Serving Beer Tank

OWNER'S MANUAL

Part No. 9865302

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MUELLER

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Section 1.0 – Introduction

1.1 GENERAL INFORMATION

This manual provides basic installation and operation information for Mueller® serving beer tanks. It is intended for use by the equipment operator in charge of installation and meets the requirements of ASME Code, Section VIII, Division 1.

Please familiarize yourself with the information provided in this manual before you begin using your serving beer tank. Please contact your Paul Mueller Company sales representative if you require additional technical assistance.

Unless otherwise indicated, all measurements are in meters.

Paul Mueller Company has compiled this manual with the greatest care. Nevertheless, we cannot completely exclude the possibility of error. Paul Mueller Company does not assume any responsibility for mistakes and subsequent damages.

Section 2.0 – Safety

2.1 SYMBOLS USED IN THIS MANUAL

The following icons are used throughout this manual:

Safety Alert Symbol:
The safety alert symbol indicates a potential personal injury hazard may exist. The safety alert symbol will be used along with a signal word—**DANGER**, **WARNING**, or **CAUTION**—indicating the level of safety concern. The safety alert symbol and signal word will be followed with a explanatory statement.

Important Notice Symbol:
The important notice symbol indicates there is potential for damage to the equipment if procedures are not executed correctly. A signal word—**IMPORTANT**—will follow the symbol, and will precede an explanatory statement.

2.2 GENERAL SAFETY INFORMATION

CAUTION: Caution is required during the use, inspection, and maintenance of serving beer tanks. To minimize any chance to injury during operation or maintenance of the serving beer tank, use all applicable personal protective equipment, such as safety shoes, work gloves, safety glasses, and hearing protection.

Paul Mueller Company cannot be held responsible in the event of equipment damage or bodily injury resulting from failure to observe the indications in this owner's manual or from neglect during installation, operation, or maintenance of this equipment. If you still have concerns about safe operating procedures after reading this manual, please call your Paul Mueller Company sales representative.

2.3 INSTRUCTIONS FOR GENERAL USE

Correct operation of the serving beer tank is vital to its safe usage and optimum performance. Please contact your Paul Mueller Company sales representative if you require additional technical assistance pertaining to the equipment's operation or maintenance procedures.

IMPORTANT: Do not lift the serving beer tank unless empty, using only lifting equipment rated for the weight of the serving beer tank. See Table 4 for dimensions and weight.

1. Operation and maintenance procedures should only be performed by qualified personnel.

2. The serving beer tank may be used only for its designed purpose with the intended operating media indicated within the pressure and temperature limits stipulated on the nameplate and in the manual. Please keep this manual in a safe, easily accessible location.

3. The pressure vessel must be equipped with the appropriate safety and test measures that prevent exceeding the maximum admissible operational data.

4. The pressure vessel must be placed on a foundation designed to accommodate its weight when full.

5. The pressure vessel must be set up and installed in a horizontal position.

6. Connections to the pressure vessel need to be attached strain-free.

7. Do not expose the pressure vessel to any vibrations during operation.

IMPORTANT: Precautions must be taken to prevent vibrations, as it can lead to fatigue failure.

8. The cooling water system should be filled before start-up and all air vented from the system. Circulate the water before filling the tank.

9. Cooling water must not contain corrosive components that can damage the equipment. In addition, the cooling water (preferably from a closed cooling circulation system) must be free of rough contamination or other impurities that may cause clogging in the pressure vessel's cooling jacket. Connect a filter if necessary.

10. During maintenance and/or inspection of the pressure vessel, the welds must be cleaned and checked for damage. New seals (original parts) are to be used. The safety valve must be checked for correct operation. Before starting maintenance and/or inspection work, ensure the vessel is no longer under pressure and is completely empty. During maintenance and/or inspection, operation may not be initiated by a third party. When maintenance and/or inspection work has been completed, a pressure test must be done before the vessel can resume operation.

11. When emptying the vessel, make sure that no vacuum develops.

2.3 INSTRUCTIONS FOR GENERAL USE (CONTINUED)

12. All local, state, and national regulations valid at the place of assembly regarding industrial safety are to be observed.

13. Local, state, and national regulations regarding safe operation of pressure vessels are to be observed.

TABLE 1: OPERATIONAL DATA

Description	Tank	Cooling
Contents	See data plate	See data plate
Maximum admissible contents	See data plate	See data plate
Maximum/minimum admissible operating pressure	2/0 bar (30/0 psi)	—
Operating pressure	—	3 bar (43 psi)
Maximum/minimum admissible operating temperature	50/0°C (122/32°F)	50/0°C (122/32°F)
Medium	Beer/Gas	Cooling water
Test pressure at a temperature of 10 to 30°C (50 to 86°F)	2.7 bar (39 psi)	4.3 bar (62 psi)

Section 3.0 – Product Data

3.1 SERVING BEER TANK COMPONENTS

Paul Mueller Company developed serving beer tanks in 1982 and has produced these convenient pressure vessels ever since. Serving beer tank components are described as follows:

1. Cooling
2. Inliner
3. Piercing valve
4. Distributor
5. Manway
6. Pressure safety valve

FIGURE 1: COMPONENT LOCATION

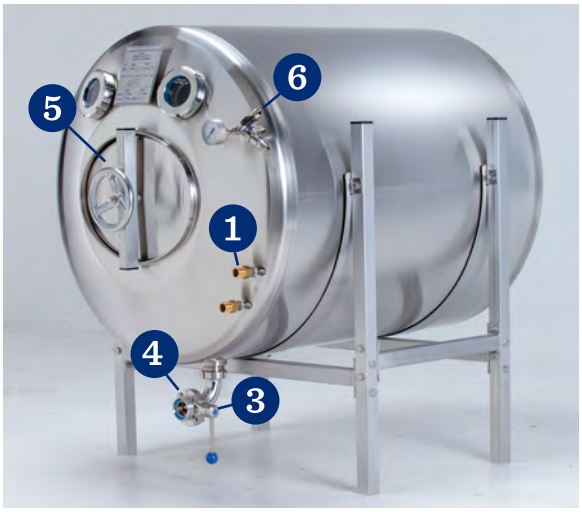


FIGURE 2: INLINER

3.2 COOLING

Serving beer tanks are available as single-wall units without insulation or insulated double-wall units.

