



# PfuZion™

Diaphragm Valve Performance Upgrade



**ITT**

# Upgrade Legacy Bio-Tek™ Valves

Light duty fractional diaphragm valves. Everyone has them. They are essential to the critical task of process sampling and countless low flow applications in the Biopharm industry. They are built to be compact to fit into small places, but the fact is that the size of these valves drives the design and ultimately their performance. Small bonnets, fasteners and diaphragms, as well as tight piping spaces, make routine maintenance a frustrating and time consuming challenge.

Wouldn't it be great if you could upgrade your existing Bio-Tek valves to the state of the art performance and convenience of the EnviZion valve architecture? Adopt a robust thermally compensated bonnet that requires zero retorquing and maintains a tight shell seal - even when large thermal swings are common? And reduce the time to change that hard to reach diaphragm from 30-40 minutes to just a few minutes ... all without losing a single loose fastener?

Well that time is now. The new ITT PfuZion topworks is the upgrade you have been seeking. With a one-time stud conversion, your legacy Bio-Tek forging or block body can be converted to a high performing, reliable, quick-change design without altering flow characteristics or materials of construction.

Don't keep struggling with maintaining your critical sampling valves. Improve your system performance and extend its useful life with a PfuZion performance upgrade today.

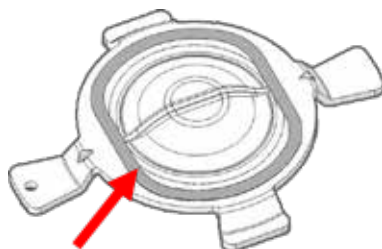


## Principle of Operation

The PfuZion utilizes patented EnviZion sealing and thermal compensation technology to achieve a robust, reliable seal on existing, in-service Bio-Tek valves. A precision machined pressure ring efficiently applies sealing force to the diaphragm at the edge of the valve body D-section. Embedded mechanical springs maintain superior sealing force even in the face of the largest process thermal swings.



Precision machined pressure ring



Pressure ring applies pressure in contact area along the Bio-Tek D-section

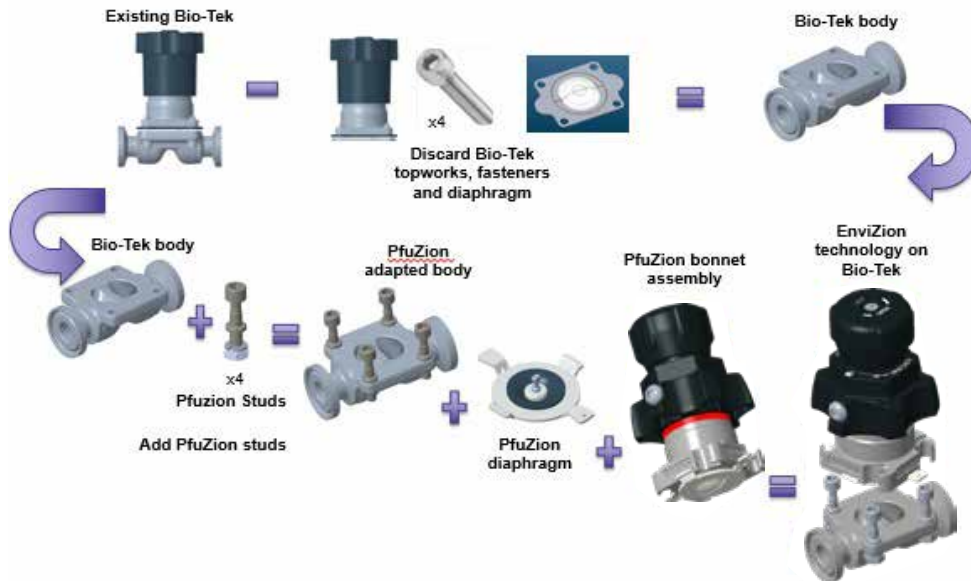


Bio-Tek body interference

# PfuZion Retrofit

## PfuZion Conversion Process

The PfuZion conversion is simple. The Bio-Tek top works, diaphragm and fasteners are discarded and PfuZion studs are permanently installed on the existing valve body. Then the PfuZion topworks and diaphragm assembly can be mounted to the valve. That's all there is to it!

