

HOME BIOGAS[®]

HBG 4.0 HOUSEHOLD BIOGAS SYSTEM - DOUBLE TOILET

OWNER'S MANUAL

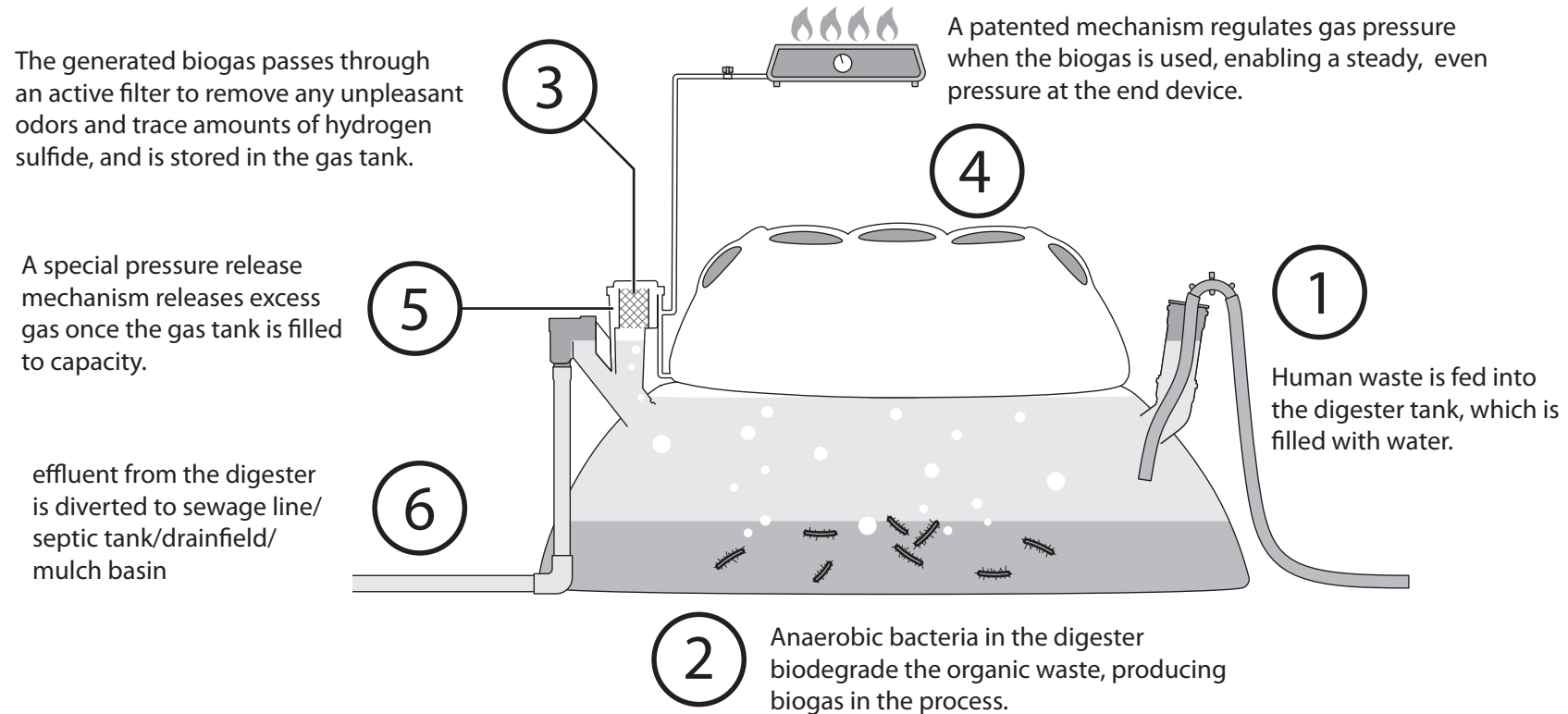
VERSION 200422



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|---------------------------------|----|
| Introduction | 3 |
| Location selection and planning | 6 |
| System Assembly | 14 |
| Bio-Toilet Installation | 36 |
| Effluent management | 46 |
| Using the toilet | 50 |
| Bio-toilet maintenance | 51 |
| System Care | 53 |
| Troubleshooting | 55 |
| Tech Specs | 56 |
| Safety | 57 |
| Warranty | 58 |

introduction

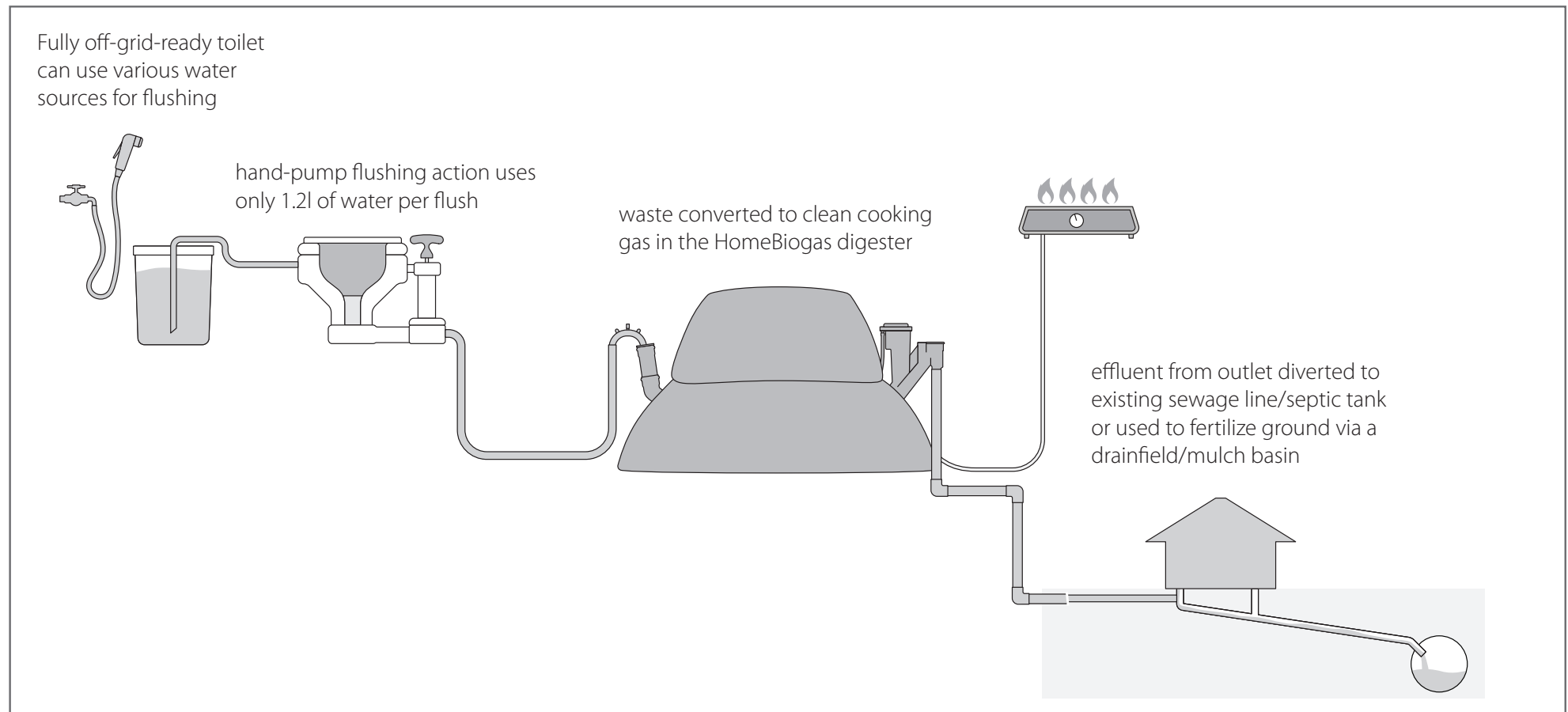
The HomeBiogas system operates as a continuous-flow system: organic waste is fed into one end, and gas and fertilizer are emitted constantly from the other as long as the system is active and being fed. (Fertilizer is produced whenever liquid & waste are added into the system)



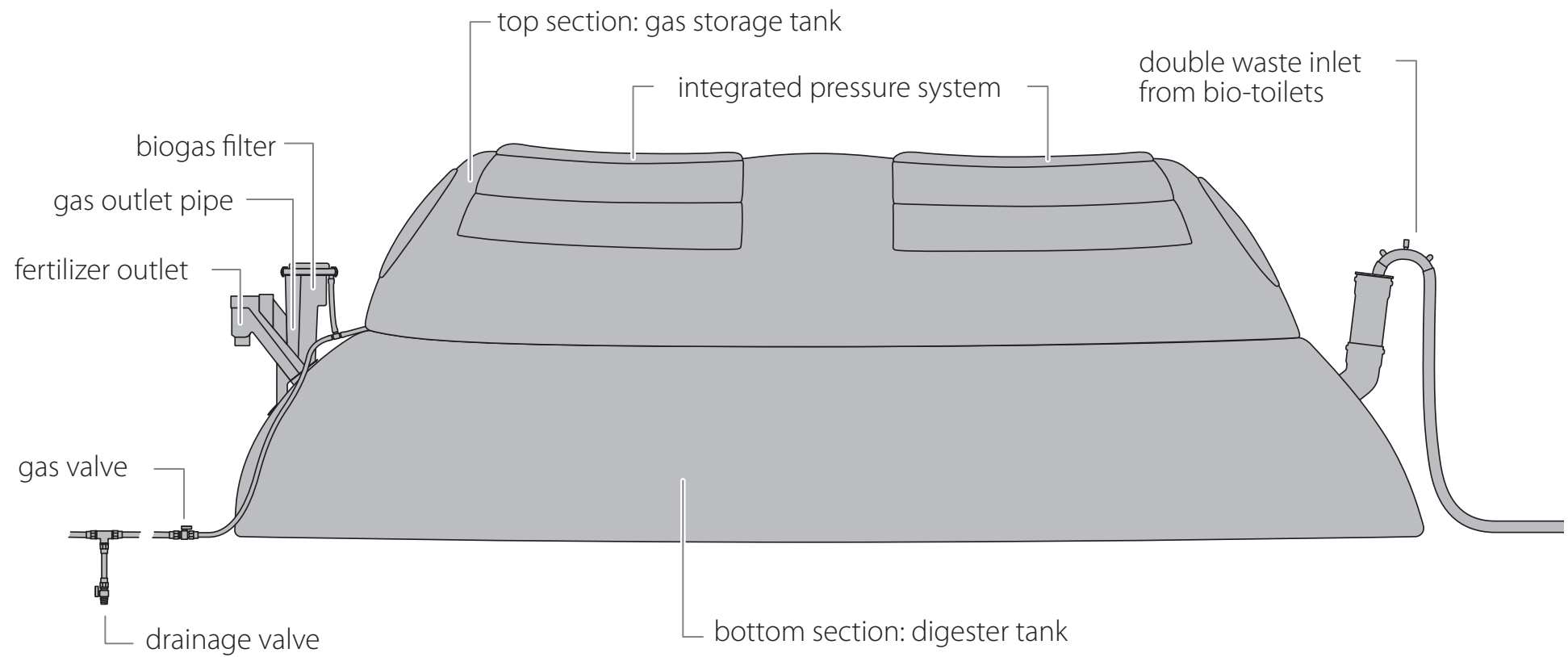
HomeBiogas Bio-toilet

The HomeBiogas bio-toilet is an add-on to the HomeBiogas domestic biogas system that allows users to turn human waste into clean energy in the form of cooking gas.

The HomeBiogas digester only provides partial, primary wastewater treatment for the connected HomeBiogas toilet. While rich in nutrients, effluent from the system requires further treatment and should be managed according to local wastewater treatment regulations.



main parts of the system

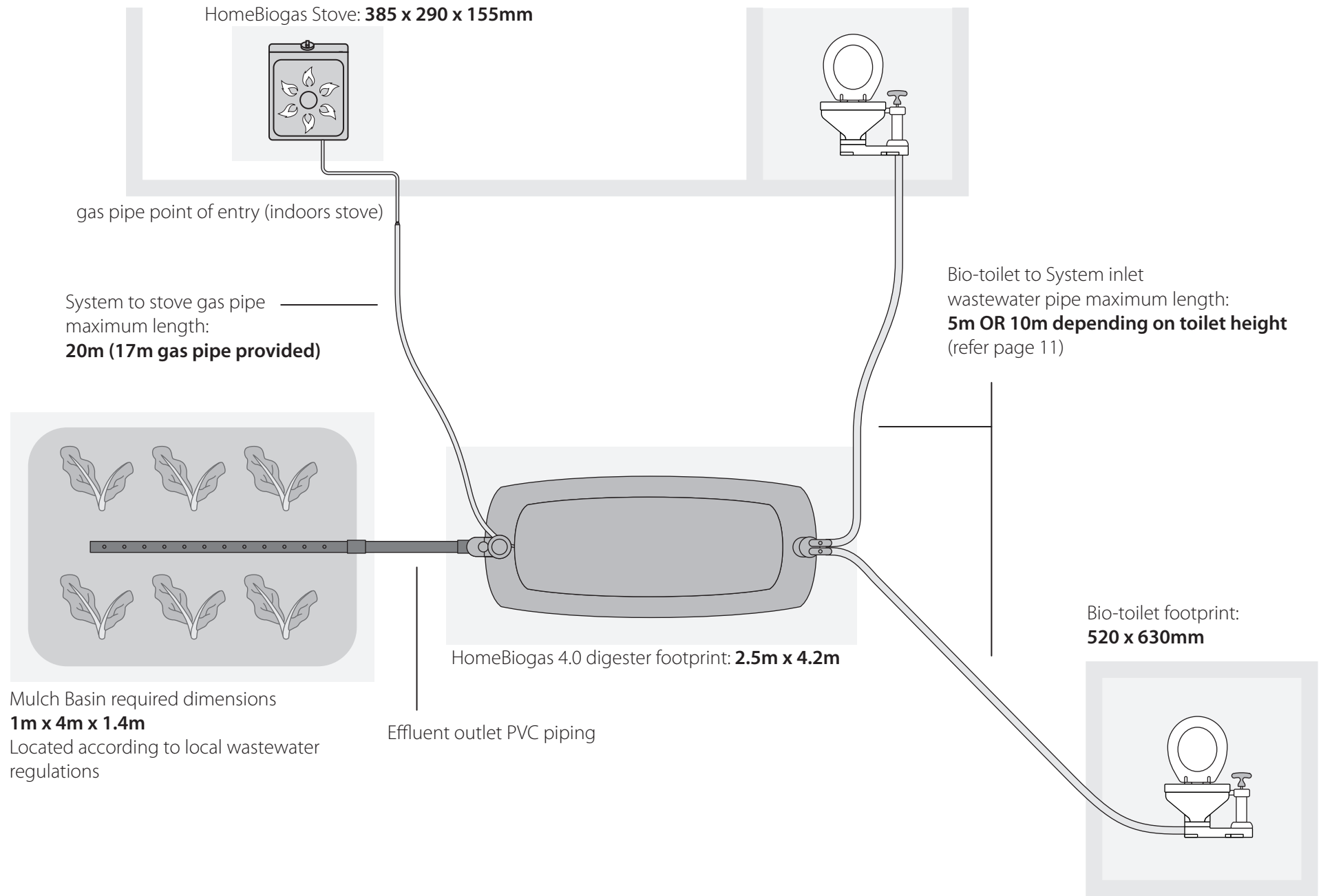


location selection & planning

It is important to plan for the installation of your HomeBiogas system, stove, bio-toilets and effluent management all together, as the different elements are connected to each other with various distance limitations between devices.

This also will help you to plan ahead and purchase additional materials/parts/piping if necessary.

The following page shows an example of a HomeBiogas system set up with a stove, bio-toilets and effluent management (mulch basin option).



biogas digester - site selection

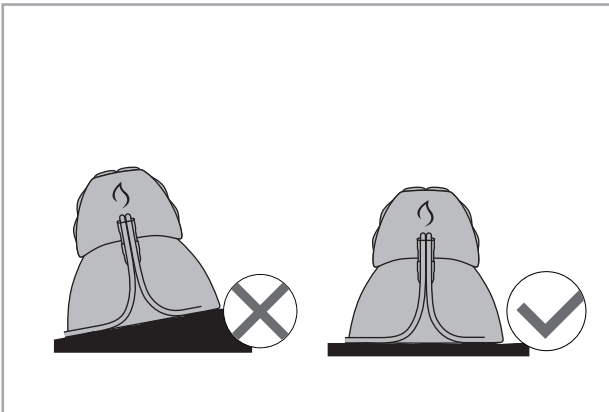
It is important to choose and prepare the right spot for your HomeBiogas system before installation to ensure optimum performance and avoid potential damage to the system.

The system is not designed to be moved or repositioned after it has been filled.

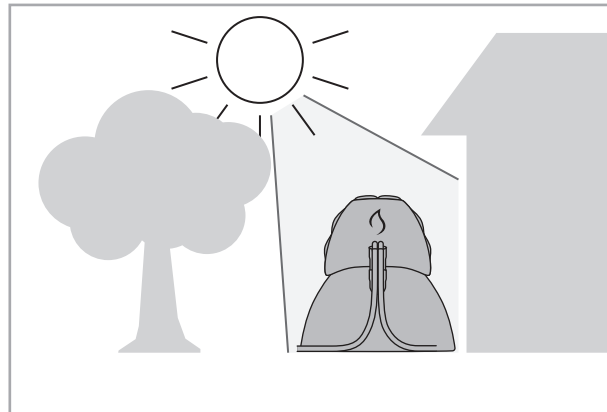
Failure to set up the system according to the following instructions could void the HomeBiogas warranty.



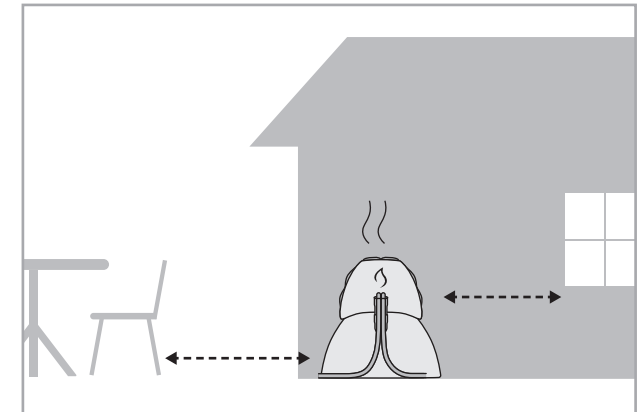
**CAUTION: Ensure that the following conditions are met when choosing a location.
The system weighs more than 2900kg when filled and cannot be moved after installation!**



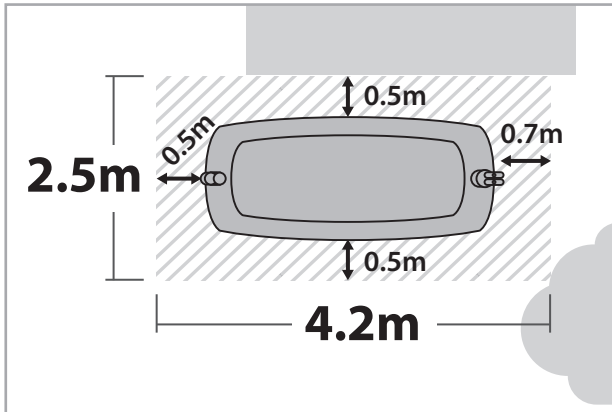
make sure the chosen location has a level surface - usage on sloping or non-level ground will damage system



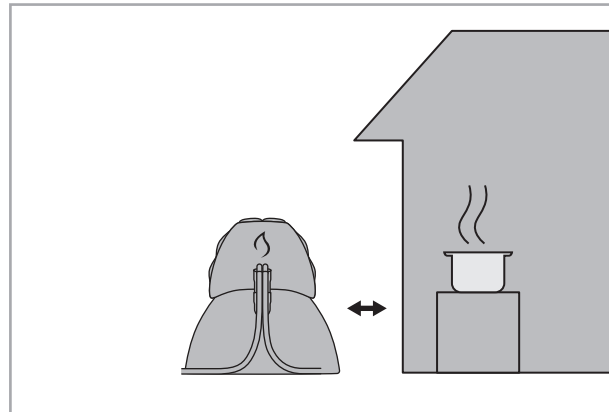
system should be installed in a sunny area outdoors for optimum gas production



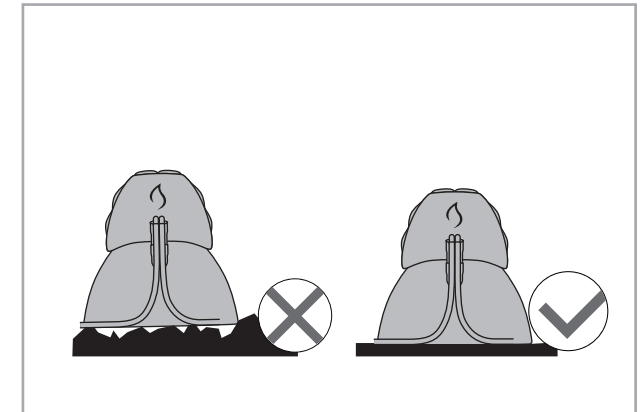
system may have mild organic scent - place away from windows/doors/outdoors seating



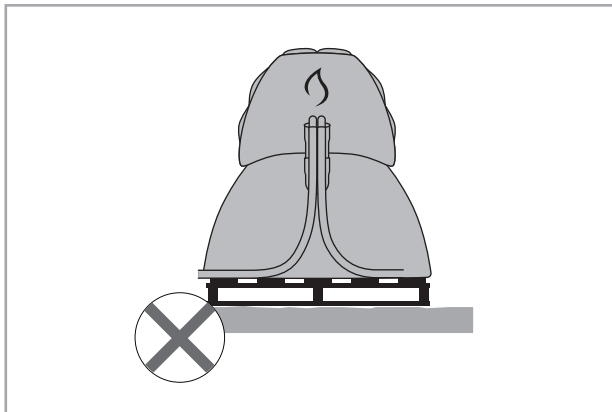
prepare at least 2.5 x 4.2m space for the system
(0.5m side, 0.7m front clearance for maintenance & daily usage)



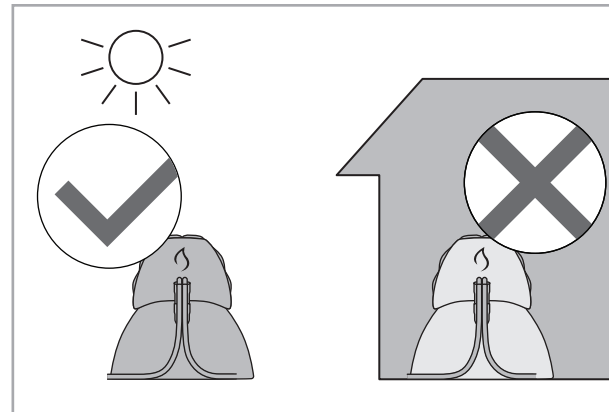
system should be installed close to kitchen/cooking area



prepare a firm, flat surface clear of obstructions - do not place on soft or unstable ground
e.g. flat dry ground, tile, concrete



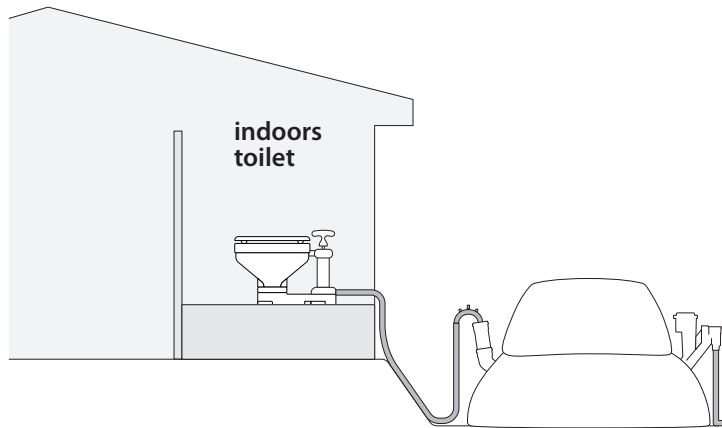
do not place system on shipping pallets or other weak raised surfaces



do not install system indoors/in an enclosed area

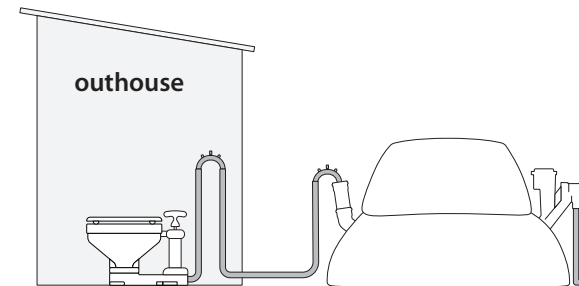
bio-toilet location planning

To ensure a smooth installation process and a well-functioning bio-toilet after installation, it is important to properly plan for the toilet's location, mounting surface, and plumbing connections to the system, as well as a suitable effluent management method.



