

Operating Manual

Dome cap unit MULTItop
(Type 19500)



Dome cap Unit MULTItop

19500

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Safekeeping and Completeness

- The operating manual is part of the delivery package and must be available to authorised personnel at all times.
- It is impermissible to delete chapters from this manual. If the operating manual or pages thereof are missing, they must be replaced immediately.

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Manufacturer

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1. General

This operating manual must be observed by everyone involved with the installation, commissioning, operation and the assembly/maintenance of the dome cap unit.

This operating manual applies to the following dome cap unit types:

Types	Equipment
19500	Dome cap unit MULTItop consisting of: Dome cap plate with assemblies, comprising a gas CIP armature (RLV), various safety armatures, monitoring sensors and monitoring armatures

Proper application

- Dome cap units on closed process tanks are used in the food and beverages industry.
- The RLV unit (gas CIP armature) on the dome cap is used to distribute media and for internal tank cleaning.
- The safety armatures on the dome cap are used to provide overpressure and underpressure protection at closed process tanks.
- The monitoring sensors and armatures on the dome cap are used to monitor the pressure and fill level as well as to carry out visual inspections.
- Dome cap units may be used for the intended purpose only.
Always pay attention to country-specific guidelines, tank design, installation situation and specified process data, such as media, pressure and temperature.

Foreseeable misuse

The following are examples of misuse:

- Generally recognised safety guidelines are not observed during installation, operation, assembly and maintenance.
- The application of operating conditions and media that deviate from those specified in the operating manual.
- Unauthorised modifications or changes to the dome cap unit that impair its safety or functionality.
- The dome cap unit, in particular the assemblies, is used although it is not functional.

The User's duty to exercise diligence

The user must especially ensure that:

- Installation of the dome cap and the assembly connections are correct and safe.
- The dome cap unit is always operated according to its intended purpose and in a fully functional state.
- The statutory requirements for commissioning, operation, assembly and maintenance are observed.
- Only sufficiently qualified and authorised personnel carry out tasks at the dome cap unit.

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2. Safety information

2.1. Symbols



Risk of injuries!
Indicates an immediate hazardous situation!

- Non-observance may result in death or serious injury.



Caution – danger zone warning!
Indicates a potentially hazardous situation!

- Non-observance may result in minor to moderate injury.



Functional impairment or material damage!
Indicates a possible functional impairment or material damage.



Note
Important additional information and recommendations.

2.2. Safety information



Note
The following safety information must be considered as an addition to the relevant applicable national accident prevention requirements and laws.
Current standards of good engineering practice must be observed when planning the application and operation of the device.
Please pay attention to the relevant rules and safety regulations in other countries.



Basic safety instructions to prevent injuries and to ensure correct functioning:

- Transportation and storage are carried out correctly in accordance with the operating manual.
- Installation and maintenance tasks as well as operating actions should only be carried out by appropriately authorised and qualified personnel with suitable tools.
- The device should only be installed and operated when in efficient working order and in accordance with the operating manual.

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Risk of injuries!

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • The dome cap units are installed at a high point on the process tanks. • If the dome cap units are used outdoor, heating elements can be fitted. • In case of malfunction, the assemblies must be put out of service immediately. • Dismounting assemblies from the dome cap or operating them manually when the pressure in the process tank has not been released or the piping system has not been shut off, may result in burns, scalding or chemical burns. • If the dome cap unit is operated in a system with acidic or alkaline media, your hands and fingers may suffer chemical burns when disassembling the unit. • If the dome cap unit is operated in a system with hot media, high surface temperatures may occur. • There is a risk of crushing due to moving parts. | <ul style="list-style-type: none"> ○ Secure access and safe work at height must be guaranteed. ○ Ensure that you do not come into contact with the heating elements or that they are switched off. ○ Faults must be eliminated immediately. ○ Ensure that the piping system is shut off and the pressure inside the tank has been released. ○ Ensure that the product area of the system is rinsed in advance. ○ Ensure that the dome cap unit or the system has cooled down to below 50°C. ○ Never reach into the switching section of the armatures. |
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3. Delivery and performance, storage

- Check the information on the delivery note for correctness and check the delivery for completeness. Later complaints will not be accepted.
- Conduct a visual inspection for transport damage. The forwarding agent must be informed immediately of any visible damage (comment on the waybill).
- Claims due to transport damage not visible right away must be made to the forwarding agent within a week.
- Store the delivery in dry rooms and, if possible, in the original packaging to protect it against external factors.



