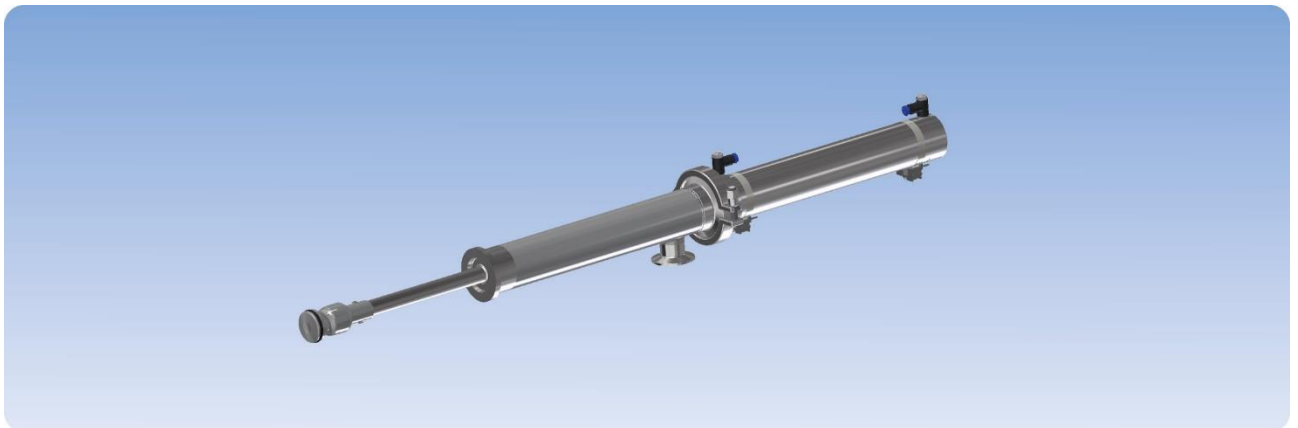

OPERATING/INSTALLATION INSTRUCTIONS

(Translation)



Retractor system TANKO[®]RT/TANKO[®]RTS

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NOTE



These instructions are an integral part of the device and must be available to operating and maintenance personnel at all times throughout its entire life cycle.

The safety instructions contained therein must be observed.

If the device is resold, the instructions must always be passed on 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 there are any discrepancies in the translated text, the original operating instructions (German) must be consulted for clarification, or the manufacturer must be contacted.

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Contents

List of Figures	II
List of Tables.....	III
Abbreviations and Units.....	V
1 Introduction	7
1.1 Means of representation.....	7
1.1.1 Explanation of signal words.....	7
1.1.2 Explanation of the warnings.....	8
1.1.3 Pictograms and symbols.....	10
1.2 Warranty and liability.....	11
1.3 Product names and trademarks.....	11
1.4 Related documents	11
2 Safety.....	12
2.1 Intended use.....	13
2.2 Spare parts, replacement parts and accessories	16
2.3 Duties of the owner	16
2.4 Personnel requirements.....	18
2.4.1 Personal Protective Equipment.....	20
2.5 Identification.....	21
2.5.1 Type plate	21
3 Design and function	22
3.1 Design	22
3.2 General function description	25
3.2.1 Functional Flow Chart	27
3.3 Technical Data	28
3.4 Cleaning media.....	32
4 Transport and storage	34
4.1 Packaging.....	35
4.2 Transport.....	35
4.3 Storage.....	36
5 Installation.....	37
5.1 Safety instructions for installation.....	37
5.2 Installation	39
5.2.1 Interfaces.....	40
5.2.2 Installation position	40
5.2.3 Installing the device.....	41
5.2.4 Assembling the Retractor with Process Connection: Clamp	43
5.2.5 Assembling the Retractor with Process Connection: Welding Joint.....	43
5.2.6 Welding the Combination Vessel Connector	44
5.2.7 Installation of the device with process connection: BioControl®	47

6 Start-up	49
6.1 Safety instructions for start-up	49
6.2 Function Check / Trial Run	51
6.3 Switch-on procedure.....	52
6.4 Operation	53
7 Maintenance	57
7.1 Safety instructions for maintenance	57
7.2 Switch-off procedure	60
7.3 Removal	62
7.3.1 Removing the device	63
7.4 Maintenance.....	66
7.4.1 Maintenance intervals.....	67
7.4.2 Tools and tightening torques.....	71
7.4.3 Replacing the O-rings, the central bearing, the piston ring and the damping ring....	72
7.4.4 Replacing the Spray Head.....	75
7.4.5 Notes on Cleaning.....	76
7.5 Spare parts and customer service	78
8 Faults	84
8.1 Safety instructions for troubleshooting.....	84
8.2 Faults and remedial action	86
8.3 What to Do in an Emergency	87
9 Putting the device out of service	88
9.1 Disposal.....	88
Index	90
Annexes	92

List of Figures

Figure 1.1-1: Overview of signal words	7
Figure 2.5-1: Type plate position.....	21
Figure 3.1-1: General Construction.....	22
Figure 3.1-2: Static Spray Head, Limit Dimensions for Holes	23
Figure 3.1-3: Example View of Welding Process Connection	24
Figure 3.3-1 Diagram - Flow Rate for Rotating Spray Head.....	30
Figure 3.3-2 Diagram - Flow Rate for Static Spray Head.....	30
Figure 3.3-3 Diagram - Range	31
Figure 5.2-1: Device interfaces	40
Figure 5.2-2: Self-Emptying of the TANKO-RT/RTS Depending on the Installation Position	41
Figure 5.2-3: Overview of Assembly Units.....	42
Figure 5.2-4: Combination Vessel Connector Standard Connection	45

Figure 5.2-5: Grinding	46
Figure 5.2-6: Container Seal.....	46
Figure 5.2-7: Special connection.....	47
Figure 7.3-1: Overview of Assembly Units.....	63
Figure 7.4-1: Maintenance points.....	69
Figure 7.4-2 Tools required for the TANKO-RTP/RTPS	71
Figure 7.4-3 Assembly tool 664MW01010050	72
Figure 7.4-4 Assembly tools assembly cone (A) and assembly anvil (B).....	72
Figure 7.4-5: Replacing the O-rings, the central bearing, the piston ring and the damping ring.....	73
Figure 7.4-6: Overview of Assembly of Central Bearing with Assembly Cone	75
Figure 7.4-7: Locking Pin Representation	75
Figure 7.5-1: Spare parts.....	79

List of Tables

Table 3.1-1: Dimensions.....	24
Table 3.1-2: Process connection, weights.....	25
Table 3.1-3: Connection variants	25
Table 3.3-1: General technical data.....	28
Table 3.3-2: Operating parameter, pneumatic side.....	28
<i>Table 3.3-3: Operating parameter, hydraulic side</i>	<i>29</i>
Table 5.2-1: Recommended Filler Materials	43
Table 7.4-1: Inspection and maintenance work.....	70
Table 7.4-2: Wear parts for replacing the O-rings, the central bearing, the piston ring and the damping ring	73
Table 7.5-1: Replacement Parts List, Wear Parts, Tightening Torques	80
Table 7.5-2: Pneumatic Cylinder Pipe Depending on Stroke	81
Table 7.5-3: Piston Rod Depending on Stroke	81
Table 7.5-4: O-Rings for Centering Adapter and Head.....	81
Table 7.5-5: O-Rings for Process Connection [PA]	81
Table 7.5-6: Centering Adapter	81
Table 7.5-7: Assignment of process and media connection	82

Table 7.5-8: Spray Head Overview	83
Table 7.5-9: Limit switch package.....	83
Table 8.2-1: Operational Disruptions – Cause and Remedy	86

Abbreviations and Units

Abbreviations

ATEX	AT mosphère EX plosible; synonym for the ATEX Directives of the European Union; comprises measures for explosion protection for explosive atmospheres
AWH	Armaturenwerk Hötensleben GmbH
AU	Assembly group
BetrSichV	Betriebssicherheitsverordnung (German industrial safety and health protection 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 equipment by employees at work
approx.	approximately
CIP	Cleaning in Place; a local (automated) cleaning process without dismantling plant components. Refers to 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 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.
EN	European Standard (Norm)
IP	Individual part
FDA	Food and Drug Administration (USA food and medication monitor regulation authority)
ISO	International Organization for Standardization
LE	Installation dimension. This installation dimension corresponds to the length from the lower edge of the process connection to the lower edge of the cleaning head.
MA [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
PA [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.
Ra	Average roughness value (dimension for surface roughness)
SI	Système international d'unités; the most widely used international system of units for physical values
SN	Serial number

TRBS	“Technische Regeln für Betriebssicherheit” (German technical rules for operational reliability and safety); these rules specify the details of the “Betriebssicherheitsverordnung” (BetrSichV = German industrial safety and health protection ordinance) with regard to the identification and assessment of hazards and the derivation of suitable measures.
TRGS	“Technische Regel für Gefahrstoffe” (German technical rules for hazardous materials); these rules reflect the state of the art, occupational medicine and occupational hygiene as well as other sound scientific knowledge for activities involving hazardous substances, including their classification and identification.
v_{eff}	effective vibration velocity
WP	Wear part
ASSY	Assembly

Units of Measure



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

bar	Unit of measure for pressure p [bar] All pressure [bar] specifications stand for positive pressure [bar _g] unless expressly described otherwise. Conversion: 1 bar = 14.50376... psi [pound-force per square inch]
°C	Unit of measure for temperature T [degrees Celsius] Conversion from Celsius to Fahrenheit: °C × 1.8 + 32 = °F [degrees Fahrenheit]
h	Unit of measure for time t [hour]
kg	Unit of measure for mass m [kilogram] 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 luminance intensity E _v [lux]
m	Unit of measure for length l [meter] Conversion: 1 m = 3.28083... ft [feet]
mm	Unit of measure for length l [millimeter] Conversion: 1 mm = 1/25.40005 in [inch] = 0.03937 in [inch]
Nm	Unit of measure for moment/torque M [newton meter] Conversion: 1 Nm = 0.737 lbft [pound-force feet]
rpm	Unit of measure for speed n [revolutions per minute] Conversion: 1 rev/min = 1 rpm [revolutions per minute]
µm	Unit of measure for length l [micrometer]
MΩ	Unit of measure for electrical resistance R [Mega Ohm = 1 million ohms]

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®RT/RTS retractor system (referred to hereinafter as the device).

The instructions must be read, understood, and applied by all persons assigned to carry out installation and assembly, start-up, maintenance, cleaning and troubleshooting of the device. This applies in particular to the safety instructions listed.

After studying the instructions, you will be able to

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

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

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

Download the instructions, if nec., from the website: <http://www.awh.eu/de/downloads>.

1.1 Means of representation

1.1.1 Explanation of signal words

The warnings are introduced by a signal word that describes the extent of the hazard. Their meaning and their classification in hazardous situations are explained in the following overview.

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

Figure 1.1-1: Overview of signal words

1.1.2 Explanation of the warnings

Section-Related Warnings

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



DANGER

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

Failure to observe it can result in death or severe physical injury.

- *Measure(s) to prevent the danger*



WARNING

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

Failure to observe it can result in 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 result in minor or moderate injury.

- *Measure(s) to prevent the danger*

NOTE

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

Failure to observe it can result in 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 the danger

Possible consequences in case of failure to observe

- Measure(s) to prevent the danger

Further Means of Representation



The Information symbol provides useful information, additional tips and recommendations.

- Texts that follow this mark are enumerations.
- Texts that follow this mark describe measures for avoiding the danger.
- 1. Texts that follow this numbering describe the first step of a task, followed by further numbered steps that have to be performed in the specified order.
- (1) Numbers in parentheses reflect the item numbers in figures 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 additionally highlighted in **bold type**, *italics* or CAPITAL LETTERS for individual words or phrases.

1.1.3 Pictograms and symbols

The following pictograms and symbols are used as an additional measures in warnings to clarify the sources of dangers and measures. They can appear at all danger levels.



Warning of electrical voltage



Warning of a potentially explosive atmosphere



Warning of hand injuries



Warning of a hot surface



Warning of corrosive substances



Warning about magnetic field



Warning about automatic startup



Warning about trapping/entanglement hazard



People with pacemakers must keep away



Unauthorized access prohibited



Warning of substances that pose a water hazard



Wear protective work clothing



Wear protective gloves



Wear safety goggles



Wear a hard hat



Wear hearing protection



Wear a welding mask



Isolate from power supply before work



Follow instructions



Wear safety shoes



Protective grounding connection required



Secure against power supply being switched back on



Return for recycling

1.2 Warranty and liability

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

Warranty and liability claims in case of personal injury and material damage shall be ruled out, 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, start-up, operation and maintenance of the device,
- failure to observe the notes in the instructions regarding assembly and installation, start-up, operation and maintenance of the device,
- constructional modifications to the device (conversions or other modifications to the device must not be made without the previous written approval from AWH. In case of infringement, the device will lose its EC conformity and the operating permit.),
- use of spare parts that do not comply with the specified technical requirements,
- improperly performed repairs,
- disasters, the effects of foreign matter and force majeure.

Disclaimer

AWH reserves the right to make changes to this document at any time and without prior notice. AWH provides no guarantee (neither explicitly 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 additional information to these instructions:

- Manufacturer's declarations 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 was built in accordance with state-of-the-art technology and the recognized safety rules. Nevertheless, the use of the device may still pose a danger to the life and limb of the user and third parties or a risk of impairments to the device and other objects of material value as a result of its function.

The following basic safety instructions are intended to prevent injury to personnel and material damage. The owner 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 that must be complied with.

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

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



WARNING



Failure to comply with these instructions, incorrectly performed installation and repair work or incorrect operation could lead to malfunctions at the device and to dangerous situations!

There is a risk of death or severe physical injury.

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



The figures in these instructions are intended to provide a basic understanding, and are primarily illustrations of the principles involved. They may deviate from the actual design of the device.



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

2.1 Intended use



DANGER



Risk of injuries from fire/explosion when using the device in an explosive atmosphere!
Use of the device in an Ex area (potentially explosive atmosphere) is PROHIBITED, UNLESS the device is expressly intended for said purpose.



There is a risk of death or severe physical injury.

- Follow the information on the **type plate** of the device (see [Section 2.5.1 Type plate](#)) and the **relevant operating instructions**.



WARNING

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

There is a risk of death or severe physical injury.

- Only use the device as intended.
 - Only use the device in accordance with the specifications contained in these instructions and the specifications on the device's type plate.
 - All 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 incorrect use of materials/media!***

The materials/media to be used for operation of the device as intended are procured and utilized by the owner of the device.

If unsuitable materials/media are selected, strong chemical reactions could result in fatal injury or severe physical injuries.

- *The proper selection and handling of these materials/media is the sole responsibility of the owner.*
- *When selecting the materials/media, 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 limits for use in the material data sheets.*
- *Adhere to the safety data sheets provided by the manufacturers of the materials and media, in particular for hazardous substances:*
 - *Comply with the hazard and disposal instructions.*
 - *Specify protective measures and compile operating instructions for hazardous substances.*
 - *This also applies to hazardous substances that may develop during work processes.*

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

The TANKO-RT/RTS retractor systems are used for the interior cleaning of pipelines, tanks, containers and barrels, with and without installations.

For the purpose of these instructions the word “container” refers to **enclosed, depressurized** tanks, silos, barrels, containers and pipes, etc. that are provided with an outlet that ensures a free flow of the supplied cleaning agent.

The possibility of using retractors is useful, particularly in situations where there is little space available for a cleaning device, due to projecting stirrers or other installations, or where critical products prevent permanent installation the device.

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 (food, chemical and pharmaceutical industries and low-germ processes). It must not be used for private purposes.

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 in a closed container.
- Never direct the cleaning jet or torrent from the device at persons.
- Protect the device from freezing (e.g. risk of frost from possible residual water).
- Use a suitable filter system in the cleaning medium supply line.
- Only operate the device within the approved parameters such as pressure and temperature (see [Section 3.3 Technical Data](#)).
- Only cleaning media that are compatible with the materials of the device (see [section 3.4 Cleaning media](#))
- The preferred installation position for the device is vertical with the cleaning head pointing downwards. Other installation locations (see [Section 5.2.2 Installation position](#)) are possible.
- The device could vibrate while the container is being cleaned. Any other vibrations must be avoided (see [Section 7.4.1 Maintenance intervals](#)).

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

- The device is NOT suitable for private use.
- The device is NOT suitable for use outside containers.
- The device is NOT suitable for ATEX applications.
- 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 penetrate the device. The spray holes/slits may become blocked. The free movement of the actuator could be obstructed.
- The device must NOT be operated with air over a long period, as the cleaning agent is used for lubrication of the bearings.

This device is intended exclusively for the purpose outlined above. Any other use beyond that described here or any conversion of the device without a written agreement with the manufacturer is considered IMPROPER use.

The manufacturer accepts NO liability for damage arising from such improper use. The owner bears the sole risk.

The device must not be put into operation until it has been assured that all the safety equipment is in fully working order 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 will put the functional safety and reliability of the device at risk.

There is a risk of death or severe physical injury.

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

- *Only use the manufacturer's original spare parts.*

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

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

Section [7.5 Spare parts and customer service](#) includes a list of spare parts.

2.3 Duties of the owner

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

In the EEA (European Economic Area), the national implementation of the Framework Directive (89/391/EEC) on taking 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.

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

As a basic rule, in Germany the Industrial Safety and Health Protection Ordinance (BetrSichV) must be observed.

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

The following, non-exhaustive instructions apply in particular:

- The owner must ensure that the device is used only as intended (see [Section 2.1 Intended use](#)).
- The owner must keep himself informed of the locally applicable occupational health and safety regulations and, in addition, use a hazard assessment to determine the hazards resulting from the specific working conditions at the location of use of the device. These must then be implemented in the form of operating instructions for operation of the device.

