

TAPTUBE - Assembly Instructions

Congratulations on your acquisition of the TAPTUBE glass drink dispenser by Bernd Weinmayer.

Each piece is individually handmade and unique.

The tubes are individually manufactured to a special design in high-quality Duran®glass and are therefore handled in a different way than conventional systems.

The TAPTUBE is available in 3 versions:

Taptube L: high version

Taptube S: standard version

Taptube Twin: 2-tube version with the same height as the Taptube S.

Safety Instructions:

- The TAPTUBE may only be operated under perfect conditions.
- The maximum operating pressure of the system is 3 bar, which applies to the beverage tubes as well as the pump pressure of the cooling system. Cooling systems which can generate a higher pressure must not be used.
- Use only the parts or tubes supplied with the system for the connections to the system.
- When the cooling process of the cooling unit is switched on, the cooling circulation must not be stopped at any time.
- Keep the workplace and equipment clean and only use equipment for the specific purpose for which it is intended.
- Please note that the system will be under pressure once installed and no which are under pressure may be loosened or disassembled.
- Inspect the system regularly for damage and do not disassemble or modify the system. Any modifications that affect the safety of the device are strictly prohibited.
- Clean each column individually, not in a series connection. Do not use any devices or equipment which can generate a pressure > 3 bar.
- Installation, commissioning and maintenance must only be carried out by suitably qualified persons.
- The system may neither be operated nor cleaned without using the recirculation system.

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1. Product inspection

On delivery, the product must be checked immediately for obvious defects due to transport damage.

Any transport damage must be reported within 3 working days for insurance reasons.

- a) Please check the packaging and report any damage immediately to the sender and make a note of it on the shipping document.
- b) Please check the taptube:
Remove the taptube from the packaging and shake it gently, not vigorously.
In this case, a knocking noise from contact between the spiral and the glass tube is normal, but no splintering noise from loose glass should be audible.
If a glass breakage is detected, please report this to the sender immediately. Please also check the system for small damage/cracks.
- c) Depending on the method of transport, the taptube may be filled with salt to protect the spiral. Please remove the red threaded caps and empty the dry salt crystals. Carefully rinse salt residues by hand with distilled water before assembly.

2. Pre-work: preparation of the bar counter

Before the beer taptube can be installed, the prerequisite holes in the bar counter must have been drilled.

Please drill according to the drilling pattern. The 8 holes for the threaded rods must be adjacent to the large 150 mm hole for the light pot.

The drilling pattern can be found on page 19.

Attention:

The drilling pattern can only be used as a template if it is printed correctly 1:1.

When printing, please make sure that you print 1:1 or use the sizing as a template.

A template is also included.

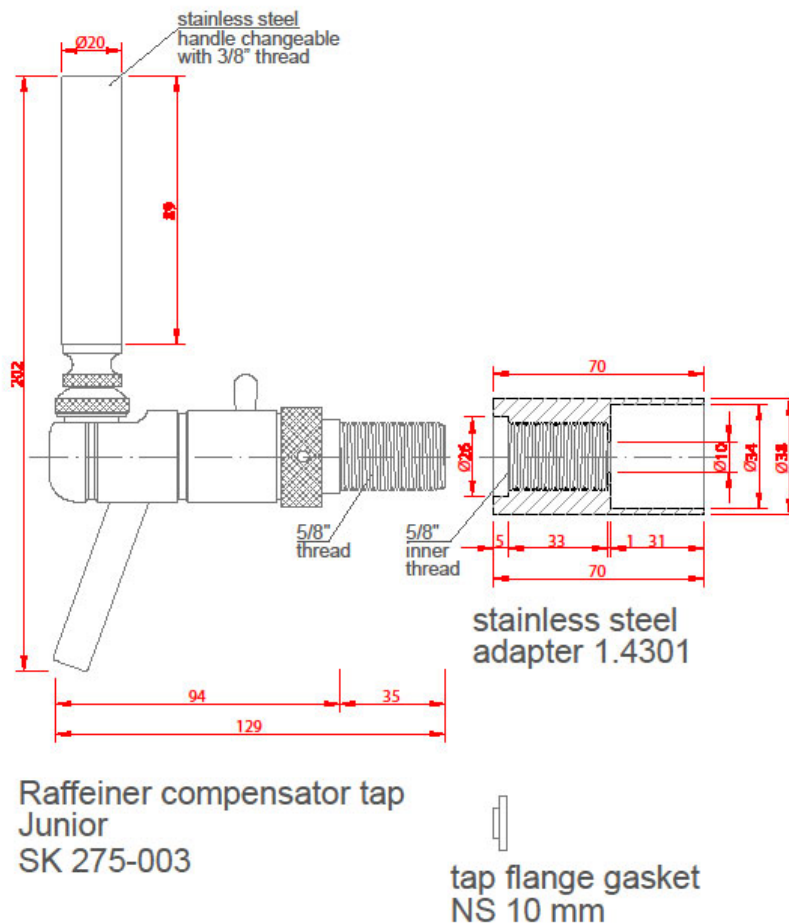
In case of doubt, simply check the technical drawing for 1:1 size using a ruler or take the measurements from the taptube. All technical drawings and data sheets can also be downloaded from www.taptube.eu.

The cutting of holes or the insertion of drip plates and other installation measures should only be carried out by suitably qualified persons.