The bio-toilet can be installed indoors as a replacement for a regular toilet.

The bio-toilet is slightly shorter than regular seating toilets - you can choose to mount it securely onto a raised platform if needed.



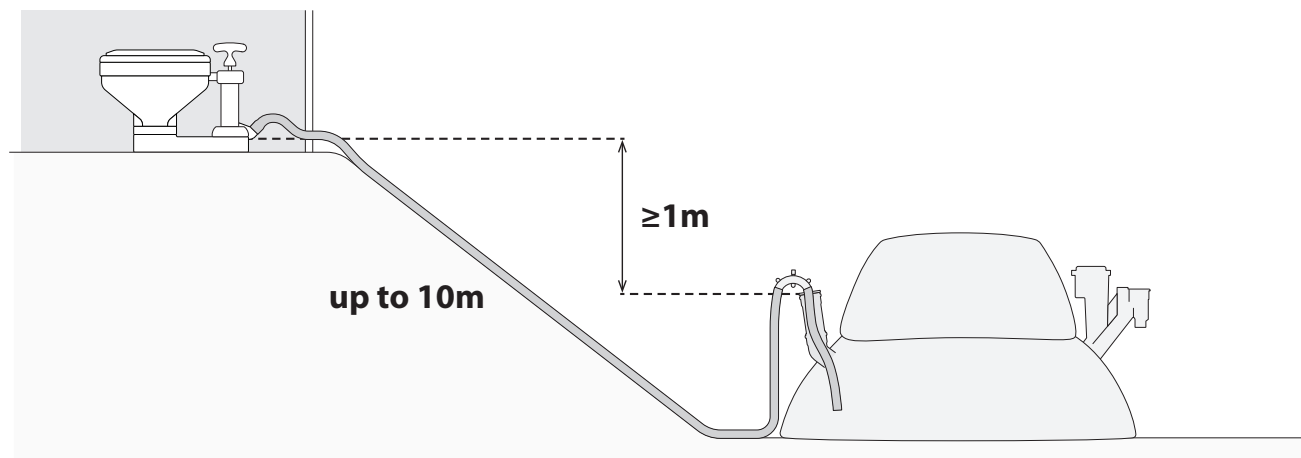
Alternatively, you can construct an outhouse for the toilet nearer to your biogas system.

There are 2 main ways to connect the bio-toilet to your HomeBiogas system - the option you choose will affect where you can locate the bio-toilet (maximum distance from system).

Option 1 (Recommended):

The toilet's discharge elbow must be **at least 1m above** the fertilizer outlet opening (where the wastewater pipe enters the system)

In this type of installation, the toilet can be located **up to 10m (33ft)** from the HomeBiogas system.

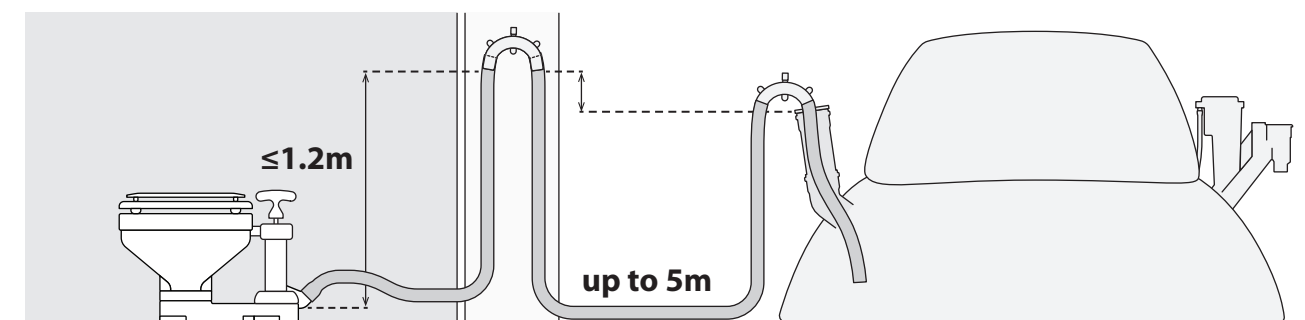


Option 2 (where option 1 is not possible):

The toilet is on the same level as the system (discharge elbow of the toilet **MUST NOT be lower** than the base of the system)

A second vented loop must be installed outdoors, close to the bio-toilet. The vented loop near the toilet must be **LESS THAN 1.2m ABOVE** the toilet discharge elbow, and positioned **HIGHER** than the fertilizer outlet vented loop.

In this type of installation, the toilet can be located **only up to 5m (16ft)** from the HomeBiogas system.

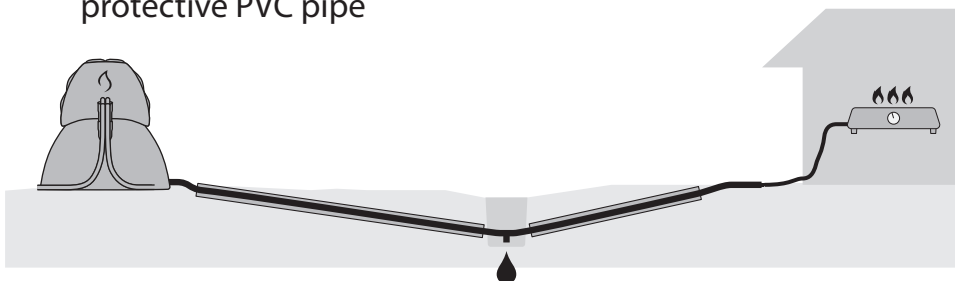


preparation for gas pipe installation

The system can be connected to a stove/appliance up to 20m away (17m gas tubing provided). Plan a suitable route for the gas pipe to ensure optimum gas flow and prevent damage to the pipe -follow detailed instructions for gas pipe and drainage valve installation on page 26, after assembling system.

Installation options:

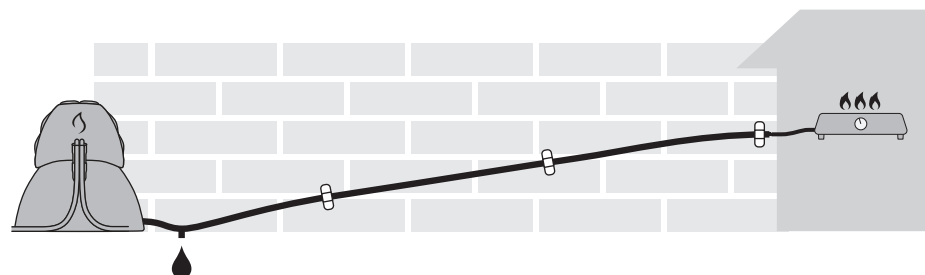
1. Gas pipe installed underground - passed through protective PVC pipe



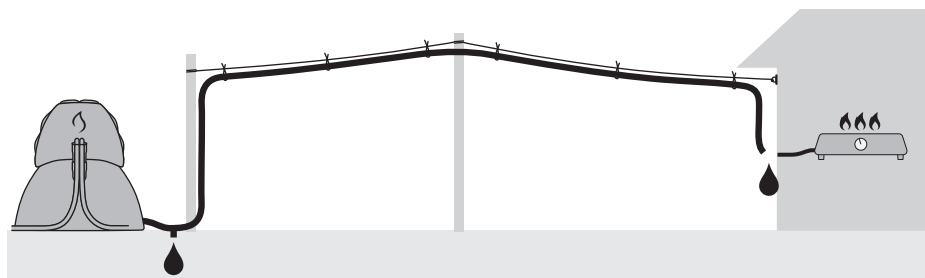
2. Gas pipe above-ground



3. Gas pipe fixed onto wall or nearby structure



4. Gas pipe suspended on overhead line



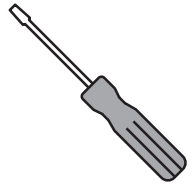
Installation options:

There should be no U-shaped bends along the pipe, where water will collect and block gas flow.

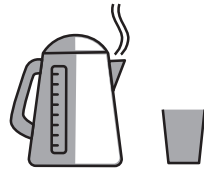
Gas pipes should be installed at a slight angle across their entire length, with a drainage valve installed at the lowest point for removal of collected condensation.

system assembly

Equipment Needed



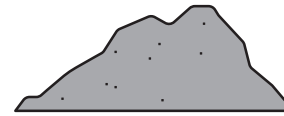
screwdriver (flat) OR
socket wrench 6/7/8



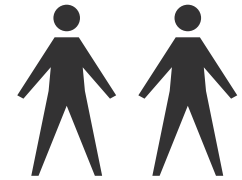
boiling water



water (2650 liters)

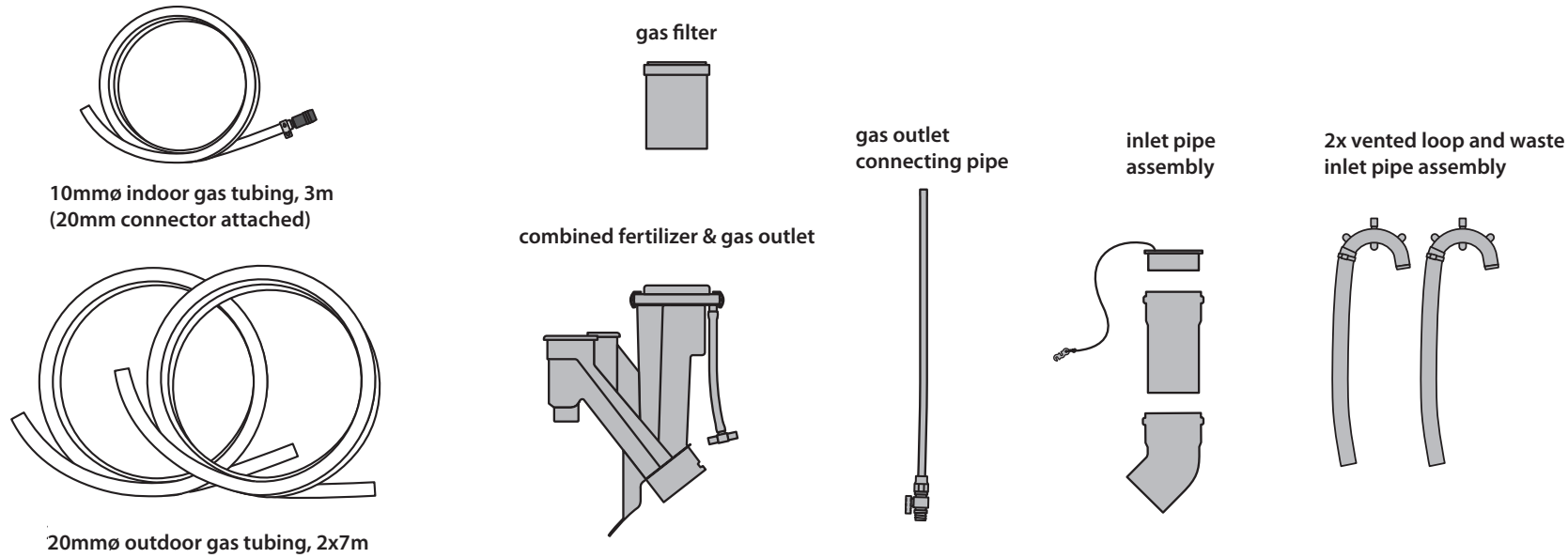


dry sand (96 liters)



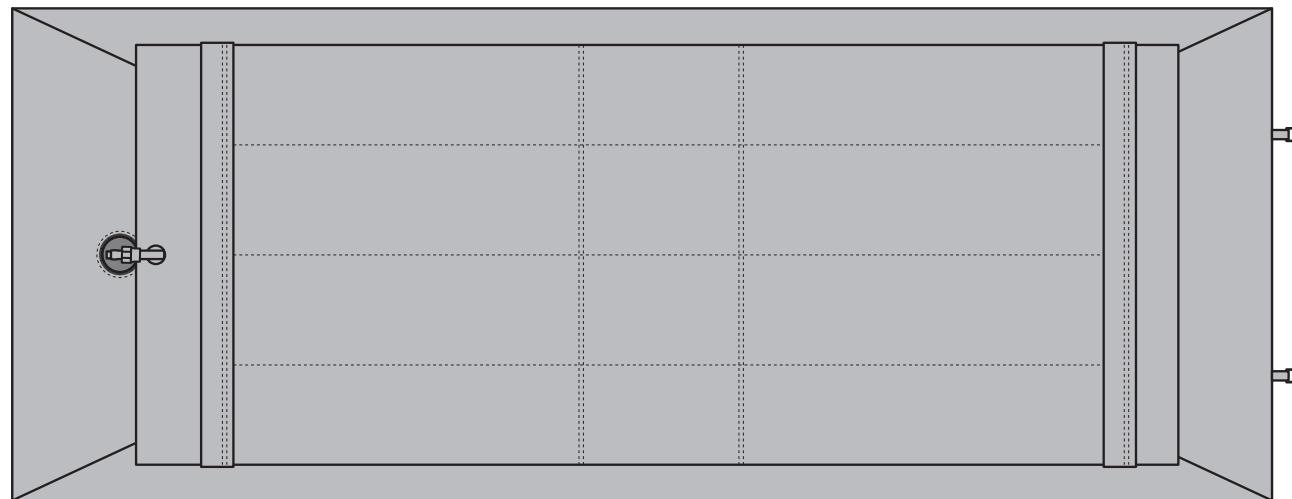
Assembly with 2 persons
recommended

system parts (box B)



B

combined gas tank + digester (box A)



combined gas tank & digester

A

parts bag 1



x4

110mm lip seal rubber ring



pipe/tubing joint lubricant

gas tank sand-packs



x48

parts bag 2

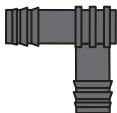


band for 10mmø
gas tubing



x7

bands for 20mmø
gas tubing



20mm gas
tube straight &
L-connectors



20mmø gas tube screw connector & fitting



x2

20mm gas tube wall clamps & stakes



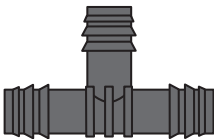
x2

drainage kit



x4

bands for 20mm
gas tubing



gas tubing T-joint
(20mm)



drainage valve (20mm)



8cm gas pipe

17



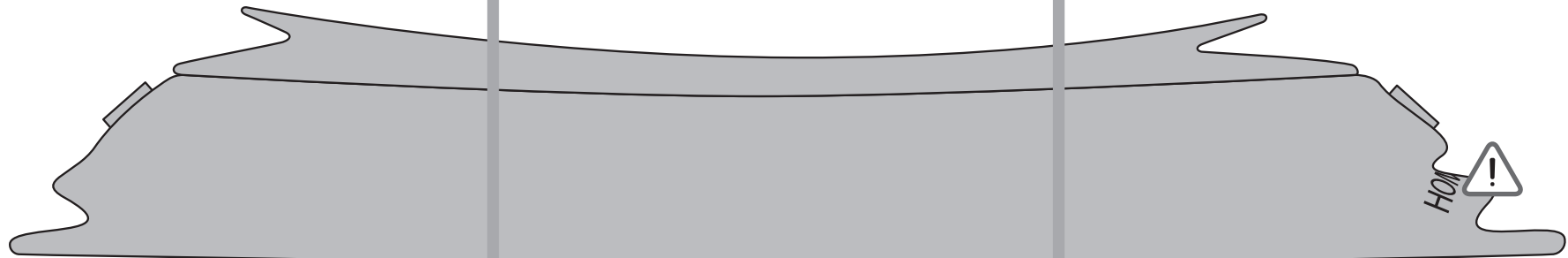
HomeBiogas logo is located at the
FRONT end of the system

back

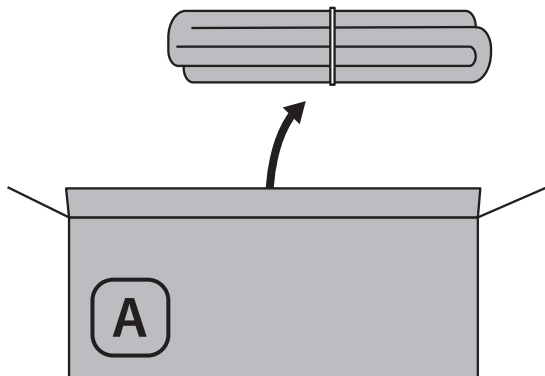
(gas, fertilizer out)

front

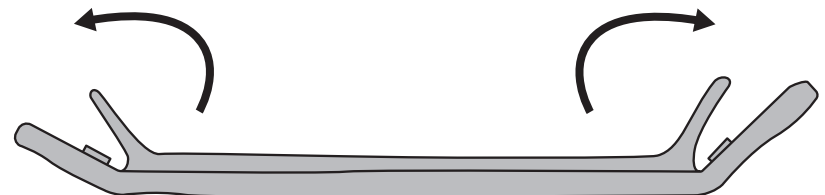
(wastewater inlet)



i



ii

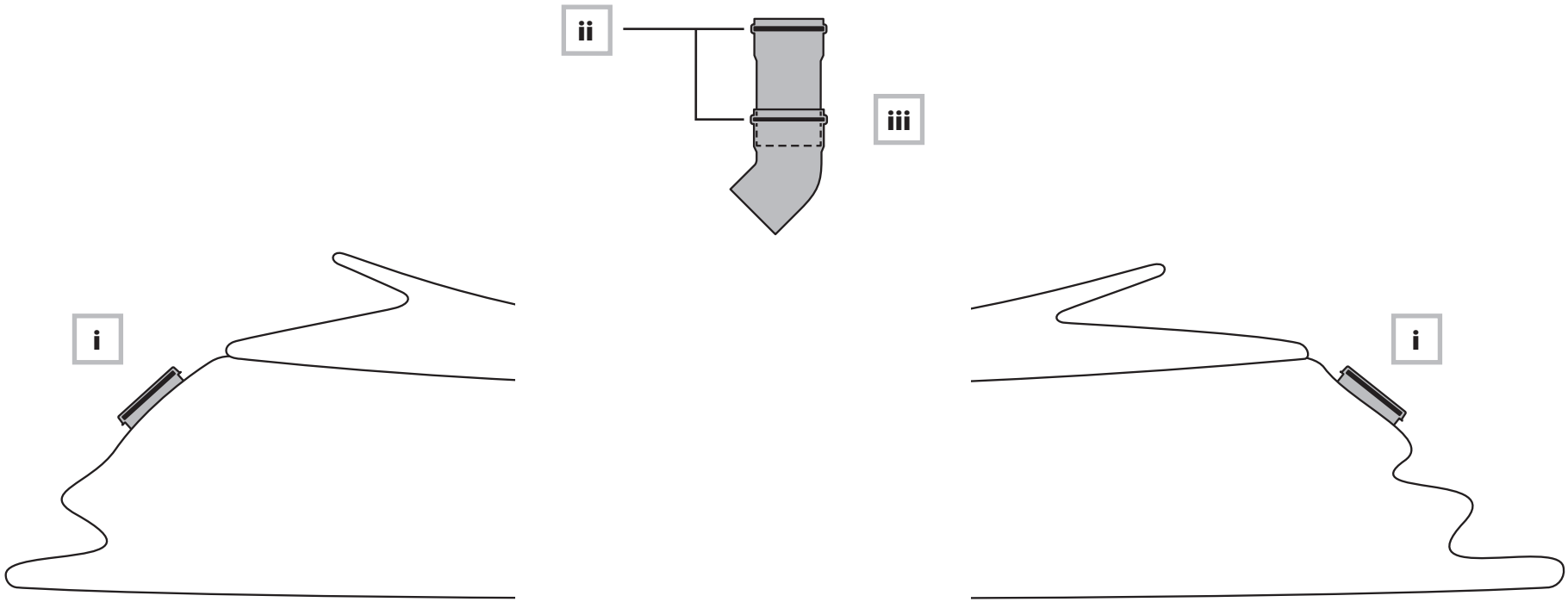




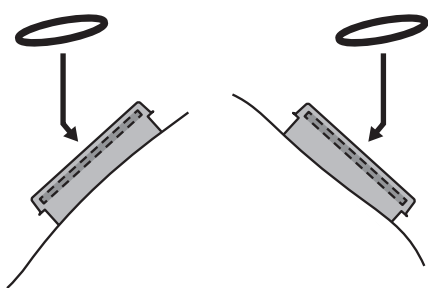
parts bag



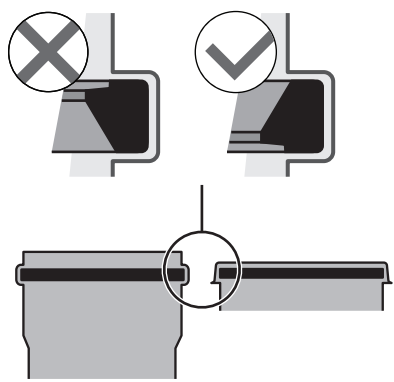
(lubricant)



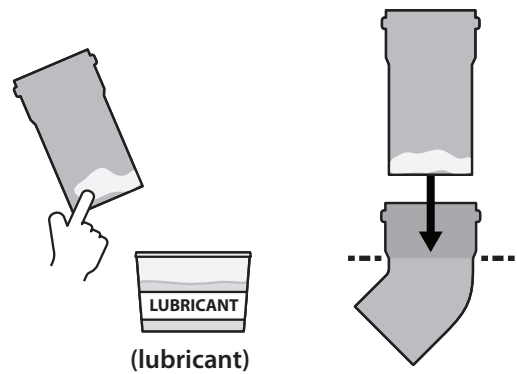
i



ii

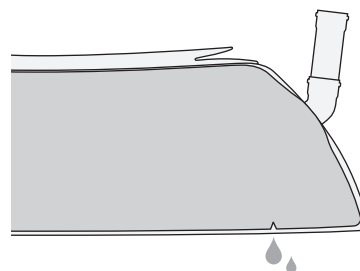
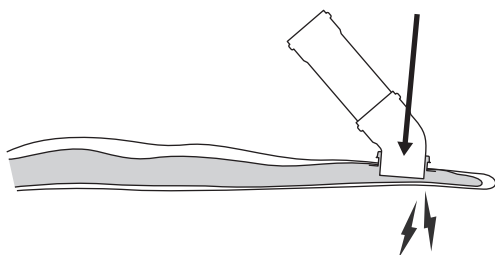


iii

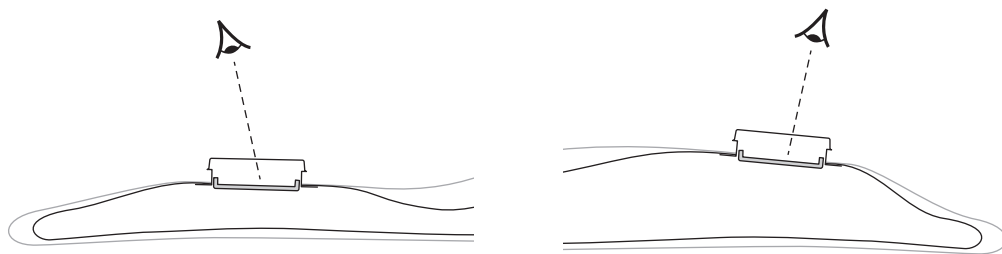




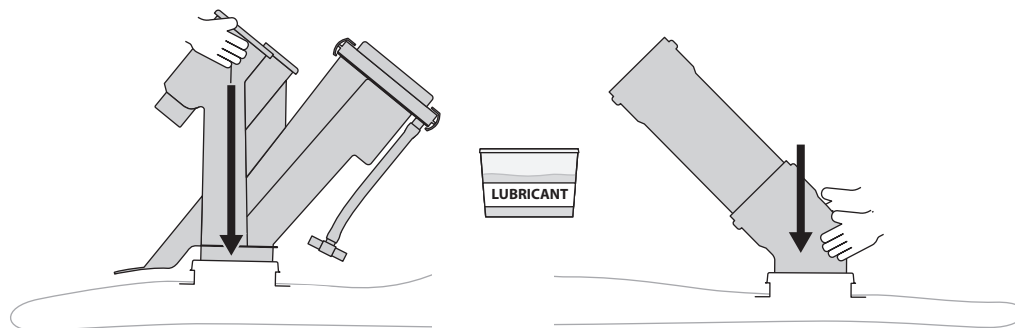
Improper installation of inlet pipe & combined outlet in the HomeBiogas system can damage the digester's inner liner, causing a leaking digester tank when filled with water. Follow the steps below to properly insert the pipes, to prevent damage and ensure a functioning system.