- When using hazardous materials, protective measures must be specified in accordance with the safety data sheets and operating instructions must be compiled for hazardous materials. Personnel must be instructed accordingly. This also applies to hazardous substances that may develop during work processes.
- A continuous hazard 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 owner 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.
- For installation of the TANKO-RT/-RTS in a plant, the operating company must guarantee safe access using steps, platforms and rails in accordance with DIN EN 14122-1-3.
- The operating company must ensure that there is a clearance of 1 m around the machine for installation, maintenance, repairs and cleaning purposes.
- The owner must ensure that all employees handling the device have read and understood the instructions.
Furthermore, he must provide personnel with training at regular intervals with certification and inform them of the hazards.
- The owner 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 owner must provide personnel with personal protective equipment and make sure that this is used (see [Section 2.4.1 Personal Protective Equipment](#)).
- The owner 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 owner is responsible for making sure that the device is only ever operated in perfect condition.
- Wherever high pneumatic pressures develop, there is a possibility of sudden failure of or damage to the lines and connections. This poses a hazard risk. The owner 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 repairs.
- The owner must design the disconnection of the energy sources on the higher-level plant technically in such a way that the switch-off procedure described in [Section 7.2](#) can be adhered to.
- The owner must define and adhere to the intervals for inspections and control measures in accordance with the environment and media used.
- The operating company must provide fire safety devices, e.g. the appropriate quantity of suitable hand-held fire extinguishers of the appropriate size, in easily accessible places and provide employees with training in fire safety.
- Warnings in the documentation of externally supplied assembly groups must be adhered to and incorporated into the hazard assessments for the specific workplace.
- The owner must ensure that the permitted operating parameters (see [Section 3.3 Technical Data](#)) are not exceeded.

Connections:

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

- The hydraulic connections must meet the requirements of DIN EN ISO 4413 and the pneumatic connections must meet the requirements of DIN EN ISO 4414.
- The grounding measures must be implemented and checked prior to start-up of the device, including the container.

2.4 Personnel requirements

The device may only be operated, serviced and repaired by persons with the appropriate qualifications. These persons must be familiar with the 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 him to carry out work on the device and identify and avoid potential risks independently.

Instructed Person

An instructed person has been instructed and, if necessary, trained by the owner or an expert in a briefing on the assigned tasks and possible hazards in the event of improper action, and instructed on the necessary safety equipment and protective measures.

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

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

Work performed in the other areas, i.e. **transport, storage, operation and disposal**, must be performed exclusively by personnel who have been given suitable instructions.

All persons 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 tight-fitting sleeves and without protruding parts. It is mainly used for protection against becoming entangled in moving components. Do not wear any rings, necklaces or other jewelry.



Safety shoes

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



Protective gloves

Wear protective gloves to protect your hands against friction, grazes, getting pierced 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 parts.



Hard hat

Wear a hard hat for protection against falling or flying parts.



Hearing protection

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



Welding mask

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

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

Furthermore, both the national regulations and, if nec., internal instructions by the owner must be observed.

2.5 Identification

2.5.1 Type plate



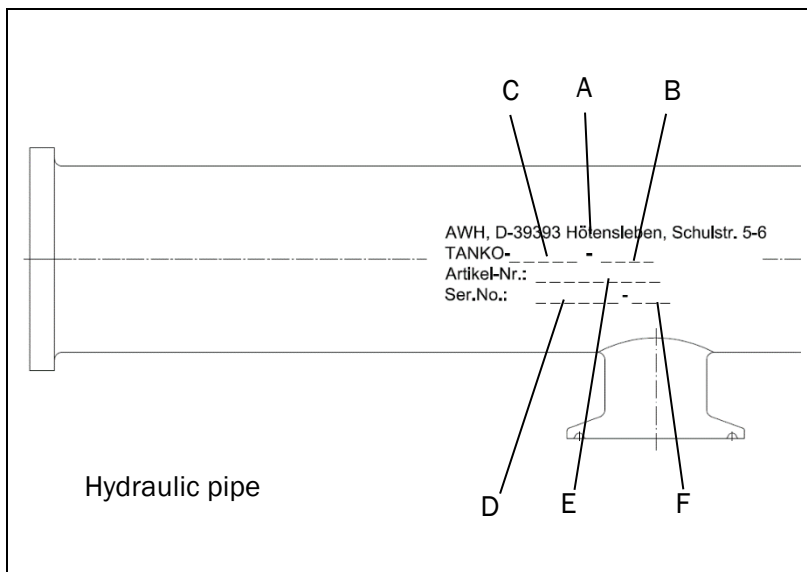
The specifications only apply to devices with types indicated on the cover sheet of these instructions.

Example: Retractor system

TANKO – RT250 PA-C2" MA-C25 V CA

- 1) Brand of the cleaning devices **TANKO**
- 2) Type: **Retractor**
- 3) Stroke: **250 mm (100, 150, 500)**
- 4) **PA** (process connection): **Clamp, 2" (DIN 32676)**
(Clamp 2.5", Clamp 3", Weld 2", Weld 2.5",
Weld 3", Combination Adapter 3")
- 5) **MA** (media connection): **Clamp, DN25**
- 6) O-ring: **FKM (e.g. Viton®)**
(EPDM)
- 7) Head type: **Clipon type A**
(Clipon type B, Clipon type C, Clipon type D)

Labeling is applied to the device according to the following illustration.



- A) Manufacturer
- B) Year of manufacture
- C) Type, stroke
- D) Article number
- E) Serial number (internal plant number)
- F) Sequential number

Figure 2.5-1: Type plate position

3 Design and function

3.1 Design

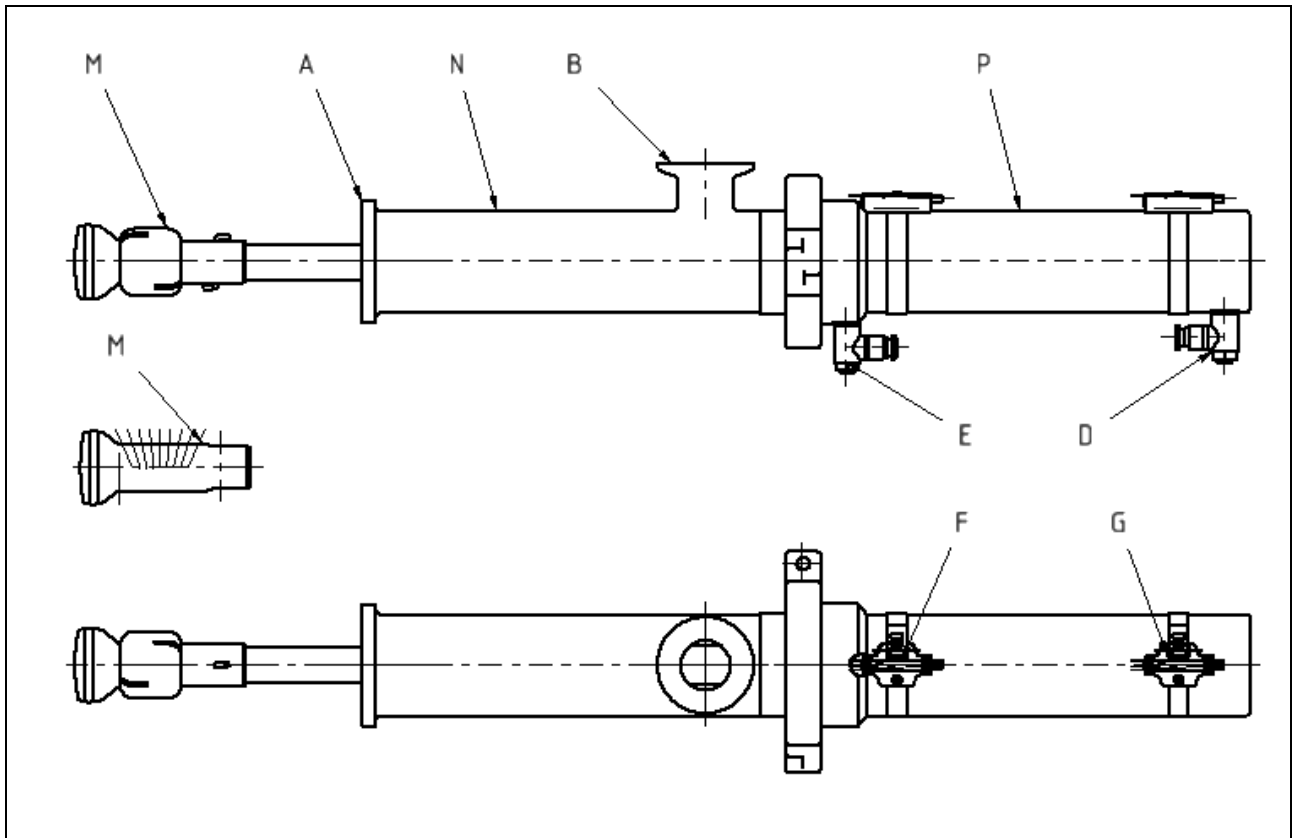


Figure 3.1-1: General Construction

The pneumatically driven cleaning devices TANKO-RT-100/150/250/500 and TANKO-RTS-100/150/250 (anti-twist version) consist of the following main components

- A Process connection [PA]
- B Media connection [MA] (cleaning agent feed)
- D Pneumatic connection Compressed air supply "extend power cylinder"
- E Pneumatic connection Compressed air supply "retract power cylinder"
- F Power cylinder "extended" limit switch
- G Power cylinder "retracted" limit switch
- N Hydraulic pipe for holding the spray head
- M Spray head, rotating type A, B, C, or D / alternative static spray head type S on TANKO-RTS anti-twist version
- P Power cylinder, pneumatic actuator with two limit switches (position: open/closed)

The power cylinder forms the pneumatic part.

The compressed air supply to the power cylinder is via two throttle check valves. These are attached to the outside of the power cylinder.

At the connection point between the pneumatic pipe / hydraulic pipe, there is a 2 ½" clamp connection to connect the two parts of the device.

The hydraulic section consists of the hydraulic pipe with process connection [PA] and media connection [MA]. The hydraulic pipe contains the centering adapter for holding the spray head and supplying the cleaning medium.

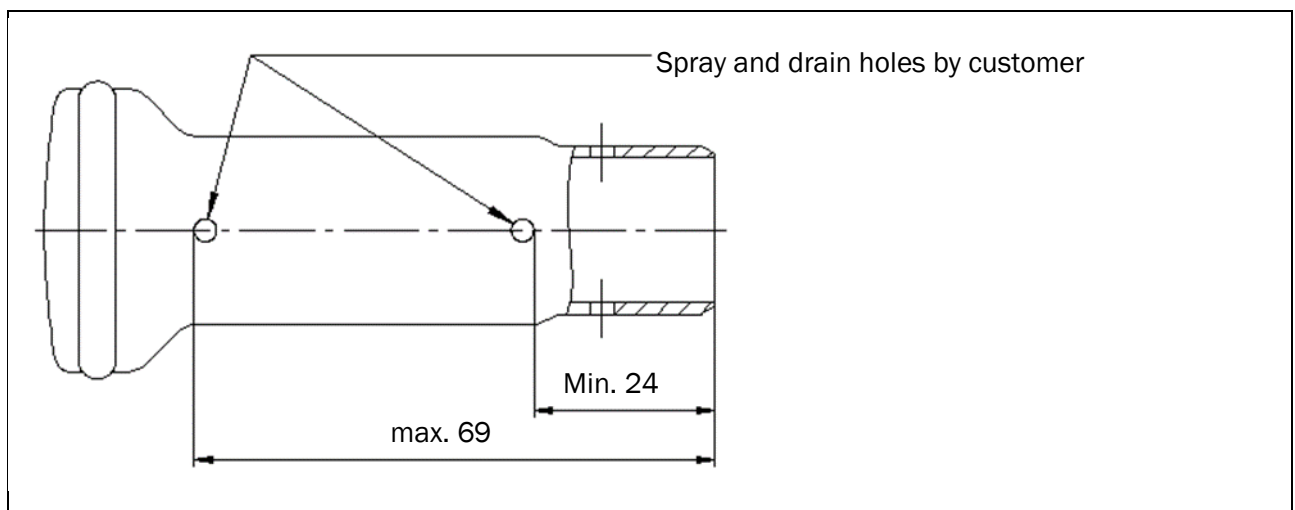
On the hydraulic pipe for mounting the spray head, there is a process connection that enables the device to be fastened to the intended container.

The connection of the piston rod to the centering adapter is implemented using a clipon connection via a wire locking pin.

There are 5 variants of the spray head, type A, B, C, D and S. Types A, B, C and D are rotating spray heads and vary in the width of the spray slit and therefore in use (see [Figure 3.3-1](#)). The spray angle of types A to D is 270° in the direction of the retractor system. Type S is a static spray head which, that is suitable for use in combination with the TANKO-RTS retractor system a targeted area of a specific area in the container. Due to the shape of the head and the closing function of the retractor, the area in front of the spray head is not sprayed with cleaning agent.

Static Spray Head

The static spray head is shown in [Figure 3.1-2](#) as a blank without spray or drain holes. The number, position, alignment and diameter of the holes are to be specified by the user according to requirements. The number and diameter must be specified in such a way that the maximum flow rate of 10 m³/h is not exceeded at the maximum medium pressure of 8 bar.



[Figure 3.1-2: Static Spray Head, Limit Dimensions for Holes](#)

The spray head is connected to the piston rod by a locking pin.



The TANKO-RT/-RTS is designed and constructed in such a way that it requires no lubrication.

The device is made of stainless steel and has been developed, designed and built exclusively for industrial and commercial use. Several versions of the device are available for different applications and container dimensions.

Application examples of the TANKO-RT and TANKO-RTS retractors

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

Dimensions and Weights

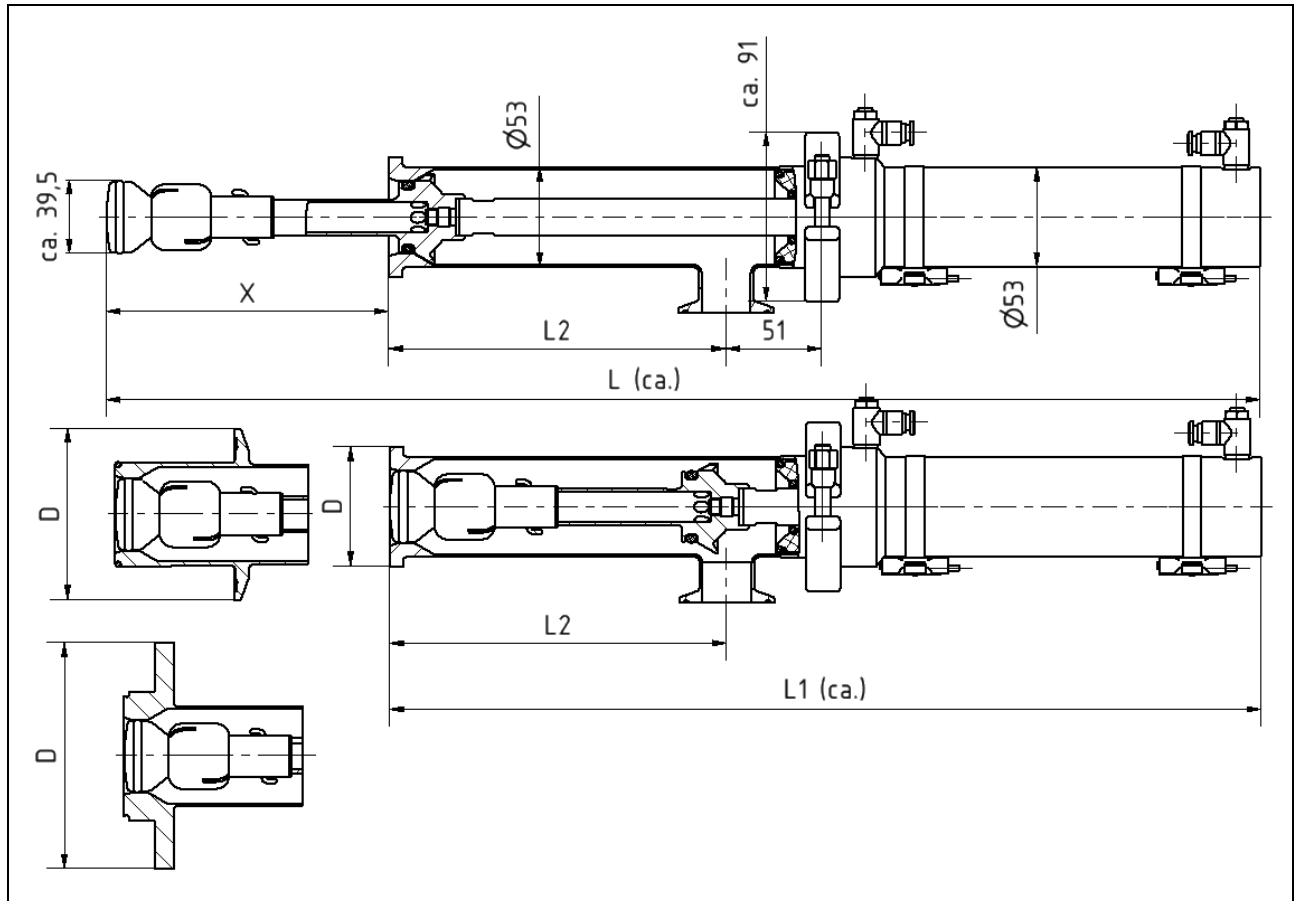


Figure 3.1-3: Example View of Welding Process Connection

Dimensions in accordance with Figure 3.3-1	Stroke 100	Stroke 150	Stroke 250	Stroke 500 TANKO-RT only
L [mm]	463	613	913	1663
L1 [mm]	363	463	663	1163
L2 [mm]	180	230	330	580

Table 3.1-1: Dimensions

Process connection [PA]			Weights [kg] with stroke length in [mm]			
Designation	D [mm]	DN	Stroke 100	Stroke 150	Stroke 250	Stroke 500
Clamp (DIN 32676)	Ø 64.0	2"	3.2	3.5	4.3	6.0
	Ø 77.5	2.5"	3.3	3.6	4.3	6.1
	Ø 91.0	3"	3.4	3.7	4.4	6.2
Weld-in connector	Ø 50.7	2"	3.2	3.5	4.3	6.0
	Ø 63.4	2.5"	3.3	3.6	4.3	6.1
	Ø 76.1	3"	3.4	3.7	4.4	6.2
Combination adapter C3	Ø 91.0	3"	3.4	4.5	5.2	6.2
– Combination vessel connectors with clamp			1.9	1.9	1.9	1.9
Flange for NEUMO BioControl®	Ø 120.0	65	3.6	3.9	4.7	6.4

Table 3.1-2: Process connection, weights

Connection variants

Process connection [PA]	Size	Stroke							
		100 mm		150 mm		250 mm		500 mm	
		CT	RTS	CT	RTS	CT	RTS	CT	RTS
Clamp connection based on DIN 32676	2"	X	X	X	X	X	X	X	X
	2.5"	X	X	X	X	X	X	X	X
	3"	X	X	X	X	X	X	X	X
Weld-in connector	2"	X	X	X	X	X	X	X	X
	2.5"	X	X	X	X	X	X	X	X
	3"	X	X	X	X	X	X	X	X
Combination adapter C3	3" (DN65)	X	X	X	X	X	X	X	X

Table 3.1-3: Connection variants

3.2 General function description



The item numbers shown in brackets refer to the Figure 7.5-1; the letters in brackets refer to the Figure 3.1-1.