Double-wall serving beer tanks have cooling spirals or cooling plates. Double-wall serving beer tanks require minimal modifications to surroundings, but should be located in an area protected from frost and full sunlight. See Figure 3 for cooling connections.

Single-wall serving beer tanks are usually kept in cool cells that cool the entire system. While single-wall serving beer tanks may require additional space, their lighter weight allows for easier installation.

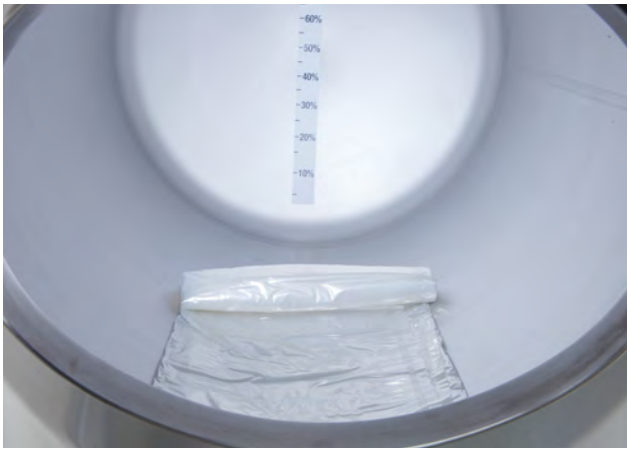
FIGURE 3: COOLING CONNECTIONS

3.3 INLINER

An inliner (see Figure 4), also called a beer liner, is a food-grade, low pressure, polyethylene bag that is filled with beer. The bag can be removed when empty, making the cleaning of the tank virtually unnecessary. Special discharge openings called piercing valves are used in conjunction with inliners (see Section 3.4).

Contact your Paul Mueller Company sales representative to purchase inliners. See Section 6 for details.

FIGURE 4: INLINER INSIDE SERVING BEER TANK



3.4 PIERCING VALVE

A piercing valve is installed on the serving beer tank when inliners are used and serves as a pressure- and fluid-tight seal between the serving beer tank and beer discharge openings. With the piercing valve, the inliner can simply be pushed into the appropriate fitting and will be sealed hermetically for beer and air.

FIGURE 5: PIERCING VALVE

3.5 BEER DISTRIBUTOR

Distributors are available with two, four, or six outlets.

A check valve is included with the distributor. The check valve lets you remove the beer hose from one serving beer tank and mount in on the other without spillage. The check valve also prevents beer from flowing back into the tank from the hose, maintaining beer quality in the tank.

The distributor can be disconnected completely for cleaning and maintenance using a spanner wrench.

FIGURE 6: TWO-OUTLET BEER DISTRIBUTOR

3.6 MANWAY

The serving beer tank can be opened by means of a removable oval manway.

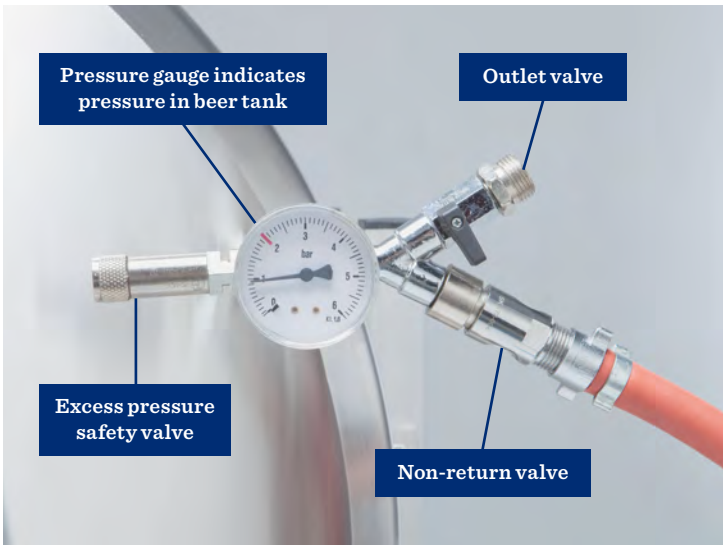
Note: If a hinged oval manway is in use, it is opened by swinging inwards.

3.7 PRESSURE SAFETY VALVE

With a maximum working pressure of 30 psi, Mueller serving beer tanks are provided with an approved safety pressure valve. We recommend the installation of Paul Mueller Company's standard pressure safety valve. This fitting must be inspected regularly to ensure it is operating correctly. See Figure 7 for components of the pressure safety valve.

CAUTION: If the pressure safety valve fails or is damaged, it must be replaced immediately!

FIGURE 7: PRESSURE SAFETY VALVE COMPONENTS



3.8 TECHNICAL SPECIFICATIONS

See Tables 2, 3, and 4 for serving beer tank technical specifications.