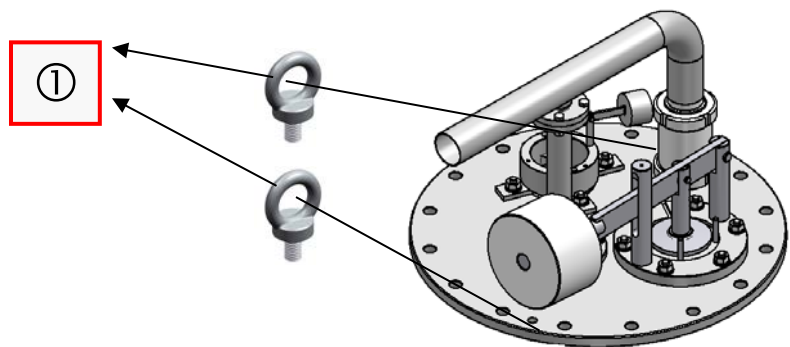
Risk of injuries!

Danger of death due to the dome cap unit falling or uncontrolled unit movements during transportation and lifting.

- Never pass under suspended loads.
- Always observe details about the provided attachment points.
- Make sure lifting gear is attached correctly.
- Only use approved lifting gear with sufficient load carrying capacity.
- Never use ropes, slings or belts that are frayed or knotted.
- Always protect ropes, slings and belts from sharp edges and corners.



Basic safety information



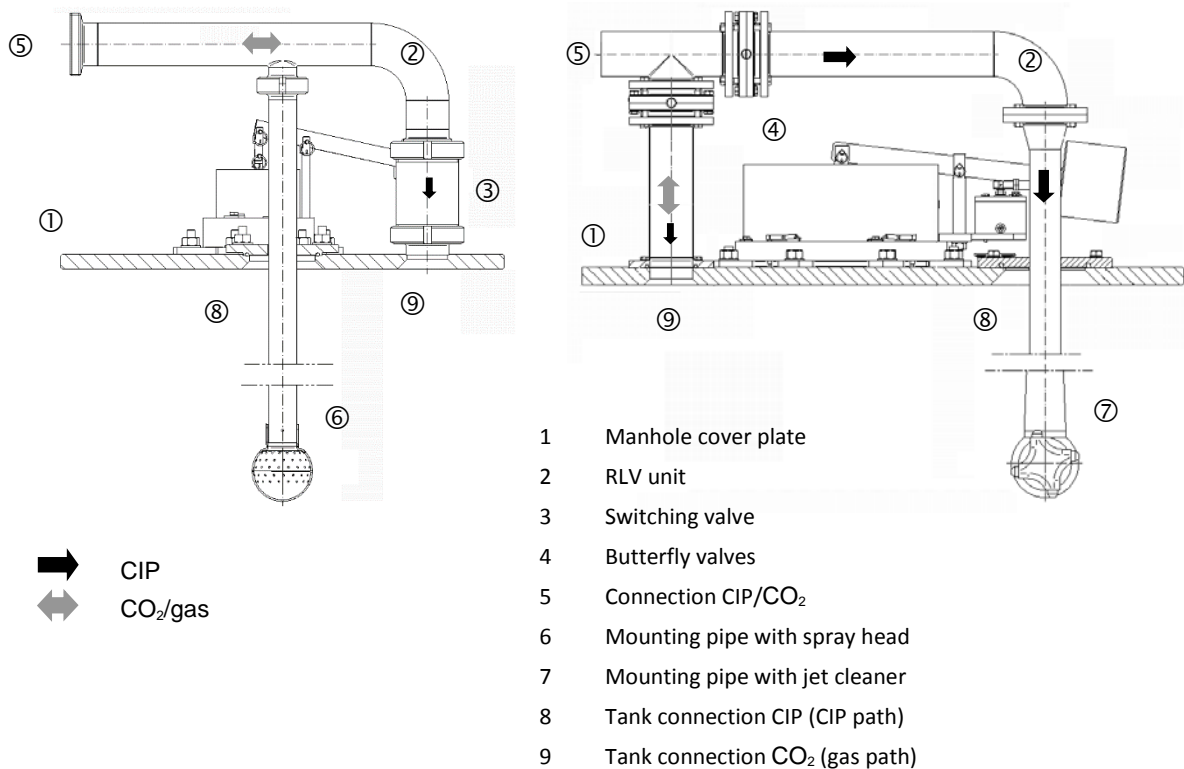
① Always use lifting rings!

