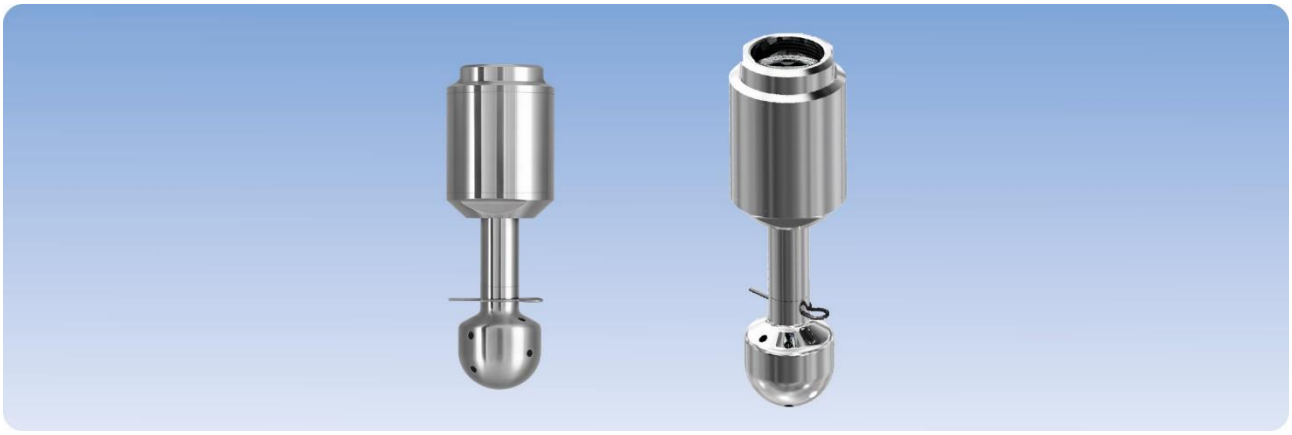
OPERATING/INSTALLATION INSTRUCTIONS

(Translation)



Container cleaning device

TANKO®CP Jet Cleaner

TANKO-CP2, TANKO-CP2S, TANKO-CP3

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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) are to be consulted for clarification, or the manufacturer is to be contacted.

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Abbreviations and Units

Abbreviations

AF	Across Flats (English wrench size)
ATEX	**AT**mosphère **EX**plosible; Synonym for the ATEX Directive of the European Union; comprises measures for explosion protection for explosive atmospheres
AWH	Armaturenwerk Hötensleben GmbH
BetrSichV	Betriebssicherheitsverordnung (German industrial safety ordinance); ordinance concerning health and safety when using work equipment; German implementation of Directive 2009/104/EC of the European Parliament concerning the minimum safety and health requirements for the use of work equipment by workers at work
BS	British Standard
BSP	British Standard Pipe; British thread standard for pipe fittings
approx.	approximately
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.
DN	DIN-Nennweite (DIN nominal width)
DIN	Deutsches Institut für Normung e.V.; is a national standards organization in the Federal Republic of Germany; The standards of this organization are referred to as DIN standards.
ES	European Standard
FDA	Food and Drug Administration (USA food and medication monitor regulation authority)
ISO	International Organization for Standardization
MC	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
NPT	National Pipe Thread; USA thread standard for pipe fittings
PC	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.
WA	Welded assembly
SI	Système international d'unités; the most widely used international system of units for physical variables
SN	Serial number
WAF	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.
v_{eff}	effective vibration velocity
AS	Assembly

Units of Measure

The following indicated factors are for orientation and conversion of the Si units to common units of measures 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 rpm = 1 revolution 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®CP jet cleaner (referred to hereinafter as the device).

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

After studying the instructions, you will be able to

- assemble, install and operate the device safely,
- clean and service the device correctly and
- take the correct measures if a fault occurs.

In addition to these instructions, generally valid, 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 it is 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 injuries
⚠ WARNING	Hazard with a medium level of risk	Death or severe physical injuries
⚠ CAUTION	Hazard with a low level of risk	Minor or moderate physical injuries
NOTE	Hazard with a low risk	Risk of material damage

Table 1.1-1: Overview of Signal Words

1.1.2 Explanation of the Warnings

Section-related Warnings

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

DANGER

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

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

- *Measure(s) to prevent the danger*

WARNING

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

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

- *Measure(s) to prevent the danger*

CAUTION

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

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

- *Measure(s) to prevent the danger*

NOTE

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

Failure to observe it can lead to material damage.

- *Measure(s) to prevent the danger*

Embedded Warnings

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

The embedded warnings are structured as follows.

⚠ **SIGNAL WORD** Type and source of danger

Possible consequences in case of failure to observe

- Measure(s) to prevent the danger

Further Means of Presentation

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

– Texts which follow this mark, are bulleted lists.

- Texts which follow this mark, describe measures for prevention of the danger.

1. Texts which follow this numbering, describe the first step of a task which is followed by further numbered steps which have to be performed in the specified order.

(1) Numbers in brackets reflect the item numbers in illustrations or parts lists.

“ “ Texts in quotation marks are (direct) quotes from documents (e.g. directives or standards) or words, word groups and parts of a text with a special meaning.

Important, significant information is shown with additional **bold type**, *in italics* or CAPITAL LETTERS for emphasis of individual words or phrases.

1.1.3 Pictograms and Symbols

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


Warning about electrical voltage

Warning about explosive atmosphere


Warning about hand injuries


Warning about a hot surface


Warning about corrosive substances


Warning about substances which are a water hazard


Unauthorized access prohibited


Wear protective work clothing


Wear safety shoes


Wear protective gloves


Wear safety goggles


Wear a hard hat


Wear hearing protection


Wear a welding mask


Isolate from voltage before work


Obey instructions


Protective grounding connection required


Secure against power being switched back on


Return for recycling

1.2 Warranty and Liability

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

Warranty and liability claims in the 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 are not in accordance 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 notes are intended to prevent injury to personnel and material damage. The owner/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 notes described in these instructions must be adhered to.

WARNING

Failure to comply with these instructions, 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 injuries.

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

The pictures in these instructions are for 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.

There is a risk of death or severe physical injuries.

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

WARNING

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

There is a risk of death or severe physical injuries.

- *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-CP is a rotating cleaning device and belongs to the group of jet cleaners. 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 **pressure in the container** to which the device is attached may not exceed a **maximum of 0.5 bar** (7.25 psi).

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

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

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

In the process, the following must always be observed:

- Only operate the device when installed inside an enclosed container.
- Never direct the cleaning jet or torrent from the device at persons.
- Protect the device from freezing (e.g. risk of frost from possible residual water).
- 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 container 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*) may be used.
- The preferred installation position for the device is vertical with the cleaning head pointing downwards. Other installation positions are possible (see *section 5.2.2 Installation Position*).
- The device may generate vibrations when cleaning the container. Any vibrations going beyond this must be avoided (see *section 7.4.1 Maintenance Intervals*).

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

- The device is NOT suitable for private use.
- The device is NOT suitable for ATEX applications.
- 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 boreholes may become blocked. The free movement of the actuator may be obstructed.
- The device must NOT by operated with air over a long period 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 this. The owner/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 injuries.*
>
> *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 replacement parts and accessories NOT supplied by AWH have NOT been checked or approved by AWH. The installation and/or the 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 3.1 Construction includes a list of spare parts.

2.3 Duties of the Owner/Operating Company

The device is used in the commercial sector. The owner/operating company is thus subject to the legal obligations of 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 are to 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 appropriately briefed about this. This also applies to hazardous substances that may arise during work processes.
- A continuous risk assessment must be carried out for workplaces, including temperature conditions for the medium and the place of use (falling). The measures are to be defined in operating instructions. Personnel must be instructed accordingly.
- Supervisors must monitor compliance with the measures specified in the operating instructions.
- Throughout the entire operating period of the device, the operating company must check whether the operating instructions he has compiled reflect current legislation requirements and adapt them as necessary.
- The operating company must clearly regulate and specify the responsibilities of personnel (e.g. for operation, maintenance and cleaning).
- The operating company must allow only sufficiently qualified and authorized personnel to work on the device.
- The operating company must ensure that all employees handling the device have read and understood the instructions.
  Furthermore, it must provide personnel with training at regular intervals with certification and inform them about the hazards.
- The user 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 safety clothing and equipment and make sure that this is used (see *section 2.4.1 Personal Protective Equipment*).
- The operating company must make sure that the danger area of the higher-level plant in which the device is installed is not accessible to unauthorized persons.
- The operating company must make sure that no one is permitted to work on the device whose ability to react is impaired by drugs, alcohol, medication or similar.

- The operating company must take appropriate measures to inform groups of persons who are not intended to come into direct contact with the device (e.g. visitor groups) about the potential dangers involved.
- The operating company is responsible for making sure that the device is only ever operated in perfect condition.
- Wherever high pneumatic pressures occur, there is a possibility of sudden failure of or damage to the lines and connections. This poses a hazard. The owner/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 *7.2* described in *section* Switch-off Procedure 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 on fire safety.
- Warnings in the documentation for externally supplied assembly units must be adhered to and incorporated into the risk assessments for the specific workplace.

Connections:

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

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 these instructions and act in accordance with them. The respective authorizations for personnel must be clearly defined.

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

Expert/Specialist Personnel

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

Instructed person

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

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

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

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

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

2.4.1 Personal Protective Equipment

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

Protective work clothing
Protective work clothing is tight-fitting work clothing with low resistance to tearing, with close-fitting sleeves and without protruding parts. It is mainly used for protection against getting 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.

Hard hat
Wear a hard hat for protection against falling or flying objects.

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

Welding mask
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 user and must be in accordance with the valid requirements.

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

2.5 Identification Marking

2.5.1 Type designation

Example: Jet cleaner **TANKO - CP2S-360° BSP**

1) Brand of the cleaning devices		
2) Type:	CP	
3) Size:	Size 2”	
	S	small
4) Variant:	360°	Spray angle 360°
	180°no	Spray angle 180° top
	180°nu	Spray angle 180° bottom
5) Connection:	BSP	3/4” BSP internal thread
	NPT	3/4” NPT internal thread
	Clip-on	Clip-on for pipe outer Ø 25.4 mm

2.5.2 Type Plate

The information only applies to devices with types indicated on the title page of these instructions.

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

Picture 2.5-1: Type Plate Position

1 Device type plate

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

- Manufacturer
- Type designation
- Year of manufacture
- Article number
- Serial no. [SN]

3 Construction and Function

3.1 Construction

3.1.1 CP2 Construction

Designs

TANKO-CP2: Jet cleaner with external housing diameter 48 mm

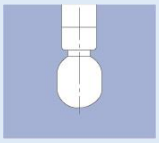
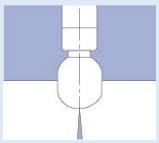
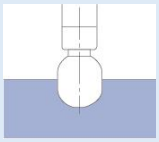
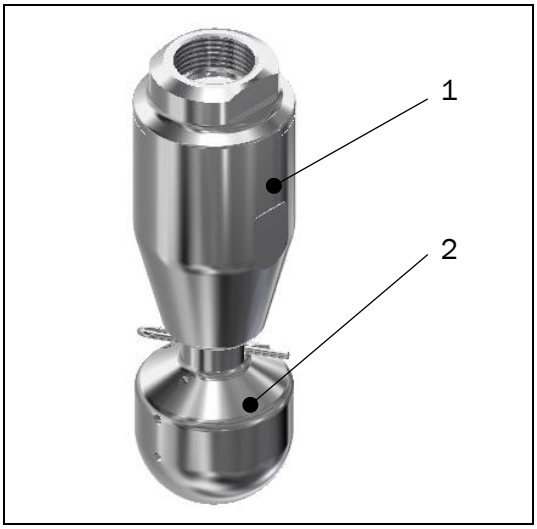
Designation	Spray Angle	Connection	Article number
TANKO-CP2, 360°, BSP	 360°	3/4" BSP	6690178001320
TANKO-CP2, 360°, NPT		3/4" NPT	6690178001420
TANKO-CP2, 360°, clip-on		Clip-on for Ø 25.4	6690191001120
TANKO-CP2 180° top BSP	 180° top	3/4" BSP	6690178002320
TANKO-CP2 180° top NPT		3/4" NPT	6690178002420
TANKO-CP2 180° upwards clip-on		Clip-on for Ø 25.4	6690191002120
TANKO-CP2 180° bottom BSP	 180° bottom	3/4" BSP	6690178003320
TANKO-CP2 180° bottom NPT		3/4" NPT	6690178003420
TANKO-CP2 180° downwards clip-on		Clip-on for Ø 25.4	6690191003120

Table 3.1-1: TANKO-CP2 type designation

The Container Cleaning Device comprises the following Main Components:



