
Lifting Station Type ABS Synconta 900B

1068-00



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901B

902B

Symbols and notices used in this booklet:



Presence of dangerous voltage.



Non-compliance may result in personal injury.

ATTENTION! *Non-observance may result in damage to the unit or negatively affect its performance.*

NOTE: *Important information for particular attention.*

Authoritative standards and guidelines overview

NOTE: *All local standards and safety regulations must be adhered to (e.g. Germany: BGV A1, BGV A3, BGV C22).*

Standard / Guideline	Issue	Description
DIN EN 12050 – 1/2 (Product Standard)	05-2001	Wastewater lifting plants for building and sites - Principles of construction and testing. Part 1 : Lifting plants for wastewater containing faecal matter. Part 2 : Lifting plants for faecal-free wastewater.
DIN EN 12056-1	01-2001	Gravity drainage systems inside buildings. Part 1 : General and performance.
DIN EN 12056-4	01-2001	Gravity drainage systems inside buildings. Part 4 : Wastewater lifting plants – Layout and calculation.
DIN EN 752	01-2001	Drain and sewer systems outside buildings.

Limits and restrictions

Maximum temperature	40 °C (short term)
Media	No acids or dangerous liquids.
Maximum ground water	1.5 m (short term)
Maximum installation depth	Tank only: 1.69 m. Tank with riser: 2.5 m.

NOTE: *For details of the warranty conditions attached to the Synconta 900B tank please contact your local Sulzer sales representative.*

NOTE: *After the lifecycle of the product, remove from the ground and dispose in accordance with the material.*

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1 General

1.1 Description

The fully equipped prefabricated synthetic Synconta tank can be used where a medium amount or steady flow of waste water is present.

The Synconta is intended for wastewater disposal from buildings which are built below the backflow and cannot depend on the natural gradient to allow the wastewater to flow directly into the sewage system.

The tank is for buried installation outside of the building and has an anti-lift design to prevent it rising if the water table lies at a level higher than its base.

A concrete cover is available for areas where there can be either pedestrian (A15) or vehicular (B125 and D400) traffic. The D400 cover can only be used in combination with a load distribution plate (see Section 4.6).

The tank can be fitted with a plastic lockable lid where installations are removed from all forms of traffic e.g. garden flower beds.



The plastic lid is not a load bearing cover and must never be stood upon or made to support either stationary or mobile objects.

An extension (riser) can be fitted which can increase the installation depth to a maximum of 2.5 m (see section 4.7).

The discharge line, pipework and gate valves are made of high quality stainless steel.

ATTENTION! *All work from installation to service must only be carried out by qualified personnel.*

1.2 Application areas

Synthetic, prefabricated, corrosion-resistant sump for Sulzer submersible pumps designed as a single pumping station for automatic pumping of wastewater and sewage in accordance with EN 12056 from locations and areas below the backwash level.



These lifting stations may not be used for the collection or pumping of flammable or corrosive liquids. Effluent containing grease, petrol, or oil should only be brought to the lifting station via a separation device.

ATTENTION *As with all electrical devices, this product may fail due to operating errors, absence of mains voltage, or even a technical defect. Such a failure may result in medium or water escaping. If damage may occur due to the specific usage, measures are required to avoid such damage arising. In this respect, taking account of the conditions in question, particularly use of an off-grid alarm system, use of an emergency generator, and provision of an additional and appropriately connected second unit are to be considered.*

1.3 Legal DIN EN regulations covering the use of lifting stations for the pumping of effluent containing faecal matter.

Automatically operated lifting stations are prescribed if:

- the water level in the odour lock of the effluent source lies below the sewer backwash level.
- rainwater gullies are present where the upper edge of the inlet grid lies below the sewer backwash level.

The sewer backwash level is the maximum possible water level in the public sewer network. Information on this can be obtained from your local authority. If the backwash level has not been fixed by the local authority, then the surface level of the roadway at the connection point is taken to be the level.

The regulations also require that all wastewater which can cause offensive odours must be collected in closed, odour-tight, and free-standing collection tanks.

The collection tanks must be vented by vent pipes which are brought above roof level.

1.4 Layout of the Synconta tank and installation example as a single pumping station.

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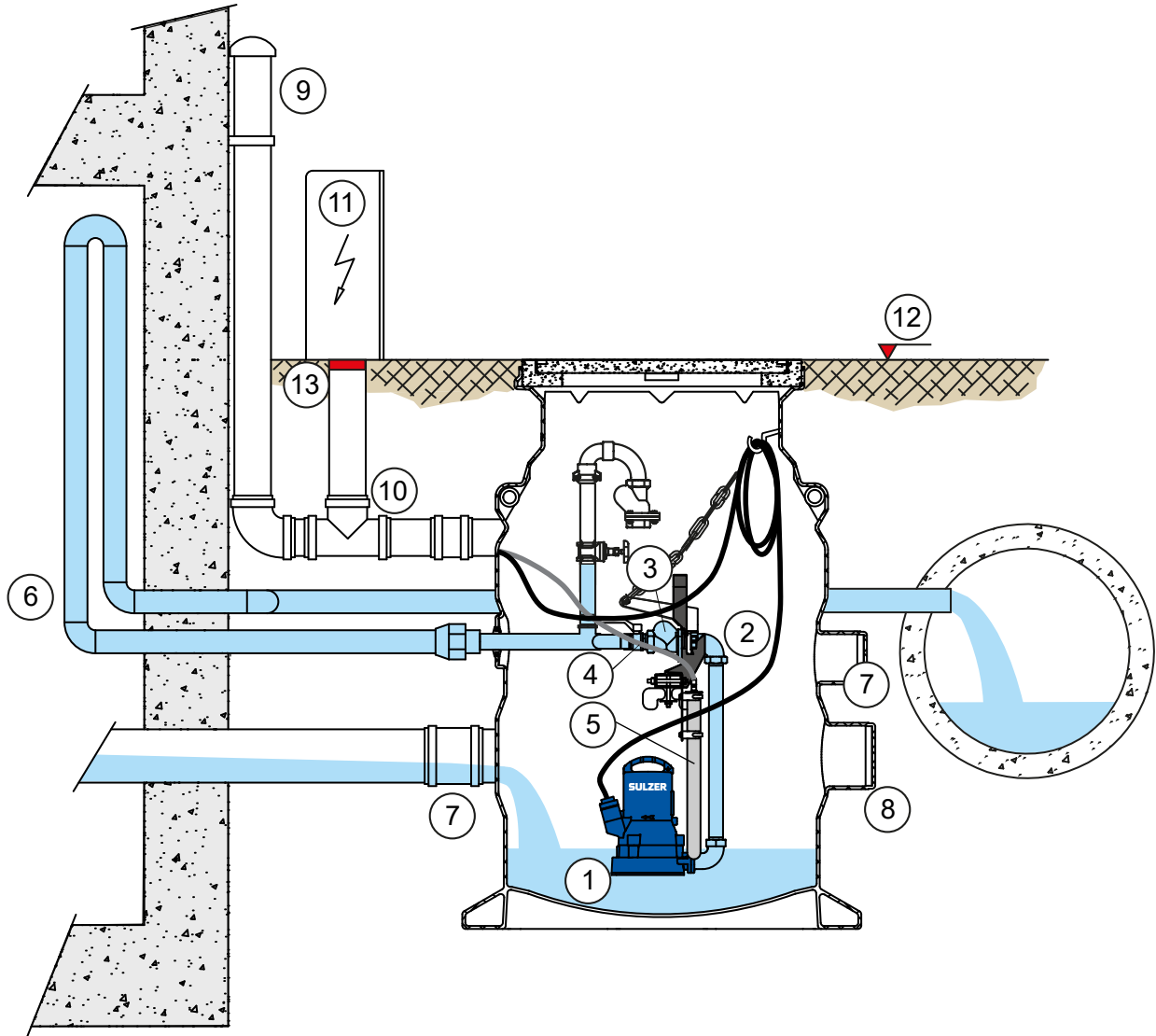


Figure 1. Installation example

Legend

- 1 Sulzer submersible pump
- 2 Sulzer coupling above water level, self sealing
- 3 Ball checkvalve
- 4 Shut-off valve
- 5 Submerged tube measuring device for pneumatic level control (accessory)
- 6 Pressure line
- 7 DN 150 inlet pipe (one of three)
- 8. DN 200 inlet pipe (one only)
- 9 Vent and cable pipe DN 100, to above roof level
- 10 Cable duct
- 11 Sulzer control unit, can be chosen with cabinet
- 12. Backwash level
- 13. Cable gland

ATTENTION *The regulations of DIN 1986/100 EN 12050 and 12056 should be observed!*

1.4.1 Removal of pump from tank for servicing

During installation it is important to leave sufficient cable inside the tank to facilitate the removal of the pump and pipework above ground level for servicing.

