

Float/Slide valve throttle

APA-SSD

APA

Umweltschutztechnik in Edelstahl
Abwassertechnik - Stahlwasserbau

The functional development
for controlling discharges

NEW
With control disk (on S2) for
maximum discharge precision

A discharge controller for:

Rain overflow tanks

Sewer storage chambers

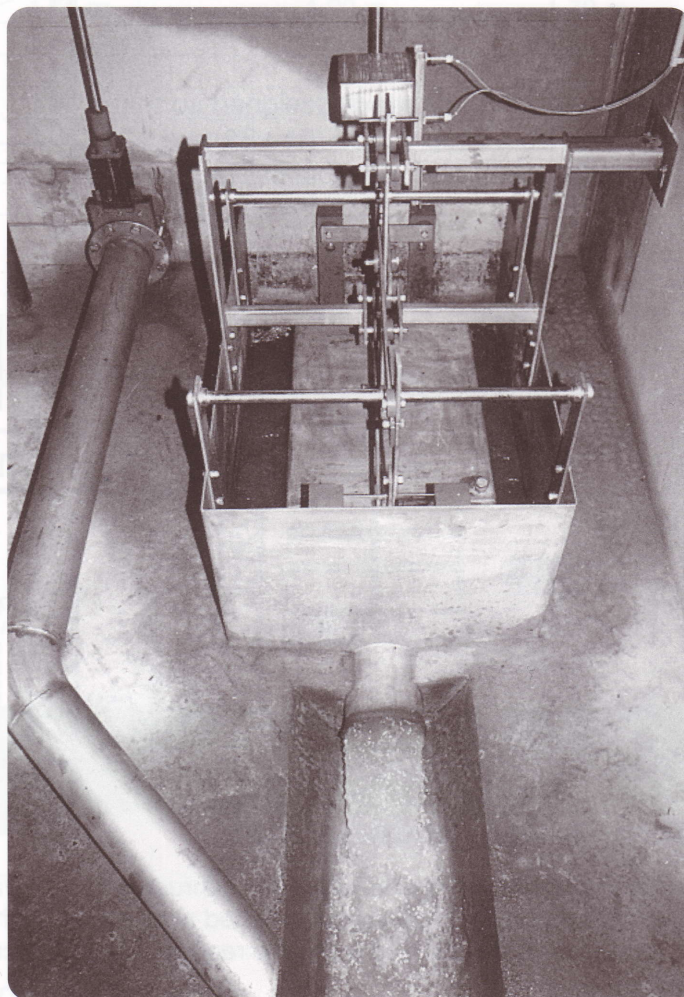
Retention chambers

Rain overflows

Sewage farm supplies

APA Abwassertechnik has launched a modern solution for controlling discharges from mixed water sewage systems and rain retention chambers – the float/slide valve throttle in a new design to act as a throttle or control device for rain overflow tanks, sewer storage chambers, retention chambers, rain overflows and sewage farm supply systems.

A large number of systems which are already in use confirm that this throttle organ which we have developed is not only a modern, technically sophisticated and proven throttle system, but also that it offers some major advantages over classic throttle methods.



Patent DE 3108 440 C2

Convincing advantages:

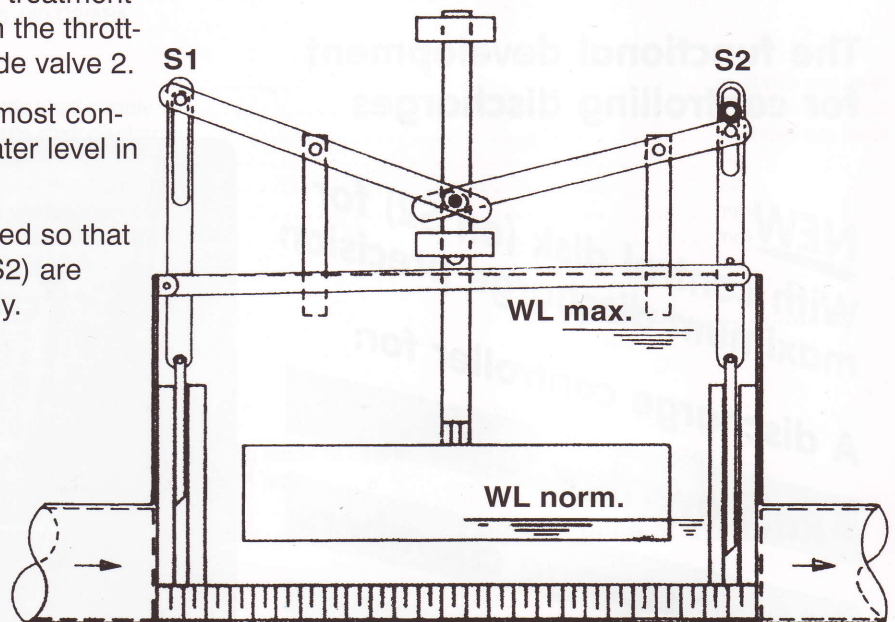
- Not height difference is required.
- The throttle organ is fully automatic and eliminates relocations on its own.
- You save energy costs since no power connection is required.
- The throttle organ offers a constant nominal flow rate and ensures high control accuracy even in the event of a blockage.
- Only one control shaft is required.
- The nominal discharge volume can be changed even retrospectively without any problem.
- Connection to remote control systems is

