

PurewaterGroup



PENSTOCKS - STOPLOGS - WEIRS - CONTROL GATES
FOR WATER & WASTEWATER TREATMENT SYSTEMS

INTRODUCTION

PUREWATER SYSTEMS Ltd. and its associate manufacturing partners in UK and Europe have long experience in the design, fabrication and supply of pentsocks, gates, stoplogs, weirs and other hydraulic control equipment to the water and effluent treatment industry, as well as to the irrigation and water resources sector.

Purewater hydraulic control equipment have been installed in numerous water and wastewater treatment plants in Europe, the Near East, Africa, for several decades, with the Middle East being of special focus, supplied mainly to local project contractors and/or to provincial municipalities.

We advise on type, materials of construction, and mode of drive operation of equipment, based on process requirements, site conditions and effluent characteristics.

We also comply with client consultant specifications when required, follow codes and standards when stipulated, or apply the latest industry guidelines within the European Community, as well as to relevant AWWA, complying with specific BS-EN, ISO, DIN, ASTM equivalent codes, covering design, materials, fabrication and testing, in addition to maintaining internal QA & QC procedures of high order.

Furthermore, certificates of EU, UK, USA or other origin are provided with equipment supply, depending on manufacturing location and specific equipment type.

Third-party inspection of goods through SGS, Bureau Veritas, Lloyds Register, or similar accredited agencies of choice are available to prospective clients for added quality and compliance guarantee.



Types of Penstocks & Gates

[diagrams courtesy of Penstocks.de]



Handstop - stsg



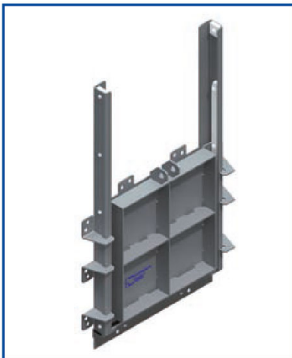
Channel Penstock - rig



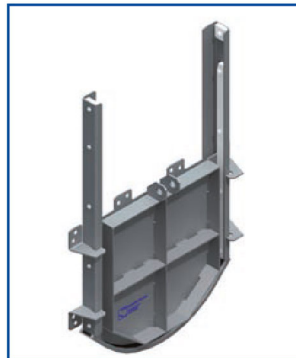
Channel Weir Penstock - ari



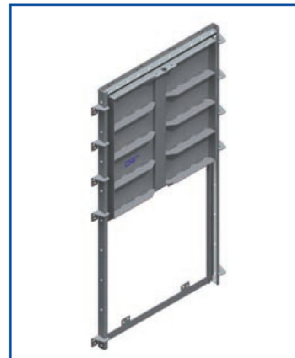
Channel Penstock w/slide rails - rig



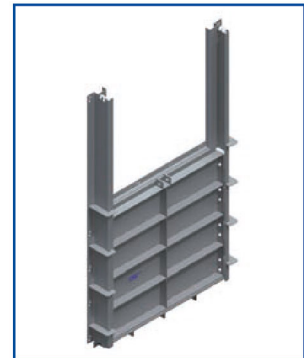
Slide Penstock - aspg



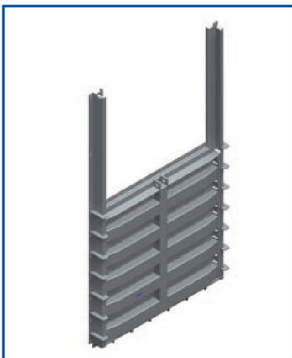
Round-sill Penstock - aspg



Weir Penstock - abs



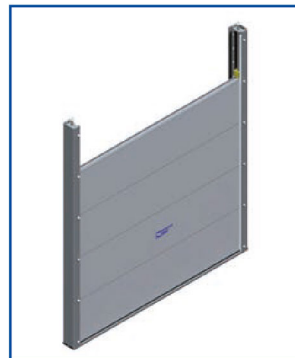
Slide Penstock w/slide rails - aspla



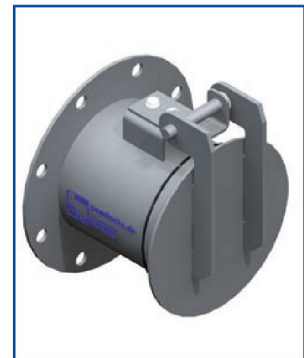
Slide Penstock with slide rails > 2000 x 2000 - aspla



