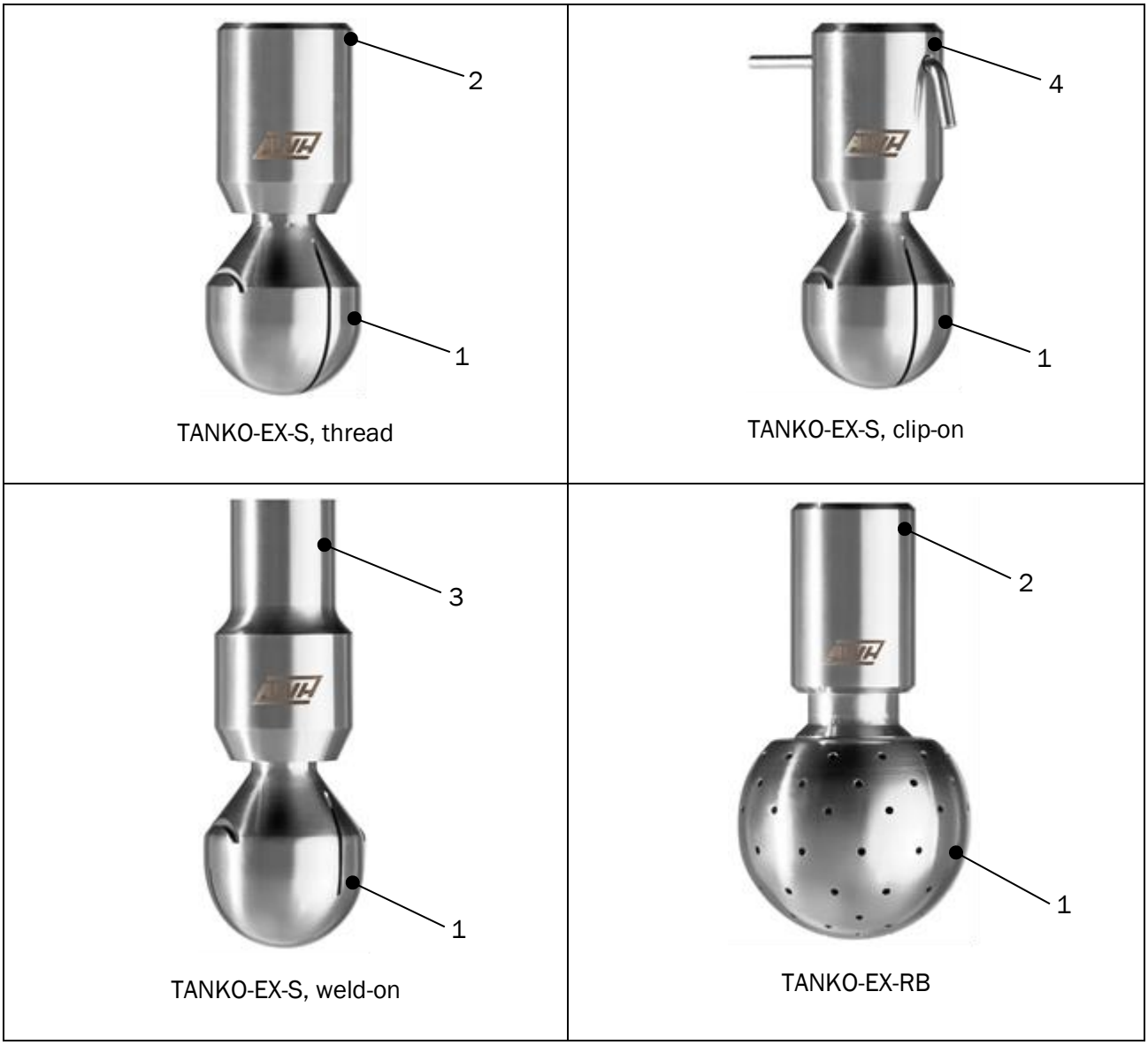


Figure 5.2-1: Interfaces of the devices (similar to picture)

The following interfaces can be found on the device:

1	Rotating spray head	
2	Threaded connection	Thread
3	Welded connection	Weld-on
4	Plug connection	Clip-on

5.2.2 Installation Position

The device is designed for vertical installation, downward suspension or standing upwards, as the preferred position. In the event of a different installation position, observe the following:

- 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

⚠ **WARNING** Risk of the device falling accidentally!

The device may strike personnel when falling.

There is a risk of severe physical injury.

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

NOTE Risk of dirt and foreign objects in the device!

Functional safety and reliability may be compromised.

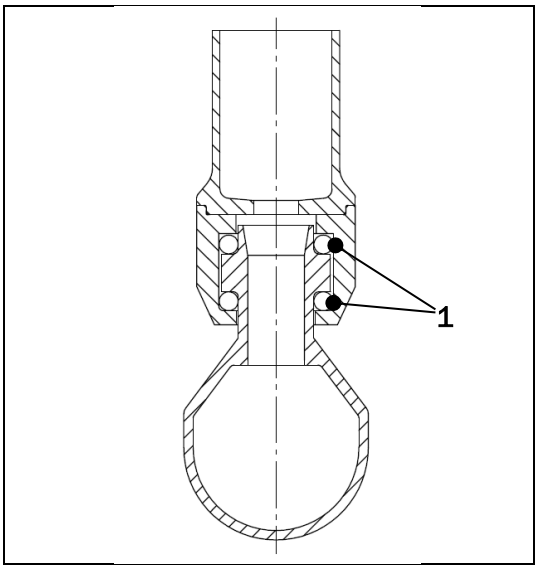
- During assembly, make sure and check that there is no dirt or foreign objects in the device (e.g. small particles, sealing material).

