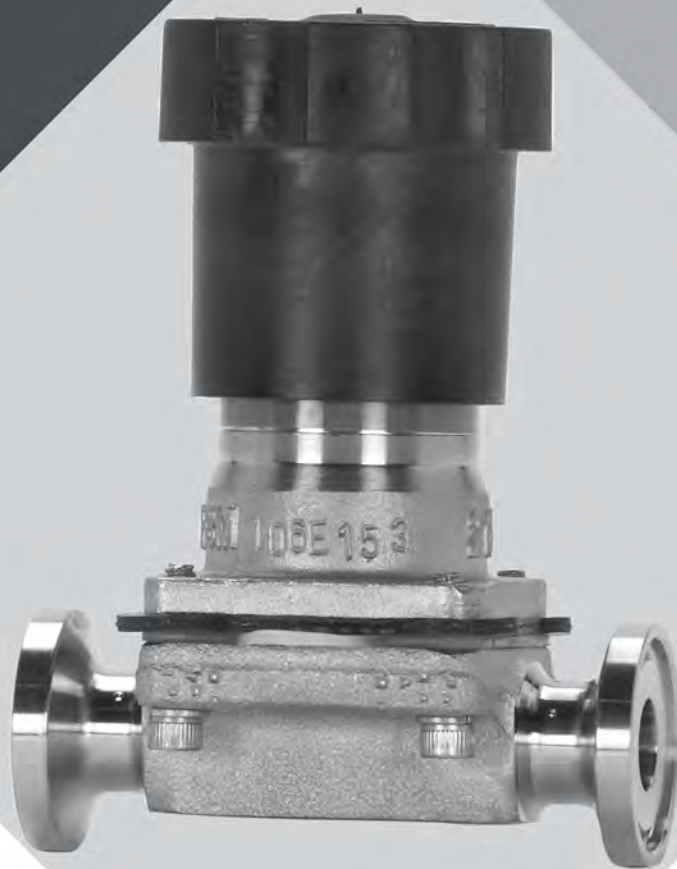


# Installation, Operation, and Maintenance Manual

Bio-Tek



**ITT**



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# 1 Introduction and Safety

## 1.1 Safety message levels

### Definitions

Safety message level	Indication
 <b>DANGER:</b>	A hazardous situation which, if not avoided, will result in death or serious injury
 <b>WARNING:</b>	A hazardous situation which, if not avoided, could result in death or serious injury
 <b>CAUTION:</b>	A hazardous situation which, if not avoided, could result in minor or moderate injury
 <b>ELECTRICAL HAZARD:</b>	The possibility of electrical risks if instructions are not followed in a proper manner
<b>NOTICE:</b>	<ul style="list-style-type: none"> <li>• A potential situation which, if not avoided, could result in an undesirable result or state</li> <li>• A practice not related to personal injury</li> </ul>

## 1.2 User health and safety

### General precautions

This product is designed and manufactured using good workmanship and materials, and meets all applicable industry standards. This product should be used only as recommended by ITT.



### WARNING:

- Misapplication of the valve can result in injury or property damage. Select valves and valve components of the proper materials and make sure that they are consistent with your specific performance requirements. Incorrect application of this product includes but is not limited to:
  - Exceeding the pressure or temperature rating
  - Failing to maintain this product according to the recommendations
  - Using this product to contain or control media that is incompatible with the materials of construction

### Qualifications and training

The personnel responsible for the assembly, operation, inspection, and maintenance of the valve must be appropriately qualified. The operating company must do the following tasks:

- Define the responsibilities and competency of all personnel handling this equipment.
- Provide instruction and training.

- Ensure that the contents of the operating instructions have been fully understood by the personnel.

Instruction and training can be carried out by



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**WARNING:**

California Proposition 65 Cancer <http://www.P65Warnings.ca.gov>. Plastics in product contain Glass Wool Fibers, known to the State of California to cause cancer. Wash hands after handling.

