



## Argus® PDS Ball Valves

FK76M PDS and FK79 PDS ball valves for high-speed, high-cycle polymer processing applications



*Experience In Motion*



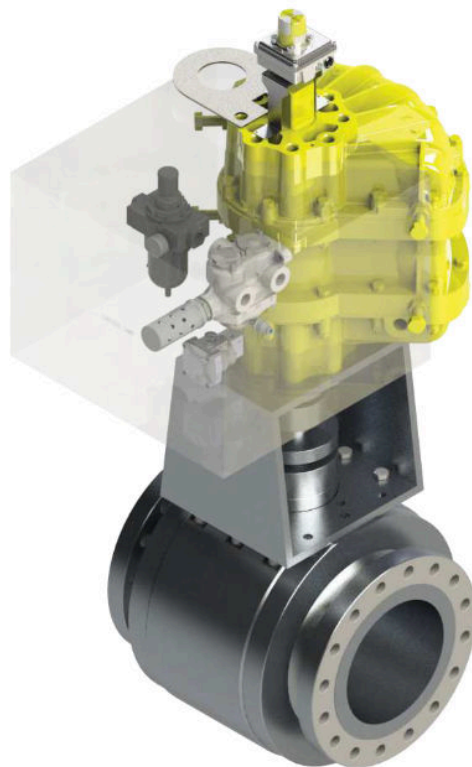
## Extend maintenance intervals in extreme high-cycle polymer processing applications

Argus PDS soft or metal-seated ball valves from Flowserve deliver long-lasting, tight shut-off performance in product discharge systems. These valves are designed specifically for high-speed and high-cycle polymer processing applications, such as polyethylene and polypropylene. The upside is longer intervals between maintenance plant shutdowns.

### Engineered to last

Frequent cycling, high temperatures and high-speed polymer particles (e.g., powders and fines) can damage valve seats and stem seals over time, resulting in increased fugitive emissions, reduced shut-off capability and shortened maintenance intervals. Argus PDS valves are engineered to overcome these abrasive conditions:

- Abrasion-resistant seats maintain tight shut-off performance to FCI 70-2 Class VI criteria.
- Integrated stuffing box provides an additional abrasion-resistant stem sealing package that can be easily retightened to avoid/reduce fugitive emissions.
- Optional reduced face-to-face dimension minimizes the valve cavity to avoid media build-up.
- Bi-directional sealing with optional uni-directional design
- Scraper design eliminates media build-up on metal seats and ball surfaces for smooth operation.



*Argus FK76M PDS valve with Kinetrol pneumatic HC actuator*

## Built for the toughest polymer processing applications

Argus PDS valves are designed specifically for high-speed, high-cycle applications containing solids. In particular, they are ideal for the following applications and media:

### Applications

- Polyethylene processing
- Polypropylene processing
- Powder discharge systems

### Media

- Ethylene
- Hydrogen
- Catalyst
- Nitrogen
- TiCl<sub>4</sub>
- TEAL
- Butene
- Propylene
- Naphtha

### Operating parameters

#### Sizes

- FK79 PDS: DN 15 to 50; NPS ½ to 2
- FK76M PDS: DN 80 to 500; NPS 3 to 20; other sizes available on demand