TABLE 2: PRESSURE VESSEL AND ACCESSORY DATA

Description	Specification
Contents, pressure vessel (range)	250, 500, 1000, or 1,500 liters (66, 132, 264, or 396 gallons)
Contents, accessory	0.05–0.3 liter (0.013–0.079 gallon)
Maximum admissible pressure	2 bar (30 psi)
Maximum/minimum admissible temperature	50/0°C (122/32°F)

TABLE 3: OTHER TECHNICAL DATA

Description	Specification
Material, tank	1.4301 (AISI 304)
Material, outside housing	1.4301 (AISI 304)
Wall thickness, cylinder	2mm (0.0787″)
Wall thickness, bottom	2.1mm (0.0826″)
Wall thickness, outside housing (by isolated tanks)	1.2mm (0.0472″)
Connection dimensions, piercing valve	DN40 (Approximately 1½″)
Connection dimensions, distributor	G ⅝″
Material / diameter, cooling water pipe	Copper / ½″
Length, cooling water pipe / hl tank contents	3 m/hl
Contact surface, cooling pipe	0.09 m2/hl
Dimensions, cooling water connection	2 x G ⅝″ of G ¾″ outer thread
Cooling water, temperature	Approximately 2.5°C (36.5°F)
Cooling water, delivery	Approximately 250 liter/hour
Cooling time, 10°C > 5°C (50°F > 41°F)	20 hours
Resistance, cooling spiral	3.6–5.0 psi
Dimensions, manway	420mm x 320mm (15.5″ x 12.5″)

TABLE 4: WEIGHTS AND DIMENSIONS

Type of Serving Beer Tank	Contents *liter*	Vessel Diameter Inner/Outer *mm*	Capacity *liter*	Length *mm*	Weight *kg (lbs)*	Weight on Pallet *kg (lbs)*
Double-wall	1,500	791/860	1,500	3,360	295 (651)	315 (695)
Single-wall	1,500	791	1,500	3,390	220 (485)	240 (530)
Double-wall	1,000	791/860	1,000/1,020	2,350	220 (485)	240 (530)
Single-wall	1,000	791	1,000/1,020	2,320	110 (243)	130 (287)
Double-wall	500	791/860	500/520	1,315	120 (265)	150 (331)
Single-wall	500	791	500/520	1,285	75 (166)	95 (210)
Double-wall, slimline	500	630/700	500/509	1,870	120 (265)	150 (331)
Single-wall, slimline	500	630	500/509	1,840	80 (177)	100 (221)
Double-wall	250	630/700	250/257	1,055	95 (210)	115 (254)
Single-wall	250	630	250/257	1,025	50 (111)	70 (155)

Section 4.0 – Transportation and Installation

4.1 SECURING SERVING BEER TANKS FOR TRANSPORT

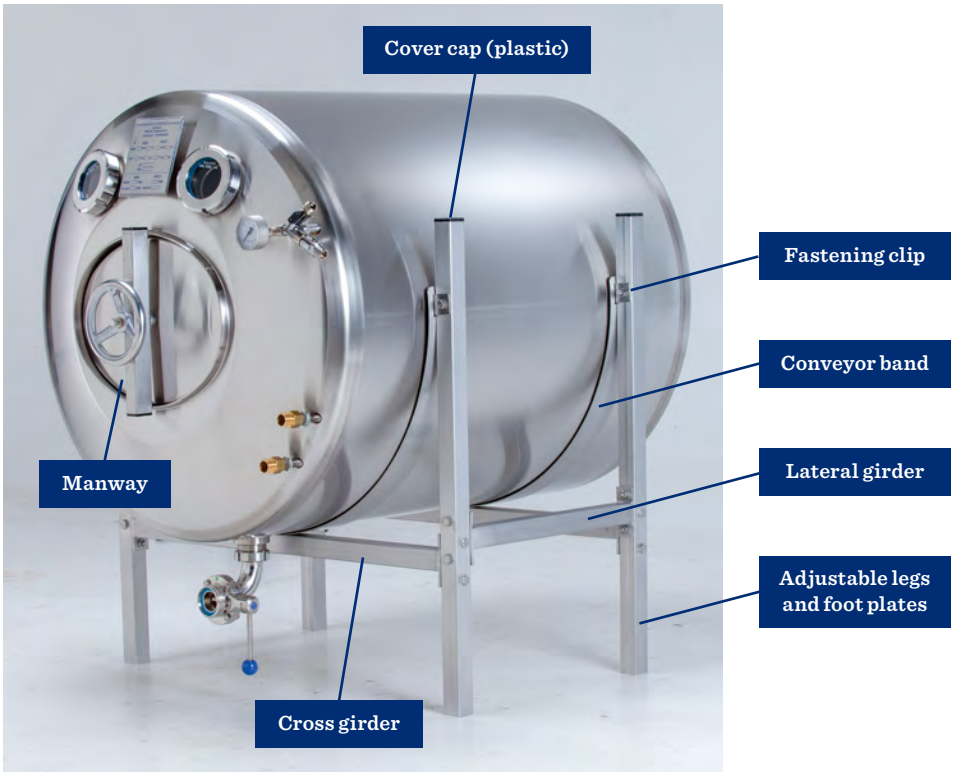
CAUTION: When transporting serving beer tanks by truck, ensure the tanks are completely secured using the pallets provided by Paul Mueller Company to prevent shifting or falling. Pay special attention to vulnerable protruding parts and manometers.

IMPORTANT: Always inspect the serving beer tank for damage before transport. Do not proceed with assembly of a damaged serving beer tank, but return to Paul Mueller Company for inspection.

4.2 STANDARD SERVING BEER TANK FRAMES

Paul Mueller Company recommends installing the serving beer tanks on the standard frames provided before use. The 100% stainless steel frames are constructed of easy-to-assemble pipes (see Figure 8).

FIGURE 8: FRAME ASSEMBLY



4.3 INSTALLATION PRECAUTIONS

CAUTION: Because hoisting the serving beer tank is necessary during installation, please observe all required safety precautions.

IMPORTANT: During hoisting, make sure no foreign (i.e., not rust proof) metals come in contact with the serving beer tank as this could lead to undesired corrosion. Wood or plastic support material is recommended, as well as the use of clean slings.