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**Non-compliance risks**

Failure to comply with all safety precautions can result in the following conditions:

- Death or serious injury due to electrical, mechanical, and chemical influences
- Environmental damage due to the leakage of dangerous materials
- Product damage
- Property damage
- Loss of all claims for damages

**Operational safety precautions**

Be aware of these safety precautions when operating this product:

- Do not hang items from the product. Any accessories must be firmly or permanently attached.
- Do not use the product as a step or hand hold.
- Do not paint over the identification tag, warnings, notices, or other identification marks associated with the product.

**Maintenance safety precautions**

Be aware of these safety precautions when performing maintenance on this product:

- You must decontaminate the product if it has been exposed to harmful substances such as caustic chemicals.

**Use of unauthorized parts**

Reconstruction or modification of the product is only permissible after consultation with ITT. Genuine spare parts and accessories authorized by ITT serve to maintain safety. Use of non-genuine ITT parts can annul liability of the manufacturer for the consequences. ITT parts are not to be used in conjunction with products not supplied by ITT as this improper use can annul all liability for the consequences.

**Unacceptable modes of operation**

The operational reliability of this product is only guaranteed when it is used as designated. The operating limits given on the identification tag and in the data sheet may not be exceeded under any circumstances. If the identification tag is missing or worn, contact for specific instructions.

# 2 Transportation and storage

## 2.1 Handling and unpacking guidelines

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**CAUTION:**

Always observe the applicable standards and regulations regarding the prevention of accidents when handling the product.

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### Handling guidelines

Follow these guidelines when handling the product to prevent damage:

- Use care when handling the product.
- Leave protective caps and covers on the product until installation.

### Unpacking guidelines

Follow these guidelines when unpacking the product:

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. Do not lift or pull on the electrical conduit lines. Doing so may cause the POC switches to come out of calibration.

## 2.2 Storage, disposal, and return requirements

### Storage

If you are not immediately installing the product after delivery, store it as follows:

- Store the product in a dry room that maintains a constant temperature.
- Make sure that the products are not stacked on top of one another.

### Disposal

Dispose of this product and associated components in compliance with federal, state, and local regulations.

### Return

Ensure these requirements are met before you return a product to ITT:

- Contact ITT for specific instructions on how to return the product.
- Clean the valve of all hazardous material.
- Complete a Material Safety Data Sheet or Process Data Sheet for any process fluid that could remain on the valve.
- Obtain a Return Material Authorization from the factory.

# 3 Product Description

## 3.1 Bio-Tek identification

### Model number

The Bio-Tek model numbers contains the following:

**Table 1: Body type**

Code	Description
8	Bio-Tek Forging

**Table 2: Diaphragm type**

Code	Description
E1	EPDM
TME	PTFE

**Table 3: Manual topworks**

Code	Description
18	Manual bonnet
18S	Manual bonnet sealed

## 3.2 Valve diaphragm identification

### Diaphragm tab codes

All diaphragm materials and physical properties are batch traceable via permanent codes molded into the diaphragm tabs. The molding date, grade of diaphragm, and size provide traceability to original batch records.



1. Date code
2. Supplier code

**Figure 1: Elastomer diaphragm front**



- 1. Valve size
- 2. Grade of diaphragm

**Figure 2: Elastomer diaphragm back**



- 1. Material code
- 2. Date code

**Figure 3: PTFE diaphragm**



## 4 Installation

### 4.1 Install the valve and topworks

#### NOTICE:

The topworks size and configuration can limit the actual operating pressure. Consult the Pure-Flo catalog for pressure limitations. Consult the factory or engineering catalog for vacuum operation.

1. If you have a weld end valve, then consider the following:

If you are welding ...	Then ...
Manually	Remove the topworks.
In line	You can weld with automatic equipment. Before you perform the weld: <ol style="list-style-type: none"> <li>1. Remove the topworks (optional).</li> <li>2. If left installed, set the valve to the open position.</li> <li>3. Properly purge the valve with an inert gas.</li> </ol>

2. Install the valve.
3. Prior to pressurization (with the valve slightly open), tighten the bonnet fasteners. For more information, see [4.2 Tighten the bonnet fasteners on page 7](#).
4. Cycle the valve two to three times to verify smooth operation.
5. Set the travel stop. For more information, see [4.3 Adjust the travel stop on page 8](#)

### 4.2 Tighten the bonnet fasteners



#### CAUTION:

Do not tighten fasteners while the system is pressurized or at elevated temperatures (greater than 38°C | 100°F).