1 AU actuator unit

2 AU cleaning head

Picture 3.1-1: CP2 Overview

3.1.2 CP2S Construction

Designs

TANKO-CP2S: Jet cleaner with external housing diameter 46 mm

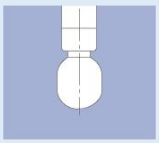
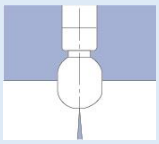
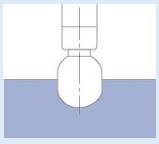
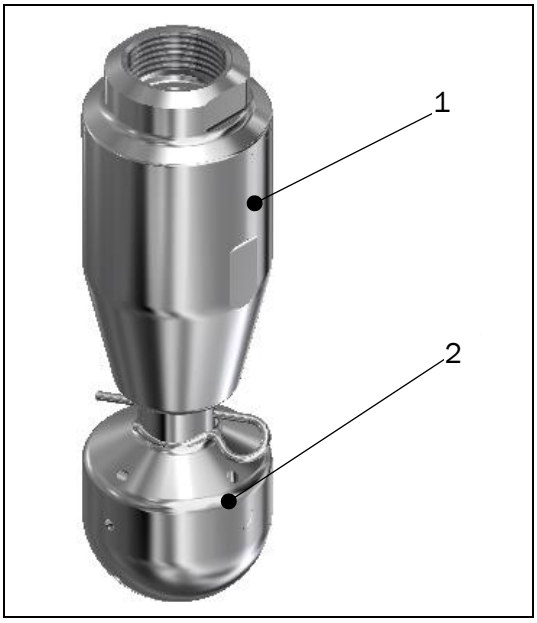
Designation	Spray Angle	Connection	Article number
TANKO-CP2S, 360°, BSP	 360°	3/4" BSP	669S178001320
TANKO-CP2S, 360°, NPT		3/4" NPT	669S178001420
TANKO-CP2S, 360°, clip-on		Clip-on for Ø 25.4	669S191001120
TANKO-CP2S 180° top BSP	 180° top	3/4" BSP	669S178002320
TANKO-CP2S 180° top NPT		3/4" NPT	669S178002420
TANKO-CP2S 180° top clip-on		Clip-on for Ø 25.4	669S191002120
TANKO-CP2S 180° bottom BSP	 180° bottom	3/4" BSP	669S178003320
TANKO-CP2S 180° bottom NPT		3/4" NPT	669S178003420
TANKO-CP2S 180° bottom clip-on		Clip-on for Ø 25.4	669S191003120

Table 3.1-2: TANKO-CP2S type designation

The Container Cleaning Device comprises the following Main Components:



1 AU actuator unit

2 AU cleaning head

Picture 3.1-2: CP2-S Overview

3.1.3 CP3 Construction

Designs

TANKO-CP3: Jet cleaner with external housing diameter 70 mm

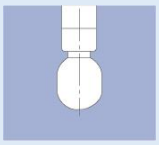
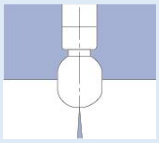
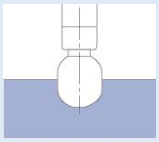
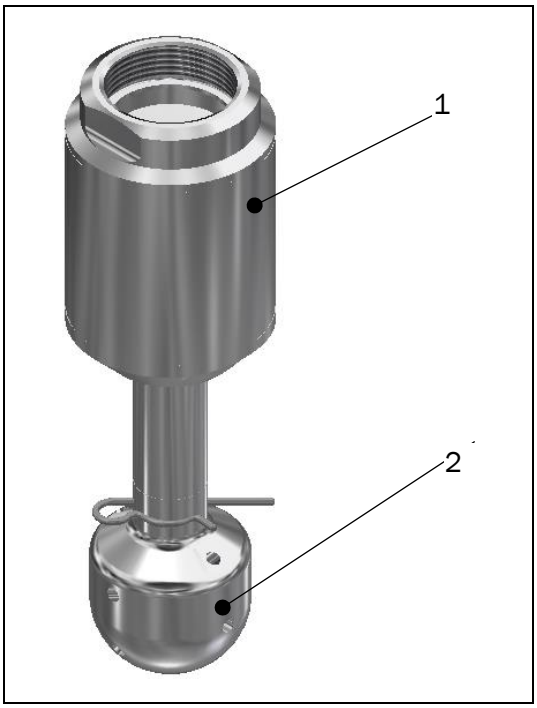
Designation	Spray Angle	Connection	Article number
TANKO-CP3, 360°, BSP	 360°	1 1/2" BSP	6690281001320
TANKO-CP3, 360°, NPT		1 1/2" NPT	6690281001420
TANKO-CP3 180° top BSP	 180° top	1 1/2" BSP	6690281002320
TANKO-CP3 180° top NPT		1 1/2" NPT	6690281002420
TANKO-CP3 180° bottom BSP	 180° bottom	1 1/2" BSP	6690281003320
TANKO-CP3 180° bottom NPT		1 1/2" NPT	6690281003420

Table 3.1-3: TANKO-CP3 type designation

The Container Cleaning Device comprises the following Main Components:



1 AU actuator unit

2 AU cleaning head

Picture 3.1-3: CP3 Overview

3.2 General Function Description

The item numbers shown in brackets refer to the Picture 7.5-1: TANKO-CP2 design and the Picture 7.5-3: TANKO-CP3 design.

The cleaning agent enters the device at the connection cover (4, 5 for CP3) and flows into the inside of the device through the drilled holes in the inflow disk (1). The fluid arrives at the shaft (2) there and sets it into rotation.

The fluid flows down on the outside of the shaft (2) and then through side holes in the shaft (2) into the inside of the shaft, and from there into the cleaning head (8, 9 for CP3). From there, the fluid passes through the spraying holes in the cleaning head and back out again.

The cleaning head is connected to the shaft using a cotter pin (9, 10 on CP3). The rotation of the shaft is transferred onto the cleaning head directly by the cotter pin.

The long drilled holes in the cleaning head ensure that the cleaning jet is concentrated in the optimum manner. The slow rotation and powerful impact of the cleaning jet removes even stubborn soiling from the container wall. The cleaning jet follows a linear path on the container wall. The spreading of the cleaning jet and the arrangement of the spray holes in the cleaning head ensure good cleaning.

Leakages on the cleaning device and the drilled hole which points upwards on the spraying head are used for self-cleaning of the device.

Depending on the requirements, devices with different spraying angles are available.

Cleaning times:

- If the entry pressure is 3 - 12 bar (44 - 174 psi), the average rotary speed of the TANKO-CP is 2 - 30 rpm.
- Deviations of 10 - 15 % in the rotation speed are a feature of the design.
- With spontaneous pressure build-up, a run-in period of 2 – 4 minutes must be added to the cycle time.
- The rotation speed of the cleaning head can be varied using a plug (10, 11 for CP3) in the middle of the inflow disk (1). As standard, the device is supplied without a plug screwed in. The plugs are provided loose with the device.
- The device rotates at its slowest rotation speed. If you want the device to rotate faster, screw a plug with a hole into the central hole in the inflow disk. The smaller the hole in the plug, the faster the cleaning head turns. It turns fastest if the closed plug (without a hole) is used.

Reducing the hole diameter in the bypass plug also reduces the flow rate in the device.

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

Sample applications for jet cleaner type TANKO-CP:

Tanks, silos, barrels, containers, pipes, dryers, centrifuges, agitators, vacuum tanks, spraying 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*, and the wear parts must be replaced regularly.

Aggressive agents can reduce the service life of the device.

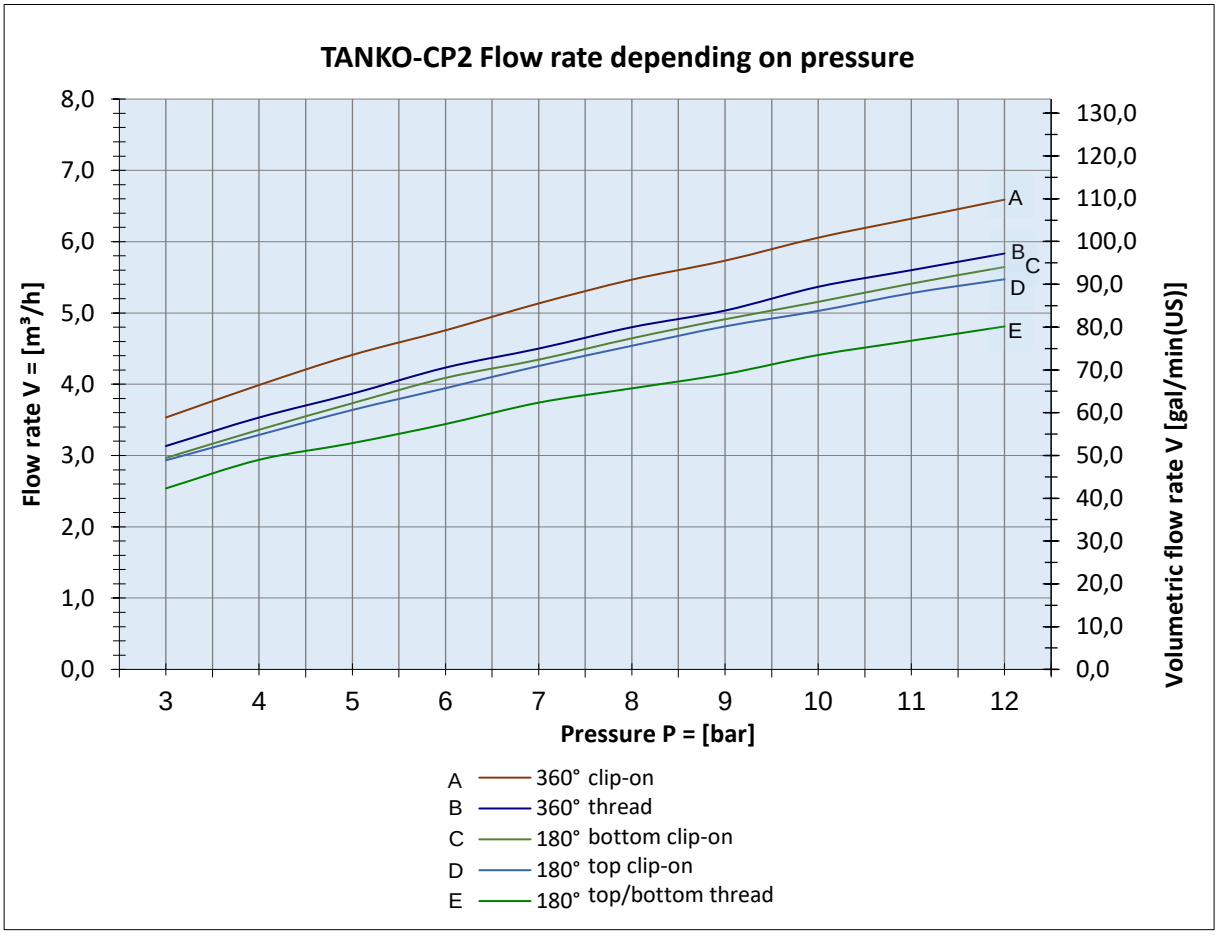
3.3.1 Operating temperature TANKO-CP2/CP2S and TANKO-CP3

Designation	TANKO-CP2	TANKO-CP2S	TANKO-CP3
Effective cleaning radius	2 m		3 m
Operating temperature (permitted): – Cleaning agent	max. +95 °C / +203 °F		
Sterilisation temperature (permitted):	max. +121 °C / +249 °F		
Ambient temperature (permitted): – Inside the container – Outside the container	max. +140 °C (max. +284 °F) ***NOTE*** Risk of frost! -20 °C – +40 °C (-4 °F – +104 °F)		
Operating pressure: – Cleaning agent	3 – 12 bar / 44 – 174 psi		
Optimum pressure range: – Cleaning agent	5 – 8 bar / 73 – 116 psi		
Flow rate: – 360° Thread	≈52.0 – 96.7 l/min (3.1 – 5.8 m³/h)	≈41.7 – 80.0 l/min (2.5 – 4.8 m³/h)	≈115.0 – 211.7 l/min (6.9 – 12.7 m³/h)
Clip-on	≈58.3 –108.3 l/min (3.5 – 6.5 m³/h)	≈53.3 -101.7 l/min (3.2 – 6.1 m³/h)	
– 180° top Thread	≈41.7 – 78.3 l/min (2.5 – 4.7 m³/h)	≈40.0 – 75.0 l/min (2.4 – 4.5 m³/h)	≈103.3 – 190.0 l/min (6.2 – 11.4 m³/h)
Clip-on	≈52.0 96.7 l/min (3.1 – 5.8 m³/h)	≈50.0 96.7 l/min (3.0 – 5.8 m³/h)	
– 180° bottom Thread	≈41.7 – 80.0 l/min (2.5 – 4.8 m³/h)	≈38.3 – 73.3 l/min (2.3 – 4.4 m³/h)	≈103.3 – 190.0 l/min (6.2 – 11.4 m³/h)
Clip-on	≈52.0 98.3 l/min (3.1 – 5.9 m³/h)	≈50.0 93.3 l/min (3.0 – 5.6 m³/h)	
Installation opening min.: – BSP/NPT connection – Clip-on connection	Ø 50 mm Ø 50 mm	Ø 48 mm Ø 48 mm	Ø 72 mm
Media connection [MC]:	3/4” BSP / NPT / clip-on for pipe outer Ø 25.4 mm		1 1/2” BSP / NPT
Length of the device – BSP/NPT connection – Clip-on connection	155 mm 165 mm		235 mm
Spray pattern:	360°; 180° top; 180° bottom		
Speed of rotation:	2 – 30 rpm		
Spray holes:	Ø 3 mm		Ø 5.2 mm

