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# AquaFlow & AquaHold

  

## Installation & Operation Guidelines

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### Kingspan Water & Energy Contact Numbers:

	Service	Warranty
GB:	0844 846 0500	0844 225 2785
NI:	028 3025 4077	0844 225 2785
IRL:	048 3025 4077	0844 225 2785

### Enclosed Documents

<b>C19.7316</b>	<b>SmartServ Pro Installation Manual</b>
<b>DS1368P</b>	<b>Silt Alarm Probe Assembly</b>
<b>DS1226</b>	<b>AquaFlow FC Ø1.2 Vertical Flow Control Tank</b>
<b>DS1227</b>	<b>AquaFlow FC Ø1.8 Vertical Flow Control Tank</b>
<b>DS1229</b>	<b>AquaFlow SF Ø1.2 Horizontal Flow Control Tank</b>
<b>DS1230</b>	<b>AquaFlow SF Ø1.4 Horizontal Flow Control Tank</b>
<b>DS1244</b>	<b>AquaFlow SF Ø1.8 Horizontal Flow Control Tank</b>
<b>DS1245</b>	<b>AquaFlow SF Ø2.6 Horizontal Flow Control Tank</b>
<b>DS1234</b>	<b>AquaHold SM Ø1.2 Master Tank</b>
<b>DS1236</b>	<b>AquaHold SM Ø1.4 Master Tank</b>
<b>DS1238</b>	<b>AquaHold SM Ø1.8 Master Tank</b>
<b>DS1240</b>	<b>AquaHold SM Ø2.6 Master Tank</b>
<b>DS1235</b>	<b>AquaHold SS Ø1.2 Storage Tank</b>
<b>DS1237</b>	<b>AquaHold SS Ø1.4 Storage Tank</b>
<b>DS1239</b>	<b>AquaHold SS Ø1.8 Storage Tank</b>
<b>DS1241</b>	<b>AquaHold SS Ø2.6 Storage Tank</b>

Part Code	Issue	Description	Date
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## 1.0 Health & Safety

### Please read and follow for your own and others safety

You must read these warnings carefully before installing or using the equipment. Please ensure that you have performed a risk assessment before commencing any installation. Note that the risk assessment should be performed by a person who understands the hazards of the work, and the work environment. Note that it must be *suitable and sufficient*, i.e. adequately considers risks and ensures controls in place to mitigate risks.



You must observe all hazard labels and take appropriate action to avoid exposure to the risks indicated. Always ensure that all relevant documents are supplied with the equipment when being transferred to a new owner.

### General guidelines

- Only experienced and competent person(s) should carry out the installation.
- The unit should have a *Pre-Service Agreement Inspection* by an approved engineer.
- Take care to maintain correct posture, particularly when lifting.
- Use appropriate lifting equipment when necessary.
- A qualified electrician must carry out any electrical work deemed necessary.
- The covers must be kept locked. During maintenance, ensure openings are secure to reduce the risk of people or animals falling into the tank.



### Personal Protective Equipment (PPE)

- Wear suitable a dust mask and gloves when cutting GRP.
- Person(s) carrying out maintenance on the equipment must wear suitable PPE.



### Maintenance and Inspection Procedures

If you wish to inspect the equipment's operation, please observe all necessary precautions as stated in your risk assessment; including those listed below.

- The power supply must be isolated at the control panel(s) before lifting the covers.
- If the equipment should run with the covers off, care must be taken to avoid contact with moving parts and electrical components or conductors.
- Once the power has been isolated, the control panel must be kept locked shut to avoid accidental reconnection while work or inspection is being carried out.

### Working Area

- Ensure that the working area is adequately lit.
- Ensure that you are familiar with the safe working areas and its access and egress.
- Use only the designated access walkways.
- Do not walk on the cover or deep well safety mesh(es).
- Always keep proper footing and your balance, avoid any sharp edges, or restricted points.

### Desludging

- Desludging must be carried out by a licensed waste disposal contractor holding the relevant permits to transport and dispose of sewage sludge in your region/area.

