

## Cryogenic Ball Valves



The production, transportation and storage of liquefied gases present several technical problems to valve designs. The integrity of the stem seals at very low temperatures is the major hurdle that must be overcome. Specially designed valve extended bonnets installed to valves offers a safe and efficient method to accomplish stem seal integrity.

At Flow-Tek we designed our cryogenic valve with investment cast stem extensions that move the packing sufficiently above the pipeline. The bonnet extension provides a gas column that allows the gas to vaporize from contact with the warm ambient temperature outside the service line. This vapor column insulates the stem seal and maintains the seal integrity.

Flow-Tek has based the cryogenic valve on our reliable stainless steel Triad and F15 valve designs covering sizes ½" to 4". Flow-Tek valves installed in cryogenic service have proven our design to be both reliable and durable in this application.

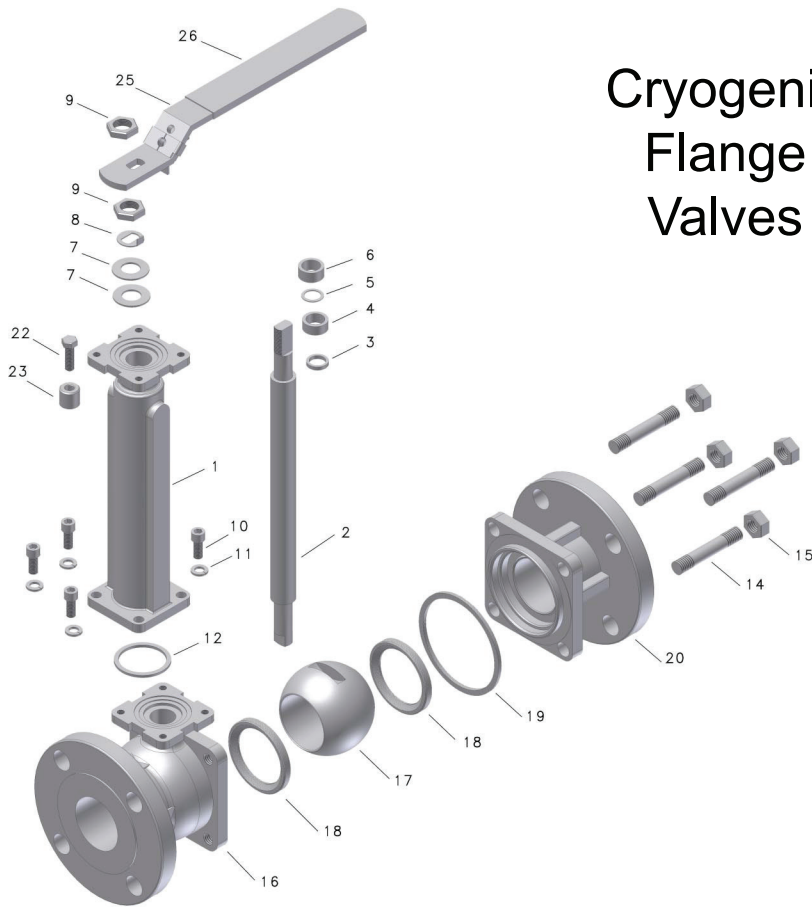
### The standard features of our valve are:

1. Extended stem and bonnet to position the stem packing above the cryogenic fluid and providing a column of warmer vapor that insulates the stem seal from the affects of low temperatures.
2. High-density TFM-1600 seats and seals throughout valve enables the valve to be rated to down -425° F service.
3. The cryogenic valve is based on the Flow-Tek Triad Series, stainless steel, three-piece valve with threaded and socket weld ends and the two-piece F15 flanged end valve designs.
4. Valve is unidirectional with vent holes in both the stem slot and the upstream face of the ball. This prevents the cold liquids from becoming trapped in the valve.
5. Each valve is permanently marked with a flow direction arrow to prevent incorrect installation.
6. Live loaded stem packing that provides self-adjustment to the stem packing is included at the top of the extension.
7. Stem primary seal and bearing are located near the packing end of the extended stem thus keeping these parts from the low temperatures and providing a blow-out proof stem design.
8. Valves are specially cleaned to remove all grease and oils that may react with the service media.
9. Each valve after cleaning is packaged and sealed in a heavy poly bag to keep the valve clean until installation.