The basic concept

Slide valve 1 is designed to pre-throttle the arriving water volume from the rainwater treatment plant so that the control water level in the throttle tank is kept almost constant for slide valve 2.

Slide valve 2 therefore controls an almost constant nominal discharge using the water level in the throttle tank.

The float/slide valve throttle is designed so that blockages in both slide valves (S1+S2) are identified and eliminated automatically.



The function principle

In **dry weather** the water level is below upthrust range of the float. Slide valve 1 is therefore opened at its maximum level and slide valve 2 is set to the required nominal discharge.

In **rainy weather** the water level in the throttle tank rises. The float now controls the two slide valves which control the required supply and the nominal discharge from the throttle tank.

In the event of a **retention** of up to 50 cm a differential water level to the retention level forms in the throttle tank. The design discharge is adjusted by the float using slide valve 2.

In the event of a **heavy retention** over 50 cm, slide valve 2 opens to the full throttle cross-section. The design discharge is now kept constant using slide valve 1.

Elimination of slide valve blockages

Blockages on the slide valves are eliminated automatically. This is achieved as follows:

If there is a blockage on slide valve 1 the water level falls, which results in slide valve 1 being reopened by the weight of the float. If there is a blockage on slide

valve 2, the water level rises in the throttle tank. The float then actuates the blockage lever and reopens the full cross-section of slide valve 2.

Discharge curve and control accuracy

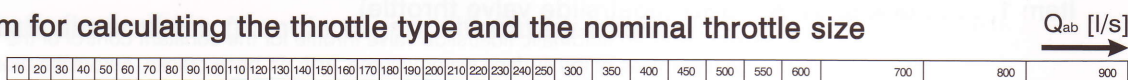
The water level in the throttle tank is the main factor for all nominal discharge volumes. The discharge curve is therefore approximately the same for all nominal discharges. The control accuracy for a discharge volume of > 35 l/s is a maximum of $\pm 3.5\%$ of the nominal discharge volume. Below 35 l/s the maximum control tolerance is ± 1.0 l/s.

Remote control equipment

Control slide valves S1 and S2 are moved to specific discharge settings using a servo drive with a threaded spindle. This may be controlled from inside the throttle shaft or using a control line from a central control room.

Technical data

The design diagram for calculating the throttle type and the nominal throttle size



DN 150

DN 200

DN 250

DN 300

DN 350

DN 400

DN 500

DN 600

DN 700

The design discharge rate and the maximum pressure head are used as a basis for calculating the throttle type.

The installation sizes

The installation sizes of the standard sizes DN 150 to DN 700 are shown in the table below. The connection to the throttle tank takes the form of a wall pipe or an F-piece with a wall plate.

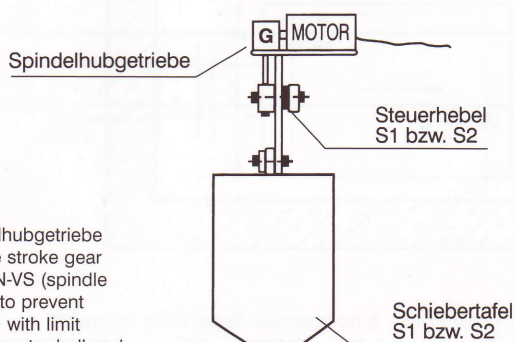
Calculation using IT

The control routes and lever forces are calculated using an IT program we have developed which incorporates all the measurement results obtained to date. The final adjustment is carried out on the throttle test bed. A precise discharge diagram is produced using a water volume measurement system.