Installation welded connection

NOTE The temperature in the ball bearings area must not exceed 90 °C during welding!

The result is distortion of the housing and disruption of the rotational behavior.

- Ensure suitable cooling measures during welding.
- Request special versions (e.g. extended welding ends) from AWH.



1 Ball-bearings
(similar to picture)

Figure 5.2-2: Weld-on design

1. Cleaning the parts to be welded.
2. ***NOTE*** Welding distortion can be avoided by selecting suitable welding parameters.

   Aligning and welding the TANKO-S with the downpipe (on-site).

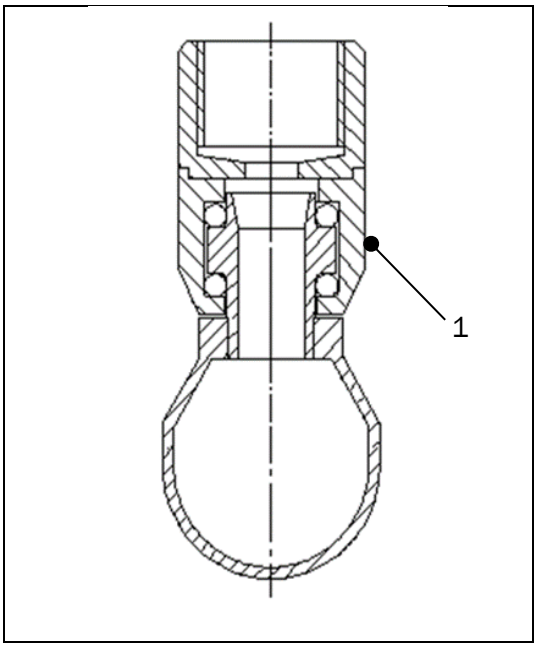
   The operating company is responsible for the selection of the correct welding filler and for the correct execution of the welding connection.

Base Material	Suitable Filler Material
1.4435	1.4430, 1.4440
2.4602	2.4607

Table 5.2-1: Recommended Filler Materials

3. Welding
   - Before welding, connect the forming gas.
   - Before welding, affix 3 to 4 tack weld-ons.
4. Welding Post-Treatment
   - In the interior area, an acid cleaning treatment is recommended after the welding.
   - The surface of accessible points can be improved by grinding.
   - The exterior can be treated afterwards by staining, brushing, grinding and polishing.
   - After welding, thoroughly rinse the downpipe with the device to remove residues from welding and after-treatment.
5. Install downpipe with device in the container.

Installation threaded connection



1 Do NOT place the strap wrench/belt pipe wrench in the ball bearings area

Figure 5.2-3: Installation threaded connection

1. Push the device with the interior thread onto the pipe for the media supply.

   NOTE There is a risk of damage to the thread if the tightening torque applied to the threaded device connection and the pipe is excessive!
   - The tightening torque value between the threaded device connection and the pipe depends on the material of the pipe for the media supply.

NOTE When tightening and loosening the device, the ball bearings can be damaged! The rotation behavior can be disturbed!

- Do NOT place the strap wrench/belt pipe wrench in the ball bearings area.

2. Tighten the threaded device connection to the pipe with the strap wrench / belt wrench.
   - The tightening torque value for the threaded connections between the connection cover and pipe depends on the material of the pipe for the media supply.
3. Screw connections are to be prevented from working loose by using appropriate measures (2 weld points between the device and supply line, bolting of the device to the supply line).

Installation clip-on connection

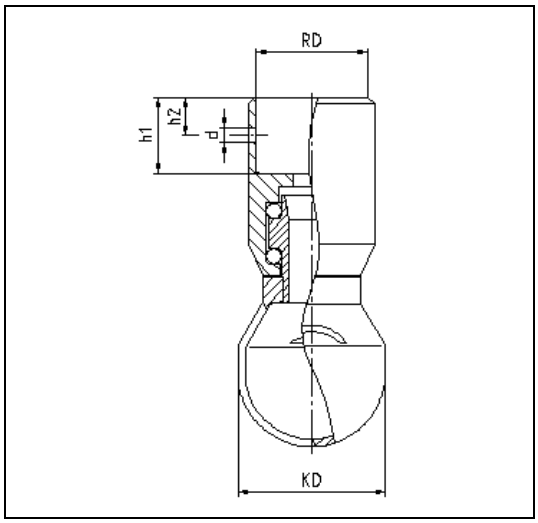


Figure 5.2-4: Dimensions clip-on

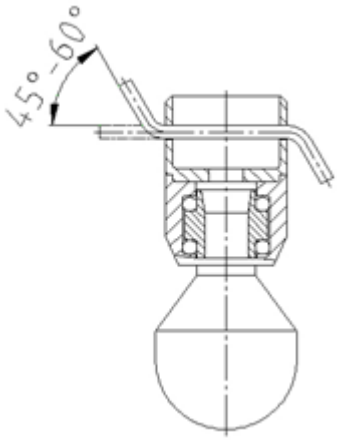
The bore holes for the clip-on locks are manufactured for delivery in such a way that the following wire diameters can be used for the cleaning devices:

