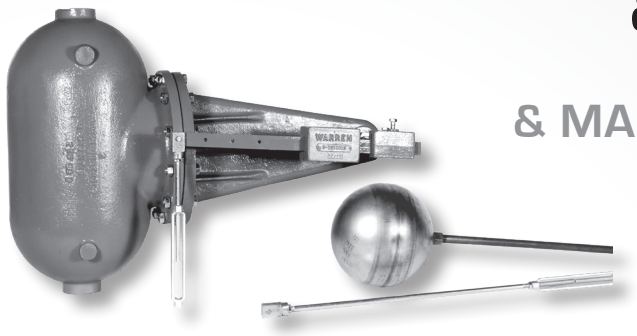
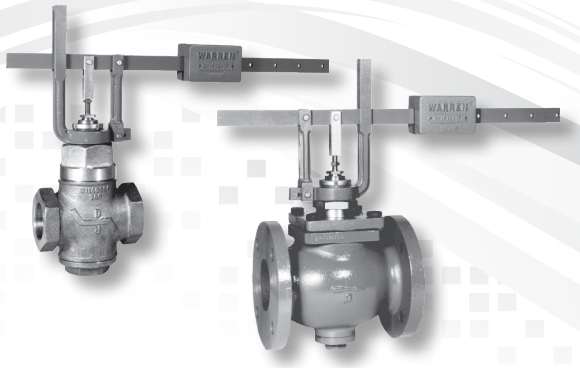
377, 326L & 322L IOM

377 FLOAT CAGE/326L & 322L LEVER VALVES

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS





WARREN CONTROLS

TABLE OF CONTENTS

Overview ..... Cover
General Information ..... Cover
Operation 3
Installation 3-5
Maintenance 5
Overhaul 6
Information Present 6-8
Specifications 9-12
Parts / Overhaul 12-13
Packing Adjustment 13
Parts Kits 14-16
Drawings 17-23

377_326L_322L_IOM_RevD_1023

PRODUCT OVERVIEW

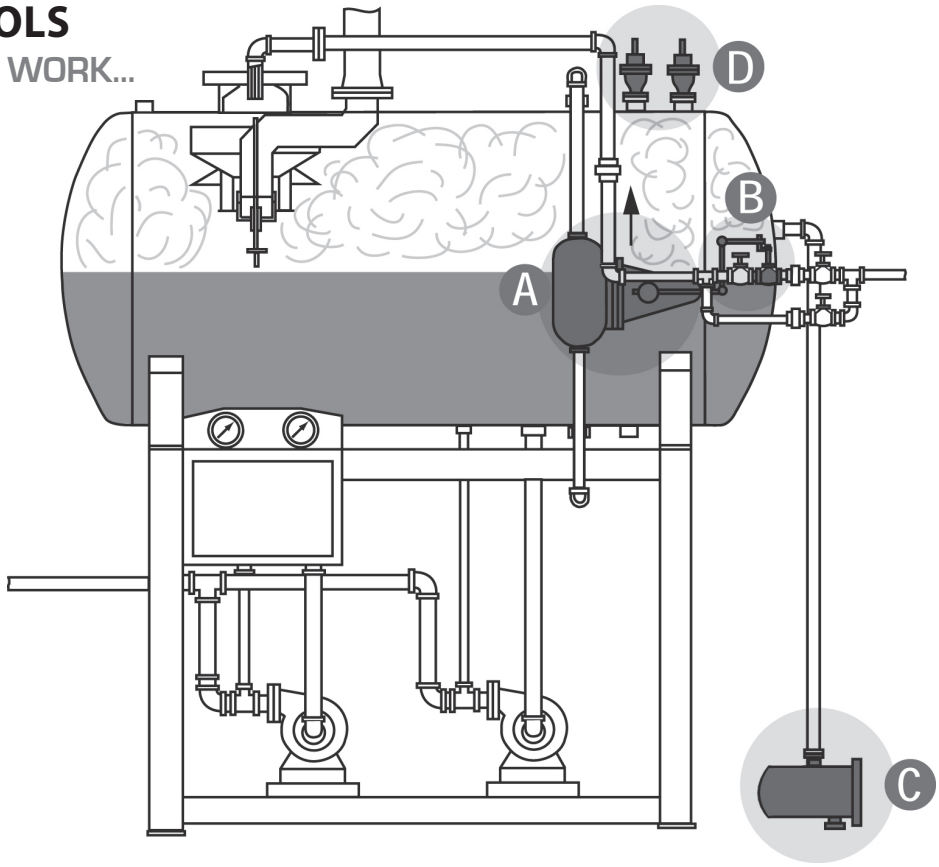
This document covers the installation, operation and maintenance of the 377 Float Cage and the 326L and 322L Lever Valves presented in the "Level Controls and Accessories", Product Specification.