Nominal throttle size	Throttle type		Throttle tank dimensions				Control water level in throttle tank		Application
		Length	Width	Top of housing	Max. top of rod = Min. shaft depth	h min.	h max.	Control of	
		L mm	B mm	H1 mm	H2 mm	mm	mm		
DN 150	1	1300	850	830	1600	150	400	Fresh water	
DN 200	2	1300	850	830	1600	200	450	Fresh water/Wastewater	
DN 250	3	1300	850	830	1600	200	450	Fresh water/Wastewater	
DN 300	4	1500	900	900	1800	250	500	Fresh water/Wastewater	
DN 350	5	1500	900	900	1800	250	500	Fresh water/Wastewater	
DN 400	6	1500	900	900	1800	350	600	Fresh water/Wastewater	
DN 500	7	1500	1000	1000	2000	350	600	Fresh water/Wastewater	
DN 600	8	1500	1000	1000	2000	400	650	Fresh water/Wastewater	
DN 700	9	1750	1000	1150	2200	450	700	Fresh water/Wastewater	

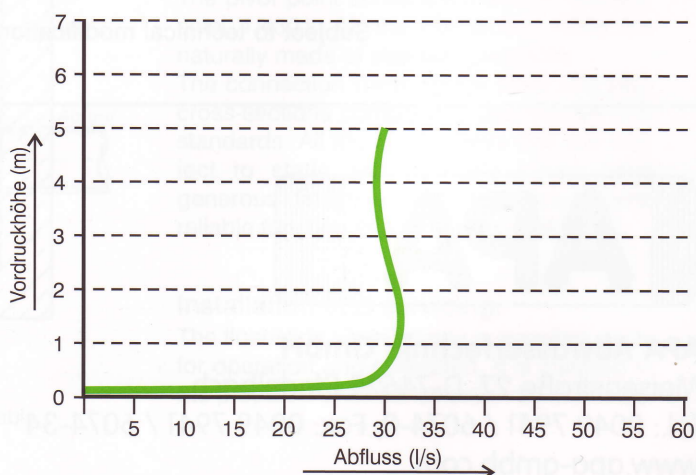
Remote control equipment

Spindle stroke gear for adjusting the discharge volume on control slide valves S1 and S2.



Spindelhubgetriebe
Spindle stroke gear
series N-VS (spindle
locked to prevent
torsion) with limit
switch, motor bell and
spiral spring cover SF.