Tilting-flap Spillway



Stop Log



Flap Valve

PENSTOCKS / SLUICE GATES

Penstocks are also termed as sluice gates that are employed for controlling or regulating hydraulic flow streams (both influent & effluent) traversing within channels, or for inflow & outflow control from basins, reservoirs and wetwells. They are normally anchored to internal-external walls of chambers, or placed inside canals on side frames, to open/close / or regulate hydraulic flow. Normally penstocks are designed for open and close operation. Other gate designs are available for flow regulation with rising or tilting flap doors (see below)



The **PUREWATER** slide penstocks comprise of a sturdy door or gate, fabricated in various grades of steel (AISI-304L, -316L stainless steel / ASTM A276, or CS ASTM A36/53 either hd-galvanized, or epoxy tar coated), or in special materials when specified, suitably reinforced according to size, location and hydraulic pressure exerted on it. The gate slides on lateral guides on a sturdy frame, anchored to the wall face, or to canal sides & floor recess.

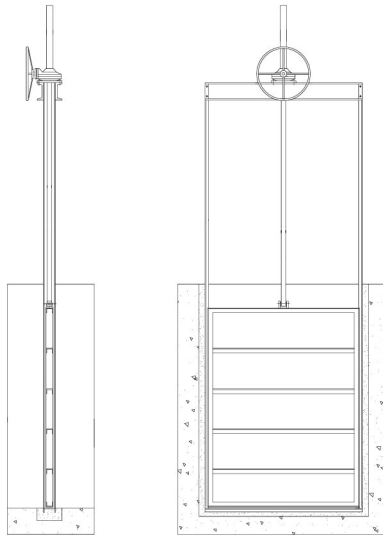
Movement is effected by means of threaded steel spindle, either rising or fixed type, extended and connected to a drive operator, supported by a floor mounted steel pedestal. The operation may be either manual via handwheel coaxial to the threaded end rod (without gear reduction) for smaller gates, or via handwheel orthogonal to the rod centerline with geared reduction drive, through conical gears for heavier gates.

For remote or automatic operation of the sluice gates we provide electric or pneumatic drive actuation fitted with motorised gear reduction, or connected directly to the threaded rod for lighter gates. Sealing of gate and frame is ensured by durable hard Neoprene rubber seals, Nitrile, or other, with steel wedges on closing.

Note: Upon specific client request, penstock control may also be available with hydraulic power pack, or pneumatically with compressed air and hydraulic ram.

CHANNEL PENSTOCKS

These are typical penstocks with 4-sided frame anchored to base and side walls of channel, with lighter reinforced gates when compared to deeper wall mounted slide gates, yet still subject to channel width and height, along with hydraulic flow characteristic.



The drive operator, whether manual or motorised, is normally mounted on the upper support frame, accessible from a steel or concrete walkway.

Options for materials of construction are similar to the slide penstocks detailed above.

ADJUSTABLE LEVEL GATES

PUREWATER's adjustable level penstock gates are designed to control the flow coming from a fixed tank level.

They may operate on tank surface (lowering the door), or on tank bottom (raising the door).

From a manufacturing point of view the door is similar to the normal penstock, and the control is done via manual handwheel or controlled by a level measurement device, or similar. In this case motorised actuators will be used to operate on a signal coming from a level measuring instrument.

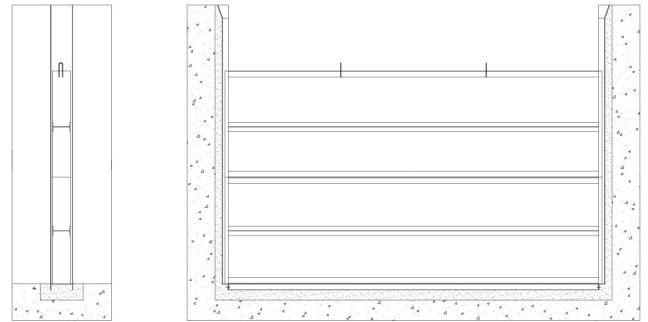


STOPLOGS

PUREWATER stop-logs are used generally to shut off or isolate channels, or to direct flow in channels, such as during periods of plant maintenance. The stop-log door and the accompanying side support frames are fabricated in various steel grades of stainless, hd-galvanized carbon steel, aluminium, or thermoplastic materials, originally also of treated timber.

They may consist of one or more pieces of gate or door panels, with adequate total height to seal off channel flow (i.e. set above the TWL), fabricated with special edges that slot into each other, and equipped with high molecular weight PE seals.

Lifting lugs are positioned on door panel for easy positioning and hoisting, plus an optional lifting beam and overhead gantry hoist as additional option. Several door panels may be employed, lying one above the other in large deeper channels.