Cleaning device	Wire diameter [mm]	d [mm]	h1 [mm]	h2 [mm]
TANKO-EX-S20	2.0	2.2	7	3
TANKO-EX-S30	2.0	2.2	10.5	5
TANKO-EX-S40	3.6 – 3.8	4.0	20	10
TANKO-EX-S50	4.5 – 5.2	5.5	19/35.2	10/24.2
TANKO-EX-RB30	2.0	3.0	17	8
TANKO-EX-RB40	2.4	3.0	17	8
TANKO-EX-RB64	3.6 – 3.8	4.0	21	10
TANKO-EX-RB90	4.5 – 5.2	5.5	28	13

Table 5.2-2: Dimensions clip-on

The article no. for the wire locking pins are listed in section 7.5.1 Spare Parts.

Wire locking pin as delivered



Type representative TANKO-EX-S with assembled locking pin

Figure 5.2-5: Clip-on Installation

NOTE Multiple utilization of the wire locking pin.
The material experiences fatigue and loses its rigidity when the wire locking pin is subjected to multiple bending. The wire locking pin may come loose.

The device and the wire locking pin could fall into the container.

- The wire locking pin is to be replaced by a new wire locking pin after it has been bent (see *section* 7.5.1 *Spare Parts*).

NOTE Non-compliance with the dimensions for media connection (see *Table 5.2-2: Dimensions* clip-on*)*
Problems with the fastening of the device to the downpipe could be the result.

- The distance between the bore hole for the clip in the downpipe and the end of the downpipe may not exceed a maximum of h1 – h2.
- The bore hole diameter for the clip in the downpipe has a diameter of d.

1. Slide the device connection over the downpipe and rotate it until the clip bore holes in the downpipe match the clip boreholes of the device.
2. Insert the wire locking pin through the bore holes in the downpipe and the device until it hits the stopper.
3. Bend the straight end of the wire locking pin with the assembly/disassembly tool for the locking pin by at least 45° (see *Figure 5.2-5: Clip-on Installation*).

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 when commissioning as a result of incorrect installation of the device!

There is a risk of death or severe physical injury.

- *As a basic rule, commissioning of the device (with cleaning agent) must not be performed until the following has been checked:*
  - *Correct mechanical installation of the device on / in the container*
  - *Correct hydraulic connection*
  - *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 and its operating conditions in a report.

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of the explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

DANGER

Danger of ignition in potentially explosive atmosphere due to potential differences!

When filling and emptying containers with liquids, when recirculating, stirring, mixing and spraying liquids and also when implementing measuring, sampling and cleaning work, the liquids themselves or the interior of the container can be provided with a hazardous charge.

Differences in potential (e.g. electrostatic charge) can cause igniting sparks or heat, which can act as an ignition source.

There is a risk of death or severe physical injury.

- *Only clean electrically conductive containers.*
- *Make sure that an electrostatic charge is prevented. Also ensure that all the electrically conductive parts on the device and the container must be grounded for potential equalization to the same potential using grounding cables with a sufficient diameter!*
- *The grounding must always be implemented before commissioning of the device.*
- *Avoid grounding faults (e.g. subsequent grounding of already charged objects or equipment).*
- *Do not secure or seal mechanical connections with electrical insulating materials (such as sealing tape, sealant, adhesive, etc.), if it impairs the grounding of the device on the container.*

DANGER

Explosion hazard due to ignition source!

Existing explosive atmosphere can be ignited.

There is a risk of death or severe physical injury.

- *The cleaning agent and the material to be cleaned may not cause a chemical reaction that might cause an ignition.*
- *Electrostatic charges when handling liquids.*

WARNING

Risk of burns from hot surfaces!

The device is supplied without additional measures to provide protection from hot surfaces.

The device may heat up significantly as a result of the cleaning agent 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 agent at temperatures of more than +60 °C (+140 °F).

- *Insulate hot surfaces.*
- *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 or pressure equalization).*

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. when installed in the container and operating with cleaning agent.

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 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 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:*
  - *Carry out noise reduction measures (e.g. sound insulation).*
  - *Place barriers around the noise area and mark it accordingly (e.g. with mandatory sign “Use hearing protection”).*
  - *Use effective hearing protection!*

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 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).*

The following conditions must be met before the device can be used in an Ex area:

- The details on the type plate of the device must comply with the requirements of the local explosion area on-site (device group, Ex category, Ex zone, temperature class).
- The ambient temperature during later use is within the permitted range.
- The device and the container are properly grounded and have equalized potential.
- The distances from the device to the on-site plant components are tested and comply with the requirements of explosion protection.
- All connections at the interfaces of the device are securely fastened and tightly sealed (danger of zone carryover).
- All required safety devices are installed.

6.2 Functional Check / Trial Run

A trial run should be carried out to check that the device functions safely and reliably 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. Persons 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 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 order.*

Switch-on procedure

1. *Securely close all of the openings on the container (e.g. inspection openings).*
2. *Switch on the cleaning agent supply (e.g. slowly open the shut-off valve or ball cock).*
3. *Check that the supply of cleaning agent 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 agent 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 agent, 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**.*
- *The plant in which the device is installed must be protected by suitable lightning protection measures.*
- *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 **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 of injuries caused by ejection of the cleaning agent!