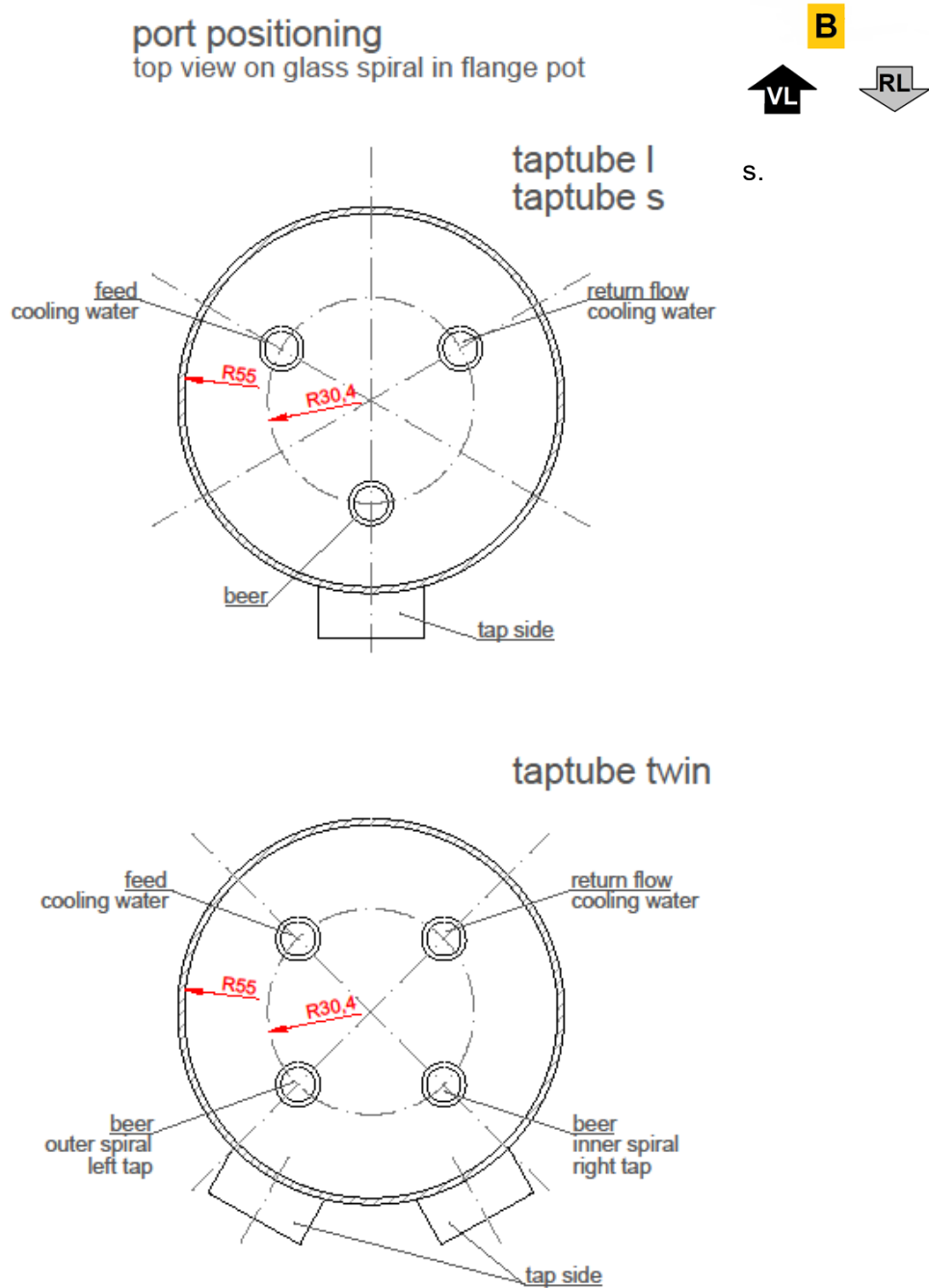
3. Assembly and installation

- 3.1. Once all pre-work for the installation has been completed, the taptube can be carefully removed from the packaging. Please ask a second person to help you. Loosen the 3 knurled screws underneath the stainless steel flange plate and remove the light pot. Now the taptube can be inserted vertically from above into the previously drilled hole and screwed onto the bar counter with the 8x Allen countersunk screws. It is important that the drilled holes for the countersunk screws are connected to the large hole for the light pot to counteract condensation. The system sweats more than conventional dispensers.

- 3.2. Now screw the tap into the stainless steel threaded attachment and align it vertically. Before screwing in, please check that the flat gasket is between the tap cock and the end of the thread. Important: do not use any other seal.



- 3.3. For the proper assembly of the three silicone tube pieces at the bottom of the light pot, please ensure the parts are correctly matched. Inside each metal cylinder, the thread connection is marked with a coloured sticker.
- 3.4. The TAPTUBE has the following tube connections.
- transparent fabric tube = beer line = B (Twin: Br & Bl)
 - black silicone tube = feed of distilled cooling water = VL
 - grey silicone tube = return flow of distilled cooling water = RL



Inside the threaded beer tube cap is a silicone flat seal. Make sure that it has not been removed or lost. The seal is integrated in the PP grommets for the water cooling system connections. During operation, the cooling water will rise up inside the outer tube, completely surrounding the beer spiral tube, and will flow back down inside the inner tube.

The silicone tubes, including the standard connecting by hand, are an integral part of the TAPTUBE system and must not be removed or altered. The soft hose pieces ensure a pressure-free, flexible flow to the glass nozzle. The metal nozzles for cooling water and for the beer tube can be connected to an existing system, which can be PVC or another insulated hose system. It is important that the inside diameter of the beer-carrying line remains constant at 10mm. The supplied water pressure reducer must be installed at the inlet of the recirculation system to the column and set to a maximum pressure of 3 bar.

- 3.5. Connect the beer tube to the keg coupler at the beer connection.

Please use only the supplied soft tubes for connections to the TAPTUBE system. Longer tube lengths can be ordered from the sales partner. Rigid PVC tubes are not flexible enough for the light pot and can loosen, bend or break the red plastic threaded cap on the glass if even slightly moved. Beer and cooling tubes can be additionally insulated outside the light pot after assembly/installation. Connecting too short hose sections with double sleeves is to be avoided, as this will reduce the internal diameter and thus lower the pumping capacity of the cooling system.

- 3.6. Please ensure the drain from the collecting tray leads to a drain or container.

The Tapube will generate condensation and the water produced here is removed via the drain.

The TAPTUBE will produce condensation at different rates depending on the season. The resulting condensation must be drained via a tube. For this purpose, a 9mm tube nozzle has been provided below the condensation water collection basin.

If the condensation drain is blocked, either the discharge hose could be kinked and should be straightened, or the two drains (at the top of the stainless steel flange or at the spout on the collecting basin) must be cleaned using a small brush or by blowing through with pressure.

- 3.7. Now test the cooling circulation by switching on the cooling unit.

Fill the cooling water tank with distilled or treated water and check the system for leaks.

