

# ZAVODA MANUFACTURING CO., INC.

we make zeals®

Since 1962



## DIAPHRAGM SEALS

### U.S. PATENTS

#3,645,139, #4,375,182,  
#4,885,983 AND #5,115,724

### CANADIAN PATENTS

PATENTED 1974 - #940,330  
PATENTED 1983 - #1,157,289

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# DIAPHRAGM SEALS

## DESIGN INFORMATION

### What is a Diaphragm Seal?

A Diaphragm Seal is a device consisting of a diaphragm firmly clamped between two suitable flanges and properly gasketed to prevent leakage of liquid or gas. In this type of device a diaphragm, which is a "dividing membrane or a thin partition", acts as a barrier to a liquid or gas that may tend to clog or corrode the sensing element in a pressure instrument and therefore render the pressure instrument useless. This type of device is sometimes called a Chemical Seal or a Gauge Protector. Our Diaphragm Seal, made by The Zavoda Manufacturing Co., Inc. is called a Zeal®. Zeal® is short for Zavoda Diaphragm Seal and is our registered trademark.

### Series

The Zavoda Diaphragm Seal (Zeal®) is available in two basic sizes - a "Small Size" and a "Large Size". The small size is the 5 series and the large size is the 6 series.

The difference between the two series is that the effective diaphragm area used in the 6 series Zeal is double that of the effective diaphragm area used in the 5 series Zeal. Therefore, the series 6 Zeal should be the choice for all sensitive and low pressure applications.

### Continuous Type

All Zeals® are the continuous type for safety. This is especially important when a diaphragm seal is used in a hazardous application. With this type of construction, the diaphragm will aid in containing the process media should the pressure instrument be accidentally broken or removed. This is very important, should the process media be either a corrosive or a harmful gas. This also allows the process operation to continue to run until a convenient time to shut down the process line and replace the damaged pressure instrument.

### Cleanout Type

All Zeals are of the cleanout type except for the styles 10 and 11. (Example: Model M511). The bolts of the cleanout type can be removed and separated at the flanges for cleaning, liquid filling, calibrating, welding, or other purposes, without the loss of the Liquid Fill fluid.

### Non-Cleanout Type

The bolts of the Non-Cleanout type Zeal (Styles 10 and 11) MUST NOT be removed. Loss of Liquid Fill fluid will result, as the diaphragm is NOT held in the instrument flange.

### Fill/Bleed Port

All Zeals come standard with a Fill/Bleed Port. This tapped hole in the instrument flange gives access to the fill area above the diaphragm. This port is used for filling the pressure instrument/seal combination and for bleeding excess fluid from the system.

### Type W - Welded Metal Diaphragm

In this type of Zeal the metal diaphragm is welded at its periphery to the instrument flange. The advantage of using this type of Zeal is that it will retain the liquid fill fluid with less danger of leakage. It is very popular because of this feature and is usually the lowest in cost. This type of Zeal is classified as a throw away type because it cannot be repaired if the diaphragm is damaged or worn out; therefore, it must be replaced with a new Diaphragm Seal.

### Type M - Metal Diaphragm

In this type of Zeal the diaphragm can be replaced if worn out or damaged. The Zeal can be rebuilt many times thus restoring it to a "like new" condition and lowering cost. This type of Zeal is the cleanout type in all models and series except styles 10 and 11, which are the non-cleanout type.

### Type V - Viton Diaphragm

Viton Diaphragms are suitable for use with extremely low pressures and high vacuums. In the cleanout style the diaphragm is bonded to the instrument flange. In the non-cleanout style the diaphragm is clamped between the flanges.

### Type T - Teflon Diaphragm

The Teflon Diaphragm Seal is truly the top of the line of Diaphragm Seals regardless of manufacturer and many have discovered that the Zeal is superior. This type of Zeal is very forgiving due to abuse or error. The list of advantages and features is very impressive. A few follow:

#### List of Features - Type T

1. DIAPHRAGM - Made of Teflon for greatest compatibility with practically all chemicals.
2. GREATER ACCURACY - The Teflon diaphragm is more sensitive than a metal diaphragm, with increased displacement due to greater flexibility and elasticity. The Type T, Series 6, Zeal is the most sensitive quality Diaphragm Seal available.
3. SIMPLIFIED LIQUID FILLING OPERATION - Highly efficient vacuum pump is not necessary; highly skilled technician not required; faster; less costly.
4. LESS TEMPERATURE ERROR - More sensitive diaphragm reduces error due to expansion of liquid fill; less back pressure.

#### List of Features - All Types and Series

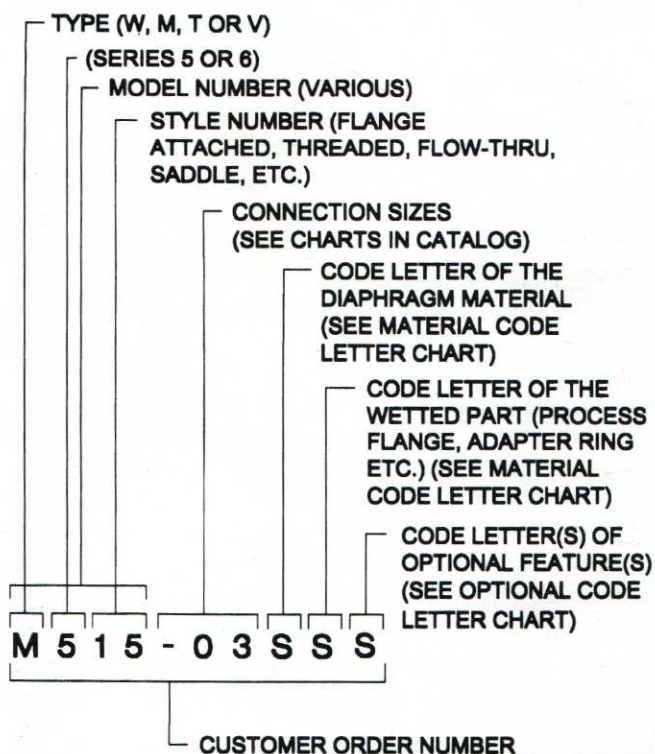
1. SPECIAL PATENTED FEATURE - A patented feature of the metal diaphragm, used in the Type W and Type M Zeal, is the addition of spoke corrugations to the radial corrugations. The spoke corrugations reduce hoop stress in the metal thus enabling the metal diaphragm to flex more readily and allow more displacement of the liquid fill fluid. This patented feature allows



our Diaphragm Seal to have more displacement than other manufacturers and therefore is more sensitive.

2. **PATENTED SNAP-IN DIAPHRAGM** - Eliminates the need for a costly machined diaphragm clamping ring (wetted part) to retain the diaphragm; lowers cost.
3. **SEALING** - Ingenious O-ring gasketing of the diaphragm insures minimal possibility of leakage of the liquid fill fluid when properly installed, operated and maintained.
4. **SIMPLIFIED ASSEMBLY** - Flanges of all Zeals, except the flanged type, are bolted solidly together, face-to-face, by four bolts; no skill or special tools required to tighten bolts.
5. **IMPOSSIBLE TO CRUSH GASKET** - Flange is recessed for gasket; flanges squeeze gasket, do not tighten on gasket.
6. **FLANGES BOLT UP EASIER** - Flanges bolt up metal-to-metal; flanges bolt up directly under bolt heads; no guesswork required to tighten bolts; no "feel" required; quicker, easier, flanges remain parallel.
7. **SELF-ENERGIZED GASKET** - Process pressure is used to pressure load the process gasket surface; the greater the process pressure, the greater the sealing pressure.
8. **GASKET PRESSURE IS CONSTANT** - When flanges separate slightly from stretch of bolts, due to high pressure, the process flange gasket pressure on sealing surfaces remains constant thus preventing leakage.
9. **EASY TO CLEAN** - Except for styles 10 or 11, all Zeals can be disassembled at the flanges and reassembled many times; simple, quick, no loss of liquid fill.

## ZEAL<sup>®</sup> NUMBERING SYSTEM



## MATERIAL CODE LETTER CHART

MATERIAL OF DIAPHRAGM	CODE LETTER	MATERIALS OF WETTED PROCESS PART
	A	ALUMINUM
	B	BRASS
	C	STEEL
CARPENTER 20	D	CARPENTER 20
304 STAINLESS STEEL	F	304 STAINLESS STEEL
HASTELLOY B	G	HASTELLOY B
HASTELLOY C	H	HASTELLOY C-276
TITANIUM	J	TITANIUM
	K	KYNAR
	L	TEFLON LINED
MONEL	M	MONEL
NICKEL	N	NICKEL
	P	POLYPROPYLENE
316 STAINLESS STEEL	S	316 STAINLESS STEEL
TEFLON	T	TEFLON
TANTALUM	U	TANTALUM
VITON	V	
	W	CPVC
INCONEL	Y	INCONEL
	Z	PVC

## OPTIONS CODE LETTER CHART

316 SS INSTRUMENT FLANGE	S
5000 PSI MAX. SERVICE	R
PROCESS SOCKET WELD CONNECTION	E

### Teflon Wetted Parts

The Diaphragm and all other parts of the Zeal in contact with the process media (gas or fluid), are referred to as "Wetted Parts". The wetted parts must be of a material selected to be reasonably immune to attack from, and compatible with, the process media. Selection of the material is the sole responsibility of the buyer and/or the user.

The use of Teflon is becoming more and more common, due to its compatibility with practically all gases and fluids. Because Teflon can be used in so many applications, now mostly reserved for high priced metals, we are offering our Zeals using Teflon for the wetted material instead of very expensive metals and even Stainless Steel.

Two methods of construction are offered for the Adapter Ring, which is the wetted part used in the Flanged Type Zeal. One method is to use a solid piece of Teflon for the Adapter Ring. The material designation for this method is 'Teflon'. The second method is to use two pieces for the Adapter Ring. The inner wetted part is made of Teflon and is fitted into an outer non-wetted metal shell. The material designation for this method is 'Teflon Lined'.

The one disadvantage of using Teflon is the "Cold Flow"



tendency that is inherent in this material. In the 'Teflon' construction the clamping flanges must be bolted up evenly and gently with the bolts being just tight enough to contain the process media, otherwise the tightening pressure of the bolts will cause the Teflon to 'cold flow' somewhat the same as if the Adapter ring was made of rubber.

In the 'Teflon Lined' construction the Teflon is prevented from cold flowing by being contained in a metal shell. Installation is virtually foolproof because of this patented design. Although this seal was designed to interface with plastic lined pipe systems, it can be used with any conventional system, especially where expensive materials are required.

In the Threaded Style Zeal, the 'cold flow' of Teflon is kept to a minimum by supplying this style, and all of our Zeals having non-metallic (i.e. Plastics) process flanges, with a thick metal ring under the hexagon nuts to prevent the nuts from embedding themselves into the process flange. In addition the metal ring helps spread the bolting pressure over a wider area.

In summary, we feel this design of Zeal would be well worth trying on any particular process for your evaluation. It can offer great savings, not only in the lower initial cost but because of Teflon's forgiving nature to tolerate user error. Also, in many applications, they outlast metal diaphragm seals as much as three to one.

When ordering, be sure to add the correct code letters in the order number: 'T' for Teflon and 'L' for Teflon Lined. See page 4 for how to order.

### Liquid Fill

With a Diaphragm Seal installed between the process media and the pressure instrument, the process pressure acts on the diaphragm which transmits the pressure to the sensing element in the pressure instrument through a liquid. This liquid is call the Liquid Fill of the Diaphragm Seal. Various standard liquids are available. See Price List for standard fill fluids. Other liquids are available on special order. This liquid is usually an instrument oil. It fills the cavities in both the sensing element and the instrument flange on the instrument side of the diaphragm. Selection of the fill fluid is the sole responsibility of the buyer and/or the user.

### Pressure

MAXIMUM recommended working pressure for Zeals in all series and all types follow and are arranged by style numbers:

- 05, 06, 10, 11, 15 and 16 threaded types - 2500 psi at 100°F
- 25, 26, 30 and 31 flange types are limited by the pressure rating of the ANSI flange being used
- 35, 40, 45, 50, 55, 60 and 65 for "In-Line" and saddle types are limited by the pressure rating of the pipe being used but not to exceed 600 psi at 100°F.
- Allowable working pressure for Zeals with wetted parts made of non-metallic material (e.g. Plastics) is 300 psi at a maximum temperature of 140°F.

MINIMUM recommended working pressure for Zeals is as follows: (arranged by series number and Zeal type)

Series 5 - Type W and Type M is 20 psi.

Type T is 15 psi.

Type V is 5" of water column.

Series 6 - Type W and Type M is 10 psi.

Type T is 8" of water column.

### Vacuum

All Zeals can be used for vacuum service. Indicated vacuum ranges in instruments with bourdon tube sensing elements are as follows and are arranged by series number and Zeal type:

Series 5 - Type W and Type M between 0" and 21"

Hg. Vac

Type T between 0" and 23" Hg. Vac.

Type V between 0" and 29" Hg. Vac.

Series 6 - Type W and Type M between 0" and 24"

Hg. Vac

Type T between 0" and 26" Hg. Vac

For extremely difficult pressure and vacuum applications consult with factory. The above pressure and vacuum ranges apply only when Zeals are properly installed, operated and maintained.

### MATERIALS

The following are standard materials. Other materials are available on special order.

**Instrument flange** - (Non-wetted part) Nickel Plated. Carbon Steel.

**Wetted Parts** - (Process flange, adapter ring, etc.) Various standard materials are available (See Price List) and must be specified when ordering. Specify by calling out proper material code letter in order number when ordering. (See Code Letter Chart). Selection of material is the sole responsibility of the buyer and/or the user.

**Diaphragm** - (Wetted part) Various standard materials are available (See Price List) and must be specified when ordering. Specify by calling out the proper material code letter in order number when ordering. (See Material Code Letter Chart). Selection of material is the sole responsibility of the buyer and/or the user.

**Gaskets** - Process flange gaskets (wetted part) are made of Teflon and are used in all the series and all the types of Zeals. Instrument flange gaskets (non-wetted part) are made of Viton and are used in all Zeals. Other materials are available on special order.

**Fill Fluids** - Various standard fluids are available (See Price List) and must be specified when necessary for Zavoda Mfg. Co., Inc. to liquid fill the assembly. Other fluids are available on special order. Selection of the Fill Fluid is the sole responsibility of the buyer and/or the user.

**Bolts** - Supplied with Zeals®, when required, are heat treated alloy steel hexagon head cap screws, socket head cap screws, or socket set screws. Other materials are available on special order.