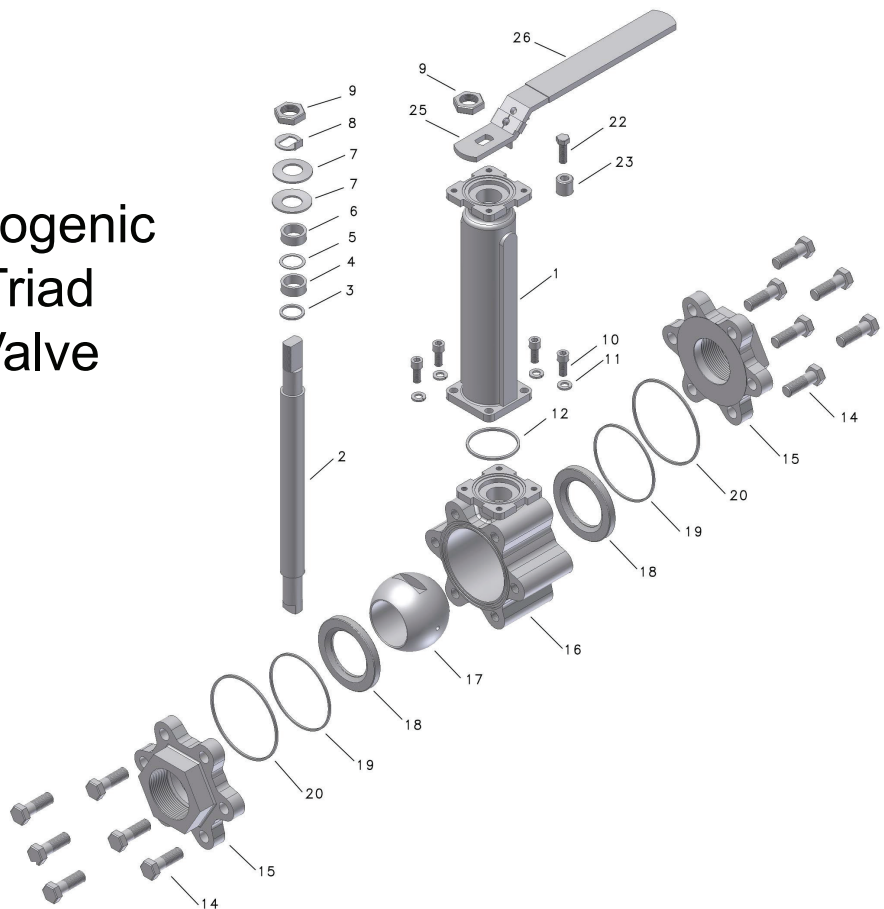


## Cryogenic Flange Valves



| ITEM | NAME                  | Qty |
|------|-----------------------|-----|
| 1    | Extension Body        | 1   |
| 2    | Stem                  | 1   |
| 3    | Thrust Washer         | 1   |
| 4    | Stem Packing          | 3   |
| 5    | Packing Protector     | 1   |
| 6    | Packing Follower      | 1   |
| 7    | Bellville Washer      | 2   |
| 8    | Tab Washer            | 1   |
| 9    | Nut                   | 2   |
| 10   | Socket Head Cap Screw | 4   |
| 11   | Cap Screw Washer      | 4   |
| 12   | MCU Gasket            | 1   |
| 14   | Body Stud             | 4   |
| 15   | Body Nut              | 4   |
| 16   | Valve Body            | 1   |
| 17   | Ball                  | 1   |
| 18   | Seat                  | 2   |
| 19   | Valve Body Gasket     | 1   |
| 20   | End Cap               | 1   |
| 22   | Valve Stop Bolt       | 1   |
| 23   | Valve Stop Set Sleeve | 1   |
| 25   | Handle with Lock      | 1   |
| 26   | Handle Sleeve         | 1   |

## Cryogenic Triad Valve



| ITEM | NAME                  | Qty  |
|------|-----------------------|------|
| 1    | Extension Body        | 1    |
| 2    | Stem                  | 1    |
| 3    | Thrust Washer         | 1    |
| 4    | Stem Packing          | 3    |
| 5    | Packing Protector     | 1    |
| 6    | Packing Follower      | 1    |
| 7    | Bellville Washer      | 2    |
| 8    | Tab Washer            | 1    |
| 9    | Nut                   | 2    |
| 10   | Socket Head Cap Screw | 4    |
| 11   | Cap Screw Washer      | 4    |
| 12   | MCU Gasket            | 1    |
| 14   | Body Bolt             | 8/12 |
| 15   | End Cap               | 1    |
| 16   | Valve Body            | 1    |
| 17   | Ball                  | 1    |
| 18   | Seat                  | 2    |
| 19   | Valve Body Gasket (1) | 1    |
| 20   | Valve Body Gasket (2) | 1    |
| 22   | Valve Stop Bolt       | 1    |
| 23   | Valve Stop Set Sleeve | 1    |
| 25   | Handle with Lock      | 1    |
| 26   | Handle Sleeve         | 1    |