Penstock & Valve Specialists

EXPRESS VALVE SERVICES LIMITED
Units 18/19 The Wallows Industrial Estate
Dudley Road, Brierley Hill
West Midlands, DY5 1HR

Tel: 01384 263872
Fax: 01384 480148
e-mail: sales@expressvalves.co.uk

INSTALLATION AND MAINTENANCE RECOMMENDATIONS FOR FLAP VALVES

Please read the following notes prior to commencing installation of the flap valve(s).

Handling and Storage

Flap valves should be stored with the mounting face flat on a horizontal surface with no other materials on top, particular care should be taken to avoid introducing twist or distortions to the frame.

If chains or slings are to be used for handling purposes the frame should be protected from damage with cloth sacking or similar material. Never use hooks unless eyebolts are fitted

Installation Guidelines

The performance from an installed flap valve is critically dependent upon the quality of installation. In view of this we strongly recommend specialist installation engineers experienced in installations of this type.

These installation guidelines apply to Express Valve Services Limited standard flap valve product range using competent, trained personnel working with suitable equipment under safe site conditions to carry out the work, and the installation will take place on concrete having a minimum strength of 25 N/mm^2.

Due to civil work tolerances mounting of the flap valve unit must be effected by grouting (wall mounting type) between the wall and frame without contact between the frame and wall avoiding distortion. Attempts to seal between the frame and wall using mastic or resilient compounds may result in leakage.

Pressure from any locating jacks must be spread evenly using timber. Avoid point or concentrated loading to any part of the frame, and never apply jacking loads to the door.

Flap valves utilised for sea outfall applications may be subjected to turbulent flow across the face of the valve which may cause 'lifting' of the door and result in excessive leakage. Under these conditions consideration should be given to siting the flap valve in a protected position to minimise these effects.

Installation Sequence

Flap valve installation avoiding distortion and consequent leakage can be achieved using the following recommendations.

Wall Mounted Flap Valves – Expanding Anchor Bolts

1. Present the flap valve unit into its required position ensuring the frame invert is flush with the 'civils' invert and the axis of the hinge pin(s) is horizontal.
2. Using the flap valve frame as a template drill all holes to the diameter and depth specified for the anchor bolts to be used.
3. During the drilling cycle anchor bolts may be inserted into two holes to prevent movement of the flap valve unit, place packing/jacking pieces local to the bolts to the recommended grout thickness. Tighten the anchor bolts sufficiently to hold the packing/jacking pieces in position.
4. The protective coating inside the frame fixing holes may be damaged during the drilling operation. Any damage should be made good immediately after drilling in accordance with the paint specification to prevent corrosion.
5. Blow/remove dust or debris from the drilled holes.
6. Insert the remaining anchor bolts, place packing pieces or jacks of the required grout thickness as close as possible to the fixing. Tighten the anchor bolt sufficiently to 'nip' the packing piece or jack.

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7. Check for plumb and level in all directions and adjust jacks or insert additional packing pieces to compensate for irregularities in the civil work.
8. Check seal faces with a feeler gauge for non-acceptance of 0.1mm (0.004") around the full perimeter of the aperture. Adjust the packing only where this tolerance is exceeded and sufficient only to close the gap.
9. Tighten all of the anchor bolts sufficiently to ensure movement of the flap valve unit does not occur during grouting. If movement is suspected when tightening the anchor bolts the feeler gauge check and possible adjustment must be repeated.

Wall Mounted Flap Valves – Chemical/Resin Anchor Bolts

1. Present the flap valve unit into its required position ensuring the frame invert is flush with the 'civils' invert and the axis of the hinge pin(s) is horizontal.
2. Using the flap valve frame as a template drill all holes to the diameter and depth specified for the anchor bolts to be used.
3. The protective coating inside the frame fixing holes may be damaged during the drilling operation. Any damage should be made good immediately after drilling in accordance with the paint specification to prevent corrosion.
4. Blow/remove dust or debris from the drilled holes.
5. Follow the recommendations and instruction provided separately with the chemical/resin anchor bolts.
6. Support the studs in the centre of each mounting hole square to the flap valve unit mounting face until the resin is fully cured. If the studs are not kept square then the flap valve unit may become 'wedged' by the misaligned studs.
7. Fit washers and nuts to the anchor studs, place packing pieces or jacks of the required grout thickness as close as possible to the fixing. Tighten the anchor bolt sufficiently to 'nip' the packing piece or jack.
8. Check for plumb and level in all directions and adjust jacks or insert additional packing pieces to compensate for irregularities in the civil work
9. Check seal faces with a feeler gauge for non-acceptance of 0.1mm (0.004") around the full perimeter of the aperture. Adjust the packing only where this tolerance is exceeded and sufficient only to close the gap.
10. Tighten all of the anchor bolts sufficiently to ensure movement of the flap valve unit does not occur during grouting. If movement is suspected when tightening the anchor bolts the feeler gauge check and possible adjustment must be repeated.

Notes: Anchor Bolts

1. The anchor bolts manufactures installation guidelines must be followed for safe application and use of their products.
2. When 'plated' mild steel anchor bolts are used the exposed portion of the bolt a protective coating should be applied to avoid corrosion.