**Nuts** - Stainless Steel hexagon nuts supplied with above hexagon head cap screws.



## GENERAL INFORMATION

**Mounting** - Pressure instruments can be connected directly to a Diaphragm Seal or can be remotely mounted and connected with capillary tubing. Lengths up to 100 feet of tubing can be provided in 1/8" outside diameter, stainless steel tubing. This tubing can be protected with stainless steel flexible spiral armor. See Price List.

**Temperature** - All Type T and M Zeals with metal process flanges can operate up to 500°F. Type V with metal process flanges can operate up to 300°F. Type W Zeals with metal process flanges can operate at higher temperatures. Consult with factory.

## HOW TO ORDER:

Be sure to specify the following when applicable:

(1) Specify Zeals by customer order number. (See Zeal Numbering System on page 2).

Example 1:

Customer order number M615-03SS Zeal.  
Above customer order number designates a Type M (metal diaphragm) large Zeal. It is a Style 15, threaded and is a cleanout type with a 1/4" NPT instrument connection and a 1/2" NPT process connection. The diaphragm material is 316 Stainless Steel and the process flange material is 316 Stainless Steel.

Example 2:

Customer order number T530-21TL Zeal.  
Above customer order number designates a Type T (Teflon diaphragm) small Zeal. It is a Style 30, flange attached and is a cleanout type with a 1/4" NPT instru-

ment connection and is a 1" pipe size and has a pressure rating of 150 lbs. The diaphragm material is Teflon and the adapter ring is Teflon Lined.

(2) Specify Capillary Tubing by catalog number and length required.

Example:

Catalog number T5582 Armored Capillary Assembly - 10 Feet Long.

Above catalog number designates an armor covered capillary tubing assembly with a 1/4" NPT male fitting on one end and a 1/2" NPT male fitting on the other end. The overall length is 10 feet long.

(3) Specify Miscellaneous Parts by catalog number. (Catalog number is the same as part number). See price list.

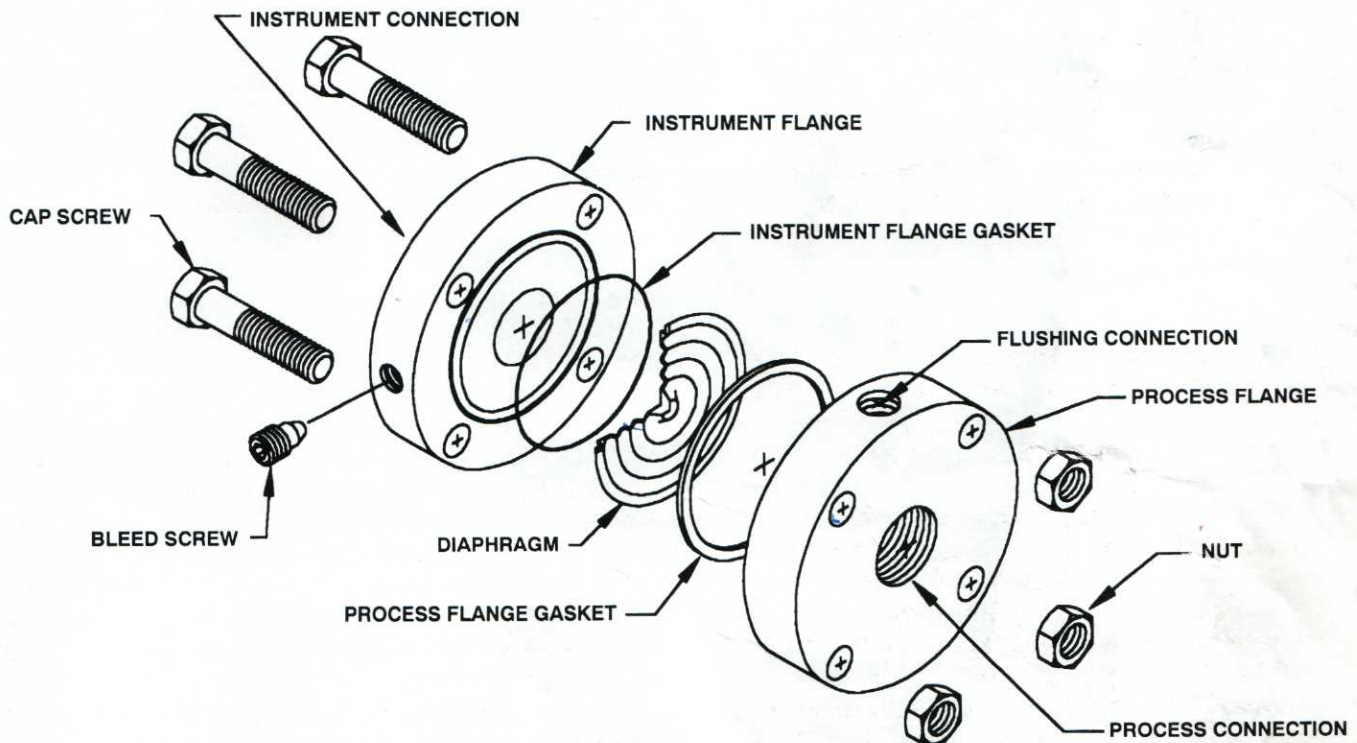
Example:

Catalog number T6403T Diaphragm.

Above catalog number designates a large cleanout type diaphragm. The material of the diaphragm is Teflon. (See Material Code Letter Chart on page 2).

(4) **Liquid Fill** - (Needed only when we are required to liquid fill pressure instruments). Specify liquid fill fluid by name (i.e. Halocarbon Oil). See price list for standard fluids available.

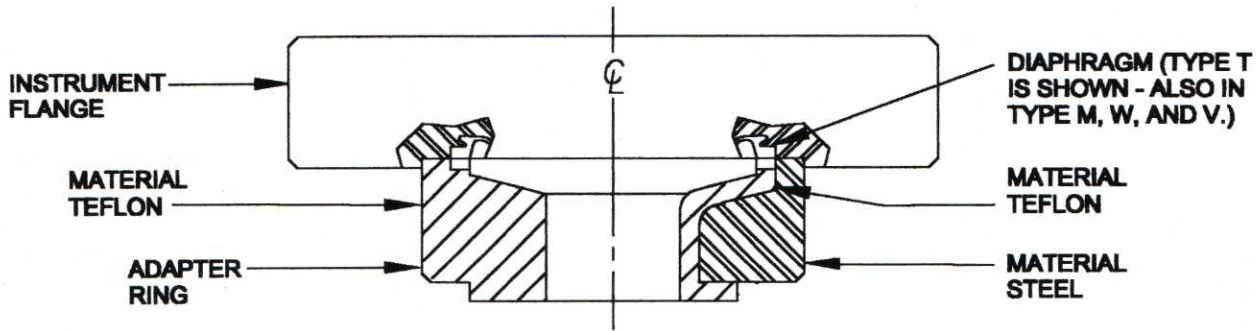
(5) **Instrument Data** - (Needed only when we are to supply the instrument). Be sure to be clear in giving the specifications and descriptions of the instrument to avoid error in procurement.



TYPICAL PARTS AS ASSEMBLED

# ZEALS

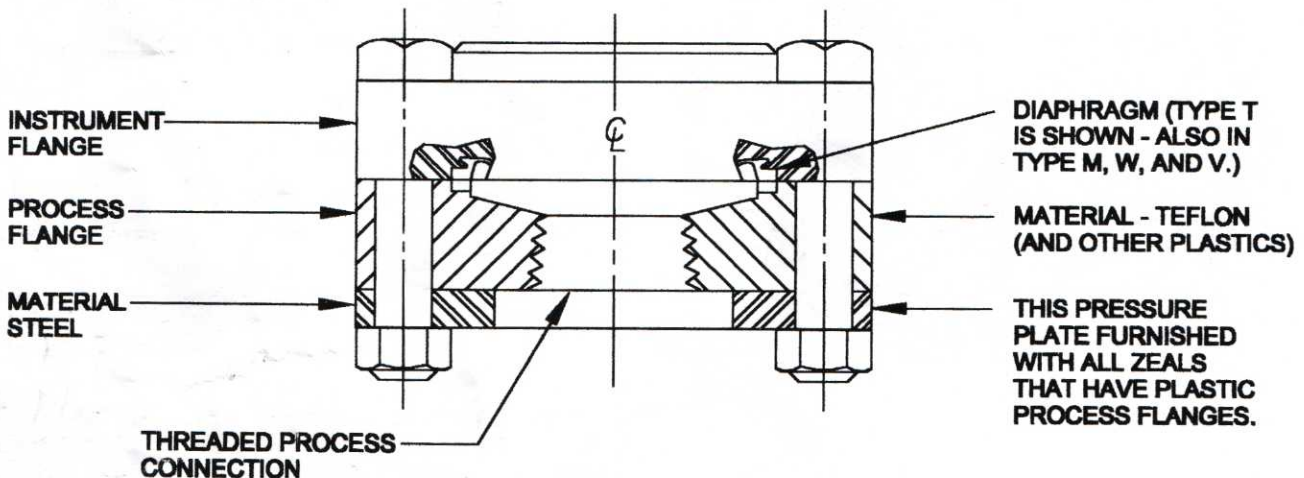
## CONSTRUCTION DETAILS OF 'TEFLON' AND 'TEFLON LINED'



THIS HALF OF ZEAL, ON THIS SIDE OF THE CENTER LINE, SHOWS TYPICAL CONSTRUCTION OF 'TEFLON' ADAPTER RING. THIS TYPE OF CONSTRUCTION IS AVAILABLE WITH A FLUSHING CONNECTION.

THIS HALF OF ZEAL, ON THIS SIDE OF THE CENTER LINE, SHOWS TYPICAL CONSTRUCTION OF 'TEFLON LINED' ADAPTER RING. THIS TYPE OF CONSTRUCTION IS NOT AVAILABLE WITH A FLUSHING CONNECTION.

## CONSTRUCTION DETAILS OF FLANGED TYPE MODELS

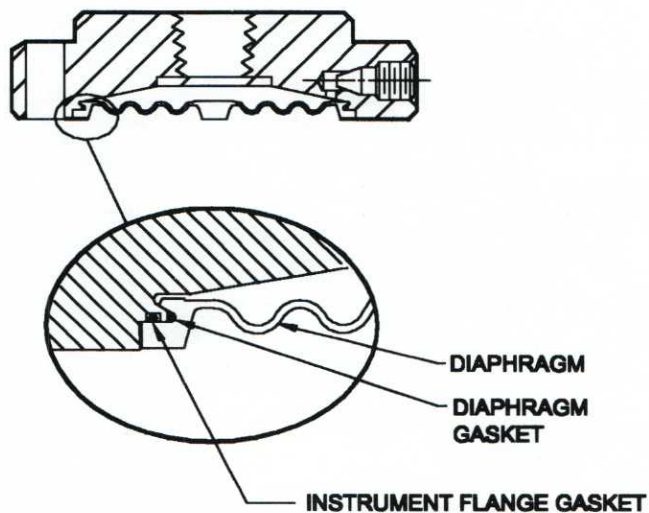


THIS ZEAL SHOWS TYPICAL CONSTRUCTION OF 'TEFLON' PROCESS FLANGE.

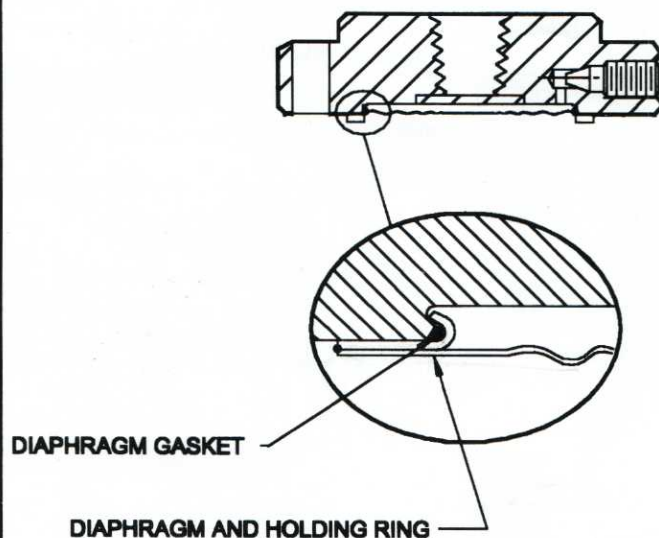
## CONSTRUCTION DETAILS OF THREADED TYPE MODELS



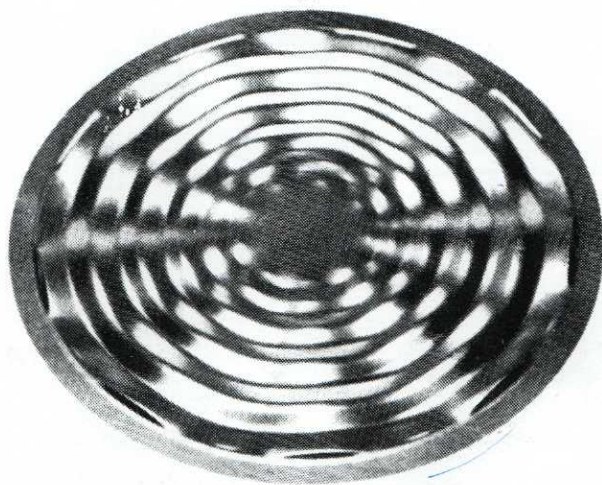
# ZAVODA PATENTED FEATURES



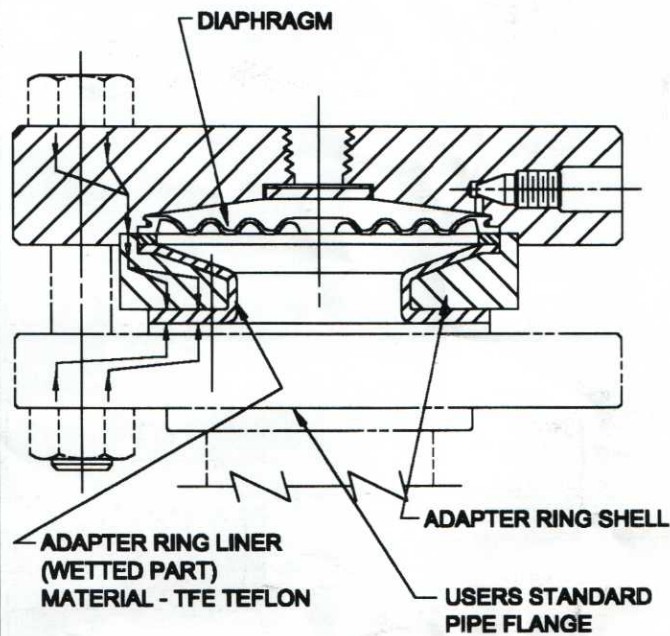
**TEFLON  
"SNAP-IN" DIAPHRAGM**



**METAL  
"SNAP-IN" DIAPHRAGM**



**SPOKE CORRUGATIONS**



CROSS SECTIONAL VIEW THROUGH A FLANGE MOUNTED DIAPHRAGM SEAL WITH A TEFLON LINED ADAPTER RING LINES OF CLAMPING FORCES ARE SHOWN BY SHORT ARROWS.