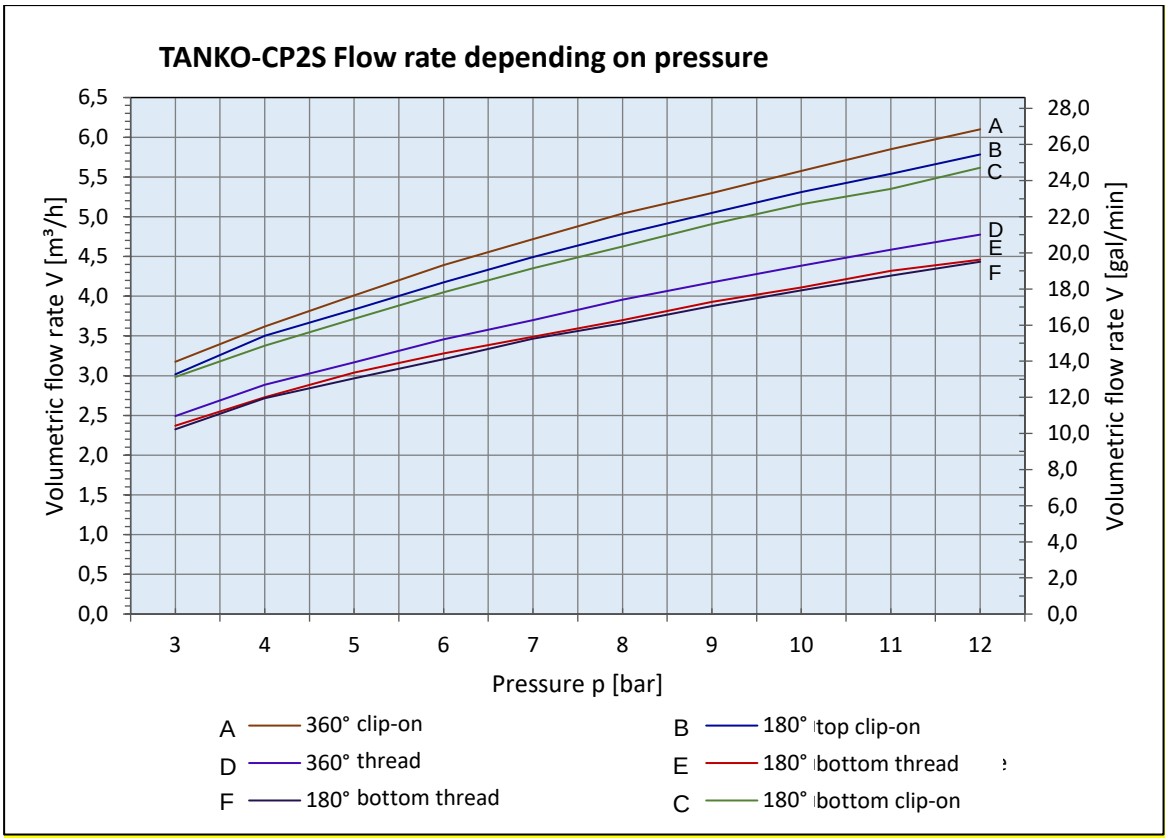
Designation	TANKO-CP2	TANKO-CP2S	TANKO-CP3
Installation position:	Vertically suspended Others possible, although with shorter service life of the plain bearings		
Materials:	1.4404; PTFE		
Weight	1.1 kg		2.5 kg

Table 3.3-1: Device operating parameters

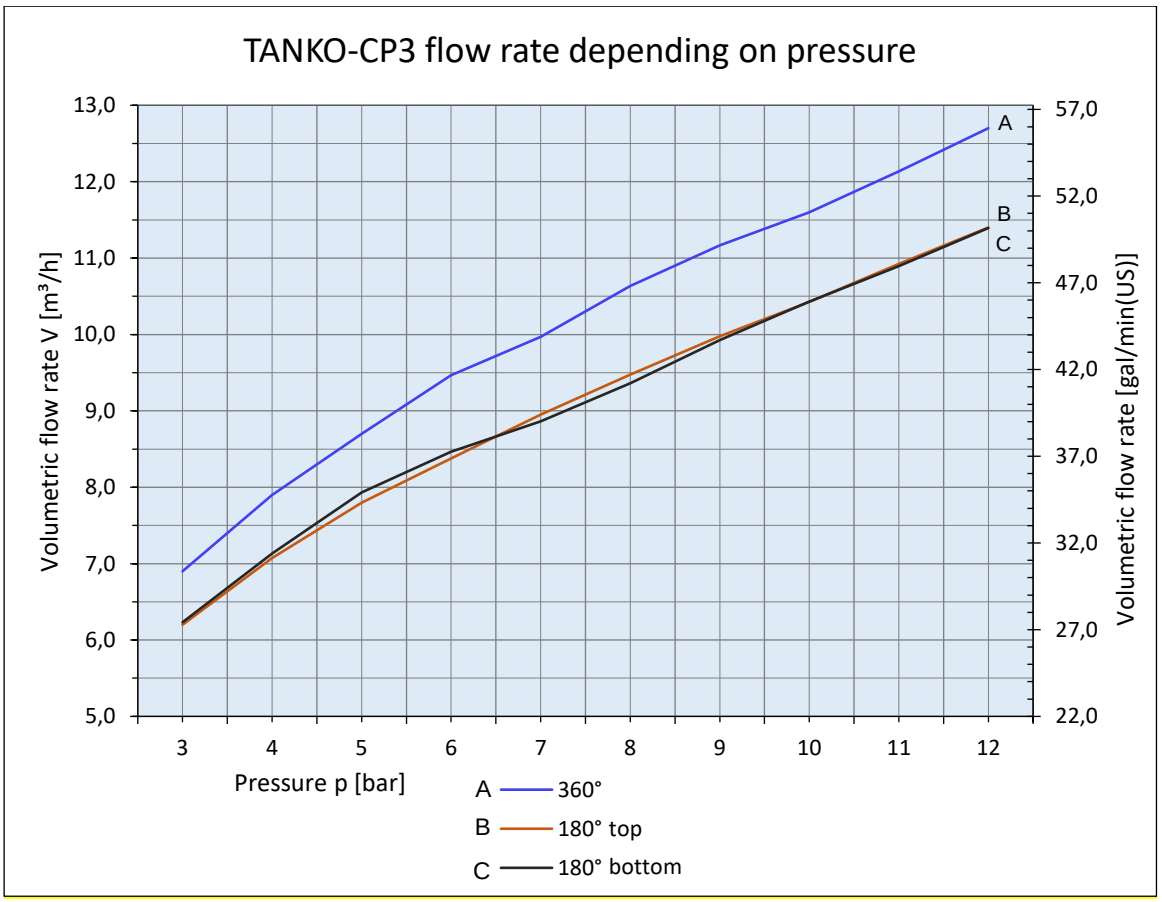
Consumption Data



Picture 3.3-1: TANKO-CP2 consumption data



Picture 3.3-2: TANKO-CP2S consumption data



Picture 3.3-3: TANKO-CP3 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 clean water as the cleaning fluid at a temperature of +25 °C / +77 °F. The values may differ if a different cleaning fluid and a different medium temperature are used.

The consumption of cleaning fluid by the TANKO-CP depends on the pressure of the cleaning fluid and the size of the plug in the inflow disk which regulates the speed.

Installing a plug with a smaller hole leads to lower consumption.

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.

DANGER

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

There is a risk of death or severe physical injuries.

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

WARNING

Warning of corrosive and aggressive cleaning agent!

There is a risk of death or severe physical injuries.

- *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%)*
    - *aliphatic, aromatic and chlorinated hydrocarbons*
    - *phenols*
    - *fluorine compounds*

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 corresponding to a mesh width of 50 µm is recommended.*
- *Adhere to the instructions on the supply and return lines in the section 5.2.3 Installing the Device.*

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.

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 and wear 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 be reused in many case or usefully processed and recycled.

Improper disposal can cause environmental damage.

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

4.2 Transport

NOTE Improper transportation can cause damage to the device.

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

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

4.3 Storage

The packaging used for the device, the components and the replacement/wear parts is designed to be stored for 3 months.

NOTE Risk of damage 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 constant environmental conditions.
  - Prevent major temperature fluctuations so that condensation does not form.
  - Prevent dirt and moisture from entering into the device.
  - Protect the device from the elements (e.g. formation of condensation in the device, sunlight).
  - Protect unpacked devices or components with dust-proof covers. Condensation must not be allowed to form beneath the covering.

Parameters for Storage (recommended):

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

5 Installation

5.1 Safety Notes for Installation

WARNING

Danger as a result of static charge!

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

There is a risk of death or severe physical injuries.

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

WARNING

Risk of falling when working at heights!

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

There is a risk of death or severe physical injuries.

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

CAUTION

Risk of accidents as a result of improper installation!

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

There is a risk of minor or moderate injuries.

- *Allow only experts to perform work on the device.*
- *Before starting work, observe the* ***working steps of the switch-off procedure*** *(see section 7.2 Switch-off Procedure).*
- *Wear protective work clothing, protective gloves and safety shoes when performing work.*
- *Do not 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.*

5.2 Installation

The safety notes in *section 5.1 Safety Notes 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!

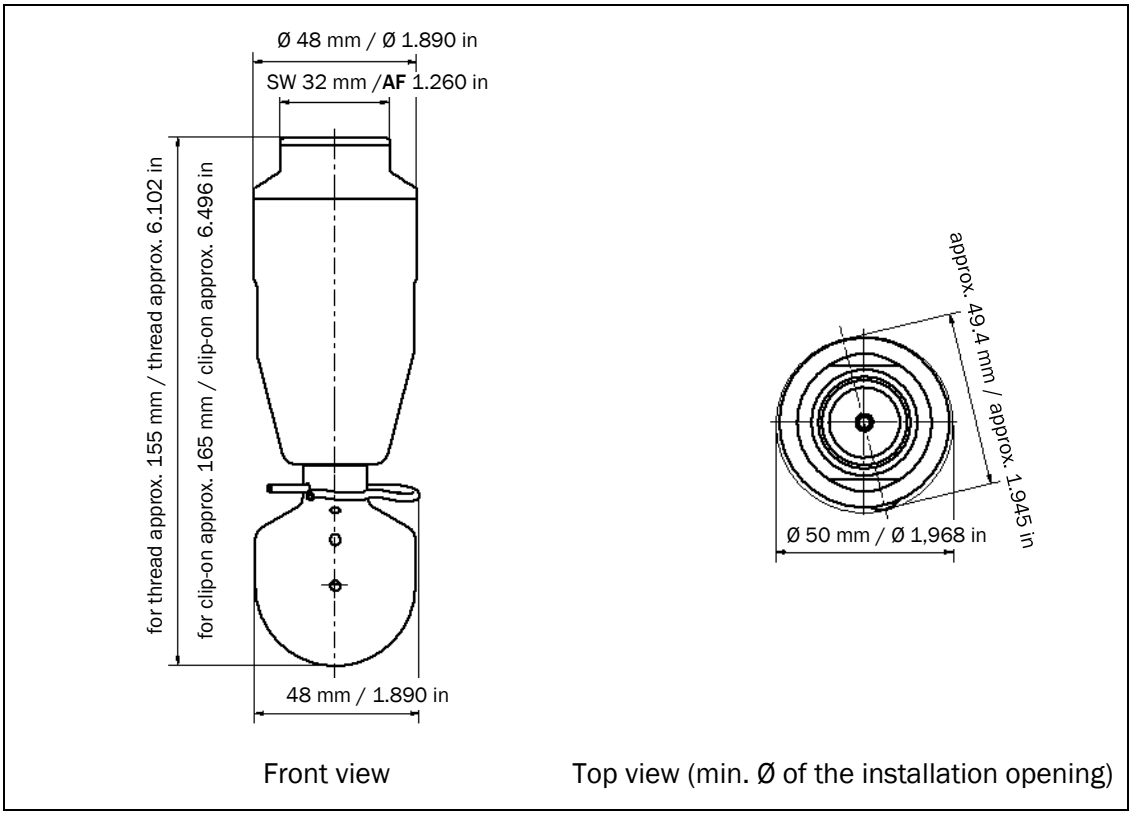
There is a risk of minor or moderate injuries.

The following measures must be observed before installing the device for the first time and 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 [MC] 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.*
- *See Section 5.2.1 Interfaces for the installation dimensions.*

5.2.1 Interfaces

5.2.1.1 CP2 Installation Dimensions and Interfaces



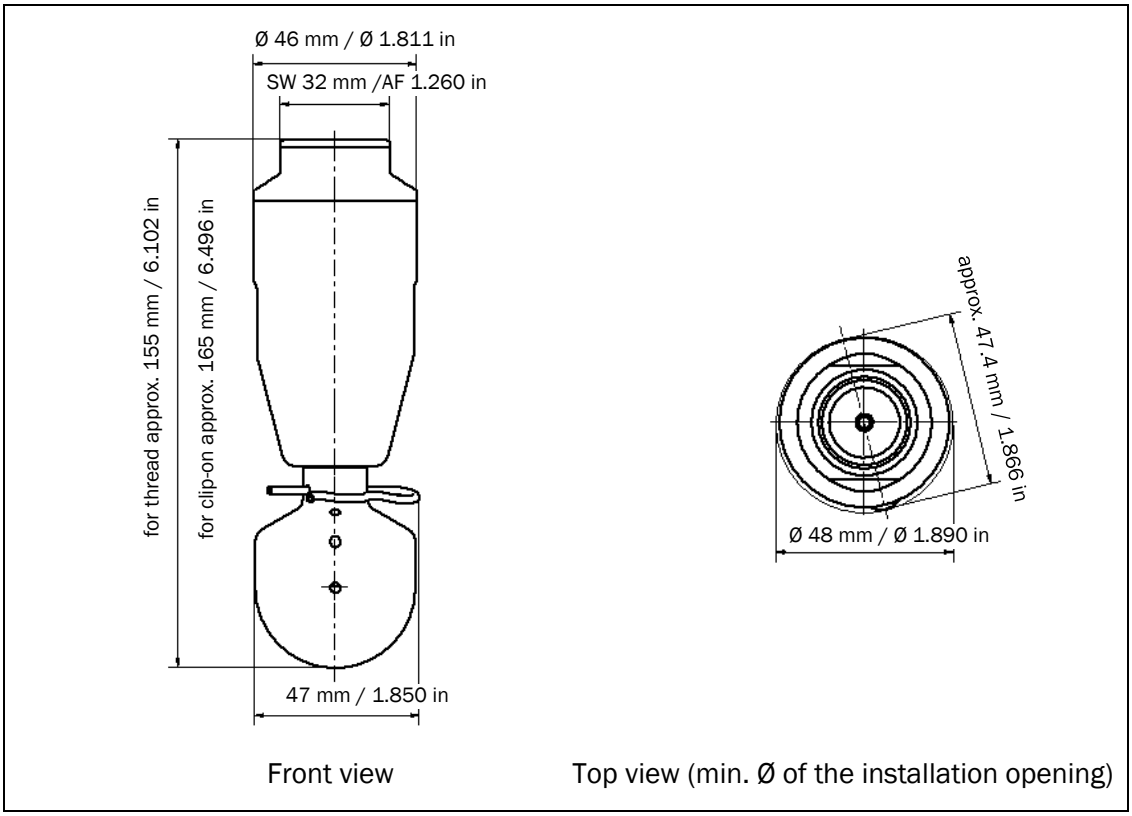
Picture 5.2-1: Installation dimensions of the CP2 device