**Pressure rating:** PN 16 to 100; Class 150 to 600

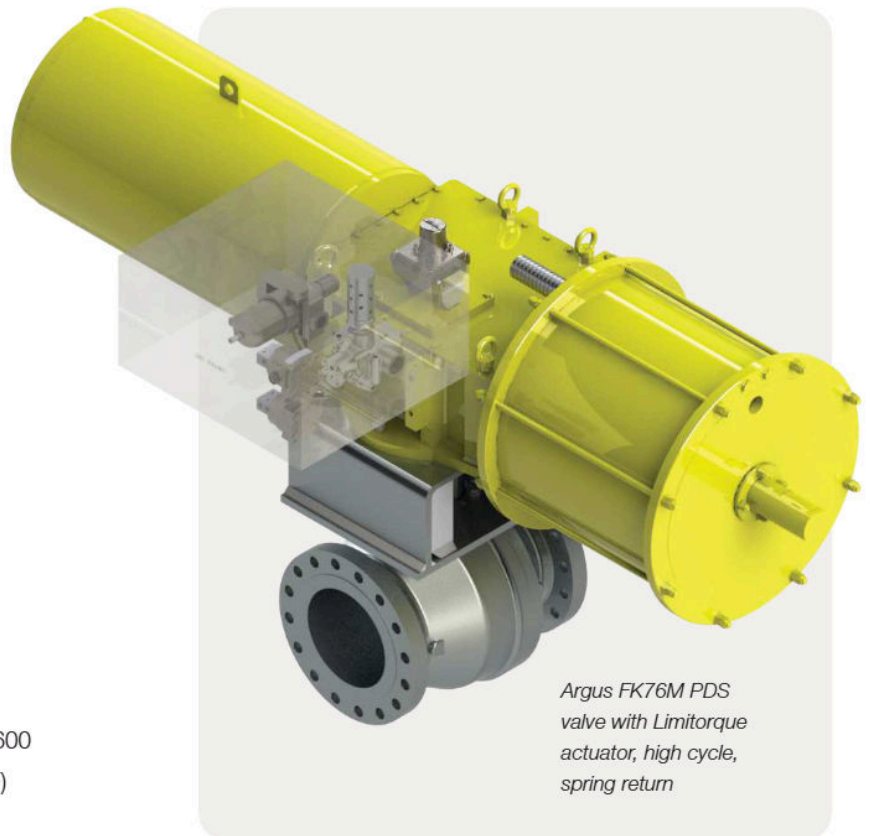
**Temperature:** -46°C to 180°C (-54°F to 356°F)

*Refer to page 7 for applicable specifications.*

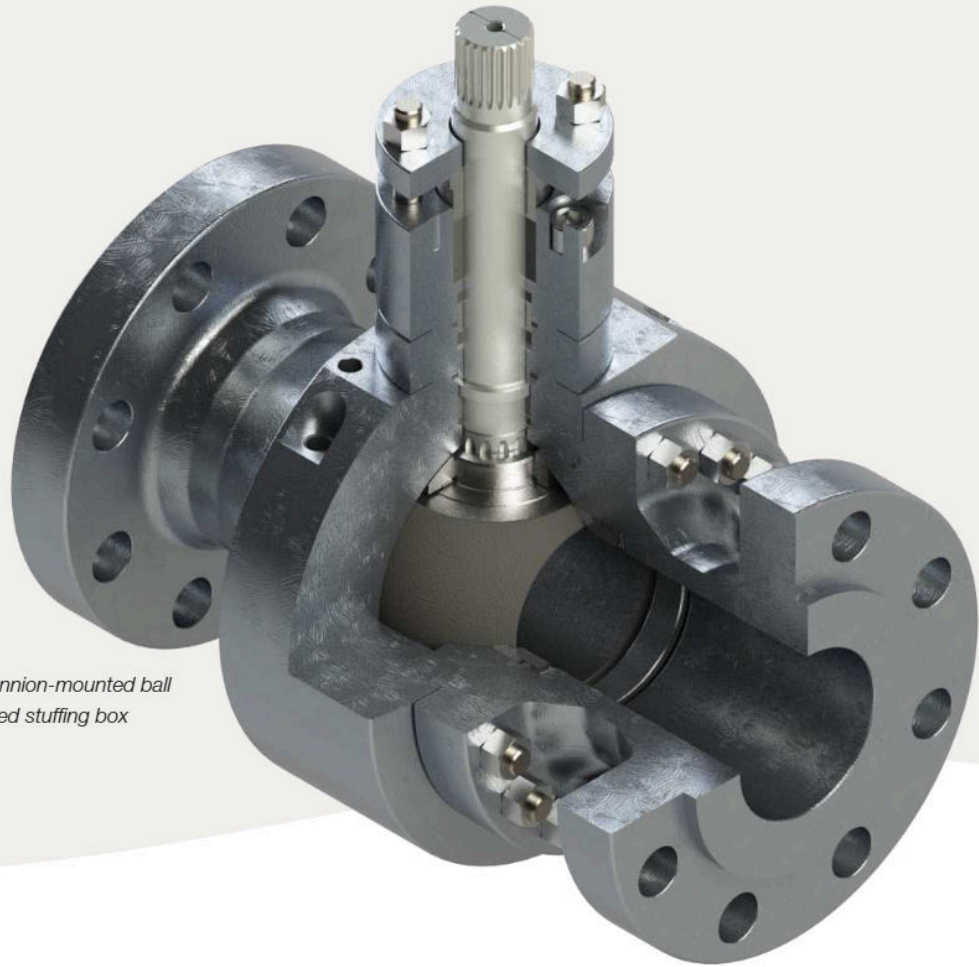
### Floating ball and trunnion-mounted configurations