**TEFLON LINED  
ADAPTER RING**

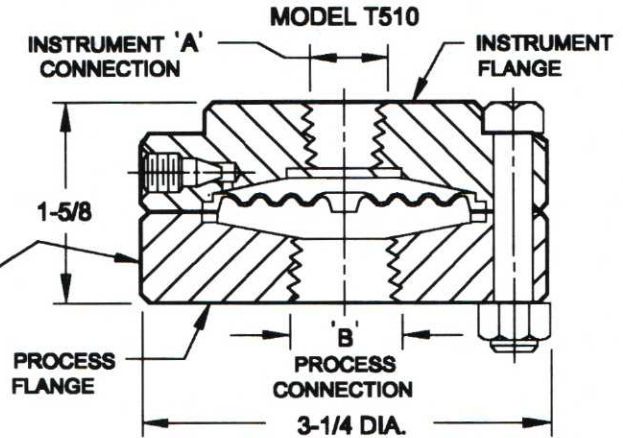
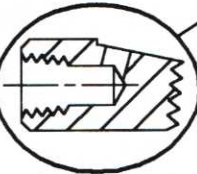
# SERIES 5 - TYPE T - TEFLON DIAPHRAGM

FOR PIPE MOUNTING

MODELS T510 AND T511								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

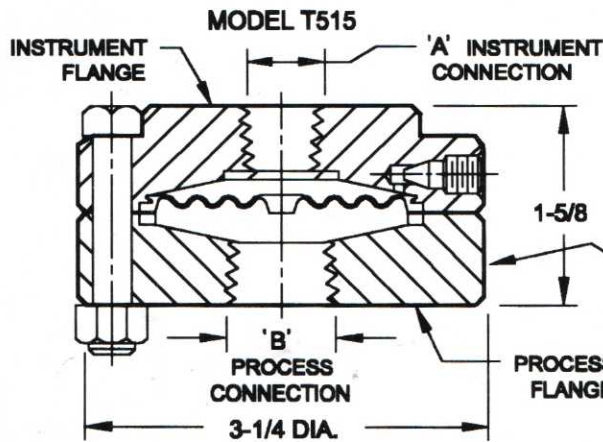
(CLAMPED NON-CLEANOUT TYPE)

MODEL T511  
HAS A 1/4" NPT  
FLUSHING CONNECTION

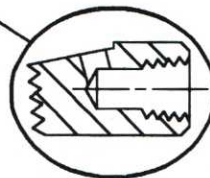


FOR PIPE MOUNTING

MODELS T515 AND T516								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

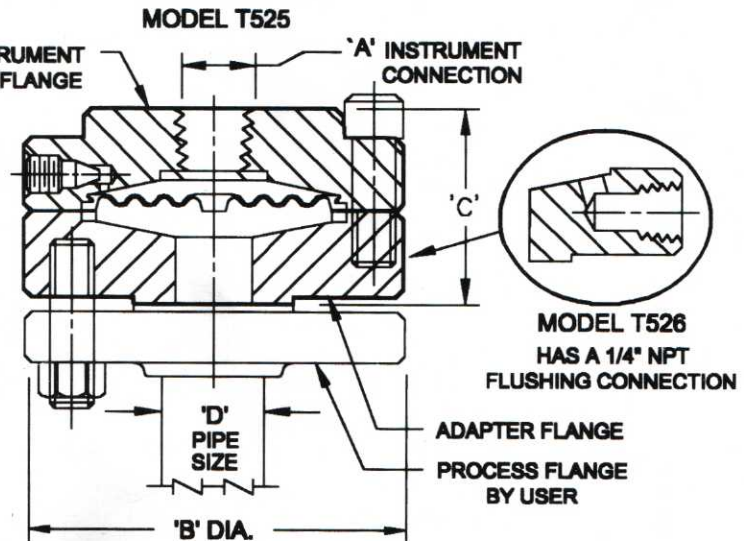


MODEL T516  
HAS A 1/4" NPT  
FLUSHING CONNECTION



FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

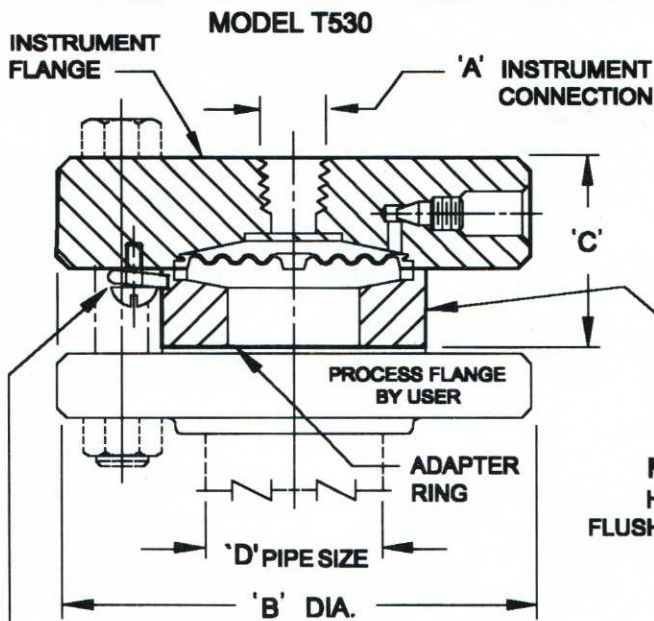
MODELS T525 AND T526					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	3-1/4	1-11/16	1/2
-02	1/2				
-03	1/4	300 LB.	3-1/2	1-11/16	
-04	1/2				
-11	1/4	150 LB.	3-1/2	1-11/16	3/4
-12	1/2				



MODEL T526  
HAS A 1/4" NPT  
FLUSHING CONNECTION



# SERIES 5 - TYPE T - TEFLON DIAPHRAGM



MODEL T531 HAS A 1/4" NPT FLUSHING CONNECTION

THE ADAPTER RING IS CLAMPED AT TWO PLACES FOR SHIPPING AND HANDLING

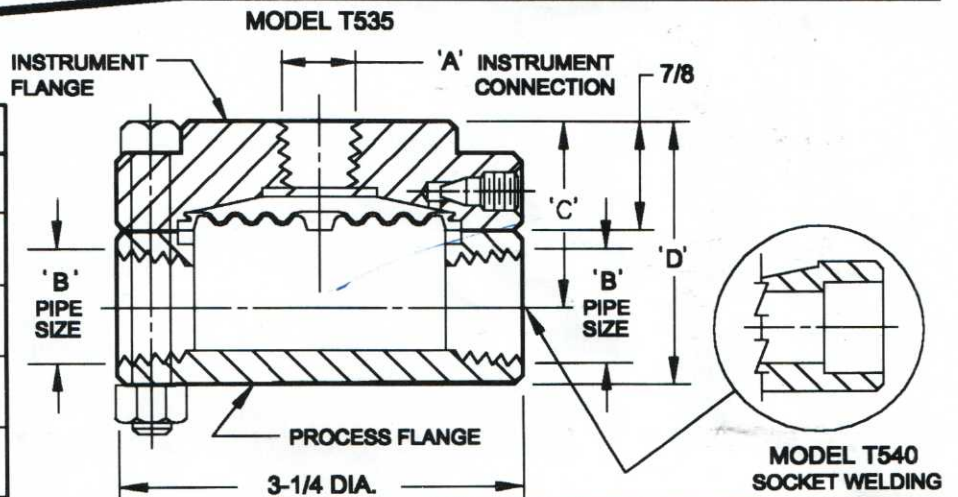
FOR FLANGE MOUNTING ON ANSI STANDARD RAISED FACE FLANGES

MODELS T530 AND T531					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-21	1/4	150 LB.	4-1/4	1-11/16	1"
-22	1/2		4-3/4	1-11/16	
-23	1/4	300 LB.	4-3/4	1-11/16	1-1/2"
-24	1/2		5"	1-5/8	
-41	1/4	150 LB.	5"	1-5/8	1-1/2"
-42	1/2		6"	1-5/8	
-43	1/4	300 LB.	6"	1-5/8	2"
-44	1/2		6"	1-5/8	
-51	1/4	150 LB.	6"	1-5/8	2"
-52	1/2		6-1/2	1-5/8	
-53	1/4	300 LB.	6-1/2	1-5/8	3"
-54	1/2		7-1/2	1-5/8	
-61	1/4	150 LB.	7-1/2	1-5/8	3"
-62	1/2		8"	1-13/16	
-63	1/4	300 LB.	8"	1-13/16	3"
-64	1/2				

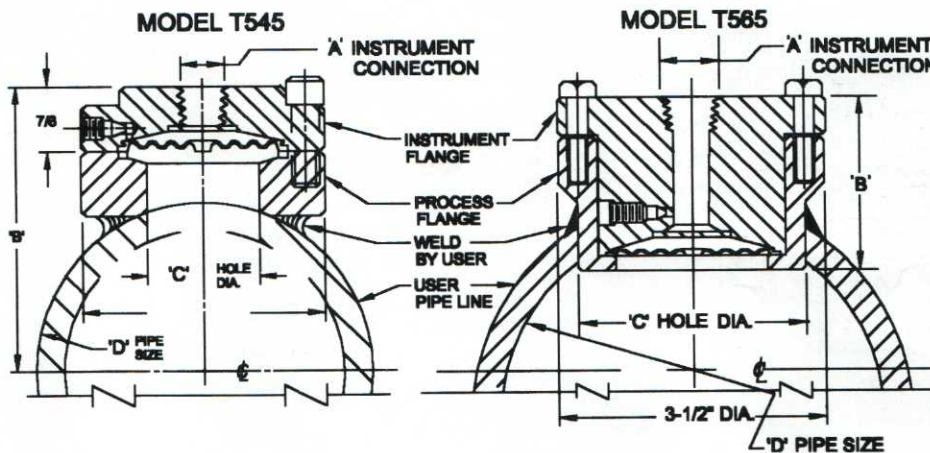
OTHER SIZES ON APPLICATION

FOR "IN-LINE" FLOW-THRU IN PROCESS PIPE LINE

MODELS T535 AND T540				
DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2		1-1/2	2-1/8
-03	1/4	1/2	1-1/2	2-1/8
-04	1/2		1-1/2	2-3/8
-05	1/4	3/4	1-5/8	2-3/8
-06	1/2	1"	1-3/4	2-5/8
-07	1/4		1-3/4	2-5/8
-08	1/2			



FOR SADDLE WELDING ON PROCESS PIPE LINE



MODEL T545				
DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2		1-1/2	1-1/2
-05	1/4	2-3/8	1-1/2	1-1/2
-06	1/2		1-1/2	2"
-07	1/4	2-5/8	1-1/2	2"
-08	1/2		1-1/2	3"
-09	1/4	3-1/4	1-1/2	3"
-10	1/2			

OTHER SIZES ON APPLICATION

MODEL T565				
DASH NO.	'A' NPT	'B'	'C'	'D'
-11	1/4	2-1/4	3"	4" OR LARGER
-12	1/2			



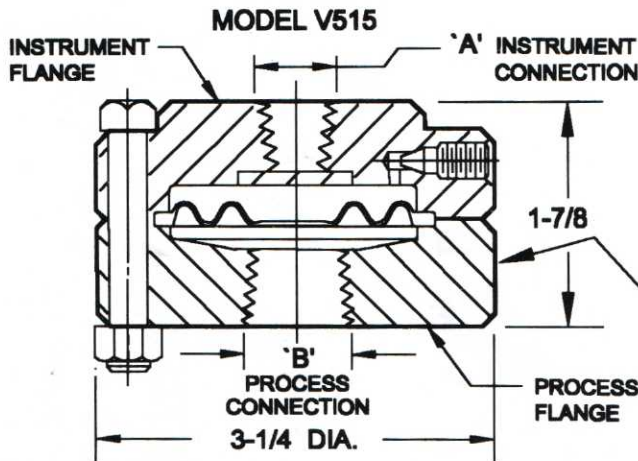
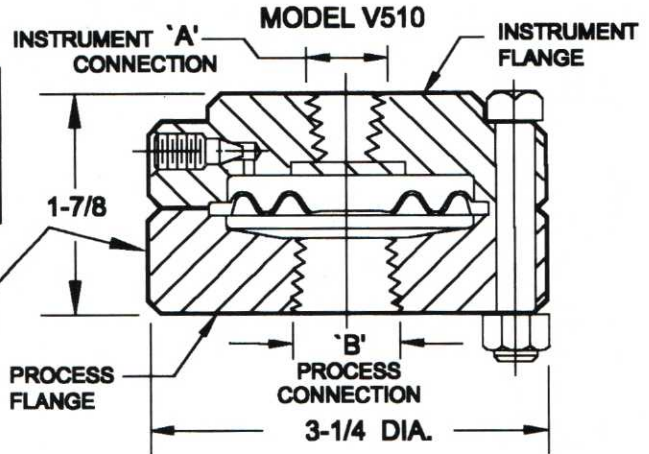
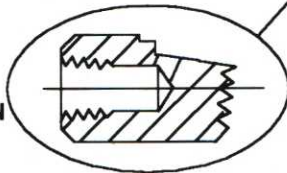
# SERIES 5 - TYPE V - VITON DIAPHRAGM

FOR PIPE MOUNTING

MODELS V510 AND V511								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

(CLAMPED NON-CLEANOUT TYPE)

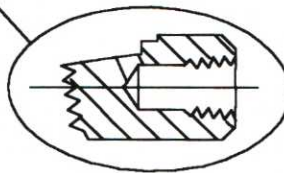
MODEL V511  
HAS A 1/4" NPT  
FLUSHING CONNECTION