ATTENTION *The cable inside the tank must be safely secured so that it cannot become entangled in the pump hydraulics.*

The length of cable inside the tank is determined by the tank installation depth, please see guide table below.

	Without riser	With 600 mm riser	With 1200 mm riser
Length mm	min. 1500	min. 2000	min. 2500

2 Safety

The general and specific health and safety hints are described in detail in the “Safety Instructions for Sulzer Products Type ABS” booklet. If anything is not clear or you have any questions as to safety make certain to contact the manufacturer Sulzer.

This unit can be used by children aged 8 years and above, and persons with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, when they have been given supervision or instruction concerning the safe use of the device and understand the hazards involved. Children must not play with the appliance. Cleaning and user maintenance should not be performed by children without supervision.

3 Transport



During transport the unit should not be dropped or thrown.

The tank has two integrated lifting lugs on the upper wall to which a chain and shackle may be attached for transport and installation (max. load on each lug is 50 kg).



If the tank has collected rainwater during storage then its weight may exceed the maximum load allowable for the lifting lugs and it must be emptied before lifting.



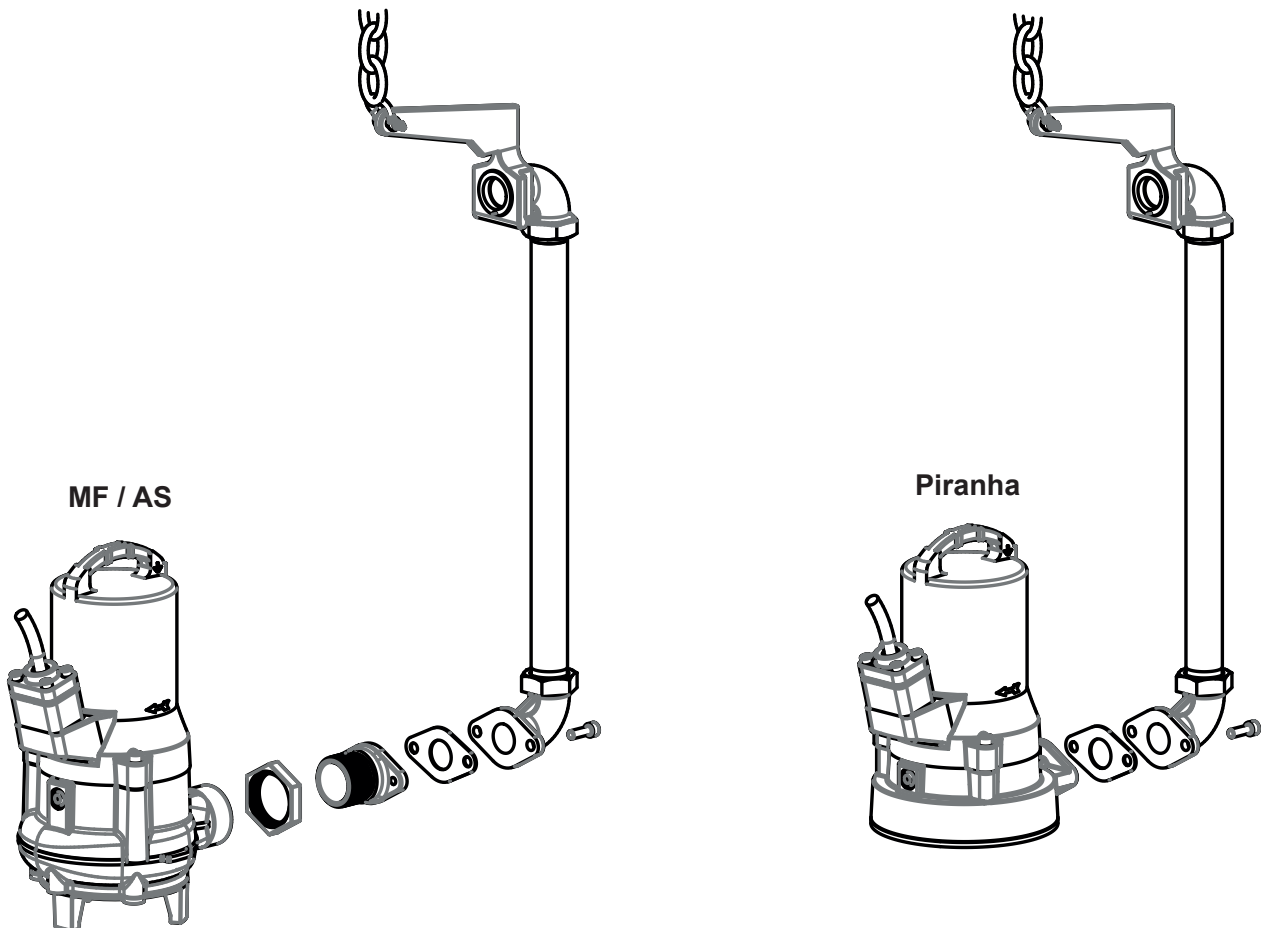
Take note of the weight of the entire unit. The hoist and chain must be adequately dimensioned for that weight and must comply with the current valid safety regulations.

All relevant safety regulations as well as general good technical practice must be complied with.

4 Set-up and installation

4.1 Pump installation

The pump(s) are connected to the flange at the end of the coupling discharge pipe. A gasket and bolts are supplied as standard with the coupling for connection of Piranha pumps. For connection of AS and MF pumps an adaptor kit is required and available as an accessory.



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Figure 2. Pump discharge connections

4.2 Discharge line

The discharge line must be installed in compliance with the relevant regulations. DIN 1986/100 and EN 12056 applies in particular to the following:

- The discharge line should be fitted with a backwash loop (180° bend) located above the backwash level and should then flow by gravity into the collection line or sewer.
- The discharge line should not be connected to a down pipe.
- Where provided the discharge cap must be fitted between the coupling and the tank.

ATTENTION *The discharge line should be installed so that it is not affected by frost.*

The vent line is connected by means of a push-on sleeve to the vertical outlet at the top of the collection tank. It should be of constant cross-section (min. DN 70) and should have a continuous rise to above roof level.

4.3 Opening of the collection tank inlet ports

Only open the inlet ports that are to be used. Saw off the end piece using the moulded ridge as a guide (do not cut the port any closer to the tank). After sawing, file down any sharp or jagged edges inside and outside.