The basic principle of the retractor is separation between the rest position (closed construction, the spray head M is located in the hydraulic pipe N and therefore outside the container to be cleaned) and cleaning mode (the spray head is extended into the container for cleaning). This movement is actuated by a pneumatic cylinder (power cylinder P).

At the central bearing, a seal to the piston rod and the housing wall ensures a complete separation of the actuator and cleaning areas.

The housing of the retractor (hydraulic pipe) is permanently installed on the container that needs to be cleaned. When closed (e.g. during the production process), the spray head (M) is in the housing and creates a seal together with the tank wall and the connector.

If the retractor system is used within the operating area of internal fittings, i.e. if there is a possibility of collision between the extended spray head and moving internal fittings in the container, safe operation of the retractor system is only possible with additional protection measures. The operator should also conduct a hazard or risk assessment to identify and implement the functional requirements for the retractor system controller, and, if necessary, additional monitoring equipment on the container to prevent collisions between the spray head and any internal fittings. The following functions and associated monitoring must be ensured:

- Air pressure loss; the container with the retractor system must be removed for safety reasons.
- The rest position of moving internal fittings must be defined and monitored.
- When you switch off the cleaning medium, you should reckon with a run-on time of 1 minute until the spray head comes to a stop. The spray head should only be retracted after this time.
- The process may only be started again after completing a cleaning process if the power cylinder of the TANKO-RT/-RTS is in the retracted (closed) position.
- When the retractor system is in rest position (power cylinder in “retracted” position, G1 signal) and during operation of the plant, compressed air must be present at the pneumatic connection E on the power cylinder (retract power cylinder).

The operating company's control system must ensure that cleaning mode can be started only if the moving installations, in whose operating range the spray head moves, in the plant are in their rest position and are secured against being turned on again.

If this requirement is met, the piston rod with the spray head attached to it moves into the container to the end position when the process for cleaning the power cylinder is started. The cleaning agent that subsequently flows into the hydraulic pipe creates a barrier effect in the interior of the pipe which, together with the flow-through of the medium, triggers the rotation of the spray head. The static spray head stays in position and does not rotate.

This process uses the proven principle of the spate cleaner. The cleaning device sprays the interior surface of the container with the cleaning agent. The material to be disposed of is loosened, dissolved and drained away.

After completion of the cleaning process, the retractor can be blown dry to remove any residual fluid. The blow-out time should be 0.5 - 1 minute, and should not exceed 1 minute. The maximum pressures for this (see [Table 3.3-3: Operating parameter, hydraulic side](#)) may not be exceeded. The spray head then returns completely into the housing and an O-ring creates a complete seal to the interior of the container.

The program sequence for these movements must be defined in the customer control system.

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.

General Technical Data

Designation	TANKO-RT/RTS
Ambient temperature (permitted): outside the container	
– During the cleaning process	+ 5 °C (+ 41 °F) to + 40 °C (+ 104 °F)
– In idle state	- 10 °C (14 °F) to + 40 °C (+ 104 °F) NOTE Risk of frost!
Operating pressure range in the container to be cleaned	
- During the cleaning process	0.0 to 0.5 bar (0.0 to 7.25 psi g)
- In idle state	- 1.0 to 3.0 bar (- 14.5 to 43.5 psi g)
Installation dimensions:	see Figure 3.1-3 with Table 3.1-1 and Table 3.1-2
Plant noise level:	L _{pA} max. = 70 dB(A)
Materials:	
– in contact with media	1.4401, 1.4430, 1.4435, PTFE-TMOF-0040, EPDM, optional: FKM (e.g. Viton®), FFKM alternative materials in line with customer order, see supplementary “Special version” sheet
– other	1.4301, 1.4404, PU, EPDM optional: FKM (e.g. Viton®), Al

Table 3.3-1: General technical data

Technical Data for pneumatic side

Designation	Retractor system TANKO-RT/RTS
Actuator:	Pneumatic (compressed air)
Drive medium:	Dry, oil-free compressed air (if necessary, install corresponding upstream maintenance unit)
Operating pressure	
– Range	min. 5 bar (72.5 psi g) – max. 6 bar (87 psi g)
– Recommended	6 bar (87 psi g)
Connection:	
– Power cylinder	Internal thread G 1/8 ISO 228-1 throttle check valve for hose external Ø = 6 mm,

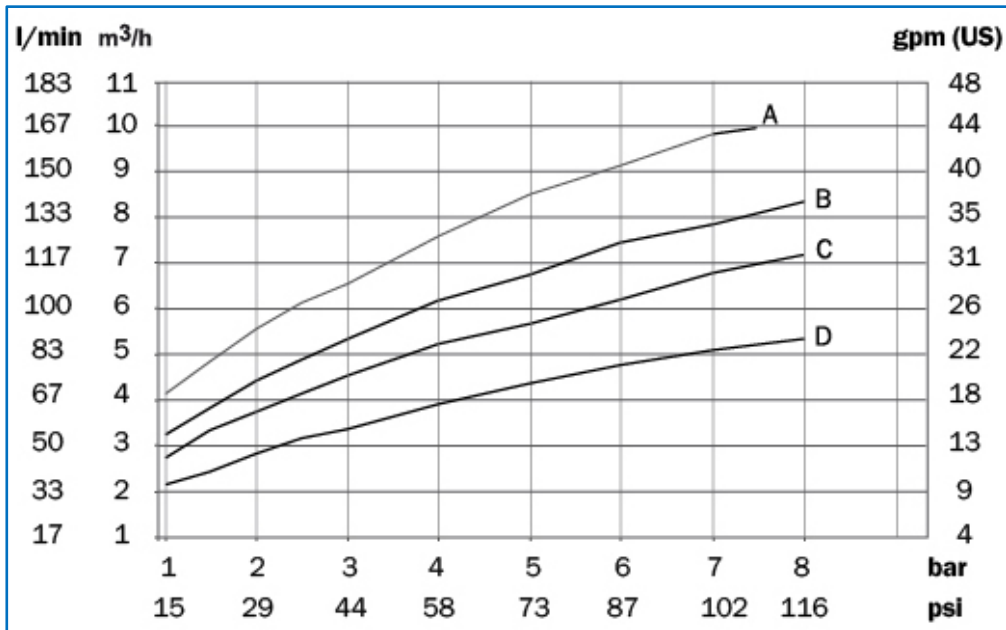
Table 3.3-2: Operating parameter, pneumatic side

Technical data for hydraulic side

Designation	TANKO-RT/RTS
Range	see Figure 3.3-3
Operating temperature (permitted): – Cleaning medium	+ 5 °C (+ 41 °F) to + 95 °C (+ 203 °F)
Ambient temperature (permitted): In the container to be cleaned – During the cleaning process	+ 5 °C (+ 41 °F) to + 95 °C (+ 203 °F)
– Rest state O-ring material EPDM O-ring material FKM and FFKM	- 20 °C (- 4 °F) to + 130 °C (+ 266 °F) - 15 °C (+ 5 °F) to + 140 °C (+ 284 °F)
Operating pressure, cleaning medium – Liquid medium – Gaseous medium (air or nitrogen)	1 – 8 bar (14.5 – 116 psi g) Recommended 3 - 5 bar / 43.5 – 72.5 psi. 1 bar (14.5 psi g), max. 1 min 0.5 bar (7.25 psi g), max. 2 min
Volume Flow Rate (depending on spray head type)	See Figure 3.3-1 and Figure 3.3-2
Rotation speed: – with water – with air	500 – 2,000 rpm 900 – 2,000 rpm
Process connection [PA]:	see Table 3.1-2 and Table 3.1-3
Media connection [MA]:	Clamp DN25, DIN 32676 Adapter on 1" clamp connection series C DIN 32676 possible.

Table 3.3-3: Operating parameter, hydraulic side

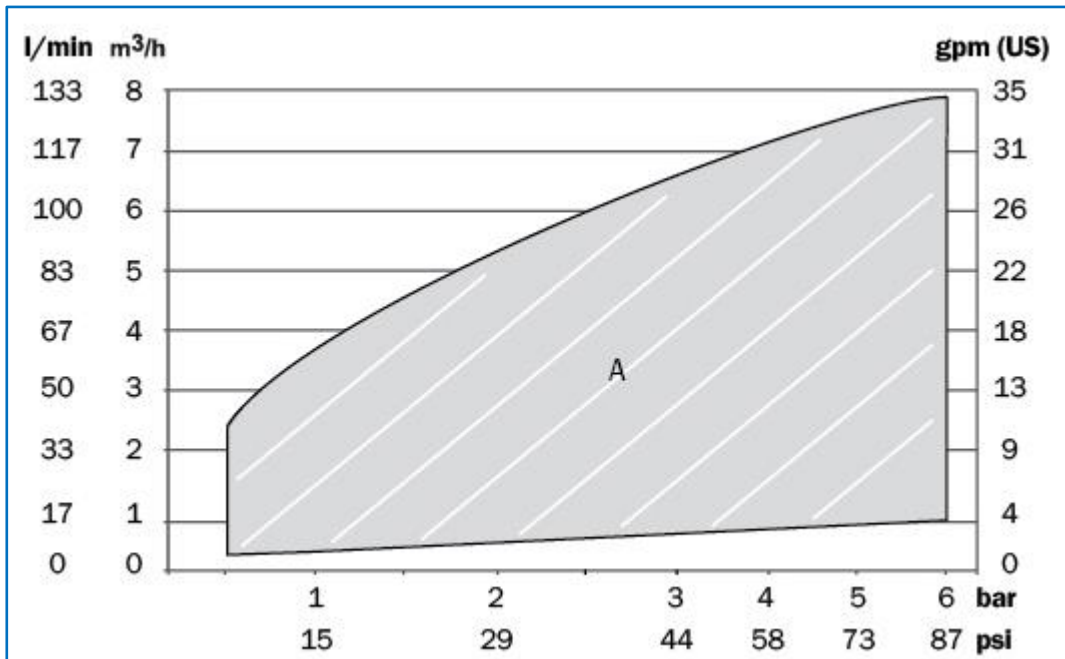
Consumption Data – Rotating Spray Head



- A** – Head type “CD” 270°
- B** – Head type “CC” 270°
- C** – Head type “CB” 270°
- D** – Head type “CA” 270°

Figure 3.3-1 Diagram - Flow Rate for Rotating Spray Head

Consumption Data – Static Spray Head “CS”



- A** – Usable flow rate

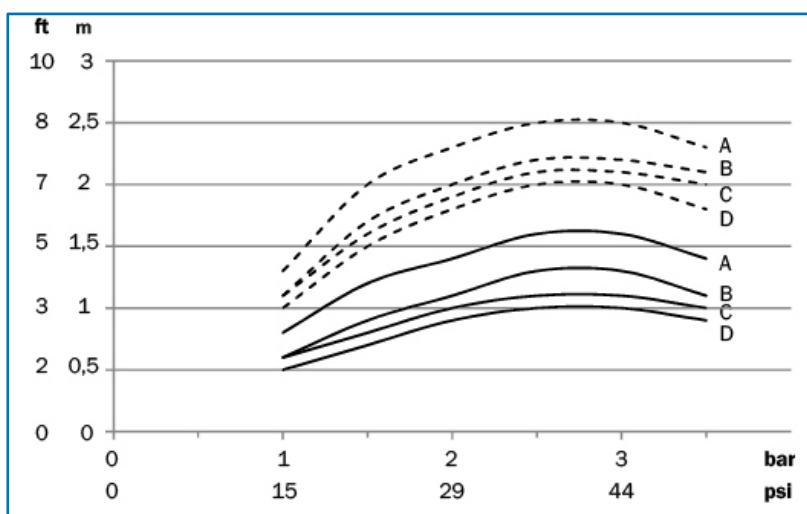
Figure 3.3-2 Diagram – Flow Rate for Static Spray Head

Consumption Data and Operating Pressure for the Cleaning Process:

The specified values for consumption in the charts are average values and may fluctuate by approx. $\pm 10\%$ in normal operation. They apply to operation with clear water as the cleaning agent at a temperature of + 25 °C/+ 77 °F. The values may differ if a different cleaning agent or temperature is used.

The consumption of cleaning fluid in TANKO-RT/-RTS devices depends on multiple factors, e.g. the pressure of the cleaning fluid and the size of the spray openings. An increase in pressure leads to increased consumption (throughput). The permitted range for the operating pressure of the cleaning medium must be adhered to.

Range of the Cleaning Fluid



A – Head type “CD” 270°

B – Head type “CC” 270°

C – Head type “CB” 270°

D – Head type “CA” 270°

--- Wetting radius

— Cleaning radius

Figure 3.3-3 Diagram - Range

Surfaces

Exterior surface

Metal bright/polished

Interior surfaces in contact with the product

Ra < 0.8 μm

3.4 Cleaning media

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

The owner bears the sole responsibility for the type of cleaning media, their use and handling.

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



DANGER



Explosion hazard due to ignition source!

An existing explosive atmosphere could be ignited.

There is a risk of death or severe physical injury.

- The following items are **PROHIBITED** for use as cleaning media:
 - 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 can form a dangerous explosive atmosphere.
 - Aggressive, flammable or explosive fluids (e.g. acids, thinners or similar).
- Observe electrostatic charges when handling fluids.



WARNING



Warning of corrosive and aggressive cleaning medium!

There is a risk of death or severe physical injury.

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

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

 **CAUTION**

Danger as a result of using incorrect cleaning media!

The cleaning media must be approved for all of the materials of the device (e.g. seals, bushings) and for the substances to be cleaned in the container that come into contact with it.

There is a risk of minor or moderate injuries.

- The following are **PROHIBITED** for use as cleaning media:
 - Cleaning media containing solids or liquids with solid particles or solid content (e.g. abrasives) which can lead to increased wear and/or blockages of the spray holes/slits.
 - 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)
 - moderately 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 medium!

Dirt or foreign matter in the cleaning medium can have a negative effect on the functional availability of the device.

There is a risk of material damage and consequential damage.

- Use a suitable filter system in the cleaning medium supply line. The use of a filter with a filtration effect corresponding to a mesh width of 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 Media are Permitted for Use for Container Cleaning:

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

4 Transport and storage

AWH products are checked carefully before they are dispatched, and are packaged in accordance with the respective transport 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 that 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

- Retractor type TANKO-RT-100, -RT-150, -RT-250 or -RT-500, including rotating spray head (or static spray head), 2 sensors incl. brackets, 2 throttle check valves, or retractor type TANKO-RTS-100, -RTS-150, -RTS-250, including static spray head (or rotating spray head), 2 sensors incl. brackets, 2 throttle check valves
- The scope of delivery of the combination adapter C3 process connection continues to include 1 combination vessel connector C3 plus bracket
- Operating instructions
- Technical documents in accordance with the order (e.g. instruction for motor, certificates and reports)
- Manufacturer's declaration

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 any 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 transport. 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 adapted to the transport conditions. Required accessories, spare parts, operating or installation instructions and technical documents are packed 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 frequently be re-used or processed and recycled practically.

Improper disposal can cause environmental damage.



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

4.2 Transport

NOTE Improper transport can result in damage to the device.

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

- Observe the symbols and instructions on the packaging.
- Always transport the device in dry condition.
- Do not transport the device at a temperature below -25°C (-13°F).
- Protect the device from impact.
- If possible, use the original packaging for transport.
- Proceed with care when unloading the device and when transporting it on your premises.
- Use only the intended attachment points, if present.
- Do not remove the packaging until shortly before installation.

5 Installation

5.1 Safety instructions for installation

WARNING



Risk of accidents due to incorrect installation!

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

This could result in death, serious injuries and/or burns.

- Only have experts perform work on the device.
- Only allow work on the electrical system to be carried out by **qualified electricians**.
- Before starting work, observe the **work steps of the switch-off procedure** (see [Section 7.2 Switch-off procedure](#)).
- Wear protective work clothing, protective gloves and safety shoes for work.
- Do not work on the device unless it is disconnected from the power supply, depressurized and in cold condition.
- Maintain a safe distance when working on the device. We recommend that you provide 1 m space for free movement around the device and container.
- Use only approved lifting gear and attach the device to the lifting gear with approved lifting devices (e.g. by wrapping a rope belt around it).

WARNING



Danger as a result of static charge!

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

There is a risk of death or severe physical injury.

- Only allow work on the device to be performed by experts.
Any person working in a hazardous area must be regularly instructed with regard to the necessity of grounding measures and they should also be made aware of typical grounding faults (e.g. subsequent grounding of objects or devices that are already charged).
- Make sure that any electrostatic charge is prevented. To do so, ground the device and the container using equipotential bonding.
- Grounding must always be carried out before start-up of the device.

WARNING**Risk of falling when working at heights!**

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

There is a risk of death or severe physical injury.



- Do not perform any work at heights except with a safety platform with cage or suitable fall protection (e.g. safety rope and safety harness).



- If you are using a harness for fall protection, it is essential 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 from protruding sharp edges on the device!**

Depending on the design, the device may have protruding sharp edges that 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 instructions for installation](#) must be adhered to before installation of the device in the container.



CAUTION

Fault as a result of soiling, foreign matter or damage to the device!

This could result in minor or moderate injury and/or material damage.

Before the device is installed for the first time and for assembly after conversion work on the system in which the device is installed, the following measures must be taken.

- *All supply and return lines for the cleaning medium must be rinsed with clear water in order to remove any contamination, foreign objects or residue in the supply line (e.g. scale, chippings, welding particles etc.).*
- *Prevent dirt and foreign matter from entering the device through appropriate measures. Install a filter upstream of the media connection [MA] in the supply line for the cleaning medium (see [Section 3.4 Cleaning media](#)).*
- *When choosing the installation position of the device, make sure that a safety distance of at least 5 cm is maintained between the spray head and the inside plant wall of the container and to any permanently installed internal fittings and the rest position of the moving internal fittings, to prevent grinding or impacts during operation.*

The self-emptying, [Figure 5.2-2](#), and the combination vessel connector, [Figure 5.2-4](#) must be observed.