FOR PIPE MOUNTING

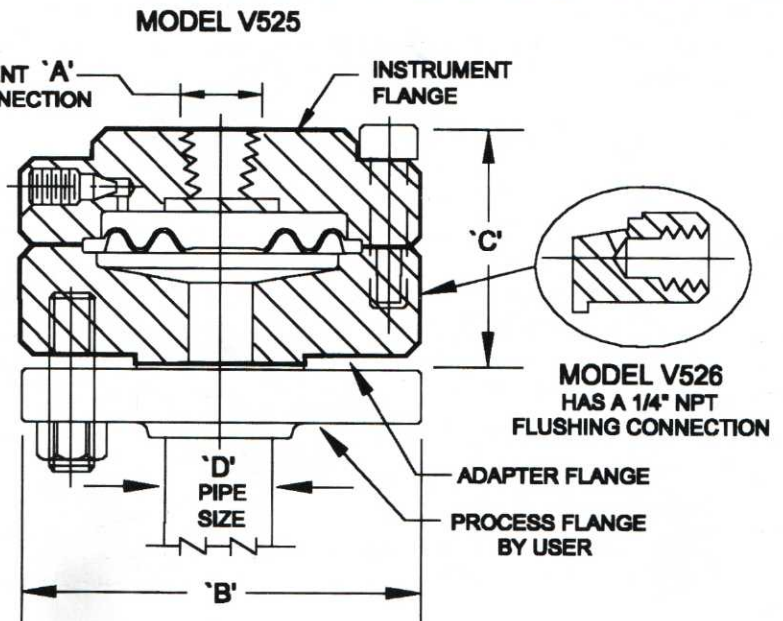
MODELS V515 AND V516								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

MODEL V516  
HAS A 1/4" NPT  
FLUSHING CONNECTION



FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

MODELS V525 AND V526					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	3-1/4	1-11/16	1/2
-02	1/2				
-03	1/4	300 LB.	3-1/2	1-11/16	
-04	1/2				
-11	1/4	150 LB.	3-1/2	1-11/16	3/4
-12	1/2				

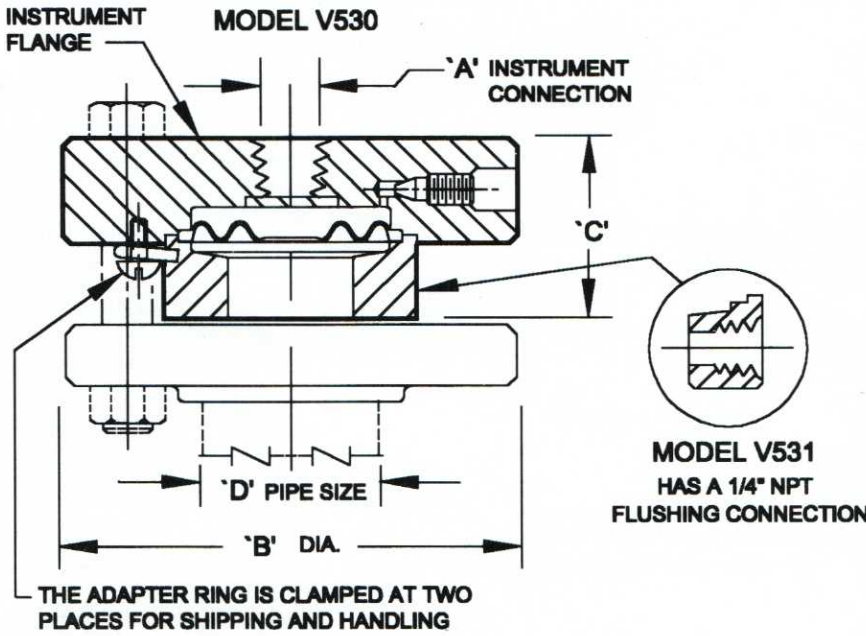


MODEL V526  
HAS A 1/4" NPT  
FLUSHING CONNECTION



# SERIES 5 - TYPE V - VITON DIAPHRAGM

FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

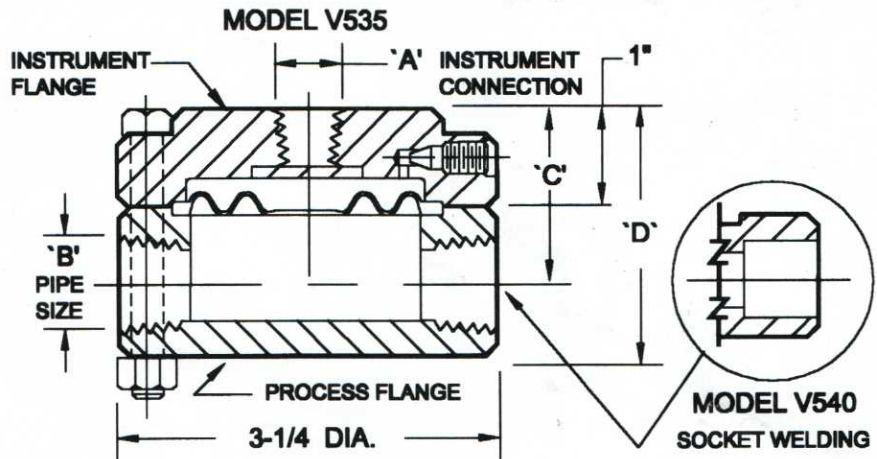


MODELS V530 AND V531					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-21	1/4	150 LB.	4-1/4	1-11/16	1"
-22	1/2		4-3/4	1-11/16	
-23	1/4	300 LB.	4-3/4	1-11/16	1-1/2"
-24	1/2		5"	1-5/8	
-41	1/4	150 LB.	5"	1-5/8	1-1/2"
-42	1/2		6"	1-5/8	
-43	1/4	300 LB.	6"	1-5/8	2"
-44	1/2		6-1/2	1-5/8	
-51	1/4	150 LB.	6"	1-5/8	2"
-52	1/2		6-1/2	1-5/8	
-53	1/4	300 LB.	6-1/2	1-5/8	3"
-54	1/2		7-1/2	1-5/8	
-81	1/4	150 LB.	7-1/2	1-5/8	3"
-82	1/2		8"	1-13/16	
-83	1/4	300 LB.	8"	1-13/16	3"
-84	1/2				

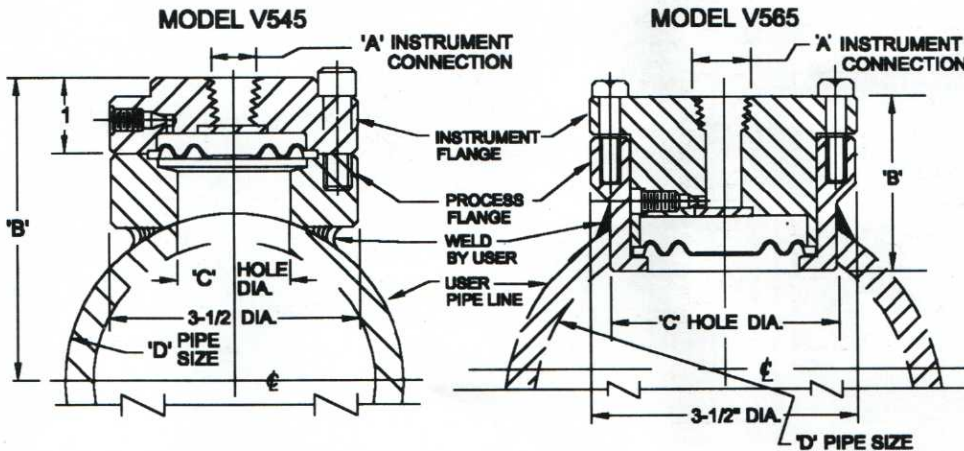
OTHER SIZES ON APPLICATION

FOR "IN-LINE" FLOW-THRU  
IN PROCESS PIPE LINE

MODELS V535 AND V540				
DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2		1-1/2	2-1/8
-03	1/4	1/2	1-1/2	2-1/8
-04	1/2		1-5/8	2-3/8
-05	1/4	3/4	1-5/8	2-3/8
-06	1/2		1-3/4	2-5/8
-07	1/4	1"	1-3/4	2-5/8
-08	1/2			



FOR SADDLE WELDING  
ON PROCESS PIPE LINE



MODEL V545				
DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2		1-1/2	1-1/2
-05	1/4	2-3/8	1-1/2	1-1/2
-06	1/2		1-1/2	2"
-07	1/4	2-5/8	1-1/2	2"
-08	1/2		1-1/2	3"
-09	1/4	3-1/4	1-1/2	3"
-10	1/2			

OTHER SIZES ON APPLICATION

MODEL V565				
DASH NO.	'A' NPT	'B'	'C'	'D'
-11	1/4	2-1/4	3"	4" OR LARGER
-12	1/2			



# SERIES 5 - TYPE M - METAL DIAPHRAGM

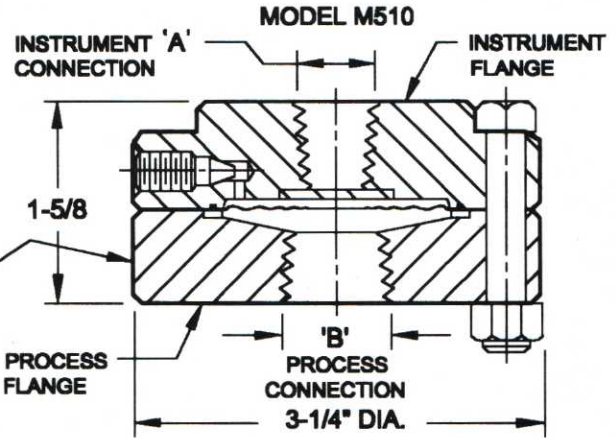
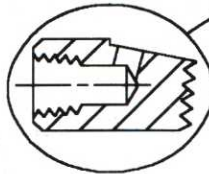
FOR PIPE MOUNTING

MODELS M510 AND M511

DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

(CLAMPED NON-CLEANOUT TYPE)

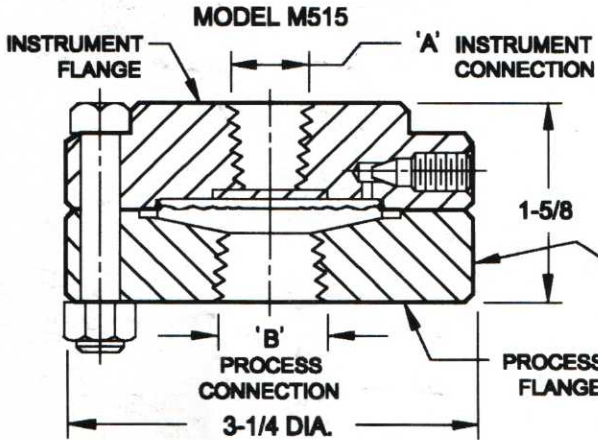
MODEL M511  
HAS A 1/4" NPT  
FLUSHING CONNECTION



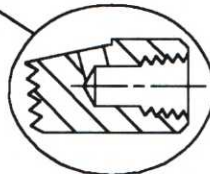
FOR PIPE MOUNTING

MODELS M515 AND M516

DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"



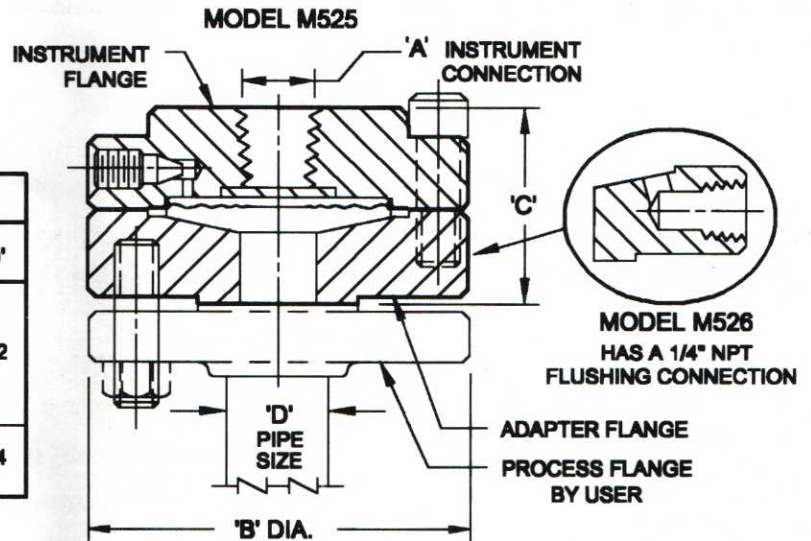
MODEL M516  
HAS A 1/4" NPT  
FLUSHING CONNECTION



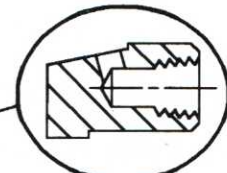
FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

MODEL M525

DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	3-1/4	1-11/16	1/2
-02	1/2				
-03	1/4	300 LB.	3-1/2	1-11/16	
-04	1/2				
-11	1/4	150 LB.	3-1/2	1-11/16	3/4
-12	1/2				



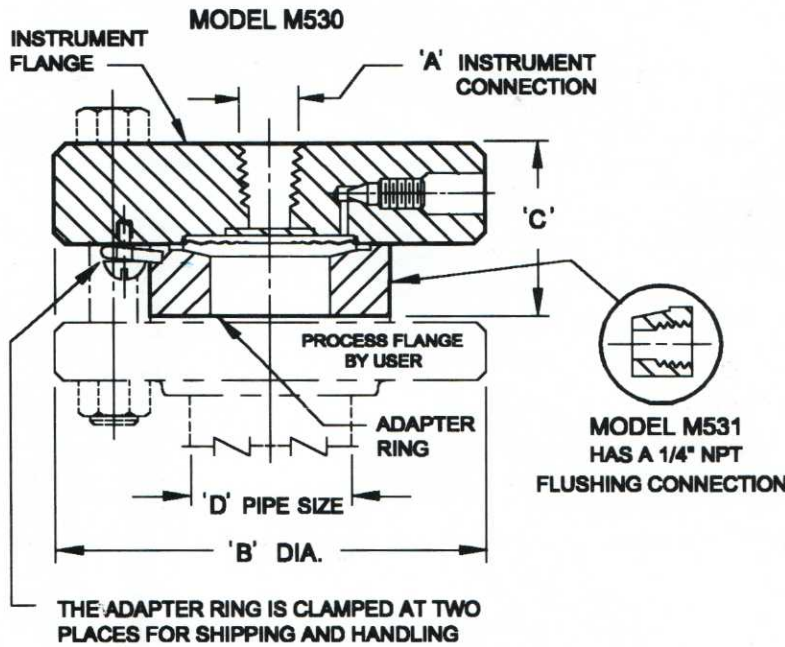
MODEL M528  
HAS A 1/4" NPT  
FLUSHING CONNECTION