GENERAL INFORMATION

The instructions given herein cover generally the operation and maintenance of subject equipment. Should any questions arise which may not be answered specifically by these instructions, they should be referred to Warren Controls Inc. for further detailed information and technical assistance. This manual cannot possibly cover every situation connected with the operation, adjustment, inspection, test, overhaul and maintenance of the equipment furnished. Every effort is made to prepare the text of this manual so that engineering and design data is transformed into the most easily understood wording. Warren Controls Inc., in furnishing this equipment and this manual, must presume that the operation and maintenance personnel assigned there to have sufficient technical knowledge and experience to apply sound safety and operational practices which may not be covered herein. In applications where Warren Controls Inc. furnished equipment is to be integrated with a process or other machinery, these instructions should be thoroughly reviewed to determine the proper integration of the equipment into the overall plant operational procedures. ***Warren Controls does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for proper selection, use, and maintenance of any Warren Controls product remains solely with the purchaser and end-user.***

WARREN CONTROLS

LEVEL CONTROLS AT WORK...



The following is a typical example of a tank filling/deaerator application using properly sized, selected, and maintained Warren Controls Level Controls. Demand for water reduces the liquid level in the tank. The [A] **377 Float Cage** opens the [B] **322L or 326L Lever Valve** to supply intake water to the tank. When the water reaches the desired level the float cage closes the lever valve to accurately maintain the liquid at the desired level. Deaerators, tanks with steam blankets, produce additional liquid as the steam condenses. The [C] **313 Overflow Trap** traps and relieves this condensate through its internal pilot without the steam blanket escaping. Overflow can occur if the water entering the tank exceeds its capacity. The 313 Overflow Trap relieves the overflow through its internal single seated main stage valve. Falling liquid levels and condensing steam can cause a vacuum that can damage the tank. The [D] **200 Vacuum Breaker** opens to admit outside air to relieve the vacuum in the tank. Warren Controls Level Controls are also used on boiler make-up water tanks and many other storage tank applications.

WARNING

CHECK FLOAT CAGE AND/OR LEVER VALVE FOR ANY DAMAGE DUE TO IMPROPER STORAGE OR TRANSPORTATION. IMMEDIATELY NOTIFY YOUR SALES ORGANIZATION OF ANY DAMAGED GOODS UPON RECEIPT. DO NOT ATTEMPT TO MOVE OR DISTURB THE FLOAT CAGE AND/OR LEVER VALVE FURTHER SO PHOTOS MAY BE TAKEN. IF THE SHIPPING CONTAINER IS NOTICEABLY DAMAGED REFUSE RECEIPT, AS THE SHIPPING COMPANY SHOULD BE HELD LIABLE UNTIL A SHIPPING REPRESENTATIVE IS AVAILABLE TO TAKE PHOTOS.

OPERATION – 377 FLOAT CAGE AND 326L OR 322L LEVER VALVE

- A rising or falling liquid level in a tank raises or lowers the float ball in the 377 Float Cage. This motion is converted to force through the rotation of the float rod and lever arm (lever) about the float shaft assembly. The force is transmitted through the turnbuckle assembly to the lever actuator of a 326L or 322L Lever Valve where it is used to open or close the valve. Fully immersed in water the float can exert approximately 150 inch-pounds of torque onto the float arm shaft. The maximum rotation of the float arm shaft is 23°.

INSTALLATION – 377 FLOAT CAGE AND 326L OR 322L LEVER VALVE

- To determine which lever valve you have locate the part number (configuration) on the factory serial number label (See Information Present on 326L Lever Valves section or Information Present on 322L Lever Valves section for location of important information on valve). Then see 326L Lever Valve Specification section or 322L Lever Valve Specification section to determine the performance and physical characteristics of the valve (configuration). See the 377 Float Cage Specification section to determine the performance and physical characteristics of the 377 Float Cage.