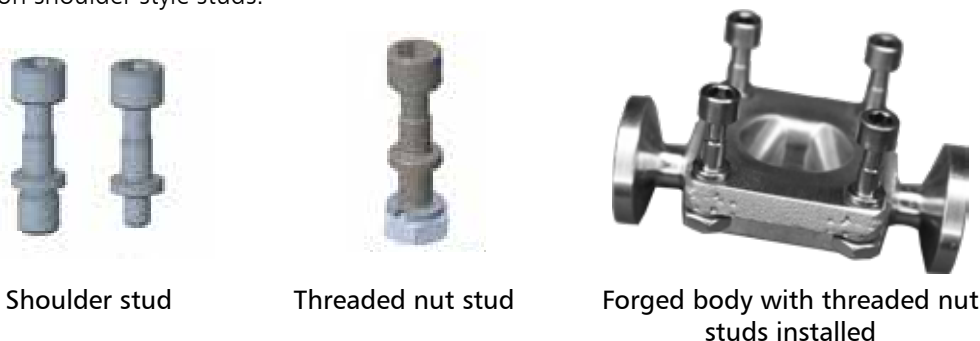


## Evaluating Body Condition

The first step in determining the feasibility of upgrading to the PfuZion system is determining the condition of the installed valve body. PfuZion was engineered to perform on the roughest of factory produced Bio-Tek finishes. A reliable seal can be achieved on just about any reasonably cared for Bio-Tek™ body. However, severe scratches or gouges in the diaphragm sealing area should be evaluated to determine if the valve is an appropriate candidate for the PfuZion upgrade, or if the valve should be replaced.

## Upgraded Mounting System

The PfuZion retrofit replaces the existing fastener / nut or threaded stud system of the Bio-Tek with a one-time attachment of PfuZion style studs. These studs will allow for quick mounting and dismounting of the PfuZion top works just like the EnviZion valve platform. Both 2-way Bio-Tek valves and block body versions can be retrofitted. These studs can be added to thru hole forgings with a stud and nut arrangement, which requires no body modification. Block body valves require existing threaded studs to be removed and replaced with PfuZion shoulder style studs.



As the Bio-Tek has been in service for decades, several versions of fasteners may have been used. Providing a valve serial number will assure the correct stud kit is supplied.

# PfuZion Technology

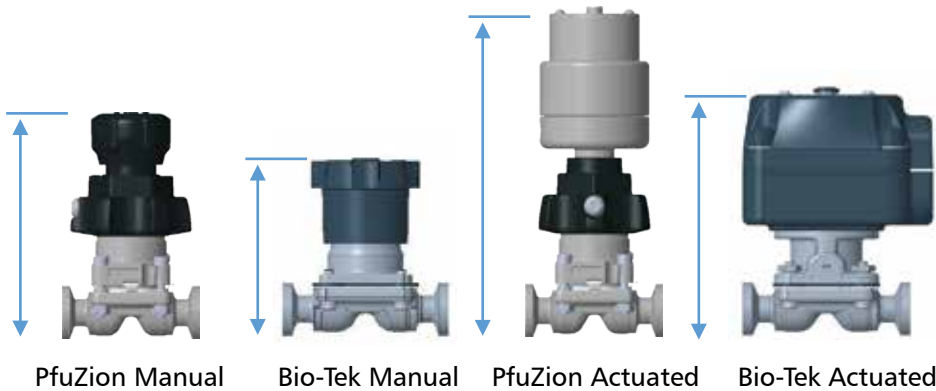
## Bonnet & Diaphragm Upgrade

The PfuZion system features a quick-connect bonnet that incorporates the patented EnviZion thermal compensation system, assuring a highly reliable shell seal on standard Bio-Tek valve bodies. Diaphragms are installed with the patented EnviZion stud, providing a simple 90° turn installation, making proper diaphragm installation reliable and fool proof. The PfuZion utilizes the BioviZion PTFE diaphragm made from the same FDA and USP Class VI compliant material as the existing Bio-Tek PTFE diaphragm, eliminating the validation of a new material..

The fastener-free bonnet connects to PfuZion studs with a mount and turn action. The bonnet cover handwheel is simply tightened by hand, or can be tightened with a wrench on the cover hex for those difficult to seal applications. A locking screw secures the bonnet from unintentional loosening once installed.



## PfuZion Size & Flow Performance



Valve Height			
Manual		Actuated	
Bio-Tek	PfuZion	Bio-Tek	PfuZion
2.874	3.635	4.126	6.225

## Equivalent Cv Performance

PfuZion utilizes the same diaphragm profile of the Bio-Tek, assuring Cv/Kv values do not change.

## Like-for-Like Change

The conversion from existing Bio-Tek valves to the PfuZion system can generally be considered a Like-for-Like change. Diaphragm and valve body product contact materials do not change. Flow characteristics remain the same as well as rated seat and shell pressures.