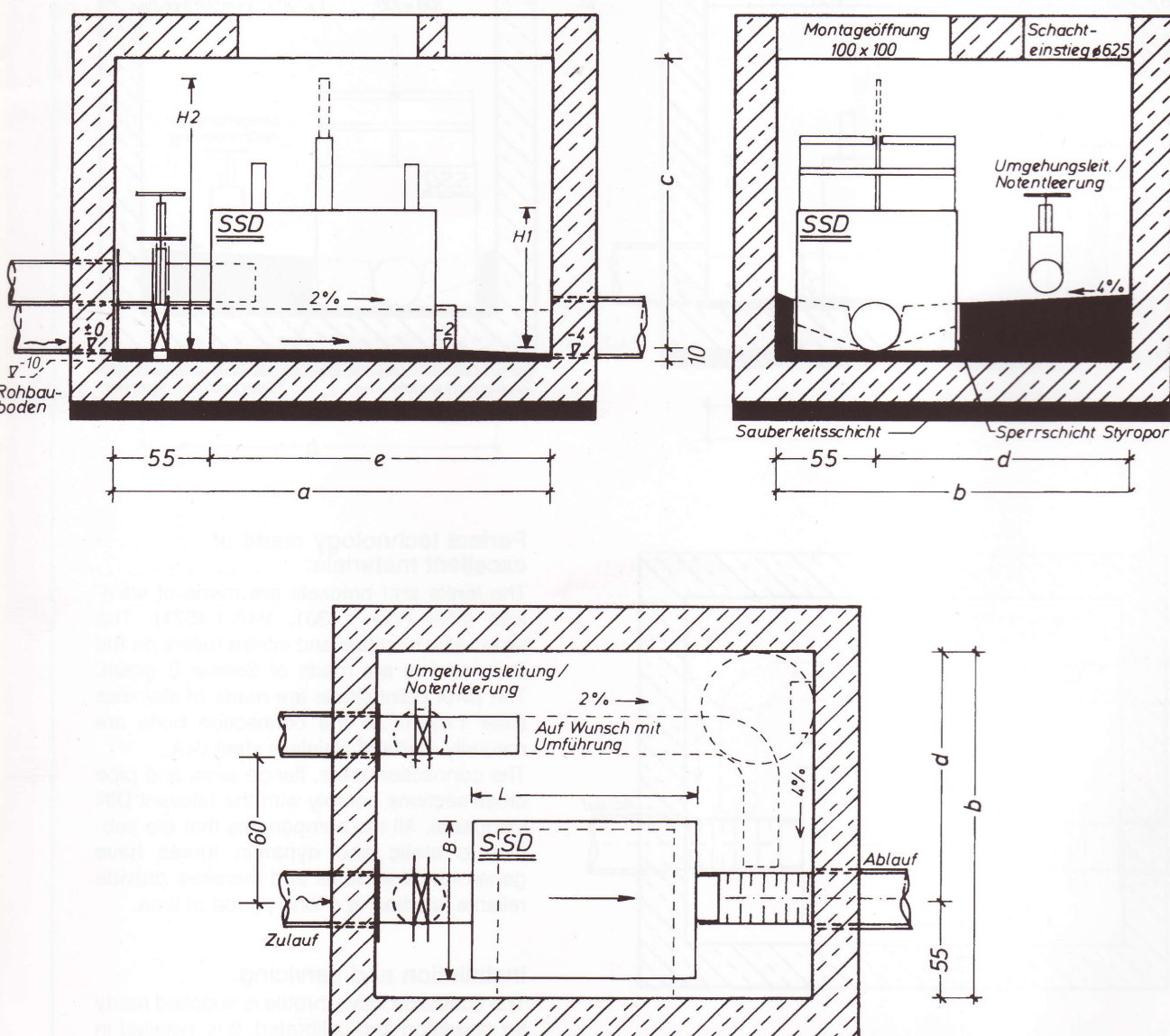
Discharge curve



Throttle shaft dimensions (throttle organ without by-pass)

Nominal throttle size	a	b	d	e
DN 150	2,50 m	2,00 m	1,45 m	1,95 m
DN 200	2,50 m	2,00 m	1,45 m	1,95 m
DN 250	2,50 m	2,00 m	1,45 m	1,95 m
DN 300	2,75 m	2,00 m	1,45 m	2,20 m
DN 350	2,75 m	2,00 m	1,45 m	2,20 m
DN 400	2,75 m	2,00 m	1,45 m	2,20 m
DN 500	2,75 m	2,25 m	1,70 m	2,20 m
DN 600	2,75 m	2,25 m	1,70 m	2,20 m
DN 700	3,00 m	2,25 m	1,95 m	2,45 m

Dimensions in cm

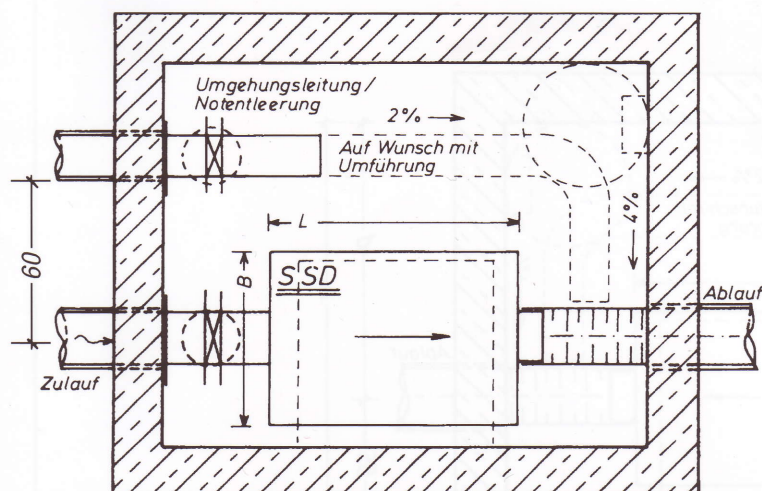
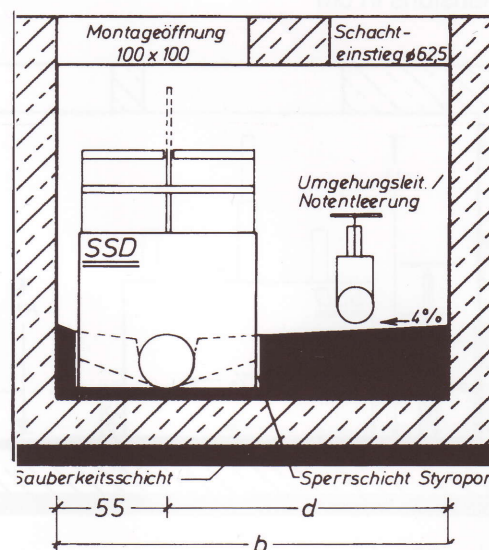
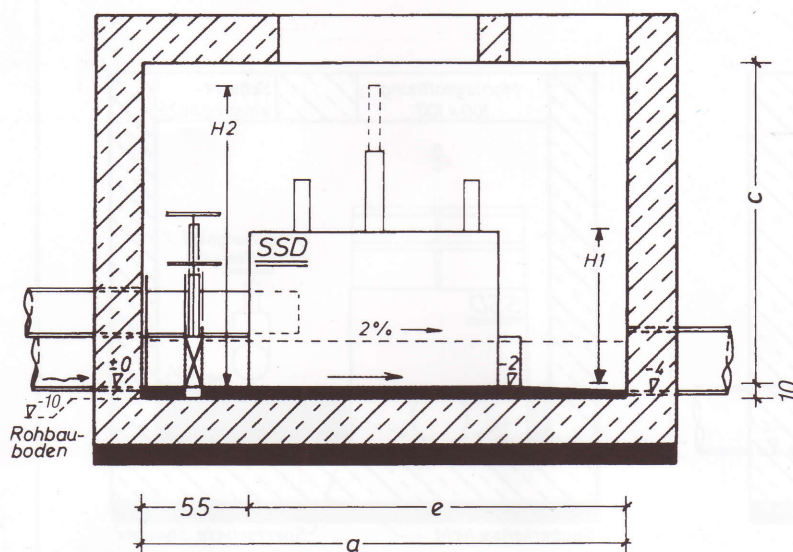