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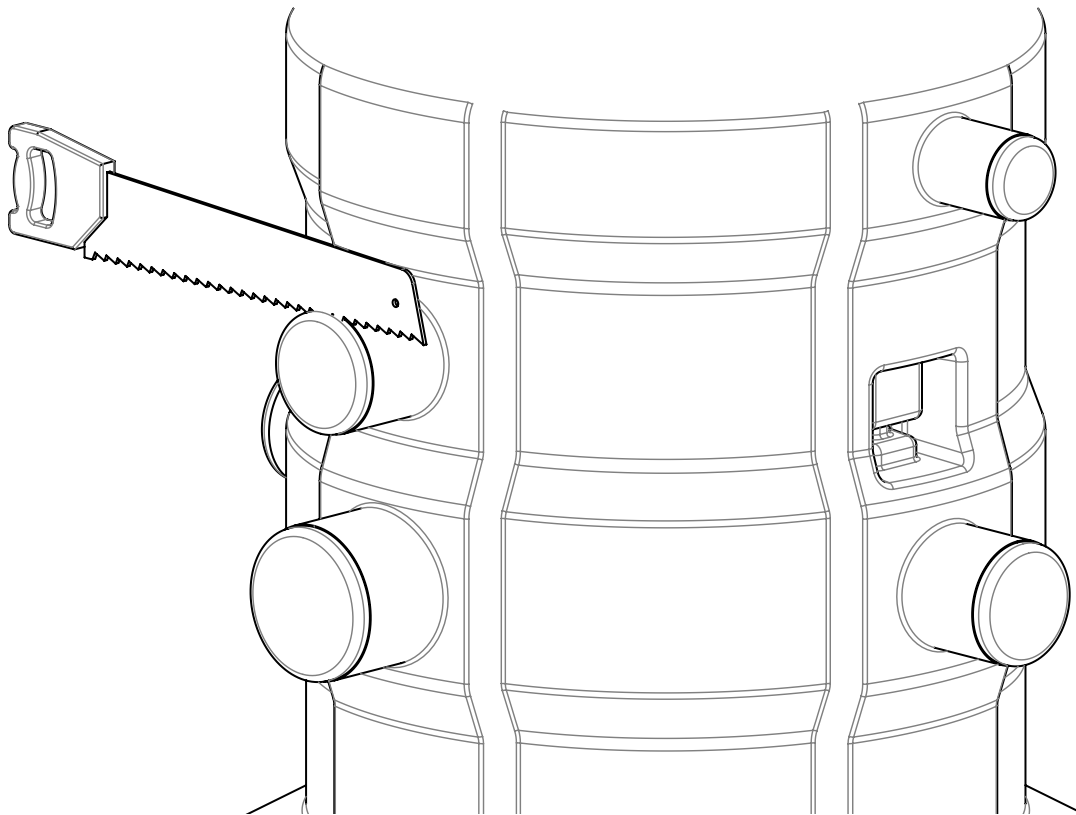


Figure 3. Opening of inlet port

4.4 Installation of the collection tank

The inlet lines must be laid in such a manner that there is a continuous fall to the correct degree to the inlet ports of the collection tank.

ATTENTION *The regulations for underground engineering work should be observed.*

The pit must be approximately 30 cm deeper than the unit and filled with sand up to the point where the unit is installed (grain size up to 2 mm). Care must be taken that no soil can slide back in.

NOTE *When setting the depth of the pit allow for the dimensions of the cover in addition to the tank, and riser if fitting (see sections 4.7 and 4.10).*

ATTENTION *Where the water table may reach a high level (maximum allowable is 1.5 m from bottom of the tank) the unit will need an additional measure to secure it against floating up. This can be achieved by setting the base area of the tank under concrete.*

Lower the unit into the pit and align on the prepared foundation.

NOTE *The foundation must be free of stone or other large objects. Additional filling may be required.*

Fill the pit with sand to the upper edge of the tank bottom. Put on tank cover, connect inlet ports and discharge lines.

NOTE: *For initial start-up and to avoid injury, ensure all connections are made correctly.*

4.5 Excavation and filling in of the pit



Before excavation ensure that all accident prevention regulations are complied with e.g. an adequate safety barrier surrounds the excavation area.

ATTENTION *The filling material should be filling sand or sand from a gravel pit. Maximum particle size is 32 mm. Marly soil, rubble, stones or sharp particles should not be used. Care should be taken that the pit is filled in evenly from all sides in order to avoid pushing in the side of the tank.*

ATTENTION *The stability of the installed sub-surface plastic components is directly correlated to the parameters of the enclosing soil. Therefore the creation of the tank foundation and the filling of the trench have to be handled with special care and best possible accuracy. This is also essential for the soil materials employed for foundation and filling. The installation and all necessary soil works are arranged to DIN EN 1610 and ATV standard A139. If significant changes occur in the stiffness of the soil, load redistributions can be the result which can have negative effects on the buried plastic component. Afterwards the stability of the tank can no longer be guaranteed.*

Table 1. Backfilling material

Material	Bulk density γ [kN/m ³]	Modulus of deformation E [N/mm ²]	Poisson's ratio ν
Backfilling: Soil group G1 *. Compaction $D_{Pr} = 97\%$. Conditions A4 and B4 ** (in accordance with ATV 127).	20	23	0.3
Grown soil	20	4	0.3

* Only non-cohesive soil is to be used

** **A4:** Trench backfill compacted against the natural soil by layers, with verification of the degree of compaction required according to ZTVEstB. Covering condition A4 is not applicable with soil of Group 4.

B4: Compacted embedding against the natural soil by layers or in embanked covering, with verification of the degree of compaction required according to ZTVEstB. Embedding condition A4 is not applicable with soil of Group 4.

ATTENTION *Do not use more than one extension. The maximum allowable depth is 2.5 m. Do not compress the filling sand with a vibrator plate.*

1. Excavate the pit to depth measuring from the bottom of the tank to the top of the tank lid (dimension A). Include riser dimension if fitting. For tank, riser, lid and pipe connection dimensions see sections 4.7, and 4.10.



Excavation must be in accordance with DIN 4124.

2. Excavate the foundation for the tank base to a minimum depth of 300 mm (dimension B).
3. Fill the foundation with non-cohesive soil e.g. sand or gravel, with a maximum particle size of 32 mm and compacted to Dpr 97% (see Table 1).

4. Ensure the base is level. Install the tank and connect the inflow and discharge pipes. Ensure the tank is centred on the base with a minimum gap of 500 mm on all sides between it and the pit wall (dimension C).

5. The pit should be filled in layers of maximum 30 cm. The individual layers should be evenly compacted using a hand rammer. Do not use a mechanical compactor. If the surrounding area is a marl soil or the water table is high the unit should be secured in position with sand or concrete in order to stop it from floating up. The concrete should only be used for securing the base section of the tank. Any device for lowering the water table should only be switched off after the pit has been filled and compacted.

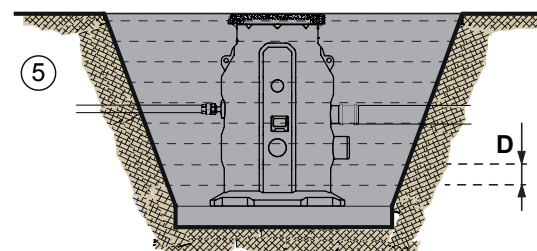
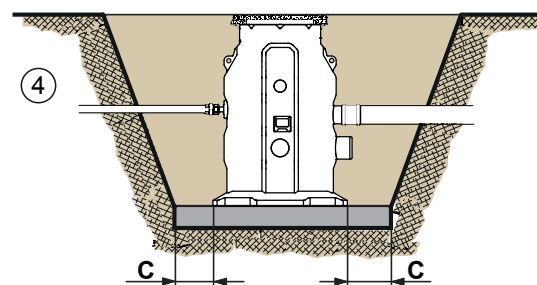
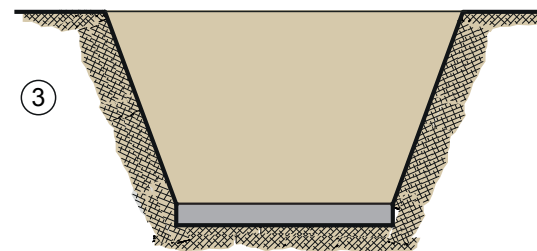
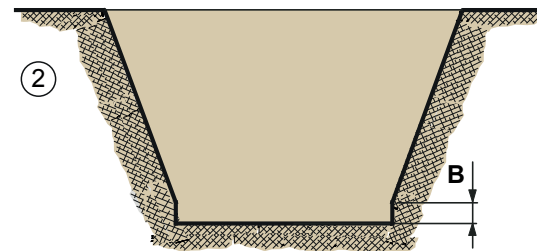
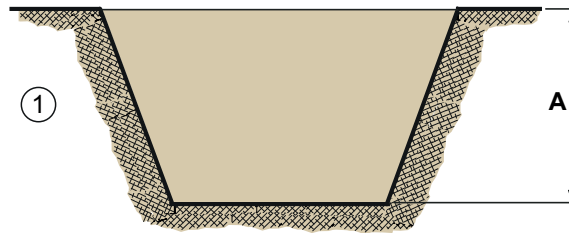