If the cleaning agent is ejected after a system failure (e.g. pressure drop due to interruption of the pressure supply) there is a risk of accident.

There is a risk of death or severe physical injury.

- *Do NOT remove the device if the cleaning agent has failed.*
- *Always follow the switch-off procedure (see section 7.2 Switch-off Procedure).*

WARNING

Risk of burns from hot surfaces!

The device may heat up significantly as a result of the cleaning agent 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 personal protective equipment (e.g. protective gloves; cloth) against hot surfaces.*
- *Do not touch the device until after a sufficient cooling time.*

When operating the device, adhere to the following additional instructions:

⚠ WARNING Persons in the container. Persons 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.
- 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).
- Comply with **the switch-on and switch-off procedures** when operating the device

  (see *sections 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 agent.
  - Immersing the device in the product of the production process.
  - Operation of the device outside the permitted parameters
    (see *section 3.3 Technical Data*).
  - Operating the device with air or gas
- 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 must be shortened in accordance with *section 7.4.1 Maintenance Intervals*.

During normal operation of the device, you must make sure that the mixture of supplied cleaning agent 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 agent
- The device DOES NOT become immersed as the fluid level rises

For cleaning agent 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.

Use only **original spare parts** when replacing parts of the device. A **functional check** must be performed after every repair (see *section 6.2 Functional Check / Trial Run*).

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.

- *Allow only **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.*

7.1 Safety Instructions for Maintenance

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

DANGER

Fatal shock hazard through contact with live parts!

Activated electrical components are live with dangerous electrical voltage and may perform uncontrolled movements.

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).*

DANGER

Danger of ignition in potentially explosive atmosphere due to potential differences!

When filling and emptying containers with liquids, when recirculating, stirring, mixing and spraying liquids and also when implementing measuring, sampling and cleaning work, the liquids themselves or the interior of the container can be provided with a hazardous charge.

Differences in potential (e.g. electrostatic charge) can cause igniting sparks or heat, which can act as an ignition source.

There is a risk of death or severe physical injury.

- *Only clean electrically conductive containers.*
- *Make sure that an electrostatic charge is prevented. Also ensure that all the electrically conductive parts on the device and the container must be grounded for potential equalization to the same potential using grounding cables with a sufficient diameter!*
- *The grounding must always be implemented before commissioning of the device.*
- *Avoid grounding faults (e.g. subsequent grounding of already charged objects or equipment).*
- *Do not secure or seal mechanical connections with electrical insulating materials (such as sealing tape, sealant, adhesive, etc.), if it impairs the grounding of the device on 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).*

WARNING

Risk of burns from hot surfaces!

The device may heat up significantly as a result of the cleaning agent 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 agent 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.*
- *Be careful with hot surfaces (e.g. pay attention to warning signs)!*
- *Use protective equipment (e.g. protective gloves; cloth) against hot surfaces.*

WARNING

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

The container and the interfaces of the device, and the fluid connection may be under pressure.

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 order:*

Switch-off Procedure

1. *Stop the supply of cleaning agent (e.g. slowly close the shut-off valve or ball cock).*
2. *Check that the supply of cleaning agent is stopped and there is not media pressure on the device.*
3. *Safeguard the supply of cleaning agent to protect it from sudden, unforeseeable or unauthorized reactivation (e.g. lockable switches/shut-off elements).*
4. *Make sure that the cleaning device and supply line for cleaning agent have 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 agent 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 agent, 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.

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

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

Danger due to freely rotating components of the device!

When gripping the device, the rotatable mounted spray head can move.

There is a risk of minor cuts.

- *When handling, e.g. unpacking, transportation without packaging, assembly/disassembly and maintenance work, be aware of the freedom of rotation.*
- *Grip the device at the media connection.*
- *Wear protective gloves when working on the device.*

CAUTION

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

There is a risk of minor or moderate injuries.

- *Take suitable measures to prevent soiling and foreign bodies 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 gap 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 severe physical injury.

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

Removing the welded connection

To disassemble the welding version, the downpipe must be removed from the holder together with the device.

1. ***NOTE*** The device could fall down!

   The device could become damaged by impact effects.

   - When screwing out the parts, take care to ensure that the housing CAN NOT fall down (e.g. by holding it with one hand).
   - Disconnect downpipe [DP] at process connection [PA].

2. Lift the downpipe out of the container.

For permanent dismounting, the device can be separated from the downpipe with a suitable procedure. The device will no longer be able to be used afterwards.

Removing the threaded connection

1. ***NOTE*** The device could fall down!

   The device could become damaged by impact effects.

   - When screwing out the parts, take care to ensure that the housing CAN NOT fall down (e.g. by holding it with one hand).
   - Remove thread lock (locking pin, welding points)
   - Undo the threaded connection to the media supply line (downpipe) using the strap wrench/belt pipe wrench.

2. Unscrew the device from the pipe for the media supply.

Removing the clip-on connection

1. Bend open the wire locking pin with the assembly/disassembly tool for locking pin (clip-on) to one side.
2. ***NOTE*** The device could fall down!

   The device could become damaged by impact effects.