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4. Function and operation

4.1. System description

The dome cap units are used in hygienic processes and are installed horizontally in the upper tank floor. Their main function is to accommodate armatures for the supply and removal of media, as well as monitoring devices for controlling specific process parameters.



4.2. Operating instruction

Operation

- The RLV unit (gas/CIP armature) is used to distribute CO₂/CIP and for internal tank cleaning via a spray nozzle or a jet cleaner.
- The safety armatures, especially the safety valve and vacuum valve, are used to provide overpressure and underpressure protection at the process tank.
- Monitoring sensors and armatures are used to measure the pressure and fill level as well as to carry out visual inspections inside the tank.



Note

Correct and safe operation of the dome cap unit is only guaranteed if the descriptions and instructions of the various assembly components are observed in the respective operating manuals.

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Services panel:

- The media distribution in the RLV unit with spray head is controlled by a switching valve (3).
- When using a jet cleaner, the media flow is controlled by two individual butterfly valves with drives or via a butterfly valve combination with only one drive with mechanical control of the butterfly discs (4).



Note

The two individual butterfly valves must be controlled pneumatically in such a manner that the media passages rotate in opposite directions. Usually, the gas path is opened and the CIP path is closed. (During CIP cleaning, the CIP path is opened, the gas path is opened only briefly or periodically).

The butterfly valve combination must be installed in such a way that the butterfly discs are aligned in opposite directions. Usually, the gas path is opened and the CIP path is closed. During pneumatic control, the CIP path is opened and the gas path is closed mechanically and automatically.

CIP cleaning:

Cleaning of the dome cap unit on the product side occurs during internal tank cleaning via the spray nozzle or the jet cleaner.

Depending on the type and the equipment of the safety armatures, they can be cleaned during internal tank cleaning via an internal CIP device.

Installation of the dome cap unit must ensure that soiling caused by ambient conditions is either fully excluded or minimised. The outer surface of the dome cap unit should be cleaned by hand at regular intervals.



Risk of injuries!

- Automatic opening of the safety armatures may result in escaping media causing scalding or chemical burns.
- Direct contact with a hot surface may result in burns.
- There is a risk of crushing due to moving parts.

Make sure that:

- The dome cap unit is separate from normal process operation.
- The tank interior has been depressurised and has cooled down to below 50°C.
- You never reach into the switching section of the armatures.



Note

Only use cleaning agents which are appropriate for stainless steel and the seals. Please refer to the safety data sheets of the cleaning agents.

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4.3. Tank cleaning



Risk of injuries!

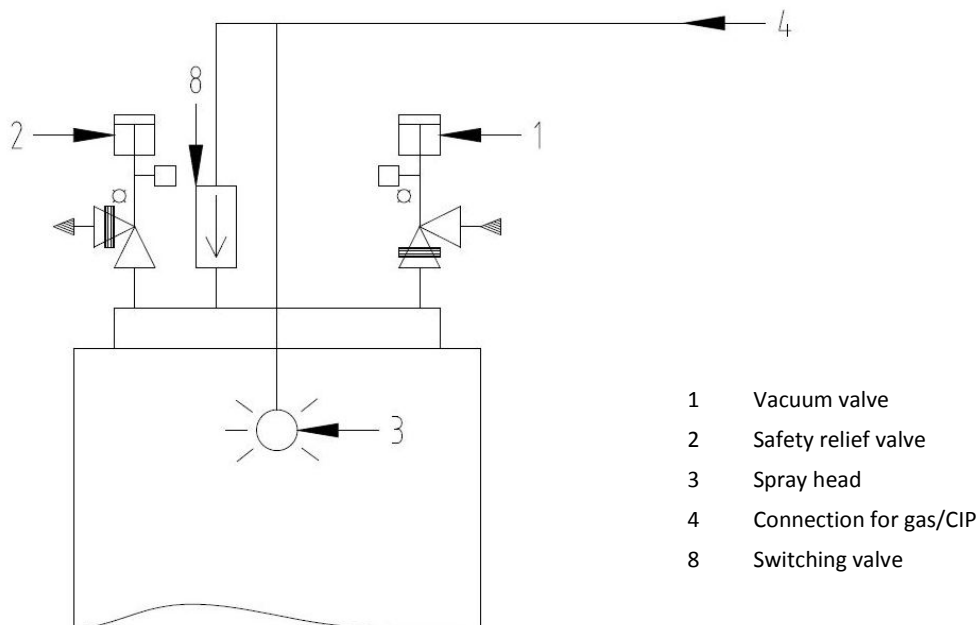
When cleaning the tank, escaping medium can cause scalding and corrosive burns. To avoid this risk, keep well away from the dome cap.