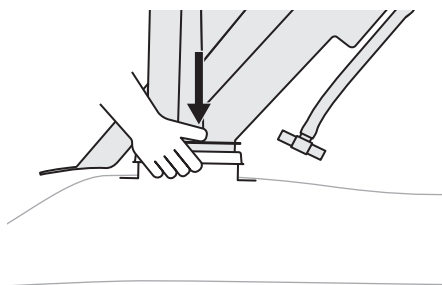
- i.** Check that there is a protective cardboard layer between the pipe connector openings and the digester's inner lining. Contact Homebiogas support if this cardboard protector is missing.



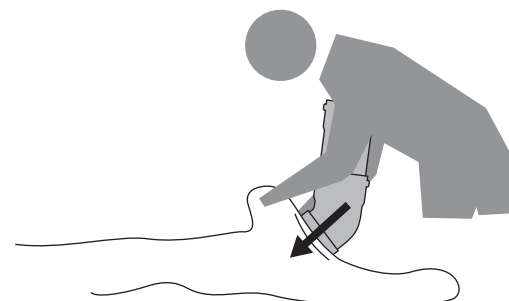
- ii.** Lubricate the pipes, align and insert each pipe firmly with the digester on a flat, hard surface. The cardboard protectors will prevent damage to the inner liner.



- iii.** Combined Outlet Pipe: Hold onto the rim of the pipe connector with both hands, use the thumbs to push the outlet pipe in all the way.



Inlet pipe: Hold onto the folds of the digester fabric around the pipe, support the mouth of the pipe against your body, and push the pipe all the way into the connector. Take care not to push the pipe against the inner liner!

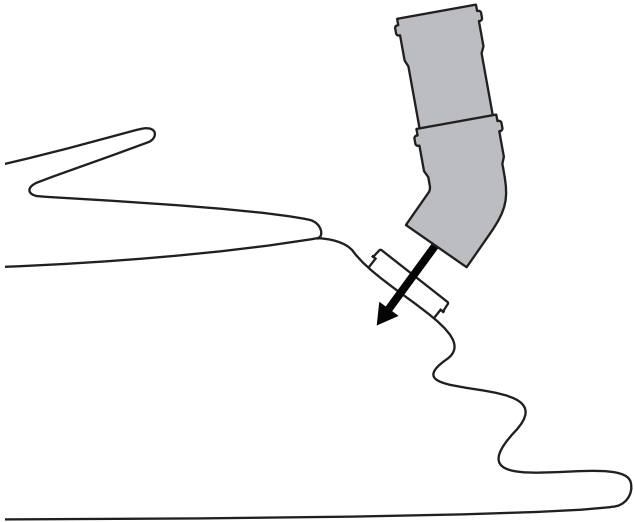
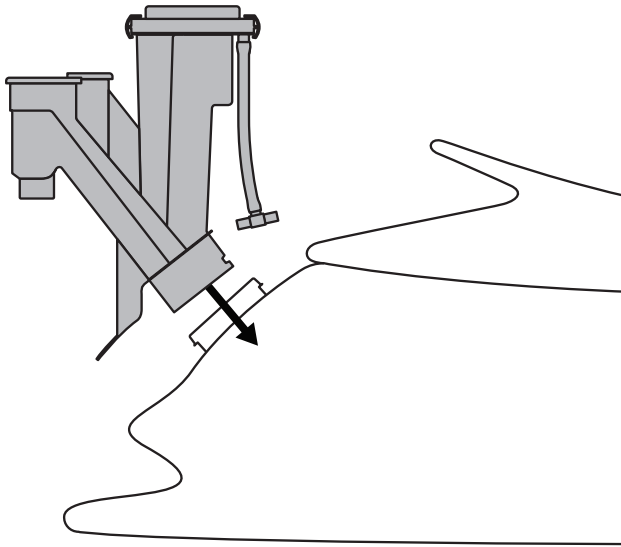




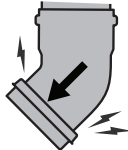
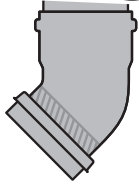
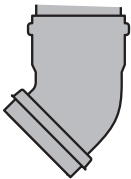
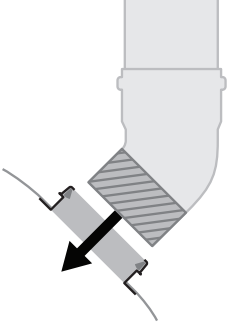
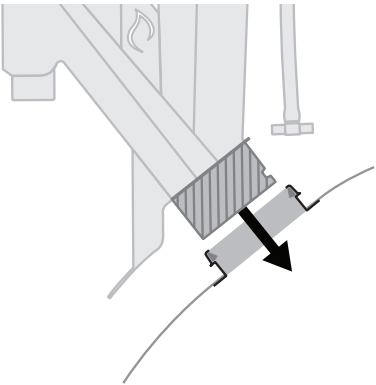
parts bag



(lubricant)



i



(lubricant)



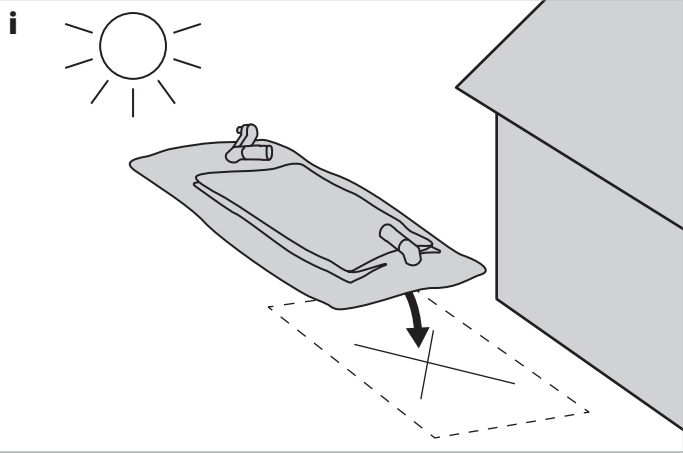
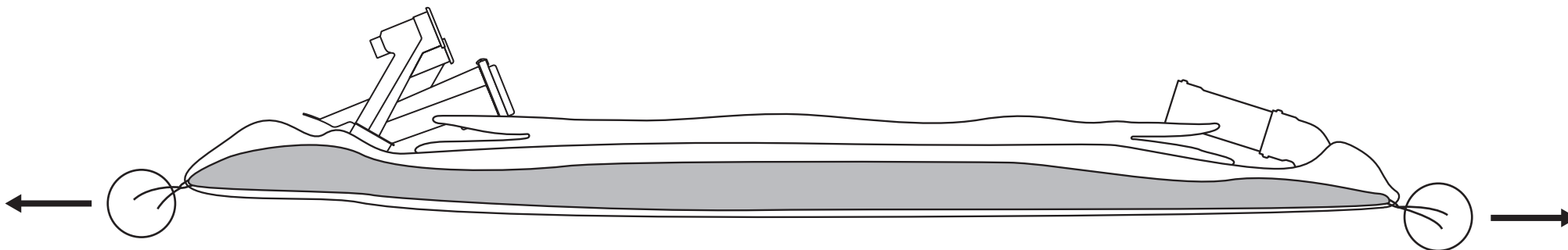


Before filling the digester, make sure it is in a suitable location, chosen according to the site selection criteria in page 7-8.

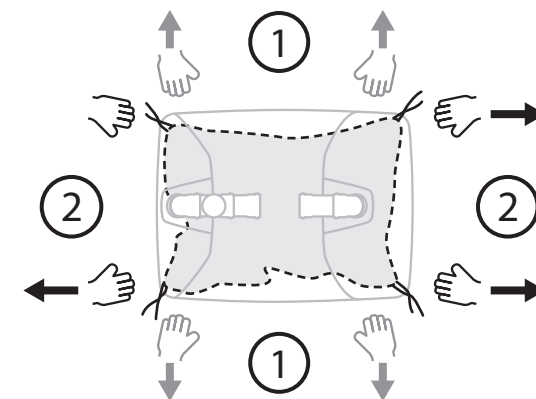
The digester must be placed on a flattened, level surface!

back
(gas, fertilizer out)

front
(wastewater inlet)

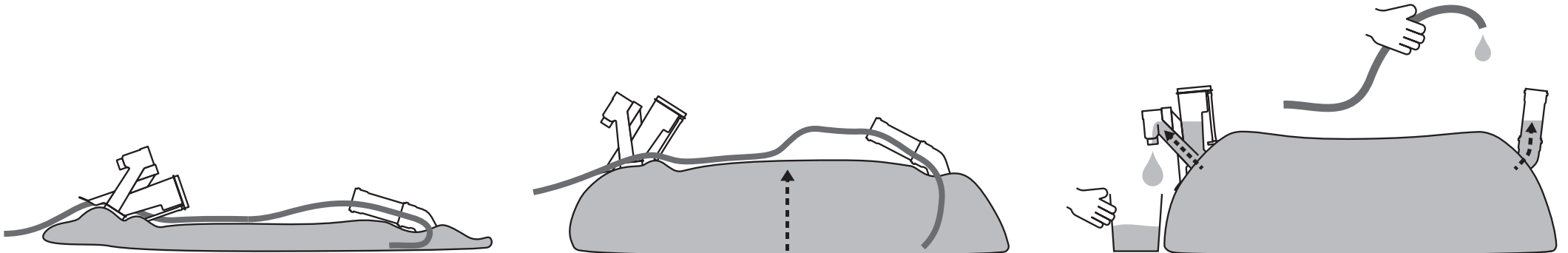
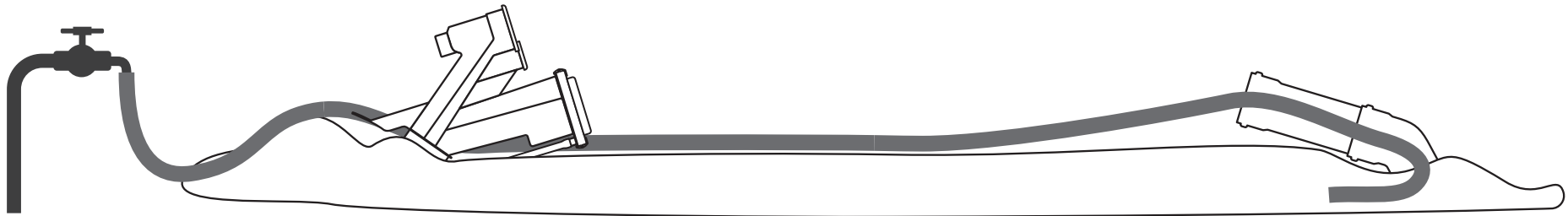
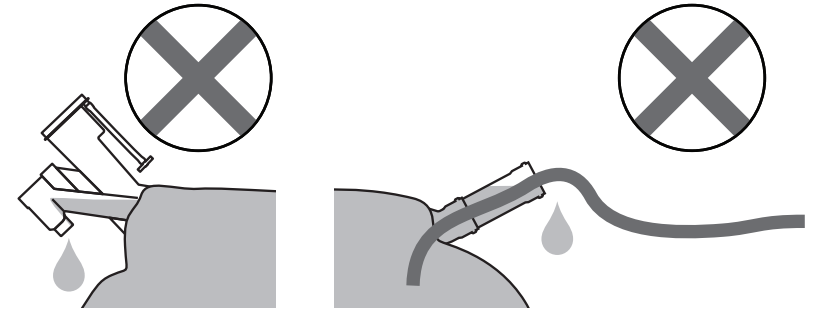
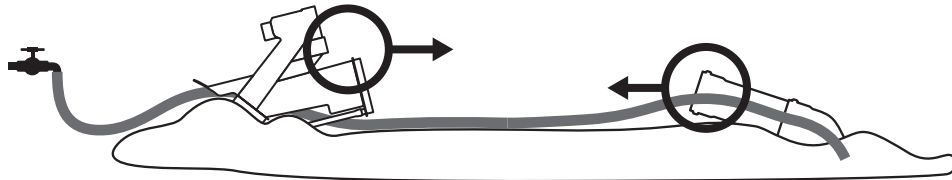


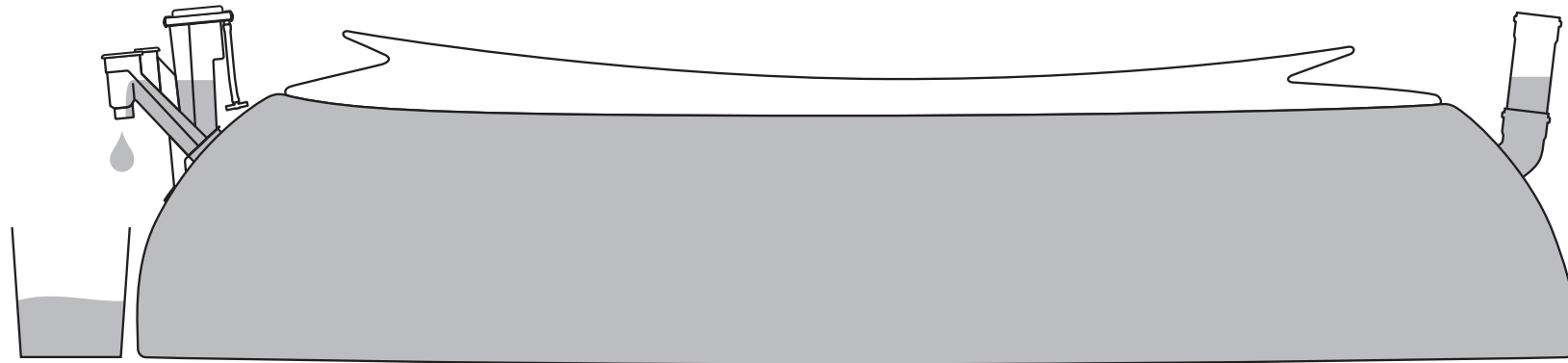
ii
with another person's help, stretch out digester inner lining with the 4 corner strings



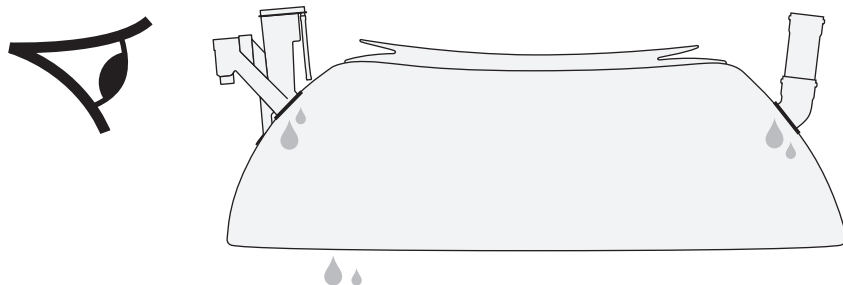


- * pipes must point inwards when filling
- * rest hose on digester & enter inlet pipe from opposite side
- * if not using tap water: pH must be between 6.5 and 8.5



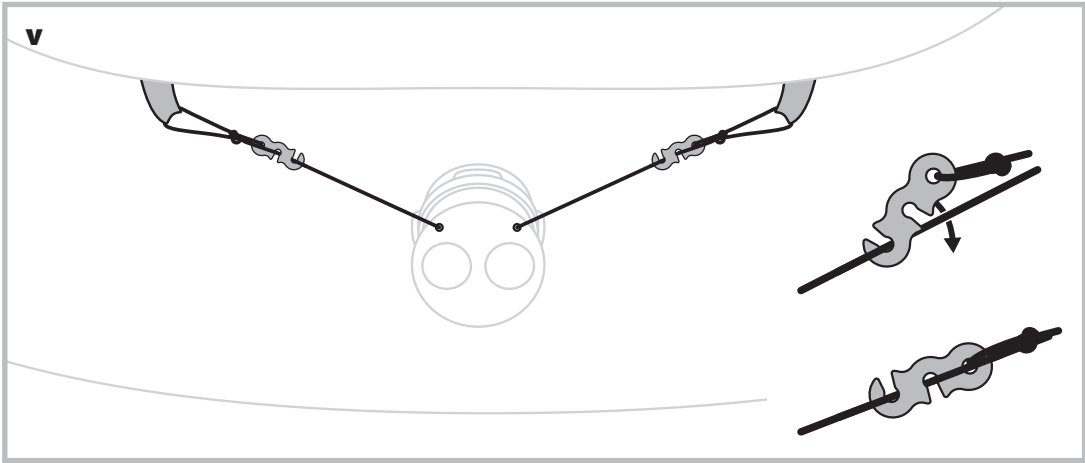
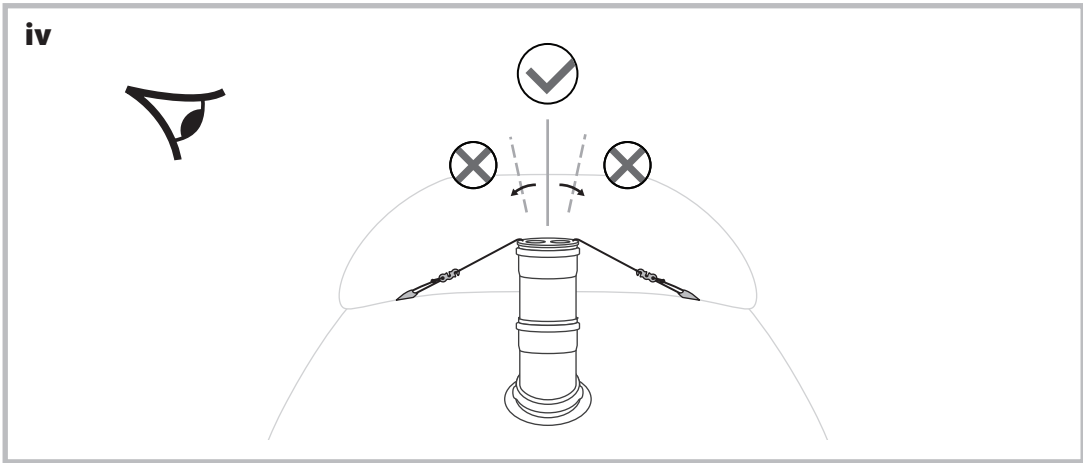
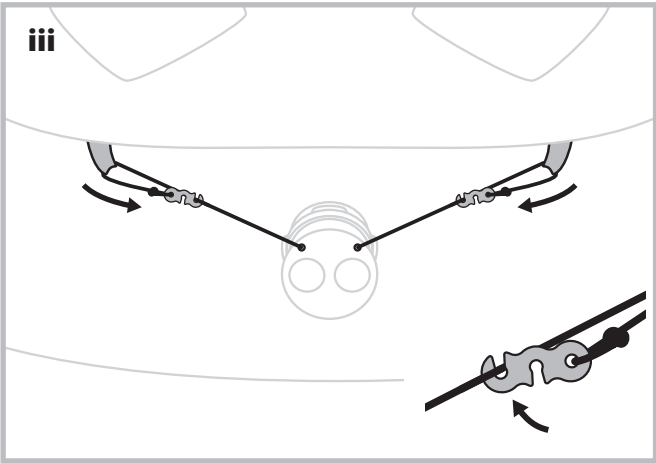
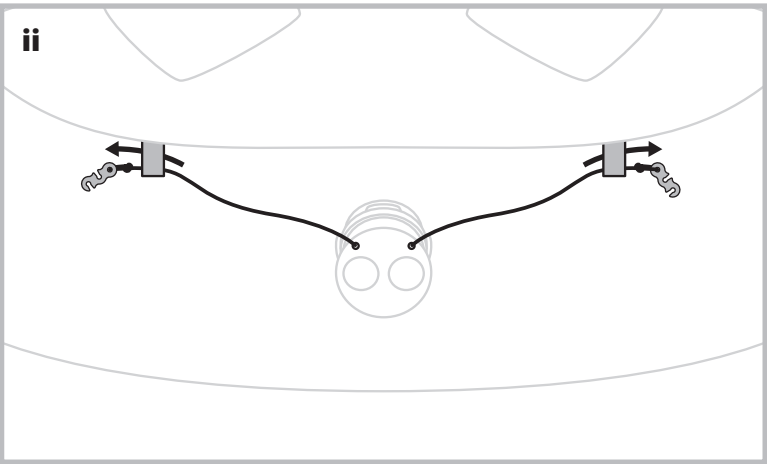
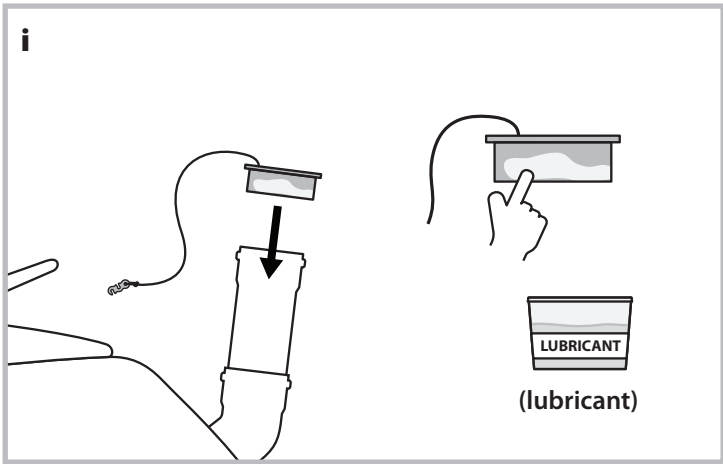
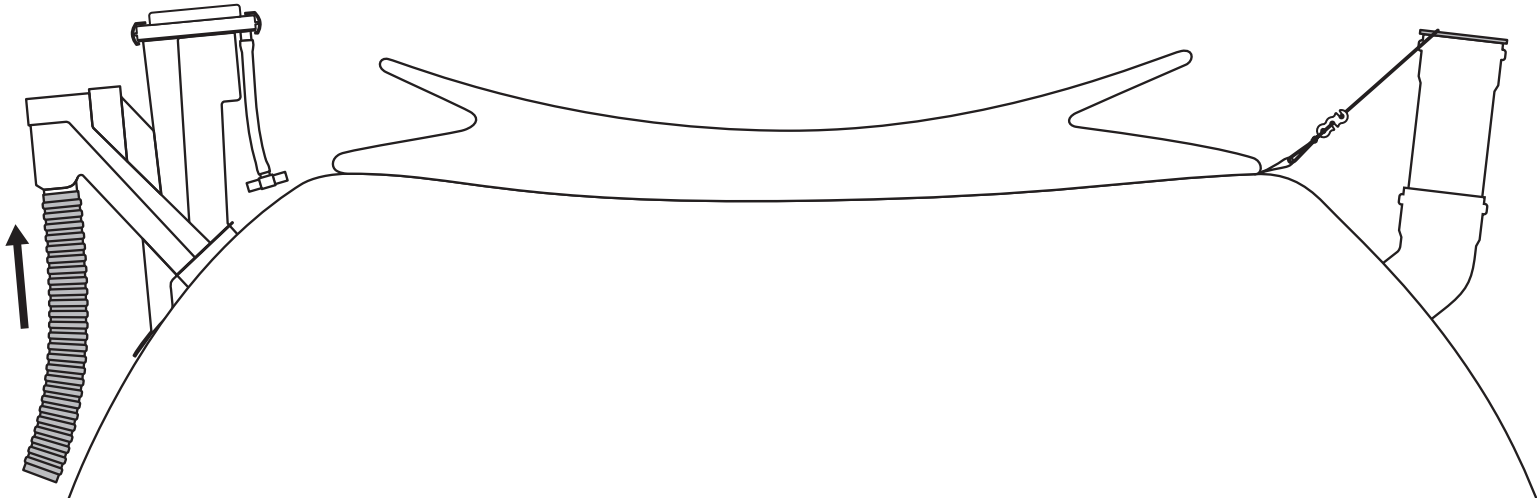