   - When screwing out the parts, take care to ensure that the housing CAN NOT fall down (e.g. by holding it with one hand).
   - Remove the wire locking pin.

3. Detach the device from the pipe for the media supply.

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.

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

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

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.

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 prolonged period of time, then we recommend that a complete functional capability check be performed on the device prior to recommissioning

(See *section 6.2 Functional Check / Trial Run*).

Service life of the ball bearings

The integrated ball bearings in the TANKO-EX series are subject to low wear.

The typical lifetime corresponds to the following standard parameters

- *Vertical installation position hanging down*
- *Cleaning agent: water*
- *Agent pressure 3 bar (43.5 psi)*
- *Agent temperature 25 °C (77 °F)*

A service life of 300 hours

With a typical cleaning cycle of 20 minutes per day and 200 days per year, this results in a product service life of 4.5 years.

Overview of Maintenance Points

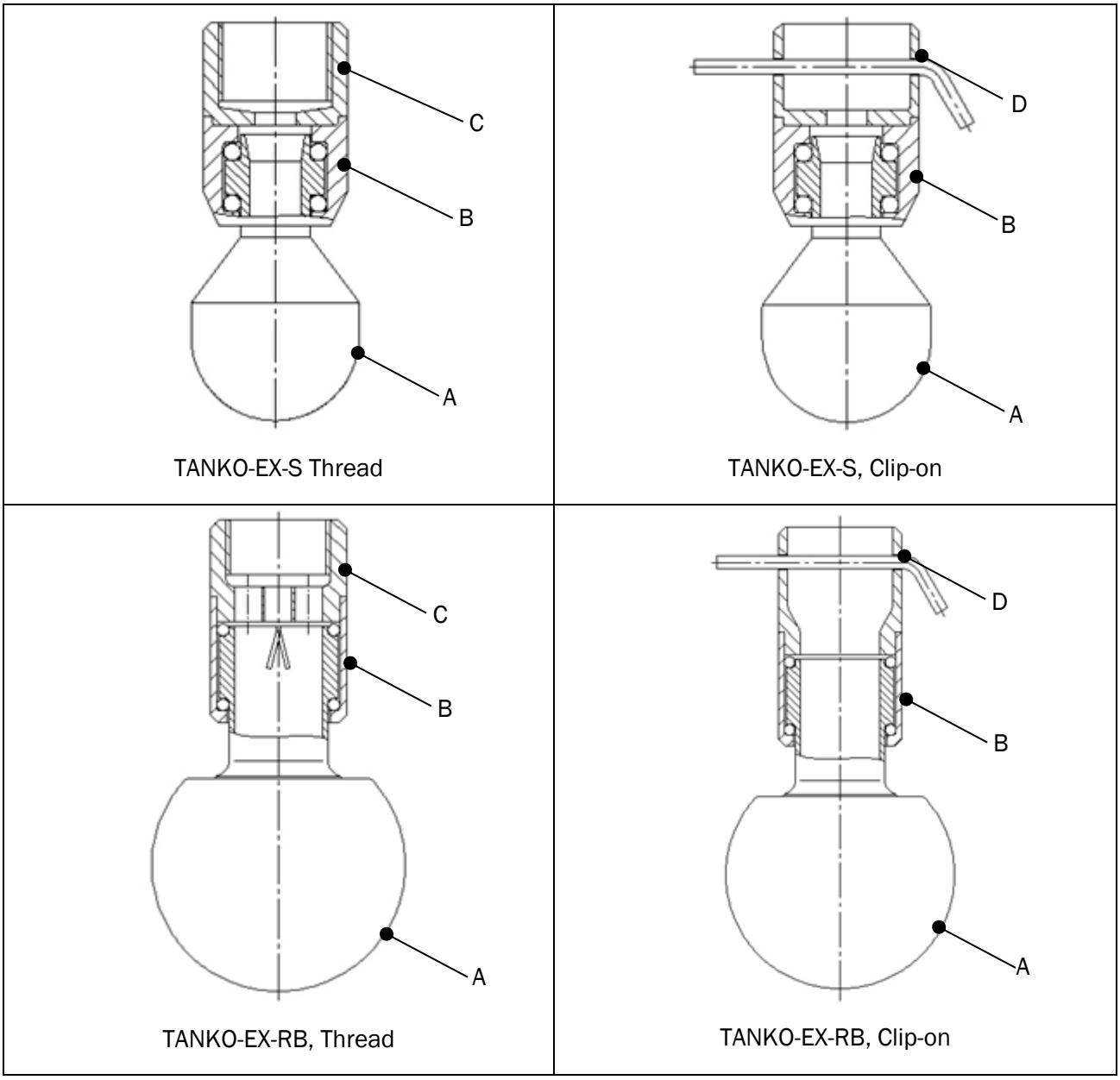


Figure 7.4-1: Maintenance Points

Maintenance Points

A Rotating head
B Actuator / ball bearing area
C Thread connection
D Clip-on connection with clip

Interval: h_O = operating hours of the device

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

Point	Inspection and Maintenance Work	Interval		Method
		Initial inspection	Follow-up check	
A	Check spray openings for contaminations, wear and damage. • Clean in the event of contaminations. • Replace device in the event of wear or damage.	200 h_B	200 h_B	S/R/A
B	Check functioning (rotatability) of actuator for contaminations, wear and damage. • Clean in the event of contaminations. • Replace device in the event of wear or damage.	200 h_B	50 h_B	R/S/F/A
C	Check tightness of thread and check the functional safety of the thread lock. • Restore safety.	200 h_B	200 h_B	S/F
D	Check clip-on connection for contaminations, wear and damage. • Replace device in the event of wear or damage to the connection. • Replace wire locking pin with original part.	200 h_B	50 h_B	S/A

Table 7.4-1: Inspection and Maintenance Work

NOTE Multiple utilization of the wire locking pin.