Argus PDS ball valves are available in floating ball (FK79) or trunnion-mounted (FK76M) designs to suit application requirements. They also are available in the following configurations:

- Two-piece or three-piece body
- Metal or soft seats and seals
- Standard, moderate and ultimate high-cycle designs



*Argus FK76M PDS valve with Limitorque actuator, high cycle, spring return*



*Argus FK76M PDS trunnion-mounted ball valve with ISB integrated stuffing box*

## Designed for extended reliability

A valve is only as reliable as its weakest component, and high-cycle, high-wear applications can take their toll. Every part of Argus PDS valves has been designed to withstand the harsh effects of polymer processing. The result is a more reliable, longer-lasting valve that helps you extend unit maintenance intervals.

### Shut-off to FCI 70-2 Class V or VI criteria

Argus PDS valves deliver reliable shut-off performance to the highest zero-tightness demands of FCI 70-2 Class V (metal-to-metal) or Class VI (soft) seat designs. The results are greater process control and efficiency.

### Full-bore design improves performance

The full-bore design of Argus PDS valves ensures non-turbulent flow without pressure drops. It also minimizes the likelihood of solids build-up that can reduce medial flow. Reduced bore designs are available if needed for gaseous media.

### Reliable bi-directional sealing

For maximum application flexibility and process control, Argus PDS valves provide bi-directional sealing. Available with soft- and metal-seated designs, they can be used in severe service applications in polyethylene, polypropylene and other powder discharge systems. Combined with tight shut-off performance, the bi-directional functionality improves plant safety and reliability. Uni-directional sealing is available.

### **Integrated stuffing box extends service life**

The Argus ISB integrated stuffing box is an adjustable stem sealing system with an ISO 15848- certified graphite sealing package. Designed for applications that require exceptional emissions control, the ISB stuffing box provides a reliable secondary sealing system to extend a valve's service life. It ensures a reduced environmental impact and improves safety by compliance with TA-Luft, EPA (Method 21) and ISO 15848 fugitive emissions requirements.

### **Double stem seal and bearing system reduces emissions**

To avoid operational side loads, Argus PDS valves employ a double stem bearing system using PEEK® or PBI stem bearings and bushings. Along with the ISO 15848 stem seal package, this alignment ensures a tight seal and provides a barrier against erosive or corrosive media from leaking into the stuffing box and out into the atmosphere.

### **Cost-saving modular design**

Argus PDS valves are built on a modular platform that allows the inner components (e.g., ball, seats, seals and bearings) to be modified according to process conditions without changing the valve bodies. This modularity enables valves to be upgraded from a soft-seated to a metal-seated ball valve more economically than buying a completely new valve.

### **Blowout-proof, solid stem**

To ensure personnel safety, Argus PDS valves have a solid, integral stem. Assembled either from inside or outside the valve body to suit application requirements, the stem is secured with an additional top plate to provide blowout-proof safety.