Before placing the serving beer tanks, inspect the location's floor to determine whether it provides adequate support. Take point load into consideration.

In the event that the tanks will be located in an environment that poses potential risk (i.e., in a situation where there is the likelihood of vibrations caused by heavy traffic, earthquakes, or due to installation on a movable platform, such as a ship), consultation with your Paul Mueller Company representative to discuss these conditions is required. Extra stability measures should be taken before placement of the serving beer tank in these instances.

CAUTION: Various supplies are required for the beer tank: a cool water source, a compressor, beer mains, and beer hoses take up space around the serving beer tank and can result in less space for service and waiting. Ensure these supplies do not place an undesired reaction force on tanks, appendages, and frames, as this can lead to installation instability.

IMPORTANT: Ensure the tank is placed in a frost-free location without exposure to direct sunlight with a constant temperature between 0–30°C (32–86°F).

Make sure the site is properly equipped with all necessary equipment and supplies before proceeding with installation. The services of a plumber and/or an electrician may be needed before installing the water cooling system.

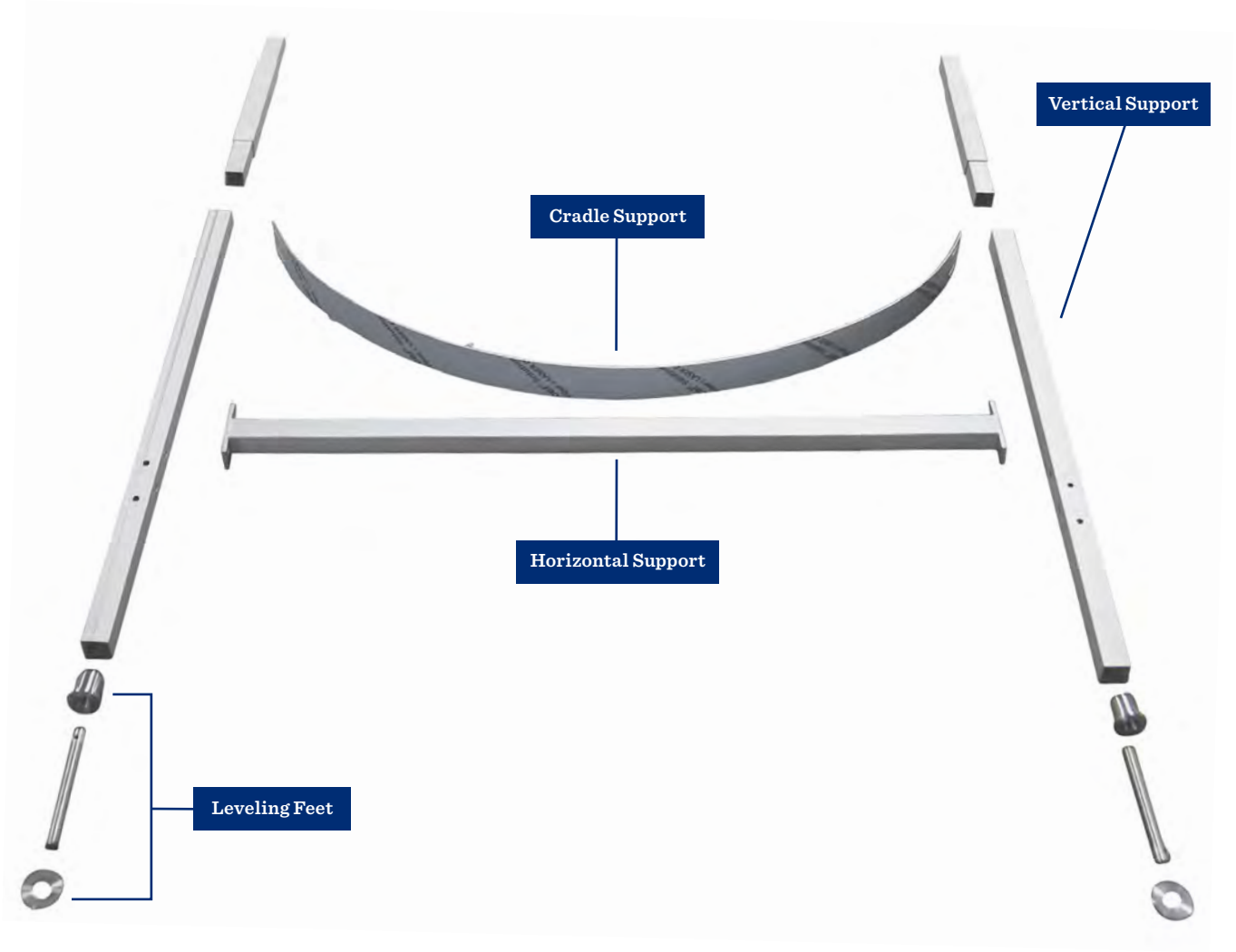
Serving beer tanks should only be lifted by a forklift while in frame. If not in frame, serving beer tanks should be lifted by no less than two (2) people. Paul Mueller Company suggests using lashing gear to lift the tanks when not using a forklift. It is recommended to lift the tanks from both ends, using the manway and center end point (using a threaded bolt in the tank) to lift from center end point.

WARNING: Under no circumstances should the tanks be lifted while pressurized.