Small single piece doors, better known as handstops, can be supplied in various materials for flow control of irrigation channels, and as isolation gates in sludge drying beds.

A V-notch can be cut out in the center of the upper edge of stoplog doors or stops for flow measurement purpose.



Stainless steel stop log

RADIAL GATES

These type of control gates comprise of a single, generally round-shaped door (although other shapes can be made to suit specific site), which is secured to one or more arms to a center pivot.

The door rotates around an outflow opening, making radial gates suitable to operate on large dimensioned channels.



Materials of fabrication are normally epoxy coated carbon steel /hd-galvanized, or optionally grades of stainless steel.

The drive system is normally hydraulic and may be operated upon a measured signal from a controller, such as level measuring device, or similar. The movement mechanism may also be of the traditional mechanical type with stems and gears.

There is also the option of using these gates to maintain a specific water head upstream, which is achieved by adjusting the position of the door to maintain flow at required rate.

FLAP GATES

A further application of the above type of gate or door movement may be exploited in fixing the pivoting point to the bottom of the channel, so that the penstock will operate like an adjustable weir.

The type of drive and control signal may be similar to the one used for radial gates, acting in similar manner.

PIVOTING DOOR WEIR

A variation of the pivoting door mechanism is applied in the manufacture of our hydraulic flow weirs, where the pivoting arm is fixed to the base of the longitudinal gate or door, in channel floor, to operate like an adjustable weir.

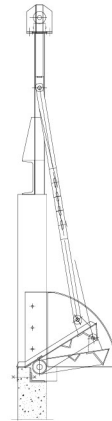
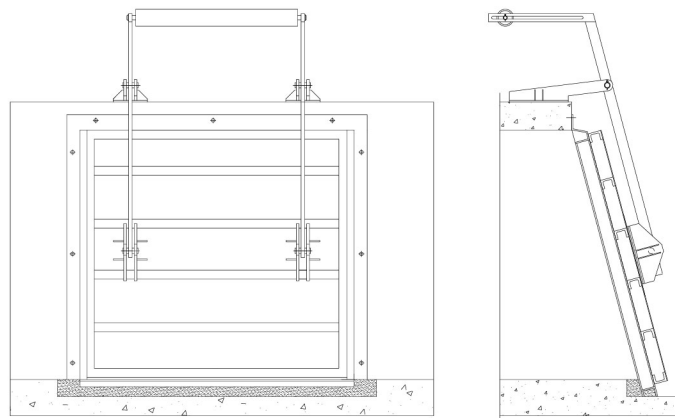


Photo and Sketch of Pivoting Door Weir

The drive operation and control system is similar to other other hydraulic weir and gates, while materials of construction are normally in various grades of stainless steel of choice, or alternatively in carbon steel, either hd-galvanized, or epoxy tar coated.

FLOW CONTROL PIVOTING GATE/ “CLAPET PENSTOCK”

The pivoting type door or gate penstocks are generally located at outlet of enclosed channels or effluent conduits, inclined in direction of flow, to open on hydraulic flow pressure and to shut on a weighted pivoting arm attached behind the gate. Hence, they function as a flow control system, allowing movement of flow in one direction only, i.e. during the open phase.



Clapet – Pivoting door type clapet penstock

Materials of construction are normally in carbon steel either hd-galvanized or epoxy tar coated, and alternatively in choice of stainless steel grades. The sealing is effected by the inclined door weight on a metal frame embedded in the concrete, while for large ‘clapet” type gates a balancing ballast is used to facilitate penstock opening.



Operating pedestals, or headstocks, for manual and/or actuated service

TELESCOPIC SLUDGE VALVE / TSV

The Purewater Systems Telescopic Valve is a standard desludging valve used with sedimentation /clarifier basins, or employed as liquid level control to regulate water levels in basins, or to decant surface fluids.

The unit basically comprises of two cylindrical tubes that slide vertically inside each other to create a differential in height to control the upper liquid level within the adjoining basin. The TSV is robust in construction and simple in operation, and is virtually maintenance-free.

The upper tube, which has a weir lip (or option with flared top for decanting scum) and is connected to a vertical threaded spindle and a gear assisted operator and hand-wheel, (or crank), telescopes in and out of the slightly larger diameter column, via a Neoprene, or UHMWPE guide seal; and by adjusting the height of the inner tube, the weir at the surface lets the overflow liquid to drain out downwards through the centre pipe, to the exterior pit.

Option for non-standard 304 / 316 stainless steel construction, as well as remote automation via electric or pneumatic actuators, should be specified or requested by client at the outset.



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