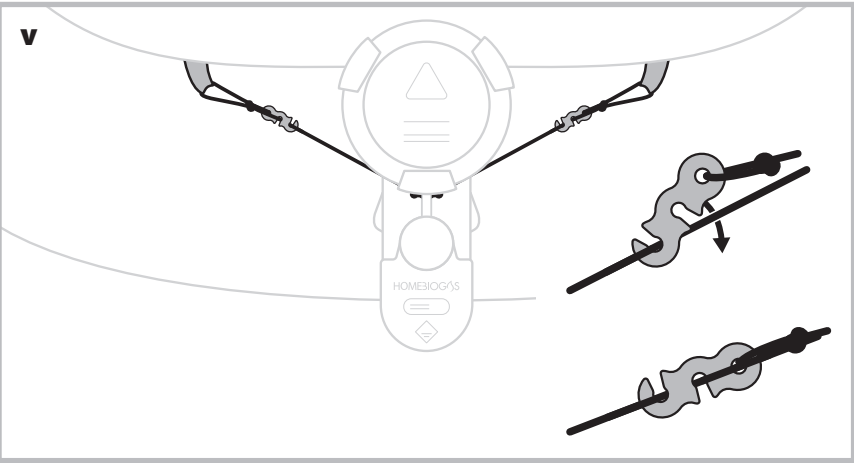
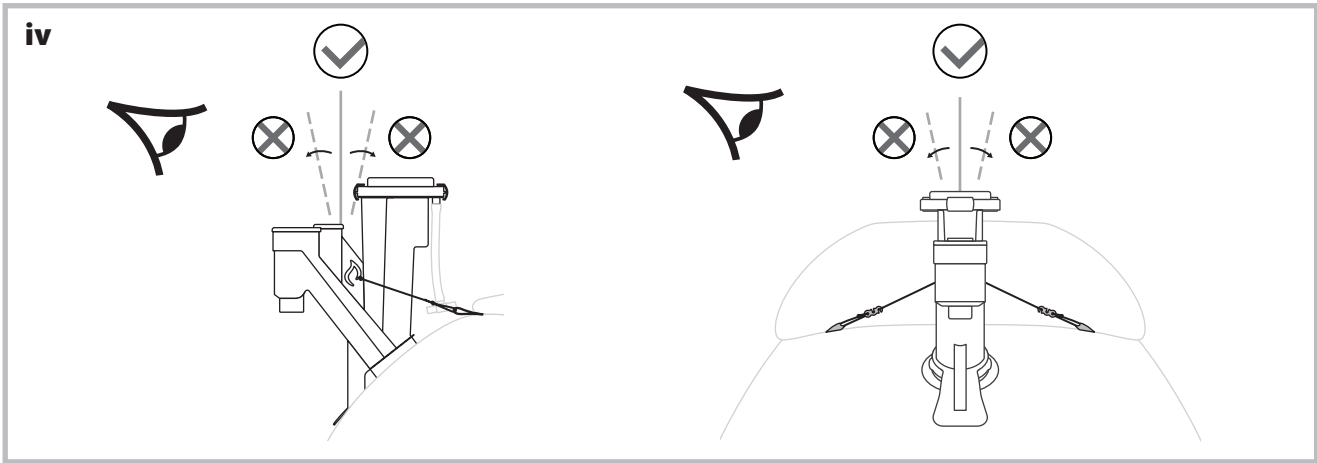
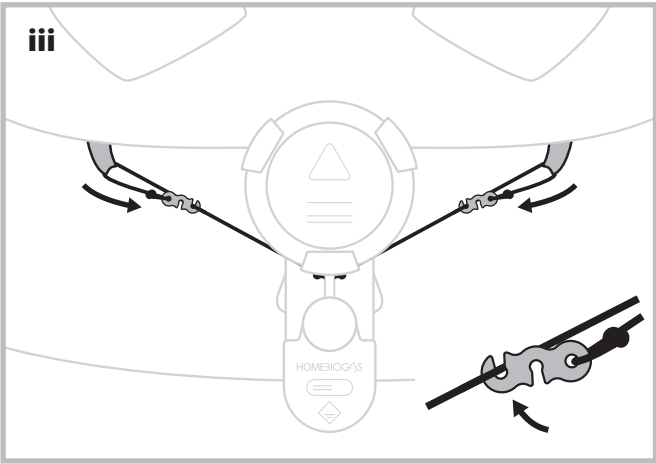
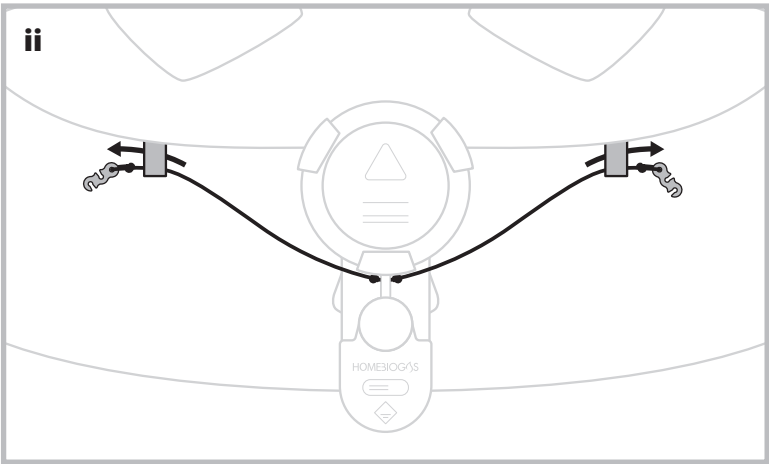
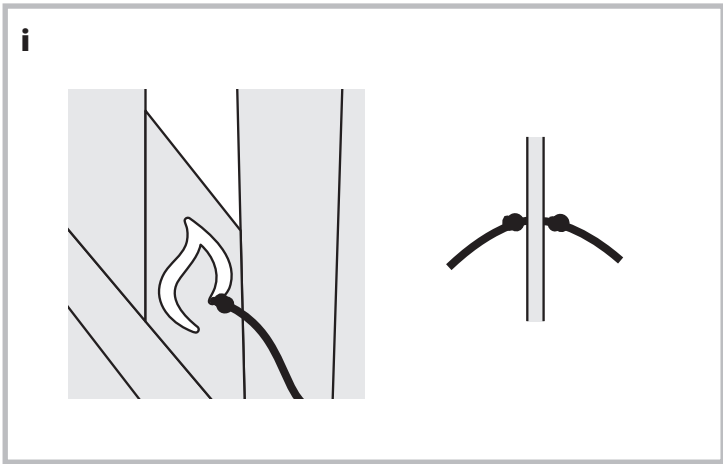
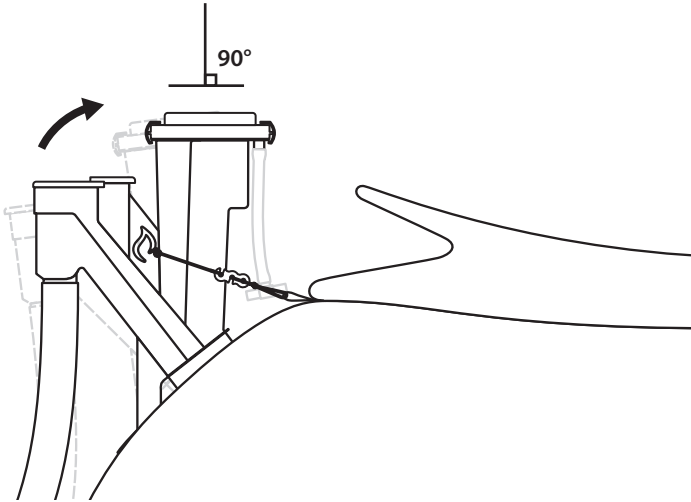
check filled digester for leaks.



**contact HomeBiogas if
any leaks are seen.**





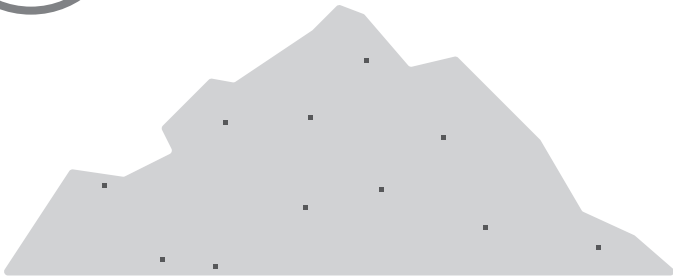




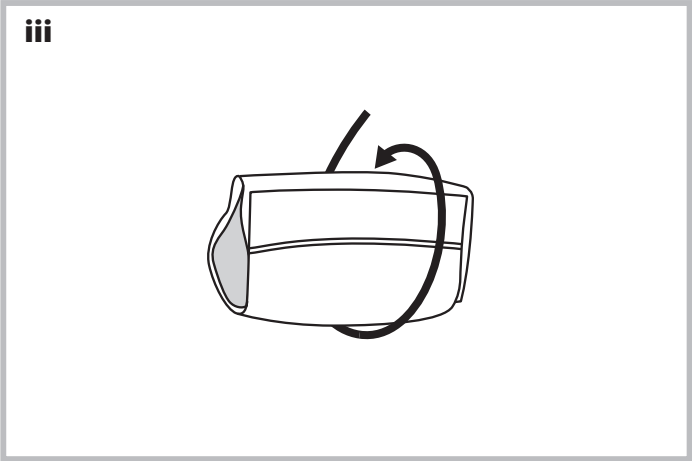
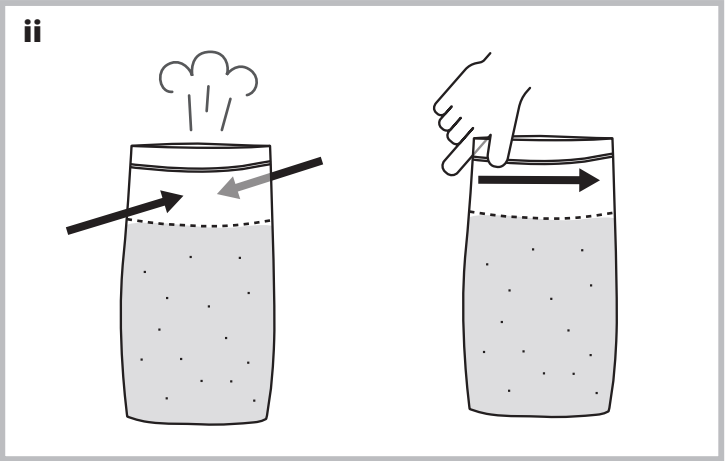
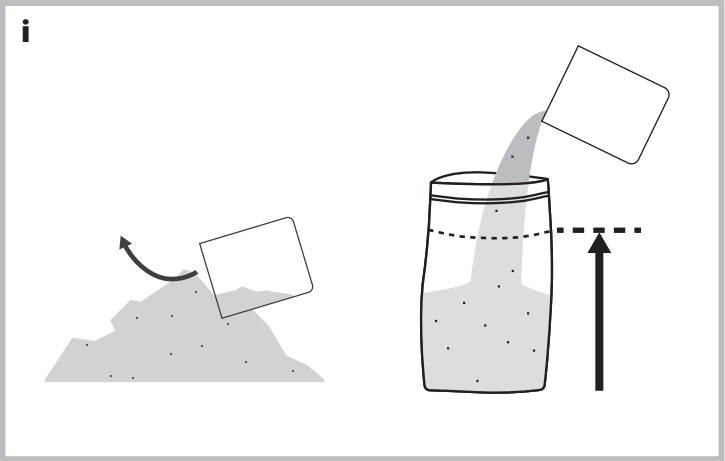
sand bags

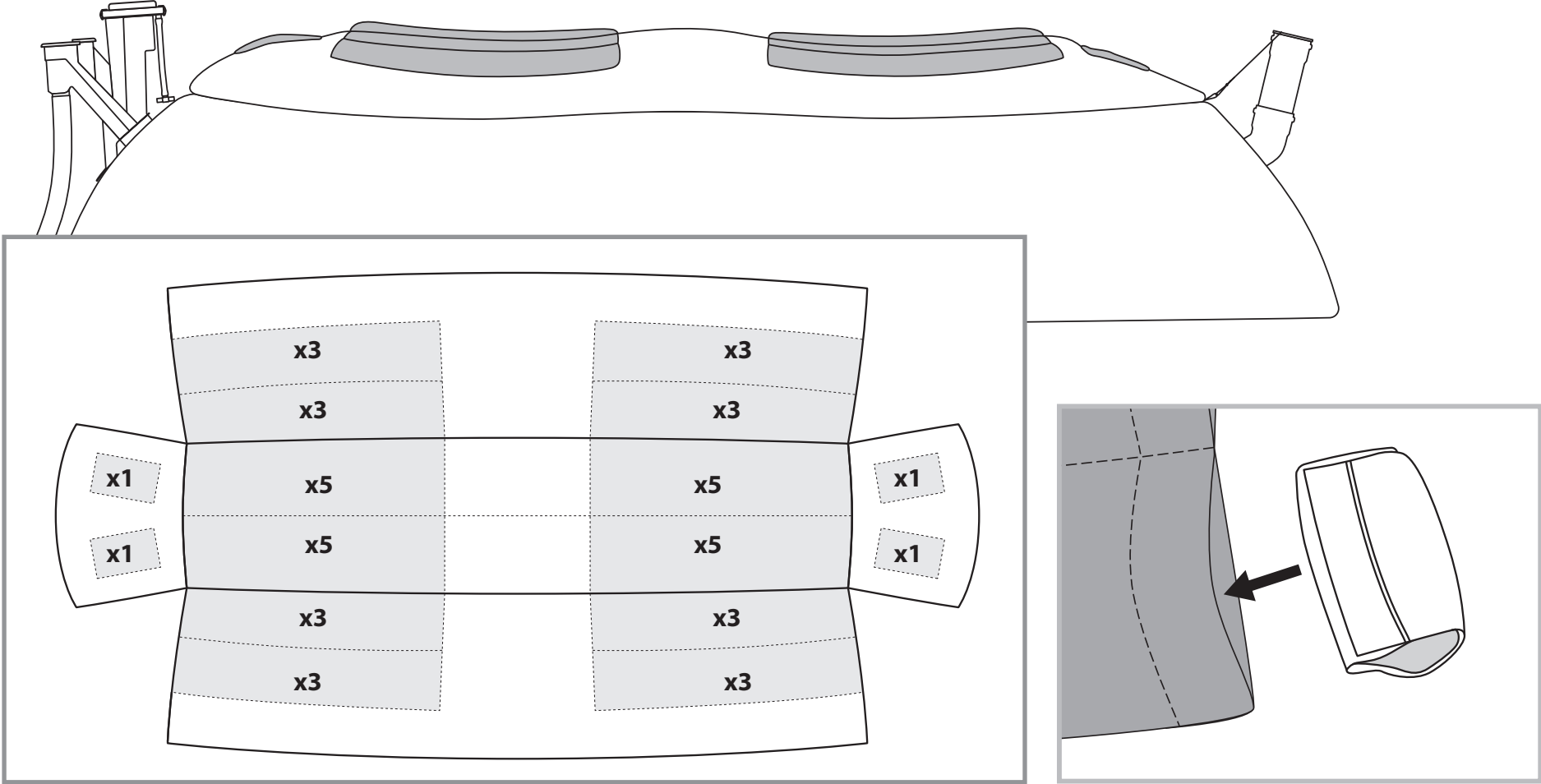


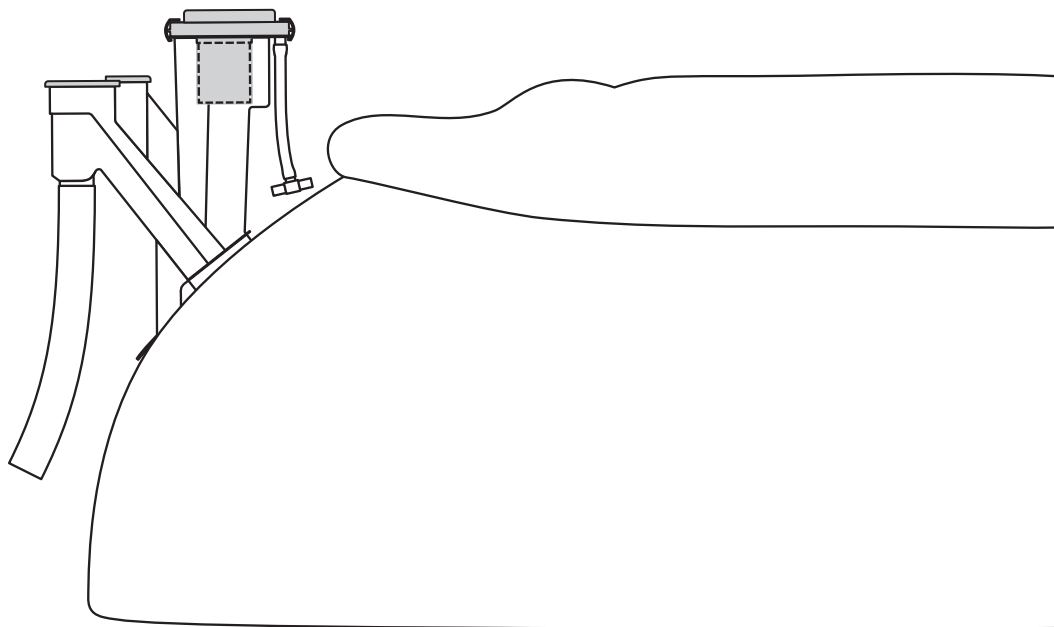
use dry sand only



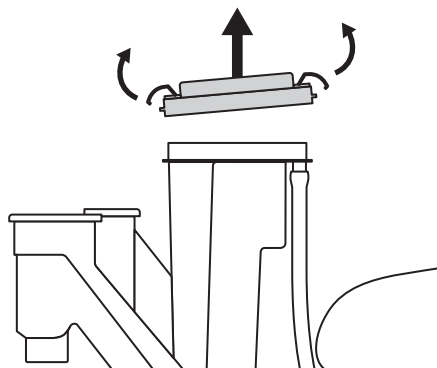
x48



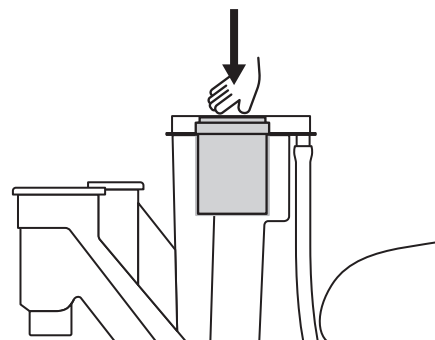




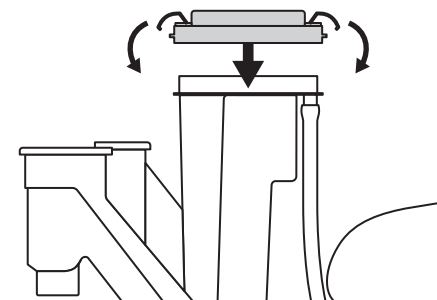
- i** remove 2 protective stickers from cover & around the base of gas filter



- ii**

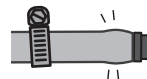
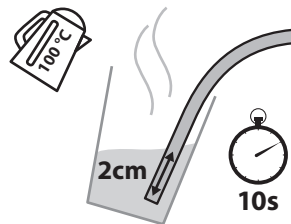
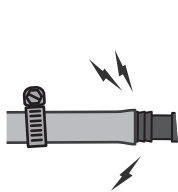