1. Depressurize the system.
2. Tighten the bonnet fasteners in a crisscross pattern. For more information, see [4.2.1 Fastener torque table for valve body to topworks on page 8](#).
3. Make multiple crisscross passes to build up torque to the final table value. Make additional crisscross passes using final table values to evenly tighten each fastener to within 5% of torque value.
4. Retighten the bonnet fasteners as noted operating pressure and temperature.
5. Monitor the valve for leakage:

If leakage ...	Then ...
Occurs at the body/bonnet flange sealing area	Depressurize the system and retighten the bonnet fasteners as noted above.
Continues	Replace the valve diaphragm.

For more information, see [5.4 Replace the valve diaphragm on page 9](#).

### 4.2.1 Fastener torque table for valve body to topworks

Values given are for lubricated fasteners.

Valve size		Bolt size		PTFE diaphragm		Elastomer diaphragm	
DN	Inch	Metric	Imperial	N-m	in-lb	N-m	in-lb
Bio-Tek (8, 10, 15)	Bio-Tek (0.25, 0.375, 0.50)	M4	#6	2.3-2.8	20-25	2.3-2.8	20-25

### 4.3 Adjust the travel stop

A travel stop is included in all manual valve configurations. The purpose of the travel stop is to prevent over closing of the valve and prolong diaphragm life. ITT recommends you adjust the travel stop:

- during valve installation
- after diaphragm replacement
- after any other maintenance procedure

Use one of the methods below to adjust the travel stop.

1. Method 1

- a) With the valve slightly open, apply air pressure at 150 psig (10 bar) to the upstream side.

**NOTICE:**

Make sure that seal leakage is not excessive at this time as it will result in the whipping action of the flexible tube.

- b) Connect the downstream side to a flexible tube immersed in a container of water.

Air bubbles should be evident in the water.

- c) Remove the cap and screw.  
 d) Turn the handwheel clockwise until the air bubbles stop.  
 e) Push down on the handwheel and reinstall the screw and cap.

The travel stop is now set.

2. Method 2

- a) With system pressure vented, remove the cap, screw, and handwheel.  
 b) Using a wrench applied to the stem flats, close the valve to the following final torque (depending on the type of diaphragm) in inch-pounds.

**Table 4: Final torque required**

Diaphragm type	in-lb.	N-m
PTFE	15	1.7
Elastomer	15	1.7

- c) Slide the handwheel over the stem, push down and reinstall the screw and cap.

The travel stop is now set.

# 5 Maintenance

## 5.1 Precautions



### WARNING:

- All procedures must be performed by qualified personnel.
- When the process fluid is hazardous, thermal (hot or cold), or corrosive, take extra precautions. Employ the appropriate safety devices and be prepared to control a process media leak.
- Always wear protective clothing and equipment to safeguard the eyes, face, hands, skin, and lungs from the fluid in the line.

## 5.2 Inspection

Inspection area	What to look for	Action if problem is found
External valve parts	Excessive wear or corrosion	<ul style="list-style-type: none"> <li>• Replace the affected parts</li> <li>• Contact ITT to obtain replacement parts or for specific instructions</li> </ul>
Topworks	Spindle binding, excessive noise, or dried lubricant	
Diaphragm and valve body	Leakage between the diaphragm and valve body	Tighten the bonnet fasteners

For more information, see:

- [5.4 Replace the valve diaphragm on page 9](#)

## 5.3 Disassemble the valve

1. Remove all line pressure.
2. Rotate handwheel clockwise to just close valve.
3. Remove the bonnet fasteners.
4. Lift the topworks assembly from the valve body.

## 5.4 Replace the valve diaphragm

1. Disassemble the valve.  
For more information, see [5.3 Disassemble the valve on page 9](#).
2. Unscrew the diaphragm from the compressor by turning the diaphragm counterclockwise. The replacement diaphragm should be identical in size and grade to the original diaphragm.
3. Rotate the diaphragm until hard stop or heavy resistance is achieved and additional force does not significantly rotate the diaphragm into the compressor.