# SERIES 5 - TYPE M - METAL DIAPHRAGM

FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

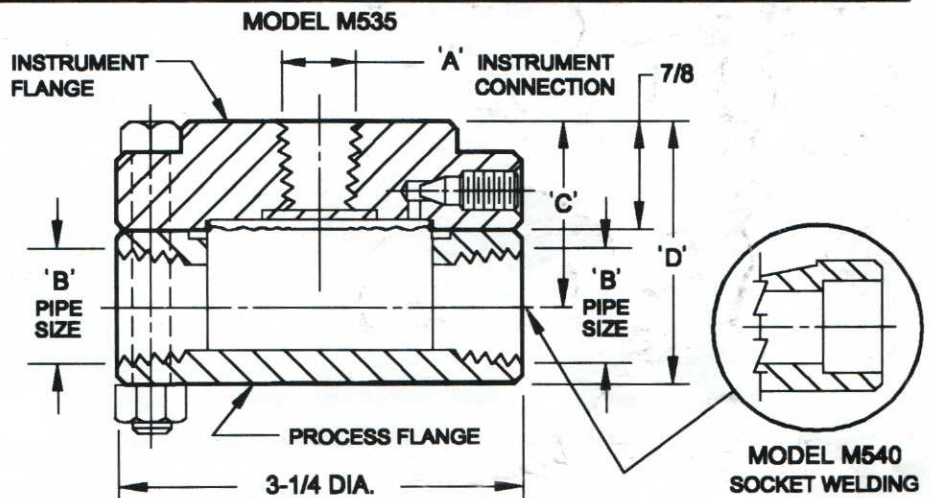


MODELS M530 AND M531					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-21	1/4	150 LB.	4-1/4	1-11/16	1"
-22	1/2				
-23	1/4	300 LB.	4-3/4	1-11/16	1-1/2
-24	1/2				
-41	1/4	150 LB.	5"	1-5/8	1-1/2
-42	1/2				
-43	1/4	300 LB.	6"	1-5/8	2"
-44	1/2				
-51	1/4	150 LB.	6"	1-5/8	2"
-52	1/2				
-53	1/4	300 LB.	6-1/2	1-5/8	3"
-54	1/2				
-61	1/4	150 LB.	7-1/2	1-5/8	3"
-62	1/2				
-63	1/4	300 LB.	8"	1-13/16	3"
-64	1/2				

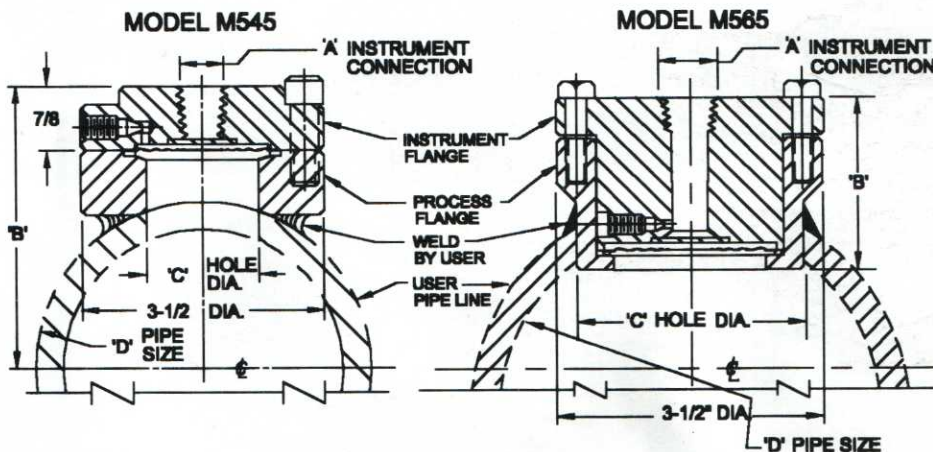
OTHER SIZES ON APPLICATION

FOR "IN-LINE" FLOW-THRU  
IN PROCESS PIPE LINE

MODELS M535 AND M540				
DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2			
-03	1/4	1/2	1-1/2	2-1/8
-04	1/2			
-05	1/4	3/4	1-5/8	2-3/8
-06	1/2			
-07	1/4	1"	1-3/4	2-5/8
-08	1/2			



FOR SADDLE WELDING  
ON PROCESS PIPE LINE



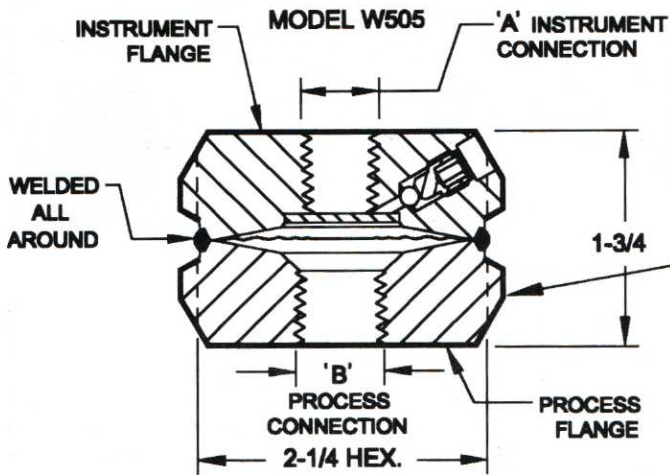
MODEL M545				
DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2			
-05	1/4	2-3/8	1-1/2	1-1/2
-06	1/2			
-07	1/4	2-5/8	1-1/2	2"
-08	1/2			
-09	1/4	3-1/4	1-1/2	3"
-10	1/2			

OTHER SIZES ON APPLICATION

MODEL M565				
DASH NO.	'A' NPT	'B'	'C'	'D'
-11	1/4	2-1/4	3"	4" OR LARGER
-12	1/2			

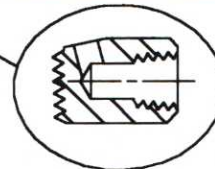


# SERIES 5 - TYPE W - WELDED DIAPHRAGM

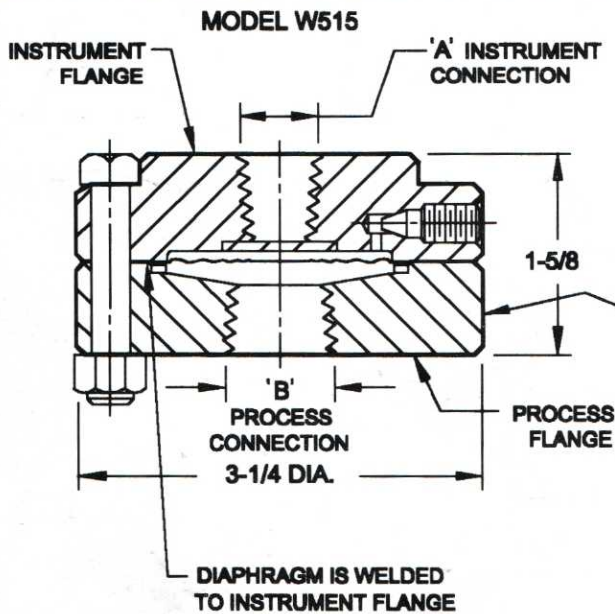


FOR PIPE MOUNTING

MODELS W505 AND W506								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

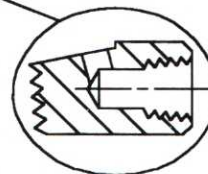


MODEL W506  
HAS A 1/4" NPT  
FLUSHING CONNECTION  
AVAILABLE IN 1/4 AND 1/2  
PROCESS CONNECTIONS ONLY



FOR PIPE MOUNTING

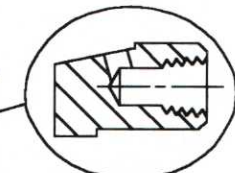
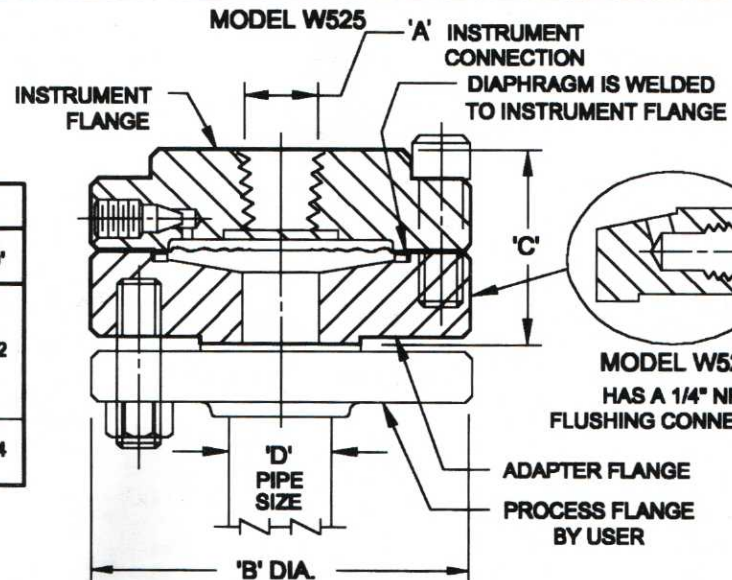
MODELS W515 AND W516								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"



MODEL W516  
HAS 1/4" NPT  
FLUSHING CONNECTION

FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

MODELS W525 AND W526					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	3-1/4	1-11/16	1/2
-02	1/2		3-1/2	1-11/16	
-03	1/4	300 LB.	3-1/2	1-11/16	3/4
-04	1/2		3-1/2	1-11/16	
-11	1/4	150 LB.	3-1/2	1-11/16	3/4
-12	1/2		3-1/2	1-11/16	



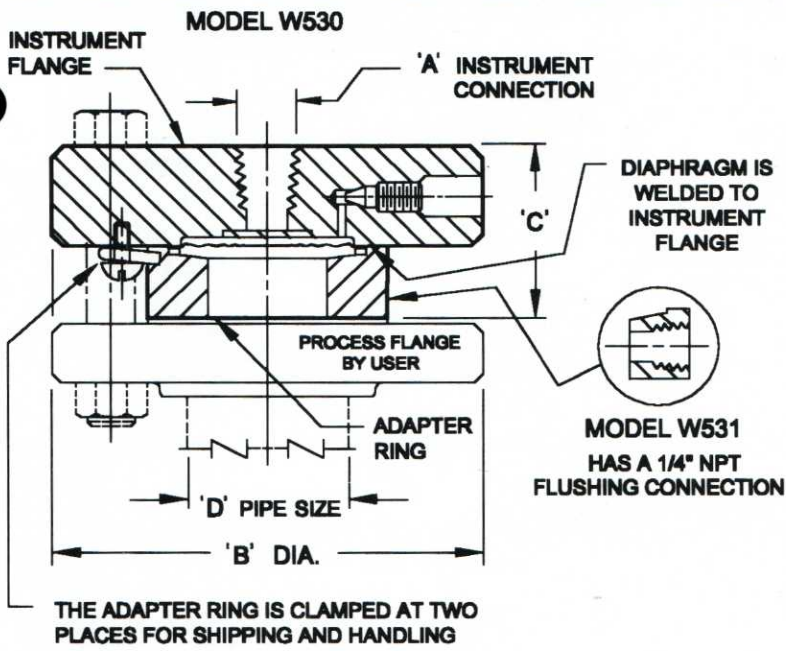
MODEL W526  
HAS A 1/4" NPT  
FLUSHING CONNECTION

ADAPTER FLANGE  
PROCESS FLANGE  
BY USER



# SERIES 5 - TYPE W - WELDED DIAPHRAGM

FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES



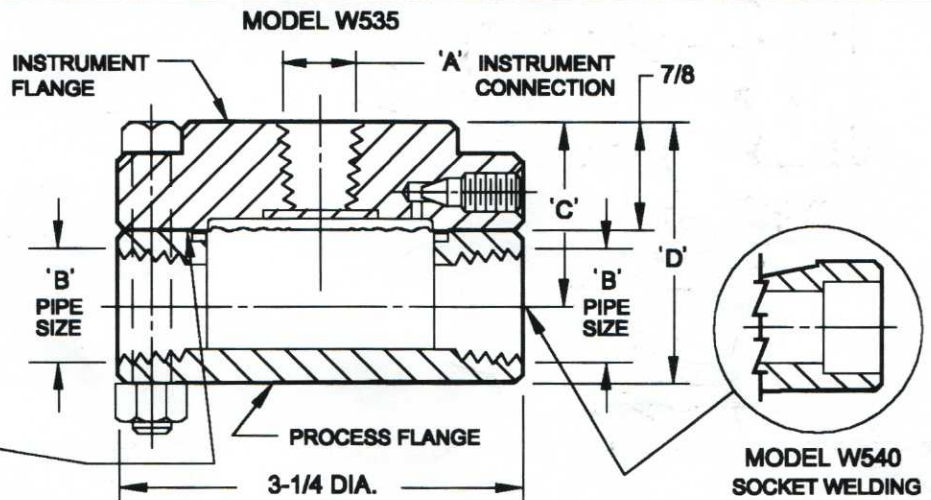
MODELS W530 AND W531					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-21	1/4	150 LB.	4-1/4	1-11/16	1"
-22	1/2				
-23	1/4	300 LB.	4-3/4	1-11/16	1-1/2
-24	1/2				
-41	1/4	150 LB.	5"	1-5/8	1-1/2
-42	1/2				
-43	1/4	300 LB.	6"	1-5/8	2"
-44	1/2				
-51	1/4	150 LB.	6"	1-5/8	2"
-52	1/2				
-53	1/4	300 LB.	6-1/2	1-5/8	3"
-54	1/2				
-61	1/4	150 LB.	7-1/2	1-5/8	3"
-62	1/2				

OTHER SIZES ON APPLICATION

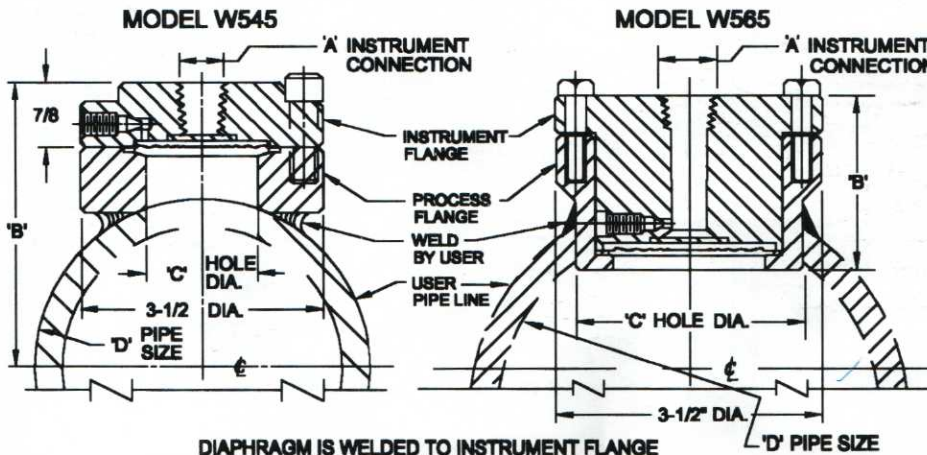
FOR "IN-LINE" FLOW-THRU  
IN PROCESS PIPE LINE

MODELS W535 AND W540				
DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2			
-03	1/4	1/2	1-1/2	2-1/8
-04	1/2			
-05	1/4	3/4	1-5/8	2-3/8
-06	1/2			
-07	1/4	1"	1-3/4	2-5/8
-08	1/2			