4.4 ASSEMBLY INSTRUCTIONS

1. Uncrate and unwrap all parts and lay them out as shown in photo. Ensure that all parts are included. Please contact us at contact@paulmueller.com if you have parts questions. Important: Use Anti-Galling lubricant on nuts and bolts to prevent damage.
2. Attach Horizontal Support Sides (9865029) to Vertical Supports (9865027) using bolts (8802048). Attach bolts with washers (3200039) and nylock nuts (9900177). Tighten to 20 lb-ft.
3. Assemble the Horizontal Support Front (9865028) using bolts (8802048). Attach bolts with washers (3200039) and nylock nuts (9900177). Tighten to 20 lb-ft.
4. At the bottom of the frame, screw in the Foot Pad (9865035) by hand to desired height. This is how you level the unit.
5. By hand, screw in the Bolt Down Swivel Leveling Mount (9865039).
6. The unit should be standing up at this point.
7. Slide the Cradle Support Bracket (9865307) over the Vertical Support (99865027) and tighten using bolts (8802048). Attach bolts with washers (3200039) and nylock nuts (9900177). Tighten to 20 lb-ft.
8. Attach the Cradle Support (9865036) to Cradle Support Bracket (9865037) using bolts (8802048). Attach bolts with washers (3200039) and nylock nuts (9900177). Tighten to 20 lb-ft.
9. If your frames were engineered for seismic rating, install Gusset Front (9865032) using bolts (8802048). Attach bolts with washers (3200039) and nylock nuts (9900177). Tighten to 20 lb-ft.
10. If your frames were engineered for seismic rating, install Gusset Sides (9865033) using bolts (8802048). Attach bolts with washers (3200039) and nylock nuts(9900177). Tighten to 20 lb-ft.
11. If you are stacking two frames, attach the top assembled section to the bottom assembled section with Pin (9865034).
12. Double check bolt tightness before installation.

FIGURE 9: SERVING BEVERAGE TANK FRAME ASSEMBLY



4.5 ADJACENT INSTALLATION OF SERVING BEER TANKS

When the serving beer tanks are installed in an adjacent position, Paul Mueller Company recommends using the standard frames provided.

IMPORTANT: All threaded connections must be checked carefully with a spanner wrench.

4.6 STACKED PLACEMENT OF SERVING BEER TANKS

To stack two serving beer tanks in frames, two complete and independent frames must first be assembled and the lower tank installed first. Approximately two inches must be left free between the conveyor band and the piercing valve. Connect the tubes and place the second frame on the first frame. At this point, the second serving beer tank can be installed (see Figure 10). The second tank must protrude far enough out in front of the first tank so that the piercing valve can be introduced. Serving beer tanks can also be stacked directly above each other if an optional raising set is used.

IMPORTANT: All threaded connections must be checked carefully with a spanner wrench.

FIGURE 10: STACKED PLACEMENT OF SERVING BEER TANKS

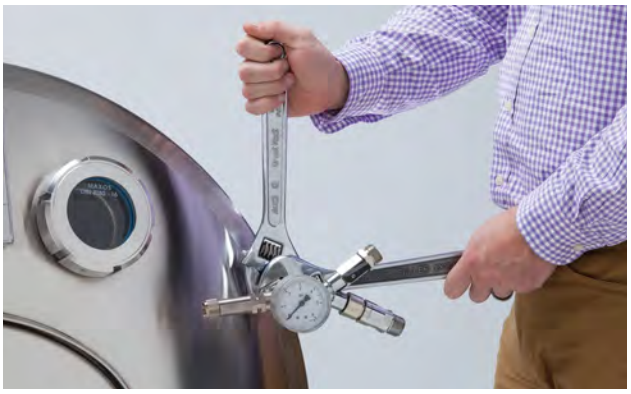
4.7 FRAME ADJUSTMENT

Adjustments will be necessary after assembly of the serving beer tank frames. Place the frame at the first level, and then place the frames in a longitudinal direction on a slat with a 1–1.5% angle (1–1.5 cm p/m), which is the lowest point that still allows flow.

4.8 PRESSURE SAFETY VALVE INSTALLATION

The pressure safety valve is attached to the serving beer tank with a G ¾" threaded connection. A Teflon™ gasket should be placed between the fitting and the serving beer tank to ensure pressure tightness. Secure the connection with two wrenches so that only the rear wrench is in a fixed position to prevent excess pressure (see Figure 11).

FIGURE 11: SECURING THE PRESSURE SAFETY VALVE



4.9 CONNECTING THE WATER/GLYCOL COOLING SYSTEM

The serving beer tank's water cooling system consists of an entry and exit opening with a G ¾" or G ⅝" threaded tube. The threaded tube connection is a solid soldered joint with a copper cooling spiral.

IMPORTANT: To prevent stripping or other damage to the cooling spiral during removal, secure the threaded tube attached to the tank with a wrench to prevent its rotation when installing the water cooling connection (see Figure 12). Instead of turning the back nut key, you must prevent it from turning along with the front nut key.

FIGURE 12: WATER COOLING CONNECTION

4.10 OPENING THE MANWAY

1. Release pressure from the serving beer tank through the pressure safety valve on the front.

2. Open the tank by opening or removing the manway (see Figure 13).

FIGURE 13: OPENING THE MANWAY

4.11 INLINER INSTALLATION

IMPORTANT: Inliners are designed for single use only!

1. Wash hands or wear gloves during this procedure.

2. Replace the sealing ring under the transit bush, if necessary, by removing the DN32 coupling nut at the bottom of the tank and pushing the transit bush up inside. Be careful not to lose the transit bush's pin.

2. Clean the connection ferrule inside the serving beer tank as described in Section 4.12.

3. Remove the inliner from the plastic bubble wrap, ensuring it does not come into contact with anything.

4. With the plastic connection of the inliner facing the connection ferrule inside the serving beer tank, push the inliner down until the connection stays in place and is fully inserted in the connection ferrule (see Figure 14).

5. Ensure the inliner is straight. Unroll the inliner 8 to 10 inches toward the back of the serving beer tank.

IMPORTANT: The inliner was packaged and shipped in such a way that after installation in the beer tank, it can roll out to the back and then unfold to the side when it is filled (see Figure 4).