Figure 4. Excavation and backfilling

4.6 Load distribution plate

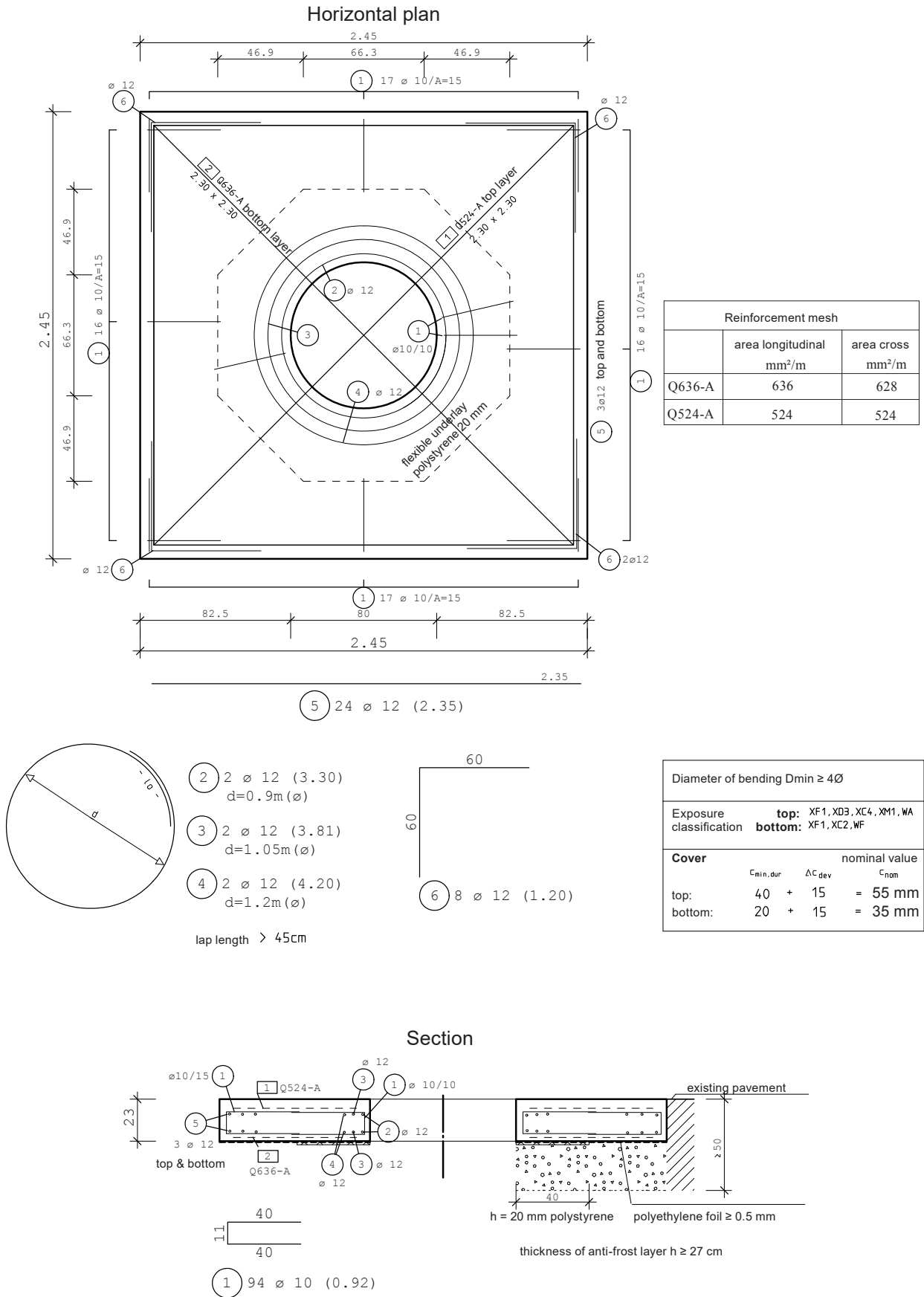


Figure 5. Distribution plate specification and dimensions

4.7 Tank and riser dimensions

NOTE *To facilitate easier access to the tank and fittings, when not extended to its maximum height we recommend cutting off any surplus riser below where the sealing rings are fitted.*

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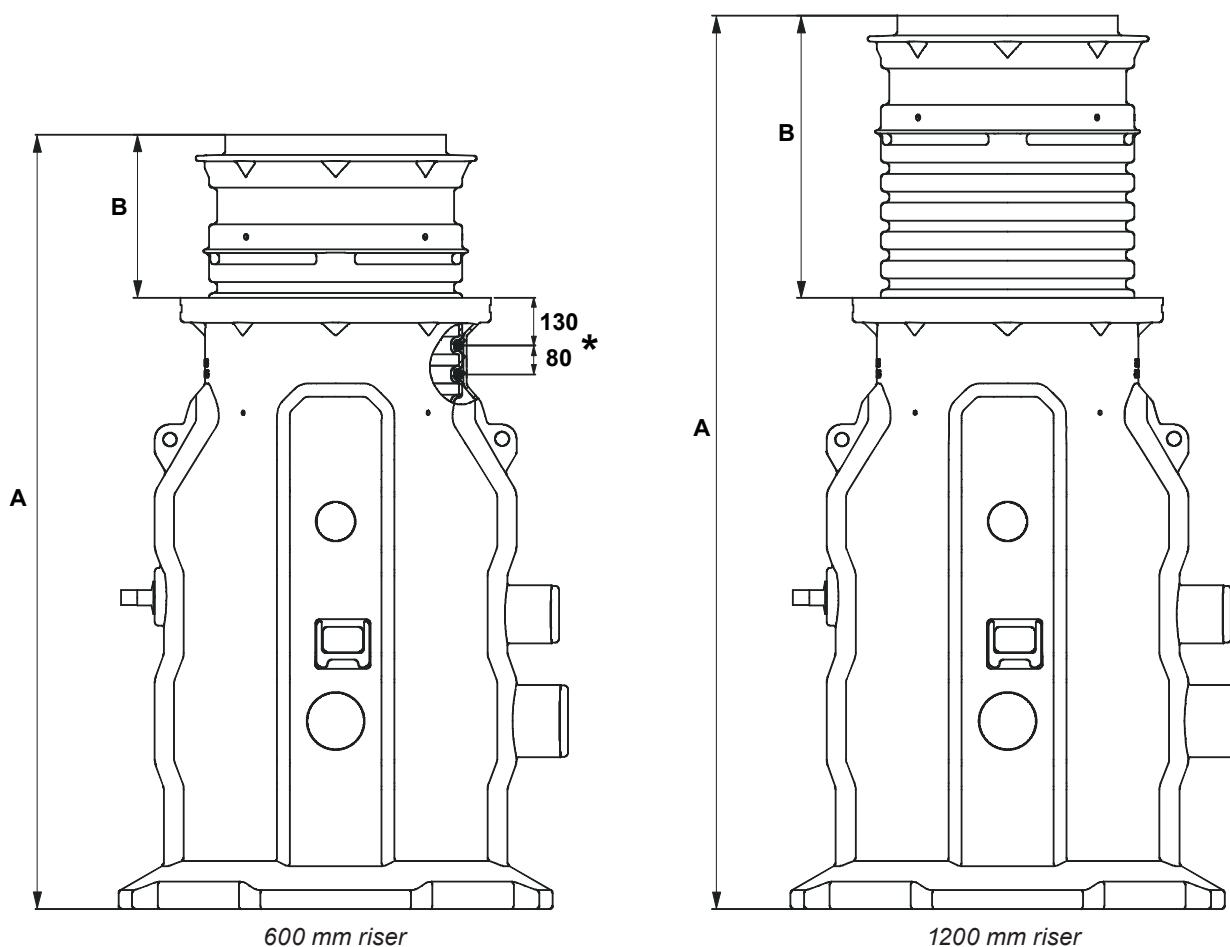


Figure 6. Tank and riser dimensions

Dimension (mm)	600 mm riser	1200 mm riser
A	min. 1930	min. 2130
	max. 2130	max. 2500
B	min. 240	min. 440
	max. 440	max. 810

ATTENTION **Both o-rings must be positioned in the sealing area.*

4.8 Level control

Level control is by one of three options; pressure pipe, float sensor or float switch.