### **Ease of maintenance saves time**

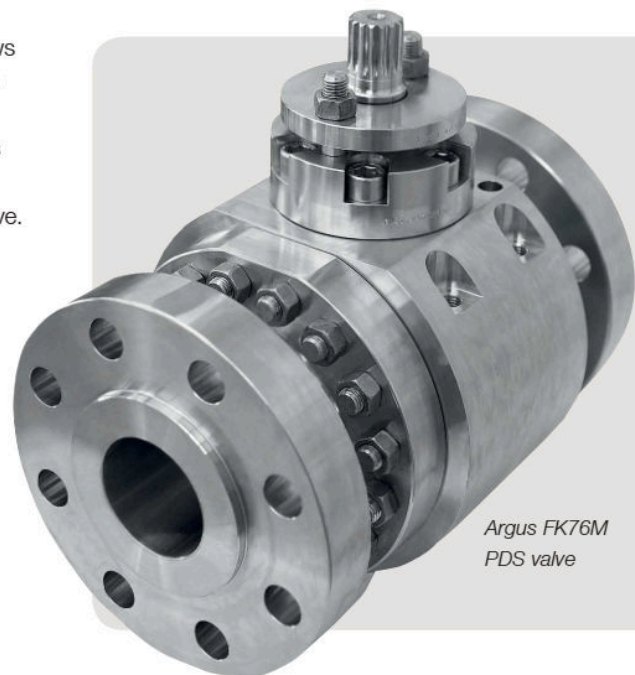
Maintenance of PDS valves is fast and easy. No specialized equipment or personnel is required, saving time and resources. Factory-tested spare parts kits can be ordered ahead of scheduled maintenance, minimizing downtime. And, because all trim kits are tested independently, seal-ability is assured.

### **Scraper design ensures smooth operation**

Argus PDS valves feature a scraper that prevents media build-up on the ball and seat. This design ensures smooth cycling and proper sealing during operation.

### **Available reduced face-to-face dimension minimizes media build-up**

For valves installed at the reactor, the face-to-face dimension of PDS valves may be reduced to minimize the space — and media build-up — between the reactor and the closed reactor valve.

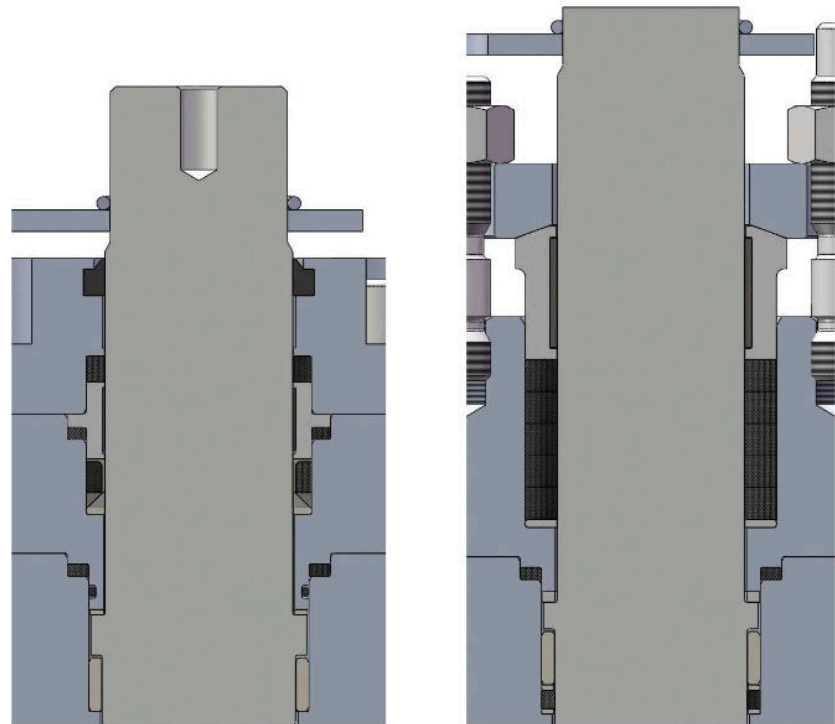


*Argus FK76M  
PDS valve*

## Technical details

### Bonnet styles

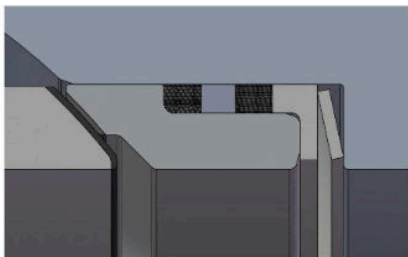
Managing fugitive emissions is a major challenge within the chemical and petrochemical industries. Both Argus stem sealing systems are certified per ISO 15848. Besides reducing fugitive emissions, the upsides are improved plant efficiency and reduced energy costs.