## 2.0 Handling and Storage

- 2.1 Care must be taken to ensure that units are not damaged during delivery and handling on site.
- 2.2 The design requirements of our products will frequently mean that the Centre of gravity of the unit is "offset". Care must therefore be taken to ensure that the unit is stable when lifting.
- 2.3 Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.
- 2.4 When lifting units, use webbing slings of a suitable specification. **DO NOT USE CHAINS.**
- 2.5 A spreader bar must be used to ensure that units are stable, with their loads evenly distributed, and that slings are not at an angle of greater than 30° to the vertical.
- 2.6 Lifting equipment must be selected by considering the unit weight, length and the distance of lift required on site.
- 2.7 We accept no responsibility for the selection of lifting equipment.
- 2.8 Whenever units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on flat and level ground to evenly support the base of the unit. Do not roll units. The unit has two stability feet at its base.

## 3.0 Site Planning

The following points should be considered before installation of the equipment:

- 3.1 Position the unit at the maximum distance from any habitation. Distances in excess of 15m are usually the minimum acceptable to the planners, but this varies depending on your local authority. The installation must be sited so as not to be prejudicial to health, nor to contaminate water supplies.
- 3.2 The tank should be installed at a suitable distance to prevent superimposed loading by vehicles. Vehicles should not be permitted within a distance equal to the depth of the unit.
- 3.3 If the system is installed in trafficked areas a suitable top slab **MUST** be designed and constructed. Loads applied to covers and frames must bear on the top slab, not the access shaft.
- 3.4 See DCG (Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code")).
- 3.5 See The SuDS Manual (C753), published by CIRIA for guidance on good practice.
- 3.6 Consider placing inspection points in the drain line before and after Units.
- 3.7 Ground conditions and water table level should be assessed. In poorly draining ground, consideration should be given to the likelihood of flotation due to surface water collecting in the concrete backfill, and an appropriate installation method should be devised to avoid this.
- 3.8 Do not install the unit deeper than necessary. The maximum invert depth of the unit is shown on the relevant equipment drawing; this is normally 2.0m invert.
- 3.9 There must be at least 1 meter of clear, level ground all around the access covers to allow for routine maintenance.
- 3.10 Provide electrical supply for alarm system. (If required)
- 3.11 Installation must only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work must be carried out by a qualified electrician, working to the latest edition of IEE.
- 3.12 Manhole covers and frames should suit the duty for the intended location.

## 4.0 Installation – General

- 4.1 The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading.
- 4.2 During installation care must be taken to ensure that the body of any unit is uniformly supported so that point loads through the unit are avoided.
- 4.3 A water supply must be available on site to enable the unit to be ballasted during backfilling.
- 4.4 When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimize the risk of damage from differential movement of the unit(s) and/or surrounding material.
- 4.5 In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete.
- 4.6 If there is a risk of a high water table or of the site flooding, a structural design by a suitable specialist will be required to hold the tank in place.
- 4.7 In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation must be de-watered, using suitable pumping equipment, until the installation is complete. Ensure that the pump discharge does not saturate the ground in the immediate vicinity. In such conditions it may be advisable to line the excavation with polythene sheeting, to prevent cement being washed out of the concrete surround/base.
- 4.8 Concrete backfill is prescribed due to everchanging ground conditions; the table below shows a general specification. It is not a site specific installation design.

<b>GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)</b>		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES:	C25 /30 C25 /30 C16 /20	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M <sup>3</sup> 220 - 230 Kg/M <sup>3</sup>
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

## 5.0 Unit Installation

### 5.1 Excavate Hole & Lay Concrete Bed

- 5.1.1 Excavate a hole with clearance on all sides and base of the unit of 150 – 200 mm, depending on site conditions.
- 5.1.2 If shuttering is required to maintain a vertical wall, increase the width of the excavation to accommodate.
- 5.1.3 If the excavation has an unstable base, excavate an additional 250 – 300 mm and fill with compacted hard-core.
- 5.1.4 If water is present in the excavation, de-water using suitable pumping equipment. Place a sheet of polythene over the base and up the sides of the excavation before creating the concrete slab.
- 5.1.5 The four anchor bars must be assembled and attached to the tank as shown.
- 5.1.6 A minimum base of 150 – 200 mm of lean mix concrete is required for all ground conditions. The installer must ensure that the base is adequate to support the weight of the tank and its contents.
- 5.1.7 It is recommended to backfill with C25 SEMI-DRY MIX.