4.8.1 Pressure pipe

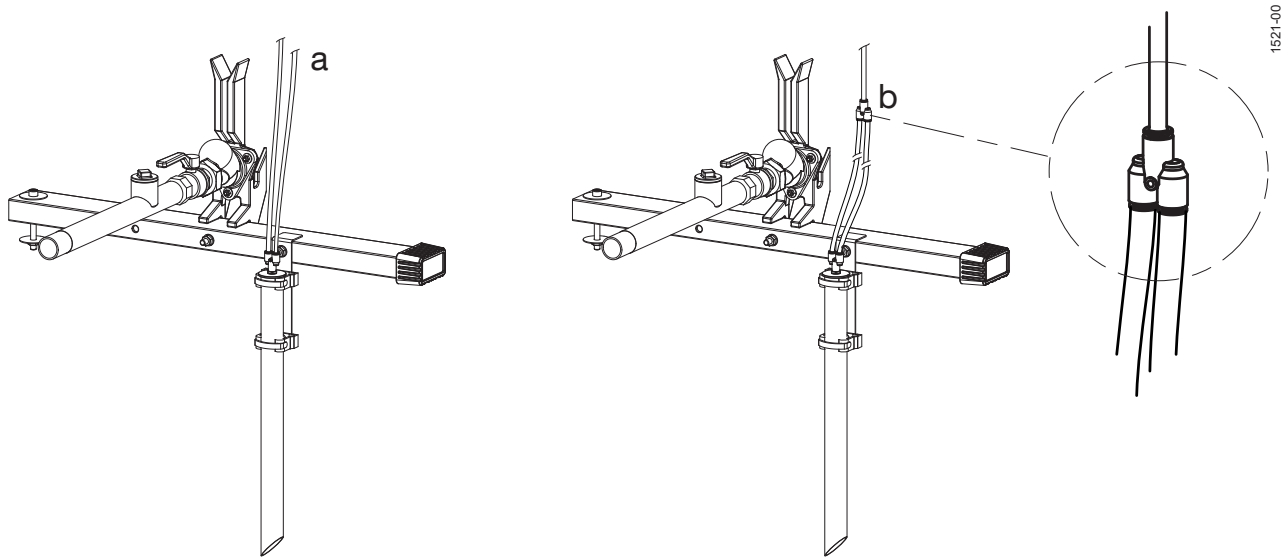


Figure 7. Pressure pipe with compressor control

Pressure pipe without compressor control

When connected to a control panel without a compressor the control tubes (a) must be joined to a single control tube using the supplied adaptor (b).

ATTENTION *Without a compressor a run-off time must be set so that the water does not empty to a level below the centre line of the pump discharge.*

ATTENTION *The control line (c) must have a continuous rise to the control panel. It must not be looped or kinked (d). This is necessary for the prevention of operational faults that would be caused by the resulting accumulation of moisture in the tubes.*

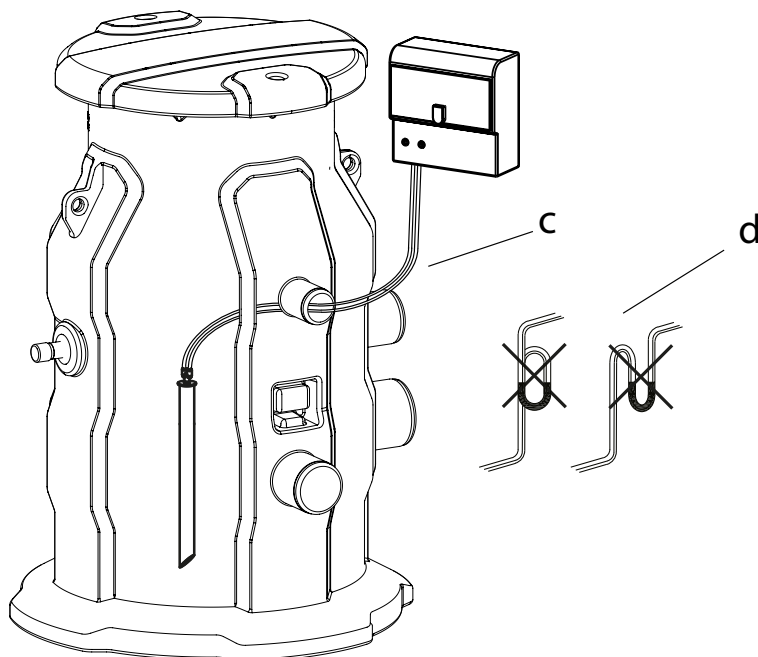
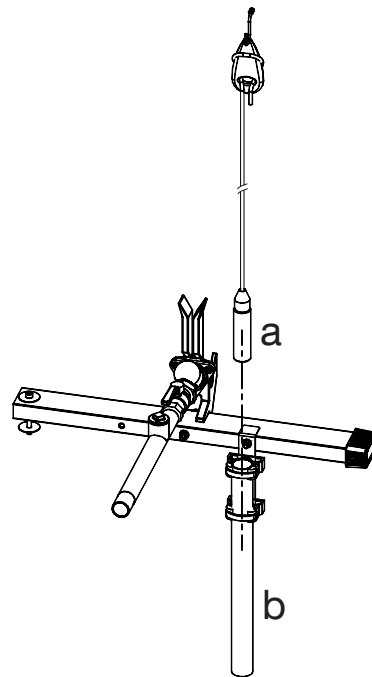


Figure 8. Installation of the control line

4.8.2 Float sensor

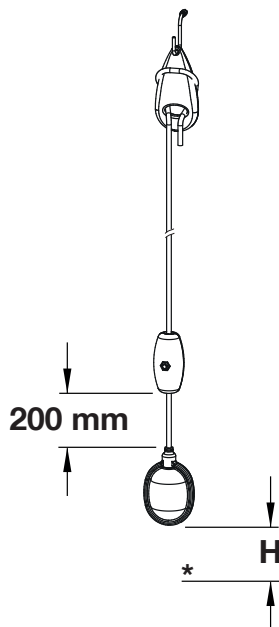


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Figure 9. Float sensor

ATTENTION Ensure that the sensor (a) does not protrude outside the end of the holding pipe (b).
For hook fitting see section 4.9.

4.8.3 Float switch



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Dimension	Float 1 - Stop (Pump 1 / Pump 2)	Float 2 - Start (Pump 1 / Pump 2)	Float 3 - Alarm (Pump 1 / Pump 2)
H	min. 100 mm	min. 200 mm	min. 300 mm

* Floor of tank

For hook fitting see section 4.9.