Picture 5.2-2: Interfaces of the CP2 device

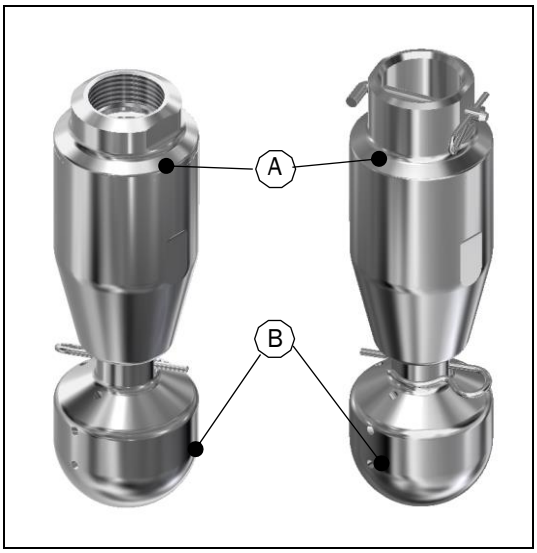
A Media connection [MC]
(is also the process connection [PA] for installation)

B Rotary cleaning head

5.2.1.2 CP2S Installation Dimensions and Interfaces



Picture 5.2-3: Installation dimensions of the CP2S device

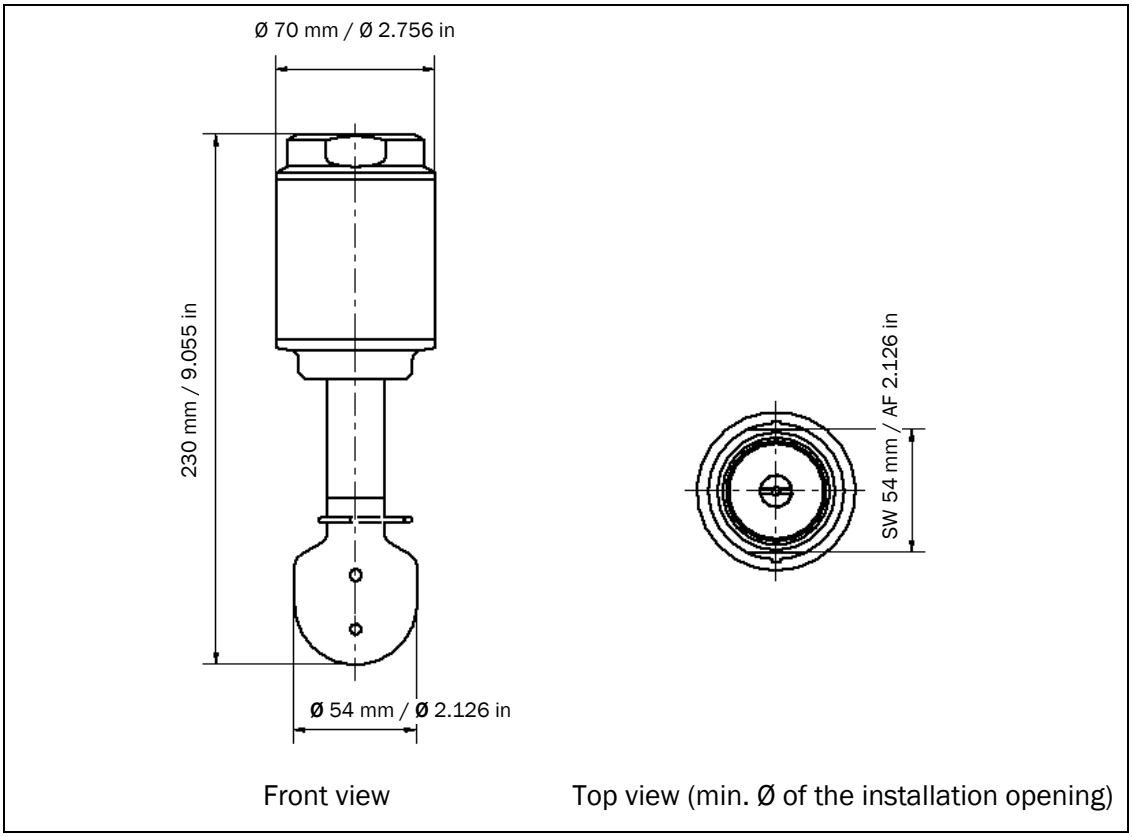


Picture 5.2-4: Interfaces of the CP2S device

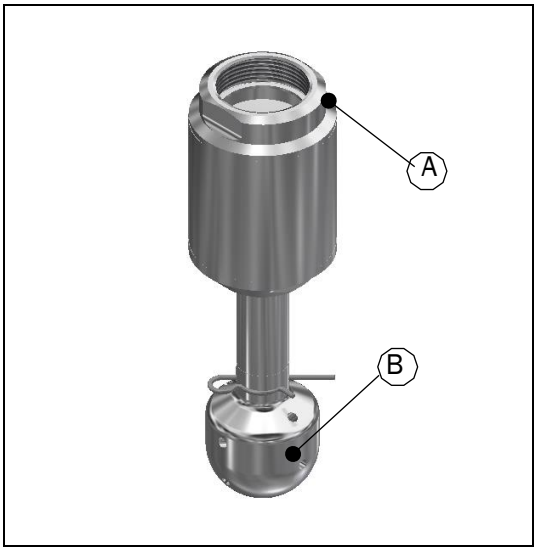
A Media connection [MC]
(is also the process connection [PA] for installation)

B Rotary cleaning head

5.2.1.3 CP3 Installation Dimensions and Interfaces



Picture 5.2-5: Installation dimensions of the CP3 device



A Media connection [MC]
(is also the process connection [PA] for installation)

B Rotary cleaning head

Picture 5.2-6: Interfaces of the CP3 device

5.2.2 Installation Position

1) Aligned vertically with the cleaning head pointing downwards (standard):
The device is designed for vertical installation as the preferred position. This installation position means that the device can drain automatically.

2) Different installation position from the standard:
A different installation position to the standard position means that the device may NOT always be able to drain automatically. The strain on the bearings is also increased.

Adhere to 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

Clip-on connection (for TANKO-CP2 and TANKO-CP2S only)

4 Connection cover
11 Connection pin
12 Cotter pin

Picture 5.2-7: Clip-on connection

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

The device may strike personnel when falling.

There is a risk of severe physical injuries.

- 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).

1. Push the device with the connection cover (4) onto the pipe for the media supply.
2. Push the connection pin (11) through the connection cover (4) and the pipe for the media supply.
3. Secure the connection pin (11) with the cotter pin (12).
4. Make sure that the cotter pin (12) is installed properly.

Threaded Connection

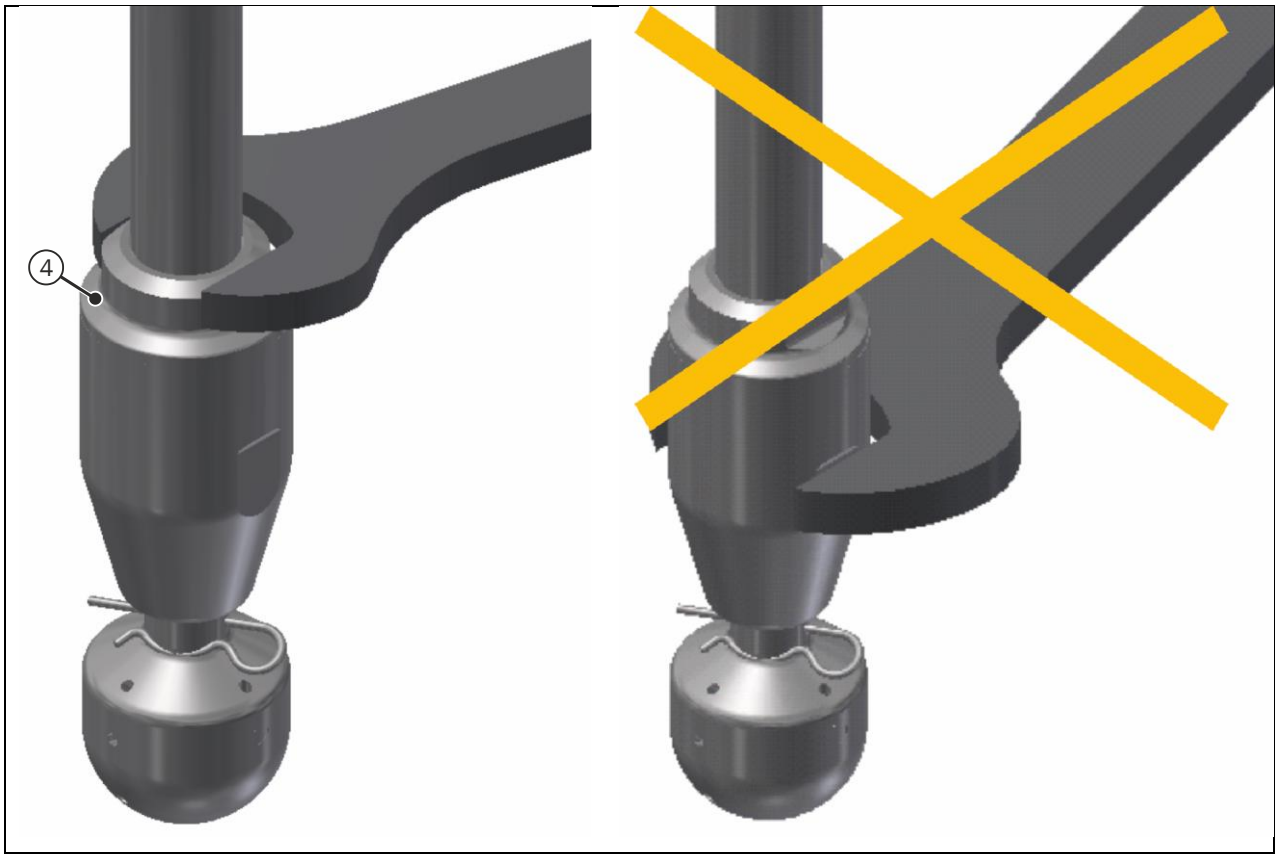
NOTE

Risk of damage to the device during installation!

*The flats on the housing are **not** suitable for fastening and unfastening the device on the pipe for the media supply.*

The threaded connection between the housing and the connection cover may become damaged as a result of excessive tightening torque. Maintenance and cleaning may become more difficult or even impossible.

- *Only use the wrench flat on the connection cover for screwing on and unscrewing the device on the pipe for the media supply (see Picture 5.2-8: Threaded connection installation).*



Picture 5.2-8: Threaded connection installation

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

The device may strike personnel when falling.

There is a risk of severe physical injuries.

- 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).

1. Remove the screw cap/sealing plug from the media connection [MC].
2. Screw the female thread in the connection cover (4) to the pipe for the media supply.

   NOTE There is a risk of damage to the thread if the tightening torque applied for the threaded connection between the connection cover and the pipe is excessive!
   - 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. Tighten the threaded connection between the connection cover and the pipe using an open-ended wrench or adjustable pliers wrench, as shown in *Picture 5.2-8*.

6 Commissioning

Before the device is commissioned in Germany, the user of the plant must adhere to the Industrial Safety Regulation (BetrSichV).

In other countries, the respective national guidelines, statutes and country-specific regulations regarding occupational safety and accident prevention are to 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 injuries.

- *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*
  - *The safe and reliable functioning of the device*

6.1 Safety Notes for Commissioning

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

We recommend that you document the commissioning in a report.

WARNING

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 fluid or the heat transfer from the container. Contact with the device can cause burns on the skin.

There is a risk of burns from 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 injuries.

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

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

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

CAUTION

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

The device emits a sound pressure level of L_{pA} < 70 dB(A).

When the device is operated in a container, the sound 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:*
  - *Perform noise reduction measures (e.g. sound insulation).*
  - *Delimit and mark the noise area (e.g. with mandatory sign “Wear hearing protection”).*
  - *Use effective hearing protection (e.g. ear muffs or ear plugs).*

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

CAUTION

Insufficient lighting in the working environment!

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

There is a risk of minor or moderate injury.

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

6.2 Functional Check / Trial Run

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

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

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

WARNING Persons in the container. A person may be struck by the jets from the cleaning head!

There is a risk of death or severe physical injuries.