Notice

When cleaning a pressurised tank, do not lift the valves.

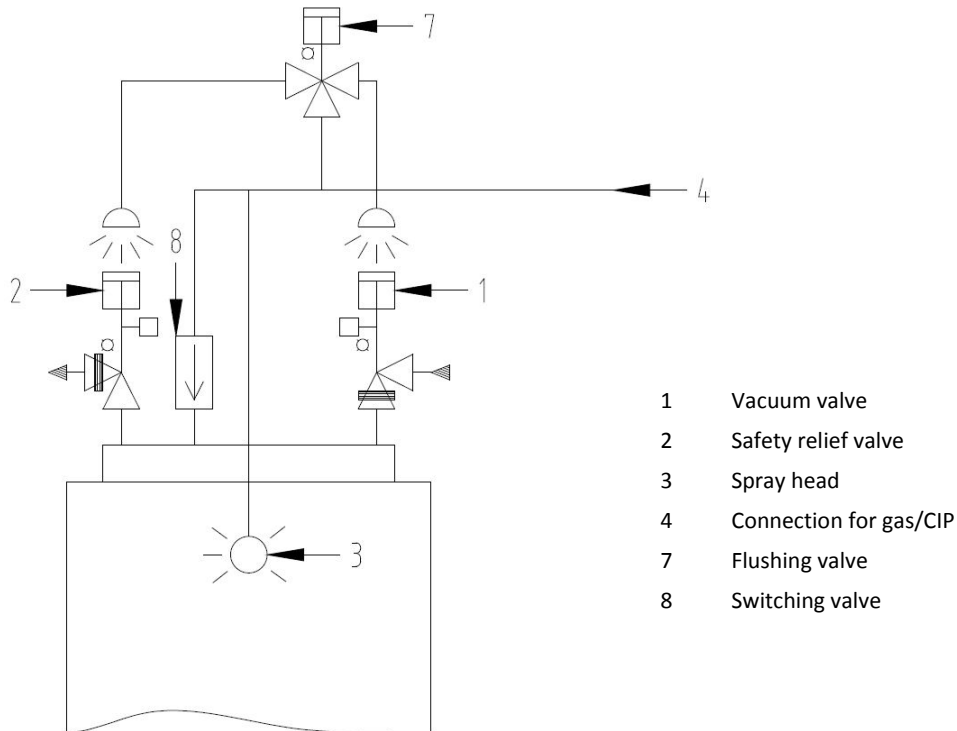
Variant 1: Spray head with switching valve/Valves with lifting



1. Start CIP flow pump (gentle start-up).
2. Lift vacuum valve (1) and safety relief valve (2).
3. Lifting time of vacuum valve (1) and safety relief valve (2) is variable (recommended time: 10 sec). Valves are lifted for valve seat cleaning.
4. Close vacuum valve (1) and safety relief valve (2).
5. Continue cleaning step with required spray head output. Vacuum valve (1) and safety relief valve (2) are in this case closed.
6. Repeat this process for all cleaning steps (base, water, acid, water, disinfectant, water).