- *It is imperative to prevent collisions while the cleaning head and surrounding components (e.g. agitators) are moving simultaneously.*
- *Use an approved hoist for assembly/disassembly and attach the device to the hoist with approved lifting accessories (e.g. sling with a lifting strap).*
- *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 tension.*
- *Protect the sealing element from damage.*
- *Fit end caps to weld ends.*
- *Protect the clamp connection from contamination.*
- *Protect the locking cylinder against shocks.*
- *Do not apply any paint to the surface of the device.*
- *The installation dimensions can be found in the figures and tables in [3.1 Design](#) .*



It is recommended that two persons be assigned to carry out the assembly.

5.2.1 Interfaces

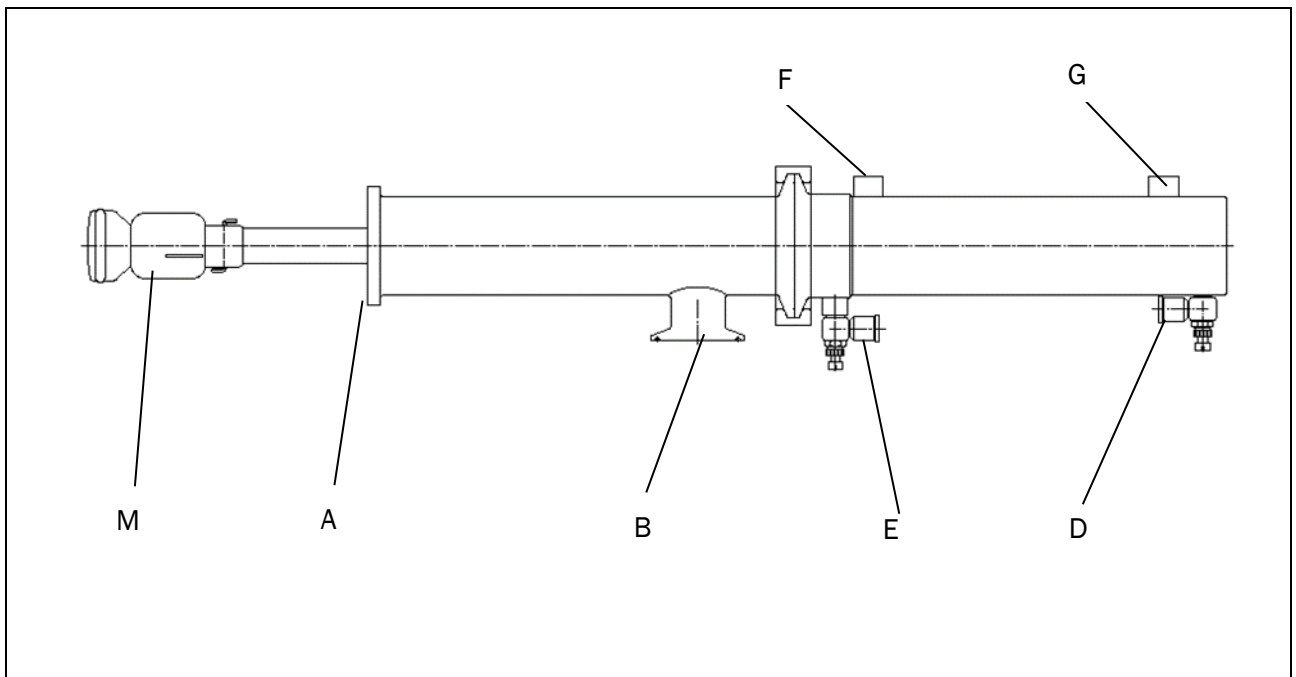


Figure 5.2-1: Device interfaces

The following interfaces are located on the cleaning device:

- A Process connection [PA], (design based on order)
- B Media connection [MA], cleaning medium supply (design based on order)
- D Compressed air feed on power cylinder for extending the spray head
- E Compressed air feed on power cylinder for retracting the spray head
- F Power cylinder “extended” limit switch
- G Power cylinder “retracted” limit switch
- M Spray head, (design based on order)

5.2.2 Installation position

The installation position of the TANKO-RT/RTS can be freely selected.



If the device is not installed in a vertical position, the retractors must be held in place/supported by suitable pipe clamps (see AWH catalog, “Pipes & Assembly Accessories” at <http://www.awh.eu>); this is recommended for stroke lengths greater than 250 mm. The pipe clamp should be secured close to the compressed air connection at the rear end of the pneumatic cylinder, otherwise there is a risk of damage to the pneumatic pipe.



The self-draining, [figure 5.2 2](#), and the combination vessel connector, [figure 5.2 8](#), must be observed.

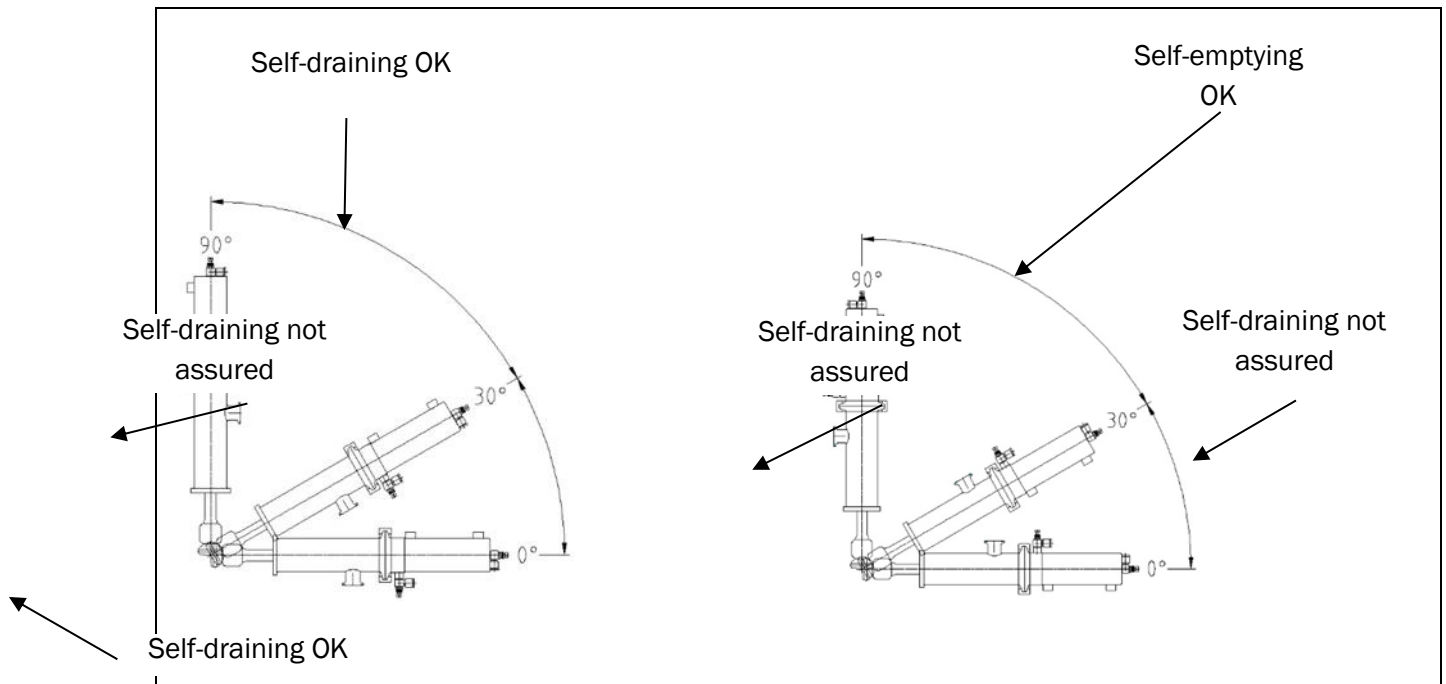


Figure 5.2-2: Self-Emptying of the TANKO-RT/RTS Depending on the Installation Position

5.2.3 Installing the device



The sealing points are the crucial part of the clamp connection, which we manufactured and packed with the utmost care and precision.

When handling the clamp connection, the sealing elements can very easily suffer damage.

Sealing elements during

- transportation
- storage
- assembly
- cleaning

that the sealing parts are protected from dirt and damage.

The retractor is comprised of three main components

1. Pneumatic section Pneumatic cylinder (P)
2. Hydraulic section Hydraulic pipe (N) with process connection (A) and cleaning fluid connection (B) including centering adapter (R) for holding the spray head and supplying the cleaning fluid.
3. Spray head M, fastened to the centering adapter

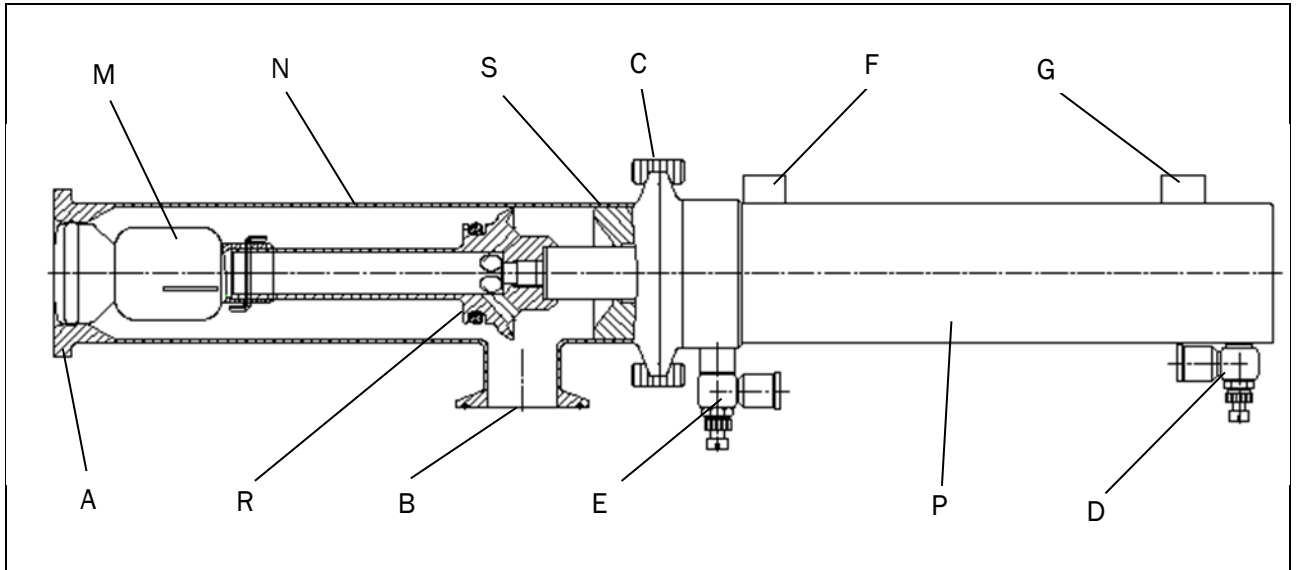


Figure 5.2-3: Overview of Assembly Units

- | | |
|---|--|
| A | Process connection [PA] |
| B | Media connection [MA] (cleaning medium supply) |
| C | Connection between hydraulic pipe and pneumatic pipe (power cylinder P) |
| D | Power cylinder “extension” pneumatic connection |
| E | Power cylinder “retraction” pneumatic connection |
| F | Power cylinder “extended” limit switch |
| G | Power cylinder “retracted” limit switch |
| M | Spray head, rotating type A, B, C, or D / alternative static spray head type S on TANKO-RTS anti-twist version |
| N | Hydraulic pipe for holding the spray head |
| P | Power cylinder, pneumatic actuator with 3 limit switches |
| R | Centering Adapter |
| S | Central bearing |

NOTE Dirt and foreign matter in the device!

Functional safety and reliability may be impaired.

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

For assembly, it is important to differentiate between three process connection versions (design depends on the order, see also [Table 3.1-3: Connection variants](#)):

- Clamp connection (stainless steel clamp connections for pipes)
The size and version of the clamp gasket at the process connection [PA] is determined by the clamp connection on the container.
- Welded connection
- Connection using combination adapter C3 and combination vessel connector C3.

5.2.4 Assembling the Retractor with Process Connection: Clamp



The gasket and bracket for the process connection (PA) and media connection (MA) are not supplied; they are available on request from Armaturenwerk Hötensleben GmbH.

1. Take the retractor out of the packaging and perform a visual inspection for damage.
2. Install the retractor on the vessel connector with an appropriate gasket and bracket.
3. Install the cleaning medium supply (standard: clamp DN25 in accordance with DIN32676) on the media connection (hydraulic pipe) with suitable gasket and clamp.
4. Fit the air hoses to the power cylinder.
5. Assemble and adjust the limit switches

5.2.5 Assembling the Retractor with Process Connection: Welding Joint



Seal and clamp are not component parts of the scope of delivery, please inquire at Armaturenwerk Hötensleben GmbH.

1. Take the retractor out of the packaging and perform a visual inspection for damage.
2. **Installed Condition**
Before welding, remove the hydraulic pipe by removing the bracket that connects the pneumatic cylinder and the hydraulic pipe.
Pull the pneumatic cylinder out of the back of the hydraulic pipe.
Ensure that the piston rod remains connected to the centering adapter and the spray head to the pneumatic cylinder.
3. **Welding preparation**
Before welding, connect the forming gas.
Before welding, affix 3 to 4 tack weld-ons
Clean all the parts to be welded prior to assembly.
4. **Welding.**

Base material	Suitable filler material
1.4435	1.4430, 1.4440
2.4602	2.4607

Table 5.2-1: Recommended Filler Materials

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

Align and weld the hydraulic pipe to the tank.

Eliminate welding distortion by selecting suitable welding parameters.

5. Welding Post-Treatment

In the interior area, an acid cleaning treatment is recommended after the welding.

The surface of accessible points can be improved by grinding.

The exterior can be treated afterwards by staining, brushing, grinding and polishing.

6. Check the sealing surface in the hydraulic pipe for impurities.
7. Assemble the retractor in reverse order (items 2 - 3).
8. Install the cleaning medium supply (standard: clamp DN25 in accordance with DIN32676) on the cleaning medium connection (hydraulic pipe) with an appropriate gasket and fastener.
9. Fit the air hoses to the power cylinder.
10. Assemble and adjust the limit switches

5.2.6 Welding the Combination Vessel Connector



Seal and clamp for media connection (MA) are not component parts of the scope of delivery, please inquire at Armaturenwerk Hötensleben GmbH.



If the internal diameter of the container ($2 \times R$) is known, the combination vessel connector can be ordered with a corresponding radius at an additional cost, or it can be modified by the customer. For more information, please consult Armaturenwerk Hötensleben GmbH.

1. Take the combination vessel connector out of the packaging and perform a visual inspection for damage.
2. **Welding preparation**
Create the hole (see [Figure 5.2-4](#)) for the combination vessel connector in the container.
Clean all the parts to be welded prior to assembly.

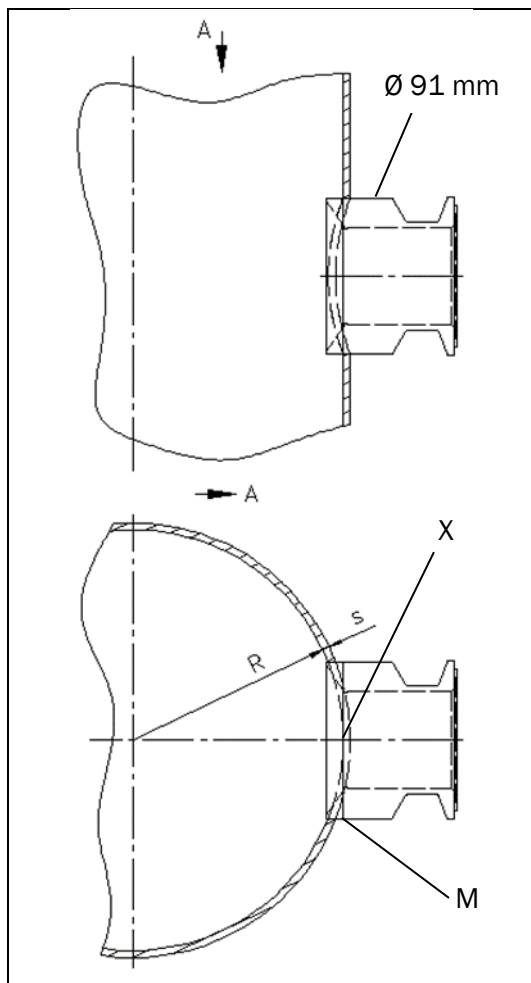


Figure 5.2-4: Combination Vessel Connector Standard Connection

The combination vessel connector has a circumferential marking [M]. This circumferential marking should form an intersection with the interior wall of the container and not protrude any deeper into the container.

For easier assembly, it is useful to make a second marking at a distance equivalent to the wall thickness [s] from the existing exterior marking onto the combination vessel connector in the direction of the clamp.

Insert the combination vessel connector far enough into the container and align it until this marking matches the outer \emptyset at its outermost position, Point [X].

Before welding, connect the forming gas.
Before welding, affix 3 to 4 tack weld-ons.

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

3. Welding

Recommended welding filler materials, see [Table 5.2-1](#).

Welding the combination vessel connector to the container.

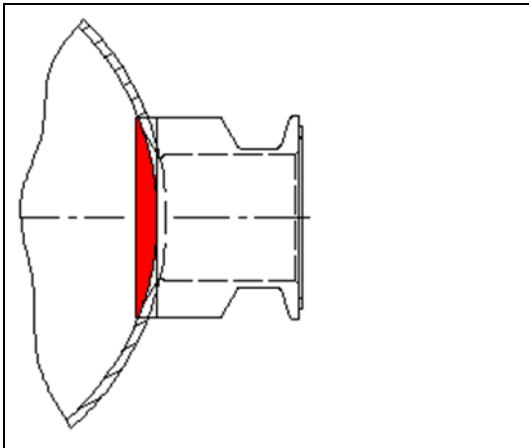
Weld distortion must be avoided by choosing suitable welding parameters.

4. Welding Post-Treatment

In the interior area, an acid cleaning treatment is recommended after the welding.

The surface of accessible points can be improved by grinding.

The exterior can be treated afterwards by staining, brushing, grinding and polishing.



After welding, the combination vessel connector can be ground with the interior wall of the container (see [Figure 5.2-5](#)).

Figure 5.2-5: Grinding

5. Take the retractor out of the packaging and perform a visual inspection for damage. Ensure that the O-ring that seals the hydraulic pipe of the TANKO-RT from the combination vessel connector is not damaged and store it safely.
6. Check the sealing surfaces in the combination vessel connector for contaminations. Keep the O-ring, O-ring groove and interior plant surface in the combination vessel connector clean. Place the O-ring correctly into the O-ring groove of the hydraulic pipe. The contact surfaces of the clamp connection between combination vessel connector and retractor (hydraulic pipe) must be kept clean.