- iii**



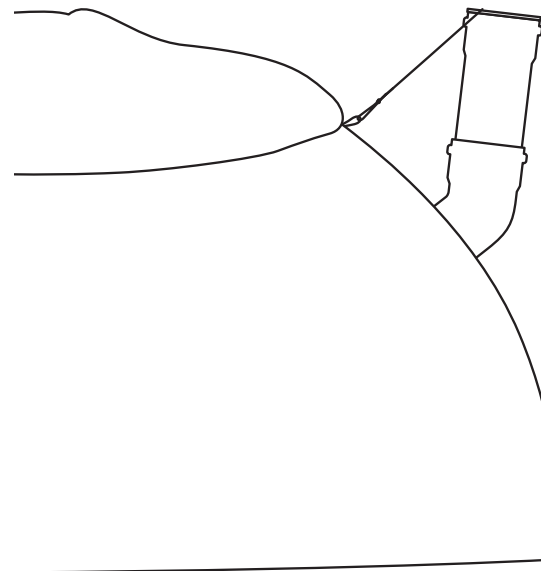
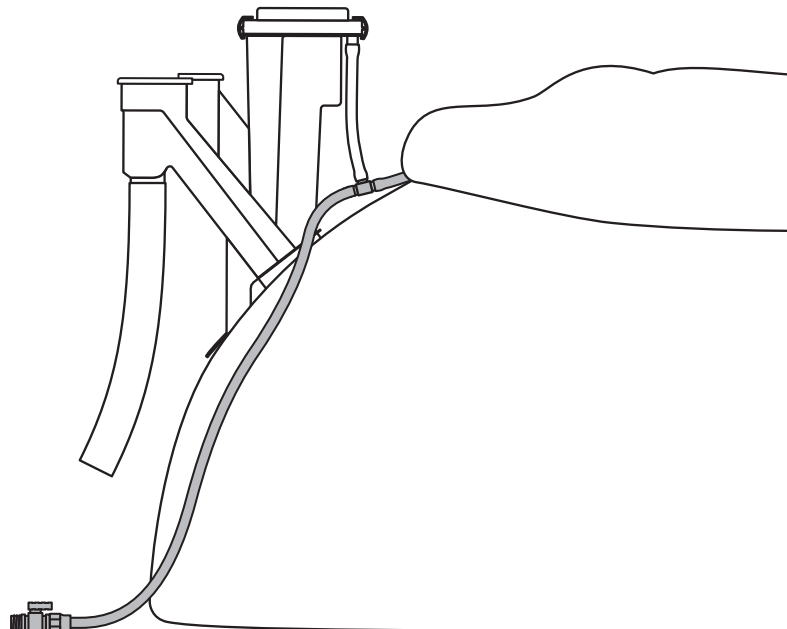


soften gas pipe in hot water for easy insertion of connectors

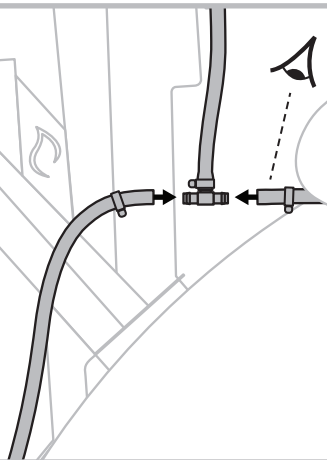


parts bag

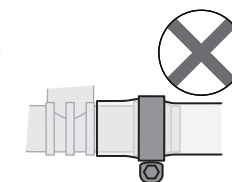
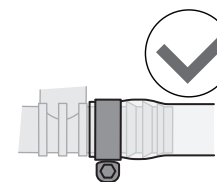
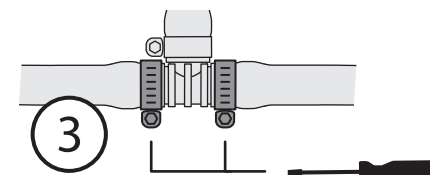
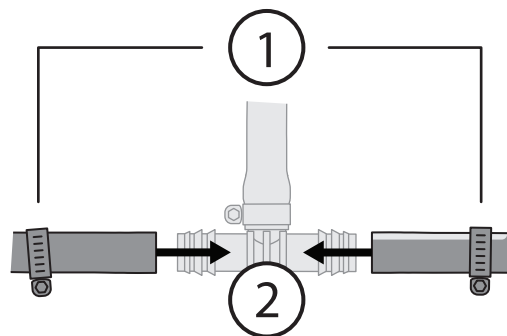
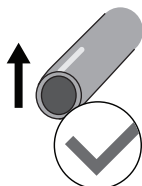
x2



i



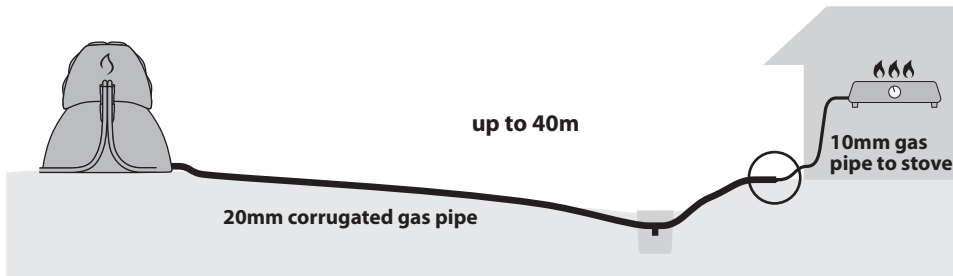
marking on gas tank outlet
pipe must be facing upwards



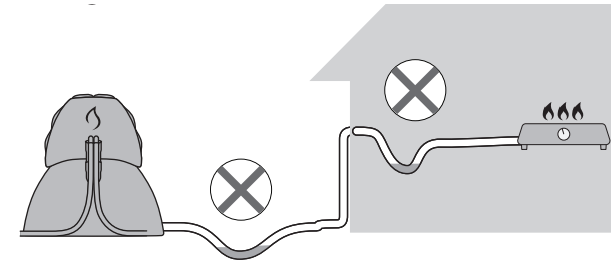
gas pipe installation

Installation Criteria & Guidelines

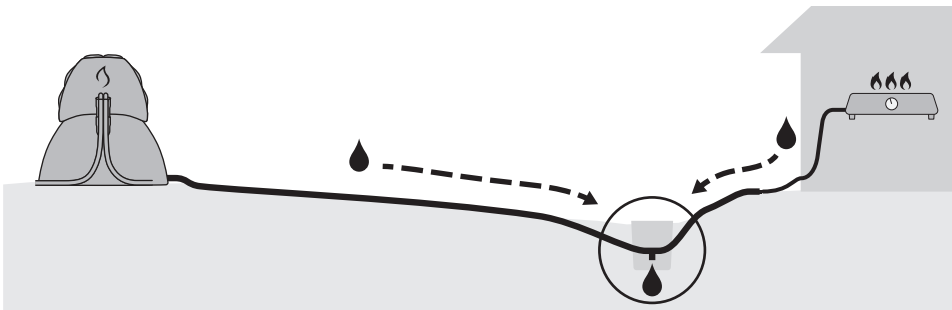
1. The length of gas pipe from the main valve to the stove can be up to 20m in length (17 meters total piping provided with system).
2. The 10mm gas pipe is meant for indoor use and should be installed as close to the stove as possible.



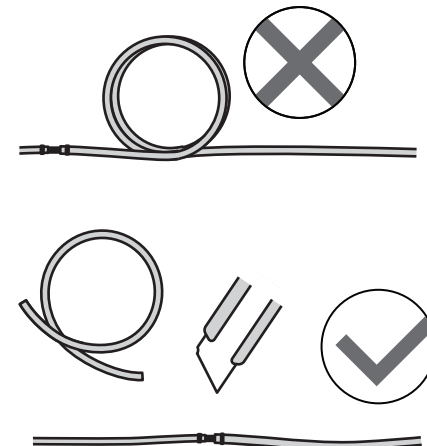
5. All gas pipes should be stretched out/straightened along their routes. There should be NO U-shaped bends along the pipe, where water will collect and block gas flow.



3. Condensation from biogas will collect in the gas piping. It is important to install the pipes at a continuous, slight angle from the system so that the water will flow towards the lowest point.



6. Cut gas pipe to the length required: do not coil the excess.



Installation Options

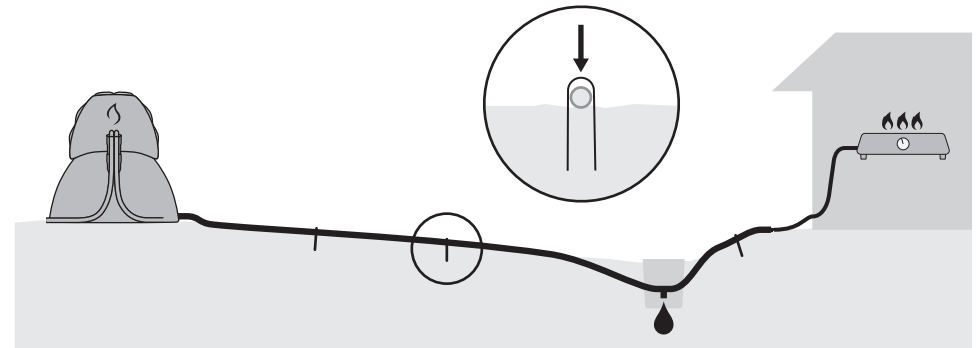
Choose the installation method most suited to your system's location and surroundings. A combination of the different methods is possible as long as all the guidelines on page 26 are met.

1. Gas pipe installed underground



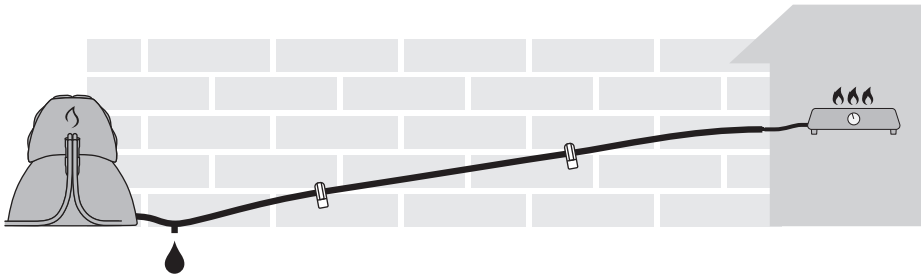
Pass gas pipe through a rigid pipe (PP/PVC 40mm) for protection.

2. Gas pipe above-ground

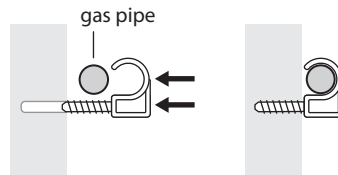
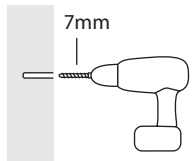


Anchor gas pipe to the ground with U-stakes provided.

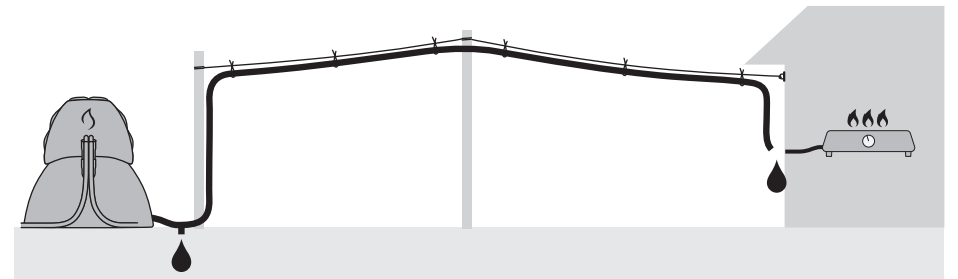
3. Gas pipe fixed onto wall or nearby structure



Use the wall clamps provided to secure gas pipe to the wall, to hold the pipe at the correct angle.



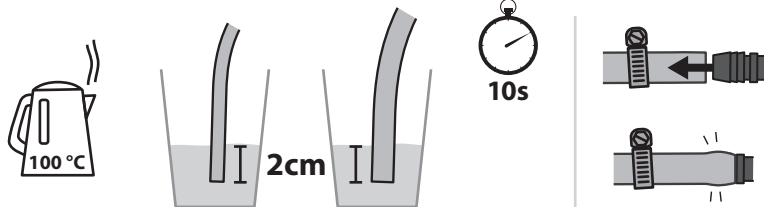
4. Gas pipe suspended on overhead line



Install poles/structures of the required height, if necessary. Securely attach strong rope/cable (e.g. 4mm PP gardening twine) across the poles - take care to maintain constant slope across the line, with no low points. Suspend gas pipe from the line with wire (e.g. copper core electrical wire) at intervals along the pipe.



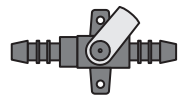
for all gas pipe fittings: soften pipe tip in hot water for easy insertion



parts bag



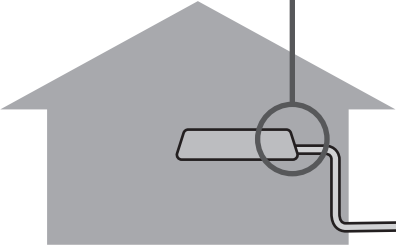
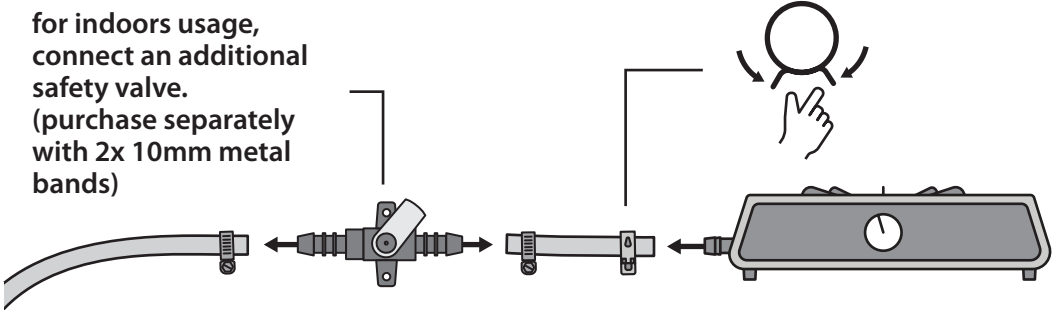
purchase



x2
10mm

iii

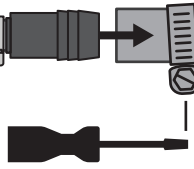
for indoors usage,
connect an additional
safety valve.
(purchase separately
with 2x 10mm metal
bands)



10mmØ gas tube into house

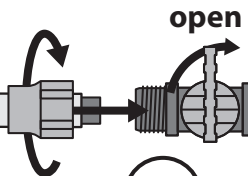
ii

20 to 10 mm
reducer fitting

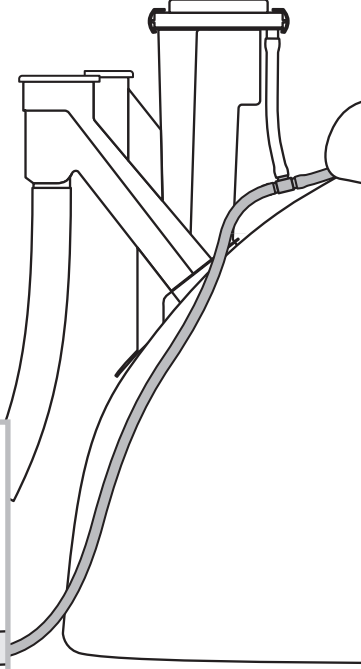


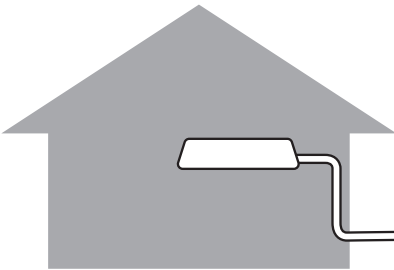
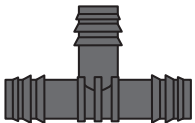
20mmØ gas tube
from system

i



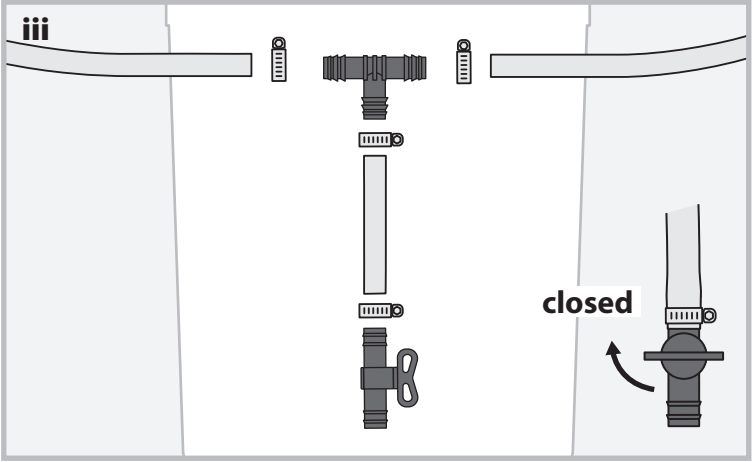
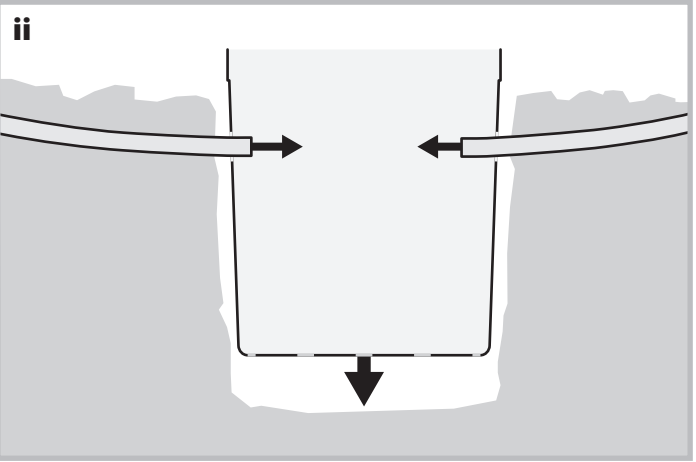
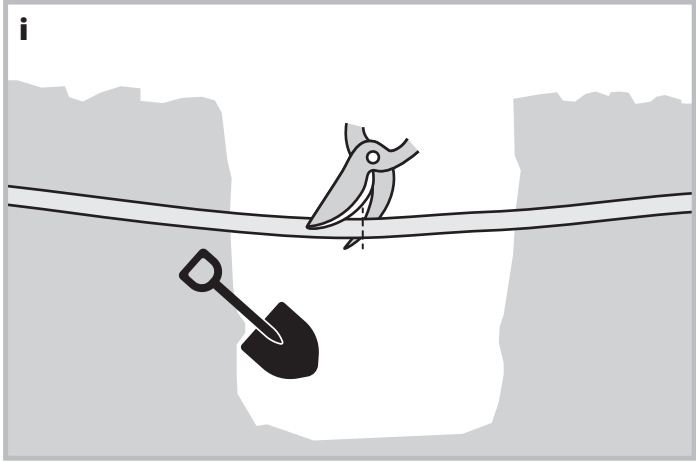
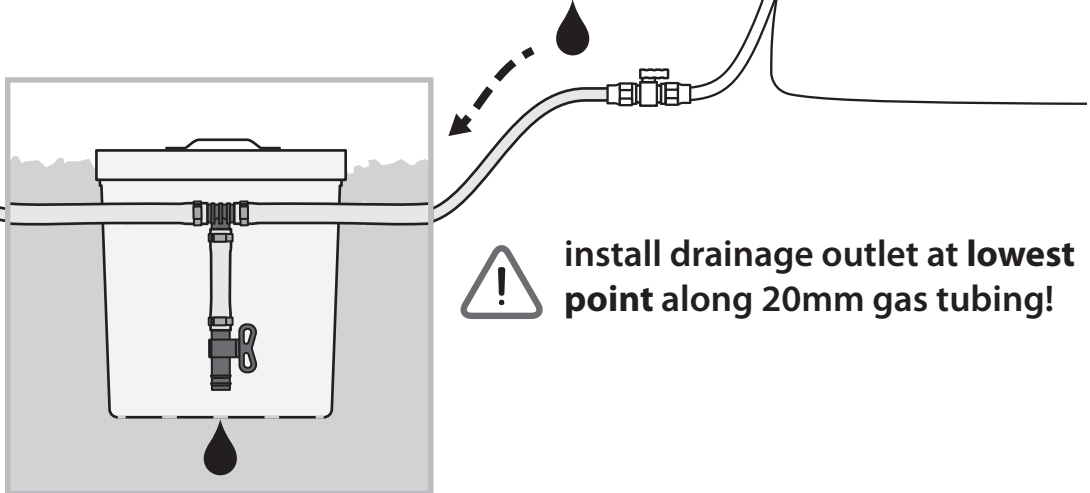
2





condensed water vapor may collect in the gas pipe over time as the stove is used, and must be emptied with the **Drainage Outlet** so that gas flow will not be blocked.

prepare

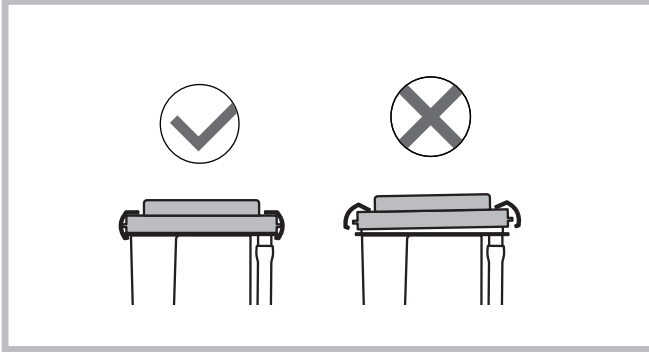




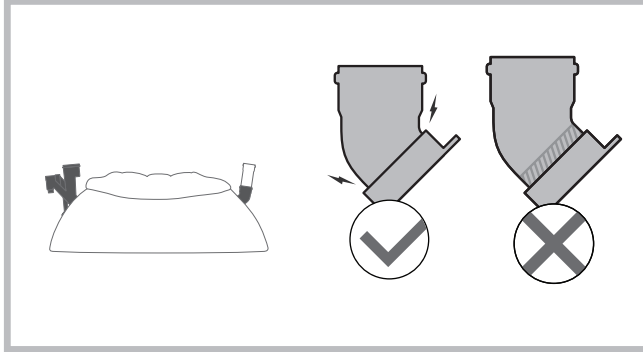
Please check your system with the following list and confirm that each item has been completed.

This will ensure your system functions smoothly and prevent potential system damage.