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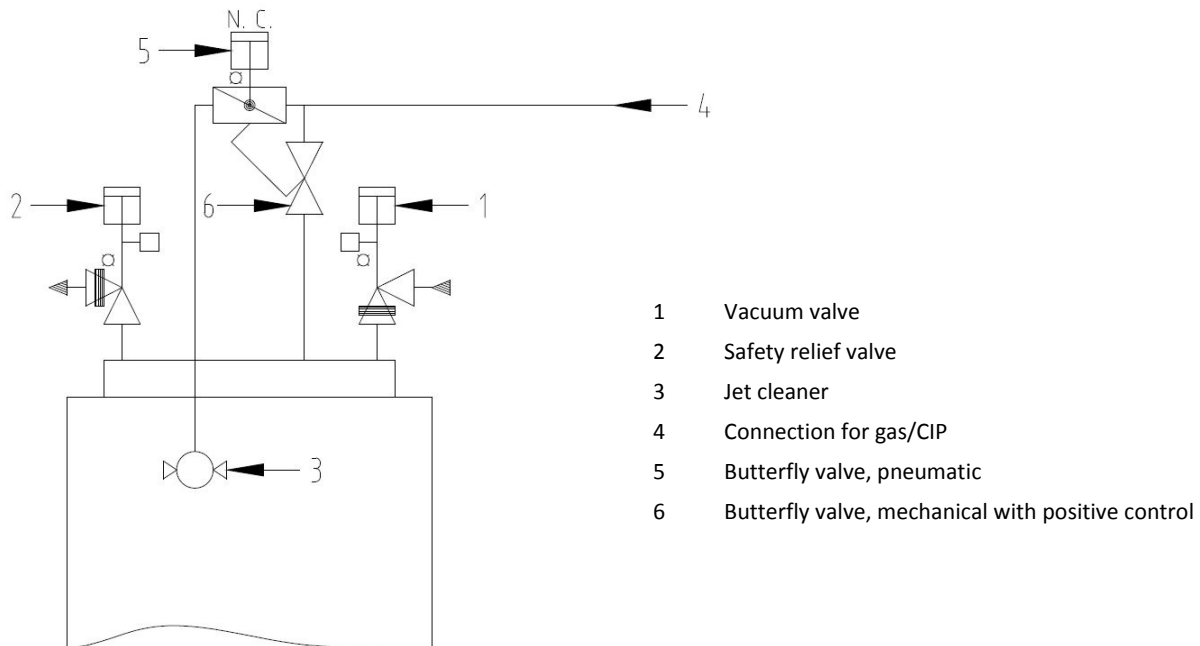
Variant 2: Spray head with switching valve/Valves with lifting and flushing valve



1. Start CIP flow pump (gentle start-up).
2. Lift vacuum valve (1) and safety relief valve (2).
3. Open flushing valve (7). Flushing time is variable (recommended time: 10 sec). Valves are lifted for valve seat and valve disc cleaning.
4. Close flushing valve (7).
5. Close vacuum valve (1) and safety relief valve (2) in a time-delayed manner (recommended time: 10 sec) after closing the flushing valve (7).
6. Continue cleaning step with required spray head output. Vacuum valve (1), safety relief valve (2) and flushing valve (7) are in this case closed.
7. Repeat this process for all cleaning steps (base, water, acid, water, disinfectant, water).

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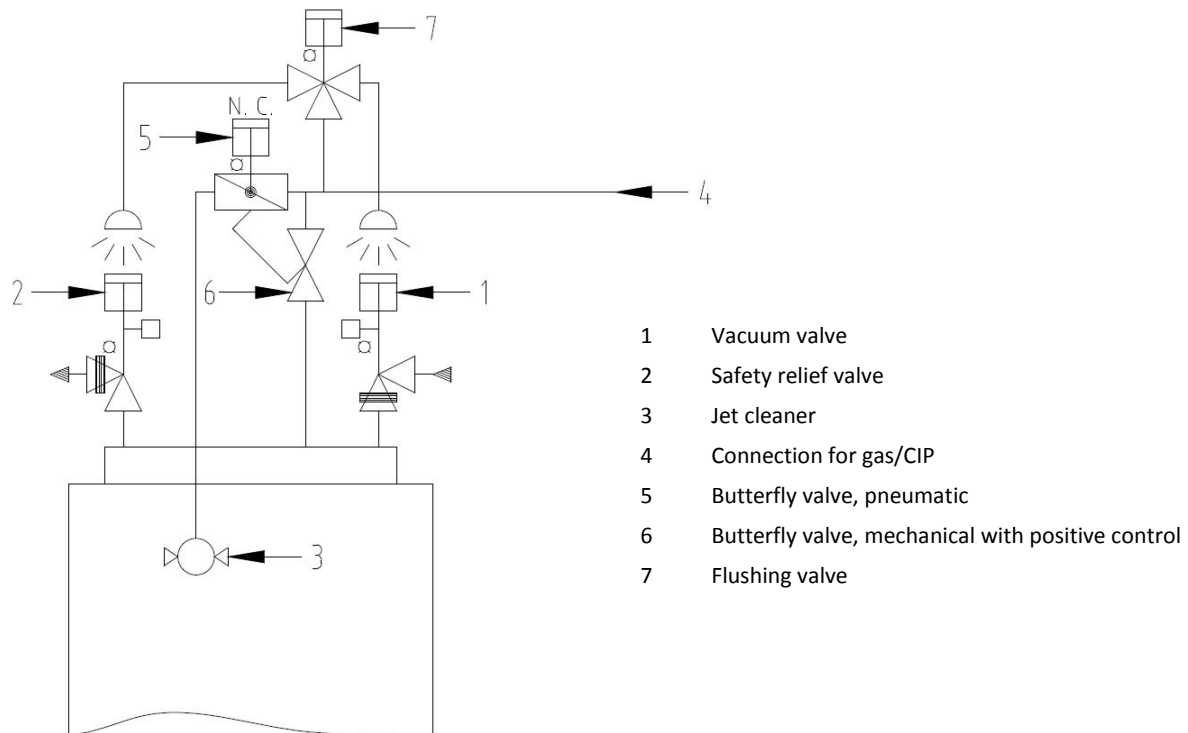
Variant 3: Cleaning machine with valve circuit/Valves with lifting