DIAPHRAGM IS WELDED TO INSTRUMENT FLANGE



FOR SADDLE WELDING  
ON PROCESS PIPE LINE



MODEL W545				
DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2			
-05	1/4	2-3/8	1-1/2	1-1/2
-06	1/2			
-07	1/4	2-5/8	1-1/2	2"
-08	1/2			
-09	1/4	3-1/4	1-1/2	3"
-10	1/2			

OTHER SIZES ON APPLICATION

MODEL W565				
DASH NO.	'A' NPT	'B'	'C'	'D'
-11	1/4	2-1/4	3"	4" OR LARGER
-12	1/2			



# SERIES 6 - TYPE T - TEFLON DIAPHRAGM

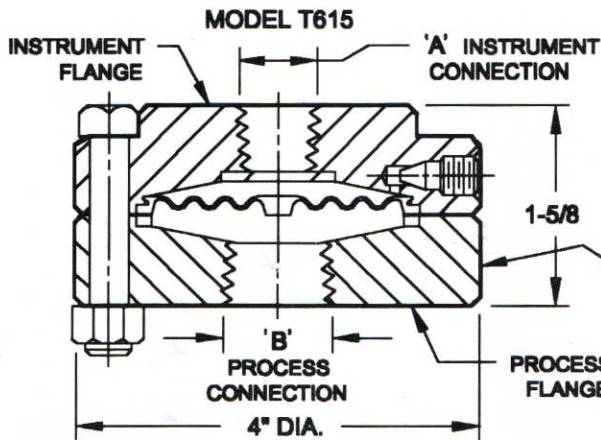
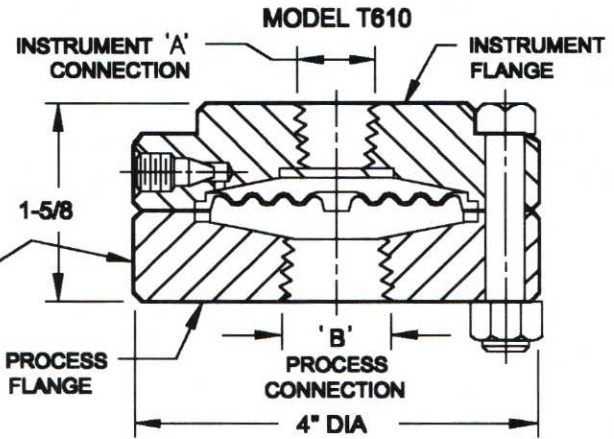
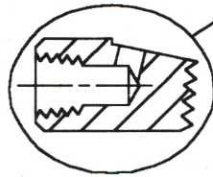
FOR PIPE MOUNTING

MODELS T610 AND T611

DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

(CLAMPED NON-CLEANOUT TYPE)

MODEL T611  
HAS A 1/4" NPT  
FLUSHING CONNECTION

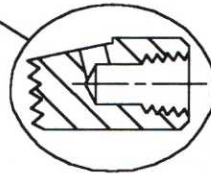


FOR PIPE MOUNTING

MODELS T615 AND T616

DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

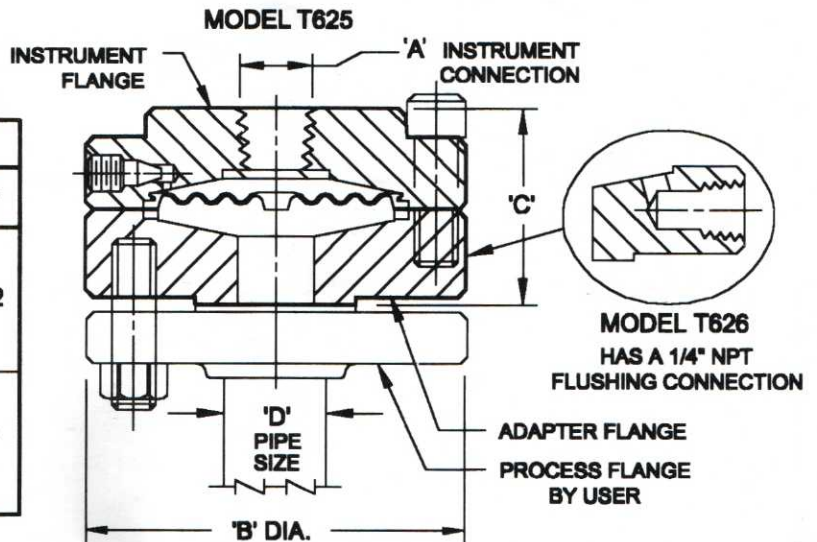
MODEL T616  
HAS A 1/4" NPT  
FLUSHING CONNECTION



FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

MODELS T625 AND T626

DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	4"	1-11/16	1/2
-02	1/2				
-03	1/4	300 LB.	4"	1-11/16	
-04	1/2				
-21	1/4	150 LB.	4"	1-11/16	1"
-22	1/2				
-23	1/4	300 LB.	4-1/2	1-13/16	
-24	1/2				

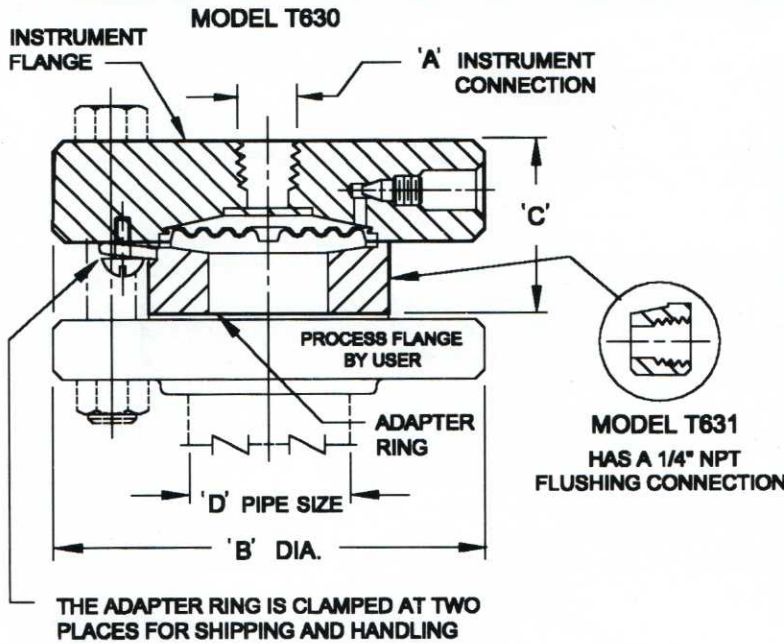


MODEL T626  
HAS A 1/4" NPT  
FLUSHING CONNECTION



# SERIES 6 - TYPE T - TEFLON DIAPHRAGM

FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES



**MODELS T630 AND T631**

DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-41	1/4	150 LB.	5"	1-5/8	1-1/2
-42	1/2				
-43	1/4	300 LB.	6"	1-5/8	
-44	1/2				
-51	1/4	150 LB.	6"	1-5/8	2"
-52	1/2				
-53	1/4	300 LB.	6-1/2"	1-5/8	
-54	1/2				
-61	1/4	150 LB.	7-1/2"	1-5/8	3"
-62	1/2				
-63	1/4	300 LB.	8"	1-5/8	
-64	1/2				

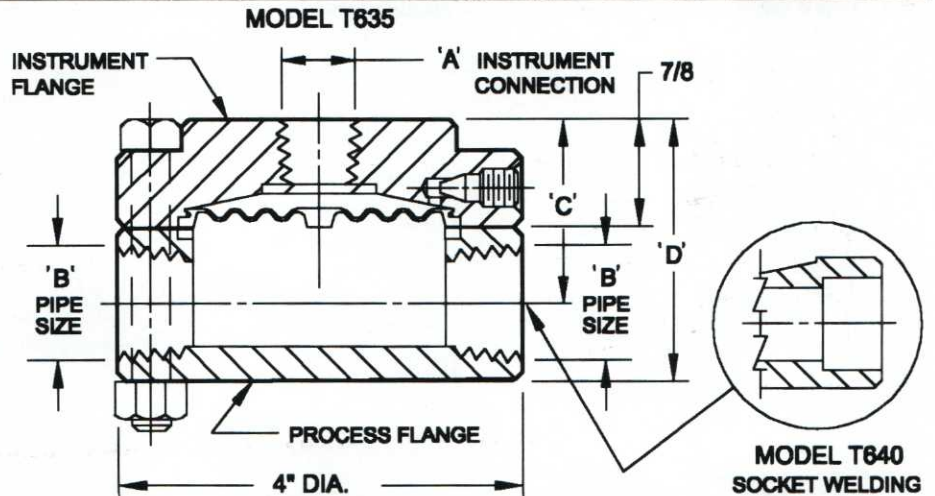
**MODEL T631**  
HAS A 1/4" NPT  
FLUSHING CONNECTION

OTHER SIZES ON APPLICATION

FOR "IN-LINE" FLOW-THRU  
IN PROCESS PIPE LINE

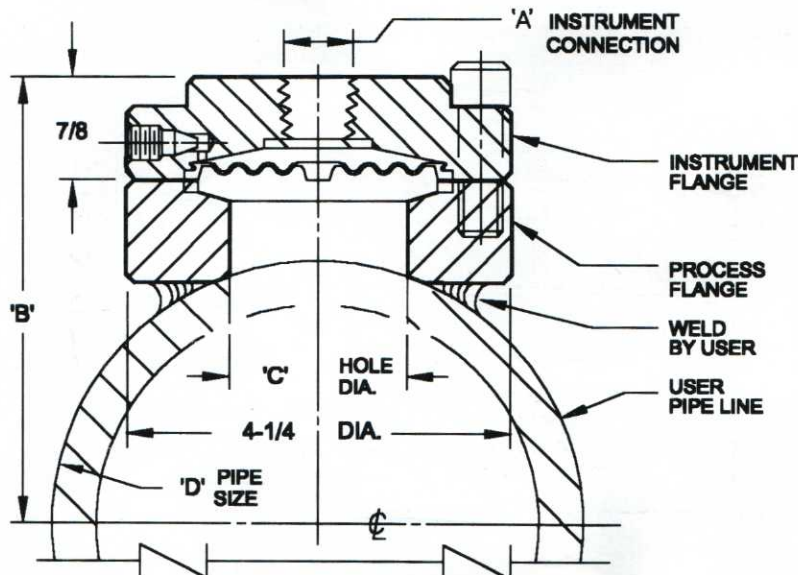
**MODELS T635 AND T640**

DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2			
-03	1/4	1/2	1-1/2	2-1/8
-04	1/2			
-05	1/4	3/4	1-5/8	2-3/8
-06	1/2			
-07	1/4	1"	1-3/4	2-5/8
-08	1/2			



**MODEL T645**

FOR SADDLE WELDING  
ON PROCESS PIPE LINE



**MODEL T645**

DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2			
-05	1/4	2-3/8	1-1/2	1-1/2
-06	1/2			
-07	1/4	2-5/8	1-1/2	2"
-08	1/2			
-09	1/4	3-1/4	1-1/2	3"
-10	1/2			
-11	1/4	3-13/16	1-1/2	4"
-12	1/2			
-13	1/4	4-15/16	1-1/2	6"
-14	1/2			
-15	1/4	5-15/16	1-1/2	8"
-16	1/2			

OTHER SIZES ON APPLICATION



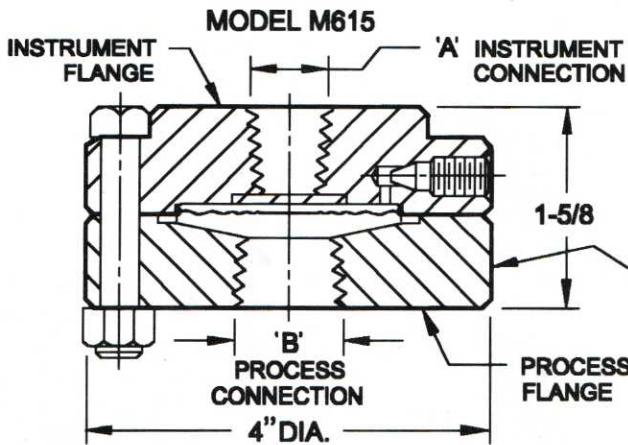
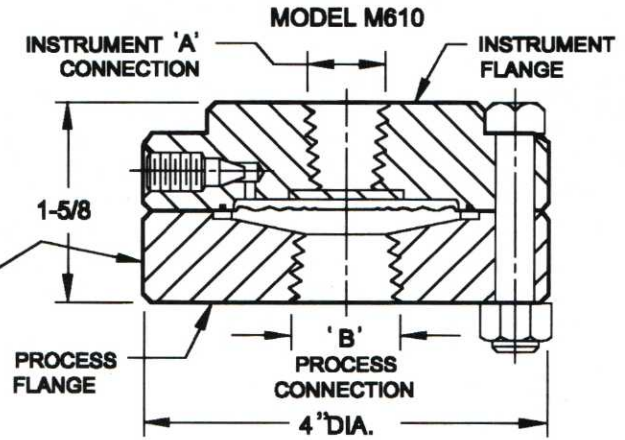
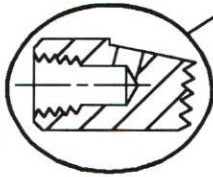
# SERIES 6 - TYPE M - METAL DIAPHRAGM

FOR PIPE MOUNTING

MODELS M610 AND M611								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

(CLAMPED NON-CLEANOUT TYPE)

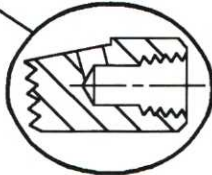
MODEL M611  
HAS A 1/4" NPT  
FLUSHING CONNECTION