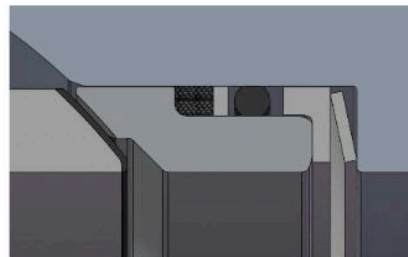
TA-Luft/ISO 15848/EPA

ISB integrated stuffing box

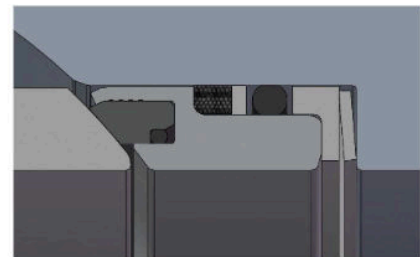
### Ball seat options



Metal seated/Graphite



Metal seated/O-ring



PEEK seated/O-ring

Argus PDS valves are available with three ball seat designs to best suit the process conditions. Either a metal-to-metal seat design or a chambered soft seat design with various secondary seals cover the highest standards related to seat tightness in the media flow.

## High-cycle design levels

### Trunnion-mounted configuration

- Standard high cycle
  - Metallic seat: >15k; max. 200k cycles/year
  - Soft seat: >15k; max. 150k cycles/year
  - Standard cycle time (> 1 sec/in)
- Moderate high cycle
  - Metallic seat: >200k; max. 1000k cycles/year
  - Soft seat: >150k; max. 800k cycles/year
  - Fast cycle time ( $\leq$  1 sec/in)
- Ultimate high cycle
  - Metallic seat: >1000k; max. 2000k cycles/year
  - Fast cycle time ( $\leq$  1 sec/in)\*

### Floating ball configuration

- Standard high cycle
  - Metallic seat: >15k; max. 200k cycles/year
  - Soft seat: >15k; max. 150k cycles/year
  - Standard cycle time (> 1 sec/in)
- Ultimate high cycle
  - Metallic seat: >200k; max. 2000k cycles/year
  - Soft seat: >150k; max. 800k cycles/year
  - Fast cycle time ( $\leq$  1 sec/in)\*

## Specifications

<b>Sizes</b>	DN 15 to 400; NPS ½ to 16
<b>Pressure ratings</b>	PN 16 to 100; Class 150 to 600
<b>Valve design</b>	API 6D, PED 97/23/EC, ASME B16.34 (on demand)
<b>Design calculation</b>	DIN EN 12516-1
<b>Pressure/temp. rating</b>	ASME B16.34 or DIN EN 1092
<b>Shell wall thickness</b>	ASME B16.34 or DIN EN 12516.1
<b>Bore dimensions</b>	API 6D or DIN EN 1983, DIN EN 17292 or DIN EN 13942
<b>End connection</b>	ASME B16.5 or DIN EN 1092
<b>Face-to-face dimensions</b>	ASME B16.10 or DIN 558
<b>End connection</b>	ASME B16.5
<b>Bonnet style</b>	Standard TA-Luft/ISO 15848; integrated stuffing box
<b>Seat configuration</b>	Bi-directional; uni-directional (on demand)
<b>Leakage rates</b>	API 598, ANSI FCI 70-2 Class V or VI, others
<b>Fire-safe</b>	ISO 10497 or API 607 (latest edition); API 641 (on demand)
<b>Anti-static</b>	DIN EN ISO 17292, chapter 5.2.7

\* Dependent on valve size



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