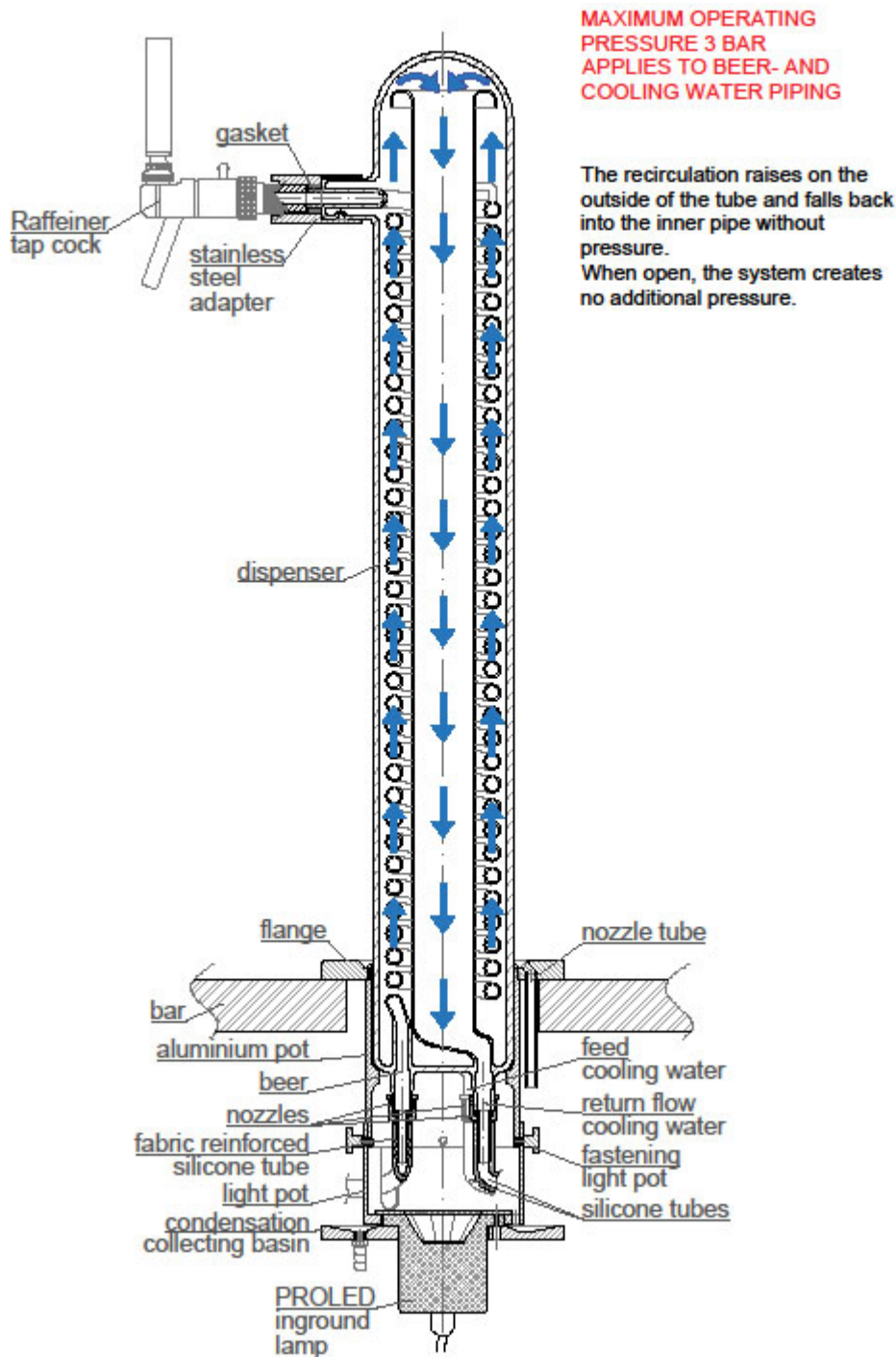
If several Tabtubes are fed in series from a single cooling unit (the second column's feed is connected to the return flow from the first column, the third column's feed is connected to the return flow from the second column, ...), the return tube must only be connected to the cooling unit's inflow just before the cooling water has finished flowing through all of the tubes. We recommend connecting a maximum of only 2 Taptubes in series.

If the system is completely connected to the cooling unit before the pumping-in process has almost finished, the pressure resistance in the cooler could rise too high and therefore the cooler pump might be not strong enough to overcome the initial pumping resistance.

The outer tube will fill up with water and this will flow back down the inner tube, enabling a double-check that it has been connected correctly.

Bleed the system of air using the return tube on the cooling unit. First immerse the return flow tube in the water bath just before the water comes back during start-up/refilling. The system will then bleed itself of air over time. Initially, you may notice a some bubbling in the return flow, but this should no longer be visible after a few days.

When the water circulation is closed, the pumping resistance will be considerably lower than during initial filling.



- 3.7.1. The reason why distilled/ionized/treated water is used for cooling is that *glass is transparent and everything can be seen.*
For the cooling water bath, the use of distilled or ionised water in combination with water sterilisation taps is recommended (e.g. Yachticon Aqua Clean 20 - 1 tablet sufficient for 20 litres of cooling water.)
Depending on its hardness and quality, pure tap water leads to unattractive limescale or greenish algae deposits after approx. 6-8 weeks. For example, when tested with Munich tap water, limescale particles were seen floating in the column after about 4-5 days.
If the system is calcified or otherwise soiled, standard decalcifiers or even highly diluted acids can be used to clean it.

The water bath should be changed every 3-4 months!

Make sure that no impurities get into the water bath and that there are no sources of dirt in the vicinity.

Everything in the taptube is visible and impurities may settle on the spiral tube. Always cover the water bath with the appropriate cover and keep the cooling unit dust-free.

We recommend using only new equipment for the initial assembly/installation. Used equipment may have deposits in the water bath which may settle on the spiral in the taptube.

- 3.8. Leak test and initial cleaning of the beer tube.
Once all connections are tight and the taptube has been filled, please initiate the beer line.
Clean the beer line so that it is ready for operation and rinse it with clear water. Please check that the system is watertight again.
Now the beer can be connected and the first effects enjoyed.
First push the light pot carefully onto the flange cylinder and attach it with the 3 knurled screws.
The correct position of the light pot can be determined by the arrow-to-arrow markings at the base of the taptube and the light pot. Make sure that each silicone tube is straight, without kinks, and leads out of one of the three slots in the light pot. Once the light pot has been attached, it can be plugged into the mains power.
Please make sure that the cables do not kink. Now the TAPTUBE system is ready for use.

3.9. ATTENTION - important

The TAPTUBE is certified and approved for a maximum operating pressure of 3 bar. This must not be exceeded – please see safety instructions on page 2.

The following instructions must be observed during the start of operation and barrel replacement:

If there is air or air bubbles in the tube, set the compensator on the tap to its minimum flow setting, in order to slowly bleed the taptube of air, until the air bubbles have completely disappeared. Otherwise, pressure surges may occur which could damage the spiral.

4. Cleaning and maintenance

After operation, cover the system with the protective cover supplied, in order to save energy and to reduce the production of condensation.