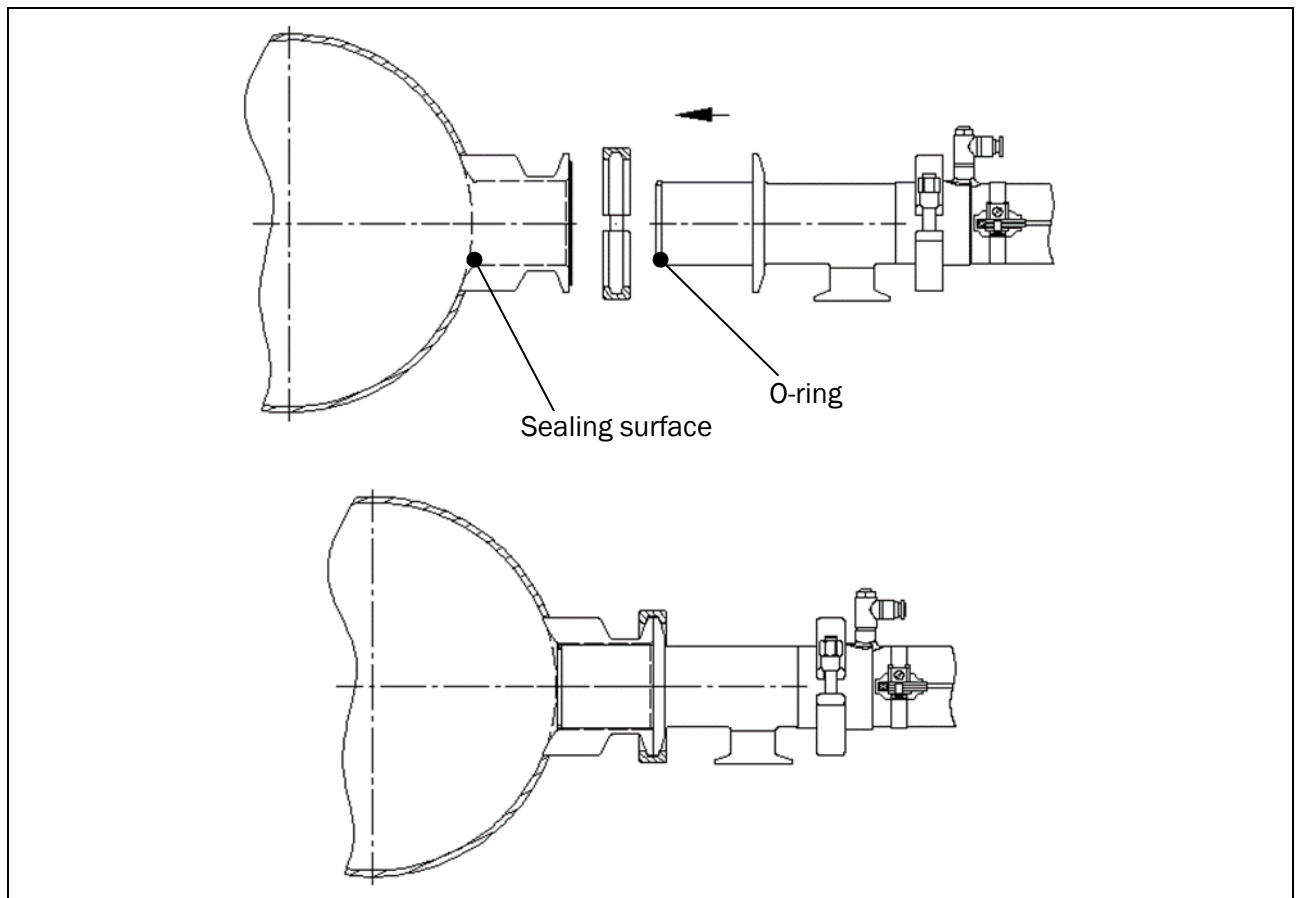


Figure 5.2-6: Container Seal

7. Carefully push the retractor into the combination vessel connector until the liner of the combination vessel connector is inserted into the groove in the clamp flange on the retractor (centering). The two clamp flanges are tightened as far as they go with the aid of the clamp bracket. The O-ring (on the outside of the hydraulic pipe) seals the retractor from the inside of the combination vessel connector and thus from the container.



The clamp flange is only used to secure the TANKO-RT and has no sealing function.

8. Install the cleaning medium supply (standard: clamp DN25 in accordance with DIN32676) on the media connection (hydraulic pipe) with suitable gasket and clamp.
9. Fit the air hoses to the power cylinder.
10. Assemble and adjust the limit switches

Special connection

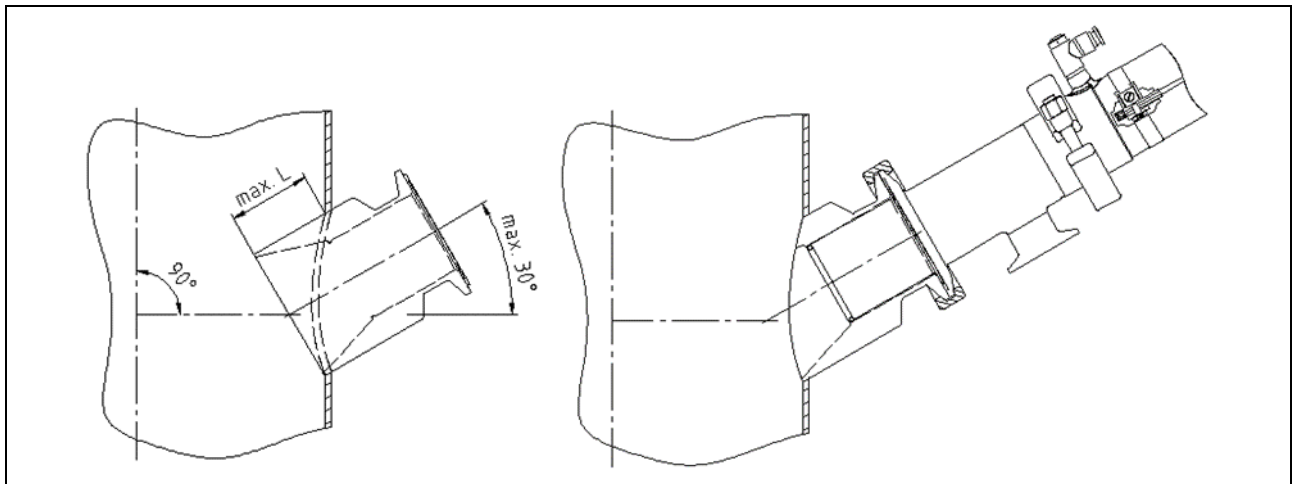


Figure 5.2-7: Special connection

A special vessel connector is available for different TANKO-RT installation angles from a horizontal position to a maximum of 30°.

For welding in, the connector may not be inserted deeper than a maximum of L (52 mm) into the container (see Figure 5.2-7).

The connector can be prepared for the intended angle at additional cost.

More detailed information is available from the ordering documents; in the event of questions, please consult Armaturenwerk Hötenleben GmbH.

5.2.7 Installation of the device with process connection: BioControl®



The sealing points are the crucial part of the BioControl® connection and have been manufactured and packed by AWH with the utmost care and precision.

When handling the BioControl® connection, the sealing elements can very easily suffer damage.

Protect sealing elements from damage and contamination during transportation, storage, assembly and cleaning!



The block flange BioControl® B65 and the O-ring 60 x 3 for process connection, as well as gasket and bracket (or screws for a screwed flange, special design) for media connection are not included in the scope of delivery; please request gasket and bracket from AWH, request block flange, O-ring and 4x screws M10 x 18 from NEUMO.

1. Take the retractor system out of the packaging and perform a visual inspection for damage.
2. **NOTE** Careless installation of the O-ring can negatively affect its sealing and hygienic functionality. Observe the installation instructions for BioControl® from NEUMO!
In accordance with the installation instructions from NEUMO, pull the O-ring for the block flange forwards onto the hydraulic pipe, keeping the O-ring and O-ring groove clean.
3. Install the retractor system on the block flange with the 4 screws M10 x 18. It is imperative to follow the installation instructions and torques of the block flange manufacturer NEUMO.
4. Install the cleaning medium supply (standard: clamp DN25 in accordance with DIN32676) on the media connection (hydraulic pipe) with suitable gasket and clamp.
5. Fit the air hoses to the power cylinder.
6. Assemble and adjust the limit switches

6 Start-up

Before starting up the device in Germany, the owner of the plant must observe the Industrial Safety and Health Protection Ordinance (BetrSichV).

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



WARNING

Hazardous situations during start-up as a result of incorrect installation of the device!

There is a risk of death or severe physical injury.

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

6.1 Safety instructions for start-up

Before operating the device, the owner must ensure that local regulations are observed during start-up.



We recommend that you document the commissioning in a report.



WARNING



Risk of burns on hot surfaces!

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



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

There is a risk of burns from the cleaning medium at temperatures of above + 60 °C (+ 140 °F).

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

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

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

There is a risk of death or severe physical injury.

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

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

For this reason, the manufacturer can only offer the owner **as a precautionary measure, a few points of reference and some notes** to be observed and to be integrated into the owner's hazard assessment.

**CAUTION*****Risk of hearing damage due to an increased noise level!***

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

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

Hearing damage could be the result.

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

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

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

The device is NOT equipped with any lighting. Insufficient lighting when working on the device can cause accidents.

There is a risk of minor or moderate injuries.

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

6.2 Function 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.



Only operate the device in perfect condition.

The container to be cleaned must be emptied and depressurized.

The cleaning device may generally be started only if assembly on the container is complete and the pipe or hose connection has been properly set up.

⚠ WARNING Persons in the container. A person could be hit by a jet from the cleaning head!

There is a risk of death or severe physical injury.

- Do NOT start cleaning while there are persons in the container.
1. Close all of the openings on the container (e.g. inspection openings).
 2. **NOTE** Plant components, such as agitators in the vessel to be cleaned
Damage to the device or vessel/installations.
 - Plant components may only be started once the retractor is completely retracted into the housing (hydraulic pipe) and is locked, and this condition is confirmed by the limit switches.
 - Continuous monitoring of the limit switchesSwitch off all moving parts in the container and secure them to prevent them from being inadvertently switched back on or set in motion.
 3. Check to ensure that there is a safe distance around the container and to the surrounding components.
 4. Switch on the device (see [Section 6.3 Switch-on procedure](#)).
 5. Check the interfaces on the device for impermeability.
 6. Make sure that there are no unusual vibrations.
 7. Check the device to make sure that it running smoothly.
 8. Switch off the device (see [Section 7.2 Switch-off procedure](#)).

6.3 Switch-on procedure

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



WARNING

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

There is a risk of death or severe physical injury.

*During start-up of the device, it is essential to perform the following **work 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 electrical power supply.*
3. *Check to make sure that the electrical power supply is NOT interrupted and that there is voltage available at the sensors.*
4. *Take suitable measures to secure the supply of electrical energy in order to prevent it from switching off suddenly, unexpectedly or without authorization.*
5. *Switch on the compressed air supply to the pneumatic cylinder.*
6. *Check that the compressed air supply is NOT interrupted and that the air pressure on the device is established.*
7. *Take suitable measures to secure the supply of compressed air in order to prevent it from switching off suddenly, unexpectedly or without authorization.*
8. *Switch on the cleaning medium supply (e.g. slowly open the shut-off valve or ball cock).*
9. *Check that the supply of cleaning medium is NOT interrupted and the media pressure is established at the device.*
10. *Take suitable measures to secure the supply of cleaning medium to prevent it from being switched off suddenly, unexpectedly or without authorization.*

NOTE***Risk of breakage due to material overload!***

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

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

- *Prevent pressure surges (“water hammers”) and gas components in the cleaning medium, e.g. caused by:*
 - *Installing a water hammer arrester or pressure relief valve in the supply line,*
 - *Slowly starting/stopping the pump 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 caused by quick changes in the flow rate (pressure increase or pressure drop), or by sudden changes in the direction of flow of fluids. This effect is particularly common in pump systems with long pipelines when starting up, stopping or changing the speed of pumps.

6.4 Operation

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

 WARNING***Danger of collision!***

When the production process starts, there is a risk of collision if the retractor is not completely retracted and if movable and movable components in the container are in motion. This can lead to damage to the retractor and the components.

There is a risk of death or severe physical injury.

- *The production process may not be started until the retractor is completely retracted.*

WARNING**Risk when used outdoors!**

If the device is used outdoors, there is a risk of lightning in the 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, stop work immediately.

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

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

There is a risk of death or severe physical injury.

- Only permit authorized specialist personnel who are qualified and trained for 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 and order 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 heat burns when opening the container!**

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



There is a risk of death or severe physical injury.



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

WARNING**Risk of burns on hot surfaces!**

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



There is a risk of death or severe physical injury.

- Comply with the warning signs and do NOT touch the marked areas.
- Do NOT remove the insulation from protected hot surfaces.
- Maintain a safety distance from 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.

WARNING**Danger of injuries caused by the cleaning medium returning!**

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

There is a risk of death or severe physical injury.

- Do NOT remove the device if the cleaning medium has failed.
- Always comply with the switch-off procedure (see [Section 7.2 Switch-off procedure](#)).

WARNING**Danger of injuries caused by the compressed air returning!**

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

There is a risk of death or severe physical injury.

- Do NOT remove the device if the compressed air supply has failed.
- Always comply with the switch-off procedure (see [Section 7.2 Switch-off procedure](#)).

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

WARNING Persons in the container. A person could be hit by a jet from the cleaning head!

There is a risk of death or severe physical injury.

- Do NOT start cleaning while there are persons in the container.
- NEVER point the cleaning jet or surge at persons.

⚠ WARNING Incorrect operation of the device!

There is a risk of death or severe physical injury.

- Only operate the device in perfect condition.
- Only operate the device installed inside a closed container.
- Drain and depressurize the container to be cleaned.
- Close all of the openings on the container (e.g. inspection openings).
- Comply with **the switch-on and switch-off procedures** when operating the device (see [sections 6.3 Switch-on procedure](#) and [7.2 Switch-off procedure](#)).
- There is no need for the device to be run in.
- The following operating states of the device are NOT permitted:
 - Operation of the device without cleaning medium.
 - Immersing the device in the product of the production process.
 - Operation of the device outside the permitted parameters (see [section 3.3 Technical Data](#)).
- Immediately stop operation in the event of any leaks outside the container.
- Refrain from any type of work which compromises the safe and reliable function of the device.
- Immediately inform the owner of any changes to the device or the plant that could impair its safety.

If you notice vibrations on the plant that are NOT caused by the device during start-up of the device, these must be prevented by suitable measures so that the vibrations CANNOT be transferred to the device.

If this is NOT possible, the maintenance intervals must be shortened in accordance with [Section 7.4.1 Maintenance intervals](#).

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

NOTE Any clogging in the drain of the container is to be eliminated at once in order that:

- no large quantities of dirt can accumulate in the container,
- there is NO impermissible filling of the container with cleaning medium,
- the device is NOT immersed in the rising fluid level.

For cleaning agent in circulation:

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

7 Maintenance

The following safety instructions apply to all work on the device 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](#)).

7.1 Safety instructions for maintenance

DANGER



Risk of fatal injury from electric shock through contact with live parts!

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

There is a risk of death or severe physical injury.

- Allow only **qualified electricians** to perform work on the electrical system.
- Before starting work, observe the **work 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



Danger as a result of static charge!

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

There is a risk of death or severe physical injury.

- Only allow work on the device to be performed by experts.
Any person working in a hazardous area must be regularly instructed with regard to the necessity of grounding measures and they should also be made aware of typical grounding faults (e.g. subsequent grounding of objects or devices that are already charged).
- Make sure that any electrostatic charge is prevented. To do so, ground the device and the container using equipotential bonding.
- Grounding must always be carried out before start-up of the device.

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

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

There is a risk of death or severe physical injury.

- Only have **experts** perform work on the device.
- Do not work on the device unless it is disconnected from the power supply, depressurized and in cold condition.
- Maintain a safe distance when working on the device.
We recommend that you provide 1 m space for free movement around the device and container.

 **WARNING**

Risk of chemical burns and heat burns when opening the container!

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



There is a risk of death or severe physical injury.



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


 **WARNING**

Risk of burns on hot surfaces!

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



There is a risk of death or severe physical injury.

There is a risk of burns from the cleaning medium at temperatures of above + 60 °C (+ 140 °F).

- Do not remove the devices unless they are in cold condition.
- 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****Danger of crushing due to unintentional start-up of the drive!**

Danger could arise from a sudden, unforeseeable return of energy supply (e.g. unauthorized switching back on).

There is a risk of death or severe physical injury.

- Switch off the energy supply (e.g. electricity or compressed air) before all maintenance, cleaning or repair work.
- Before starting work, observe the **work steps of the switch-off procedure** (See [section 7.2 Switch-off procedure](#)).

 **WARNING****Risk of crushing during maintenance, cleaning and repair work!**

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

There is a risk of death or severe physical injury.



- Before starting work, depressurize the container and all lines.
- Switch off all moving parts in the container and secure them to prevent them from being inadvertently switched back on or set in motion.
- Only remove the device if it has been depressurized.
- Wear protective gloves.



It is recommended that two persons be assigned to carry out the disassembly.

7.2 Switch-off procedure

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

WARNING



Risk from sudden, unforeseeable or unauthorized reactivation of the device

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



There is a risk of death or severe physical injury.

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

Switch-off procedure

1. Interrupt the supply of cleaning medium (e.g. slowly close the shut-off valve or ball cock).
2. Check that the supply of cleaning medium is stopped and there is no media pressure at the device.
3. Safeguard the supply of cleaning agent to prevent sudden, unforeseeable or unauthorized reactivation (e.g. lockable switch/shut-off elements).
4. Stop the supply of compressed air (e.g. slowly close the shut-off valve or ball cock).
5. Check that the compressed air supply is interrupted and that there is no air pressure on the device.
6. Safeguard the compressed air supply to prevent sudden, unforeseeable or unauthorized reactivation (e.g. lockable switch/shut-off elements).
7. Disconnect the power supply.
8. Check to make sure that the power supply is interrupted and that there is no voltage at the sensors.
9. Safeguard the power supply to prevent sudden, unforeseen or unauthorized reactivation (e.g. lockable switches)
10. 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 compressed air on or off can lead to high movement speeds in the pneumatic cylinder, thus causing 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 in the compressed air, e.g. by:*
 - *Installing a pressure relief valve in the compressed air supply*
 - *Slowly starting/stopping the pump and*
 - *Opening/closing the shut-off fitting (e.g. valve or ball cock) slowly.*

NOTE***Risk of breakage due to material overload!***

Pressure surges when switching the cleaning medium on or off, in particular pressure surges which exceed the operating pressure, and gas components in the cleaning medium can 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 medium, e.g. caused by:*
 - *Installing a water hammer arrester or pressure relief valve in the supply line,*
 - *Slowly starting/stopping the pump and*
 - *opening/closing the shut-off fitting slowly (e.g. valve or ball cock).*

7.3 Removal

The safety instructions in [Section 7.1 Safety instructions for maintenance](#) must be observed before removing the device from the container.

