Float operated valve

TYPE (SWDS)

Assembly and Operating Instructions for all models

Table of Contents

1. General

The operating instructions included herein pertain to the Float operated valve, Type SWDS, applicable to all construction sizes. They include references for assembly, dismantling, maintenance, service and rectifying malfunctions. Before work (especially the assembly) on the equipment can begin, it is necessary to read the complete operating instructions.

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The operating instructions include references to hazardous areas when the Float operated valve is in operation. These area are marked in the margin with the following symbol:

2. Equipment View

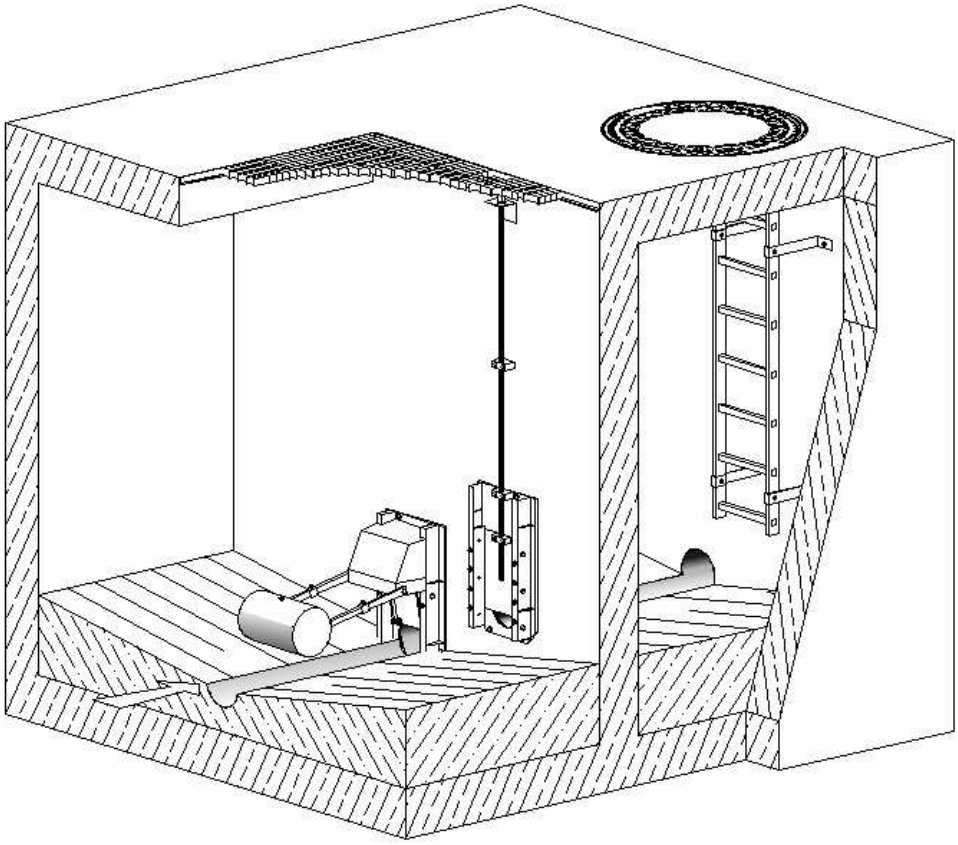


Illustration No. 1: Float operated valve, Type SWDS

3. Assembly Instructions for the SWDS

3.1 Construction personnel must wear a protective helmet and safety shoes during assembly.

3.2 Proper lighting and ventilation must be secured for the shaft.

3.3 In sewage disposal systems the maximum concentration of related digester gas in the workplace must not be exceeded (utilize gas-warning apparatus).

3.4 Check if the mounting opening for the SWDS is large enough. If not, this can be helped in many cases by dismantling the main float during construction so that the full diameter of the shaft opening is available. Another

3.5 The mounting area for the outlet pipe must be even, vertical and clean.

Should the mounting area not be even, the surface must be re-worked.