Figure 10. Float switch setting

4.9 Fitting the chain and sensor hooks

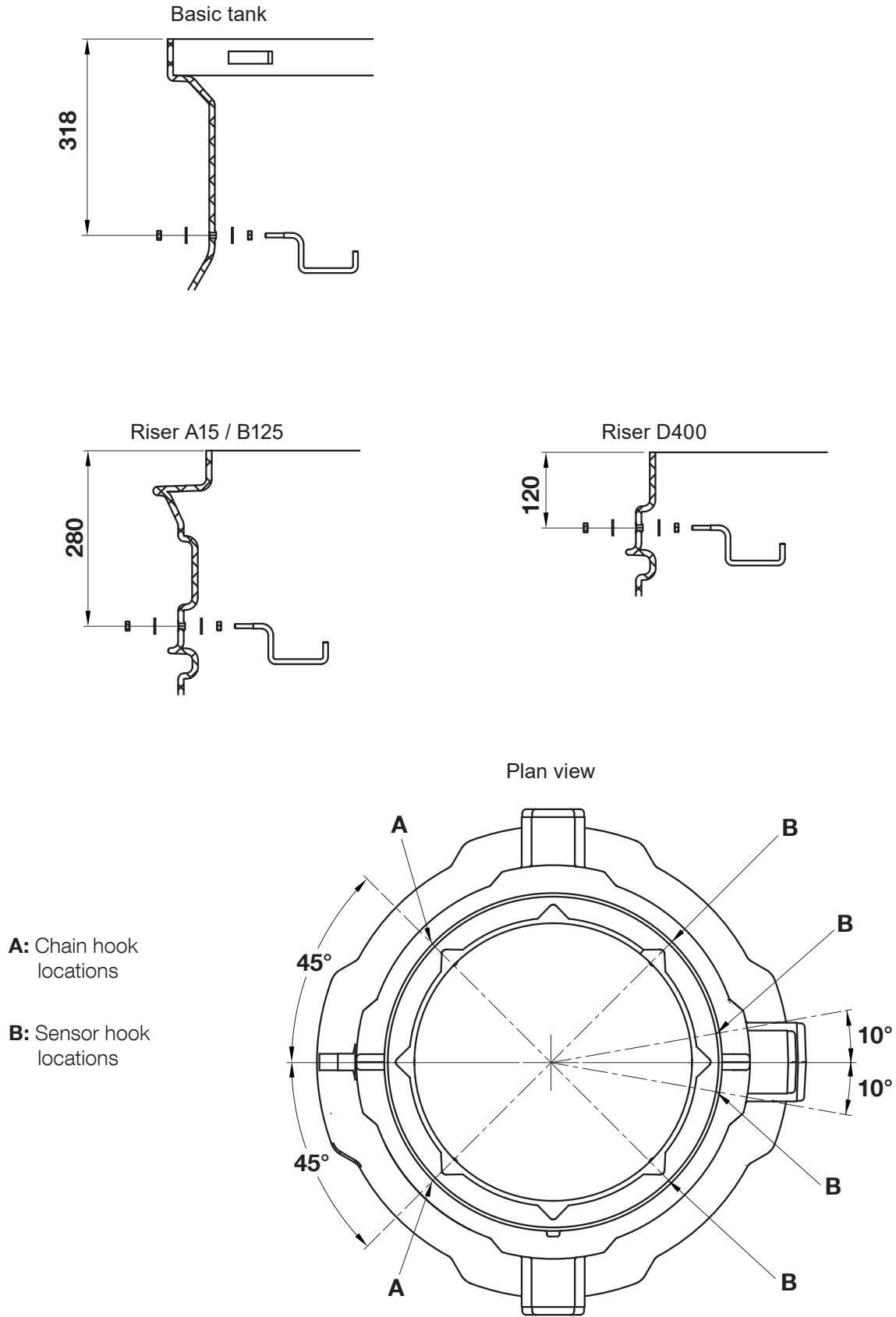


Figure 11. Hook locations

4.10 Lid details

4.10.1 Plastic lockable lid

Application: installations that are removed from all forms of traffic.

ATTENTION *Can only be used on the basic tank (i.e. without riser) and is not watertight.*

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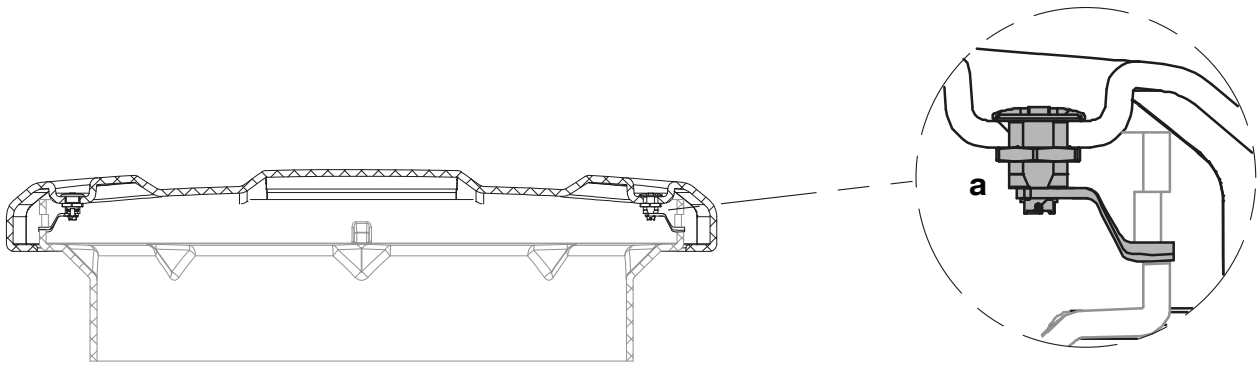


Figure 12. Plastic lid - cross section drawing and lock

The lid is secured and locked with two low profile cam latches (a).



The plastic lid is not a load bearing cover and must never be stood upon or made to support either stationary or mobile objects.

4.10.2 Class A15 lid

Application: installations for pedestrian traffic only. Can be used with 3 x 80 mm concrete height adjustment rings.

ATTENTION *Can only be used on the basic tank (i.e. without riser).*

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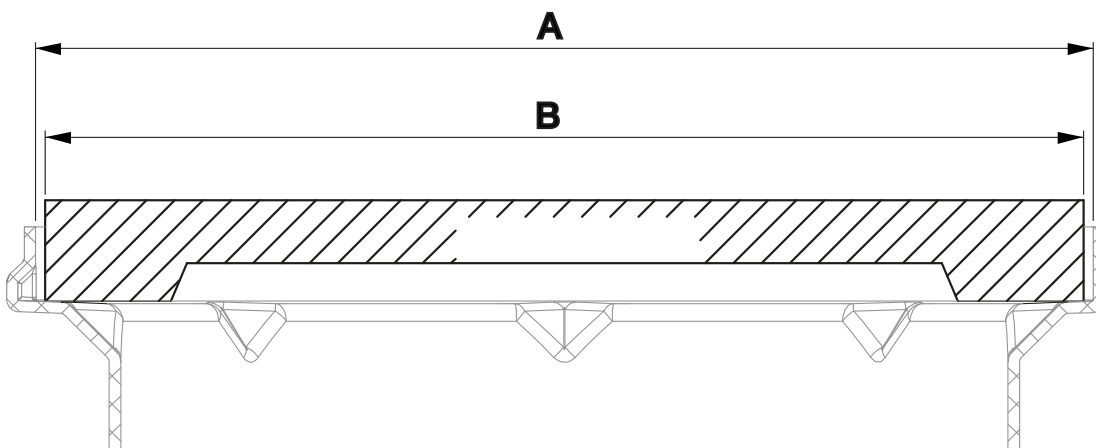


Figure 13. Class A15 lid - cross section drawing and dimensions

Dimensions

A: tank - internal diameter	840 mm
B: lid - outer diameter	825 mm

4.10.3 Class B125 lid

Application: installations for light vehicular traffic.

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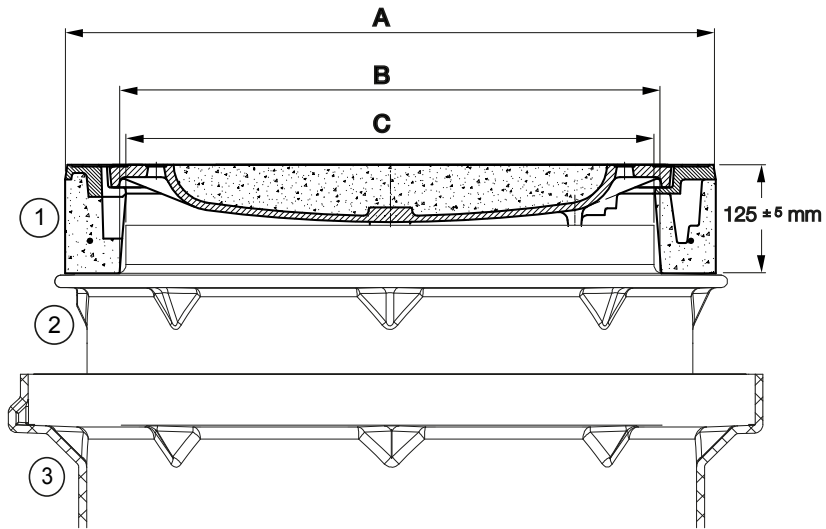


