

**Minimum Recommended Torque**

Valve Size	Packing Nut (in./lb.)	Bonnet Bolts (in./lb.) each	Seat Retainer (in./lb.)
1/4" - 1/2"	20	50	20
3/4" - 1"	25	80	170
1 1/2"	80	125	540
2"	120	125	600

Packing Nut and Bonnet Bolts may require retightening after first cool down.

*It is solely the responsibility of the system designer and the user to select products and materials suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Assistance shall be afforded with the selection of the materials based on the technical information supplied to CPC-Cryolab™; however, the system designer and user retain final responsibility. The designer should consider applicable Codes, material compatibility, product ratings and application details in the selection and application. Improper selection, application or use of the products described herein can cause personal injury or property damage. If the designer or user intends to use the product for an application or use other than originally specified, he must reconfirm that the selection is suitable for the new operating conditions.*



**INSTALLATION AND MAINTENANCE GUIDE**



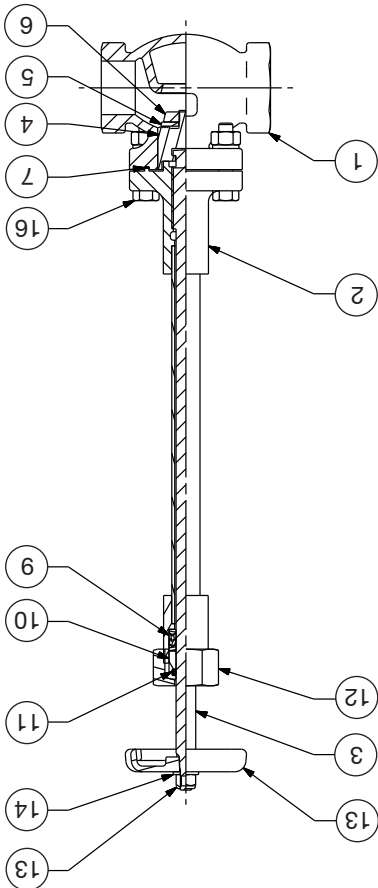
**ES4 Series  
Bronze Valves  
1/2" - 2"**



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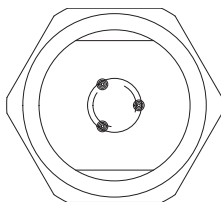
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**CAUTION:** The piping system must be adequately designed and supported to prevent extraordinary loads to the pressure equipment.



**WARNING:** Injury or death can occur due to failure to completely isolate valve from all sources of pressure before beginning disassembly. Do not proceed until valve has been completely isolated from process stream and vented to atmosphere.

After the seat retainer has been torqued, stake 3 (three) places as shown to deform the retainer and stud threads.



- A. Disassembly of Valve:**
1. Remove handwheel nut and washer, items 14 & 15, remove handwheel, item 13.
  2. Remove packing nut, item 12, packing follower, item 10.
  3. Remove stem o-ring, item 11, from packing follower, item 10.
  4. Remove bonnet assembly, item 2, by removing bonnet bolts, item 16.
  5. Remove plug and seat assembly, item 4, 5 & 6, by sliding loose from stem, item 3.
  6. Remove stem by unthreading stem out of bottom side of bonnet assembly.
  7. Remove old bonnet gasket, item 7, making sure not to scratch gasket groove in valve body.
  8. Clean all parts for service intended. Remove any burrs and refinish any rough or worn surface prior to reassembly.
- B. Assembly of Valve:** Reassemble in reverse order
1. Replace packing with open face of chevron rings facing down. Replace O-ring into packing follower carefully and place packing follower over packing Lube O-ring with grease compatible with service. (Do not torque packing now.)
  2. Reinstall stem into bonnet. Carefully slide stem into lower bonnet making sure not to scratch stem or scar packing or tear o-ring in packing follower.
  3. Install seat and plug assembly by sliding over lower stem. Open stem fully to lock seat and plug assembly onto stem preparing for assembly onto valve body.
  4. Install new bonnet gasket, item 7, into groove of valve body. Replace bonnet assembly onto valve body insuring tongue and groove for bonnet gasket is mated and interfaces. Torque bonnet bolts in place to required torque value.
  5. Torque packing nut until leak stops or proper torque is reached.
- C. Seat Holder Assembly:** To replace Kel-F seat item 5,
1. Remove seat retainer, item 6, by screwing off counterclockwise. Replace new Kel-F seat onto seatholder and replace seat retainer. Torque seat retainer to required value.
  2. Once seat is torqued to required value, stake retainer to seat plug to prevent possible backing off of retainer, see detail.