4.1. Depending on the location of the TAPTUBE, different mandatory cleaning intervals will apply. This applies to all food contact components.

We recommend cleaning the taptube at least every 2 weeks.

Each system may only be cleaned individually.

Due to the transparent glass design, sterilisation with modern cleaning solutions with indicator control colours is recommended.

For example, with DesanaMax:

Reconnect the tap head to the cleaning container, rinse out the liquid and leave the violet cleaning agent in the glass spiral for 5 minutes.

If the cleaning agent turns from violet to a green-brown colour, repeat this rinsing process. If the purple indicator color remains, this is a sign that the system is clean.

Before the spiral tube is filled with beer again, rinse it thoroughly with water.

If a solid foreign body is still visible in the spiral, mechanical cleaning can be carried out using a standard cleaning sponge ball for a 10mm beer line. For this purpose, the beer tube must be depressurized and the tap handle position must be closed. Now the hexagon nuts of the quick coupling can be opened and the sponge ball can be inserted into the line. When the coupling is closed again, normal line pressure can be applied and the sponge ball "moves" slowly upwards when the tap is opened. Once the ball reaches the tap, the tube must be depressurized again. Then unscrew the tap and remove the sponge ball by hand or with tweezers from the end of the glass tube. For a detailed explanation of use, see the system video.

<http://www.taptube.eu/videos/>.

Alternatively, a cleaning adapter can be used to rinse the sponge ball immediately.

This is available for the compensator tap Eurostar Junior.

4.2. Important: Cleaning the water circuit.

If the glass in the cooling water circuit shows limescale marks, or if other substances have settled due to external contamination of the water bath, the system can be cleaned with acetic acid or oxalic acid (recommended).

Please wear protective clothing, protective gloves and safety goggles.

Carefully disassemble and remove the TAPTUBE from the flange device and place the glass column upside down in a well-secured position. Via a small funnel, acetic or oxalic acid (which removes organic residues as well as rust stains) and water in the respective recommended quantity ratio 1:2 can be poured into the cooling water tube. Shake the glass carefully and gently so that the acidic liquid wets the entire glass surface.

Leave the acid to work for about 20 minutes and then rinse well with distilled water. Repeat the procedure if necessary.

If distilled water is used for the cooling circuit and regularly changed, this somewhat time-consuming cleaning cycle can be avoided. Under correct operating conditions, we recommend changing the water bath every 3-4 months, depending on the place of use.

A cleaning process takes about 3 hours, including disassembly and restarting operations.

Do not use hydrofluoric acid!

With the exception of hydrofluoric acid, the borosilicate glass DURAN® used is acid-resistant. See material info starting on page 20.

4.3. If the beer foams too much, then either the optimum cooling temperature has not yet been reached, the CO₂ pressure is incorrectly set, the compensator position on the tap is not correctly adjusted, the keg is empty or the beer has already been carbonated. Please contact your technical support.

4.4. The TAPTUBE dispensing system is designed for an almost unlimited functional period. If the glass column is kept free of scratches and cleaned regularly, there should be no reduction in load limits even after decades of use. By using components that are manufactured exclusively in Bavaria, Tyrol and South Tyrol, we can guarantee the highest possible quality standards and a very environmentally friendly, fair product development process.

Further answers to technical questions can be found at

www.taptube.eu/FAQS.

4.5. Important – please adhere to the following:

- The taptubes are individually manufactured to a unique design in high-quality glass and are therefore to be treated differently from conventional systems. Each tube may only be cleaned individually.
- The beer tube may only be cleaned when the cooling water in the tube is completely full.
The reason for this is that the spiral tube oscillates, which can cause damage if there is no surrounding cooling water.
The compensator of the tap must not be completely open during cleaning.
- The column is certified and approved for a maximum operating pressure of 3 bar.
This is not to be exceeded.
If using cleaning machines, please ensure that no systems are used which can generate more pressure.
- If there are air or gas bubbles in the tube, set the compensator on the tap to minimum flow setting to slowly bleed the column of air until the air bubbles have completely escaped.
Otherwise pressure surges may occur which could damage the spiral, see also point 3.9. on page 8.
- Please lead the drain of the collecting tray to a drain or container. The column will create condensation and the water produced here is removed via the drain.

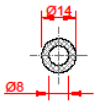
4.6 Decommissioning

If you want to shut down the system generally or temporarily, you should clean and empty the beer line and then drain the water circuit.

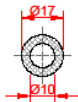
If there is water in the system and the recirculation cooling is switched off, deposits will quickly form on the spirals of the column.

5. Parts

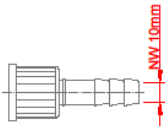
All parts are available separately.
 Please take special care with loose sealing rings
 1x TDS seal tap (2x for Twin)
 a total of 3x2 TDS seals cylindrical (4x for Twin)



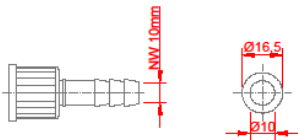
silicone tubes
cooling water



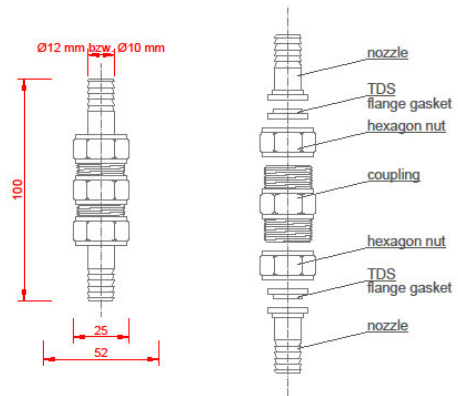
silicone fabric tube
food-safe
beer



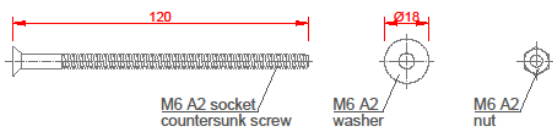
Schott GL18 nozzle PP
for 2x cooling water tube



stainless steel nozzle NS 10 for
beer fabric pressure tube with
GL18 PBT screw cap red and
2 mm silicone flat gasket OD 16,5 mm ID 10 m



2x double nozzle for 8 mm inner diameter of
feed cooling water tube (black silicone) and
return flow cooling water tube (grey silicone)



8x flange bolting A2 M6

1x double nozzle for 10 mm inner diameter of the
transparent silicone fabric beer tube