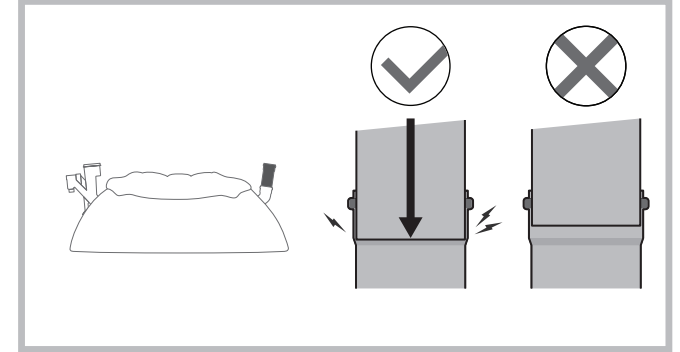
1. Gas Outlet Cap is pushed down completely and locking clips are fastened



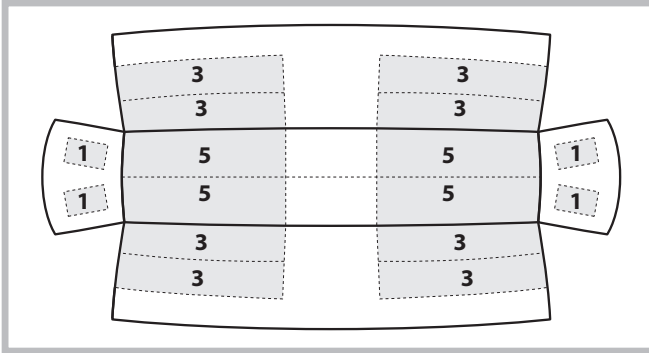
2. Waste inlet & Combined outlet inserted completely



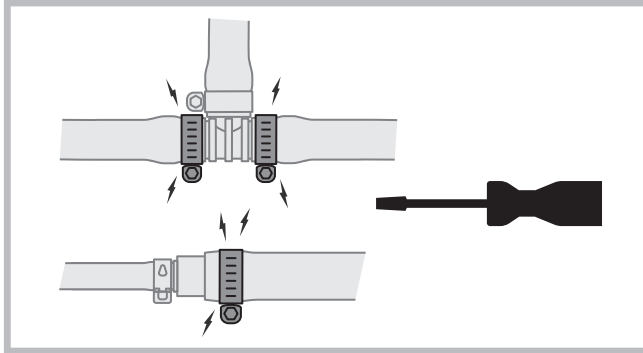
3. Straight pipe in wastewater inlet assembly inserted fully



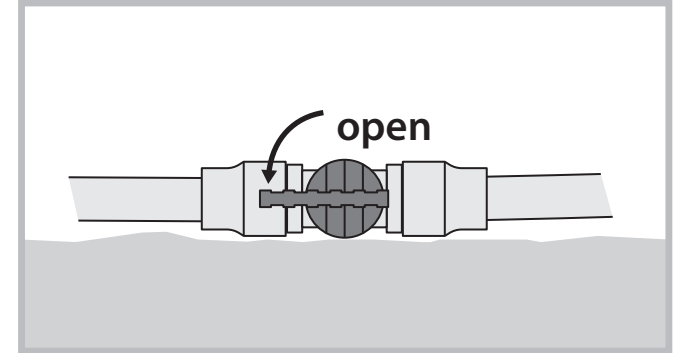
4. sandbags inserted in correct locations (page 21)



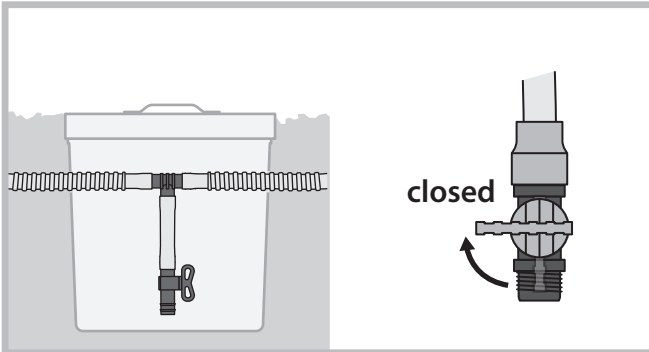
5. Steel bands on 20mm gas tube securely tightened



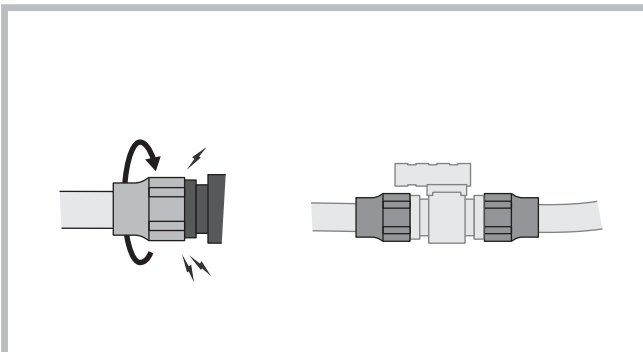
6. Gas valve closed (until activation complete) & gas valve on ground level



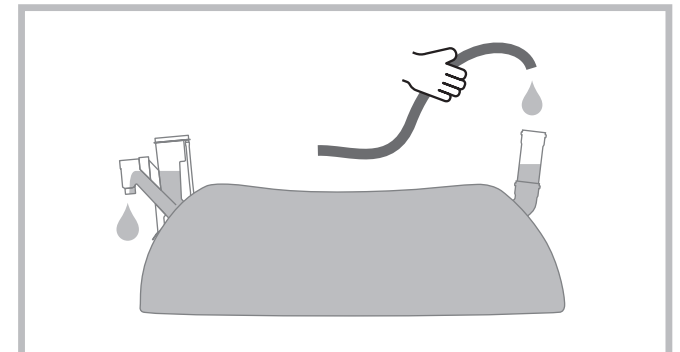
7. Water Drainage Outlet valve closed



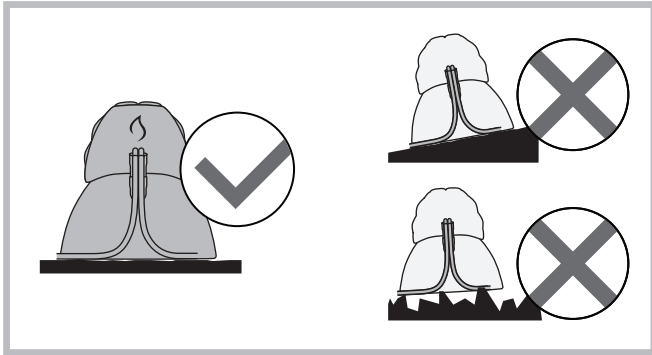
8. All gas connectors screwed tight



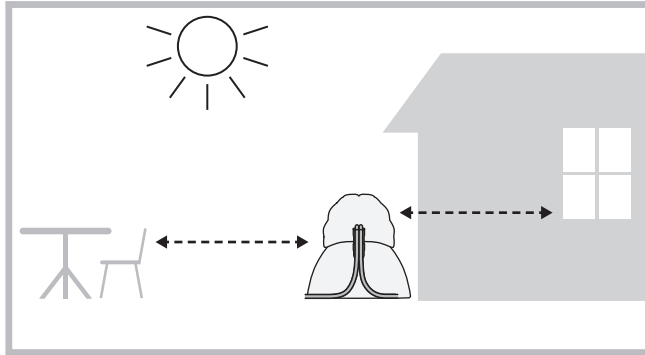
9. Digester filled until water flows from fertilizer outlet



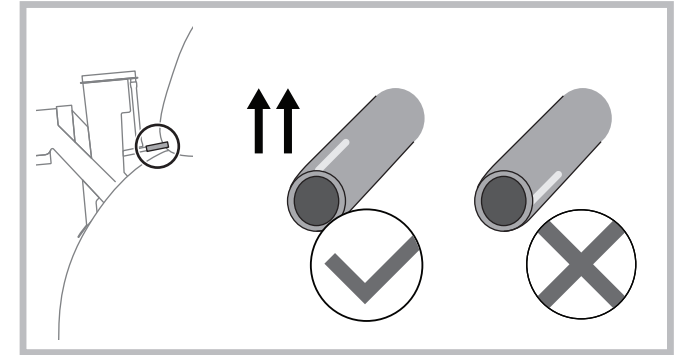
10. Digester is placed on strong, flat, level surface (refer page 7-8)



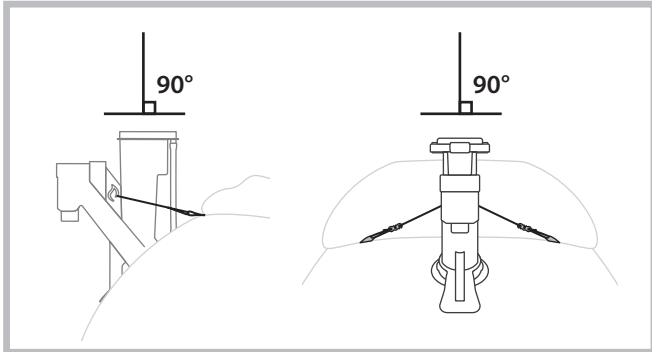
11. Digester is placed in sunny location near kitchen, away from windows/sitting areas (refer page 7-8)



12. Marking on Gas Tank Outlet pipe is facing upwards

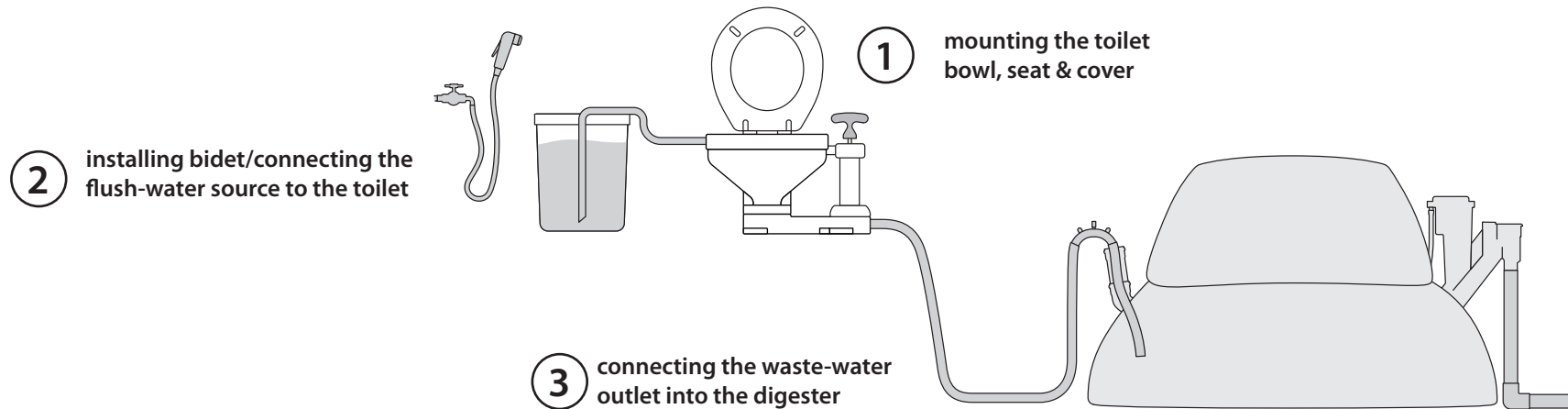


13. Combined outlet is aligned 90° vertically and not leaning in any direction



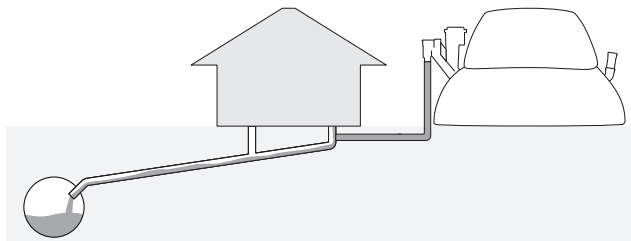
installing the bio-toilet

1. installing the toilet in a suitable location and connecting it to the system

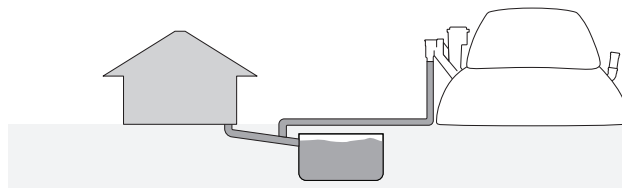


2. planning effluent management & connecting the digester to a suitable effluent management system

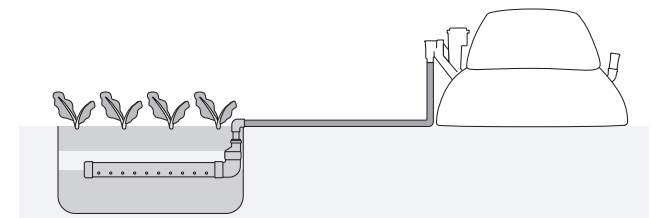
option 1 (preferred):
connect to existing sewage system



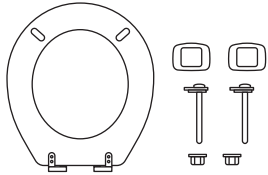
option 2:
connect to existing septic tank



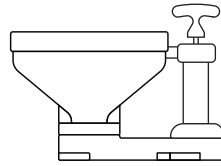
option 3 (If option 1 and 2 not possible):
build a drainfield/mulch basin



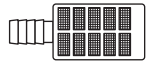
Parts supplied in the box (x2 units)



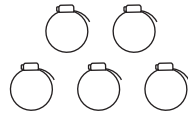
toilet seat & seat cover
+ fittings



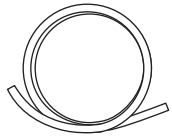
ceramic toilet bowl &
pump assembly



flush reservoir water
filter



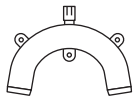
5 hose-clamps
for waste pipe



2m flush water
inlet pipe



lubricant
(for monthly
maintenance)



vented loop

Parts/Materials to prepare (not supplied)

- Flexible, reinforced sanitation hose (38mm/1.5in) of suitable length to connect toilet to system.
An **odor-proof sanitation hose** is recommended, especially for indoors toilet connections.
- 8mm diameter bolts for mounting toilet bowl (length depending on flooring/platform)
- PVC pipes and fittings to connect fertilizer outlet to chosen effluent system (length depending on toilet location - p15)
- Optional ball valve for 38mm/1.5in pipe, to install after pipe for easier maintenance

If constructing drainfield/mulch basin (optional - refer p16):

Drainfield:

- large gravel (1-2" diameter), 240 liter
- fine gravel (0.25-0.75" diameter), 50 liter

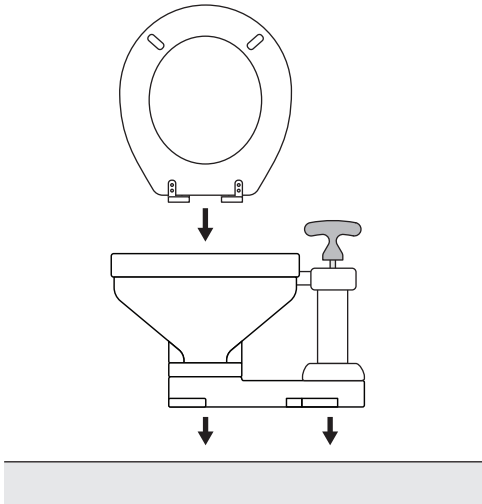
Mulch Basin

- landscaping mulch, large wood chips, fine wood chips/sawdust

Other tools required:

- Power drill (holes for mounting toilet bowl)
- Screwdriver (flat) for hose clamps
- Shovel for drainfield construction

1

Mounting the toilet bowl and attaching the toilet seat

The toilet is shorter than a regular home toilet. It must be bolted down securely onto the floor or on a raised platform. If installing onto a platform, it should be level, rigid and strong enough to support the weight of an adult. Do not mount the toilet on shipping pallets or other weak surfaces. The platform should measure at least 52x63cm (W x L).

Parts & Tools:

- Toilet bowl & Pump assembly
- Toilet Seat and Cover assembly
- 4x 8mmØ steel bolts (with matching nuts if mounting on platform)
- Plastic seat fittings (see picture)
- Power drill (holes for bolts)
- Pen/marker for marking drilling location



1. Place the toilet on the mounting surface and mark the positions of the 4 bolt holes.



2. Drill out the marked holes and bolt the toilet down to the surface with the appropriate bolts/screws/fasteners for your chosen surface. Use a right-angle adapter for screwing into hard surfaces.



3. Prepare plastic seat fittings (2 plastic bolts and nuts, 2 rectangular washers)



4. With the seat and cover facing cover-side up, slide bolts into position on the seat joints.



5. Fit both the rectangular washers in place over the plastic screws.



6. Hold the seat and cover assembly along with the bolts, and slide the bolts into the holes on the back end of the toilet bowl.



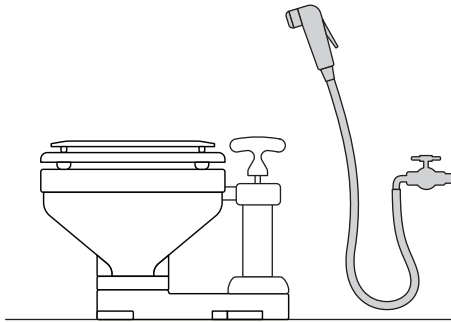
7. Screw the plastic nut onto the bolts, all the way until the plastic nut is snug against the porcelain of the bowl.

2

setting up the fresh/greywater reservoir for flushing the toilet

Parts & Tools:

- 19mmø water inlet pipe
- flush reservoir water filter
- suitable water reservoir (bucket/tank etc)
- not provided with the toilet
- utility knife/cutter



You can install a bidet beside the toilet both for cleaning up and as a water source - using a bidet will simplify the process of flushing the toilet.

With a bidet installed, the toilet's water inlet can be left unconnected.

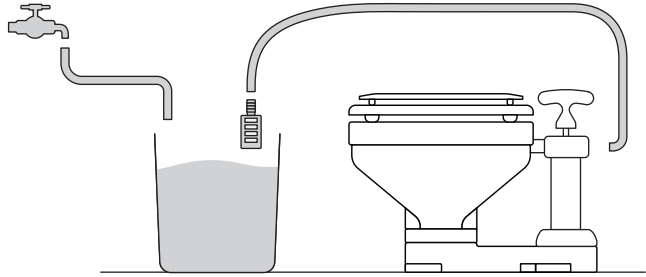
Handheld Bidet:

1. Install the bidet close to the toilet.

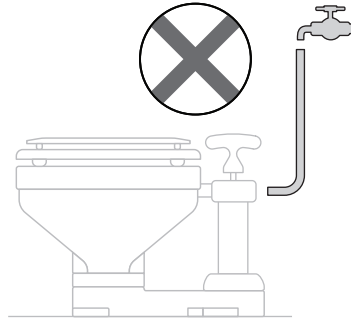
Note:

With a bidet installed, the flush control level can be permanently set to the right (wastewater out) position since there is no need to pump in clean water. This will be covered in more detail in 'using the toilet' (page 14)

Water reservoir:



Alternatively, connect the toilet's water inlet to a suitable water reservoir (e.g. a large covered bucket). You can fill the reservoir with tap water, or use rainwater/well water/other water sources. The bucket can be located inside or outside the washroom - up to 1m lower than the toilet if necessary.



DO NOT connect toilet's water inlet directly to mains water - the water pressure will damage the bio-toilet!



1. Attach water filter to one end of the 19mm hose included in the kit - this is the water inlet pipe connected to the flush water reservoir.



2. Pass the other end of the pipe through the bucket's lid so the filter is in the bucket when the lid is closed.



3. The filter should be immersed in water when the bucket is filled.



4. Connect the other end to the toilet's water inlet, making sure the hose is snugly fitted onto the pipe.

3

Connecting the wastewater Discharge Pipe to your HomeBiogas system

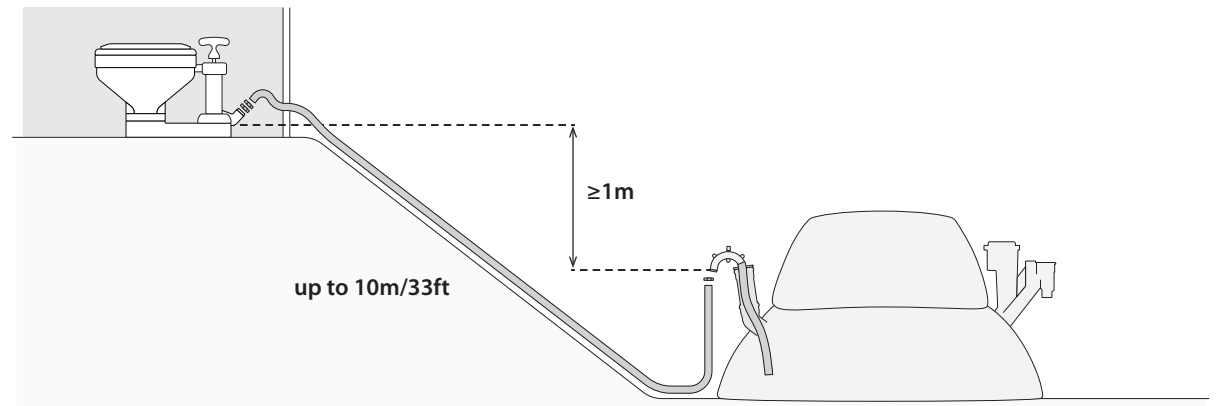
Parts & Tools:

- 2m 38mmØ flexible pipe (vented loop attached)
- 38mmØ flexible discharge pipe - **not included in kit - need to purchase**
- 38mmØ steel hose clamps
- stabilizing cord
- screwdriver (flat)

Note: when connecting discharge pipe to vented loops and toilet discharge elbow, use liquid soap on connecting surfaces for an easier insertion.

Option 1 (Recommended):

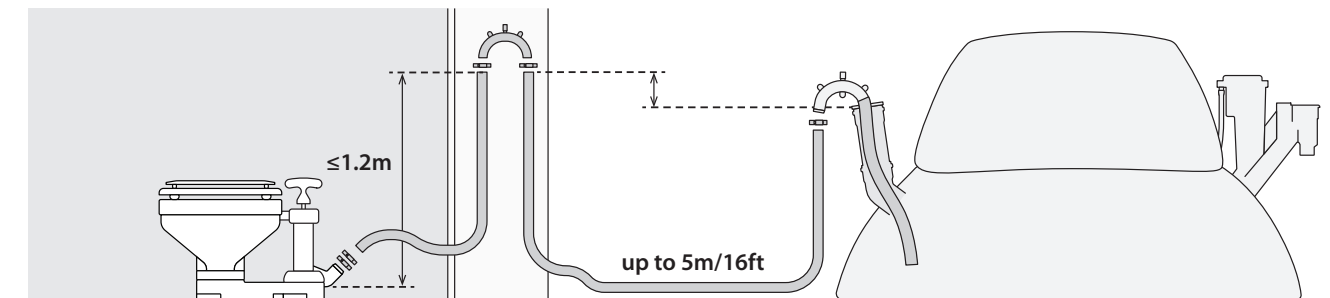
Toilet discharge elbow should be **at least 1m higher** than the top of fertilizer outlet (where wastewater pipe enters system)

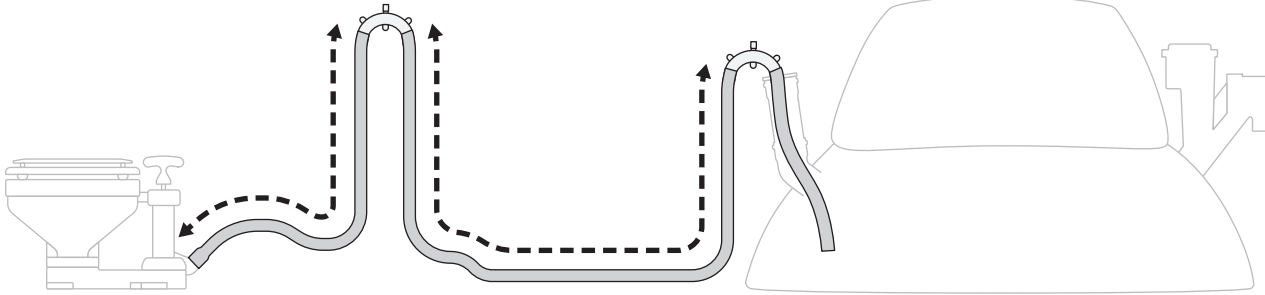


Option 2:

Toilet level with Homebiogas system (toilet cannot be lower than system base)

A second vented loop must be installed outside the building, as close as possible to the toilet - it should be **less than 1.2m above** the toilet discharge elbow, and positioned **higher** than the vented loop at the system inlet.