- DO NOT start cleaning operation while there are persons in the container.

1. Close all of the openings on the container (e.g. inspection openings).
2. Switch off moving parts in the container and secure against being inadvertently switched back on or set in motion.
3. Check to see if 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 injuries.

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

Switch-on procedure

1. *Close all of the openings on the container (e.g. inspection openings).*
2. *Switch on the supply of cleaning agent (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 and*
  - *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 speed (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

After commissioning and performing inspection, the device can be put into operation, observing the following instructions.

WARNING

Risk when using outdoors!

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

There is a risk of death or severe physical injury.

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

WARNING

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

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

There is a risk of death or severe physical injuries.

- *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 injuries.

- ***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

Risk of burns from hot surfaces!

The device may heat up significantly as a result of the cleaning fluid 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 injuries.

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

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

⚠ **WARNING** Persons in the container. A person may be struck by the jets from the cleaning head!

There is a risk of death or severe physical injuries.

- 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 injuries.

- 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 being cleaned.
- Close all of the openings on the container (e.g. inspection openings).
- When operating the device, **adhere to the switch-on and switch-off procedures** (see *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.
  - Immerse the device in the product of the production process.
  - Operation of the device outside the permitted parameters (see *section 3.3 Technical data*).
- Immediately stop operation in the event of leaks outside the container.
- Refrain from any type of work which compromises the safe and reliable function of the device.
- Immediately inform the operating company of any changes to the device or the plant that may impair its safety.

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

If this is NOT possible, the maintenance intervals in *section 7.4.1 Maintenance Intervals* must be shortened accordingly.

During normal operation of the device, you must make sure that the mixture of supplied cleaning agent and detached 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 notes 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*).

7.1 Safety Notes for Maintenance

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 injuries.

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

WARNING

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

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

There is a risk of death or severe physical injuries.

- *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.

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 injuries.

- ***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 fluid 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 injuries.

There is a risk of burns from 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.*
- *Beware of hot surfaces (e.g. warning signs).*
- *Use safety clothing and equipment (e.g. protective gloves, cloths) to provide protection against the hot surface.*

WARNING


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

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

There is a risk of death or severe physical injuries.

- *Before starting work, depressurize the container and all lines.*
- *Switch off moving parts in the container and secure against 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 injuries.

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 no 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 and*
  - *opening/closing the shut-off fitting slowly (e.g. valve or ball cock).*

7.3 Removal

The safety notes in *section 7.1 Safety Notes for Maintenance* must be adhered to before removing the device from the container.

WARNING




Risk of chemical burns and burns when opening the container!

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

There is a risk of death or severe physical injuries.

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

CAUTION

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

There is a risk of minor or moderate injuries.

- *Implement suitable measures to prevent soiling and foreign objects from entering via the interfaces of the device.*
- *Before starting work, make sure that all necessary tools, accessories 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

For clip-on connection (see *Picture 5.2-7: Clip-on connection*):

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

The device may strike personnel when falling.

There is a risk of severe physical injuries.

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

1. Pull the cotter pin (12) from the connection pin (11).
2. Remove the connection pin (11).
3. Detach the device from the pipe for the media supply.

For threaded connection (see *Picture 5.2-8: Threaded connection installation*):

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

The device may strike personnel when falling.

There is a risk of severe physical injuries.

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

1. Unfasten the connection cover threaded connection - media supply pipe with an open-end wrench or an adjustable pliers wrench.
2. Unscrew 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.

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

The safety notes in *section 7.1 Safety Notes 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 first with short maintenance intervals.
  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 longer period, we recommend that you check the device completely before re-commissioning to make sure that it is fully functional
(see *section 6.2 Functional Check / Trial Run*).

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

Cleaning agent: Water
Media pressure: 5 bar / 72 psi
Media temperature: +25 °C / +77 °F.

Interval:

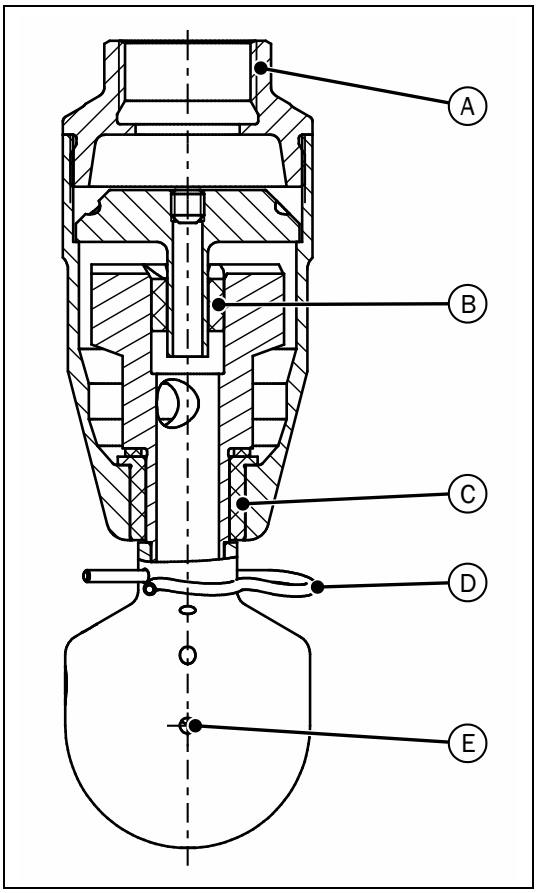
h_O	= operating hours of the device
d	= daily
w	= weekly
m	= monthly
¼ y	= quarterly
½ y	= every six months
y	= annually

Method:

V	= visual inspection
F	= functional check
M	= measurement
C	= cleaning*

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

7.4.1.1 CP2 and CP2S maintenance intervals



A Media connection [MC] / Process connection [PA]

B Plain bearings between shaft and inflow disk

C Plain bearings between shaft and housing

D Cleaning head /shaft connection

E Spray holes in the cleaning head

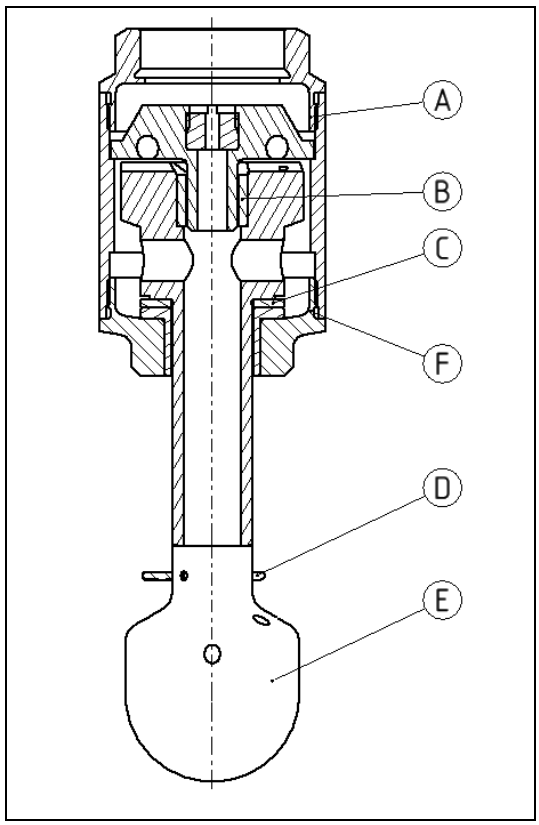
Picture 7.4-1: Maintenance points: CP2 and CP2S

The tightening torque values for the thread connections required for maintenance are listed in section 7.5 Spare Parts and Customer Service.

Point	Inspection and Maintenance Work	Interval	Method
A	The media and process connections are established with a threaded connection or a clip-on connection. Vibration due to operation can lead to the threaded connection working loose, or wear on the cotter pin. You must that the connection is firmly in place regularly. If necessary, replace the cotter pin.	m	V, F
B	Check plain bearing to make sure it is fully functional and for wear. Clean or replace the plain bearing washers as necessary.	300 h_O	V, F, C
C	Check plain bearing to make sure it is fully functional and for wear. Clean or replace the plain bearing washers as necessary.	300 h_O	V, F, C
D	Check the cotter pin for wear. After 2 years of normal operation, replace the cotter pin.	½ y	V, M
E	Check the drilled holes in the cleaning head for soiling and blockages. Clean the cleaning head as necessary.	m	V, F

Table 7.4-1: Inspection and maintenance work CP2 and CP2S

7.4.1.2 CP3 maintenance interval



A Media connection [MC] / Process connection [PA]

B Plain bearings between shaft and inflow disk

C Plain bearings between shaft and housing

D Cleaning head /shaft connection

E Spray holes in the cleaning head

Picture 7.4-2: CP3 Maintenance Points

The tightening torque values for the thread connections required for maintenance are listed in section 7.5 Spare Parts and Customer Service.

Point	Inspection and Maintenance Work	Interval	Method
A	The fluid and process connection is implemented using a threaded connection. Vibrations from operation could under certain circumstances cause the thread connection to become loose. You must that the connection is firmly in place regularly.	m	V, F
B	Check plain bearing to make sure it is fully functional and for wear. Clean or replace the plain bearing washers as necessary.	300 h_O	V, F, C
C	Check plain bearing to make sure it is fully functional and for wear. Clean or replace the plain bearing washers as necessary.	300 h_O	V, F, C
D	Check the cotter pin for wear. After 2 years of normal operation, replace the cotter pin.	½ y	V, M
E	Check the drilled holes in the cleaning head for soiling and blockages. Clean the cleaning head as necessary.	m	V, F
F	Check the thread connection between the housing and the bottom section of the housing is firmly tightened.	m	V, F

Table 7.4-2: CP3 inspection and maintenance work

7.4.2 Tools and Tightening Torque Values

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

Normal workshop equipment is sufficient for the mechanical work on the device. The following tools are required at least:

- Screwdriver set (slot head)
- Hexagon socket wrench (hexagon socket 3 mm)
- Open-end wrench (width across flats 32 mm) or adjustable pliers wrench
- Strap wrench/belt pipe wrench (e.g. Ø 140) with woven belt

An assembly tool for installing the plain bearing bushing in the shaft can be obtained from AWH:

Device	Article number for assembly tool
TANKO-CP2/CP2S	664MWCP20001
TANKO-CP3	664MWCP30001

Table 7.4-3: Assembly tool

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

All the relevant tightening torque valued for the screw connections are listed in section 7.5 Spare Parts and Customer Service.

7.4.3 Disassembling the Device

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 a vise with protective jaws, e.g. plastic or light metal, for clamping.*
- *Use only suitable tools which do not damage the surface.*
- *For assembly work, adhere to the specified tightening torque values (see Table 7.5-6: Torques CP2, Table 7.5-12: CP2S torque, Table 7.5-17: Torques CP3).*

NOTE

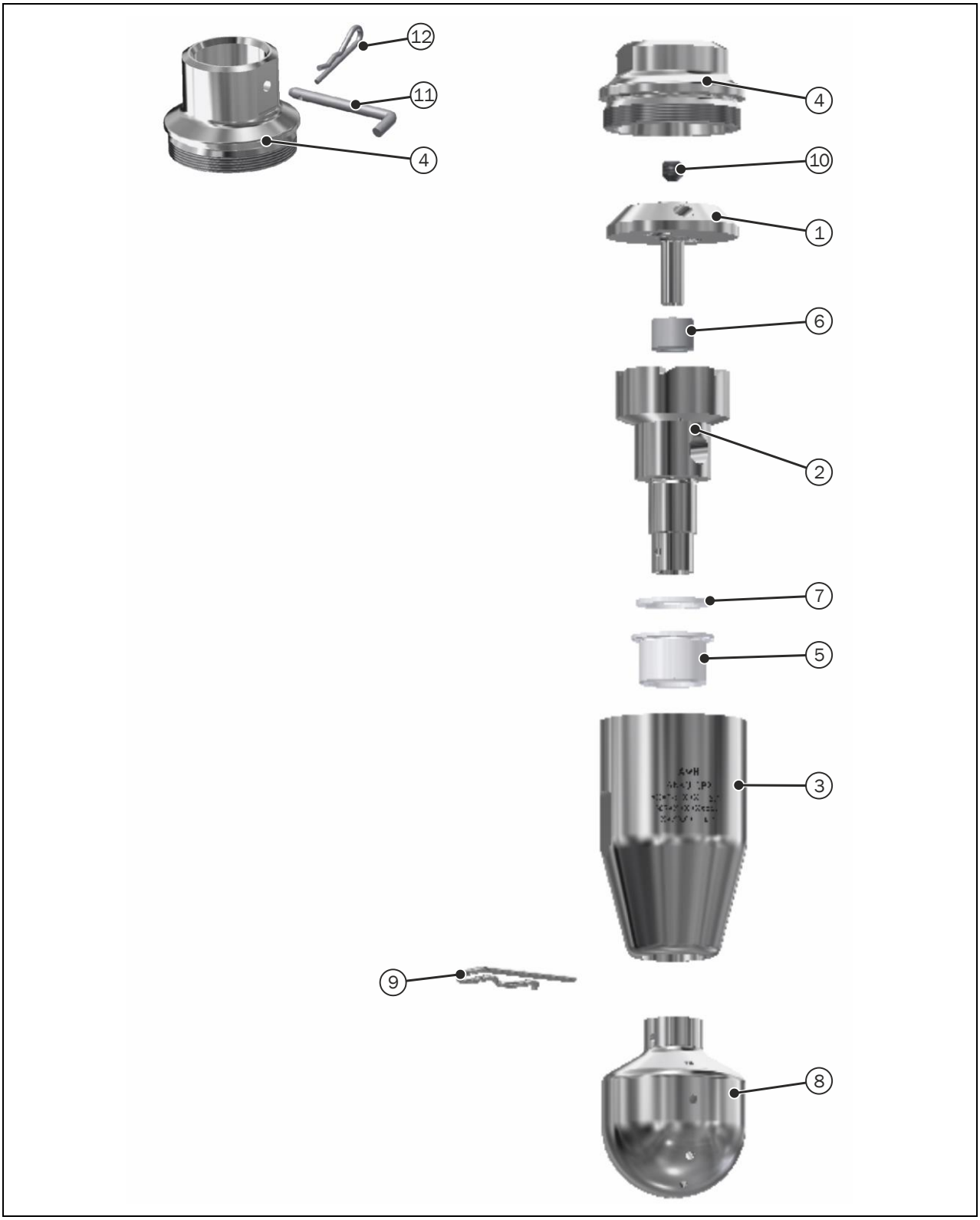
Edge compression in the area of the wrench flats!