### 5.2 Lower Unit onto Concrete

- 5.2.1 Lower the first unit onto the slab using suitable webbing slings and lifting equipment. The selection of lifting equipment is the responsibility of the installer considering unit weight, length, height and distance of lift.
- 5.2.2 The slings must not be attached to any pipework.
- 5.2.3 Tanks must not be lifted with any water inside.
- 5.2.4 Install the tanks in the following series:
  1. Master Tank (SM)
  2. Storage Tank(s) (SS)
  3. Flow Control Tank (SF/FC)
- 5.2.5 Once the tanks are in their final position on the base/bed, connect ALL low-level interconnecting pipes between the tanks and the flow-controlled discharge pipe to outlet point, ensuring watertight seal is maintained at each connection.

### 5.3 Backfill

- 5.3.1 Temporarily blank the SF/FC tank outlet to maintain water level throughout the tank series.
- 5.3.2 The backfilling must start before the base has hardened and must be a single continuous operation, so the tank has a full concrete jacket without joints.
- 5.3.3 The backfill must be free from organic material, large stones, brick or sharp objects.
- 5.3.4 Pour clean water to a depth of 300mm into the units, avoiding shock loads.
- 5.3.5 Pour concrete backfill to a depth of 300mm under and around the tanks ensuring good compaction to remove voids. Backfill material must be manually compacted; we DO NOT recommend the use of vibrating lances. Ensure backfill material fills the voids underneath the tank and feet (if fitted).
- 5.3.6 Continue backfilling to just below any remaining pipework, giving sufficient room to connect the pipework. Simultaneously, fill the tank with clean water, keeping the water level 300 mm above the backfill to stabilise pressures on the tank. If the pressures are not stable the tank can become distorted and damaged.
- 5.3.7 Continue backfilling over the tank body to the required ground level.
- 5.3.8 Allow the concrete to fully cure before removing the blanking on the SF/FC tank outlet.

## 6.0 Operation

- 6.1 The system will operate via gravity only, the water level across each tank should be the same, no fall is required between each tank, but it is IMPERATIVE that the series of tanks are level.
- 6.2 The Master Tank (SM) collects water from the entire site thus, drainage must be designed to direct surface water to a single point. Different inlet sizes are available on the Master Tank to suit the site.
- 6.3 The Storage Tanks (SS) are only for water retention, access shafts can be fitted to each tank if required for removal of silt/sediment if the site is prone to accumulation.
- 6.4 The Flow Control Tank (SF/FC) controls the flow of water out of the site, this is fitted with either a mechanical flow control device, or an orifice plate to restrict outflow to the predetermined rate.
- 6.5 The low-level connections ensure the units to be able to cater for excess water in the event of heavy rainfall; the units have been designed to release the water from the lowest point in a controlled manner during this time.

## 7.0 Maintenance

- 7.1 Maintenance requirements on this system are limited due to the nature of the design but general requirements are necessary.
- 7.2 Silt and Sediment removal will be required periodically; this is heavily reliant on the local area ground and site conditions. It is recommended that the Master Tank (SM) should be checked for silt levels every 6 months or after a particularly heavy storm event. If large amounts of silt are present, we recommend you check all other tanks for build-up and remove via tanker.
- 7.3 The key part of this Attenuation system is the flow control device, it is essential that this is continually operational to enable compliance with site discharge rates. We recommend you check the flow control device every 6 months or after a particularly heavy storm event to ensure there are no blockages. We recommend you clean the flow control device at each visit. NB only remove the flow control device in dry periods, DO NOT remove flow control device if system is full.

## 8.0 Warranty

Taken from 'Kingspan's Terms & Conditions of Sale'

The company will replace or, at its option, properly repair without charge any goods which are found to be defective and which cause failure in normal circumstances of use within a period of twelve months from the date of delivery.

This warranty is conditional upon:

- a) The Buyer notifying the Company of any claim within Seven days of the failure becoming discernible.
- b) The Company being allowed a reasonable opportunity to inspect the goods so as to confirm that they are defective.
- c) The goods not having been modified, mishandled or misused and being used strictly in accordance with any relevant instructions issued by the Company.

The Company's liability under this Clause is limited to the repair or replacement of the defective goods, and does not cover costs of transport, installation or associated site costs, if applicable.

The Company's liability to replace or repair the goods is in lieu of and excludes all other warranties and conditions, and in particular (but without limitation) the Company shall have no liability of any kind for consequential loss or damage.

For any further advice, please contact the Warranty department on 0844 225 2785

A Warranty Form is included in this package, to register your unit for Warranty. Please complete ALL sections of the Form and return it at your earliest convenience.

Also, within this package are Notices, describing the necessary maintenance of the plant in use. This should be fixed within the building.