WARNING



Danger as a result of static charge!

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

There is a risk of death or severe physical injury.

- Only allow work on the device to be performed by experts.
Any person working in a hazardous area must be regularly instructed with regard to the necessity of grounding measures and they should also be made aware of typical grounding faults (e.g. subsequent grounding of objects or devices that are already charged).
- Make sure that any electrostatic charge is prevented. To do so, ground the device and the container using equipotential bonding.
- Grounding must always be carried out before start-up of the device.

WARNING



Risk of chemical burns and heat burns when opening the container!

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



There is a risk of death or severe physical injury.



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

CAUTION

Fault as a result of soiling, foreign matter 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, auxiliary materials and information are available and observe the instructions for the interfaces.
- When lifting the device out of the container, maintain a distance from the inner wall of the container and surrounding components (e.g. agitators), to avoid scraping or knocking.
- Place the device on a firm surface after removing it.

7.3.1 Removing the device

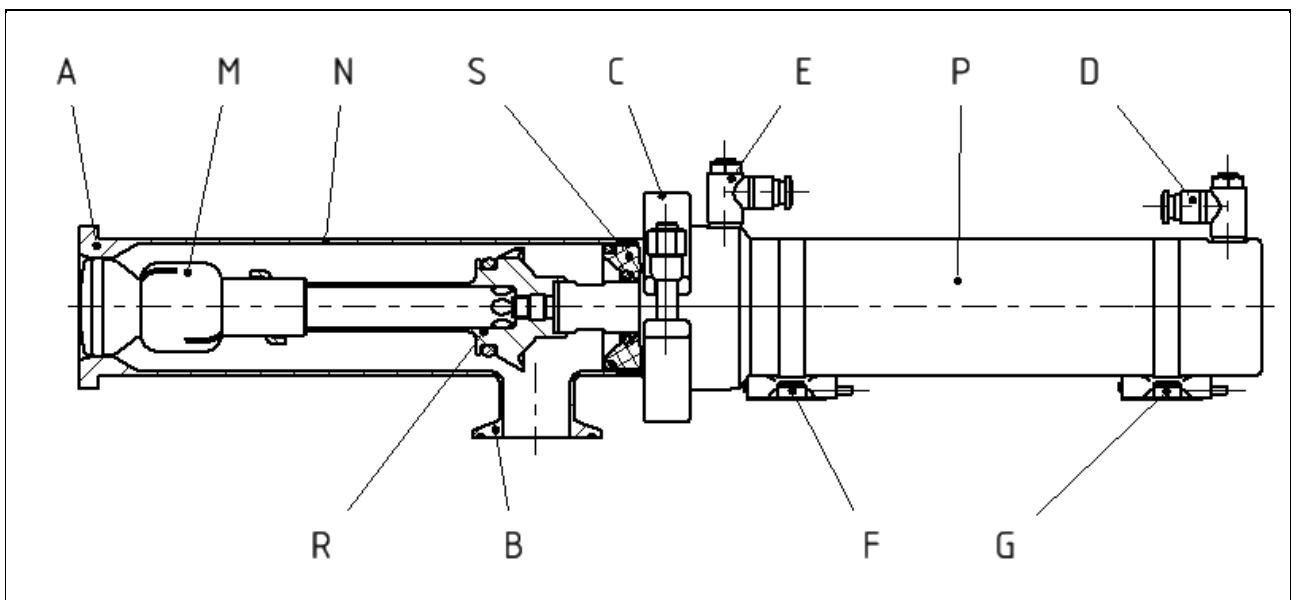


Figure 7.3-1: Overview of Assembly Units

- | | |
|---|--|
| A | Process connection [PA] |
| B | Media connection [MA] (cleaning medium supply) |
| C | Connection between hydraulic pipe and pneumatic pipe (power cylinder P) |
| D | Power cylinder “extension” pneumatic connection |
| E | Power cylinder “retraction” pneumatic connection |
| F | Power cylinder “extended” limit switch |
| G | Power cylinder “retracted” limit switch |
| M | Spray head, rotating type A, B, C, or D / alternative static spray head type S on TANKO-RTS anti-twist version |
| N | Hydraulic pipe for holding the spray head |
| P | Power cylinder, pneumatic actuator with 3 limit switches |
| R | Centering Adapter |
| S | Central bearing |

⚠ WARNING Risk of the device falling accidentally!

The device may hit personnel when falling.

There is a risk of severe physical injury.

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

NOTE Prior to removal, the device should be in the rest position, i.e. with the spray head retracted into the hydraulic pipe to create a seal. If this is not possible due to a fault, the spray head will protrude into the container. The small installation opening for the container and components (e.g. agitators) in the container cause obstructive contours! The spray head may get knocked during removal.

Damage to the device.

- The spray head must NOT collide with obstructive contours!

Interfaces F and G

NOTE The sensors are electrical components. The electrical connection values are not included in these instructions; they must be obtained from the instructions/data sheet provided by the sensor manufacturer.

The sensors may be damaged if connected incorrectly or subjected to excessive voltage.

- Observe the sensor manufacturer's specifications!
1. Check to make sure that the power supply to the sensors has been switched off. (see [Section 7.2 Switch-off procedure](#))
 2. Disconnect the electrical connection from the sensors OR
 3. Remove the sensors from the retractor. (See installation instructions/data sheet provided by sensor manufacturer)

Interfaces D and E

1. Check to ensure that the compressed air supply is interrupted (see [Section 7.2 Switch-off procedure](#)).
2. Detach the compressed air hoses from the screw connections on the device

Interface B

The supply line for the cleaning medium has to be disconnected at the media connection [MA]. The media connection [MA] has to be sealed with a screw cap.

1. *Check to make sure that the media supply is interrupted (see [Section](#)).*
2. Undo the screw connection on the heavy duty clamp.
3. Remove the heavy duty clamp.
4. Keep the gasket in a safe place.

Interface A

NOTE When removing the device after a fault that has prevented the spray head from retracting into the hydraulic pipe, the spray head will protrude into the container. The small installation opening for the container and components (e.g. agitators) in the container cause obstructive contours! The spray head may get knocked during removal.

Damage to the device.

- The spray head must NOT collide with obstructive contours!
- Be extremely careful to avoid collisions during removal.

Process connection clamp and combination vessel connector

1. Check the following before pulling the device out of the container:
 - Device in “rest position”, i.e. spray head in hydraulic pipe
 - Check for interfering contours on surrounding components in the container.
2. The device must be supported/held securely in place during removal.
3. Undo the additional fastening on the retractor system.
4. Undo the heavy duty clamp on the process connection and set it to one side.
5. Remove the device from the clamps or the container adapter on the container.
6. Keep the gasket in a safe place.
7. Seal the process connection using a suitable screw cap.
8. If necessary, close the clamps or combination vessel connectors on the container.



To close off the combination container port, a blind plug can be obtained from Armaturenwerk Hötensleben.

Material	Blind plug for combination vessel connector, article number
1.4435	66R0000004Z30
2.4602	66R0000004Z80

Weld process connection

9. Check the following before pulling the device out of the container:
 - Device in “rest position”, i.e. spray head in hydraulic pipe
 - Check for interfering contours on surrounding components in the container.
10. The device must be supported/held securely in place during removal.
11. Undo the additional fastening on the retractor system.
12. Undo the heavy duty clamp at the connection between the hydraulic pipe and the pneumatic pipe and set aside.
13. Carefully remove the pneumatic pipe from the hydraulic pipe. The piston rod with centering adapter, spray head and all attachments is held in place by the locking cylinder on the pneumatic pipe and is also pulled out of the hydraulic pipe.
14. Close off the hydraulic pipe with blind clamp connector 2 1/2" DIN 32676.

7.4 Maintenance

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

The presence and legibility of information and warning signs must be checked regularly.

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

WARNING



Danger from the magnetic field (magnets in pneumatic cylinder) during assembly and disassembly of the device!

Magnets generate a wide-ranging, strong magnetic field. Among other things, they can damage devices (e.g. televisions, laptops, computer hard drives, data carriers, credit and EC cards, clocks, hearing devices and loudspeakers).

Magnets can cause malfunctions for individuals with cardiac pacemakers and/or serious endangerment of their health.

There is a risk of death or severe physical injury.

- *Assembly or disassembly must not be carried out by persons with pacemakers.*
- *Maintain a minimum safety distance of at least 0.5 m between magnet carriers/magnets in the device and objects and technical devices whose function can be impaired by magnetic fields.*

CAUTION



Danger of catching/entanglement in moving components!

Failure to observe it can result in minor or moderate injury.

- *Beware of moving parts whenever working with the device.*
- *Wear tight-fitting clothes.*

NOTE**Risk of device malfunction if not fully sealed!**

The sealing elements are polished surfaces with no scratches or grooves. Incorrect handling during installation and removal can lead to damage.

This can cause leaks and potentially impair the function of the device.

- Protect the sealing surfaces of the clamp connections during the following processes to protect them from damage:
 - Transport
 - Storage
 - Installation
 - Cleaning



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



All relevant tightening torques are listed in [Table 7.5-1](#).

7.4.1 Maintenance intervals

NOTE**Component failure due to vibration damage!**

During operation, vibrations can cause screw and clamp connections to become loose or the device to be exposed to severe strain, thus possibly resulting in a component failure.

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

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

NOTE Foreign objects impair the functional safety of the device!

This can cause damage, mechanical sparks and/or hot surfaces in the device.

- Ensure that no foreign objects enter the device while you are working with it.

Maintenance Intervals and Methods



Reduce 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 that are NOT caused by the device and CANNOT be prevented.

If the device is NOT operated for a prolonged period of time, then we recommend that a complete functional capability check be performed on the device prior to recommissioning (See [section 6.2 Function 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 medium: Water
 Media pressure: 3 bar / 43.5 psi
 Media temperature: + 25 °C (+ 77 °F)

Interval:

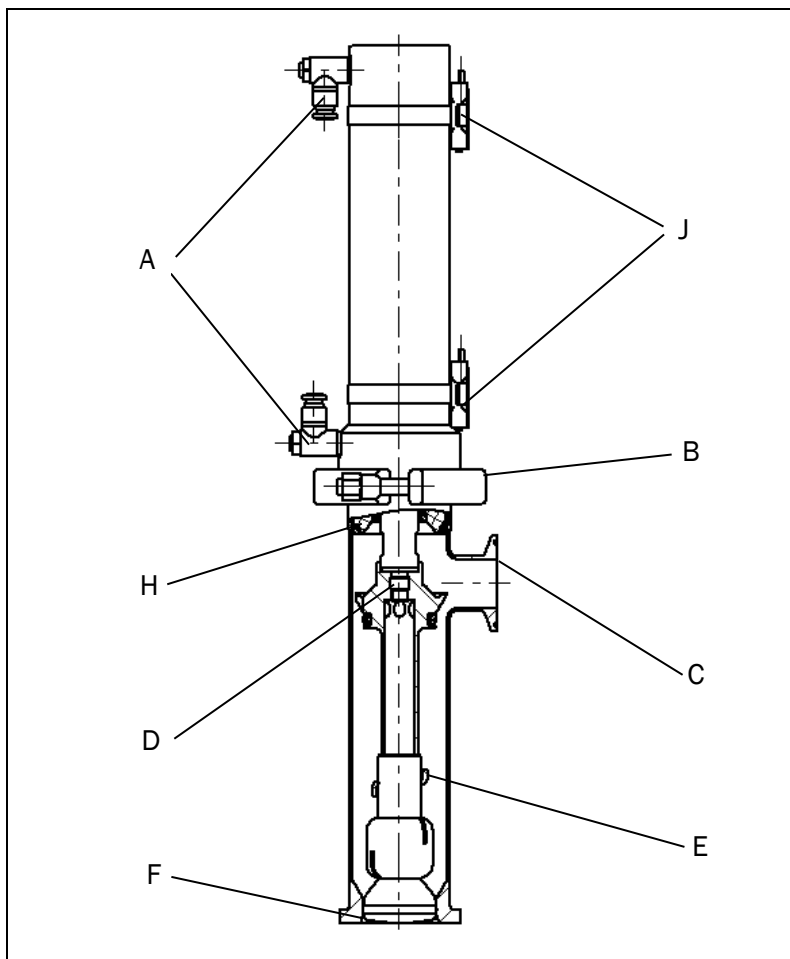
- H = operating strokes
- t = daily
- w = weekly
- m = monthly
- ¼ y = quarterly
- ½ y = every six months
- y = annually

Method:

- S = visual inspection
- F = function check
- M = measurement
- R = cleaning*
- A = replace



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

Overview of Maintenance Points



- A Compressed air connections
- B Hydraulic pipe/pneumatic pipe clamp connection
- C Clamp connection media connection [MA]
- D Piston rod / centering adapter connection and damping ring holder / piston connection
- E Spray head, plug connection with single-use locking pin
- F Clamp connection process connection [PA]
- H Central bearing
- J Limit switches

Figure 7.4-1: Maintenance points

-  The tightening torque values required for the thread connections are listed in [Table 7.5-1](#) .
-  The item numbers shown in brackets refer to [Figure 7.5-1](#).

Point	Inspection and maintenance work	Interval	Method
A	Check compressed air hoses for damage and signs of age. Replace them if necessary.	m	S, F
B	Check that the clamp connection and its screw connections are securely fitted.	¼ y	S, F
C	Check the clamp connection and its screw connection for tight fitting and impermeability.	m	S, F
D	Check that the threaded connection is securely fastened (for the tightening torque, see Table 7.5-1). Check the O-ring seal and inspect the O-ring for wear (Item 1.19 Centering adapter). Check that the screws between the damping ring holder and the piston are securely fastened. This screw connection is secured with Loctite "243".	H1000 or ¼ y	S, F
E	Check that the locking pin is securely fastened. Check the rotation of the spray head by hand. Check the O-ring (Item 2.05) for wear. When disassembling the spray head from the centering adapter, replace the locking pin.	1. and 2. H500 then H1000 or ¼-j	S, F
F	Check the clamp connection and the screw connection for tight fitting and impermeability.	m	S, F
H	Replace the central bearing, depending on the stroke length Stroke length = 100 - 250 mm Stroke length = 500 mm	H10000 H5000	A
J	Check limit switch for function and correct position, replace if necessary.	t	S, F

Table 7.4-1: Inspection and maintenance work

7.4.2 Tools and tightening torques

Use only proper tools that 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:

- Hexagon socket wrench (size 4)
- Open-end wrench (WAF 10 mm, WAF 12 mm, WAF 14 mm; WAF 17 mm; WAF 24 mm)
- Torque wrench with socket shaft □ 14 x 18
- Torque screwdriver with inserts and accessories



Figure 7.4-2 Tools required for the TANKO-RTP/RTPS

Recommended assembly tools:

The following assembly tools can be purchased from Armaturenwerk Hötensleben to facilitate assembly:

- Assembly tool for wire locking pin, size A, Art. no. 664MW01010050
- Assembly anvil for central bearing, Art. no. 664MW03020020
- Assembly cone for central bearing, Art. no. 664MW03010020



Figure 7.4-3 Assembly tool 664MW01010050

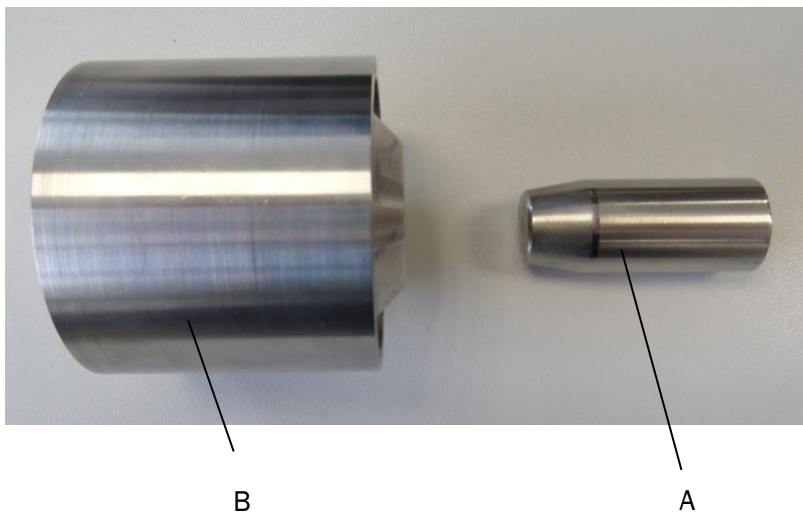


Figure 7.4-4 Assembly tools assembly cone (A) and assembly anvil (B)

All the screw connections on the device are tightened to the appropriate tightening torque in the factory in order to ensure the necessary clamping force between the components that need to be connected, even when the maximum operating forces are applied.





All relevant tightening torques for the screw connections are listed in [Section 7.5 Spare parts and customer service](#).

7.4.3 Replacing the O-rings, the central bearing, the piston ring and the damping ring



The tools required for assembly/disassembly work are listed in [Section 7.4.2 Tools and tightening torques](#).

 The item numbers shown in brackets refer to Figure 7.5-1.

 Table 7.5-1 includes a list of spare parts.