FIGURE 14: CONNECTING THE INLINER

7. Attach the piercing valve (see Figure 15A). Tighten the coupling nut with a spanner wrench (see Figure 15B).

FIGURE 15: ATTACHING THE PIERCING VALVE

4.12 INLINER REMOVAL

1. Close the piercing valve by pulling the blue handle until it is pointing down.
2. Remove the piercing valve with the spanner wrench (see Figure 16).
3. Remove the inliner and discard (see Figure 17).
4. Clean the serving beer tank (see Section 4.14).

FIGURE 16: PIERCING VALVE REMOVAL

FIGURE 17: INLINER REMOVAL

4.13 PRESSURIZATION

Once the serving beer tank is clean, and the inliner, piercing valve, and manway are installed and sealed, you are ready to pressurize the tank.

1. Ensure the piercing valve is closed (the blue handle will be facing down).
2. Pressurize the tank (see Figure 18) to one bar (14.5 psi).
3. Run your hand along the seal of the manway to ensure no air is leaking.

FIGURE 18: ADJUSTING TANK PRESSURE

4.14 CHECKING FOR AIR LEAKS IN THE INLINER

1. Open the valve on the piercing unit to allow any air in the inliner to escape.
2. Close the valve on the piercing unit and wait for approximately 15 seconds before reopening the valve. At this point, no air should be escaping. If air is still escaping, this indicates either the inliner is leaking or there is an insufficient seal between the piercing unit and the transit bush. Re-tighten the nut on the piercing unit (see Figure 15B). If there is still air escaping after re-tightening the nut on the piercing unit, replace the inliner by repeating the steps above.
3. If there is no more air leakage, the tank may be filled with beer.

IMPORTANT: Take care that the first approximately 100 liters are pumped into the tank steadily.

4.15 CLEANING THE SERVING BEER TANK

Clean the serving beer tank on a regular basis, using only soap and water. Promptly remove any spills.

IMPORTANT: Never use cleaning agents or solvents containing chloride!

FIGURE 19: CLEANING THE SERVING BEER TANK

4.16 INLINER STORAGE

Store inliners in a dry, dark, odor-free, cool area between 4°C (39°F) and 20°C (68°F).

IMPORTANT: Inliners should not be stored in an area exposed to sunlight.

4.17 DISENGAGING

1. Tap the beer.
2. Remove all pressure from the system.
3. Tap all liquids.
4. Clean the whole installation.

IMPORTANT: When storing double-walled serving beer tanks outdoors, empty the cooling spiral totally to avoid the danger of frost.

Section 5.0 – Service and Parts

5.1 SERVICE

For service-related questions, please contact your Paul Mueller Company sales representative, Jon Sprenger, at jsprenger@paulmueller.com.

5.2 PARTS LIST

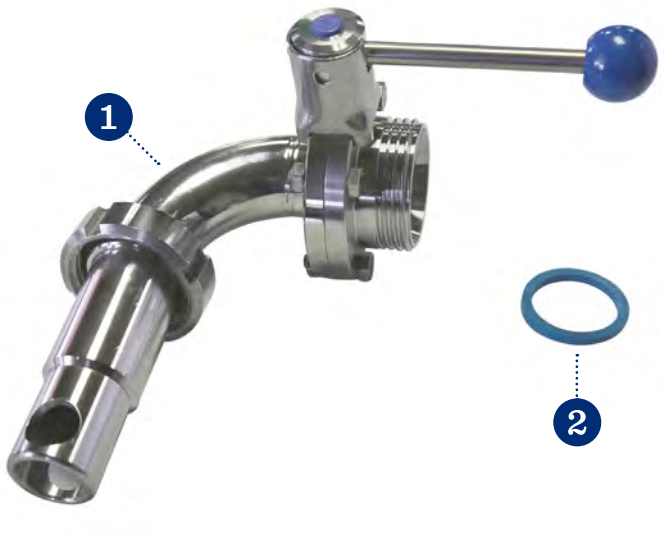
- Piercing valve
- Transit bush for piercing valve
- Pressure safety valve
- Sight glass, DN50
- Sight glass, DN80
- Manway
- Beer distributors
- Standard frames
- Inliners

5.3 ORDERING REPLACEMENT PARTS

To purchase inliners or replacement parts, please contact your Paul Mueller Company sales representative, Jon Sprenger, at jsprenger@paulmueller.com.

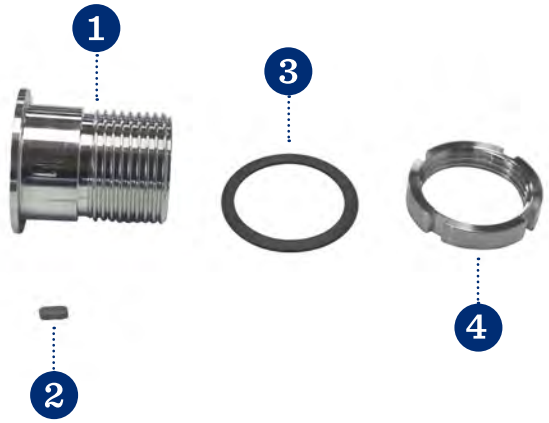
5.4 PIERCING VALVE

Reference Number	Part Number	Description
1	9864959	Piercing valve
2	9864948	Gasket, DN40, NBR
3	9864949	Gasket, 50mm x 40mm x 2mm, neoprene (not shown)