Based on the installation options chosen, measure and purchase the length(s) of flexible discharge pipe needed to connect your toilets and digester. Measure the length of the entire route of the pipe - include the vertical sections of pipe if using second vented loop, and also account for any sloping ground or obstacles that the pipe will route around.



1. Connect one end of the pipe to the vented loop which comes already connected to the 60cm entry pipe - first, slide a loose hose clamp over the end of the pipe.



2. Fit the pipe over the open end of the vented loop. Use liquid soap on the connecting surfaces to allow the pipe to fit onto the vented loop more easily.
3. Securely tighten the clamp around the section where the pipe overlaps with the vented loop.
4. Insert the 60cm digester entry pipe into the system from the port in the inlet cap. Ensure the discharge pipe goes straight downwards without bends or kinks.



5. **If installing toilet level with system (option 2):** route discharge pipe from system to the planned location of the vented loop, then mark and cut the pipe to the required length.



6. **(Option 2 continued):** Connect discharge pipe from system, and remaining pipe to the vented loop near the system.



7. **(Option 2 continued):** Attach vented loop to the wall, at the planned location outdoors near the toilet.



8. Drill out/create entry point through the wall for the discharge pipe to pass through to connect to the bio-toilet. Insert pipe through the opening, route it over to the toilet's discharge elbow, and make a final cut to remove any excess pipe.



9. Connect the toilet-end of the discharge pipe to the discharge elbow - fasten the pipe with 2 hose clamps. Rotate the clamps before tightening so that the bands are aligned differently on the pipe. This prevents leakage.



10. Repeat steps 3-8 to connect the second bio-toilet.



11. Attach the two vented loops together with the included bolts.



Example: double discharge pipe from system to 2 bio-toilets installed level with system. (Outdoors setup shown)

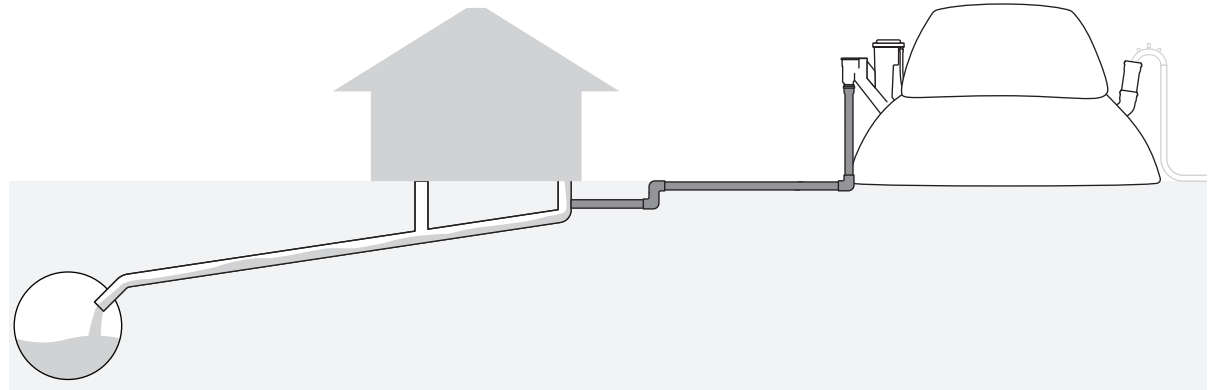
effluent management

With the Bio-toilet connected, the HomeBiogas system's liquid fertilizer should be safely diverted directly to a treatment solution **WITHOUT** potential for user contact. The effluent should **NOT** be fed directly to plants.

Option 1: Connect to existing Sewage Line

If possible, divert the effluent output from the HomeBiogas system to the existing sewage lines of your home.

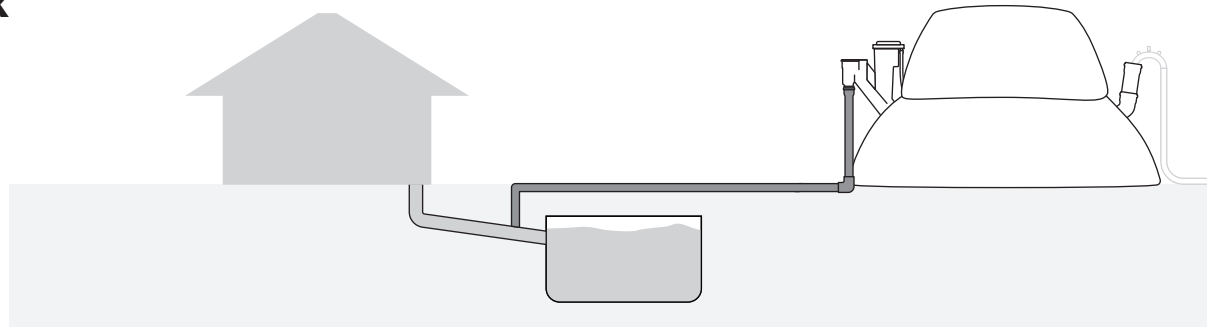
The digester's fertilizer outlet fits a standard 2" PVC pipe connector.



Option 2: Connect to existing Septic Tank

Alternatively, you can drain the effluent from the system into an existing septic tank.

Do observe local wastewater regulations and consult a professional when working with sanitation plumbing!



Option 3 (if 1 & 2 are not possible): Construct a Mulch Basin/Drainfield

A **mulch basin** is an ecological, permaculture landscaping method used to filter contaminants and impurities from the digester's effluent before it enters groundwater. Constructed from organic materials like mulch, wood chips and sawdust, it allows for the absorption and release of water and nutrients to supply nearby plants/crops.

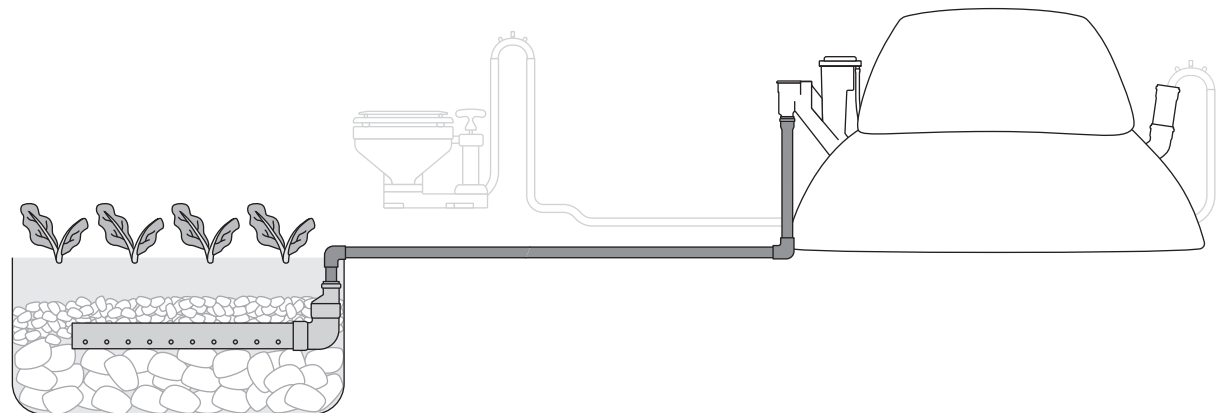
A **drainfield** functions in a similar way, but is constructed from layers of differently-sized gravel.

Drainfield/mulch basin usage must meet local regulations for wastewater treatment and disposal/reuse. The size of the drainfield/mulch basin must be adjusted according to the expected usage volume of the Homebiogas toilet, to avoid any ponding of the effluent.

Mulch basins/drainfields must be sized appropriately for the expected usage/effluent output of the digester:
The mulch basin/drainfield for the HomeBiogas 4.0 system in the following guide is sized for a maximum of **50 flushes per day**.

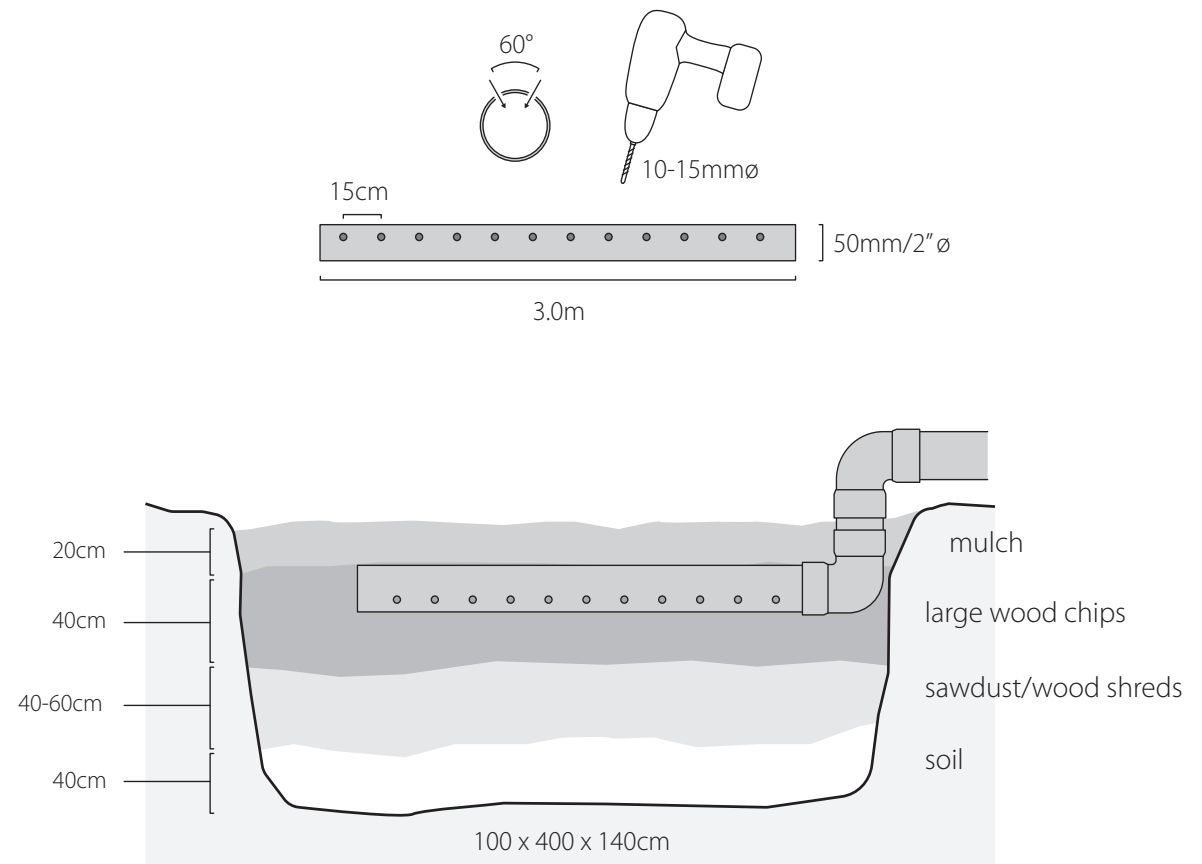
Parts & Tools:

- 2"Ø PVC piping, fittings and connectors
- large gravel (1-2" diameter) - 240 liter
- fine gravel (0.25-0.75" diameter) - 50 liter
- shovel
- power drill & 10-15mm bit



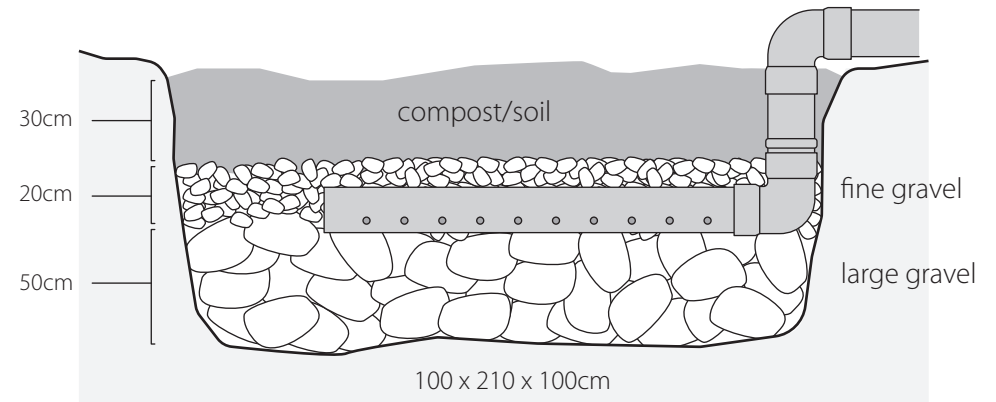
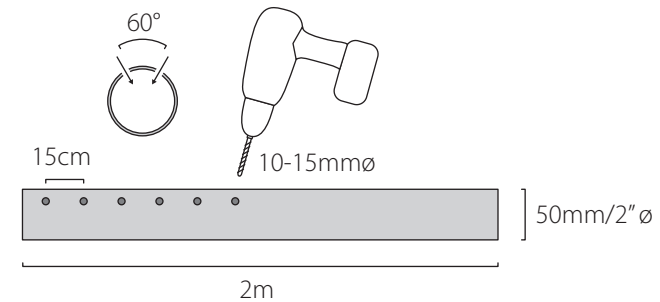
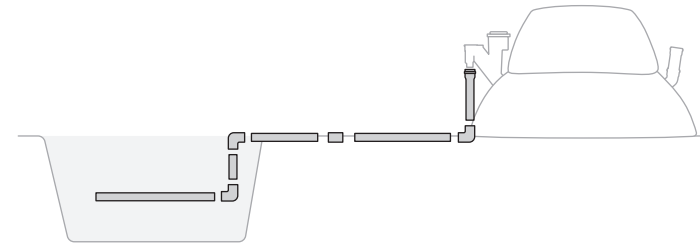
Mulch Basin

1. Measure and prepare piping of the correct length required to connect the system's fertilizer outlet to the mulch basin location.
2. Prepare perforated 2"Ø distribution pipe 3m long. Drill two rows of holes in a 60-degree arc, at roughly 15cm intervals along the 2" pipe.
3. Measure out and dig the mulch basin pit in the chosen location, according to the required dimensions for your HomeBiogas system model. Fill the pit first with a layer of soil/compost, followed by a layer of sawdust or wood shreds, then a layer of large wood chips. Install the 2" distribution pipe on top of the large wood chips with holes facing downwards, and add more wood chips until the pipe is covered. Fill up the pit with a final layer of landscaping mulch.



Drainfield

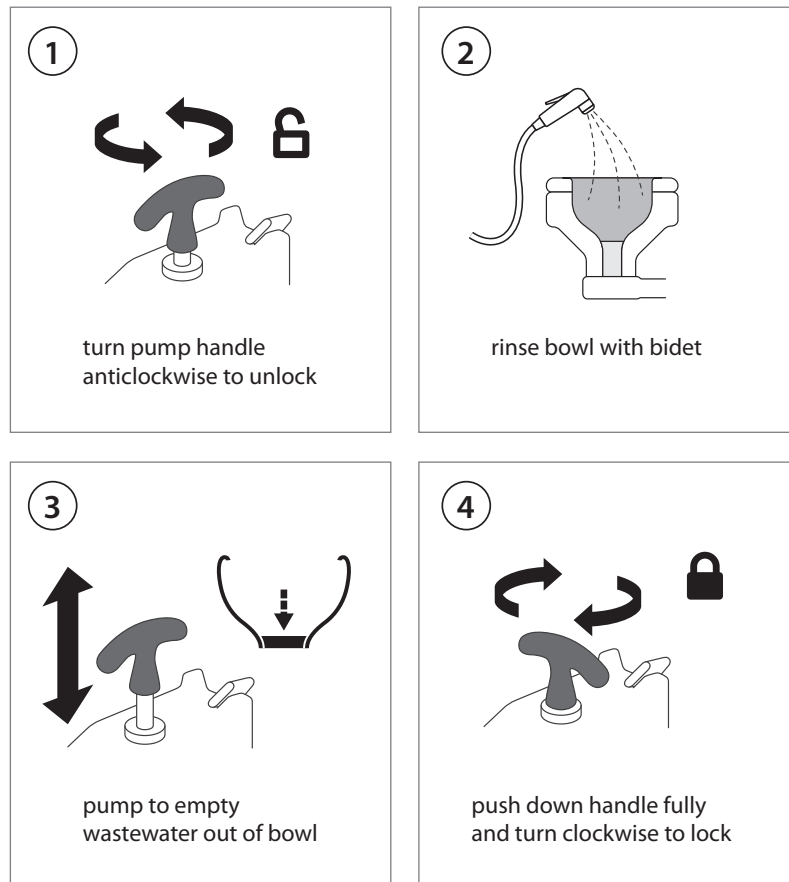
1. Measure and prepare piping of the correct length required to connect the system's fertilizer outlet to the drainfield location.
2. Prepare perforated 2"Ø distribution pipe 2m long. Drill two rows of holes in a 60-degree arc, at roughly 15cm intervals along the 2" pipe.
Fill the pit with the first layer of large gravel. Install the 2" distribution pipe on top of the large gravel layer with holes facing downwards, and then place more large gravel around the pipe.
3. Measure out and dig the drainfield pit in the chosen location, according to the required dimensions for your HomeBiogas system model.
Add a layer of fine gravel to the pit. Cover and fill up the rest of the pit with a final layer of soil/compost.



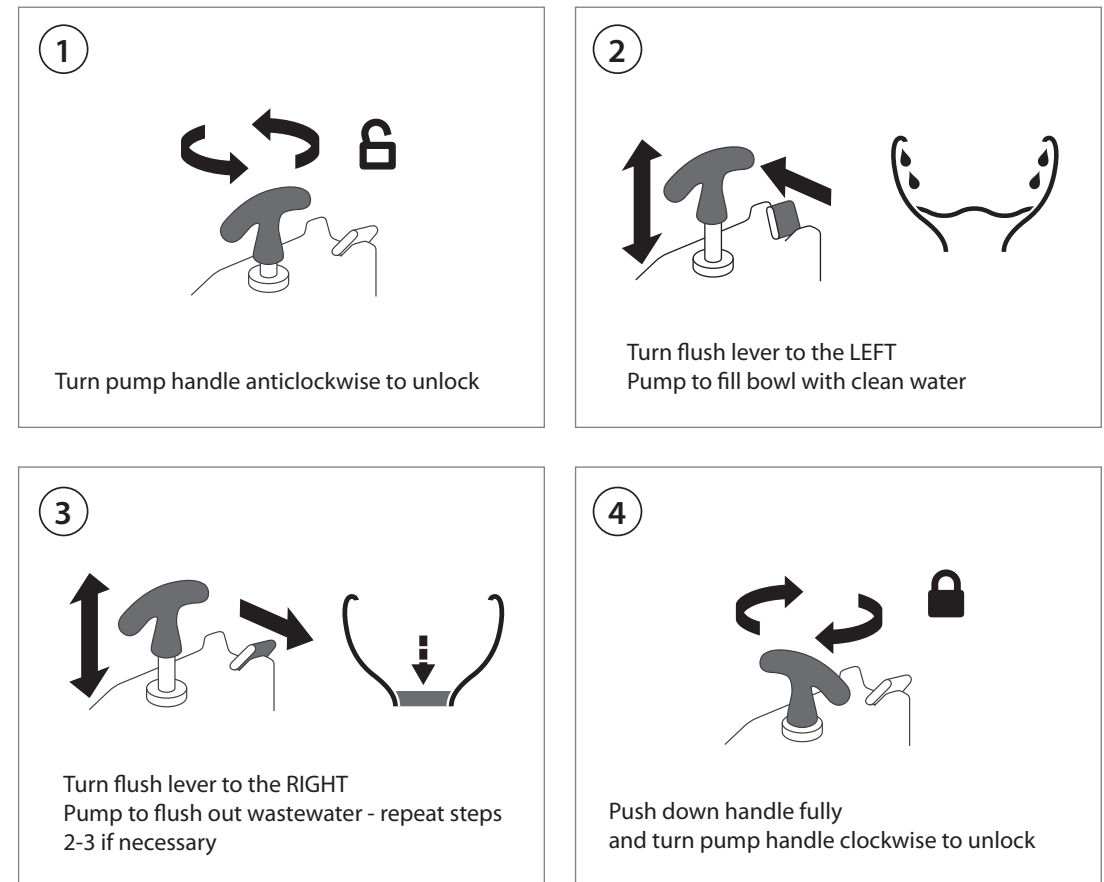
using the toilet

Handheld Bidet:

When using a bidet with the bio-toilet, keep the flush control lever always turned towards the right, on the 'pump out' setting - there is no need to pump in clean water as the bidet provides the running water.



Water reservoir:



bio-toilet maintenance

Regular cleaning

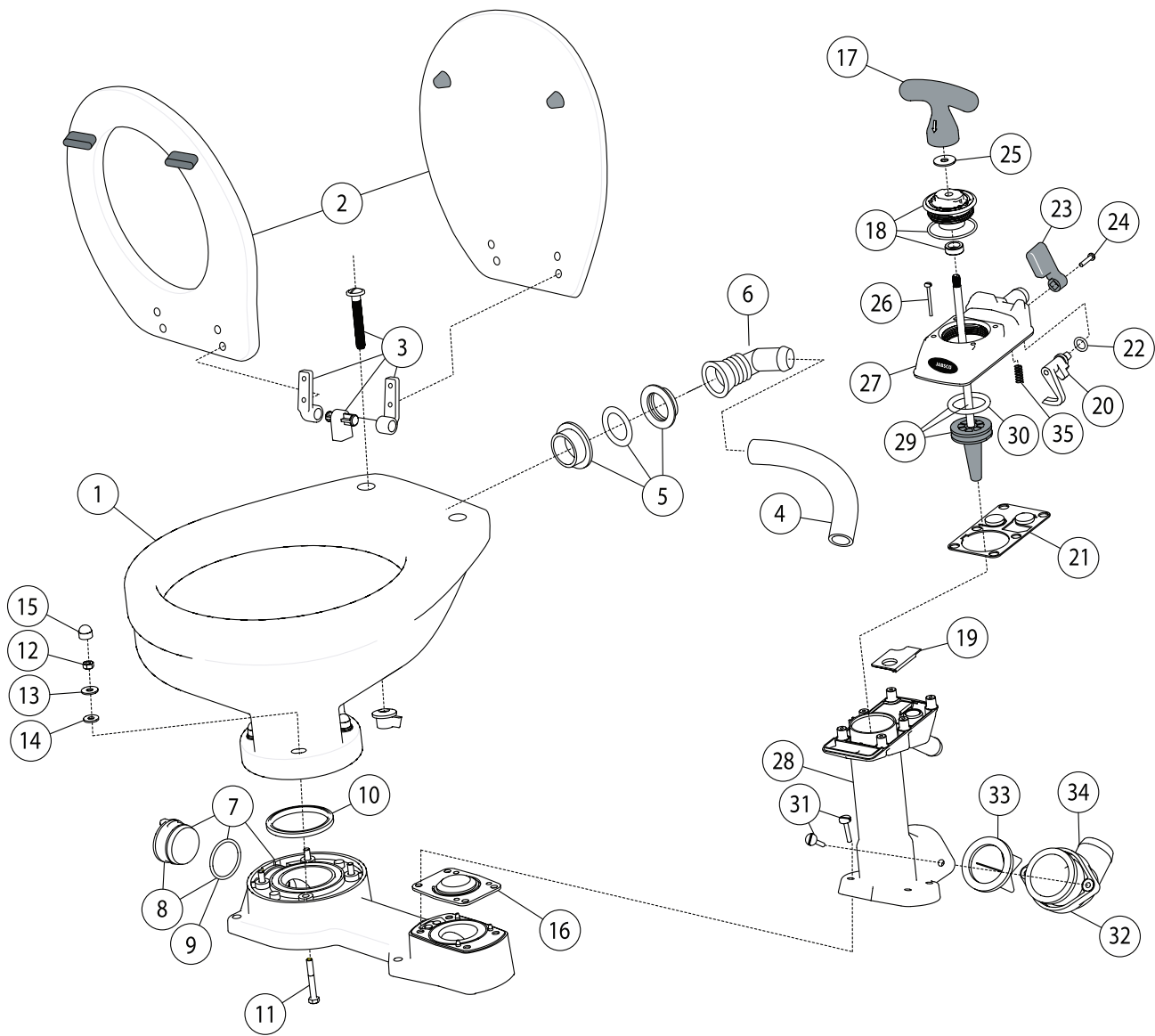
1. Clean the toilet bowl with all-natural cleaners or vinegar.
Avoid chemical cleaners like bleach or Clorox which will kill the bacteria in the system.
2. Do not use abrasive pads on any part of the toilet.
3. Clean with a dry cloth only.