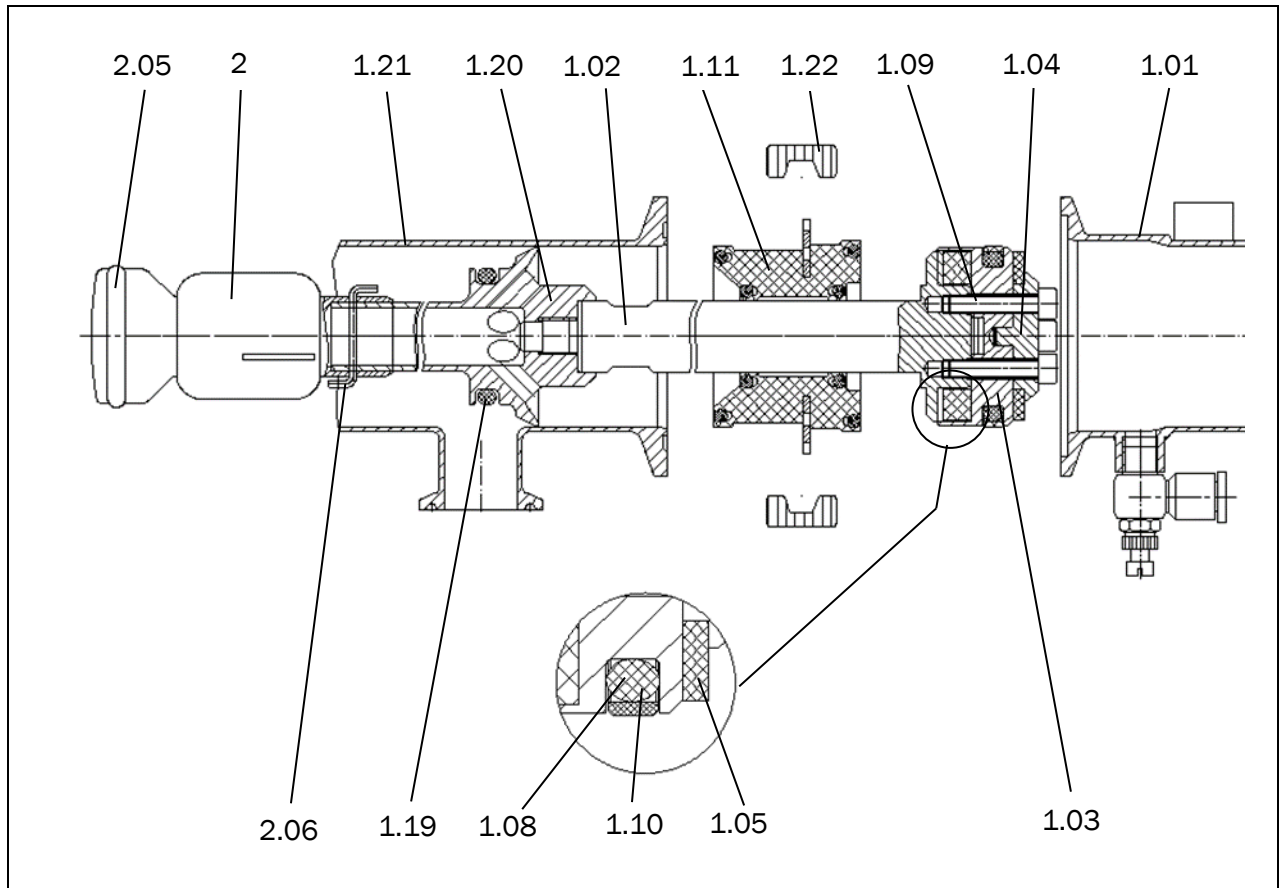


Figure 7.4-5: Replacing the O-rings, the central bearing, the piston ring and the damping ring

Item	Qty.	Designation	Article number.	Material
1.05	1	Damping ring	66R01000005P0	Polyurethane
1.10	1	Piston ring	66R01000024L0	TOMF-0040 PTFE
1.11	1	Central bearing	66R01000012L0	TOMF-0040 PTFE
1.19	1	O-Ring 27 x 5	106050253 1060500002706	EPDM/FDA VITON®/FDA
2	1	Spray head	See Table 7.5-8.	1.4435
2.05	1	O-Ring 27 x 5	106050253 1060500002706 1060500002707	EPDM/FDA VITON®/FDA FFKM
2.06	1	Wire locking pin	667000006020540	1.4404

Table 7.4-2: Wear parts for replacing the O-rings, the central bearing, the piston ring and the damping ring



If the spray head becomes detached from the centering adapter during disassembly, then the wire locking pin (2.06) must be replaced. This is added to the new spray head when the old one is being replaced.

It can also be ordered separately in a four-pack (article number 667000006020544).

When replacing the O-rings, the central bearing, the piston ring and the damping ring, perform the following work steps:

NOTE Damage to the sealing surfaces must be prevented during disassembly and assembly.

1. Loosen the bracket (1.22) on the retractor that connects the hydraulic pipe (1.21) to the pneumatic cylinder (1.01). Carefully pull the two parts apart.
2. Pull the piston rod out of the hydraulic pipe at the rear, towards the pneumatic cylinder.
NOTE Do not damage the outer sealing surfaces of the central bearing (1.11).
 - Pull the piston rod out of the hydraulic pipe at the rear, towards the pneumatic cylinder.
3. **NOTE** The cleaning device can be damaged if not set down in a safe place!
 - During subsequent work take particular care to ensure that the disassembled pneumatic section of the cleaning device is stored safely, particularly the centering adapter (1.20).
4. Check that the spray head is able to rotate smoothly. If replacement of the spray head is necessary, follow the procedure set out in [Section 7.4.4](#) points 2) to 5).
5. Remove the O-rings from the spray head (2.05) and the centering adapter (1.19).
6. Install the new O-rings according to [Figure 7.4-5](#).
Make sure the new O-ring is undamaged and pay attention to correct material allocation (see [Table 7.4-2](#) or order).
7. To replace the piston ring (1.10) remove the old piston ring.
Do not damage the O-ring (1.08) beneath it.
8. **NOTE** Risk of burns
To make it easier to fit the new piston ring, it should be heated first, e.g. in a water bath (+ 70 °C - + 90 °C / + 158 °F - 194 °F).
9. To replace the damping ring (1.05), loosen the retaining screws (1.09) and then the damping ring holder (1.04).
10. Replace the damping ring (1.05) and reassemble on the piston (1.03) with the damping ring holder (1.04) and retaining screws (1.09). When doing so, secure the threads with Loctite "243" (for tightening torques, see [Table 7.5-1](#)).
11. When replacing the central bearing, carry out the following work steps:
 - a) Loosen the set screw (1.24) with the PTFE washer (1.25) and detach the centering adapter (1.20) from the piston rod (1.02) by turning it counterclockwise.
 - b) Pull the central bearing (1.11) off the piston rod (1.02) and remove the 2 central bearing retaining plates (1.12).
 - c) Mount these in the new central bearing.
 - d) Install the new central bearing (1.11) with the central bearing retaining plates (1.12) on the piston rod (1.02).

To prevent damage to the central bearing, the use of an assembly cone (A) is recommended when assembling the central bearing on the piston rod. This is available from Armaturenwerk Hötensleben GmbH under the article number 664MW03010020.

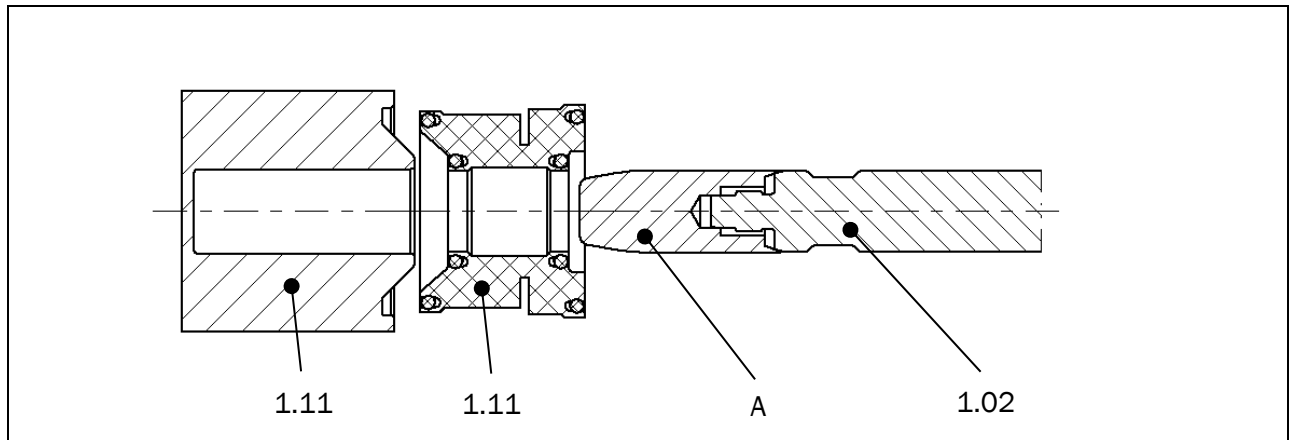


Figure 7.4-6: Overview of Assembly of Central Bearing with Assembly Cone

- e). Turn the centering adapter clockwise to screw it onto the piston rod. Pay attention to the tightening torques according to [Table 7.5-1](#).
Tighten the set screw (1.24) with the PTFE washer (1.25)
(For tightening torque, see [Table 7.5-1](#)).
If the PTFE washer is damaged or lost, replace it.
11. Fit the piston rod with the centering adapter and spray head into the hydraulic pipe, with the spray head first.
12. Press the central bearing into the hydraulic pipe as far as it will go (central bearing retaining plate, 1.12).
13. Push the pneumatic pipe onto the piston rod and secure the pneumatic pipe and hydraulic pipe with the clamp (1.22) and nut (1.23). Pay attention to the tightening torques in [Table 7.5-1](#).

7.4.4 Replacing the Spray Head



[Table 7.5-1](#) includes a list of spare parts.

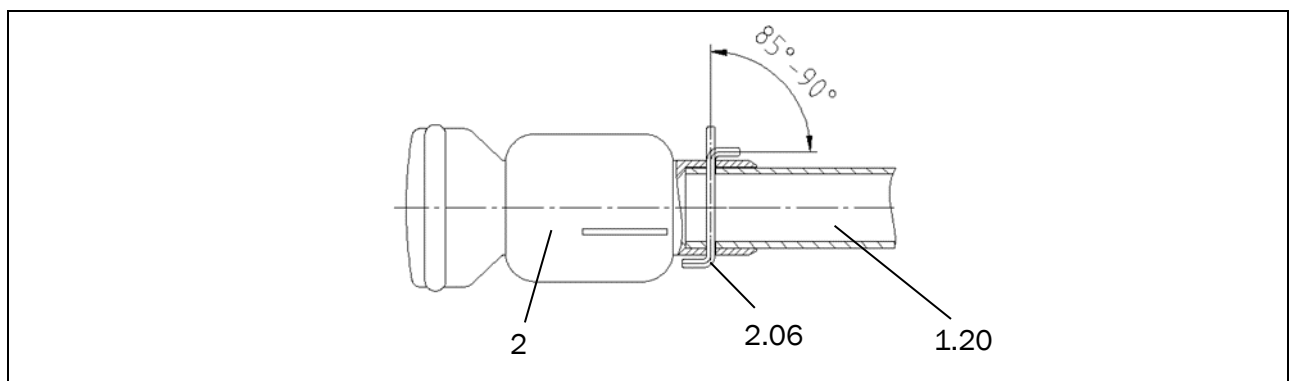


Figure 7.4-7: Locking Pin Representation

1. [Section 7.4.3](#) Follow points 1) to 2).
2. Bend the locking pin (2.06) open or pinch off a bent end. Remove the locking pin. Pull the spray head (2) off the centering adapter (1.20).

3. Install the new spray head (2) on the centering adapter (1.20). Turn the spray head until the holes for the locking pin are aligned with the holes in the centering adapter.
4. Insert the new locking pin, which is included with the new spray head, through the holes as far as it will go and bend the 2nd side of the locking pin using pliers.
NOTE Bend the locking pin far enough that it does not grind at any point when retracting into the hydraulic pipe (1.21).
5. The new spray head is now installed. Carry out the subsequent work steps, see [Section 7.4.3](#) from point 4), or, if no further action is necessary from point 11) to point 13).

7.4.5 Notes on Cleaning

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

Follow the following safety instructions prior to cleaning.

WARNING



Hazard from corrosive or aggressive cleaning agents!

There is a risk of death or severe physical injury.

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



NOTE

Risk of damage to the device during cleaning!

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

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

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

Before commencing cleaning work, the working steps of the switch-off procedure must be carried out (see [Section 7.2 Switch-off procedure](#)).

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 instructions for maintenance](#) must be observed.

Cleaning is carried out when disassembled by simply washing the surfaces that come into contact with media.

Cleaning media: e.g. 3% caustic soda

Temperature: max. + 80 °C/+ 176 °F

- Only use clean and chlorine-free water as a diluting agent.
- Measure carefully to avoid overly strong concentrations of cleaning agent.
- Rinse with plenty of clean water after cleaning.
- When cleaning the parts of the device outside the container make sure that dust and adhering materials (e.g. grease and oil residues) are removed.

Cleaning of 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 get into the groundwater, waterways or sewer system.

There is a risk of environmental damage.

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

7.5 Spare parts and customer service

Spare Parts and Wear Parts

The individual parts marked with a cross in [Table 7.5-1](#) can be ordered as a wearing parts package and purchased from AWH.



Subject to technical modifications in the interest of further development and improvement of 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 Customer Service as follows:

Armaturenwerk Hötensleben GmbH

Schulstraße 5 – 6

D-39393 Hötensleben, Germany

Telephone +49 39405 92-0

Fax +49 39405 92-111

E-mail info@awh.eu

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

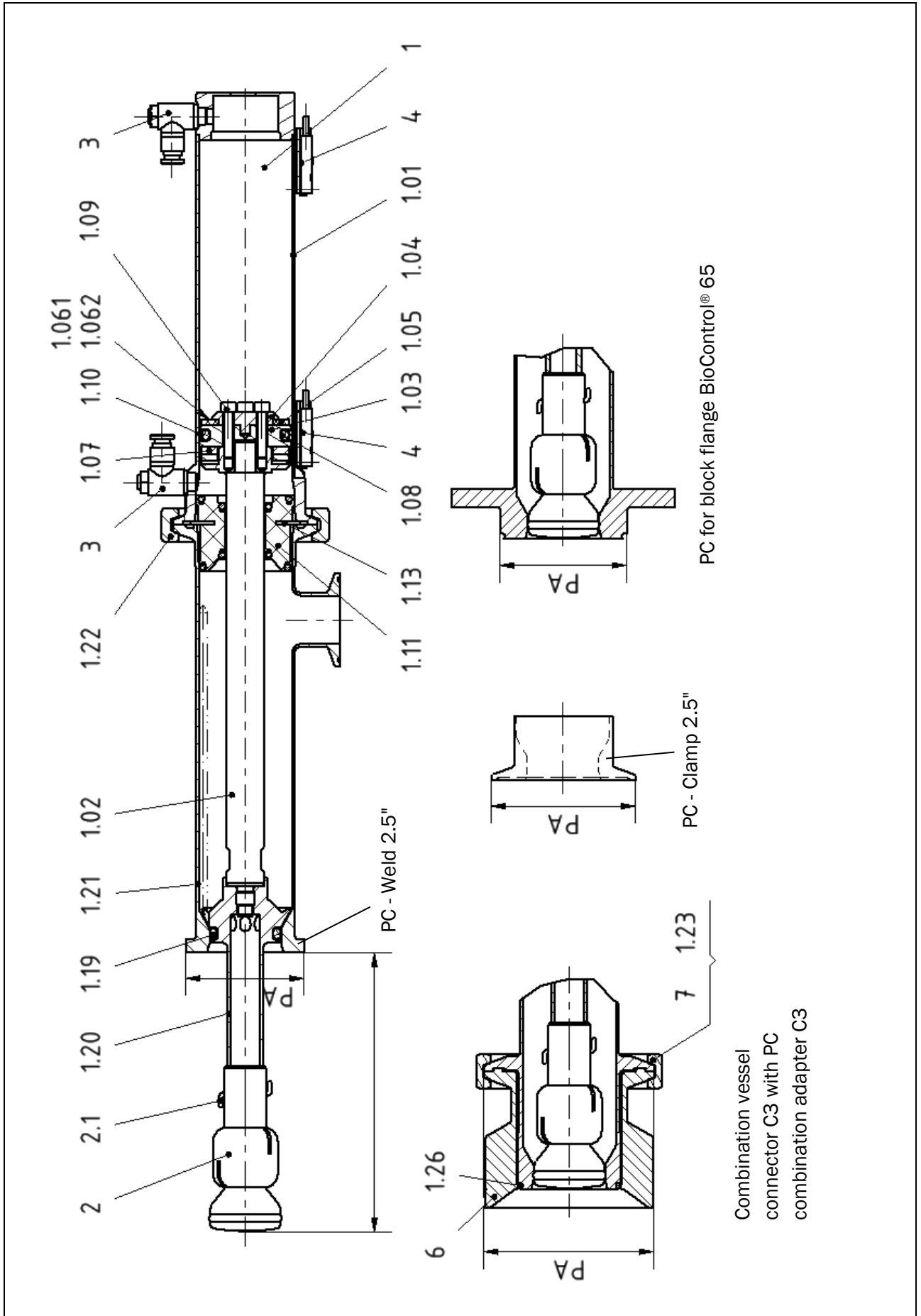


Figure 7.5-1: Spare parts

Item	Qty.	Designation	Tightening torque [Nm]	Article number	Material	Wear part
1.01	1	Pneumatic cylinder pipe	—	See Table 7.5-2	1.4404	
1.02	1	Piston rod	44	See Table 7.5-3	1.4435	
1.03	1	Piston SMF	—	66R0100200320	1.4404	
1.04	1	Damping ring holder	—	66R0100001420	1.4404	
1.05	1	Damping ring	—	66R01000005P0	PU	X
1,061	n. B.	Spacer disk 0.5	—	66R0100000850	1.4571	
1,062	n. B.	Spacer disk 1.0	—	66R0100000950	1.4571	
1.07	2	Magnet ring 47 x 30 x 5.33	—	390136	Flexor W45S	
1.08	1	O-Ring 37.47 x 5.33	—	10605325BE70S1	EPDM	
1.09	4	Hexagon socket-head screws M5 x 25	3.5	540132	A4	
1.10	1	Piston ring	—	66R01000024L0	TOMF-0040 PTFE	X
1.11	1	Central bearing	—	66R01000012L0		X
1.12	2	Central bearing retaining plate	—	66R0100001720	1.4404	
1.19	1	O-Ring 27 x 5	—	See Table 7.5-4		X
1.20	1	Centering Adapter	44	See Table 7.5-6	1.4435	
1.21	1	Hydraulic pipe	—	See Table 7.5-7	1.4435	
1.22	1	Heavy duty clamp 2 1/2"	—	111100591	A2	
1.23	2/3	Hexagon nut 1/2" - 5"	5	570038	A2	
1.26	1	O-Ring 45 x 3	—	See Table 7.5-5	EPDM	
2	1	Spray head	—	See Table 7.5-8	1.4435	X
2.05	1	O-Ring 27 x 5	—	See Table 7.5-4		X
2.06	1	Locking pin	—	667000006020440	1.4430	
3	2	Angle throttle check valve	5.5	420076/420064		
4	3	RT Limit switch package Balluff	—	66R000000000100 (see Table 7.5-9)		
5.02	3	Assembly accessories	—	390041		
6	1	Combination vessel connector C3	—	66R0000004N30	1.4435	
7	1	Heavy duty clamp 3"	5	111100092	A2	