If workpieces are NOT grasped without play and in a protective manner by the flats during assembly/disassembly, then they are at risk of damage:

- *To avoid causing damage during assembly/disassembly work, use an adjustable wrench with parallel, smooth clamping jaws.*
- *Apply the clamping jaws of the adjustable wrench or pliers wrench to the flats without play so that they rest evenly across the surface and loosen or tighten the screwed part.*

The tools required for assembly/disassembly work are listed in section 7.4.2 Tools and Tightening Torque Values.

7.4.3.1 Disassembling the TANKO-CP2 and CP2S device



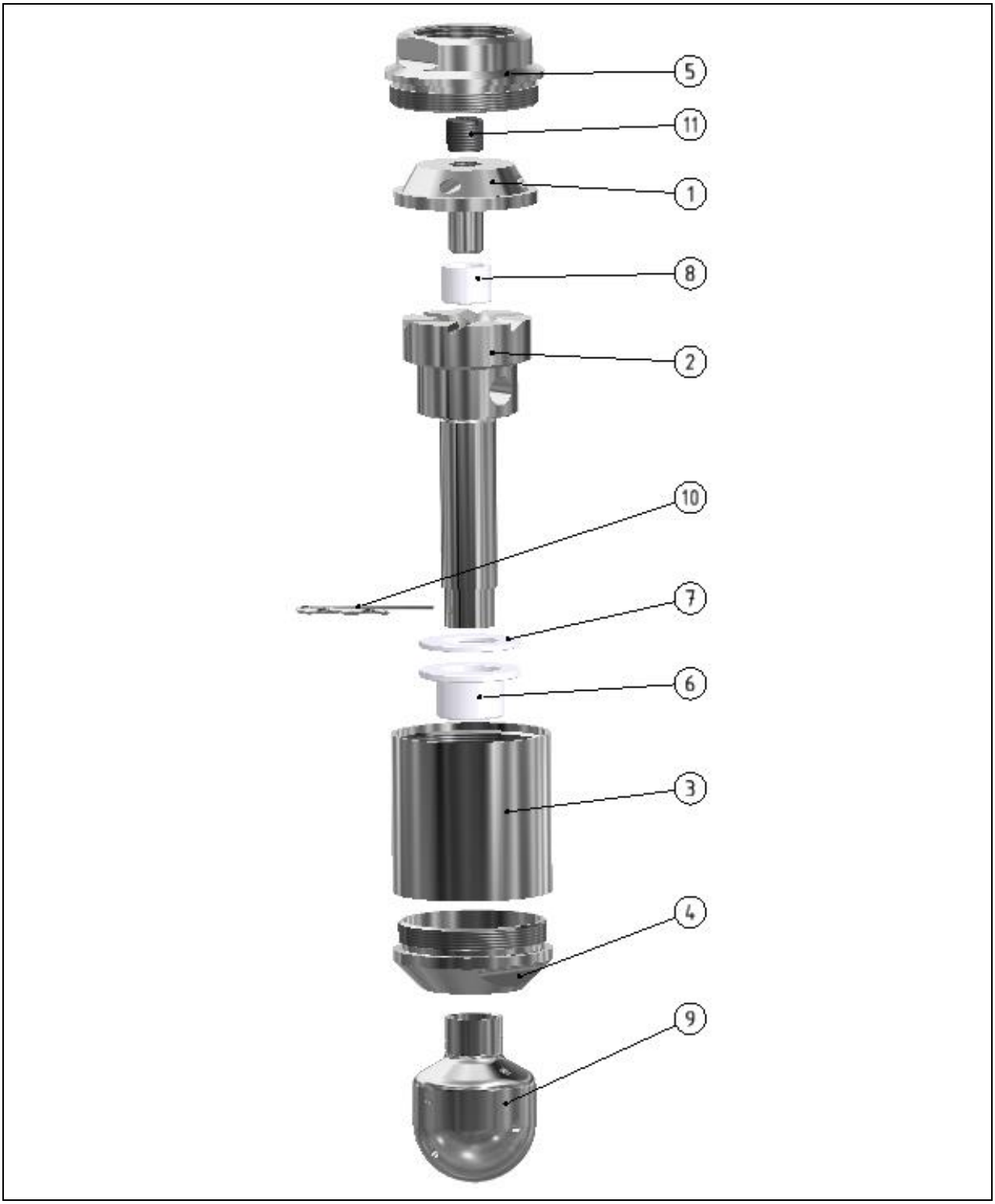
Picture 7.4-3: Exploded diagram of device CP2 and CP2S

The item numbers shown in brackets refer to the Picture 7.4-3: Exploded diagram of device CP2 and CP2S.

1. Place the device on a cushioned surface.
2. Remove the cotter pin (9).
3. Remove the cleaning head (8) from the shaft (2).
4. ***NOTE*** Incorrect clamping in the vise can cause threaded connections to become jammed and deformed unintentionally!
   The threaded connection cannot be screwed and may become damaged.
   - The jaws of the vise must clamp too firmly and not directly in the area of the threaded connection being unfastened.
   - Clamp the device in the vise in such a way on the housing (3) that the threaded connection on the connection lid (4) does NOT become jammed.
   - Clamp the device in a vise by the housing (3) with the connection cover (4) upwards.
     We recommend that you use an adjustable pliers wrench with smooth jaws for the connection cover.
5. Unfasten and unscrew the connection cover (4) from the housing (3).
6. Remove the device from the vise.
7. Remove the inflow disk (1) from the housing (3).
8. Remove the shaft (2) from the housing (3).
9. Remove the sliding disk (7) and collar bushing (5) from the housing (3).
10. Push the plain bearing bushing (6) out through the drilled hole in the shaft (2) from below and remove it.

The device is now completely disassembled. The individual parts can now be cleaned, e.g. in an ultrasound bath. Wear parts with signs of wear have to be replaced.

7.4.3.2 Disassembling the TANKO-CP3 device



Picture 7.4-4: Exploded diagram of the CP3 device

The item numbers shown in brackets refer to the Picture 7.4-4: Exploded diagram of the CP3 device.

1. Place the device on a cushioned surface.
2. Remove the cotter pin (10).
3. Remove the cleaning head (9) from the shaft (2).
4. ***NOTE*** Incorrect clamping in the vise can cause threaded connections to become jammed and deformed unintentionally!
   The threaded connection cannot be screwed and may become damaged.
   - The jaws of the vise must clamp too firmly and not directly in the area of the threaded connection being unfastened.
   - Clamp the device in the vise in such a way on the housing (3) that the threaded connection on the connection lid (5) does NOT become jammed.
   - Clamp the device in a vise by the housing (3) with the connection cover (5) upwards.
     We recommend that you use an adjustable pliers wrench with smooth jaws for the connection cover.
5. Unfasten and unscrew the connection cover (5) from the housing (3).
6. Remove the device from the vise.
7. Remove the inflow disk (1) from the housing (3).
8. Remove the shaft (2) from the housing (3).
9. Remove the sliding disk (7) and collar bushing (6) from the bottom section of the housing (4).
10. Push the plain bearing bushing (8) out through the drilled hole in the shaft (2) from below and remove it.
11. Clamp the housing assembly on the screw surface of the housing bottom section (4) in the protective jaws and release and unscrew the housing (3) from the housing base using a strap wrench or belt pipe wrench. This disassembly stage is only required for device maintenance.

The device is now completely disassembled. The individual parts can now be cleaned, e.g. in an ultrasound bath. Wear parts with signs of wear have to be replaced.

7.4.4 Assembling the Device

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 a vise with protective jaws, e.g. plastic or light metal, for clamping.*
- *Use only suitable tools which do not damage the surface.*
- *For assembly work, adhere to the specified tightening torque values (see Table 7.5-6: Torques CP2 Table 7.5-12: CP2S torque Table 7.5-17: Torques CP3).*

NOTE

Edge compression in the area of the wrench flats!

If workpieces are NOT grasped without play and in a protective manner by the flats during assembly/disassembly, then they are at risk of damage:

- *To avoid causing damage during assembly/disassembly work, use an adjustable wrench with parallel, smooth clamping jaws.*
- *Apply the clamping jaws of the adjustable wrench or pliers wrench to the flats without play so that they rest evenly across the surface and loosen or tighten the screwed part.*

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.

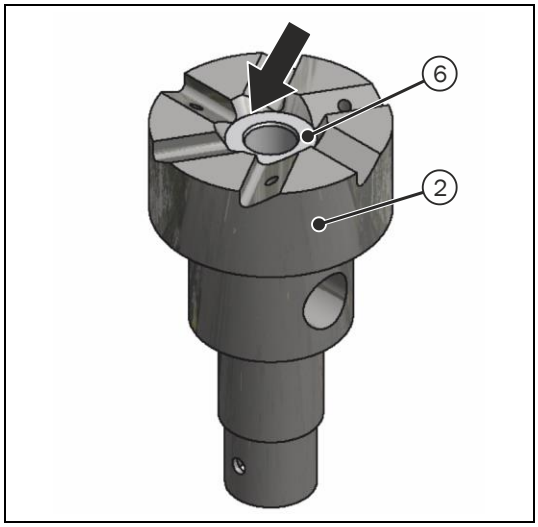
- *During assembly, make sure and check that there is no dirt or foreign objects in the device (e.g. small particles, sealing material).*

An assembly tool for installing the plain bearing bushing in the shaft can be obtained from AWH (see *Table 7.4-3: Assembly tool*).

7.4.4.1 Installing the TANKO-CP2 and CP2S device

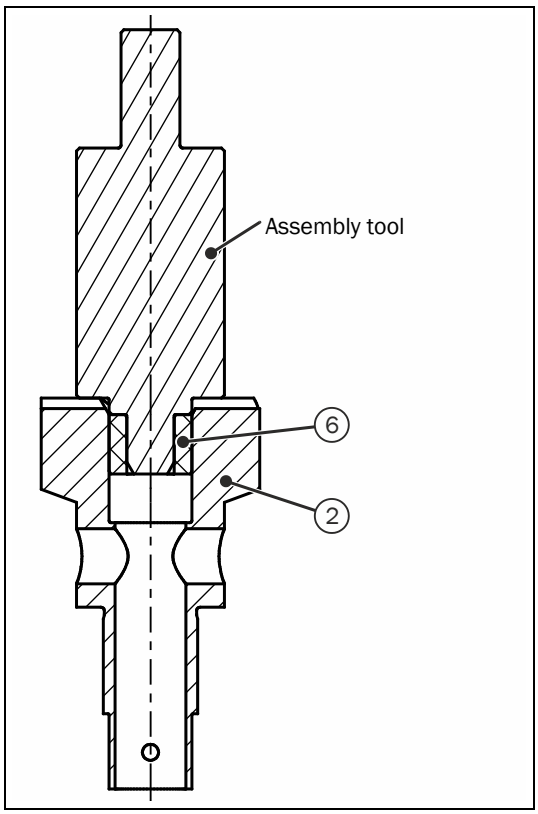
The item numbers shown in brackets refer to the Picture 7.4-3: Exploded diagram of device. The tools required for assembly/disassembly work are listed in section 7.4.2 Tools and Tightening Torque Values.

1. Connect the collar bushing (5) to the housing (3).



2. Connect the plain bearing bushing (6) to the shaft (2). Make sure that the plain bearing bushing is flush with the bottom edge of the chamfer in the shaft (see arrow) so that cleaning agent can flow into the inside of the shaft (2) without obstruction (see *Picture 7.4-6: Installation using assembly tool for plain bearing bushing CP2/CP2S*).

Picture 7.4-5: Position of the plain bearing bushing in the shaft



The assembly tool ensures that the plain bearing bushing (6) is pressed into the shaft (2) to the correct depth.

Picture 7.4-6: Installation using assembly tool for plain bearing bushing CP2/CP2S

3. Push the sliding disk (7) onto the shaft (2).
4. Insert the shaft (2), together with the sliding disk (7), into the housing (3) and into the collar bushing (5) from above.

5. Insert the inflow disk (1) into the plain bearing bushing (6) in the shaft (2) so that the inflow disk (1) rests flush on the support edge in the housing (3).
6. Screw a connection cover (4) into the housing (3).
7. Fasten the connection cover (4) with tightening torque as per *Table 7.5-6: Torques CP2 or Table 7.5-12: CP2S torque* .