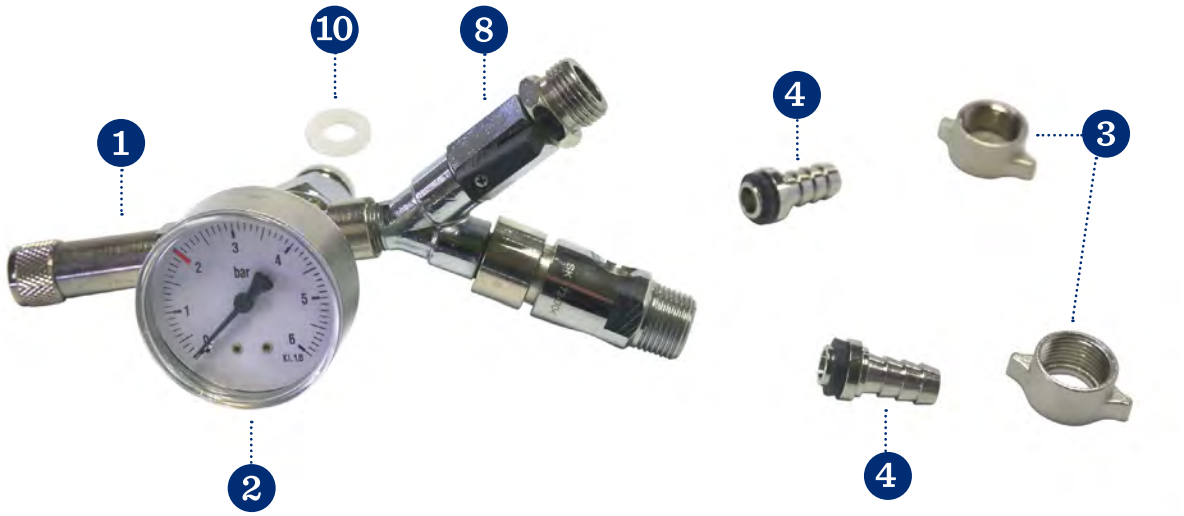
5.5 TRANSIT BUSH FOR PIERCING VALVE

Reference Number	Part Number	Description
1	9865249	Transit bush
2	9864951	Pin
3	9864950	Gasket, 74mm x 60mm x 2mm, neoprene
4	9865250	Cap nut



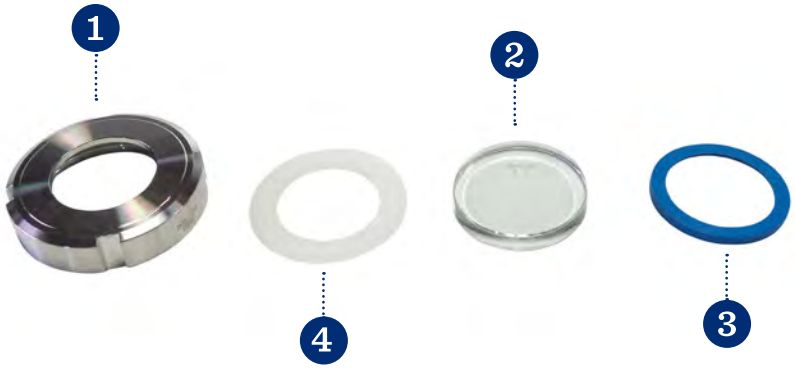
5.6 PRESSURE SAFETY VALVE

Reference Number	Part Number	Description
1	9865070	Pressure safety valve (complete assembly)
2	9865071	Pressure gauge
3	9865069	Winged nut
4	9865068	Hose attachment
5	9865067	Sealing ring (not shown)
6	9865066	Holder lip valve (not shown)
7	9865065	Lip valve (not shown)
8	9865064	Ball valve
9	9865063	Casing, non-return valve (not shown)
10	9865062	Rubber gasket



5.7 SIGHT GLASS, DN50

Reference Number	Part Number	Description
1	9865072	Swivel sight glass
2	9865073	Sight glass
3	9865074	O-ring
4	9865075	Gasket

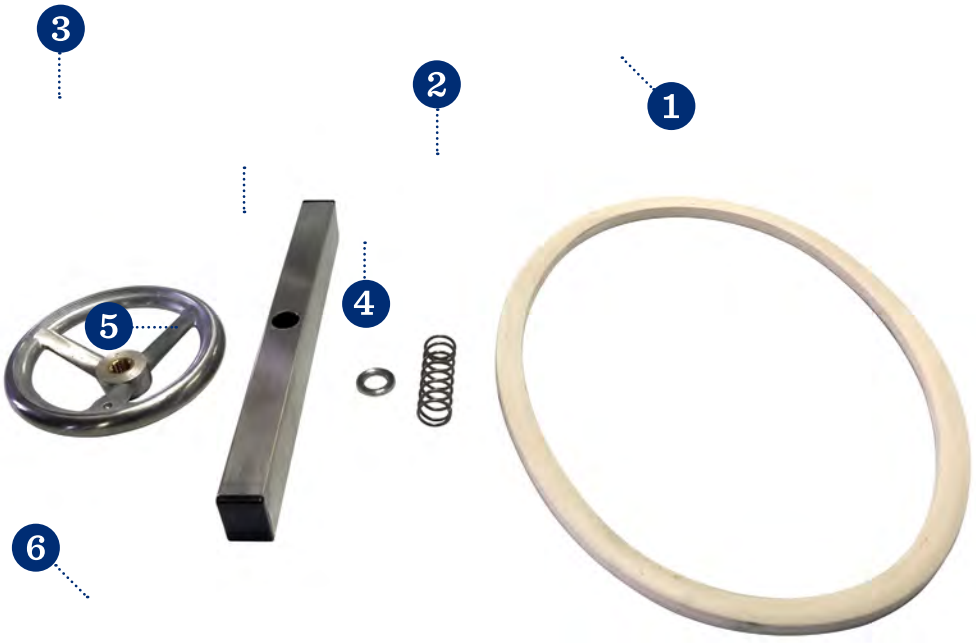


5.8 SIGHT GLASS, DN80

Reference Number	Part Number	Description
1	9865076	Swivel sight glass (not shown)
2	9865077	Sight glass (not shown)
3	9865078	O-ring (not shown)
4	9865079	Sealing disk (not shown)