1. Start CIP flow pump (gentle start-up).
2. Lift vacuum valve (1) and safety relief valve (2).
3. Valve (6) (gas path) is open. Gas path is cleaned temporarily.
4. Open valve (5). Valve (6) closes with positive control.
5. Lifting time of vacuum valve (1) and safety relief valve (2) is variable (recommended time: 10 sec). Valves are lifted for valve seat cleaning.
6. Close vacuum valve (1) and safety relief valve (2).
7. Continue cleaning step with required jet cleaning output. Vacuum valve (1) and safety relief valve (2) are in this case closed.
8. Repeat this process for all cleaning steps (base, water, acid, water, disinfectant, water).

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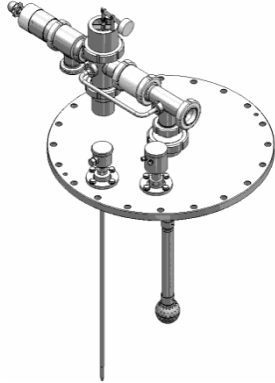
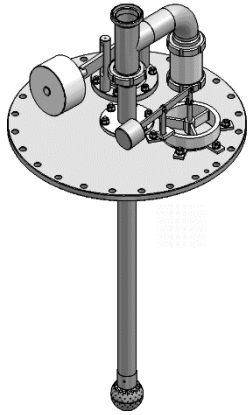
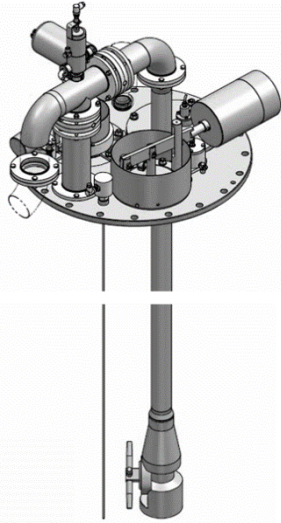
Variant 4: Cleaning machine with valve circuit/Valves with lifting and flushing valve



1. Start CIP flow pump (gentle start-up).
2. Lift vacuum valve (1) and safety relief valve (2).
3. Valve (6) (gas path) is open. Gas path is cleaned temporarily.
4. Open valve (5). Valve (6) closes with positive control.
5. Open flushing valve (7). Flushing time is variable (recommended time: 10 sec). Valves are lifted for valve seat and valve disc cleaning.
6. Close flushing valve (7).
7. Close vacuum valve (1) and safety relief valve (2) in a time-delayed manner (recommended time: 10 sec) after closing the flushing valve.
8. Continue cleaning step with required jet cleaning output. Vacuum valve (1), safety relief valve (2) and flushing valve (7) are in this case closed.
9. Repeat this process for all cleaning steps (base, water, acid, water, disinfectant, water).