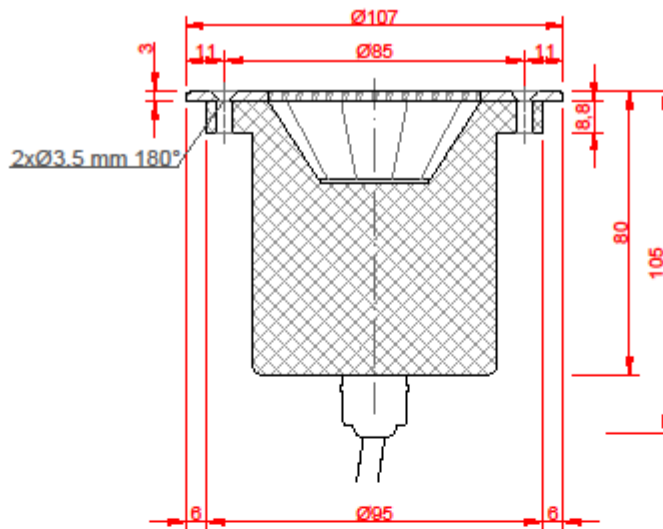
standard coupling
material: stainless steel

5.1. LED

The high-quality Proled Inground IP 67 class spotlight (recessed spotlight for outdoor use) can be reordered at any time. We only use radiators with a colour temperature of 3000 K (warm white).

In our opinion, the different shades of colour of the drink should be created exclusively by the illuminated beer colour.

The transformer is connected with a quick-release coupling. Please make sure that the connection is opened and closed correctly.



light source:

PROLED
Inground COB6 R Mono
IP67

TECHNICAL DATA

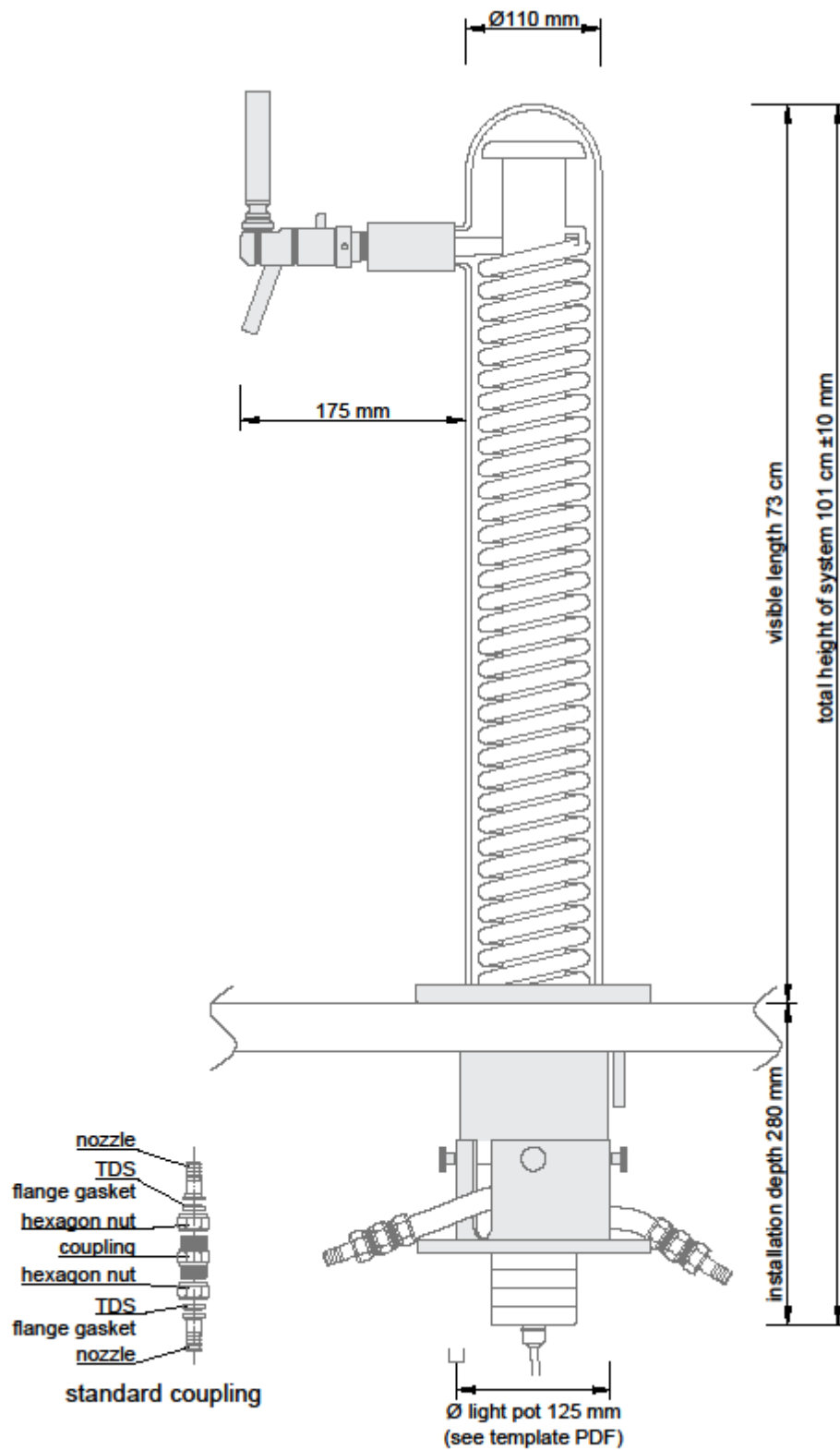
| | |
|-----------------------|--|
| IP grade: | IP67 (for outdoor use) |
| voltage supply: | 24 VDC |
| ring: | stainless steel 316 (V4A) |
| housing: | powder coated aluminium grey, 8 mm hardened glass |
| resilience: | entire surface = 2500 kg |
| connection: | 1x cable 0.5 m H05RN-F 2x 1.0 mm ² on open cable end |
| ambient temperature : | -10° C to +45° C |