Figure 14. Class B125 lid fitted to riser - cross section drawing and dimensions

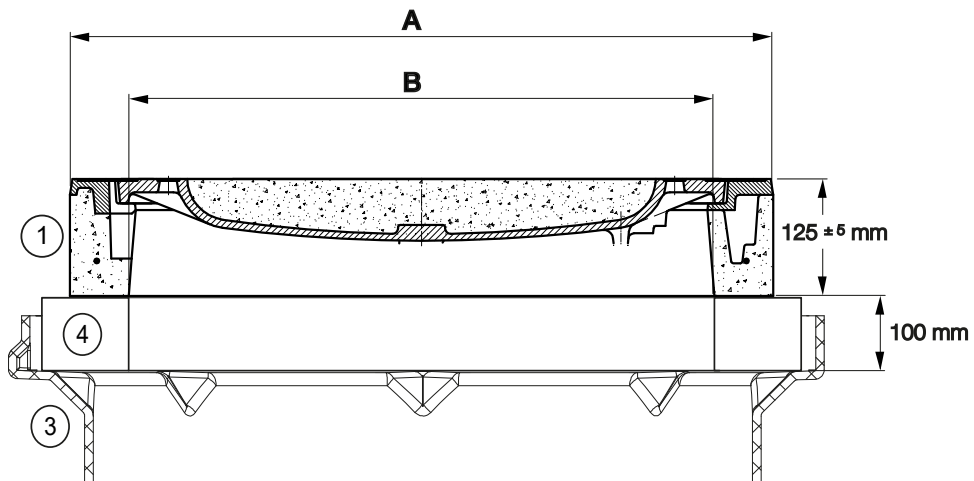


Figure 15. Class B125 lid fitted directly to tank - cross section drawing and dimensions

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Legend

1. B125 lid 2. Riser 3. Tank 4. Concrete support ring

Dimensions

A: lid - outer diameter	750 mm
B: lid - internal diameter	625 mm
C: riser - outer diameter	610 mm

ATTENTION *When fitting directly to a tank without a riser a single 100 mm ring (part no.44505000) must first be fitted to support the B125 lid (max. one ring).*

NOTE *For installation in traffic areas, B125/D400, all local traffic regulations and safety instructions must be adhered to (E.g. Germany –ZTVE StB 09).*

4.10.4 Class D400 lid

Application: installations for heavy vehicular traffic.

ATTENTION *Can only be used with a riser (i.e. not on basic tank), and must be used with a load distribution plate similar to design in section 4.6.*

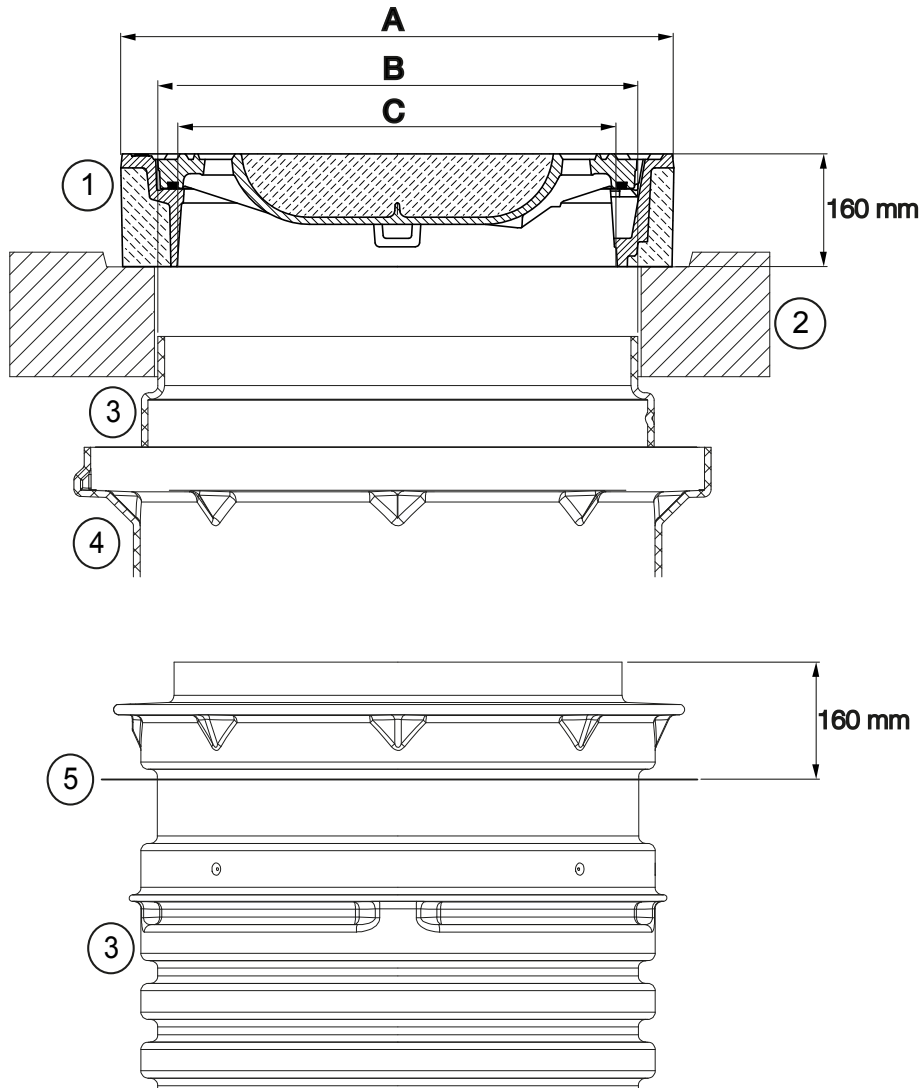


Figure 16. Class D400 lid - cross section drawing and dimensions

Legend

- 1. D400 lid
- 2. Load distribution plate
- 3. Riser
- 4. Tank
- 5. Riser cut line

Dimensions

A: lid - outer diameter	785 mm
B: riser - outer diameter	655 mm
C: lid - internal diameter	625 mm

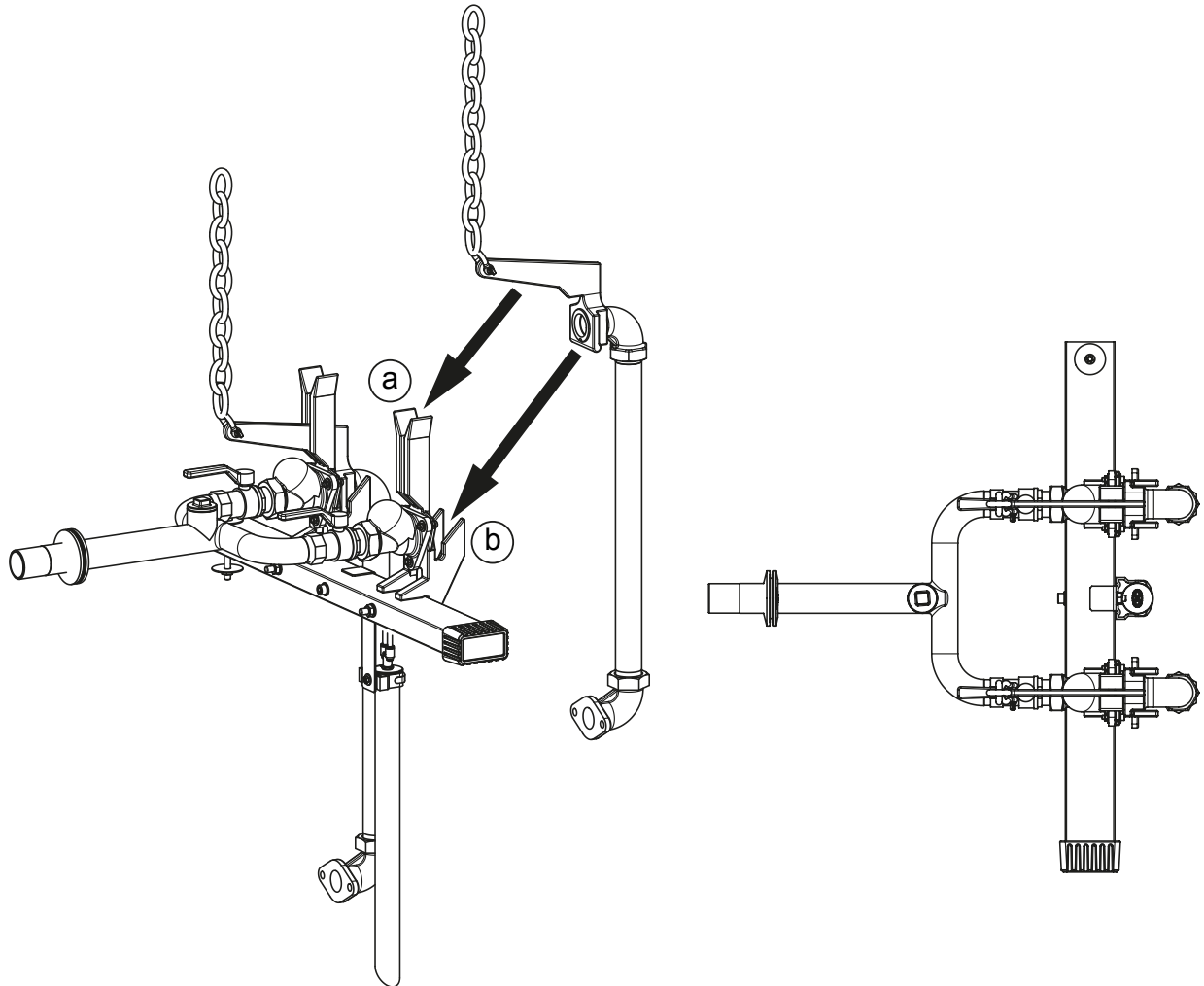
NOTE

For installation in traffic areas, B125/D400, all local traffic regulations and safety instructions must be adhered to (E.g. Germany – ZTVE StB 09).