3.6 The SWDS will be fastened to the transport rings/ fixing hole with an adequate rope on a hoist and lowered into the basin or shaft.

3.7 The flow limiter will be placed in the shaft, perpendicular to the wall in order to mark the drill holes, where it will be later installed. The base of the SWDS must be aligned carefully with the base of the outlet in the wall.

3.8 Until the chrome screws can be tightened, be careful that the SWDS stands securely and cannot tip over.

3.9 The dowel holes can now be drilled with a 12 mm masonry drill. After cleaning the mounting surface on the wall and controller, the supplied sealing material can be applied to the ground

plate. After this the SWDS can be fixed to the wall with the supplied dowels and chrome screws (wrench width - 17 mm).

3.10 The easy motion of the float is checked by hand movement.

3.13 Once installed the concrete base can be laid using the welded half pipe on the base of the SWDS as a guide for the half pipe and the concrete base. When pouring the concrete care must be taken to avoid contact with the gate plate apparatuses as obstructing its smooth operation will result in unsatisfactory performance.

Caution: In no case the concrete should touch the area of the valve plate guide or the slide surface.

3.14 The SWDS is equipped with a **transport safeguard**. After assembly the red-marked screws on the valve plate can be removed.

4. Dismantling / Assembly of Components

4.1 **Main Float dismantling:** The main float can be removed by loosening of the fixing screws. Install transport safeguards to eliminate unnecessary mechanical movement, which can lead to injury.

4.2 **Apparatus dismantling:** When dismantling the apparatus please take caution that, when loosening the last fastening screws, that the SWDS doesn't tip away from the wall. With the help of transport rings / fixing hole and an adequately large hoist, the SWDS can be lifted from the shaft. Otherwise the same instructions apply for dismantling as for assembly.

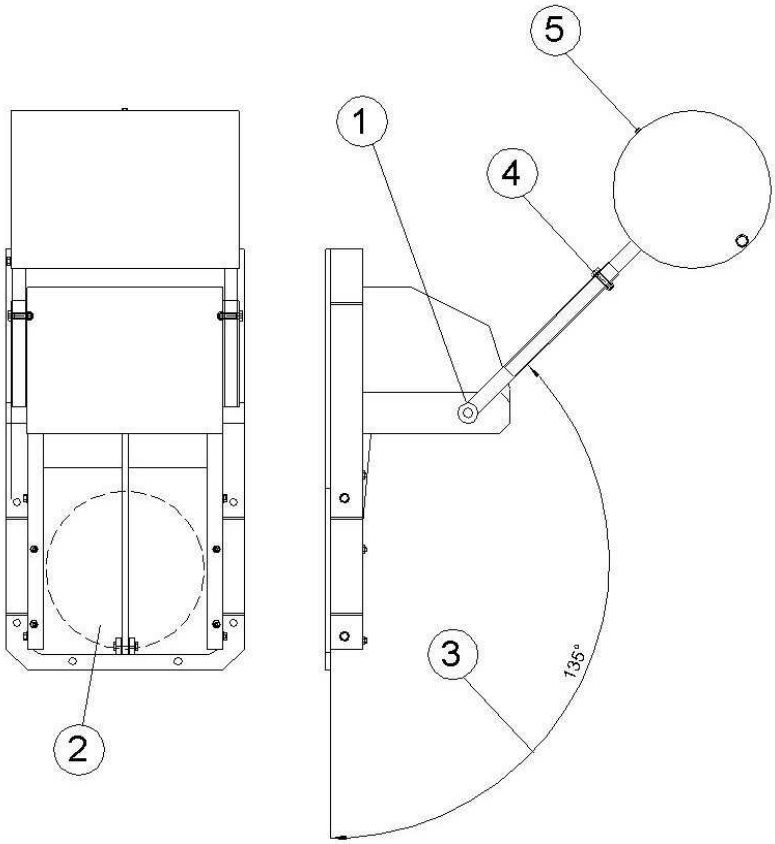
4.3 **Assembly Tools**: The following tools are necessary for assembly of the Float operated valve SWDS:

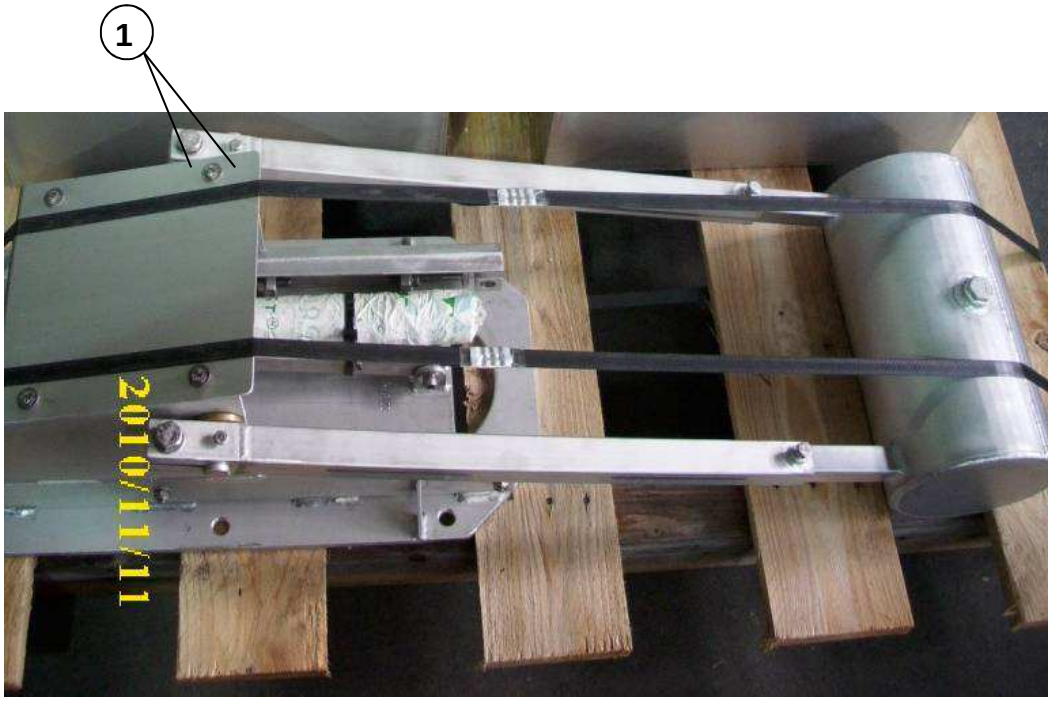
- **Hammer Drill**
- **Masonary Drill Bit Ø 10 / 12 mm**
- **Spirit Level**
- **Wrenches SW 8, SW 10, SW13, SW 17**
- **Wrenches for Socket Head Cap Screws 6, 8, 10, 12**

4.1. Setting

Loose the fittings of the float arms on the axle (1). Fix the valve plate in the lower position (2). Position the float arms with float in the 135° position to the SWDS (3). Tighten the bolts on the axle (1) and unlock the fixation of the valve plate (2). The float or the float arm (4) can be made adjusted in length as needed after loosening the mounting screws on the float arms. The longer the float arms are set the greater the force positioning force whereby the device reacts accordingly slower. If the float is not moving downward in water pressure of the valve plate and the sinking water level, the float must be filled with water or antifreeze (5).

Note: In no case shall the float upright upwards. From this position, the float, due to the weight ratios, cannot go back**.**