PHOTOMETRIC DATA

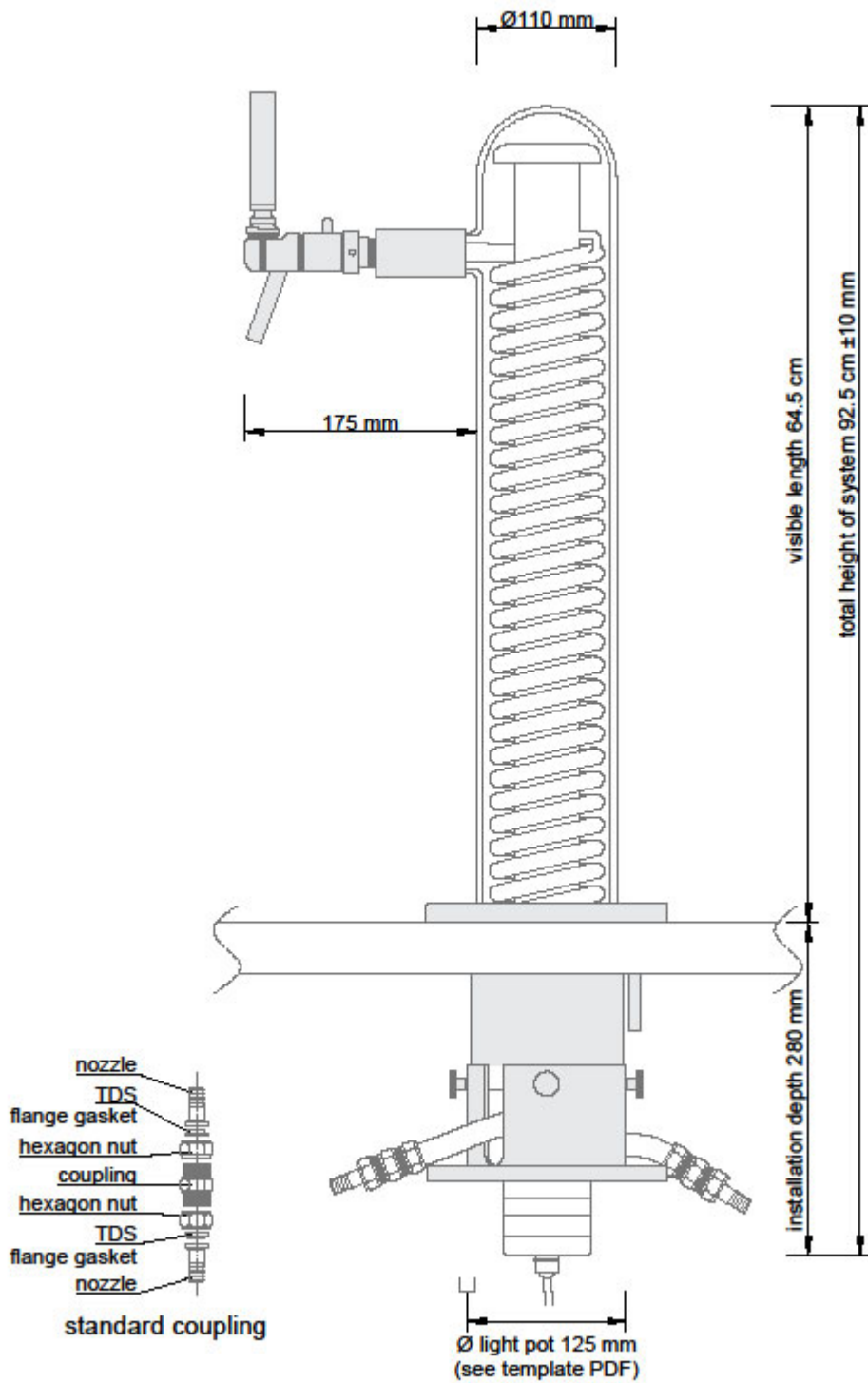
| | |
|-----------------------|----------------------|
| LED type: | BRIDGELUX COB 6 watt |
| luminous flux: | warm white 550 lumen |
| colour temperature: | warm white 3000 K |
| CRI: | 80 |
| reflected beam angle: | 25° |