Installing the Device

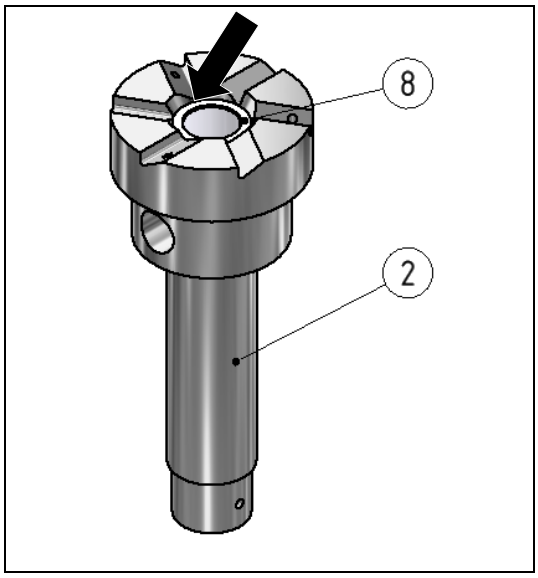
The device is fully assembled and is ready for installation (see *section 5.2 Installation*) on the plant.

7.4.4.2 Installing the TANKO-CP3 device

The item numbers shown in brackets refer to the Picture 7.4-4: Exploded diagram of the CP3 device.

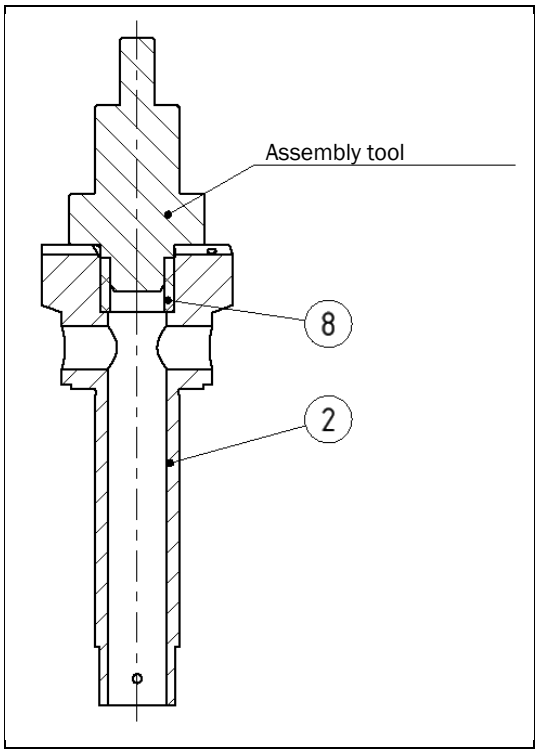
The tools required for assembly/disassembly work are listed in section 7.4.2 Tools and Tightening Torque Values.

1. Clamp the housing bottom section (4) with the screw surface into the protective jaws and screw in the housing (3) and tighten it with a strap wrench or belt pipe wrench (for torque setting, see *Table 7.5-17: Torques CP3*)
2. Connect the collar bushing (6) to the bottom section of the housing (4).



3. Connect the plain bearing bushing (8) to the shaft (2). Make sure that the plain bearing bushing is flush with the bottom edge of the chamfer in the shaft (see arrow) so that cleaning agent can flow into the inside of the shaft (2) without obstruction (see *Picture 7.4-8: Installation using assembly tool for plain bearing bushing CP3*).

Picture 7.4-7: Position of the plain bearing bushing in the shaft, CP3



The assembly tool ensures that the plain bearing bushing (8) is pressed into the shaft (2) to the correct depth.

Picture 7.4-8: Installation using assembly tool for plain bearing bushing CP3

4. Push the sliding disk (7) onto the shaft (2).
5. Insert the shaft (2), together with the sliding disk (7), into the bottom section of the housing (4) and into the collar bushing (5) from above.
6. Insert the inflow disk (1) into the plain bearing bushing (8) in the shaft (2) so that the inflow disk (1) rests flush on the support edge in the housing (3).
7. Screw a connection cover (5) into the housing (3).
8. Fasten the connection cover (5) with tightening torque as per *Table 7.5-17: Torques CP3.*

Installing the Device

The device is fully assembled and is ready for installation (see *section 5.2 Installation*) on the plant.

7.4.5 Notes on Cleaning

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

Comply with the following safety notes prior to cleaning.

WARNING

Hazard from corrosive or aggressive cleaning agents!

There is a risk of death or severe physical injuries.

- *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 excessive 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 materials of the device (e.g. seals, bushings).*
- *Do not use sharp objects (e.g. knives) or tools.*

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 flushing 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 after Removal:

Prior to cleaning, the device must have been removed from the container by an **expert** and disassembled into its individual parts. The safety instructions in *section 7.1 Safety Notes for Maintenance* must be observed.

Cleaning the device in a disassembled state 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 enter the groundwater, waterways or sewerage 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 turn them in for recycling.*

7.5 Spare Parts and Customer Service

Spare Parts and Wear Parts

The individual parts identified with a cross in *Table 7.5-1: TANKO-CP2 parts list*, *Table 7.5-7: TANKO-CP2S parts list* and *Table 7.5-13: TANKO-CP3 parts list* are included in the wearing parts kit, article number 66901000V0000. It can be purchased from AWH.

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

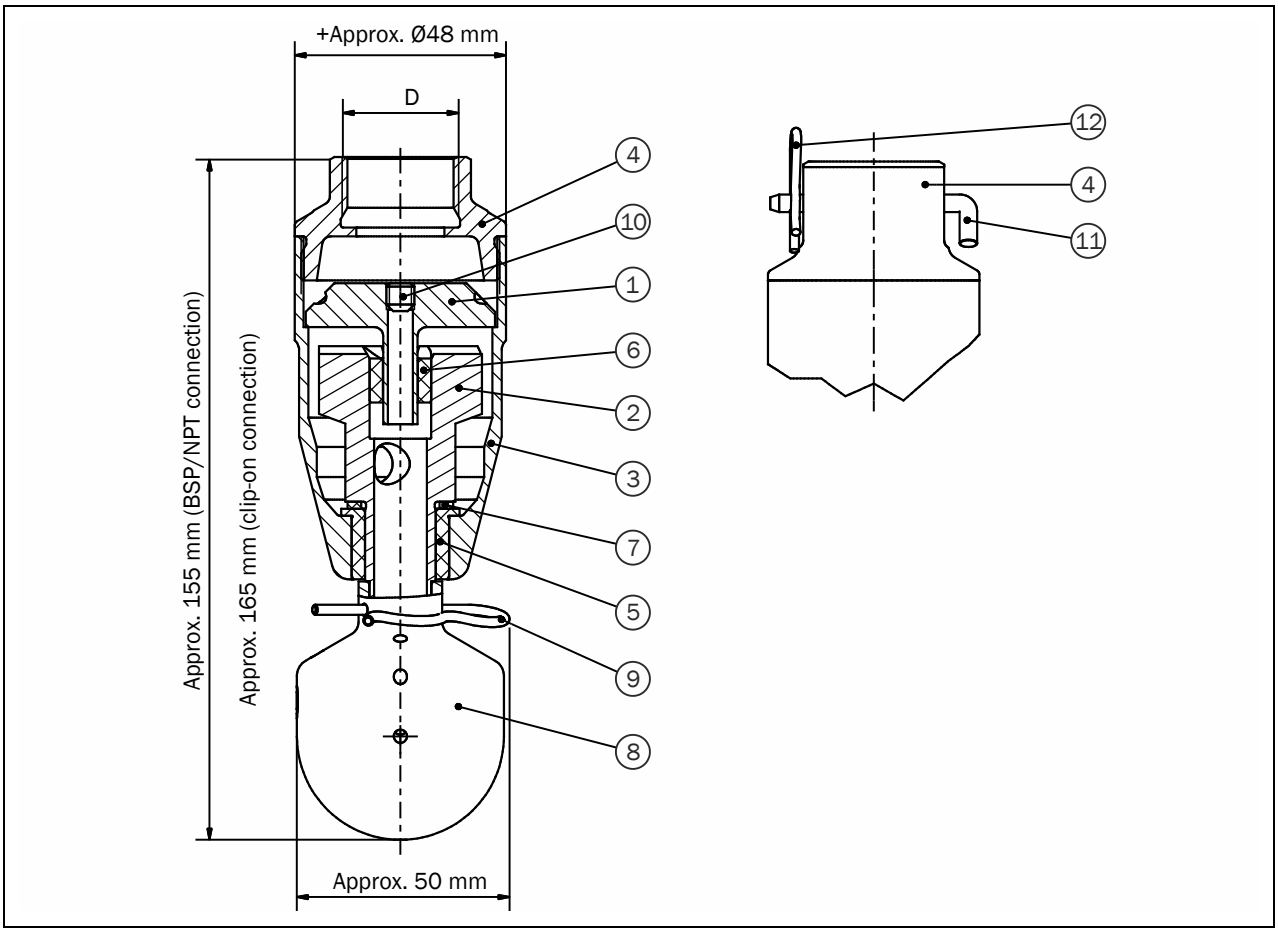
- Designation
- Article No.

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
Tel: +49 39405 92-0
E-mail info@awh.eu
Internet http://www.awh.eu

7.5.1 TANKO-CP2 spare parts



Picture 7.5-1: TANKO-CP2 design

Remark: The items marked “X” are included in the wear parts package and can be ordered.

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
1	1	6690100010020	Inflow disk	1.4404	
2	1	6690100020020	Shaft	1.4404	
3	1	6690100030020	Housing D48	1.4404	
4	1	see *Table 7.5-2*	Connection cover D48	1.4404	
5	1	66901000500K0	Collar bushing	PTFE (TFM)	X
6	1	1136	Plain bearing bushing	PTFE (TFM)	X
7	1	66901000700K0	Sliding disk	PTFE (TFM)	X
8	1	see *Table 7.5-3*	Cleaning head	1.4404	
9	1	664FSDN1220	Cotter pin DN12	1.4401	X
10	1	See *Table 7.5-4* and *Table 7.5-5*	Plug	1.4404	X
11*	1	6640C00210020	Connection pin d4.0	1.4404	
12*	1	66F0034800023	Cotter pin d2.0	1.4404	
–	–	66901000V0000	TANKO-CP2 wear parts package		

Table 7.5-1: TANKO-CP2 parts list

* Items 11 and 12 are only included in the clip-on connection variant and can be ordered from AWH as a set with the article no. 6640C01210020.

Options for connection

Item	Quantity	D	Article number	Designation	Material
4	1	BSP-IG 3/4" internal thread	6690178010320	Connection cover BSP 3/4"	1.4404
		NPT-IG 3/4" internal thread	6690178010420	Connection cover NPT 3/4"	1.4404
		25.7 mm	6690191010120	Clip-on connection cover D25.4	1.4404

Table 7.5-2: TANKO-CP2 connections

Cleaning Heads for different Spray Angles

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
8	1	6690100200020	Cleaning head 360°	1.4404	
		6690100230020	Cleaning head 180° upwards	1.4404	
		6690100250020	Cleaning head 180° downwards	1.4404	

Table 7.5-3: TANKO-CP2 cleaning heads

Plugs for Speed Control for threaded Connection

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
10	1	668100U0023M020	Plug d = 3.8	1.4404	X
		668100U00230020	Plug d = 0.0	1.4404	X
		668100U0023N020	Plug d = 4.0	1.4404	X

Table 7.5-4: Plugs for threaded connection TANKO-CP2

Plugs for Speed Control for clip-on Connection

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
10	1	668100U0023G020	Plug d = 2.6	1.4404	X
		668100U00230020	Plug d = 0.0	1.4404	X
		668100U0023C020	Plug d = 1.6	1.4404	X

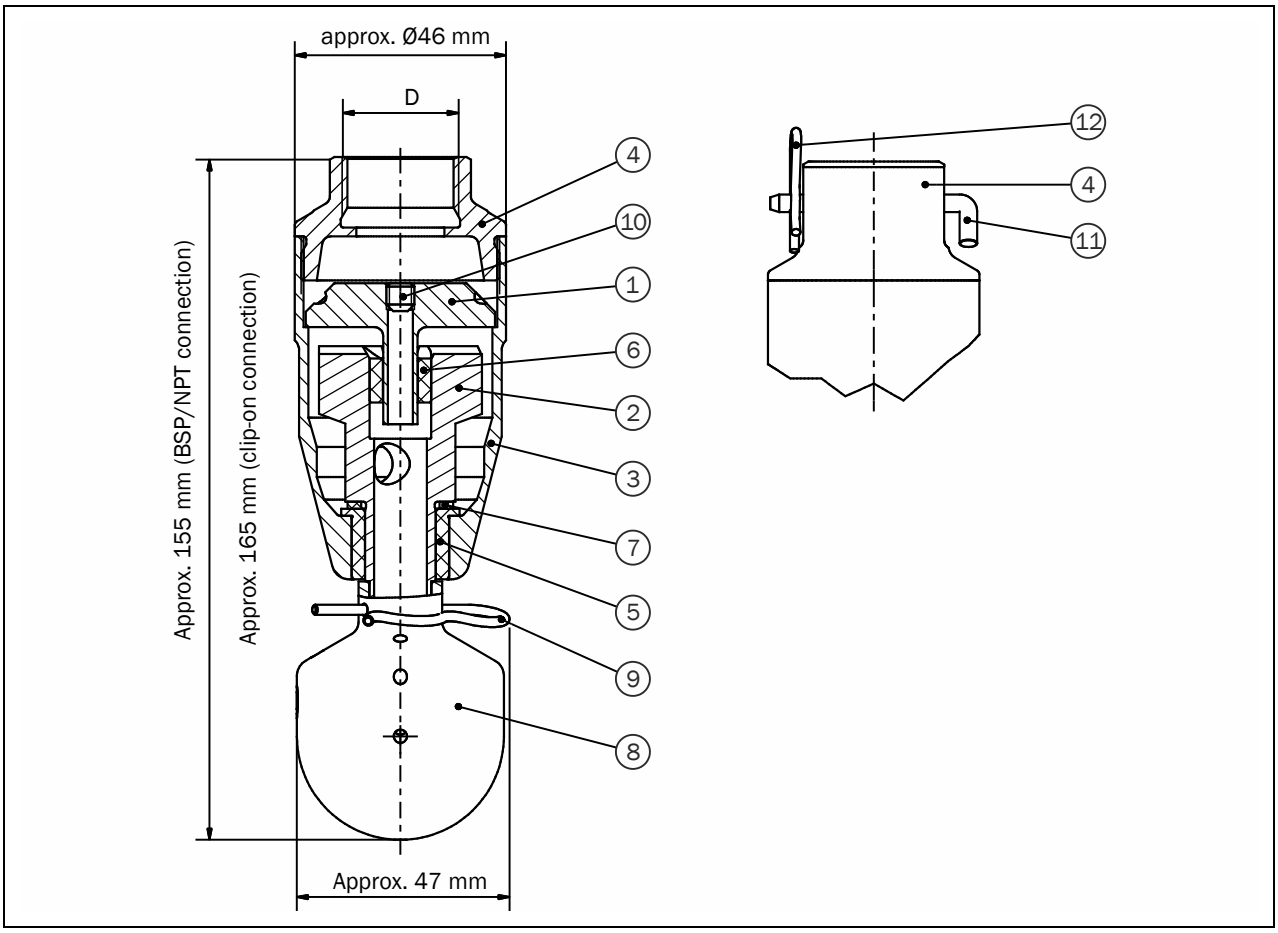
Table 7.5-5: Plugs for clip-on connection TANKO-CP2