5
1
4
3
135°
2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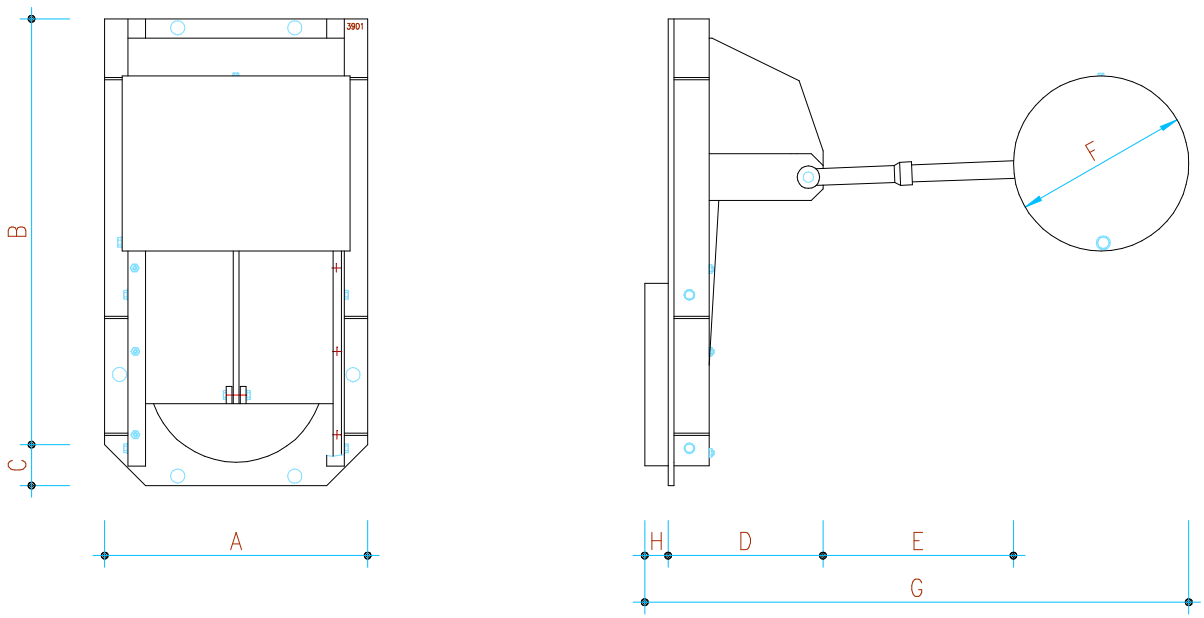
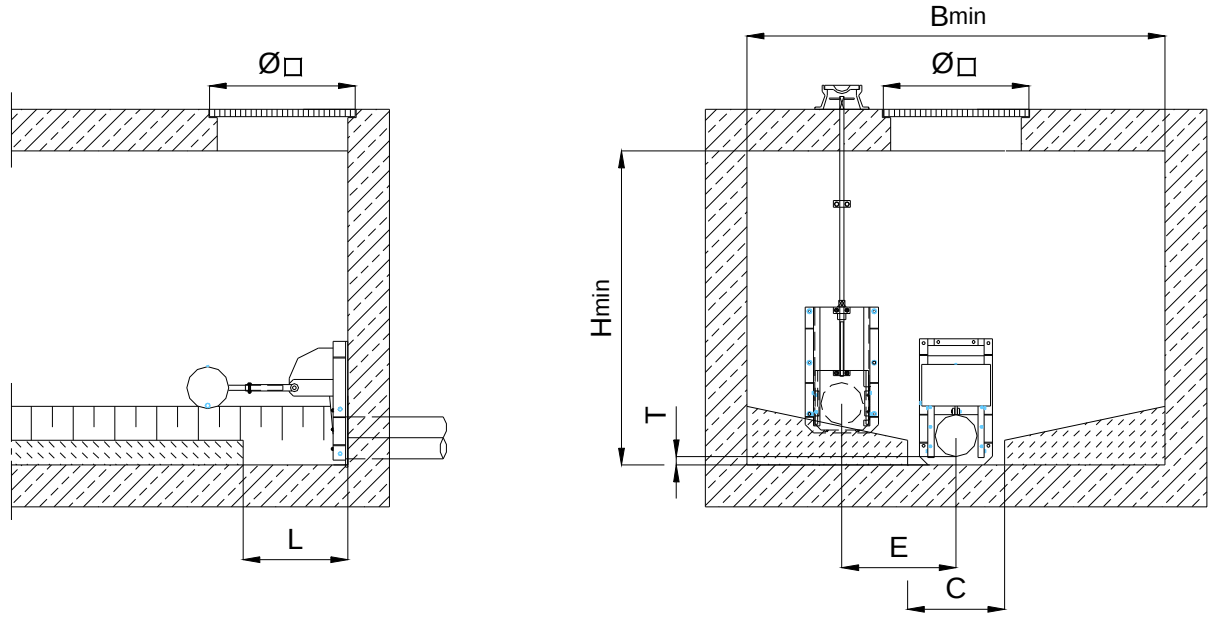
5.0 Weights and dimensions