- Be sure that the flow medium, pressure, and temperature will not exceed the limits of the 377 Float Cage. Information can be found in the product specifications (See 377 Float Cage Specification section).

- Be sure that the flow medium, pressure, and temperature will not exceed the limits of the 326L or 322L Lever Valve. Information can be found in the product specifications (See 326L Lever Valve Specification section or 322L Lever Valve Specification section) and on the flow diagram plate regarding these limits (See Information Present on 326L Lever Valves section for location of important information on valve).

- Type 326L bronze body and stainless steel body valves have EPDM lip packing standard. TFE v-ring packing is optional. EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids. TFE v-ring packing is not suitable for use with fluid temperatures below 60°F. Type 322L iron body valves have EPDM lip packing standard. TFE v-ring packing is optional. EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids. TFE v-ring packing is not suitable for use with fluid temperatures below 60°F.

- Eliminate vibration in piping. 377 Float Cages and 326L or 322L Lever Valves are not suitable in installations where vibration exists.

- Follow good piping practices. Install a bypass around the 326L or 322L Lever Valve. Install stop valves in the inlet and outlet piping to provide a means to isolate the lever valve.

- A straight run of pipe is recommended for 10 pipe diameters upstream of the 326L or 322L Lever Valve and 20 pipe diameters downstream of the 326L or 322L Lever Valve.

- Protect 326L or 322L Lever Valve and downstream equipment with a self-cleaning strainer.

- Install gauges in inlet and outlet piping of 326L or 322L Lever Valve to provide means for checking adjustment and operation.

- Before installing, be sure the 377 Float Cage, 326L or 322L Lever Valve and piping are clean inside and free of scale, chips, welding spatter, and foreign material. Thoroughly blow out or flush pipe lines.

- Pipes must be aligned squarely with the 377 Float Cage and 326L or 322L Lever Valve at each connection.

- If the lever valve has screwed ends, do not apply pipe dope to the threads of the valve body or to the first two threads of the pipe.

- If the lever valve has flanged ends, tighten flange bolts evenly to prevent excessive stress and the possibility of cracking.

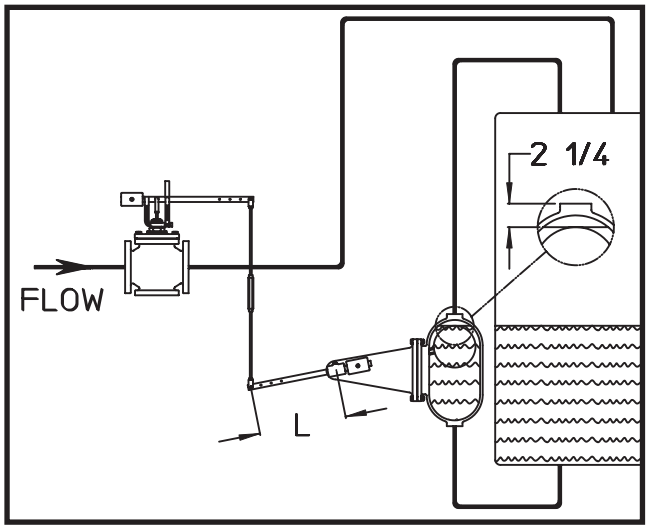
- Do not obscure factory serial number labels with paint. If flow diagram plates or inlet markings will be covered with insulation, it is recommended the information on the plates and markings be transcribed on the outside of the insulation in the same location as the plate or marking.

