

PENSTOCKS



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PENSTOCKS

GENERAL DESCRIPTION and INTENDED USE

Penstocks are used to control, to direct or the flow water flow with intervention. They are designed with different dimensions according to the water load to be carried and the place to assemble.



WORKING PRINCIPLE OF EQUIPMENT

Penstocks work based on the principle which a moving cover stops the flow of the water by applying pressure to the gaskets on a fixed frame. Moving cover is moved in a horizontal direction with a drive mechanism and shaft system, so that the cover is opened and closed.

In weir type penstocks, when the moving cover is down, water flows on the moving cover. In this type of covers, when the moving cover is adjusted to the top level, water flow is stopped. Weir type penstocks are mostly preferred for distribution structures requiring flow rate adjustment or units requiring water level adjustment. In other penstock types, when the moving cover is up, water flows under the moving cover. These covers are opened as moved upward.

TECHNICAL SPECIFICATIONS

- All penstocks are manufactured to provide suitable sealing in accordance with ANSI/AWWA C561 standards.
- They are manufactured with elevating shaft to provide easy intervention and maintenance.
- According to sealing type, it is manufactured with gaskets from 3 or 4 edges.
- According to the assembly depth, they are manufactured as short frame or long frame.
- They are manufactured as channel assembly and wall assembly according to assembly location.
- It is manufactured as manual remote control, electrical actuator or pneumatic actuator drive mechanism according to customer's request and using location.
- Sealing pressure logs and gaskets are selected according to the process of cover operation.
- It is manufactured to provide opportunity to change sealing pressure adjustment.
- Safe tension and portion values are calculated by taking maximum water load on the cover and operation conditions into account. Penstocks are designed and manufactured according to this calculation.
- As all penstocks are designed according to detailed resistance calculation, material thickness and sizes are selected in an optimum level.
- To facilitate manual use of the cover and to open and close easily, a special design bearing group with double line bearing is used under the flywheel group.
- According to customer's request, electrical actuator models are coupled to the covers to have various communication protocols. Upon request, position of the penstock is monitored and controlled with the aim of information obtained from the actuator.
- As a standard, electrical actuators of all penstocks are selected in a way to move the moving cover with a speed which does not damage the gaskets.
- In accordance with the customer's request and process selection, pneumatic actuators are selected to be equipped with accessories providing to monitor and control limit or position of the actuators.

- Penstocks with 1800 mm width and above are generally manufactured as double-shaft.
- As a standard, all penstocks are equipped with polycarbonate shaft protection tubes to prevent any damage caused by environmental conditions such as dust, raining etc.
- Penstocks of which shaft twisting is calculated before design are designed and manufactured to have interim bearing preventing shaft twisting. It is selected according to interim bearing process.
- Long frame penstocks are manufactured to be minimum 1100 mm above walkway platform level as they provide easily intervention opportunity to the drive group and act as guardrail.
- All actuators are selected according to resistance and torque calculations.
- Manual controlled double-shaft penstocks are equipped with gearbox systems according to the technique to transmit drive to both shafts with the aim of a single flywheel.



No	Part Name
la	Shaft Protection Tube
1b	Drive Mechanism
2	Shaft
3	Frame
4	Gasket
5	Pressure Adjustment Log
6	Moving Cover
7	Wall Assembly Bracket
8	Press Overload Control Log

ADVANTAGES

- Economical and Resistant Design,
- Manufacturing in Several Dimensions,
- Suitable for Outdoor Operation,
- Long Operation Life,
- Directing Water,
- Easy Maintenance and Low Maintenance Costs,
- Possibility to Tracking and Check the System Operation over SCADA,
- Maximum Impermeability.





Electrical Actuatared

Pneumatic Actuatared

Manual

No	Part Name
la	Shaft Protection Tube
1b	Drive Mechanism
2	Mounting Bench
3	Shaft
4	Interim Bearing
5	Frame
6	Gasket
7	Moving Cover
8	Pressure Adjustment Log
9	Press Overload Control Log

ACCESSORIES

- Pressure Adjustment Log
- Overload Control Log
- Overload Bronze Control Log*
- Polycarbonate Shaft Protection Tube*
- Pneumatic Actuator*
- Electrical Actuator*
- Online Position Monitoring and Control System*
- Local Power and Control Panel*
- * Optional accessories are defined.



Material Details

- Frame: They can be manufactured as DIN
 1.4301 (AISI 304) or DIN
 1.4401 (AISI 316).
- Shaft: They can be manufactured as DIN 1.4301 (AISI 304) or DIN 1.4401 (AISI 316).
- Mounting Bench: They can be manufactured as \$235JR + Hot Dipping Galvanized Coating, \$235JR + Epoxy Paint, DIN 1.4301 (AISI 304) or DIN 1.4401 (AISI 316).
- Moving Cover: They can be manufactured as DIN 1.4301 (AISI 304) or DIN 1.4401 (AISI 316).
- Pressure Adjustment
 Log: It is manufactured from Castermid or
 Polyethylene.
- Overload Control Log: It is manufactured from Castermid, Polyethylene or Bronze.
- Sealing: It is manufactured as EPDM or Neoprene.
- Shaft Protection: Provided with polycarbonate tube.

"Different materials can be preferred in accordance with the request of the customer."

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