unit DN	A Width	B height	C	D	E min	E max	F	G min	G max	H *	Kg
100	250	400	30	160	200	280	150	560	640	50	18
150	300	500	30	190	250	380	150	640	770	50	23
200	350	600	30	220	300	480	200	770	950	50	34
250	400	700	30	250	350	580	250	900	1130	50	42
300	450	800	30	270	400	680	300	1020	1300	50	54
350	550	900	30	310	450	780	350	1160	1490	50	73
400	600	1000	30	340	510	880	400	1300	1670	50	86
450	650	1100	30	370	560	980	450	1430	1850	50	95
500	700	1200	30	390	610	1080	500	1550	2020	50	112
550	850	1400	40	450	780	1170	550	1830	2220	50	
600	900	1500	40	490	830	1270	600	1970	2410	50	
650	950	1600	40	530	880	1370	650	2110	2600	50	
700	1000	1700	40	580	930	1470	700	2260	2800	50	
750	1050	1800	40	610	980	1570	750	2390	2980	50	410
800	1100	1900	40	650	1030	1670	800	2530	3170	50	
850	1150	2000	40	700	1080	1770	850	2680	3370	50	
900	1200	2100	40	730	1130	1870	900	2810	3550	50	
950	1250	2200	40	770	1180	1970	950	2950	3740	50	
1000	1300	2300	40	800	1230	2070	1000	3080	3920	50	

6.0 Minimum manhole dimensions and installed dimensions



Nominal Size DN	**H** min (1) mm	**B min** Structure width mm	**E min** Axis centre spacing (2) mm	**□ min** Installation opening mm	**Ø min** Installation opening (3) mm	**C min** Opening width (4) mm	**L min** Opening length mm	**T min** Opening depth below pip invert mm
100	1000	830	350	260 x 230	350	300	500	40
150	1000	830	375	310 x 260	400	350	500	40
200	1100	830	400	360 x 290	450	400	500	40
250	1200	880	425	410 x 320	510	450	500	40
300	1300	930	450	460 x 360	570	500	600	40
350	1400	980	500	560 x 390	670	600	600	40
400	1500	1030	525	610 x 430	730	650	600	40
450	1600	1080	575	660 x 470	800	700	600	40
500	1700	1130	600	720 x 510	860	750	600	40
550	1900	1180	675	870 x 590	1030	900	600	70
600	2100	1230	725	920 x 620	1090	950	800	70
650	2200	1280	750	970 x 660	1150	1000	800	70
700	2400	1330	775	1030 x 730	1230	1050	800	70
750	2500	1380	950	1080 x 770	1300	1100	800	70
800	2600	1430	900	1130 x 830	1350	1150	800	70
850	2700	1480	925	1180 x 880	1420	1200	800	70
900	2800	1530	950	1230 x 930	1470	1250	800	70
950	2900	1580	975	1280 x 980	1540	1300	800	70
1000	3000	1630	1000	1330 x 980	1600	1350	800	70

1) If possible, for devices from DN 500 a mounting hole above the device should be provided.

2) Axis centre spacing E_{min} as shown in table between SWDS and separate emergency valve

SWDS 100 to SWDS 400	in combination with emergency valve DN 200
SWDS 450 to SWDS 550	in combination with emergency valve DN 250
SWDS 600 to SWDS 700	in combination with emergency valve DN 300
SWDS 750 to SWDS 1000	in combination with emergency valve DN 400

3) Installation opening without step iron.