INSTALLATION GUIDELINES

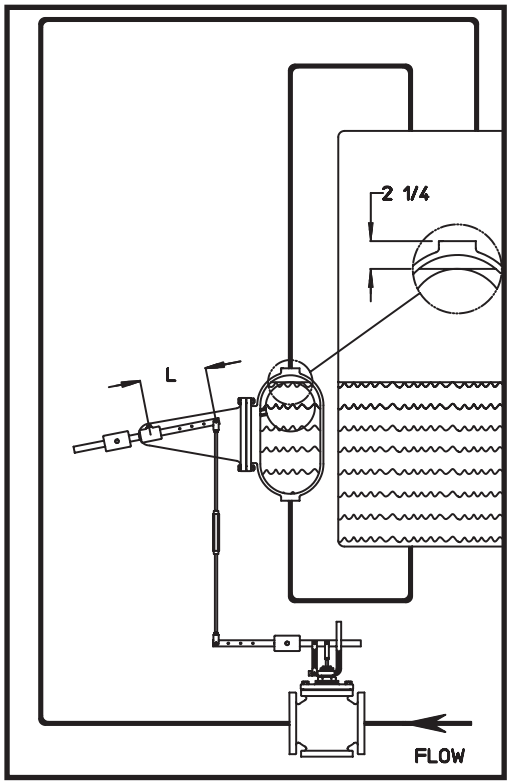
BEFORE YOU BEGIN

The guidelines presented here are for a typical tank filling application utilizing a 377 Float Cage and a Warren Controls Lever Valve. As shown in the Typical Installation Drawings the 377 closes the Lever Valve when the water in the tank reaches the desired level. Since there are numerous possible working configurations it is necessary for you to determine where the 377 and Lever Valve will be located before you install them. The INSTALLATION GUIDELINES are presented for this purpose. Please read all guidelines thoroughly before you begin.

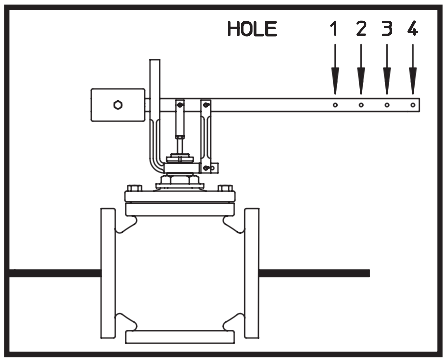
RISING LEVER OPENS VALVE DIAGRAM



RISING LEVER CLOSES VALVE DIAGRAM



TURNBUCKLE CONNECTING HOLE DIAGRAM



DIMENSION L - RISING LEVER OPENS VALVE

VALVE	HOLE 1	HOLE 2	HOLE 3	HOLE 4
1/2, 3/4 & 1 IN 326L	9	10-1/4	11-3/4	13-1/4
1-1/4 & 1-1/2 IN 326L	13	15-1/4	17-1/2	19-3/4
2 IN 326L	16	18-1/2	21-1/4	NA
1-1/2 & 2 IN 322L	7-1/2	8-3/4	10	11-1/4
2-1/2 & 3 IN 322L	11-1/4	13-1/4	15	17

DIMENSION L - RISING LEVER CLOSES VALVE

VALVE	HOLE 1	HOLE 2	HOLE 3	HOLE 4
1/2, 3/4 & 1 IN 326L	7-1/2	9	10-1/4	11-3/4
1-1/4 & 1-1/2 IN 326L	11	13	15-1/4	17-1/2
2 IN 326L	13-1/4	16	18-1/2	21-1/4
1-1/2 & 2 IN 322L	6-1/4	7-1/2	8-3/4	10
2-1/2 & 3 IN 322L	9-1/2	11-1/4	13-1/4	15

The 377 when installed according to these guidelines will provide a maximum water level in the tank that is 2-1/4 inches below the top of the 377. The 377 Float Cage must be installed with the axis through the 1-1/2 NPT pipe connections oriented vertically. The 326L or 322L Lever Valve is located above the 377 in rising lever opens valve applications, and below the 377 in rising lever closes valve applications. The lever valve must be installed with the fluid flowing in the correct direction. For proper operation in all applications, lever valves must be piped according to the corresponding flow arrows, or inlet markings present on each valve (See Information Present on 326L Lever Valves section or Information Present on 322L Lever Valves section for location of important information on valve). The lever valve must be installed in the vertical position with the stem pointing upward. When the maximum desired water level in the tank is reached the 377 closes the lever valve stopping the flow of water into the tank. When the lever valve is closed its lever is horizontal, the turnbuckle is vertical, the end of the 377 lever connected to the turnbuckle is at its lowest point in rising lever opens valve applications and at its highest point in rising lever closes valve applications. Clearance must be allowed for each turnbuckle connection and lever rotation. There are four possible turnbuckle connecting holes on the lever.