4. If replacing a PTFE diaphragm, re-invert the diaphragm.



5. Replace the valve bonnet on the body and tighten the bonnet fasteners handtight. For more information, see [4.2 Tighten the bonnet fasteners on page 7](#).
6. Set the travel stop. For more information, see [4.3 Adjust the travel stop on page 8](#).

## 5.5 Lubrication requirements

### Lubrication schedule

1. Remove bonnet screws and lift bonnet assembly from body.
2. Pry caplug loose and remove screw, o-ring, and handwheel
3. Inspect and replace o-ring as necessary. Coat o-ring with lubricant.
4. Reinstall screw and rotate clockwise until spindle begins turning. Continue rotating until the spindle disengages from the bonnet.
5. Inspect and replace o-ring as necessary. Coat o-ring with lubricant.
6. Remove any residual grease and re-lubricate spindle threads and bonnet screw threads prior to assembly.
7. Reassembly is the reverse of the above procedure. Ensure the compressor pin is aligned and engages the hole in the bonnet when reassembling.

### Acceptable lubricants

Brand	Lubricant type
Chevron	

# 6 Parts Listing and Cross-Sectional Drawings

## 6.1 Bio-Tek manual topworks

### List of parts

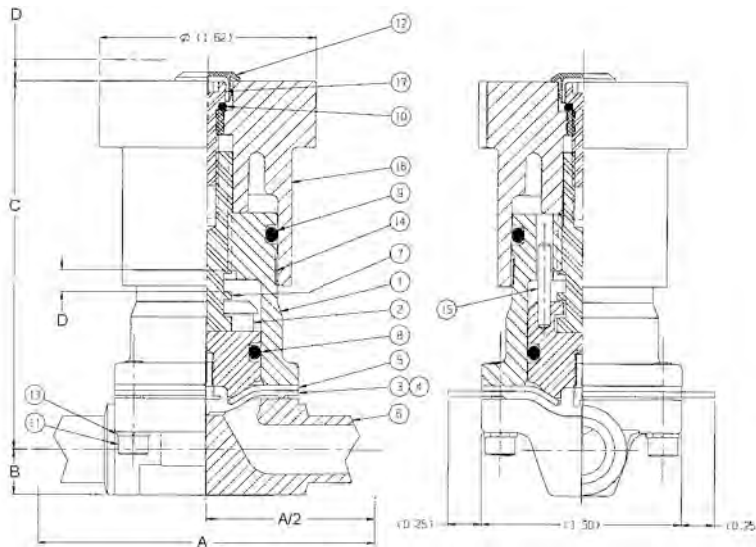


Figure 4: Bio-Tek Drawing

Table 5: Parts List

Item	Description	Material	Quantity
1	Bonnet	Stainless steel	1
2	Compressor	Stainless steel	1
3	Diaphragm - Plastic	TFE	1
4	Diaphragm - Elastomer	Elastomer	1
5	Backing cushion	EPDM	1
6	Body	Stainless steel	1
7	Spindle	Stainless steel	1
8*1	O-ring #114	Viton	1
9*2	O-ring #118	Viton	1
10*3	O-ring #007	Viton	1
11	Screw	Stainless steel	1
12	Cap - Caplug	Flextemp	1
13	Washer - Spring Lock	Stainless steel	
14	Indicating label	Mylar	
15	Pin - Spring	Stainless steel	
16	Handwheel	PAS	
17	Screw	Stainless steel	

\*1 Recommended spare part. Only applicable to Model 18S.

\*2 Recommended spare part. Only applicable to Model 18S.

\*3 Recommended spare part. Only applicable to Model 18S.

**Table 6: Dimensions**

<b>Body Type</b>	<b>A*1</b>	<b>A/2</b>	<b>B</b>	<b>C</b>	<b>D*2</b>
Tri-Clamp	2.53	1.27	0.34	2.77	0.16
Buttweld	3.53	1.77	0.37	2.84	0.16

\*1 End to end of body

\*2 Valve travel

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