4) A cutout n profiled concrete must be provided only if the profile concrete is installed before the mounting of the SWDS:

7.0 Discharge opening / Wall opening / Outgoing pipes

The diameter of the discharge opening must be at least equal to the diameter of the SWDS. Larger discharge openings are of course possible, as the base design of the SWDS can be adapted to larger outgoing pipe diameter (specify when ordering necessarily).

8.0 Operating Description

8.1 Installation

The Float operated valve SWDS is principally installed upstream, therefore in the storage area of the regulated medium (rain water, combined sewage, etc.). The conditions for orderly apparatus function are: a perpendicular mounting on the basin wall and/or shaft, an axial inflow with a well-formed dry-weather flume and sufficiently large flow incline, as well as a good access to the actuation grip for the manual opening of the flow measuring section (manual device).

8.2 Dry-Weather Flow

As the following illustration of a SWDS shows, by dry weather flow, the valve plates are in their normal position therefore leaving the round flow measurement section mostly free. Likewise, the float is found in its normal position.

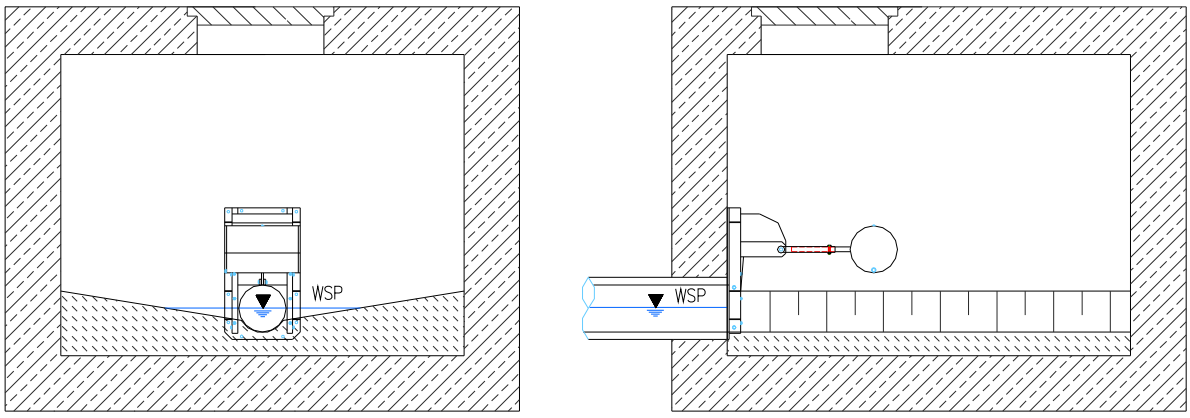
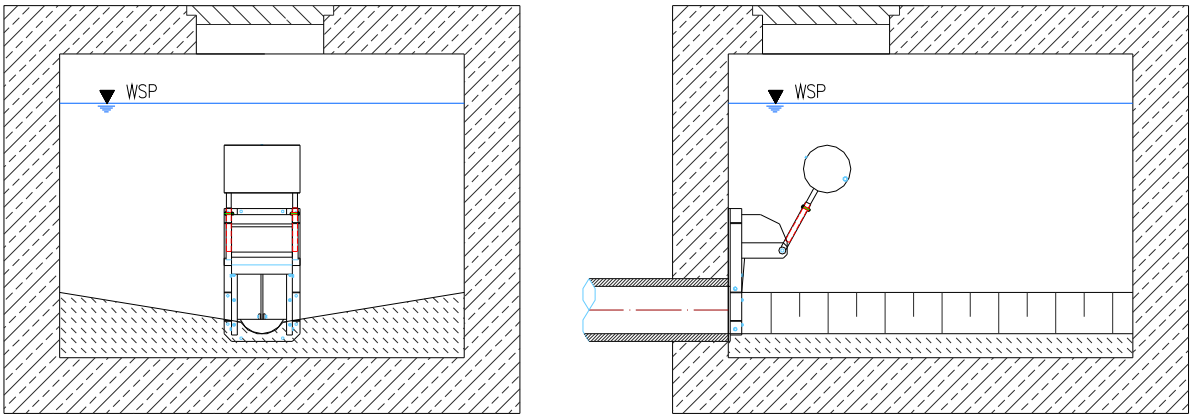