The material experiences fatigue and loses its rigidity when the wire locking pin is subjected to multiple bending. The wire locking pin may come loose.

The device and the wire locking pin could fall into the container.

- The wire locking pin is to be replaced by a new wire locking pin after it has been bent (see *section* 5.2.3 *Installing the Device, "Installation Clip-on Connection"*).

7.4.2 Tools and Tightening Torque Values

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

NOTE ON EXPLOSION PROTECTION

When working in areas where flammable or easily ignitable vapors, liquids or dusts are present, where sparks could result in a potential fire or explosion hazard, tools that are unlikely to create sparks should be used.

Non-compliance can result in the loss of explosion protection.

- *Do not use a tool that could create sparks.*

When working in an explosive atmosphere, it is important to remember that possible sparking is influenced can be caused by factors other than the tool. E.g.:

- The material to be processed
- The hardness of the material to be processed compared to the hardness of the tool
- The impact or friction energy applied
- Additional, existing deposits that could cause sparking, such as rust, aluminum, combustible dusts and the amount of oxygen.

The following tools/special tools are sufficient for mechanical work on the device.

- Screwdriver set (slot head)
- Open end / box wrench set (WAF 12; 16; 22; 28; 32; 38; 48; 54; 75 mm)
- Pliers wrench or adjustable wrench / crescent wrench with smooth parallel jaws
- Torque wrench with socket shaft ☐ 14 x 18
- Torque screwdriver with inserts and accessories
- Strap wrench/belt pipe wrench (e.g. Ø 140) with woven belt

Special Tools

Assembly/disassembly tool for locking pin (clip-on):

Art. no. 664 MW0 101 005 0 size A for wire Ø 2.0 mm

Art. no. 664 MW0 102 005 0 size B for wire Ø 2.4 mm

Art. no. 664 MW0 103 005 0 size C for wire Ø 3.6 mm

Art. no. 664 MW0 104 005 0 size D for wire Ø 4.5 mm

NOTE

Risk of damage to the device as a result of improper assembly/disassembly work!

Assembly/disassembly of the device which is NOT performed properly can cause damage to the device which puts the functional safety and reliability at risk when re-commissioning.

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

- *Use only suitable tools which do not damage the surface.*
- *For assembly work, adhere to the specified tightening torque values.*

The tightening torques must be selected according to the strength of the material and the thread size of the pipe connection.

NOTE

Damage to the screw connections!

Stainless steel screw connections may tend to seize up during assembly as a result of friction caused by high preload forces and high friction values, and can cause problems when tightening and unfastening.

- *Lubricate the screw connections before assembly.*
- *Define the choice of lubricant very exactly for the application and the requirements (e.g. Klüberpaste UH1 96-402 or UH1 84-201).*
- *Adhere to the information in the safety data sheets provided by the lubricant manufacturer.*

NOTE

Risk of dirt and foreign bodies in the device!

Dirt or foreign bodies can compromise the functional safety and reliability of the device.

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

7.4.3 Notes on Cleaning

NOTE ON EXPLOSION PROTECTION

Cleaning work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

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 aggressive cleaning agents!

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.*
- *Flush 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 of the materials in the device (e.g. seals, sockets)!*
- *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.

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

- *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 container** 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 agents:	3% nitric acid	max. +60 °C (+140 °F)
	3% caustic soda	max. +80 °C (+176 °F)

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 can 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

Environmental damage in case of improper disposal!

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

There is a risk of 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 Spare Parts and 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 data is important when requesting spare parts and for all inquiries:

Device

- Type
- Serial number

Spare part

- Designation
- Article No.

Customer Service

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

Armaturenwerk Hötensleben GmbH
Schulstraße 5 – 6
39393 Hötensleben, Germany
Telephone +49 39405 92-0
Fax +49 39405 92-111
E-mail info@awh.eu
Internet http://www.awh.eu

7.5.1 Spare Parts

Article No. (Pack = 4 items)	Material	Wire Ø / length [mm]	TANKO-EX-S20	TANKO-EX-S30	TANKO-EX-S40	TANKO-EX-S50	TANKO-EX-RB30	TANKO-EX-RB40	TANKO-EX-RB64	TANKO-EX-RB90
6640000A20044	1.4430	Ø 2.0 / L = 40	X	---	---	---	X	---	---	---
6640000A20064	1.4576	Ø 2.0 / L = 40	X	---	---	---	X	---	---	---
6640000A20094	2.4607	Ø 2.0 / L = 40	X	---	---	---	X	---	---	---
6640000A30064	1.4576	Ø 2.0 / L = 49	---	X	---	---	---	---	---	---
6640000A30044	1.4430	Ø 2.0 / L = 49	---	X	---	---	---	---	---	---
6640000A30094	2.4607	Ø 2.0 / L = 49	---	X	---	---	---	---	---	---
6640000A50064	1.4576	Ø 2.4 / L = 49	---	---	---	---	---	X	---	---
6640000A50044	1.4430	Ø 2.4 / L = 49	---	---	---	---	---	X	---	---
6640000A50094	2.4607	Ø 2.4 / L = 49	---	---	---	---	---	X	---	---
6640000A60054	1.4571	Ø 3.6 / L = 78	---	---	X	---	---	---	X	---
6640000A60074	2.4610	Ø 3.6 / L = 78	---	---	X	---	---	---	X	---
6640000A70054	1.4571	Ø 4.5 / L = 115	---	---	---	X	---	---	---	X
6640000A70074	2.4610	Ø 4.5 / L = 115	---	---	---	X	---	---	---	X