Tightening torque values for screw connections

Position	Device	Thread	Tightening Torque [Nm]
Connection cover/housing	TANKO-CP2	M45 x 1	82
Inflow disk/Plug	TANKO-CP2	UNC 1/4-20	2.6

Table 7.5-6: Torques CP2

7.5.2 TANKO-CP2S spare parts



Picture 7.5-2: TANKO-CP2S design

Remark: The items marked “X” are included in the wear parts package and can be ordered.

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
1	1	669S100010020	Inflow disk	1.4404	
2	1	6690100020020	Shaft	1.4404	
3	1	669S100030020	Housing D46	1.4404	
4	1	see *Table 7.5-8*	Connection cover D46	1.4404	
5	1	66901000500K0	Collar bushing	PTFE (TFM)	X
6	1	1136	Plain bearing bushing	PTFE (TFM)	X
7	1	66901000700K0	Sliding disk	PTFE (TFM)	X
8	1	see *Table 7.5-9*	Cleaning head	1.4404	
9	1	664FSDN1220	Cotter pin DN12	1.4401	X
10	1	See *Table 7.5-10* and *Table 7.5-11*	Plug	1.4404	X
11*	1	6640C00210120	Connection pin d4.0 short	1.4404	
12*	1	66F0034800023	Cotter pin d2.0	1.4404	
–	–	66901000V0000	TANKO-CP2 wear parts package		

Table 7.5-7: TANKO-CP2S parts list

* Items 11 and 12 are only included in the clip-on connection variant and can be ordered from AWH as a set with the article no. 6640C01210020.

Options for connection

Item	Quantity	D	Article number	Designation	Material
4	1	BSP-IG 3/4" internal thread	669S178010320	Connection cover BSP 3/4"	1.4404
		NPT-IG 3/4" internal thread	669S178010420	Connection cover NPT 3/4"	1.4404
		25.7 mm	669S191010120	Clip-on connection cover D25.4	1.4404

Table 7.5-8: TANKO-CP2S connections

Cleaning Heads for different Spray Angles

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
8	1	669S100200020	Cleaning head 360°	1.4404	
		669S100230020	Cleaning head 180° upwards	1.4404	
		669S100250020	Cleaning head 180° downwards	1.4404	

Table 7.5-9: TANKO-CP2S cleaning heads

Plugs for Speed Control for threaded Connection

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
10	1	668100U0023M020	Plug d = 3.8	1.4404	X
		668100U00230020	Plug d = 0.0	1.4404	X
		668100U0023N020	Plug d = 4.0	1.4404	X

Table 7.5-10: Plugs for threaded connection TANKO-CP2S

Plugs for Speed Control for clip-on Connection

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
10	1	668100U0023G020	Plug d = 2.6	1.4404	X
		668100U00230020	Plug d = 0.0	1.4404	X
		668100U0023C020	Plug d = 1.6	1.4404	X

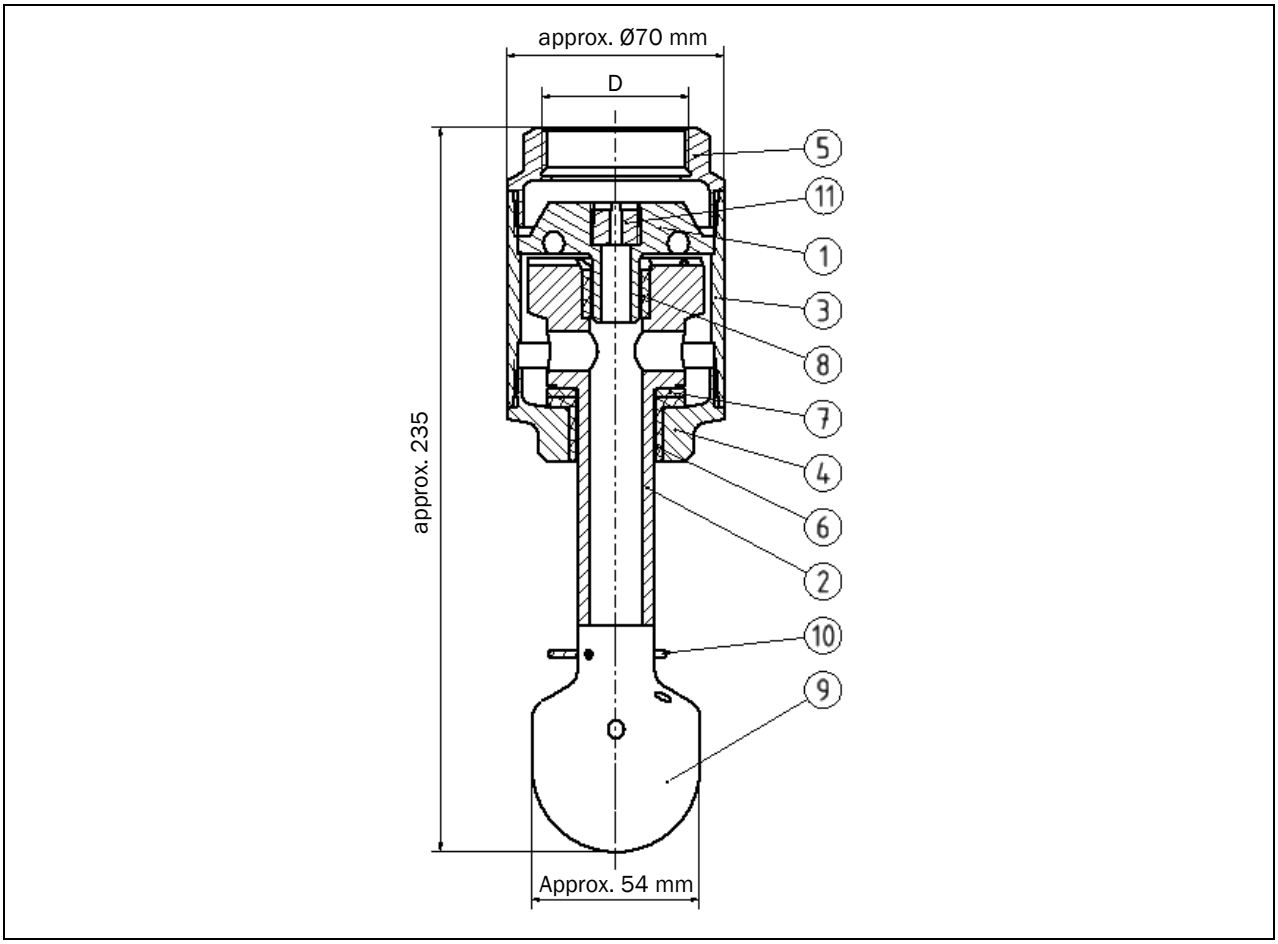
Table 7.5-11: Plugs for clip-on connection TANKO-CP2S

Tightening torque values for screw connections

Position	Device	Thread	Tightening Torque [Nm]
Connection cover/housing	TANKO-CP2S	M45 x 1	82
Inflow disk/Plug	TANKO-CP2S	UNC 1/4-20	2.6

Table 7.5-12: CP2S torque

7.5.3 TANKO-CP3 spare parts



Picture 7.5-3: TANKO-CP3 design

Remark: The items marked “X” are included in the wear parts package and can be ordered.

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
1	1	6690200050020	Inflow disk	1.4404	
2	1	6690200040020	Shaft	1.4404	
3	1	6690200010020	Housing	1.4404	
4	1	6690200020020	Housing bottom section		
5	1	see *Table 7.5-14*	Connection cover	1.4404	
6	1	66902000600K0	Collar bushing	PTFE (TFM)	X
7	1	66902000700K0	Sliding disk	PTFE (TFM)	X
8	1	1153	Plain bearing bushing	A200	X
9	1	see *Table 7.5-15*	Cleaning head	1.4404	
10	1	664FSDN1520	Cotter pin DN15	1.4401	X
11	1	see *Table 7.5-16*	Plug	1.4404	X
12*	1	66F0034800023	Cotter pin d2.0	1.4404	
–	–	66902000V0000	TANKO-CP3 wear parts package		

Table 7.5-13: TANKO-CP3 parts list

Options for connection

Item	Quantity	D	Article number	Designation	Material
4	1	BSP-IG 1 1/2"	6690281030320	Connection cover BSP 1 1/2"	1.4404
		NPT-IG 1 1/2" internal thread	6690281030420	Connection cover NPT 1 1/2"	1.4404

Table 7.5-14: TANKO-CP3 connections

Cleaning Heads for different Spray Angles

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
8	1	6690200200020	Cleaning head 360°	1.4404	
		6690200230020	Cleaning head 180° upwards	1.4404	
		6690281003320	Cleaning head 180° downwards	1.4404	

Table 7.5-15: TANKO-CP3 cleaning heads

Plugs for Speed Control for threaded Connection

Item	Quantity	Article number	Designation	Material	Wear Parts Kit
11	1	668500000230020	Plug d = 0.0	1.4404	X
		66850000023E020	Plug d = 2.0	1.4404	X
		66850000023N020	Plug d = 4.0	1.4404	X

Table 7.5-16: Plugs for threaded connection TANKO-CP3

Tightening torque values for screw connections

Position	Device	Thread	Tightening Torque [Nm]
Connection cover/housing	TANKO-CP3	M65 x 1.5	135
Housing / Housing bottom section	TANKO-CP3	M65 x 1.5	135

Table 7.5-17: Torques CP3

8 Faults

8.1 Safety Notes for Fault Clearance

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

WARNING

Risk of chemical burns and burns when opening the container!

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

There is a risk of death or severe physical injuries.

- ***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 injuries.

- *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
The cleaning head does not rotate and/or no fluid is expelled.	Pressure for the cleaning fluid is insufficient or no cleaning fluid pressure.	Set the pressure and volumetric flow rate to the standard values.
	The strainer/filter or spray holes are blocked.	Clean the strainer and filter. Remove the device and check for blocked spray holes or deposits. Check the volumetric flow rate of the device while the cleaning head is removed.
Spraying head does not rotate although enough cleaning fluid is flowing	The plain or running surfaces of the bearing have been damaged. Bushings and/or bearings are seizing.	Move the cleaning head by hand. In case of stiffness, internal damage may have been caused by a knock or blow. Replace faulty parts.
	Deposits or damage in the device	Check the bushings and/or bearings for wear, clean or replace them.

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 Hazardous Substance Directive (GefStoffV).

Request the form for the hazardous substance declaration from AWH.

8.3 How to Act in Case of an Emergency

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

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

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

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

Source:
- *DIN EN 60204-1 / VDE 0113-1 “Safety of machinery – Electrical equipment of machines – Part 1: General requirements”*
- *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, dismantled and disposed of in an environmentally friendly manner. Disposal must be performed in accordance with the respective valid local, national and international regulations.

WARNING

Danger due to improper removal from operation / disposal!

A risk of poisoning or irritation exists when using media that is hazardous to health, toxic or hazardous in any other way.

There is a risk of death or severe physical injuries.

- *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 Notes 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, the entire device must be properly:

– cleaned (see *section 7.4.5 Notes on Cleaning*) and

– disassembled into its assembly units and individual parts (see *section 7.4.3 Disassembling the Device*).

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

– 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 enter the groundwater, waterways or sewerage 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)

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Declaration for incorporation as per

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

We hereby declare that the container cleaning device

Name: **Jet cleaner**
Type: **TANKO®-CP2, TANKO®-CP2S, TANKO®-CP3**
Year of construction: **See type plate on the device**
Serial number: **See type plate on the device**

is consistent with the following essential health and safety requirements of Directive 2006/42/EC: 1.1.2 – 1.1.7, 1.3, 1.5.2 – 1.5.9, 1.5.15, 1.5.16, 1.6, 1.7.1 – 1.7.3, 1.7.4, 1.7.4.1, 1.7.4.2, 1.7.4.3.

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

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

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

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

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the guidelines.

Hötensleben, 9. June 2021

Thomas Erhorn (CEO)

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

Notes

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