illustration No. 2

9.0 Storm flow

As a result of storm activity and a quantity of combined sewage storm water flowing into the system which exceeds the hydraulic capacity of the SWDS transmission profile, there will be an avoidable back up in the SWDS chamber. If the storage water level reaches the float, regulation begins. As the float rises the valve plate sinks, so that the flow rate is reduced. Transfer of the float movement to the valve plate results with the aid of internally designed mechanics. Thereby the upwards directed float movement converts to a downwards directed valve plate movement.



10.0 Various Control Concepts

The SWDS can be delivered in two different control concepts:

a) Apparatus construction **with flush thrust**

b) Apparatus construction **without flush thrust** (diaphragm)

In its basic version the SWDS-Float operated valve is delivered as a so-called "Flush-Thrust-Apparatus". In this version the specific flow regulation first begins when, the stored water stands at 10 cm over the apex of the flow section. Up to this point the mixed sewage flows uncontrolled through the SWDS whereby a flush thrust can be produced. The flush period is dependent upon the inflowing quantity of mixed water and can last between a few seconds and several minutes. The advantages with the flush thrust is that flushed solids can flow with the mixed sewage through the full SWDS opening, minimizing danger of blockage.

The disadvantages of the flush thrust lie in the fact that canal systems and respectively equipment sturdiness can be overloaded hydraulically by SWDS, as is the case during real flow regulation. Should these areas not be able to handle the hydraulic overload, a so-called *diaphragm* must be placed onto the SWDS. The flow opening is reduced by the **diaphragm**. If there is now rain activity, the resulting flow quantity of back-water will be greatly reduced leading to low level rated values and the described flush thrust can be avoided.

Nevertheless: The diaphragm has a disadvantage of being sensitive to blockage during dry-weather flow or at the start of rainy weather because of a smaller flow diameter.

11.0 Selection

The dimension of the valve depends on the outlet flow. If your desired flow rate can be handled by more than one unit select the smaller model. When selecting a model it is important to consider the potential for blockages therefore the larger the gap, between the gate plate and the base of the outlet, the lower the risk of blockage.

Unit DN	Max. water level up to	Outlet flow	Contents
100	1,0 m	2 – 10 l/s	rain water
150	1,0 m	8 - 26 l/s	rain water
200	1,0 m	10 - 48 l/s	rain-/waste water
250	1,5 m	20 - 82 l/s	rain-/waste water
300	1,5 m	35 - 128 l/s	rain-/waste water
350	1,5 m	60 - 185 l/s	rain-/waste water
400	2,0 m	80 - 256 l/s	rain-/waste water
450	3,0 m	140 - 340 l/s	rain-/waste water
500	3,0 m	210 - 438 l/s	rain-/waste water
550	3,0 m	300 - 550 l/s	rain-/waste water
600	3,0 m	370 - 680 l/s	rain-/waste water
650	3,0 m	450 - 820 l/s	rain-/waste water
700	3,0 m	540 - 990 l/s	rain-/waste water
750	3,0 m	650 - 1170 l/s	rain-/waste water
800	3,0 m	760 - 1370 l/s	rain-/waste water
850	3,0 m	890 - 1590 l/s	rain-/waste water
900	3,0 m	1020 - 1830 l/s	rain-/waste water
950	3,0 m	1170 - 2090 l/s	rain-/waste water
1000	3,0 m	1330 - 2400 l/s	rain-/waste water

12.0 Various Float position

The Float operated valve SWDS can be delivered in three different float concepts:

a) Float in front of the control body

b) Float to the left of the control body

c) Float to the right of the control body

With this options of installation it has a wide range of flexibility due to different building dimensions.

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