6. Dimensions

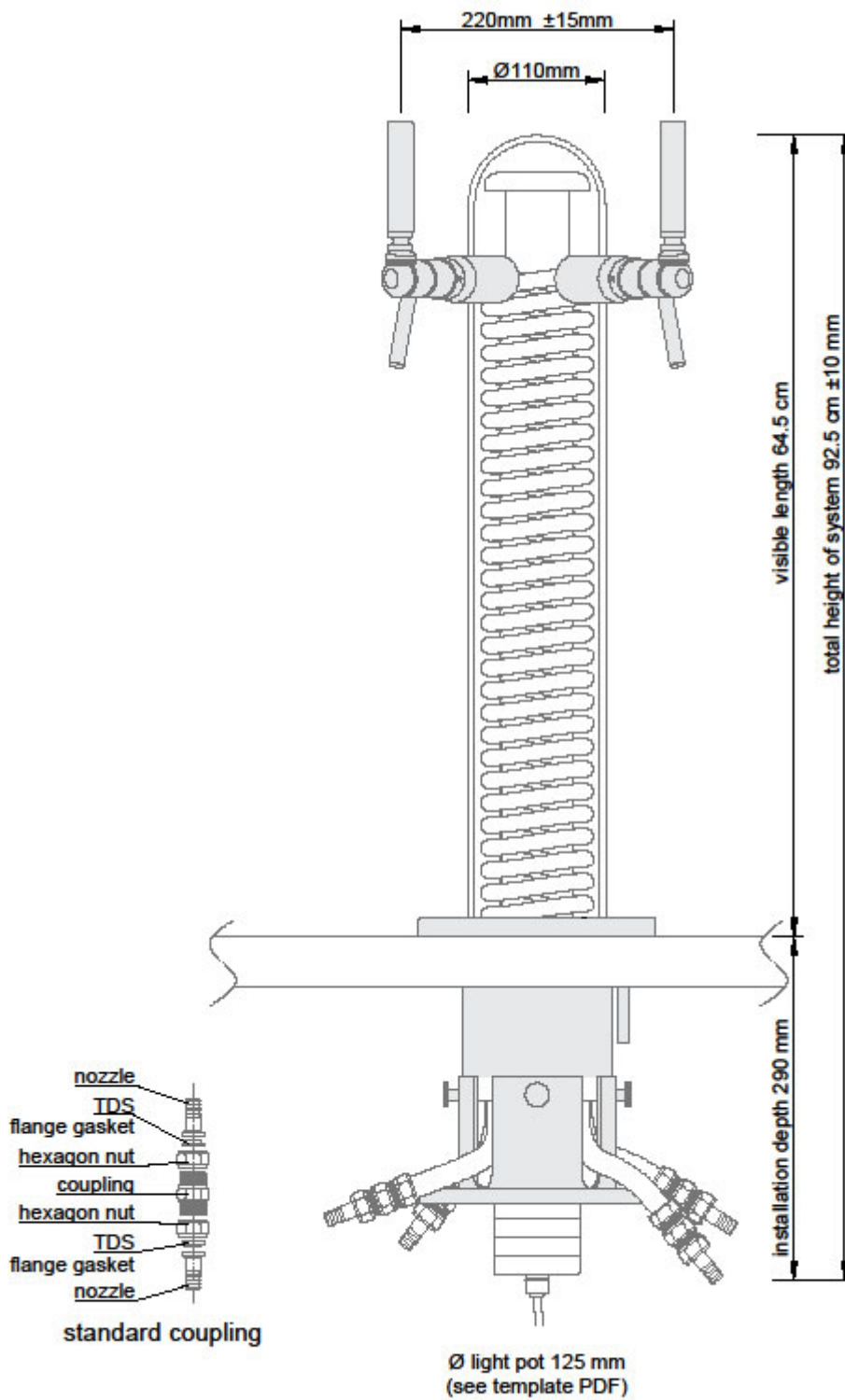
6.1. Taptube L



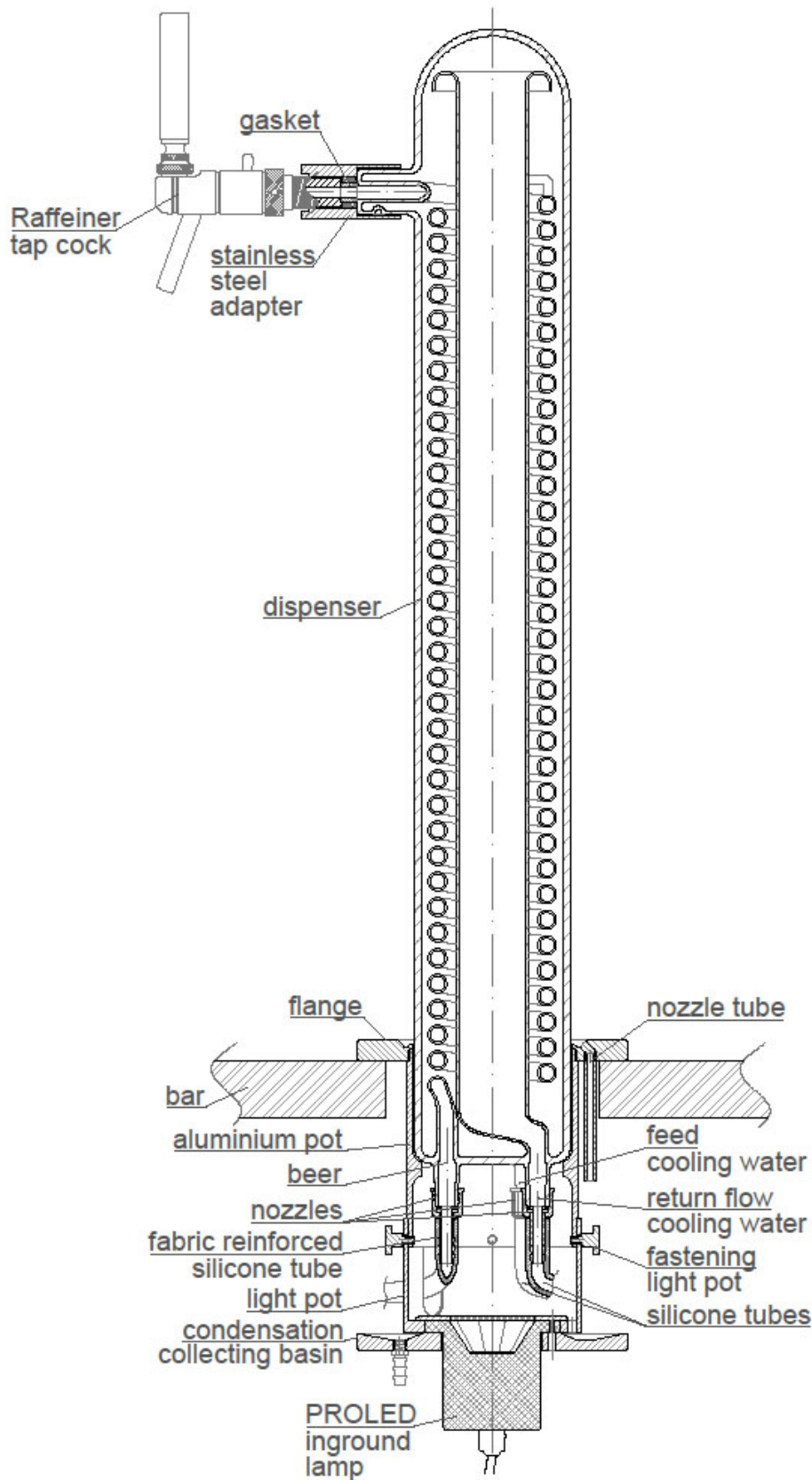
6.2 Taptube S



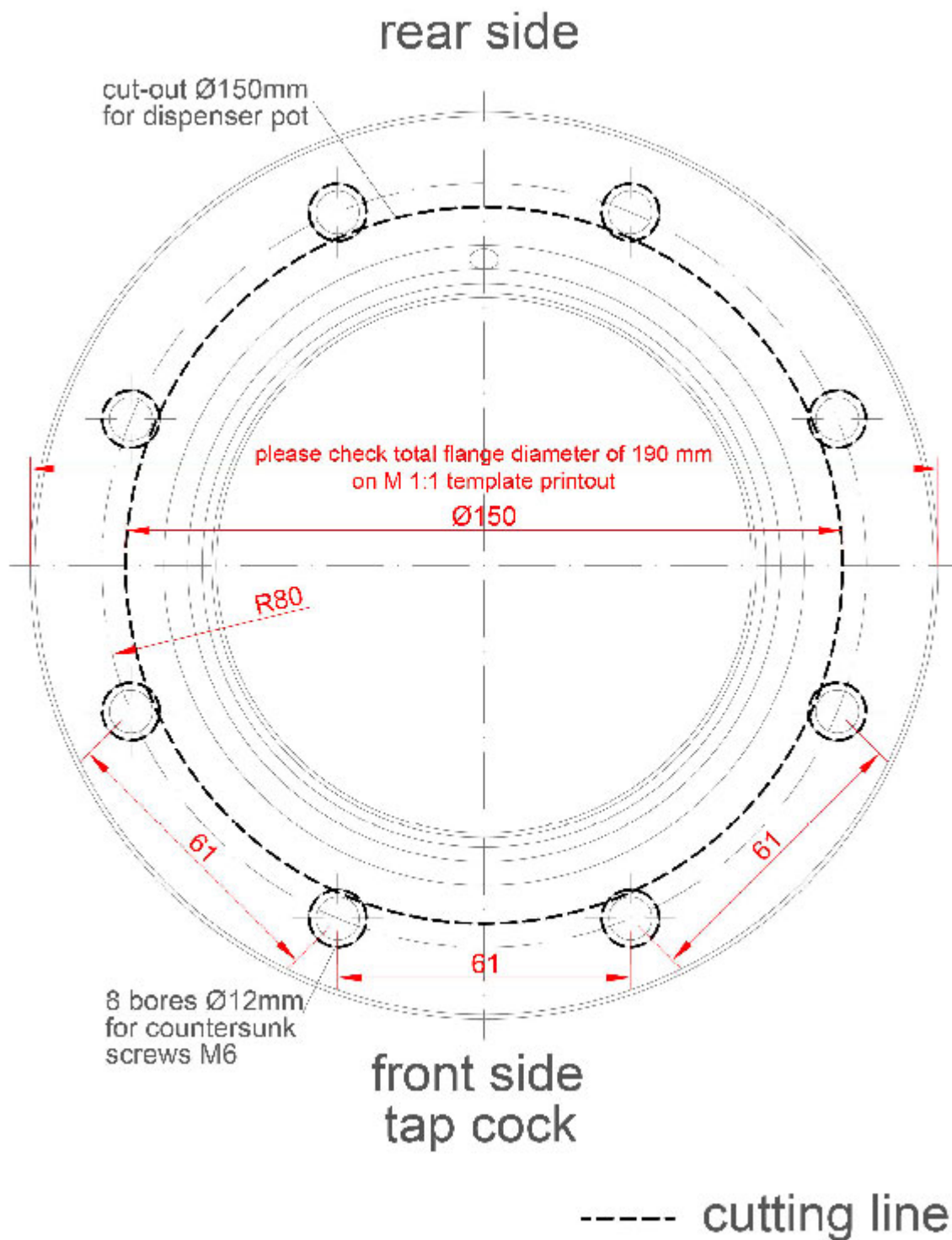
6.3 Taptube Twin



6.4. Cross-sectional drawing



6.5. Drilling dimensions



7. Technical data of the glass

7.1 DURAN properties

Very good chemical resistance

DURAN® borosilicate glass 3.3 is highly resistant to water, neutral and acidic solutions, strong acids and their mixtures as well as to chlorine, bromine, iodine and organic substances. Even with longer exposure times and temperatures above 100 °C, its chemical resistance exceeds that of most metals and other materials. Only hydrofluoric acid, concentrated phosphoric acid and strong alkaline solutions with simultaneously high temperatures (>100 °C) remove the glass surface (glass corrosion).

Chemical composition

DURAN® has the following approximate composition (in % by weight). SiO_2 B_2O_3 Na_2O + K_2O Al_2O_3 - 81134 2

Chemical resistance

Water resistance class (DIN ISO 719) Class 1 Acid class (DIN 12 116) Class 1 Alkali class (DIN ISO 695) Class 2

Due to its good water resistance, DURAN® meets USP/EP specifications and is a neutral glass or corresponds to glass type 1, which means that DURAN® can be used almost without restriction in pharmaceutical applications and in contact with foodstuffs.

You can find further information here.

Inert behaviour

Due to the almost inert behaviour of DURAN® there are no interactions, e.g. ion exchange, between medium and glass. Thus a disturbing influence on experiments can be excluded.

High operating temperature

The maximum permissible operating temperature of DURAN® glass is +500 °C.

Above a temperature of +525 °C, the glass begins to soften, and from a temperature of +860 °C it changes into the liquid state.

DURAN® can be cooled down to the maximum possible negative temperature and is therefore suitable for use with liquid nitrogen (about -196 °C). In general, the use of DURAN® products is recommended down to -70 °C.

When defrosting, make sure that the temperature difference is not greater than 100 K.

DURAN® glass is also suitable for use in the microwave.

Minimal thermal expansion & high thermal shock resistance