FOR PIPE MOUNTING

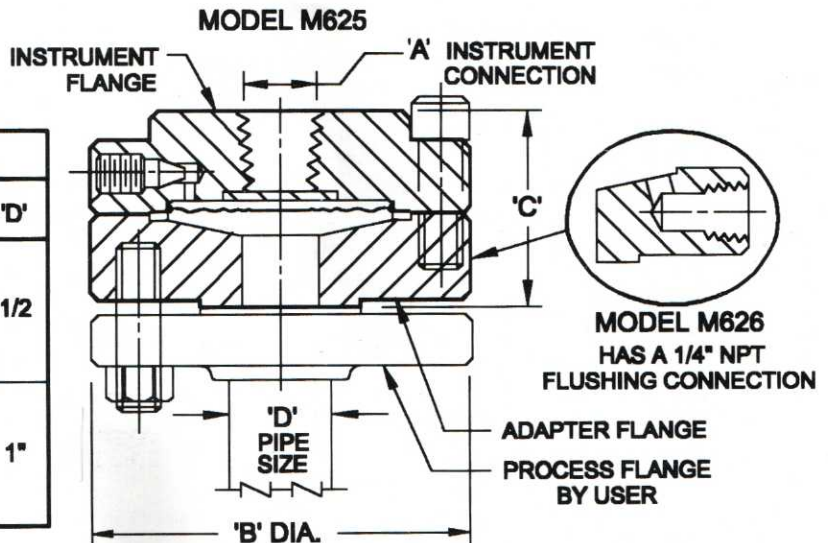
MODELS M615 AND M616								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"

MODEL M616  
HAS A 1/4" NPT  
FLUSHING CONNECTION



FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

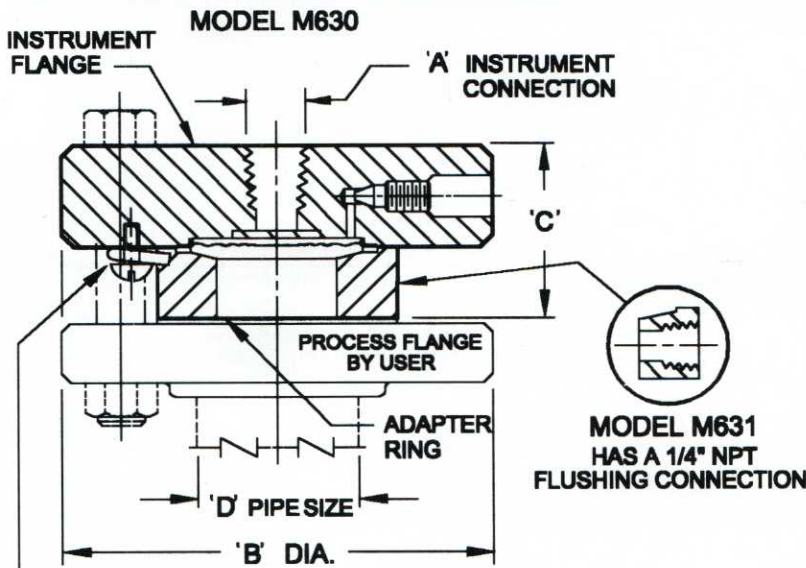
MODELS M625 AND M626					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	4"	1-11/16	1/2
-02	1/2			1-11/16	
-03	1/4	300 LB.	4"	1-11/16	1"
-04	1/2			1-11/16	
-21	1/4	150 LB.	4"	1-11/16	1"
-22	1/2			1-11/16	
-23	1/4	300 LB.	4-1/2	1-13/16	1"
-24	1/2			1-13/16	



MODEL M626  
HAS A 1/4" NPT  
FLUSHING CONNECTION



# SERIES 6 - TYPE M - METAL DIAPHRAGM



THE ADAPTER RING IS CLAMPED AT TWO PLACES FOR SHIPPING AND HANDLING

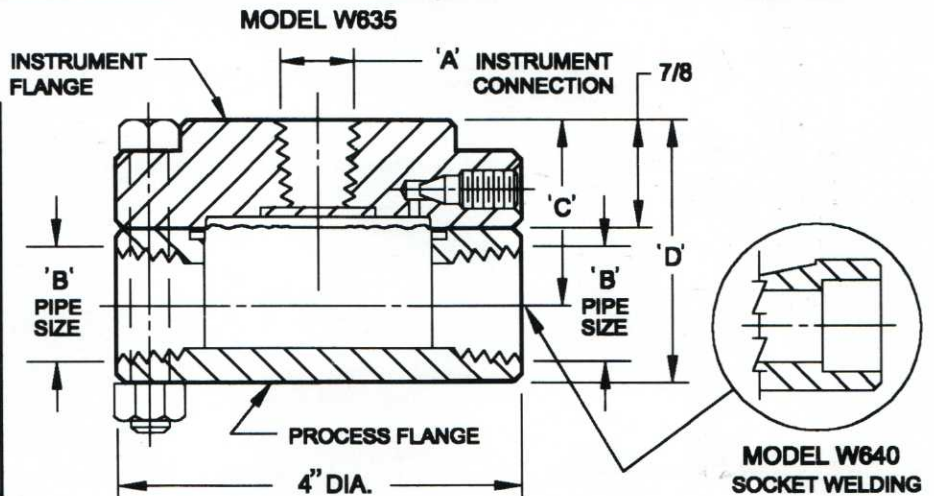
FOR FLANGE MOUNTING ON ANSI STANDARD RAISED FACE FLANGES

MODELS M630 AND M631					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-41	1/4	150 LB.	5"	1-5/8	1-1/2
-42	1/2		6"	1-5/8	
-43	1/4	300 LB.	6"	1-5/8	2"
-44	1/2		6"	1-5/8	
-51	1/4	150 LB.	6"	1-5/8	3"
-52	1/2		6-1/2	1-5/8	
-53	1/4	300 LB.	6-1/2	1-5/8	3"
-54	1/2		7-1/2	1-5/8	
-61	1/4	150 LB.	7-1/2	1-5/8	3"
-62	1/2		8"	1-5/8	
-63	1/4	300 LB.	8"	1-5/8	3"
-64	1/2		8"	1-5/8	

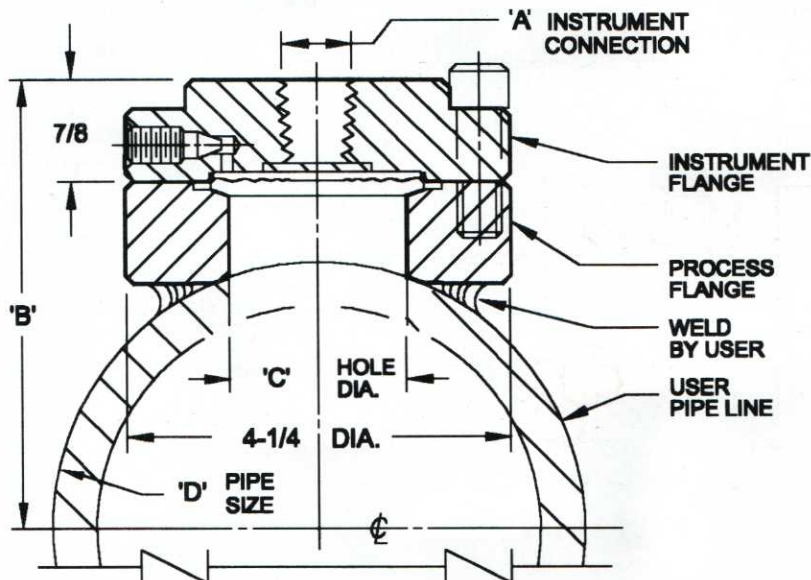
OTHER SIZES ON APPLICATION

FOR "IN-LINE" FLOW-THRU IN PROCESS PIPE LINE

MODELS M635 AND M640				
DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2	1/2	1-1/2	2-1/8
-03	1/4	3/4	1-5/8	2-3/8
-04	1/2	1"	1-3/4	2-5/8
-05	1/4			
-06	1/2			
-07	1/4			
-08	1/2			



MODEL M645



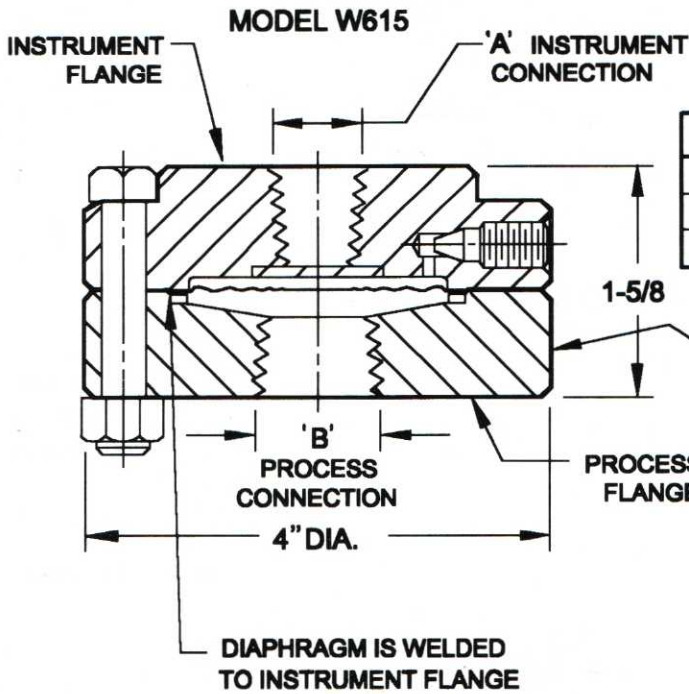
FOR SADDLE WELDING ON PROCESS PIPE LINE

MODEL M645				
DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2	2-3/8	1-1/2	1-1/2
-05	1/4	2-5/8	1-1/2	2"
-06	1/2	3-1/4	1-1/2	3"
-07	1/4	3-13/16	1-1/2	4"
-08	1/2	4-15/16	1-1/2	6"
-09	1/4	5-15/16	1-1/2	8"
-10	1/2			
-11	1/4			
-12	1/2			
-13	1/4			
-14	1/2			
-15	1/4			
-16	1/2			

OTHER SIZES ON APPLICATION

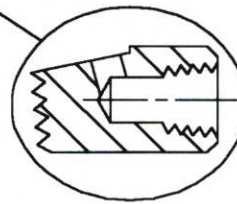


# SERIES 6 - TYPE W - WELDED DIAPHRAGM



FOR PIPE MOUNTING

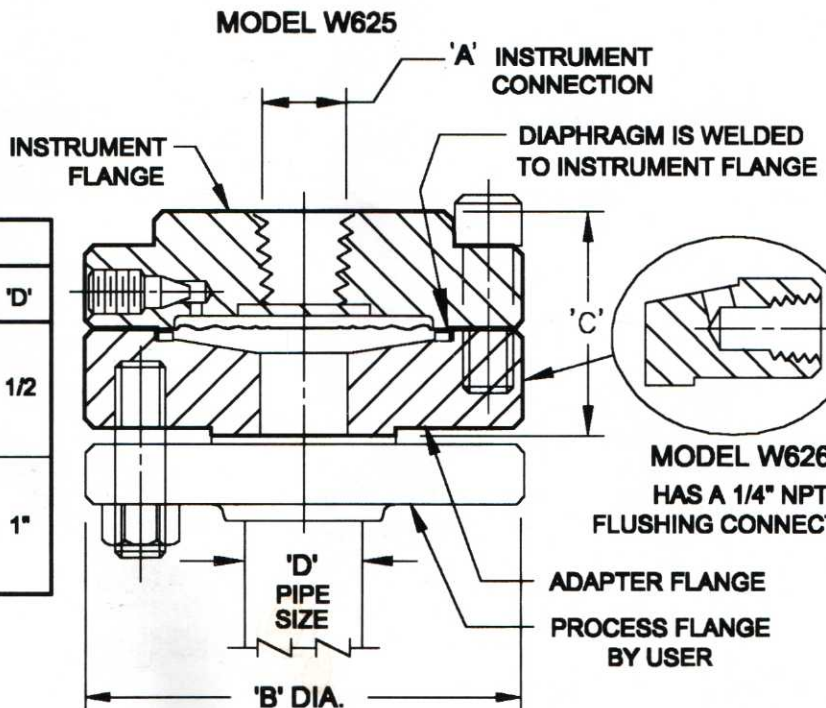
MODELS W615 AND W616								
DASH NO.	-01	-02	-03	-04	-05	-06	-07	-08
'A' NPT	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2
'B' NPT	1/4	1/4	1/2	1/2	3/4	3/4	1"	1"



**MODEL W616**  
HAS A 1/4" NPT FLUSHING CONNECTION

FOR FLANGE MOUNTING ON  
ANSI STANDARD RAISED FACE FLANGES

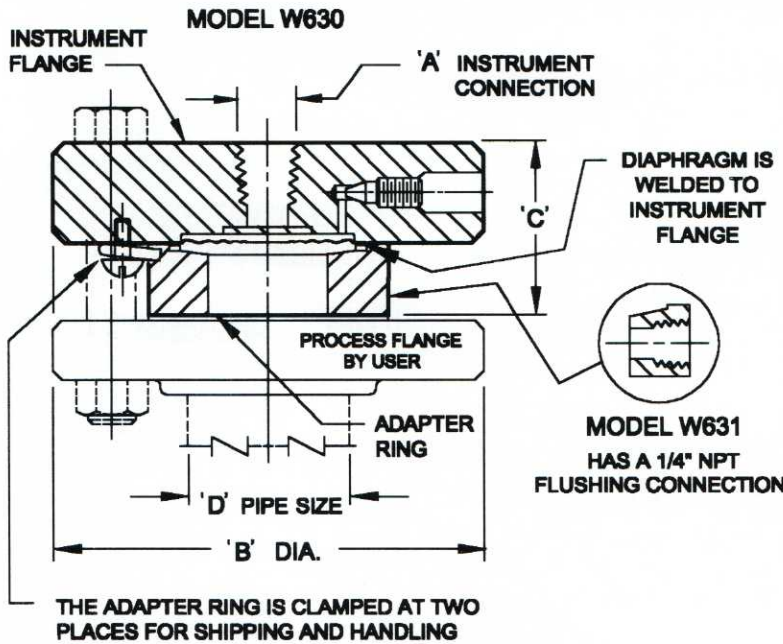
MODELS W625 AND W626					
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-01	1/4	150 LB.	4"	1-11/16	1/2
-02	1/2				
-03	1/4				
-04	1/2				
-21	1/4	150 LB.	4"	1-11/16	1"
-22	1/2				
-23	1/4				
-24	1/2	300 LB.	4-1/2	1-13/16	