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4.11 Sulzer high level coupling with discharge pipe pump suspension.

The Sulzer high level coupling ensures a quick and easy installation without the need to enter the tank. The connection unit with coupling bracket and valves is installed and secured in the tank before the tank itself is installed in the pit. The complete pump unit is lowered with a chain down into the guide rail (a) and claw (b) in the coupling bracket. The unit automatically aligns and locates itself in the correct position, effecting a seal on the discharge coupling. This automatic coupling process is especially useful where inspection work is needed. The pump unit can be lifted out and lowered down even if the tank is flooded.



1071-01

Figure 17. Sulzer high level coupling with discharge pipe pump suspension

4.12 Opening and closing the shut-off valves

To open (b) and close (a) the shut-off valves a service bar tool with an extendable handle is available that fits onto the valve lever.

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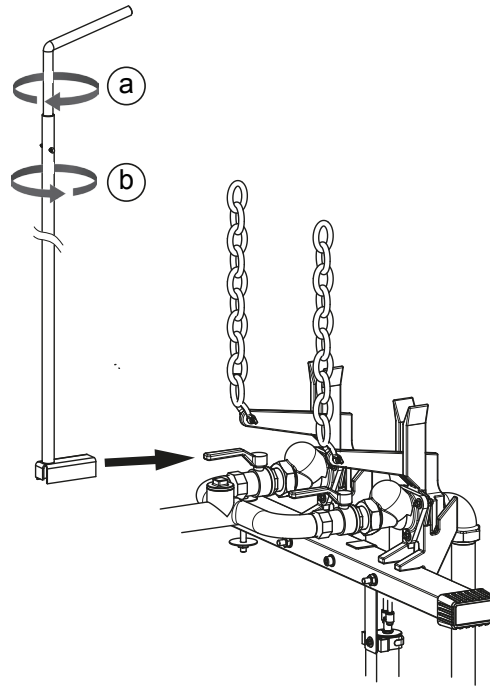


Figure 18. Open and close non-return valve

4.13 Fitting the flushing kit and vacuum breaker

The discharge line has a connection point to which a flushing kit (a), and as an extension a vacuum breaker (b), can be fitted.

ATTENTION *In single pump installations, to allow access to the non-return valve with the service bar tool, the vacuum breaker must be fitted at 45° to the discharge line.*

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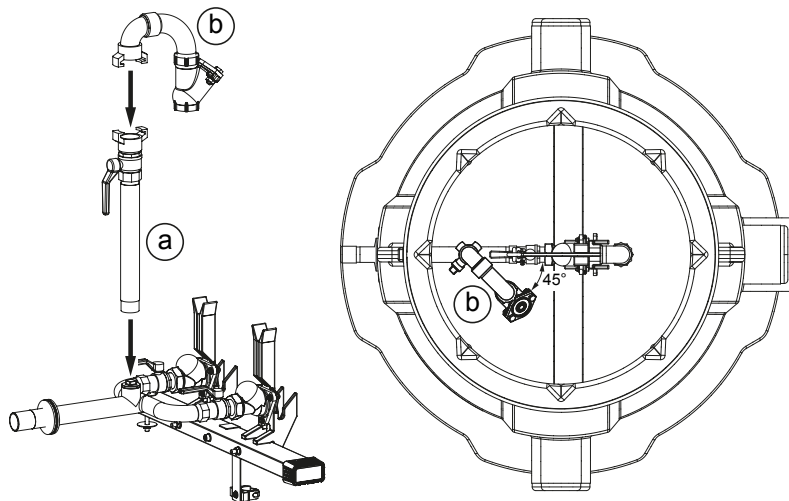


Figure 19. Flushing kit and vacuum breaker

4.14 Installation of the control unit

ATTENTION *The control unit should be fitted above possible flood level in a well ventilated room and in an easily accessible position. Protection Class of the control unit is IP 54.*

The control unit should be secured at all fixing points. The fixing holes are accessible after unscrewing the lower housing cover.

ATTENTION *Do not drill through the housing of the control unit itself.*

NOTE *A number of different control box models exist. Please check the wiring diagram / instruction manual for the control box.*

5 Commissioning



The safety hints in the previous sections must be observed!

Before commissioning, the unit should be checked and a functional test carried out. Particular attention should be paid to the following:

- Have the electrical connections been carried out in accordance with regulations?
- Have the thermal sensors been connected?
- Is the seal monitoring device (where fitted) correctly installed?
- Is the motor overload switch correctly set?
- Have the power and control circuit cables been correctly fitted?
- Was the sump cleaned out?
- Have the inflow and outflows of the pump station been cleaned and checked?
- Is the direction of rotation correct, even if run via an emergency generator?
- Are the level controls functioning correctly?
- Are the required gate valves (where fitted) open?
- Do the non-return valves (where fitted) function easily?
- Have the hydraulics been vented in the case of dry-installed pumps?

ATTENTION *Before commissioning, the collection tank should be cleaned of any large particles and filled with water. If the control line (rubber hose) was connected to the retaining pipe after the collection tank was fitted the collection tank has to be emptied manually once by setting the selector switch to "Hand". After commissioning, the lifting unit is normally operated with the selector switch in position "Auto".*

6 Maintenance



To avoid danger if the power cable is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.



Before commencing any maintenance work the unit should be completely disconnected from the mains by a qualified person and care should be taken that it cannot be inadvertently switched back on.



Servicing must only be carried out by qualified personnel.



When carrying out any repair or maintenance work, the safety regulations covering work in enclosed areas of sewage installations as well as good general technical practices should be followed.

NOTE *The maintenance hints given here are not designed for “do-it-yourself” repairs as special technical knowledge is required.*

NOTE *A maintenance contract with our Service Department will guarantee you the best technical service under all circumstances.*

6.1 Maintenance of lifting stations in accordance with EN 12056

It is recommended that the lifting station be visually inspected monthly and its function checked. In the case of any irregularities, deformations, or plastic colour changes, report immediately.

In accordance with EN regulations, the lifting station should be maintained by a qualified person at the following intervals:

- in commercial premises every three months.
- in apartment blocks every six months.
- in a single family home once a year.

In addition we recommend that a maintenance contract be taken out with a qualified company.

6.2 General maintenance hints

Sulzer submersible pumps are reliable quality products, each being subjected to careful final inspection. Lubricated-for-life ball bearings, together with monitoring devices, ensure optimum pump reliability provided that the pump has been connected and operated in accordance with the operating instructions.

Should nevertheless a malfunction occur, do not improvise but ask your Sulzer Customer Service Department for assistance.

This applies particularly if the unit is continually switched off by the current overload in the control panel, by the thermal sensors of the thermo-control system, or by the seal monitoring system (DI).

Regular inspection and care is recommended to ensure a long service life.

NOTE *The Sulzer Service Organisation would be pleased to advise you on any applications you may have and to assist you in solving your pumping problems.*

NOTE *The Sulzer warranty conditions are only valid provided that any repair work has been carried out in a Sulzer approved workshop and where original Sulzer spare parts have been used.*