Table 7.5-1: Spare part wire locking pin for clip-on

8 Faults

8.1 Safety Instructions for Troubleshooting

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

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

DANGER

Danger of ignition in potentially explosive atmosphere due to potential differences!

When filling and emptying containers with liquids, when recirculating, stirring, mixing and spraying liquids and also when implementing measuring, sampling and cleaning work, the liquids themselves or the interior of the container can be provided with a hazardous charge.

Differences in potential (e.g. electrostatic charge) can cause igniting sparks or heat, which can act as an ignition source.

There is a risk of death or severe physical injury.

- *Only clean electrically conductive containers.*
- *Make sure that an electrostatic charge is prevented. Also ensure that all the electrically conductive parts on the device and the container must be grounded for potential equalization to the same potential using grounding cables with a sufficient diameter!*
- *The grounding must always be implemented before commissioning of the device.*
- *Avoid grounding faults (e.g. subsequent grounding of already charged objects or equipment).*
- *Do not secure or seal mechanical connections with electrical insulating materials (such as sealing tape, sealant, adhesive, etc.), if it impairs the grounding of the device on 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).*

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
Screw connection not tight.	Thread damaged.	Removing the device.
	Thread not screwed fully.	Retighten the threaded connection.
Effectiveness of the cleaning process is inadequate.	Connection pressure is too low.	Check, increase the connection pressure. Attention! Observe pressure limit for clip-on versions.
	Connection pressure is too high, cleaning agent is misty.	Check, reduce the connection pressure.
Head/bearing does not rotate.	Openings locked.	Clean openings.
	Openings deformed.	Removing the device.
	Ball bearing worn	Removing 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 for switching off the device listed in *section 7.2 Switch-off Procedure* must be adhered to.
- 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”*
- *DIN 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 agent (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 and disposed of in an environmentally friendly manner. Disposal must be performed in accordance with the respective valid local, national and international regulations.

NOTE ON EXPLOSION PROTECTION

Work on the device in an explosive atmosphere is PROHIBITED!

Non-compliance can result in the loss of explosion protection.

- *Only allow instructed personnel to work in potentially explosive atmospheres.*
- *The personal protective equipment must satisfy the requirements of explosion protection.*
- *Do not use a tool that could create sparks.*

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 perform the removal from the container and the disassembly of the device for disposal. The *section 7.3 Removal* contains information on the removal of the devices and its interfaces. 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 stainless steel and plastic. Stainless steel is a valuable raw material and can easily be recycled.

After removal, for proper disposal, the entire device must be properly

- cleaned (see *section 7.4.3 Notes on Cleaning*) and
- broken down into assembly groups and individual parts.
- 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

Risk of environmental damage as a result of improper disposal!

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

There is a risk of 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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Appendices

Appendix 1: Declaration (Translation)

Armaturenwerk Hötensleben GmbH

Schulstraße 5 – 6
39393 Hötensleben, Germany

Telephone: + 49 (0) 39405 92-0
Fax: + 49 (0) 39405 92-111
E-mail: info@awh.eu
Homepage: http://www.awh.eu

Declaration of incorporation as per
– EC Directive - Machinery 2006/42/EC, Annex II B

EU declaration of conformity in accordance with
– EU Directive relating to Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres 2014/34/EC

We hereby declare that the container cleaning device

Name:	Spray cleaner, spate cleaner
Type:	TANKO-EX-S, TANKO-EX-RB
Year of manufacture:	See type plate on the device
Serial number:	See type plate on the device

is consistent with the following basic health and safety requirements of Directive 2006/42/EC, Annex I: 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 B.
The supplied version of the device is consistent with the following directives and standards:

Directive/standard	Title	Version	Comments
2006/42/EC	EC Directive - Machinery	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	---
2014/34/EU	EU Directive relating to Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres	2014	
DIN EN 1127-1	Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology	2011-10	Harmonized standard
DIN EN 13463-1	Non-electrical equipment intended for use in potentially explosive atmospheres - Part 1: Basic concepts and requirements	2009-07	Harmonized standard
DIN EN 13463-5	Non-electrical equipment intended for use in potentially explosive atmospheres - Part 5: Protection by constructional safety 'c'	2011-10	Harmonized standard

Designation in accordance with Directive 2014/34/EC:  II 1 GD c T(X)

EC-type examination certificate EX5 06 08 55073 002 of the designated body
TÜV SÜD Product Service GmbH, certification body, identification number 0123, Ridlerstrasse 65, 80339 Munich, Germany

Quality assurance system according to DIN EN ISO / IEC 80079-34, certified by the designated body TÜV NORD CERT GmbH, identification number 0044, Langemarckstraße 20, 45141 Essen, Germany.