5.9 MANWAY

Reference Number	Part Number	Description
1	9864953	Gasket
2	9865069	Spring
3	9865068	Hand wheel
4	9865262	Sealing ring
5	9865261	Clamping bar
6	9865264	Manway lid

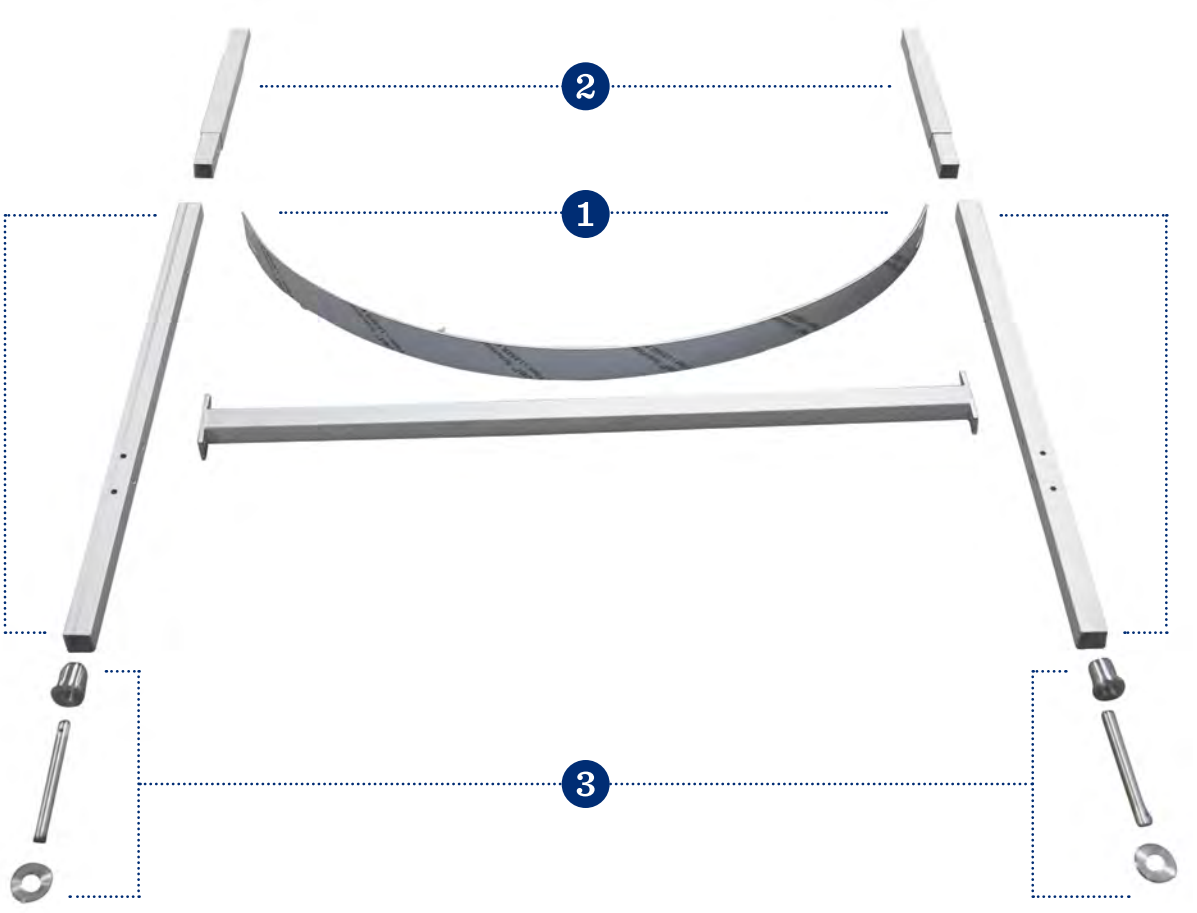


5.10 BEER DISTRIBUTORS

Reference Number	Part Number	Description
1	9864961	Beer distributor, two lines
2	9864962	Beer distributor, four lines
3	9864963	Beer distributor, six lines
4	9865258	Non-return valve
5	9865251	Clamping ring
6	9865252	Gasket
7	9865253	O-ring
8	9865257	Spring
9	9865259	Casing
10	9865254	Distributor plate, two lines
11	9865255	Distributor plate, four lines (not shown)
12	9865256	Distributor plate, six lines (not shown)

5.11 STANDARD FRAMES

Reference Number	Part Number	Description
1	9864973	Lateral girders and conveyor bands, 500 liter
1	9864972	Lateral girders and conveyor bands, 1,000 liter
1	9864965	Lateral girders and conveyor bands, 1,500 liter
2	9864974	Extension feet
3	9864967	Adjustable legs and foot plates



Section 6.0 – Troubleshooting

6.1 TROUBLESHOOTING CHART

Description	Reason	Cause	Solution
The serving beer tank does not pressurize or loses pressure.	Manway is not sealed.	Gasket broken.	Replace gasket.
		Hand wheel is not tightened.	Inspect the position of the clamping bar and tighten the hand wheel.
	Piercing unit.	Coupling nut is not tightened.	Adjust with spanner wrench.
	Pressure safety valve.	Outlet valve is not closed.	Close outlet valve.
	Sight glass is leaking.	Gasket is broken.	Replace gasket.
	Pressure drops too fast.	Pressure safety valve is broken.	Replace pressure safety valve.
		Pressure safety valve is incorrectly set.	Adjust to correct pressure.
Refrigeration is not running.	No refrigerant supply.	Valves are still closed.	Open valves.
		Pump is not running.	Turn on pump.
Beer leaking at piercing valve.	Piercing valve not well connected.	Gasket is broken.	Replace gasket.
	Inliner not well connected.	Inliner outlet is damaged.	Replace inliner.

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