# PfuZion Actuator Sizing

Valve Size	BioviZion	
$\Delta P$	100%	0%
Actuator Model	Fail Closed - Reverse Acting - Spring to Close Maximum Line Pressure (psi/(bar))	
ZPB2/ZPB2S	150 (10.3)	150 (10.3)

Valve Size		BioviZion	
$\Delta P$		100%	0%
Actuator Model	Line Pressure	Fail Open - Direct Acting - Spring to Open Air pressure required to shut-off line pressure (psi/(bar))	
ZPB1/ZPB1S	20	61 (4.2)	57 (3.9)
	40	63 (4.3)	61 (4.2)
	60	65 (4.5)	65 (4.5)
	80	67 (4.6)	68 (4.7)
	100	69 (4.8)	73 (5.0)
	125	71 (4.9)	76 (5.2)
	150	74 (5.1)	82 (5.6)
Actuator Model	Line Pressure	Double Acting - Air to Open Air to Close Air pressure required to shut-off line pressure (psi/(bar))	
ZPB3/ZPB3S	20	37 (2.6)	32 (2.2)
	40	39 (2.7)	36 (2.5)
	60	41 (2.8)	39 (2.7)
	80	43 (3.0)	43 (3.0)
	100	45 (3.1)	46 (3.1)
	125	47 (3.2)	51 (3.5)
	150	49 (3.4)	55 (3.8)

# EnviZion Technology

## Experience the Future with EnviZion

The Biopharm industry relies on hygienic diaphragm valves for demanding process applications due to their unique balance of clean-ability, drain-ability and pressure/temperature capability. For more than 40 years the technology of these valves has changed very little. Advances in performance have been nominal as the basic design concept has remained the same: body, diaphragm, topworks, and four fasteners. This design requires experienced personnel and stringent maintenance practices to assure consistent, reliable valve performance. All while the industry is forced to increase productivity, extend preventative maintenance intervals, and reduce operating costs.

ITT's breakthrough technology, the EnviZion valve, sets a new standard for the future of hygienic diaphragm valves. The EnviZion valve is designed specifically to help customers install, operate, and maintain their valves more efficiently. This unique design provides a significant reduction in total cost of ownership while supporting the industries' goals to increase productivity, improve reliability and enhance clean-ability.

**QUICK  
CHANGE  
BONNET**



**DeviceNet**  
INTELLIGENT  
AUTOMATION



**TOOL-LESS  
ASSEMBLY**



**CONTAMINATION  
FREE**



**SEALING SYSTEM  
3RD PARTY  
CERTIFIED**



**LEAK FREE  
SEAL INTEGRITY**






**FASTENER FREE**



**ZERO  
RETORQUES**

# EnviZion Value Proposition

			User Benefit	User Value
✓		✓	Reduced installation time	\$\$
	✓		Eliminates re-torque time (CIP, SIP)	\$\$
	✓		Efficient system pressure checks / reduced investigation time	\$\$\$
	✓		Increased production capacity (less downtime)	\$\$\$\$
	✓		Reduced product loss (no contamination)	\$\$\$\$
	✓		Reduced unscheduled down time	\$\$\$
	✓		Reduction of Investigation time / cost	\$\$\$
✓		✓	Reduced diaphragm change time (10x)	\$\$\$
✓			Operators vs maintenance for diaphragm changes	\$\$
		✓	Eliminates fastener replacements / galling issues	\$

Installation    Operation    Maintenance

Technology delivers significant value and cost benefits

## How to Order

PfuZion retrofit assemblies are sold as topworks assemblies with diaphragms included.

Topworks codes are per the chart below:

CODE	DESCRIPTION
<b>PfuZion Manual Bonnets</b>	
ZMB	ZMB - PFUZION RETROFIT MANUAL - BIOTEK
ZMBS	ZMBS - PFUZION RETROFIT MANUAL SEALED - BIOTEK

<b>PfuZion Actuated Bonnets</b>	
ZPB1	ZPB1 - PFUZION RETROFIT BIOTEK ACT-FO
ZPB2	ZPB2 - PFUZION RETROFIT BIOTEK ACT-FC (90#)
ZPB26	ZPB26 - PFUZION RETROFIT BIOTEK ACT-FC (60#)
ZPB3	ZPB3 - PFUZION RETROFIT BIOTEK ACT-DA
ZPB1S	ZPB1S - PFUZION RETROFIT BIOTEK ACT-FO SEALED
ZPB2S	ZPB2S - PFUZION RETROFIT BIOTEK ACT-FC (90#) SEALED
ZPB26S	ZPB26S - PFUZION RETROFIT BIOTEK ACT-FC (60#) SEALED
ZPB3S	ZPB3S - PFUZION RETROFIT BIOTEK ACT-DA SEALED

## PfuZion Stud Kits

PfuZion retrofits require the use of PfuZion studs. Valve serial numbers are required to identify the proper stud selection for each application.



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EnviZion, Pure-Flo