Regular maintenance

1. Lightly lubricate the piston metal rod of the bio toilet pump with the silicone grease (included in the box). Repeat this step every 2 weeks. IMPORTANT!!!
2. Empty the toilet. Pour half a cup of vinegar into the toilet. Pump once and wait a few hours before use. Repeat every month.
3. Check there are no water leakages.
4. Check all bolts, nuts, and clamps are fastened tight

Safety

1. Effluent from fertilizer outlet should be diverted directly to a treatment solution WITHOUT potential for user contact.
2. Effluent from fertilizer outlet should NOT be fed directly to plants, but rather incorporated into a treatment solution.
3. Any usage of the effluent must meet with local regulations and guidelines for wastewater reuse.

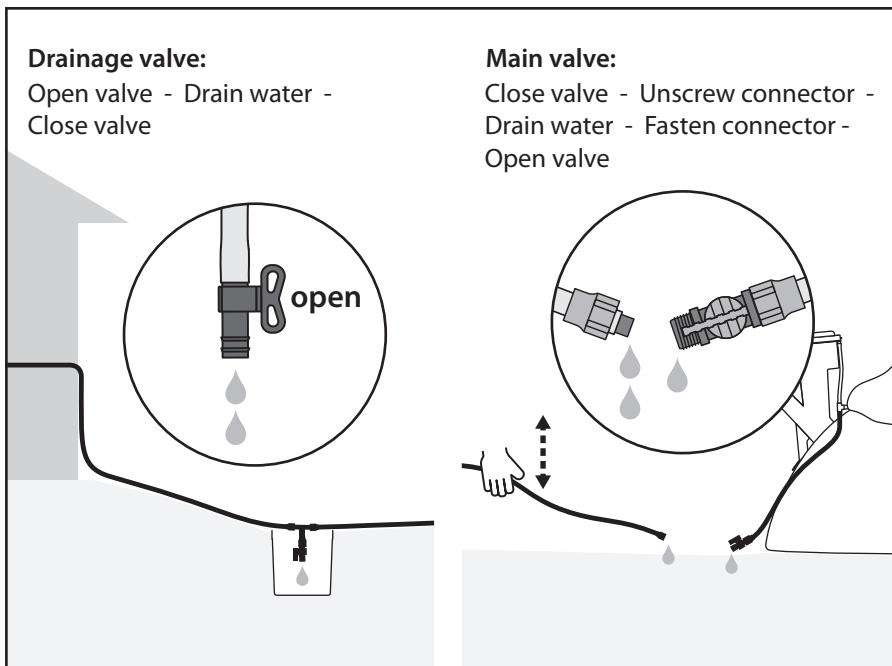


| | | |
|----|----------------------------|------------|
| 1 | Bowl Regular | 29096-1000 |
| 2 | Seat & Cover | 58104-1000 |
| 3 | Hinge Set | 58105-1000 |
| 4 | Hose Regular Toilet | 29035-1001 |
| 5 | Intake Seal | 58107-1000 |
| 6 | Intake Elbow | 58107-1000 |
| 7 | Base, Plug + O-Ring Assy | 29041-1000 |
| 8 | Plug + O-Ring Assy | 29028-2000 |
| 9 | O-Ring (Plug) | - |
| 10 | O-Ring (Bowl) | - |
| 11 | Bolt (S/S) (x4) | - |
| 12 | Nut (S/S) (x4) | - |
| 13 | Washer (S/S) (x4) | - |
| 14 | Washer (Nylon) (x4) | - |
| 15 | Cap (x4) | - |
| 16 | Base Valve Gasket | 29043-0000 |
| 17 | Handle | - |
| 18 | Seal Housing Assy | 29044-3000 |
| 19 | Top Valve Seat | |
| 20 | Cam | |
| 21 | Top Valve Gasket | 29042-0000 |
| 22 | O-Ring (Flush Lever) | - |
| 23 | Flush Control Lever | - |
| 24 | Screw (Flush Lever) | - |
| 25 | Buffer | - |
| 26 | Screw (Valve Cover) (x6) | - |
| 27 | Valve Cover | - |
| 28 | Pump Cylinder | - |
| 29 | Piston, Rod & O-Ring Assy | 29046-3000 |
| 30 | O-Ring (Piston) | - |
| 31 | Screw (Pump Cylinder) (x6) | - |
| 32 | Discharge Flange | 29091-1000 |
| 33 | Joker Valve | 29092-1000 |
| 34 | Discharge Elbow | 29029-1000 |
| 35 | Valve Spring | - |

system care

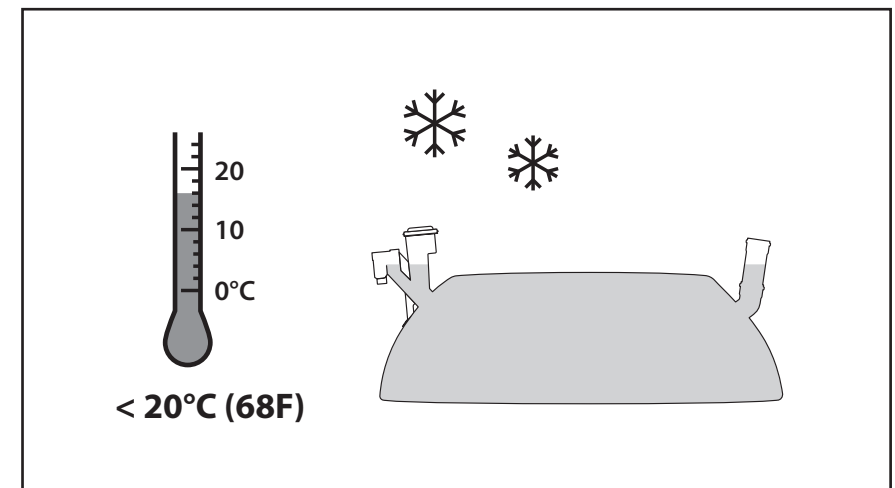
frequent care

Empty the condensed water accumulated in the gas pipes.



Biogas contains water vapor that may condense during cooler nights and accumulate in the gas pipes, blocking gas flow. If your stove's flame is sputtering, you should empty the water from the gas pipes. (Refer troubleshooting section in p40 for more detail)

Cold Weather Operation



Gas production will slow down when the system's average surrounding temperature drops below 20 °C (68F). Feeding the system at average temperatures below 20°C may lower the pH of the system and cause system failure!

If temperatures will drop below freezing, you may drain at least 200 liters of liquid from the system and reactivate it (page 32) when warmer weather comes.

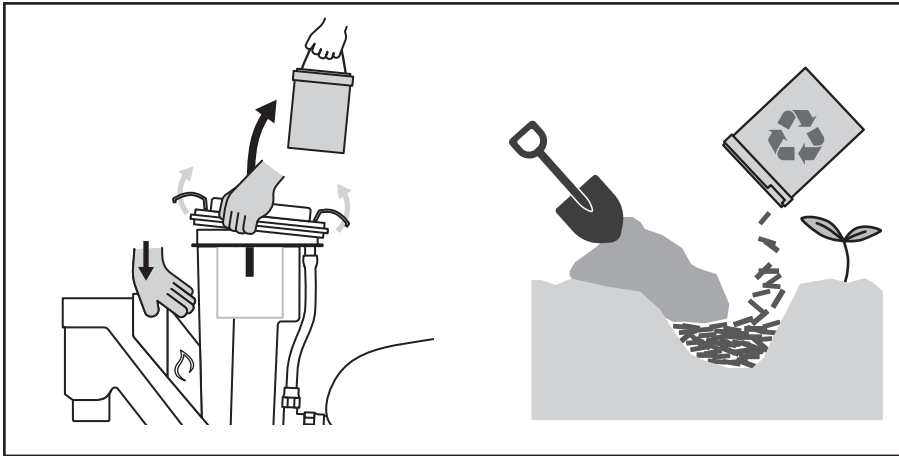
Visit homebiogas.com/faq for more information on heating instructions and solutions, or contact HomeBiogas if you have additional enquiries.

periodic care

* System components are rated for 10-year lifespan. After 10 years check materials and contact HomeBiogas for replacement parts if required.

Replacing the Gas Filter

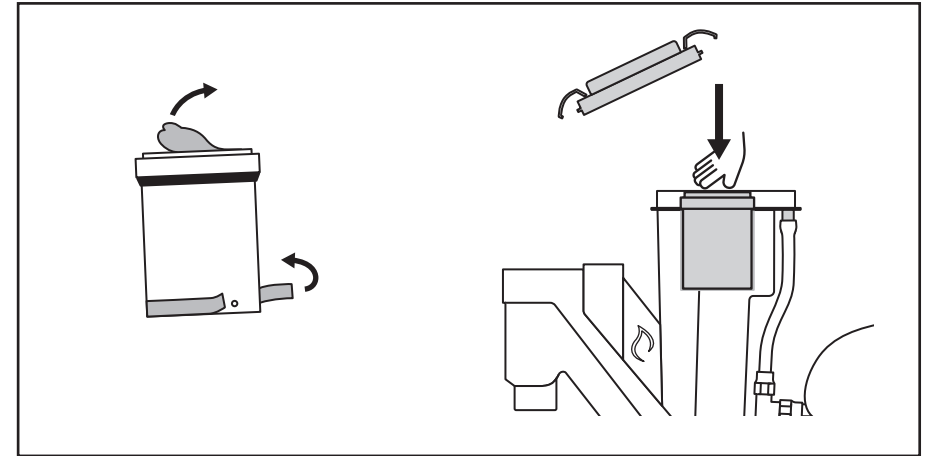
When gas burns with unpleasant odor



Contact the company or your distributor for a new filter.

Remove the filter and dispose of used filter media

1. Use or release the gas from the system until the gas tank is empty. (To keep gas, block the gas duct while removing filter and place outlet cap back on)
2. Release the locking clips and lift the Gas Outlet Cover.
3. Remove the Gas Filter by the cord handle attached to the filter's cover.
4. Properly dispose of the spent filter media by burying it underground as a soil improver, or add it to compost. Take care not to breathe in vapors from the filter media.



Install the new filter:

1. Remove the 2 protective stickers from the top and around the base of the new filter.
2. Place the filter into its slot in the gas outlet - make sure to push the filter down completely.
3. Replace the Gas Outlet Cover, pushing it down securely, and press the cover locking clips back into place.

troubleshooting

No gas at the burner, and the gas tank is empty

1. Gas valve was left open.

Check if system gas valve, drainage connector or stove's gas valve have been left open, allowing the gas to escape. ensure stove is turned off, gas valve is closed and drainage connector is screwed shut.

2. System has not been fed for some time.

Feed the system.

3. Water level in the digester tank has fallen too low allowing gas to escape through inlet.

Fill the digester tank with water until you see liquid pouring out of Fertilizer Outlet.

4. Cold weather caused bacteria to stop gas production.

Reduce feeding volumes (refer to cold weather operations on page 34) or wait for the weather to warm up.

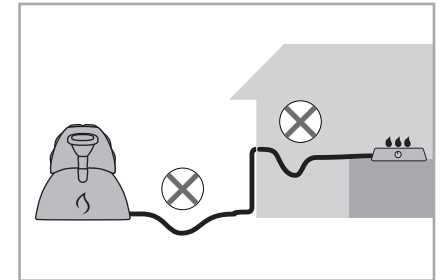
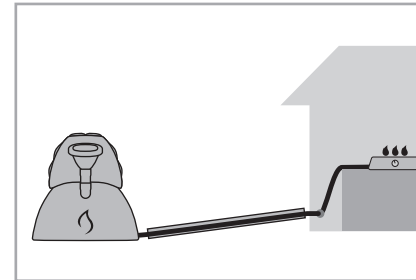
5. There is a gas leak somewhere in the system or along the gas tubes.

To locate leak, apply soapy water along the gas pipes, tank flanges and pipe joints. Leakage will cause bubbles to appear. Fix the leak or replace the leaky element.

Gas tank is filled but there is no gas flow, or flame sputters and dies frequently

The most likely cause is accumulation of water condensation in the gas pipe, blocking the free flow of gas to the stove.

Ensure there are no bends/dips in the pipe from stove to system that water can collect in. The gas pipe should also be installed at a slight angle from the system to the stove.



1. Drain collected water from the gas pipes.

- i. Open the water drainage valve and drain any collected condensation from the gas tube (refer p38).
- ii. If problem persists, you may need to empty the 10mm gas tube separately - open clamps, disconnect the 10mm gas tube from the reducer fitting and stove and drain out any water from the tube. Blowing through the tube or using an electric air pump to pass air through the tube will help to clear out collected water.
- iii. Close drainage connector and reopen gas valve.

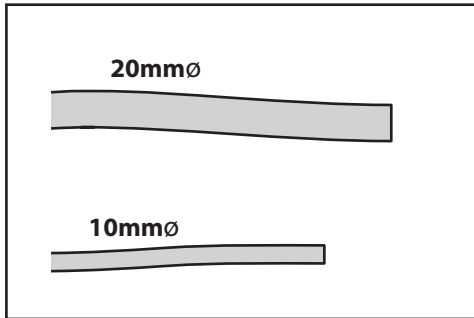
tech specs

HBG 4.0 household biogas system technical specifications:

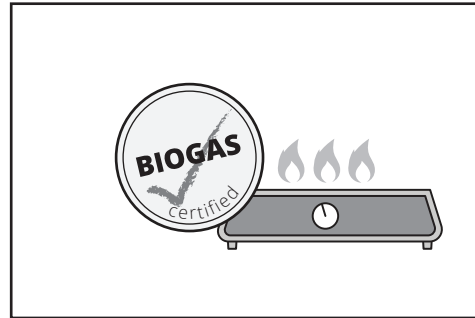
| | |
|----------------------------|---------------------------------|
| System volume | 3.8m ³ |
| Dimensions Assembled | 300 x 150 x 145 (cm, L x W x H) |
| Weight Assembled (approx.) | 2900 kg |
| Gas pipe max length | up to 20m |
| Nominal gas pressure | 10 mbar |
| Max energy capacity | 7.54 kWh/27.1 MJ |
| Operating temperature | >20°C/68 F |

safety

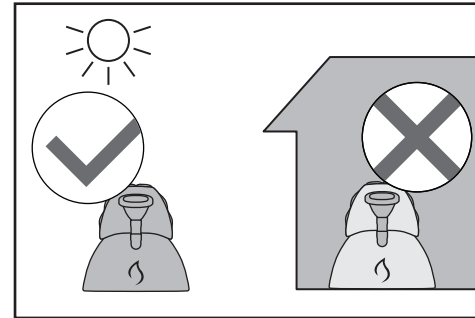
Biogas is a flammable gas. Always observe these precautions to prevent accidents:



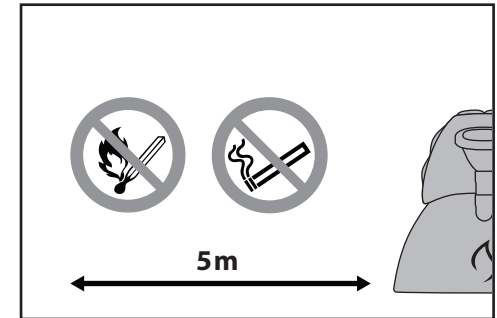
Only use gas tubing with the right diameter. Contact Homebiogas if you need more information.



Use only devices compatible with or adapted for biogas use. Visit homebiogas.com/faq to find out how to adapt a stove for biogas use.

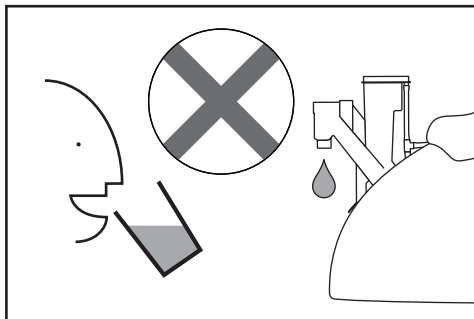


Only install system outdoors so excess gas can be released safely.

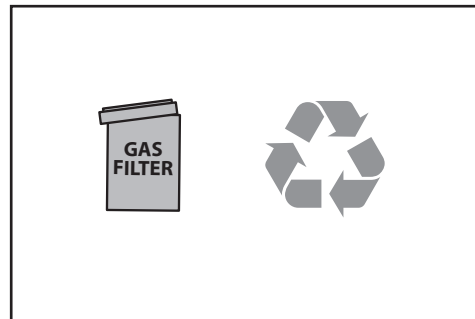


No open flames or sparks within 5 meters (15 ft.) from the system.

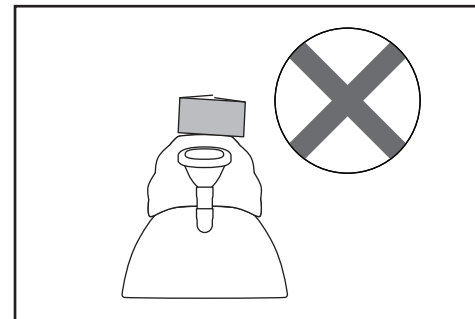
other safety precautions:



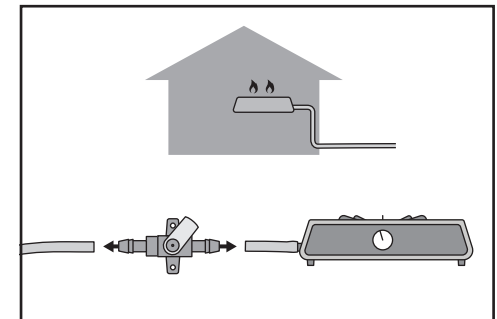
Do not drink the liquid effluence.



Dispose of used gas filters safely – refer to page 39 for details.



Do not place any object on top of the system.



Purchase and install a safety valve when using devices indoors. (Not included in assembly kit)

HOMEBIOGAS HBG 4.0 LIMITED PRODUCT WARRANTY

This warranty is provided by HomeBiogas LTD. in connection with the purchase of the HomeBiogas HBG 4.0 Household System (the “System”).

1. Warranty Description. HomeBiogas warrants to the Customer that for 24 months after the delivery of the product to the customer, the company shall provide, free of charge, a replacement for any part that is faulty or has failed.

1.1 Subject to assembly and use per the Company’s Manuals and under normal use and service, the System shall be in compliance in all material respects with the specifications thereof at the time of delivery to Customer and for a warranty period of twenty four (24) months from the date of delivery to Customer (the “Warranty Period”) shall be free from defects in workmanship and materials.

1.2 During the Warranty Period, HomeBiogas shall repair or replace at its option and expense any part which fails to comply with the Warranty specified above in Sections 1.1 Shipment of the replacement parts to Customer’s original destination shall be at the expense of the Customer. Notwithstanding the above, the final determination whether a part is defective shall be made by HomeBiogas.

2. Limitation on Warranties. Warranties and Customer’s remedies hereunder are solely for the benefit of Customer and shall not be extended to any person whatsoever. Customer shall be solely responsible for the selection, use, efficiency and suitability of the System. This warranty shall not apply to any System or related items if HomeBiogas’ testing and examination describes that the alleged defect or non-conformity does not exist or, that:

- (i) have been used with accessories and appliances not compatible with biogas;
- (ii) have been damaged by improper installation, operation, maintenance, misuse, accident, neglect, fire, lightning, or other peril, failure to continually provide a suitable operating environment, or from any other cause beyond HomeBiogas’ reasonable control, including Force Majeure events (as described in the General Conditions);
- (iii) have been used in a manner not in accordance with the instructions supplied by HomeBiogas and/or the General Conditions;
- (iv) have been subject to the opening of any sealed components without HomeBiogas’ prior written approval;
- (v) have had changes made by Customer or Customer’s representatives to the physical, mechanical or interconnection components of the System supplied by HomeBiogas without written authorization of HomeBiogas to do so; or
- (vi) have been repaired or otherwise altered by anyone not under the control of, or not having the written authorization of HomeBiogas to do such repair or alteration; or
- (vii) have been repositioned from its original location of set-up, or otherwise relocated; and
- (viii) does not apply to any cosmetic damage such as scratches or dents; and
- (ix) does not apply to any consumables or perishables.

3. Warranty and Post-Warranty Services. All warranty and post warranty services to the Systems shall be performed only by HomeBiogas, or by any entity appointed by HomeBiogas. This Warranty does not cover any installation, training or service charges.

4. THE WARRANTIES PROVIDED IN THIS WARRANTY DOCUMENT CONSTITUTE HOMEBIOGAS’ SOLE AND EXCLUSIVE LIABILITY FOR DEFECTIVE OR NONCONFORMING SYSTEM AND SERVICES AND SHALL CONSTITUTE CUSTOMER’S SOLE AND EXCLUSIVE REMEDY FOR DEFECTIVE OR NONCONFORMING SYSTEM AND SERVICES. THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF HOMEBIOGAS FOR DAMAGES.

5. For service, contact HomeBiogas or the HomeBiogas certified reseller of the Systems specifying the model number and the serial number indicated on the nameplate that is affixed to the System’s frame.

HOME BIOGAS BIO-TOILET LIMITED WARRANTY

HOME BIOGAS LIMITED WARRANTY WARRANTS THIS PRODUCT TO BE FREE OF DEFECTS AND WORKMANSHIP FOR A PERIOD OF 2 YEARS. THE WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, CONDITIONS OR TERMS OF WHATEVER NATURE RELATING TO THE GOODS PROVIDED HEREUNDER, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED. EXCEPT AS OTHERWISE PROVIDED BY LAW, BUYER'S EXCLUSIVE REMEDY AND SELLER'S AGGREGATE LIABILITY FOR BREACH OF ANY OF THE FOREGOING WARRANTIES ARE LIMITED TO REPAIRING OR REPLACING THE PRODUCT AND SHALL IN ALL CASES BE LIMITED TO THE AMOUNT PAID BY THE BUYER HEREUNDER. IN NO EVENT IS SELLER LIABLE FOR ANY OTHER FORM OF DAMAGES, WHETHER DIRECT, INDIRECT, LIQUIDATED, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY OR LOSS OF REPUTATION. THIS WARRANTY IS ONLY A REPRESENTATION OF THE COMPLETE LIMITED WARRANTY. FOR A DETAILED EXPLANATION, EMAIL support@homebiogas.com.