The profile concrete is to be inserted after the throttle installation.

Throttle shaft dimensions (throttle organ without by-pass)

Nominal throttle size	a	b	d	e
DN 150	2,25 m	1,75 m	1,20 m	1,70 m
DN 200	2,25 m	1,75 m	1,20 m	1,70 m
DN 250	2,25 m	1,75 m	1,20 m	1,70 m
DN 300	2,50 m	1,75 m	1,20 m	1,95 m
DN 350	2,50 m	1,75 m	1,20 m	1,95 m
DN 400	2,50 m	1,75 m	1,20 m	1,95 m
DN 500	2,50 m	1,75 m	1,20 m	1,95 m
DN 600	2,50 m	1,75 m	1,20 m	1,95 m
DN 700	2,75 m	1,90 m	1,35 m	2,20 m

Dimensions in cm



Minimum shaft depth (dimension c – regardless of version):
Type 1-3 = 1.6 m; type 4-6 = 1.8 m; smaller dimensions available to order.

Perfect technology made of excellent materials:

The tanks and brackets are made of stainless steel (V2A-1.4301, V4A-1.4571). The slide valve sections and centre rollers on the float holders are made of Solidur S green. The pivot point shafts are made of stainless steel 1.4301. All the connection bolts are naturally made of stainless steel V4A. The connection parts, flange sizes and pipe cross-sections comply with the relevant DIN standards. All the components that are subject to static and dynamic forces have generous dimensions and therefore provide reliable function of a long period of time.

Installation and servicing:

The float/slide valve throttle is supplied ready for operation and calibrated. It is installed in the prepared shaft construction by our fitters.

Tender text

Item 1, unit(s) APA – SSD (float/slide valve throttle)

Supply and install an automatic float/slide valve throttle for the constant control of the discharge regardless of the surface water volume, with no base cracks, automatic blockage elimination, including factory adjustment to the nominal discharge rate.
Patent No. DE 3108 440 C2/APA

Technical data:

Max. water level m above sea level
Base height of throttle shaft supply m above sea level
Base height of throttle shaft discharge m above sea level
Dry weather discharge l/s
Design discharge (Qab constant) l/s
Diameter of throttle shaft supply line mm
Diameter of throttle shaft discharge line mm
Material (stainless steel V2A or V4A)

at a price of€

Item 2, unit(s) Throttle shut-off slide valve

Supply and install a plate slide valve, housing made of cast iron, slide plate made of stainless steel, including gaskets, hand wheel and V2A bolts,

DN

at a price of€

Item 3, unit(s) APA WA (wall connector)

Supply and install a wall connector, with flange and fastening parts.
Material (stainless steel V2A or V4A)

DN

at a price of€

Item 4, unit(s) APA NE (emergency discharge)

Supply and install an emergency discharge, consisting of a wall connector with flanges and fastening parts, pipe sections, including plate slide valve as in Item 2.
Material (stainless steel V2A or V4A)

DN

at a price of€

Item 5, unit(s) APA SV (spindle extension)

Supply and install a spindle extension with fastening parts.
Material: stainless steel V2A, with control wrench

For Item 2 length approx. mm

For Item 4 length approx. mm

at a price of€

Subject to technical modifications.



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Vertretung