**MODEL W626**  
HAS A 1/4" NPT FLUSHING CONNECTION



# SERIES 6 - TYPE W - WELDED DIAPHRAGM



FOR FLANGE MOUNTING ON ANSI STANDARD RAISED FACE FLANGES

MODELS T630 AND T631

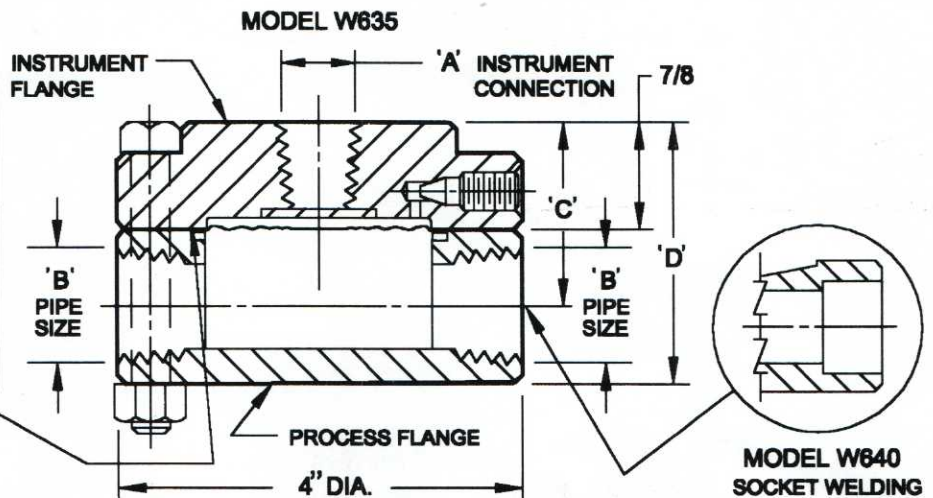
DASH NO.	'A' NPT	PRESSURE RATING	'B'	'C'	'D'
-41	1/4	150 LB.	5"	1-5/8	1-1/2
-42	1/2				
-43	1/4	300 LB.	6"	1-5/8	
-44	1/2				
-51	1/4	150 LB.	6"	1-5/8	2"
-52	1/2				
-53	1/4	300 LB.	6-1/2	1-5/8	
-54	1/2				
-81	1/4	150 LB.	7-1/2	1-5/8	3"
-82	1/2				

OTHER SIZES ON APPLICATION

FOR "IN-LINE" FLOW-THRU IN PROCESS PIPE LINE

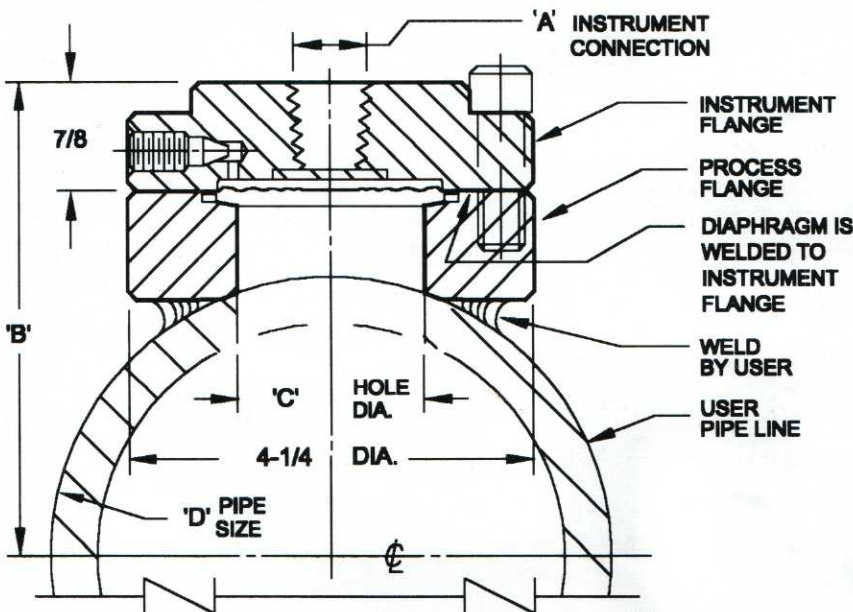
MODELS W635 AND W640

DASH NO.	'A' NPT	'B' NPT	'C'	'D'
-01	1/4	1/4	1-1/4	1-5/8
-02	1/2			
-03	1/4	1/2	1-1/2	2-1/8
-04	1/2			
-05	1/4	3/4	1-5/8	2-3/8
-06	1/2			
-07	1/4	1"	1-3/4	2-5/8
-08	1/2			



**MODEL W645**

FOR SADDLE WELDING ON PROCESS PIPE LINE



MODEL W645

DASH NO.	'A' NPT	'B'	'C'	'D'
-01	1/4	2-1/8	1"	1"
-02	1/2			
-05	1/4	2-3/8	1-1/2	1-1/2
-06	1/2			
-07	1/4	2-5/8	1-1/2	2"
-08	1/2			
-09	1/4	3-1/4	1-1/2	3"
-10	1/2			
-11	1/4	3-13/16	1-1/2	4"
-12	1/2			
-13	1/4	4-15/16	1-1/2	6"
-14	1/2			
-15	1/4	5-15/16	1-1/2	8"
-16	1/2			

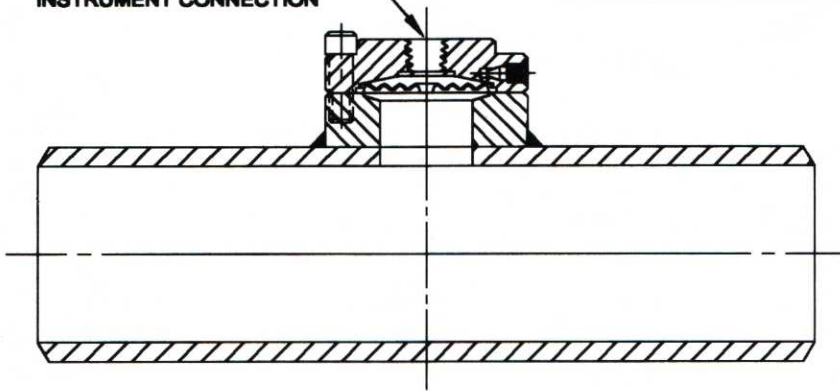
OTHER SIZES ON APPLICATION



# SERIES 5 AND 6 - TYPES M,V,T AND W

1/4" NPT OR 1/2" NPT  
INSTRUMENT CONNECTION

WELDED CONSTRUCTION



STYLE 50

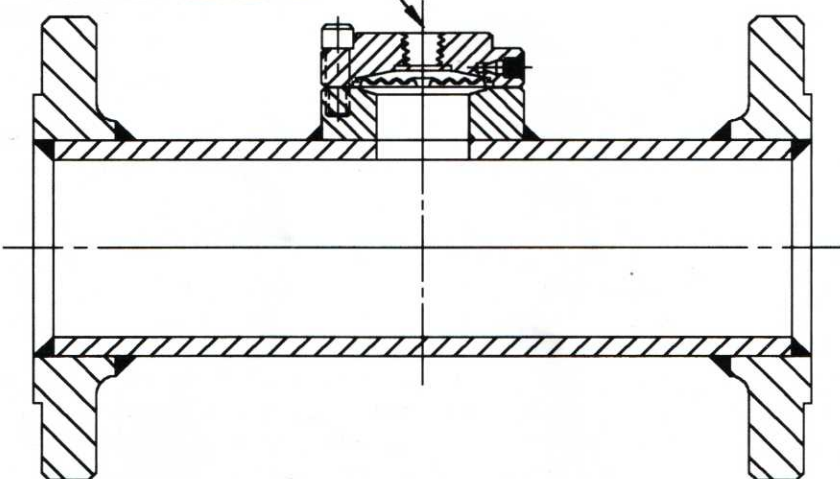
FOR BUTT WELDING  
IN PROCESS PIPE LINE

1" PIPE - SCHEDULE 40  
THRU 12" PIPE - SCHEDULE 80

DIMENSIONS - ON APPLICATION

1/4" NPT OR 1/2" NPT  
INSTRUMENT CONNECTION

WELDED CONSTRUCTION



STYLE 55

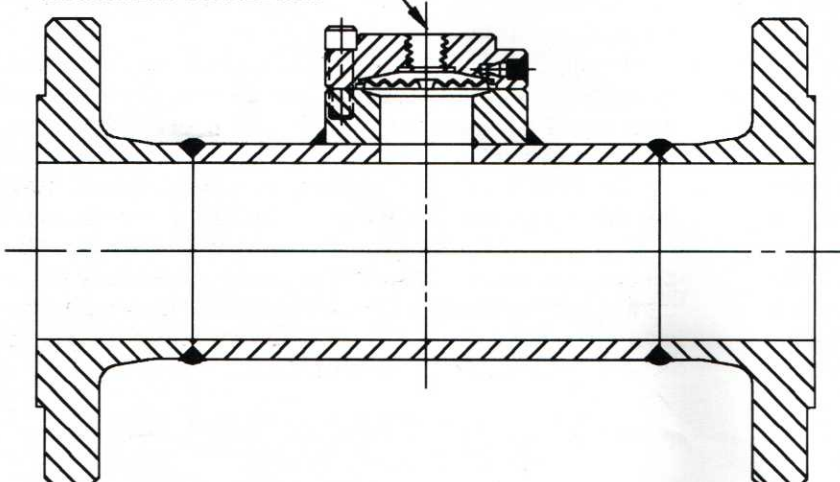
FOR FLANGE BOLTING  
IN PROCESS PIPE LINE

1"-150# THRU 12"-300# ANSI

DIMENSIONS - ON APPLICATION

1/4" NPT OR 1/2" NPT  
INSTRUMENT CONNECTION

WELDED CONSTRUCTION



STYLE 60

FOR FLANGE BOLTING  
IN PROCESS PIPE LINE

1"-150# THRU 12"-300# ANSI

DIMENSIONS - ON APPLICATION



## Operating Instructions

**LIQUID FILLING** - When a Zeal is attached to a pressure instrument, the two must act as an integral unit. To accomplish this, all the cavities, or space, occupied by air in the instrument flange of the Zeal, in the sensing element of the pressure instrument and in the hole through the capillary tubing (if used) must be filled with a fluid.

The function of the liquid fill fluid is to transmit the process pressure, which acts on the diaphragm, from the diaphragm to the sensing element of the pressure instrument.

Usually, this fluid is a light instrument oil but other fluids can be used should oil tend to contaminate the process in case of leakage.

The instrument/seal assembly can be filled in either of two methods.

The instrument and seal can be filled separately and then assembled. Back pressure, if present, should be relieved by use of the fill/bleed screw provided in the seal for this purpose.

The liquid filling operation can be done by evacuating all the air from all the cavities in the pressure instrument with the aid of a vacuum pump and then, by the proper arrangement of pipes and valves, allowing the fill fluid to replace the evacuated air in the cavities. The cavity in the instrument flange of the diaphragm seal can be easily filled through the instrument connection from an oil can or other container prior to attaching it to the pressure instrument.

In the second method of filling, the instrument and seal are assembled first, then the entire internal cavities of the instrument and seal can be evacuated and completely filled through the fill/bleed port by the use of a fill adapter that is inserted into the port. After filling, the bleed screw is inserted into the fill/bleed port to seal it. If you use this method, it is strongly recommended that an equal vacuum be pulled on the process side of the diaphragm, especially on the Type T and Type V Zeals.

It is a fact that the smallest amount of movement, required of the diaphragm, occurs when all the air is removed from the unit.

It is also a fact that the larger the amount of movement required to fully actuate a sensing element of a pressure instrument, the greater the spring rate of a diaphragm. The greater the spring rate - the greater the inaccuracy of the unit. These facts are inherent regardless of make or manufacturer of the diaphragm seal.

The spring rate of the diaphragm can be calibrated into the assembled unit by recalibrating the unit after liquid filling. But, this is possible only if the calibration range of the sensing element in the pressure instrument is great enough to compensate for the added spring rate of the diaphragm. In instruments of low pressure range, the spring rate of the sensing element is too small to allow for the compensation necessary for the high spring rate of some diaphragms. In fact, the spring rate of some diaphragms is so great that it is equal to and sometimes even greater than the spring rate of the sensing element in low pressure instruments.

The more precise and exacting the process require-

ments, the more important it is to remove all the air from a pressure instrument and to carefully recalibrate the unit after liquid filling.

In the large Type T Zavoda Diaphragm Seal (Zeal), the spring rate of the diaphragm is equal to only two ounces of pressure per square inch, when all the air is evacuated from the unit, and is so small that in most uses this will not require the costly recalibration of the instrument.

**INSTALLATION** - Depending on model used, Zeals can be welded, bolted or threaded into the process system using any good installation procedure. A hole is provided in the instrument flange for the use of a pin spanner wrench when attaching a Zeal onto a threaded process pipe.

**MAINTENANCE** - All Zeals in all series, except styles 10 and 11, are of the cleanout type and, by removing the flange bolts, can be separated at the flanges without loss of the liquid fill fluid to permit periodic cleaning of the diaphragm.

The cavity in the process flange and the process side of the diaphragm must be kept clean and free of any clogging matter, otherwise proper movement of the diaphragm may be impaired.

The retention of the liquid fill is accomplished by the diaphragm being firmly held by a holding groove in the instrument flange.

**CAUTION** - At all times extreme care must be taken not to nick or scratch the gasketing surfaces or leakage may result.

**DIAPHRAGM REPLACEMENT** - When removing a damaged diaphragm from the instrument flange, extreme care must be taken not to dent, nick or otherwise damage the groove area at the instrument flange gasketing surface.

Install a new diaphragm by inserting one point of the diaphragm into the holding groove with the instrument flange gasket assembled in place on the diaphragm and then press the diaphragm in with the fingers pushing down on the thickened edge of the diaphragm and working around the periphery until the opposite side has been reached.

Lightly oil all parts to aid installation, if necessary, but hammers or like objects should not be used, as they may dent or nick the gasketing surface and may result in leakage after assembling.

Zeals with the style numbers 10 and 11 do not have the holding groove in the instrument flange, nor the self-holding type of diaphragm. Therefore, to assemble a diaphragm into one of these models, simply assemble an instrument flange gasket in place and insert the diaphragm into the recess provided for it in the instrument flange and bolt the process flange to the instrument flange.

**ZAVODA MANUFACTURING CO., INC.  
LA GRANGE, TEXAS 78945**

FEBRUARY, 2000



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