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

Commissioning is prohibited until it is certain that the overall system fulfills the applicable provisions of the directives applied.

Hötensleben, Germany, Wednesday, March 07, 2018 8:11:23 AM

Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:
Armaturenwerk Hötensleben GmbH, Ms. Schlange; Schulstr. 5 - 6, D-39393 Hötensleben, Germany

Appendix 2: Corrosion resistance of the materials

Corrosion resistance (excerpts from data sheets)

Material no. 1.4401 (AISI 316)

The corrosion resistance of 1.4401 is significantly better than that of stainless steel grades 1.4301 and 1.4307, particularly when chlorides are also present, thanks to the addition of 2 - 3% molybdenum.
1.4401 exhibits excellent corrosion resistance in natural environmental media (water, rural and urban atmospheres), as well as in industrial sectors with moderate chlorine and salt concentrations, in the food industry and the agricultural food sector.
Due to its relatively high carbon content it must be taken into account that 1.4401 is not resistant to intergranular corrosion. Furthermore, it should also be pointed out that 1.4401 is not resistant to sea water.

Material no. 1.4404 (AISI 316L)

The corrosion resistance of 1.4404 is significantly better than that of stainless steel grades 1.4301 and 1.4307, particularly when chlorides are present, thanks to the addition of 2 - 3% molybdenum.
1.4404 exhibits excellent corrosion resistance in natural environmental media (water, rural and urban environments), as well as in industrial sectors with moderate chlorine and salt concentrations, in the food and pharmaceutical industries and in the agricultural food sector. Due to its low carbon content 1.4404 is even resistant to intergranular corrosion after welding.
1.4404 is not resistant to sea water!

Material no. 1.4430

1.4430 is the filler material for the base materials 1.4404 and 1.4435.

Material no. 1.4435 (AISI 316 L)

1.4435 exhibits excellent corrosion resistance in natural environmental media (water, rural and urban environments), in industrial sectors with moderate chlorine and salt concentrations, as well as in the food industry and the agricultural food sector. In addition, this grade is also resistant to various acidic media. As this material is also resistant to intergranular corrosion after welding, it complies with the following standardized test procedures:
AFNOR NF 05-159 / ASTM A262-75. Practice E / DIN 50914
The higher proportion of molybdenum in 1.4435 compared to 1.4404 makes it significantly more resistant to reducing acids and chloride media.

Material no. 1.4571 (AISI 316Ti)

1.4571 exhibits good resistance to corrosion in most natural waters (urban and industrial), provided that the concentrations of chloride, salt, hydrochloric acid and organic acids are low to medium.
1.4571 exhibits excellent corrosion resistance both in the food and beverage industry, as well as in the agricultural food sector.
As this grade is also resistant to intergranular corrosion after welding, it complies with the following standardized test procedures:
AFNOR NF 05-159 / ASTM A262-75. Practice E / DIN EN ISO3651-2

Material no. 1.4576

1.4576 is the filler material for the base material 1.4571

Material no. 2.4602 (HASTELLOY® C-22™ alloy)

HASTELLOY® C-22™ alloy also offers good resistance to liquid media, such as sulfuric acid, phosphoric acid, nitric acid, chlorine gas, acidic mixtures consisting of sulfuric acid and oxidizing acids with chloride ions. The use of this material is recommended when strong oxidants such as iron (III) and copper (II) chlorides, chlorine, formic acid, acetic acid, sea water and other salt solutions are present.
A special feature of this alloy is its high resistance to crevice, pitting and stress corrosion at higher temperatures under oxidizing and reducing conditions.
Due to its good thermal stability HASTELLOY® C-22™ alloy can generally be used in a welded condition without any additional heat treatment.

Material no. 2.4607

2.4607 is the filler material for the base material 2.4602, 2.4610, 2.4819

Stainless with high corrosion resistance in reducing media and oxidizing media

Material no. 2.4610 (HASTELLOY® C-4 alloy)

HASTELLOY® C-4 alloy belongs to the group of highly corrosion resistant nickel-chrome-molybdenum alloys and exhibits good corrosion resistance even at higher temperatures.
HASTELLOY® C-4 alloy offers good resistance under reducing and oxidizing conditions, for example in hot, contaminated media such as sulfuric acid, nitric acid, dry chlorine, formic acid, acetic acid, solvents, chlorine and chloride media. This material is characterized by its low tendency for intergranular corrosion, stress corrosion cracking and pitting corrosion.
Due to its excellent thermal stability HASTELLOY® C-4 alloy is extremely suitable for welding and is generally used in a welded state.

Material no. 2.4819 (HASTELLOY® C-276 alloy)

Nicrofer 5716 hMoW can be used in numerous chemical processes with both oxidizing and reducing media. Its high content of chrome and molybdenum make the alloy resistant to chloride ion attack. The tungsten content further enhances this resistance. Nicrofer 5716 hMoW is one of the few materials that is resistant to wet chlorine gas, hypochlorite and chlorine dioxide solutions. The alloy exhibits excellent resistance to concentrated solutions of oxidizing salts (such as iron III and copper chloride).

Notes

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