Shuttering and Grouting

1. Shutter up around the external profile of the frame and the internal aperture using timber faced with a thin neoprene type sponge material to ensure a good, clean seal without undue pressure.

   Check again for plumb and levels, and non-acceptance of a 0.01mm (0.004") feeler gauge at the seal faces. If correct mix and pour a fluid grout in proportions of 50 Kg of Ordinary Portland Cement, 50 Kg of silver sand and one small tub (0.227 Kg) of Conbex or equivalent non-shrink additive between the flap valve frame and wall

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1. Leave the installation undisturbed for the duration of the grout curing cycle as recommended by the Conbex or equivalent additive manufacturer. When the grout is fully cured, check that the anchor bolts are still tight in sequence (i.e. when one bolt has been checked follow on with the bolt diagonally or diametrically opposite).
2. If all anchor bolts are tight then remove the shuttering and generally clean up and remove any excess grout or debris from the penstock. Pay particular attention to the sealing faces to ensure they are not damaged to minimise leakage.
3. If 'excessive' tightening of any of the anchor bolts was required during the above checking procedure re-check the sealing faces for non-acceptance of a 0.1mm (0.004") feeler gauge.
4. Exposed portions of plated steel anchor bolts should be painted on completion of the installation.
5. Do not cut off protruding threads on chemical anchor studs when fitted.

Pipe Flange Mounting

1. Pipe flange mounted flap valves, with the **exception** of UNIFLAP valves require a gasket between the valve and pipe flange.
2. Ensure the pipe flange gasket surface is clean, flat and vertical.
3. Check that the connecting holes in the flap valve and pipe flange are in alignment and the axis of the hinge pin(s) is horizontal.
4. Insert the bolts through the rear of the pipe flange and position the gasket into its seating position. Locate the flap valve unit on to the flange bolts ensuring the valve is centrally positioned and fit nuts, ensure the axis of the hinge pin(s) is horizontal and take up the 'slack' in the nuts.
5. For safety purposes the handling/lifting equipment should remain in position until the flap valve is securely clamped.
6. Tighten the nuts uniformly, diagonally or diametrically opposite in turn. Excessive tightening of the bolts/nuts is unnecessary.
7. Check the sealing faces for non-acceptance of a 0.1mm (0.004") feeler gauge. Compensate for minor discrepancies by adjusting the flange bolt clamping torque.

Wall Mounting with Gasket – HMWP Flap Valves

1. The flap valve is supplied with an EPDM non-intercellular gasket bonded the flap valve frame.
2. Ensure the flap valve and gasket are clean and free from grease, dirt and dust.
3. Ensure the mounting surface (wall) is clean and flat.
4. Present the flap valve unit into its required position ensuring the frame invert is level with the invert of the pipe and the axis of the hinge pin(s) is horizontal.
5. Using the flap valve frame as a template drill all holes to the diameter and depth specified for the anchor bolts to be used.
6. Blow/remove dust or debris from the drilled holes.
7. Support the studs in the centre of each mounting hole square to the flap valve unit mounting face until the resin is fully cured. If the studs are not kept square then the flap valve unit may become 'wedged' by the misaligned studs.

Fit washers and nuts to the anchor studs. Tighten the anchor bolt sufficiently 'nip' the flap valve in position.

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8. Check the flap valve unit for plumb in all directions, ensure the flap valve is vertical for correct operation of the equipment.
9. Tighten the anchor bolts by hand compressing the seal evenly to ensure a good seal between the flap valve unit and the wall. Care should be taken to avoid distortion of the flap valve unit by over compression of the seal.

Operation

Operation of the flap valve(s) is automatic providing the installation recommendations have been implemented.

1. On completion of the installation and before use clean the flap valve to remove excess grout and debris. With the door fully open check the frame and door sealing faces and remove any debris.
2. Flap valves are designed to open and close automatically and the door must not be obstructed or restrained in any way.
3. A flap valve is designed to open at a very low differential head. As a result of this sensitivity the door may a perfect seal may not always be achieved in a low closing head situation, or under ebb and low flow conditions.

Maintenance Schedule

Frequency of maintenance is dependent on the frequency of use and operating duty, in view of this the following recommendations must be considered as minimum requirement.

Every Six Months

Carry out a thorough visual inspection and implement the following actions;

- Clean the flap valve unit by hosing down with clean water to remove grit or debris. Particular attention should be paid to the sealing faces, hinge links and invert.
- Check for signs of leakage between the flap valve frame and 'civils', make good any faults. For pipe flange mounted valves and wall mounted HMPV valves check the gasket interface for leakage.
- Check the tightness of bolts/anchor bolts. Adjust as necessary.
- Check for damage to the flap valve frame, door and sealing faces. Repair and/or replace damaged components.
- Check the operating linkage for freedom of movement, ensure there are no damage or worn components.
- Moving parts should be lightly oiled or greased as appropriate.
- Check the equipment for signs of corrosion or damage to the paint system. Repair as necessary

Recommended Lubricants

- For general lubrication purposes under normal operating conditions we recommend Shell Alvania R2 (or equivalent).
- For seawater applications we recommend Rocol Tuflube Allweather grease.
- For potable water applications we recommend using Rocol MX22 or Rocol MX66 grease.