
Manual and Power Actuated Water Gates

Manual and power actuated water gates shall be Watergates sp model 25S-T or equivalent.

Performance

Under the maximum design on and off-seating heads under normal conditions, the leakage rate shall not exceed 0.1L/min per metre of seal.

Frames:

Shall be manufactured from grade 316 stainless steel and suitably designed to withstand all loads that are a result from the nominated maximum head acting on the gate and those resulting from the operator. Deflections shall not exceed 1/500 of any span nor shall maximum stresses exceed half the yield stress of the material – which ever is the worst case. Where the nominated maximum off-seating head will result in a significant deflection of the gate, increasing the leakage along the top seal, the frame shall incorporate a strong back arrangement suitably designed with a means of pushing the gate onto the seal in the closed position. The seals/guides shall be of such length to support a minimum of two thirds of the gate height in the fully in the open position. Frames shall be manufactured as flat back. All fasteners shall be grade 316 stainless steel. All welds to be passivated.

Gates:

Shall be manufactured from stiffened grade 316 stainless steel plate and designed so that the deflection due to the nominated maximum head acting on the gate will not exceed 1/500 of the gate span nor shall maximum stresses exceed half the yield stress of the material – which ever is the worst case. The stem connection shall be of the clevis type coupling for rising stem applications, or a lift nut supported in a welded nut pocket for non-rising stem applications. The coupling or nut pocket shall be capable of withstanding, without permanent deformation, at five times the rated output of the operator (manual operation rated at 180N rim pull). All welds shall be passivated

Stems:

Shall be manufactured from a machining grade 316 stainless steel (Ugima™ or similar) with a minimum diameter of 28mm. Stems shall be of ample cross section to prevent buckling and shall be capable of withstanding, without permanent deformation, twice the rated output of the operator (manual operation rated at 180N rim pull). Stems shall be supported such that the L/r ratio for the unsupported portion of the stem shall not exceed 200.

Seals:

Frames shall be fitted with fixed sealing faces that completely surround the aperture. The sealing faces shall provide a maximum coefficient of friction of 0.15 with the surface of the gate. Under the nominated maximum head acting on the gate, the resultant pressure acting on the seals shall be limited to prevent long-term creep of the material. The penstock frame shall be fitted with a resilient flush bottom seal arrangement with a minimum seating width of 30mm and shall be securely attached to the frame along the invert. All seals shall be easily replaced in situ. Adjustable pressure plates shall be fitted to the frame with grade 316 stainless steel fasteners to compress the seal against the gate to achieve optimum sealing. These plates shall be easily adjustable on site.

Anchor Bolts:

Shall be grade 316 stainless steel and of the chemical resin type. Anchor bolts shall be of suitable size and quantity to prevent the penstock and other associated components coming away from the structure as a result of the nominated maximum head acting on the gate and those loads resulting from the operator.



Operators:

Penstocks may be supplied with yoke mounted operators for manual operation with handwheel, tee key or where required, a reduction gearbox. Electric, pneumatic or hydraulic powered operators can also be supplied.

Stem extensions with stem guides and operator mounting pedestals supplied upon request.

Operators shall be positioned between 900mm to 1200mm above operating level.

Maximum allowable rim pull required to operate the penstock shall be limited to 180N.

Installation:

Penstocks with standard flat back frames do not require a wall thimble. Chemical resin (recommended) or expansion type anchors may be used with a nominal 25mm thick non-shrink grout seal for attaching the penstock to the structure.