DURAN® glass is characterised by high thermal shock resistance (Temperature difference resistance = 100 K) due to its very low coefficient of linear expansion ($3.3 \times 10^{-6} \text{ K}^{-1}$). The coefficient of linear expansion is so low that hardly any stress is created in the material and the glass does not shatter, e.g. when boiling water is poured in.

Physical data

Mean linear thermal expansion coefficient α (20 °C; 300 °C) according to DIN ISO 7991

Transformation temperature T_g

$3.3 \times 10^{-6} \text{ K}^{-1}$ 525 °C

Temperature of the glass at the viscosities η in $\text{dPa} \times \text{s}$: 10^{13} (upper cooling temperature)

$10^{7.6}$ (softening temperature)

10^4 (processing temperature)

Short-term maximum permissible operational temperature density ρ at 25 °C

Modulus of elasticity E (Young's modulus) Poisson number μ

Thermal conductivity λ_w λ_w at 90 °C

Temperature for the specific electrical resistance of $10^8 \Omega \times \text{cm}$ (DIN 52 326) $t_k 100$
Logarithm of the electrical volume resistance ($\Omega \times \text{cm}$)
Dielectric properties (1 MHz, 25 °C) Dielectric constant ϵ
Dielectric loss factor $\tan \delta$
Brechzahl ($\lambda = 587.6 \text{ nm}$) n_d
Stress optical coefficient (DIN 52 314) K

Optical properties

In the spectral range from approx. 310 to 2 200 nm the absorption of DURAN® is negligibly low. It is clear and colourless. Larger layer thicknesses (axial view through pipes) appear slightly yellow/greenish.

Pressure calculation glass tube AD 110 x WD 5.0 mm

Compressive strength: $WD \times 20 \times 7 / AD - WD$

WD: 5,00

AD: 110,00

Interim result: 700,00

Interim result: 105,00

Result in bar: 6,67

Wall thickness: $AD \times P / 20 \times 7 + P$

AD: 0,00

P (bar): 0.00

Interim result: 0,00

Interim result: 140,00

Result in WD mm: 0,00

Important:

The glass tube must not have any scratches or similar.

The 1-minute test is 5 times the permissible operating pressure

The continuous value is 2.5 times the permissible operating pressure

Your installation partner:



Further support:

Germany + international: MISA-Vertriebs GmbH, Boden 1, 85646 Anzing, Tel. +49 8121 777940, info@misa.de

Austria: Zapfdoktor Ausschanksysteme GesmbH, Am Berg 26, 4274 Schönau, Tel. +43 7261 770 66, office@zapfdoktor.at