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4.4. Type variants*)

<p>A</p> <ul style="list-style-type: none"> • Dome cap plate with RLV unit, consisting of a switching valve for CIP/CO₂ distribution as well as a safety valve and a vacuum valve • Spring-loaded safety valve • Weight-loaded vacuum valve, alternatively spring-loaded <p>>> Application for standard CIP processes</p> <p>Accessories</p> <ul style="list-style-type: none"> • Pneumatic lifting, heating elements • Monitoring of fill level and pressure, inspection glass 	
<p>B</p> <ul style="list-style-type: none"> • Dome cap plate with RLV unit with switching valve for CIP/CO₂ distribution • Weight-loaded safety valve, mounted separately • Weight-loaded vacuum valve, mounted separately <p>>> Application for standard CIP processes >> Hot-Cold cleaning with powerful SV and VV possible</p> <p>Accessories</p> <ul style="list-style-type: none"> • Pneumatic lifting, heating elements • Monitoring of fill level and pressure, inspection glass • Internal CIP device for safety valve and vacuum valve 	
<p>C</p> <ul style="list-style-type: none"> • Dome cap with RLV unit and pneumatic rotary dampers for CIP/CO₂ distribution, jet cleaner, safety armatures with CIP equipment • Weight-loaded safety valve, mounted separately • Weight-loaded vacuum valve, mounted separately <p>>> Application for standard CIP processes >> Hot-Cold cleaning with powerful SV and VV possible</p> <p>Accessories</p> <ul style="list-style-type: none"> • Pneumatic lifting, heating elements • Monitoring of fill level and pressure, inspection glass 	

*) other customized variants are possible

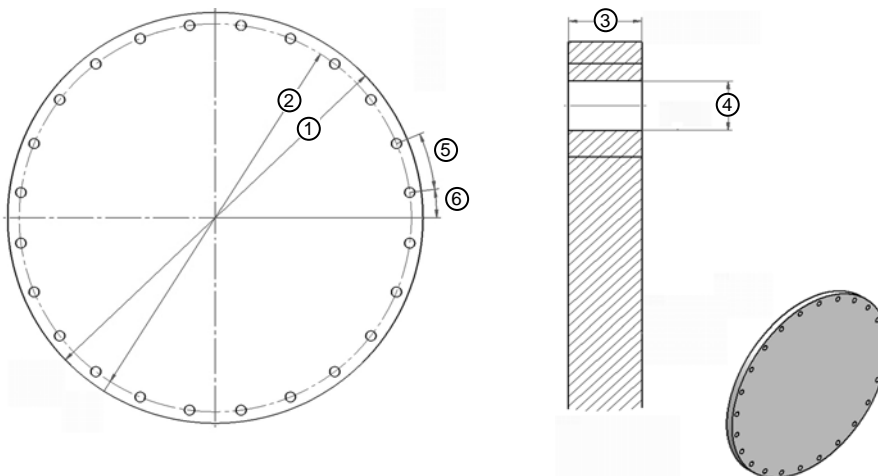
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4.5. Technical data (Default)

Product range	
Plate material	Stainless steel 1.4307, alternative 1.4404
Weld-in flange material	Stainless steel 1.4307, alternative 1.4404
Surface product side (Ra)	Ground $\leq 0.8 \mu\text{m}$
Seals (in the flange)	EPDM
Production / CIP	
Process media	Liquids and gases, (non-toxic, less aggressive)
CIP media	Commercially available alkaline and acidic solutions in a concentration range of 2-3%.
Operating pressure	Up to 6 bar
Temperature CIP / SIP	0 - 95°C

Dome cap dimensions *)		Nominal sizes (DN)			
		450	500	600	800
	Pos.				
Nominal diameter	1	550	615	700	900
Pitch circle	2	500	575	660	850
Plate thickness	3	19	20	20, 25	28, 30
Bolt hole	4	16 x 18	20 x 18	20 x 19	24 x 22
Hole angle	5	22.5	18.0	18.0	15.0
Axis angle	6	0, (11.25)	0, (9.0)	0, (9.0)	0, (7.5)