Table 7.5-1: Replacement Parts List, Wear Parts, Tightening Torques

Item 1.01 Pneumatic cylinder pipe	
Stroke	Article number
100	66R0110110020
150	66R0115110020
250	66R0125110020
500	66R0150110020

Table 7.5-2: Pneumatic Cylinder Pipe Depending on Stroke

Item 1.02 Piston rod	
Stroke	Article number
100	66R0110020030
150	66R0115020030
250	66R0125020030
500	66R0150020030

Table 7.5-3: Piston Rod Depending on Stroke

Item 1.19 + 2.05 O-ring Ø 27 x 5	
Material	Article No.
EPDM	106050253
FKM (VITON®)	1060500002706
FFKM	1060500002707

Table 7.5-4: O-Rings for Centering Adapter and Head

Item 1.26 O-ring Ø 45 x 3	
Material	Article No.
EPDM	1060500004501
FKM (e.g. VITON®)	1060500002706
FFKM	1060500002707

Table 7.5-5: O-Rings for Process Connection [PA]

Item 1.20 Centering adapter	
Stroke	Article number
100	66R0110131030
150	66R0115131030
250	66R0125131030
500	66R0150131030

Table 7.5-6: Centering Adapter

Hydraulic pipe			
		Article number	
Stroke	PA 745450002= Process connection in accordance with DIN 32676	MA = Media connection clamp DN25, DIN 32676	
		Standard	Anti-twist
100	Clamp 2"	66R0110042130	66RS110042130
	Clamp 2.5"	66R0110042230	66RS110042230
	Clamp 3"	66R0110042330	66RS110042330
100	Weld 2"	66R0110043130	66RS110043130
	Weld 2.5"	66R0110043230	66RS110043230
	Weld 3"	66R0110043330	66RS110043330
150	Clamp 2"	66R0115042130	66RS115042130
	Clamp 2.5"	66R0115042230	66RS115042230
	Clamp 3"	66R0115042330	66RS115042330
150	Weld 2"	66R0115043130	66RS115043130
	Weld 2.5"	66R0115043230	66RS115043230
	Weld 3"	66R0115043330	66RS115043330
250	Clamp 2"	66R0125042130	66RS125042130
	Clamp 2.5"	66R0125042230	66RS125042230
	Clamp 3"	66R0125042330	66RS125042330
250	Weld 2"	66R0125043130	66RS125043130
	Weld 2.5"	66R0125043230	66RS125043230
	Weld 3"	66R0125043330	66RS125043330
500	Clamp 2"	66R0150042130	—
	Clamp 2.5"	66R0150042230	—
	Clamp 3"	66R0150042330	—
500	Weld 2"	66R0150043130	—
	Weld 2.5"	66R0150043330	—
	Weld 3"	66R0150043230	—
100	Combination adapter C3	66R0110044730	66RS110044730
150		66R0115044730	66RS115044730
250		66R0125044730	66RS125044730
500		66R0150044730	—

Table 7.5-7: Assignment of process and media connection

Spray head		
Type	Article number	
	With EDPM O-ring	with O-ring made of FKM (e.g. VITON®)
A	667233016020031	667233016020032
B	667434216020031	667434216020032
C	667435216020031	667435216020032
D	667436216020031	667436216020032
S	6676X0X06020231	6676X0X06020232

Table 7.5-8: Spray Head Overview

Item 4 End position switch set, Balluff			
Item	Quantity	Designation	Article number
1	2	Limit switch without cable	390037
2	2	Assembly accessories	390041

Table 7.5-9: Limit switch package

8 Faults

8.1 Safety instructions for troubleshooting

Before rectifying a fault, the following safety instructions must always be adhered to:

WARNING



Danger as a result of static charge!

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

There is a risk of death or severe physical injury.

- Only allow work on the device to be performed by experts.
Any person working in a hazardous area must be regularly instructed with regard to the necessity of grounding measures and they should also be made aware of typical grounding faults (e.g. subsequent grounding of objects or devices that are already charged).
- Make sure that any electrostatic charge is prevented. To do so, ground the device and the container using equipotential bonding.
- Grounding must always be carried out before start-up of the device.

WARNING

Hazardous situations caused by performing work on the device incorrectly!

There is a risk of death or severe physical injury.

- Have repairs and troubleshooting work performed only by qualified specialist personnel who have knowledge of the “Technische Regeln für Betriebssicherheit (TRBS)” (German technical rules for operational reliability and safety).
- Before starting work, observe the **work steps of the switch-off procedure** (see [Section 7.2 Switch-off procedure](#)).
- Before rectifying any fault, observe the safety instructions in [Chapter 7 Maintenance](#).
- In case of any uncertainty or doubt, contact AWH.

WARNING

Danger of injuries caused by the cleaning medium returning!

In case of unexpected return of the cleaning medium after interruption of the energy supply (compressed air failure), there is a risk of accident.

- Do not disassemble the device if the cleaning medium has failed.
- Always adhere to the switch-off procedure (see [Section 7.2 Switch-off procedure](#)).

WARNING***Danger of injuries caused by the compressed air returning!***

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

There is a risk of death or severe physical injury.

- Do NOT remove the device if the compressed air supply has failed.
- Always comply with the switch-off procedure (see [Section 7.2 Switch-off procedure](#)).

WARNING***Risk of chemical burns and heat burns when opening the container!***

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



There is a risk of death or severe physical injury.



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

**WARNING*****Danger of crushing being drawn into the equipment due to inadvertent starting-up of the actuator.***

Danger could arise from a sudden, unforeseeable return of energy supply (e.g. unauthorized switching back on).

There is a risk of death or severe physical injury.

- Switch off the energy supply (e.g. electricity or compressed air) before all maintenance, cleaning or repair work.
- Before starting work, observe the **work steps of the switch-off procedure** (see [Section 7.2 Switch-off procedure](#)).

CAUTION***Danger of catching/entanglement in rotating components!***

Failure to observe it can result in minor or moderate injury.

- Beware of moving parts whenever working with the device.
- Wear tight-fitting clothes.

8.2 Faults and remedial action

Fault	Cause	Remedy
Spray head/pneumatic cylinder does not extend/retract.	Compressed air not switched on.	Switch on compressed air or control system.
	Compressed air hose kinked.	Remove any kinks in the placement of the compressed air hoses.
	Throttle check valves closed/set incorrectly.	Adjust the throttle check valves
	Severe soiling of the spray head in the area of the container connection.	Clean the area Attention: Do not damage sealing surfaces.
	Limit switch or cable defective.	Replace limit switch or cable.
	Item 1.08 O-ring and/or 1.10 piston ring defective.	Replace item 1.08 and/or item 1.10.
Spray head does not turn and/or no fluid comes out.	Cleaning fluid pressure and flow rate too low.	Configure the pressure and throughput to standard values.
	Strainer in filter is contaminated.	Check the flow rate of the unit with the spray head removed. Clean the strainer/filter.
	Nozzle holes/slits clogged.	Disassemble the unit and check for deposits / check whether the nozzle slits are clogged. If necessary, clean or replace the spray head.
Effectiveness of cleaning is not sufficient.	Connection pressure too low.	Check connection pressure, adjust it.
	Connection pressure is too high.	Check connection pressure, adjust it.
	Spray slits blocked.	Clean the spray slits.
Spray head does not rotate.	Bearing worn.	Replace the spray head.
Pneumatic cylinder does not retract.	Item 1.10 piston ring or item 1.08 O-ring defective.	Check piston ring and O-ring on piston, replace if necessary.

Table 8.2-1: Operational Disruptions – Cause and Remedy

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



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

Request the form for the hazardous substance declaration from AWH.

8.3 What to Do in an Emergency

If a hazardous situation occurs, or if you need to avert a potential danger, quickly switch 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 owner.

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

- The work steps for switching off the device listed in [Section 7.2 Switch-off procedure](#) must be adhered to.
- The EMERGENCY STOP circuit must be designed in such a way that the machine or system operator can actuate it immediately in the event of an emergency.
- Switching off in an emergency (“EMERGENCY STOP”) is intended to disconnect the entire machine from the power supply without delay in order to eliminate the risks caused by electrical voltage immediately.
- Shutting down in an emergency (“EMERGENCY STOP”) is intended to prevent risks that 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 an Emergency:

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

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

9 Putting the device out of service

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 incorrect shutdown / disposal!

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



There is a risk of death or severe physical injury.

- *Have the work carried out by an expert only.*
- *Before starting work, observe the **work 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 work.*
- *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. [Section 7.3 Removal](#) contains information on the removal of the devices and its interfaces. The safety instructions in [Section 7.1 Safety instructions for maintenance](#) must be observed.

9.1 Disposal



CAUTION



Risk of injuries from harmful fluids!

During disposal, there is a risk of injury from contact with harmful fluids.

There is a risk of minor or moderate injuries.



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

NOTE***Risk of environmental damage as a result of improper disposal!***

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

There is a risk of environmental damage.

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

NOTE

The cleaning device is made predominantly of stainless steel. Stainless steel is a valuable raw material and can easily be recycled.

After removal, the entire device must be properly:

- Clean it (see [Section 7.4.5 Notes on Cleaning](#)) and
- Disassemble it into assembly groups and individual parts.

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

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

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

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

Index

A		I	
Abbreviations.....	V	Identification.....	21
C		Installation.....	17, 37, 39
Cleaning.....	17	Installation position.....	40
Cleaning media.....	14, 32	Installing the device.....	41
Connections.....	18	Clamp installation.....	43
Connection variants.....	25	Welding joint installation.....	43
Pneumatic connection.....	22	Intended use.....	13
Container		M	
Container diameter.....	29	Maintenance.....	17, 57, 66
Container in the context of these		Maintenance points.....	69
instructions.....	14	Maintenance work.....	70
Pressure in the container.....	14	Replacing the O-rings.....	72
Customer service.....	78	Replacing the Spray Head.....	75
D		Maintenance intervals.....	67
Design and function.....	22	Materials.....	28
Device interfaces.....	40, 59	Means of representation.....	7, 9
Media connection.....	22, 42, 63	N	
Media connection [MA].....	29, 64	Noise level	
Process connection.....	22, 42, 63	Noise level of the device.....	50
Process connection [PA].....	V, 25, 29, 40	Noise level of the plant.....	50
Dimensions.....	24	Notes on cleaning.....	76
Disposal.....	88	O	
Duties of the owner.....	16	Operating pressure.....	28, 29
E		Operation.....	53
Emergency.....	87	P	
Expert		Packaging.....	35
Expert.....	18, 37, 58, 76	Personal protective equipment.....	20
Instructed person.....	18, 77	Personnel requirements.....	18
Qualified electrician.....	37, 57	Pictograms and symbols.....	10
Explanation of signal words.....	7	Product names and trademarks.....	11
Explanation of the warnings.....	8	Putting the device out of service.....	88
F		R	
Faults.....	12, 84	Related documents.....	11
Faults and remedial action.....	86	Removal.....	62, 88, 89
Function check		Return.....	84
Trial run with the device.....	51, 57, 68	S	
Functional Flow Chart.....	27	Safety.....	12
G		Safety instructions for installation.....	37
General function description.....	25	Safety instructions for maintenance.....	57

Safety instructions for start-up	49	Pneumatic side	28
Safety instructions for troubleshooting.....	84	Temperature	
Scope of delivery	34	Ambient temperature	28, 29
Self-emptying.....	41	Operating temperature.....	29
Spare parts and customer service	78	Tightening Torque.....	80
Spare Parts and Wear Parts		Tools and tightening torques	71
Spare parts	13, 16, 78	Transport.....	35
Spare parts, replacement parts and		Transport and storage.....	34
accessories	16	Type plate.....	13, 21
Start-up	49		
Static spray head.....	23	U	
Storage.....	36	Units of measure	VI
Surfaces.....	31		
Switch-off procedure	60	W	
Switch-on procedure	52	Warranty and liability.....	11
Switch-on procedure work steps	52	Welding the Combination Vessel Connector...	44
		What to do in an emergency	87
T		Work steps	
Technical data	28	Switch-off procedure ..37, 58, 59, 60, 84, 85,	
Technical Data		87, 88	
General technical data.....	28	Switch-on procedure.....	52
Hydraulic side	29		

Annexes

Appendix 1: Declaration (Translation)..... 94

Appendix 2 Declaration (original)..... 95

Appendix 3: Corrosion Resistance of Steels (Excerpts from Data Sheets)..... 96

Appendix 1: Declaration (Translation)

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Declaration of incorporation as per

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

We hereby declare that the container cleaning device

Designation: Retractor system TANKO-RT with pneumatic actuator air/air

Type: Stroke 100, 150, 250, 500 with head type A, B, C, D

Year of manufacture: see type plate on the device

Serial number: see type plate on the device

is consistent with the following essential health and safety requirements of Directive 2006/42/EC: no. 1, no. 1.1.2 (a+b), 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.4, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.5.13., 1.6.1, 1.6.3, 1.7.1, 1.7.3

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

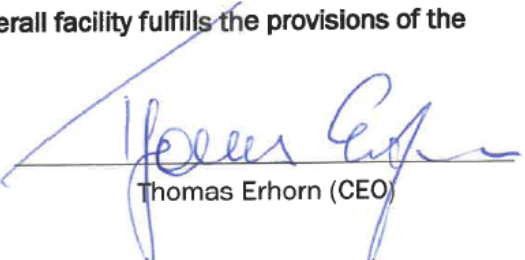
The supplied version of the device corresponds to the following directives and standards:

Directive/standard	Title	Version	Remarks
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 of DIN EN ISO 12100:2011-03	2013-08	
DIN EN ISO 4414	Pneumatic fluid power - General rules and safety requirements for systems and their components	2011-04	Harmonized standard

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 directives.

Hötensleben, 14. January 2021



Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:

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

Appendix 2 Declaration (original)

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Declaration of incorporation as per

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

We hereby declare that the container cleaning device

Designation: Retractor system TANKO-RTS with pneumatic actuator air/air

Type: Stroke 100, 150, 250 with head type A, B, C, D or S

Year of manufacture: see type plate on the device

Serial number: see type plate on the device

is consistent with the following essential health and safety requirements of Directive 2006/42/EC: no. 1, no. 1.1.2 (a+b), 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.4, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.5.13., 1.6.1, 1.6.3, 1.7.1,1.7.3

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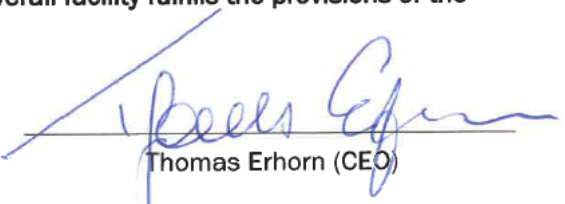
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Appendix 3: Corrosion Resistance of Steels (Excerpts from Data Sheets)

Material number 1.4301 (AISI 304) as a component that does not come into contact with the medium (e.g. clamp on the clamp connection).

Stainless austenitic chrome-nickel steel

1.4301 is the standard for austenitic chrome-nickel steels. It is used in numerous areas because of its high corrosion resistance and ease of processing, as well as its attractive appearance in a high-gloss polished, ground or brushed condition. Because 1.4301 is not resistant to intergranular corrosion when welded, if large parts have to be welded and subsequent solution annealing is not possible, 1.4307 should be used.

The moderate carbon content of 1.4301 means that this grade tends to be sensitive. The formation of chromium carbides and the associated areas of depleted chrome around these depositions make this steel susceptible to intergranular corrosion. Although there is no risk of intergranular corrosion in the condition supplied (solution-annealed), it can set in after welding or when used at high temperatures. It exhibits good corrosion resistance in natural environmental media (water, rural and urban atmospheres) in the absence of significant chlorine and salt concentrations. 1.4301 is not suitable for applications involving contact with seawater, nor is it suitable for use in swimming pools.

Material no. 1.4401 (AISI 316)

The corrosion resistance of 1.4401 is significantly better than that of stainless steel grades 1.4301 and 1.4307, particularly when chlorides are also present, thanks to the addition of 2 - 3% molybdenum.

1.4401 has excellent corrosion resistance in natural environmental media (water, rural and urban atmospheres), as well as in industrial sectors with moderate chlorine and salt concentrations, in the food industry and the agricultural food sector.

Due to its relatively high carbon content it must be taken into account that 1.4401 is not resistant to intergranular corrosion.

Furthermore, it should also be pointed out that 1.4401 is not resistant to sea water.

Material no. 1.4404

The corrosion resistance of 1.4404 is significantly better than that of stainless steel grades 1.4301 and 1.4307, particularly when chlorides are present, thanks to the addition of 2-3% molybdenum.

1.4404 exhibits excellent corrosion resistance in natural environmental media (water, rural and urban environments), as well as in industrial sectors with moderate chlorine and salt concentrations, in the food and pharmaceutical industries and in the agricultural food sector. Due to its low carbon content 1.4404 is even resistant to intergranular corrosion after welding.

1.4404 is not resistant to sea water!

Material no. 1.4435 (AISI 316L)

1.4435 has excellent corrosion resistance in natural environmental media (water, rural and urban environments), in industrial sectors with moderate chlorine and salt concentrations, as well as in the food industry and the agricultural food sector. In addition, this grade is also resistant to various acidic media. As this material is also resistant to intergranular corrosion after welding, it complies with the following standardized test procedures:

AFNOR NF 05-159 / ASTM A262-75. Practice E / DIN 50914

The higher proportion of molybdenum in 1.4435 compared to 1.4404 makes it significantly more resistant to reducing acids and chloride media.

Material no. 1.4571

1.4571 has good resistance to corrosion in most natural waters (urban and industrial), provided that the concentrations of chloride, salt, hydrochloric acid and organic acids are low to medium. 1.4571 has excellent corrosion resistance both in the food and beverage industry, as well as in the agricultural food sector.

As this grade is also resistant to intergranular corrosion after welding, it complies with the following standardized test procedures:

AFNOR NF 05-159 / ASTM A262-75. Practice E / DIN EN ISO 3651-2

Notes



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