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Typical Specifications

Stainless Steel Channel Penstocks

TESACO H10-020, 021, 030, 032, 033, 035 - series

1. General Conditions

1.1 Scope

This section applies to stainless steel Channel Penstocks and its appropriate operating equipment.

1.2 Applicable standards

All Channel Penstocks and its appropriate operating equipment shall be conform to the requirements of DIN ISO 19569-4 and BS 7775 standard - latest edition, except as modfied or supplemented herein.

1.3 General

All equipment provided under this section shall be produced, assembled and installed in proper operating condition in full conformity with the drawings, specifications, engineering data, installation, operating and maintenance instructions of the manufacturer unless exeptions are agreed.

Channel Penstocks and its appropriate operating equipment shall be supplied including all accessories indicated on the drawings and specifications or otherwise required for a complete, properly operating installation. It shall be the latest standard product of the manufacturer regularly engaged in the production of fabricated Channel Penstocks.

Channel Penstocks supplied under this section shall be H10-020, 021, 030, 032, 033, 035 - series as manufactured by TESACO-TECHNIQUE GmbH, Germany.

1.4 Submittals

The manufacturer shall submit to purchaser for approval the installation drawings indicating the main dimension and material specification used for the Channel Penstocks.

1.5 Quality Assurance

The manufacturer shall show evidence of experience for the production and installation of Channel Penstocks for at least 10 years.

All Channel Penstocks shall be inspected in the factory before shipping. The result shall be recorded in a Inspection Report (Certificate).

The manufacturers welders shall be qualified and certified to meet the requirements of DIN EN 287-1 - latest edition.

2. Product

2.1 Channel Penstocks

2.1.1 General Design
A Channel Penstocks is a vertically sliding valve and used inside or at the end of a open channel and has a 3-face (left, right and bottom) sealing. It shall be either self-contained or non-selfcontained and raised and lowered by either rising spindle or non-rising spindle.

2.1.2 Frame
The frame shall be designed to be grouted in channel recesses or wall fixed inside the channel or wall fixed in front of the channel via anchor bolts and shall be of open top or closed top type. The frame shall be designed to cause no obstruction (only in case of grouting in recesses and wall fixing in front of the channel) to the flow and shall have flush-bottom invert.

The replacement of the side- and bottom seals shall be possible without removing the frame from the civil structure.

2.1.3 Door
The door shall consists of a flat plate reinforced with ribs, designed for high impact. The number of reinforcing ribs will vary according to the specific design head and size requirements.

2.1.4 Sealing
The side sealings shall be of resilient rubber in double-lip type to ensure self-adjustment under design water head.

The bottom sealing shall be of resilient rubber in flat type inside the frame bottom pocket to ensure the flush-bottom.

2.1.5 Yoke
Closed top frames (self-contained penstocks) shall be equipped with a yoke made of structural formed plates and designed to withstand the lifting forces under max. design head.

2.2 Operating Equipment

2.2.1 Spindle and Spindle Nut
The spindle shall be either rising or non-rising type in stainless steel and shall be of trapezoidal, machined cut thread.

Rising spindles shall be provided with a clear polycarbonate spindle cover including cap. If required a position indicating tape shall be applied at site, after the Penstock has been installed and Positioned.

The spindle nut shall be of bronze.

Channel Penstocks having a width bigger than 2000 mm or two times their heigth shall be equipped with a double spindle mechanisms connected by tandem shaft.

2.2.2 Coupling
The couplings are connecting the spindle with the other sections of the operator and shall be of muff type. Depending upon the specific requirements it shall be a plain muff coupling or screwed muff coupling.

2.2.3 Spindle Guide
Spindle guides shall be manufactured in stainless steel including an UHMWPE bushing. They shall be a wall fixing type and adjustable and spaced in line with the manufacturers recommendation.

When considering the vertical spacing of the guide, the L/r (length/radius) should not exceed 200 mm.

2.2.4 Drive
Any Drive (Operator) shall be provided by the Channel Penstocks manufacturer and shall be in accordance the individual requirements.

Each Drive (Operator) shall be designed to operate the Channel Penstocks under the maximum design on- and/or offseating head. The max. manual opening effort should not exeed temporarily (lifting the door out of the wedges) 400 N and in the long run (remaining full stroke) 100 N at the Tee Key or handwheel.
All gears and bearings shall be totally enclosed according IP 67 and the pinion shaft of the handwheel shall be of stainless steel, supported by roller or needle

bearings. The handwheel shall be of removable type.

3. Performance

3.1 Design Head

The Channel Penstocks shall be designed to withstand the design head specified in the Channel Penstocks Identification.

3.2 Allowable Leakage Rates

Channel Penstocks shall be virtually drop-tight at their working pressure if installation has been carried out correctly at least shall has a maximum leakage of **5% as specified in DIN 19569-4** stipulated as follows:

For on-seating pressure the leakage rate shall not exceed 0,1 l/(sec * m) of seal perimeter. For off-seating pressure the leakage rate shall not exceed 0,3 l/(sec * m) of seal perimeter.

4. Materials

Frame:	Stainless steel acc. BS EN 10088, grade 1.4301 (304) or 1.4571 (316Ti)
Door:	Stainless steel acc. BS EN 10088, grade 1.4301 (304) or 1.4571 (316Ti)
Door seal:	Neoprene acc. BS 2752
Spindle:	Stainless steel acc. BS EN 10088, grade 1.4301 (304) or 1.4571 (316Ti)
Spindle nut:	Bronze acc. EN 12164
Spindle guide:	Stainless steel acc. BS EN 10088, grade 1.4301 (304) or 1.4571 (316Ti) with bushing of UHMWPE
Yoke :	Stainless steel acc. BS EN 10088, grade 1.4301 (304) or 1.4571 (316Ti)
Spindle cover:	Galvanized steel or clear Polycarbonate
Fastening elements:	Stainless steel acc. BS EN 10088, grade 1.4301 (304) or 1.4571 (316Ti)

All stainless steel parts shall be pickled and passivated.

5. Channel Penstocks Identification

Aperture: mm

Max. Head: mWC static
mWC operat.

Direction of pressure: on- or off-seating

Channel depth: mm

Type of installation:

Operation: manual or electric

Material: SS304 or SS 316Ti

6. Execution

6.1 Installation

The manufacturers Installation,- Operating- and Maintenance Instructions shall be observed in order to get the full performance of the Channel Penstocks.

6.2 Field Test

Before a site leakage test is undertaken the installer shall ensure that the Channel Penstocks and it operating equipment have been correctly installed and not damaged during transportation and installation.