*) Dimensions may vary, customized types



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5. Assembly and disassembly

5.1. Safety and assembly instructions (Default)



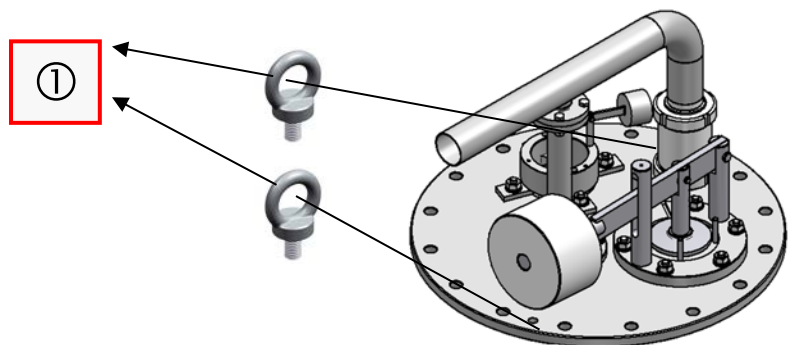
Risk of injuries!

Danger of death due to the dome cap unit falling or uncontrolled unit movements during transportation and lifting.

- Never pass under suspended loads.
- Always observe details about the provided attachment points.
- Make sure lifting gear is attached correctly.
- Only use approved lifting gear with sufficient load carrying capacity.
- Never use ropes, slings or belts that are frayed or damaged.
- Always protect ropes, slings and belts from sharp edges and corners.



Basic safety information



- ① Always use lifting rings!



Caution – danger zone warning!

Please pay attention to the following prior to installing and commissioning the dome cap unit:

- Check the dome cap unit for visible external and internal damage.
- Check the current system status (pressure, temperature, medium).

Please pay attention to the following prior to installing and commissioning the assemblies:

- Pay attention to the safety instructions and the instructions regarding assembly, operation and maintenance of the assembly components in the respective operating manuals.
- Always check the current system status (pressure, temperature, medium) prior to intervention at the components.



Caution – danger zone warning!

Please pay attention to the following points if malfunctions occur, and prior to dismantling the assemblies:

- The respective assembly component must be put out of service.
- Check the current system status (pressure, temperature, medium) prior to disassembly.



Caution – functional impairment or material damage!

Installation instructions:

- Use suitable and safe lifting equipment to position the dome cap unit on the provided mating flange.
- Clean the flange surface in advance and ensure the seal is positioned correctly.
- Slightly tighten the dome cap without putting any undue strain on the unit with the specified number of flange bolts.
- Subsequently tighten the flange bolts in a cross pattern using a torque spanner.
- The flange bolts should be retightened after commissioning or the first heating cycle.



Caution – functional impairment or material damage!

Installation instructions:

- Welding work (TIG, welding gas) should only be carried out by qualified welders (EN 287-1).
- Always dismantle the assembly components before carrying out welding work on them.
- Always remove weld residue.



Caution – functional impairment or material damage!

Assembly instructions:

- Do not damage the valve insert, sliding surfaces or sealing surfaces. Use only suitable tools and tensioning devices.
- use only suitable and approved spare parts from the manufacturer.
- Slightly grease seals and insert them evenly into the groove. (use only grease approved for the field of food processing)
- Bolts, slightly grease threads. Tighten parts evenly.
- Carry out a manual function test.

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6. Maintenance

6.1. Maintenance instructions



Caution – functional impairment or material damage!

Inspection and maintenance intervals:

- Visual inspections of the dome cap unit must be carried out every 4 weeks.
 - >> Leakage test
 - >> Manual function test, wherever possible.
- To ensure that the assembly components are ready for operation and functionally reliable, they should be checked annually within the scope of the general internal maintenance procedure.
 - >> Maintenance intervals must be set by the user.
- After maintenance, always remove protective devices and reconnect the feed and drain lines to the valve.
- Ensure that a functional test is always performed on the assembled components following maintenance work.

6.2. Troubleshooting

Malfunction	Possible causes	Measures
Leakage at the dome cap	<ul style="list-style-type: none"> • Seal between the flange and the housing damage • Flange bolts have become loose • Screw connections at the assembly components have become loose 	<ul style="list-style-type: none"> • Replace seal • Test tightening torque • Retighten screw connections
Leakage or malfunctioning at the assembly components	<ul style="list-style-type: none"> • Please refer to information in the operating manuals of the respective components 	<ul style="list-style-type: none"> • Faults must be eliminated immediately
Noise development	<ul style="list-style-type: none"> • Uneven flow • Cavitation • Jet cleaner 	<ul style="list-style-type: none"> • Check process conditions

6.3. Spare parts



Note

Please refer to the respective operating manuals for the armatures assembled on the dome cap.