INSTALLATION GUIDELINES CONTINUED

Corresponding turnbuckle connections on the 377 lever are designated by the dimension "L". Dimension "L" is the distance in inches from the center of the rocker arm to the point where the turnbuckle connects to the 377 lever. (See diagrams and tables) The 377 lever may be moved in the rocker arm if the hole for the turnbuckle connection is not present at dimension "L". To move the 377 lever loosen the lever capscrew and slide the lever until a hole is in the correct location. Finally to facilitate the turnbuckle connection the lever valve lever may be rotated 360° around the valve stem. To rotate the lever loosen the yoke locknut, lift the lever slightly, and turn the lever to the desired position. Tighten the locknut to hold the lever in position. The turnbuckle must then be adjusted so the clevises line up with the levers.

BEFORE MOUNTING THE LEVER VALVE AND 377

Before mounting the Lever Valve and 377 the water level in the tank must be at least 19 inches below the maximum desired level. Do not apply water pressure to the Lever Valve inlet until you are ready to test it.

MOUNT THE 377

Mount the 377 according to the INSTALLATION GUIDELINES.

MOUNT THE LEVER VALVE

Mount the 326L or 322L Lever Valve according to the INSTALLATION GUIDELINES.

CONNECT THE TURNBUCKLE

Remove the weights from the levers. Move the lever valve lever full up and down to break the packing friction so the lever moves smoothly. Connect the turnbuckle to the correct hole on the lever valve lever. Push the end of the 377 lever farthest away from the float ball down until you hear the float ball hit the top of the 377. With the lever valve lever down as far as it will go (horizontal) for rising lever opens valve applications or up as far as it will go (horizontal) for rising lever closes valve applications adjust the turnbuckle length and connect the turnbuckle to the 377 lever at the correct dimension "L". Shorten the turnbuckle so the float ball just misses hitting the top of the 377 (you do not hear it hit the top). Make sure that the levers and turnbuckle move freely without binding or locking up then tighten the turnbuckle jamnuts.

POSITION THE WEIGHTS

Position the weights as necessary on the levers to balance the assembly. Readjust the weights until the lever valve lever just moves on its own from horizontal to full up for rising lever opens valve applications or from horizontal to full down for rising lever closes valve applications. Tighten the weight capscrews to hold the weights in position. (You may only need one weight)

TEST THE LEVER VALVE AND 377

Apply water pressure to the lever valve inlet. Water should pass through the Lever Valve and enter the tank. The water level in the tank should rise to the maximum desired level then the 377 should close the lever valve stopping the flow of water into the tank.

MAINTENANCE – 377 FLOAT CAGE AND 326L OR 322L LEVER VALVE

- 377 Float Cages for the most part are maintenance free when chosen properly for the application. Maintain the fluid pressure and temperature within the limits of the 377 Float Cage (See 377 Float Cage Specification section for additional details).
- 326L and 322L Lever Valves for the most part are maintenance free when sized and chosen properly for the application. Maintain the fluid pressure, temperature, flow, and shut-off differential pressure within the limits of the valve (See Information Present on 326L Lever Valves section or Information Present on 322L Lever Valves section for location of important information on valve and 326L Lever Valve Specification section or 322L Lever Valve Specification section for additional details).
- 326 and 322L Lever Valves are equipped with self-adjusting packing; no adjustment is required. The valve stem must be kept free of debris, deposits, dirt, dust, and scratches or the packing parts may be damaged resulting in a packing leak.
- In water or water and glycol applications, good water quality must be maintained or the service life of the 377 Float Cage and 326L or 322L Lever Valve may be reduced (See Warren Controls Water Quality Guidelines for details).

OVERHAUL – 377 FLOAT CAGE, AND 326L OR 322L LEVER VALVE

- Rebuilding of the 377 Float Cage and 326L or 322L Lever Valve should not be necessary under normal operating conditions. Should the 377 Float Cage and 326L or 322L Lever Valve become worn or defective, parts kits are available. See Parts/ Overhaul.

INFORMATION PRESENT ON 377 FLOAT CAGE

There is information present on each float cage ranging in importance from the part number and serial number to casting numbers. This information is important for identifying the float cage, installing it correctly, and obtaining parts. **An example of the current factory serial number label used on 377 float cages is shown here.** The accompanying table identifies the information present and where to find it on the float cage. There may also be other casting numbers and foundry marks present that do not provide useful information. Customer specific tagging may also present. The labels or plates used, and information present, on Warren Controls other product lines or older float cages may be different, contact the factory for details.

FACTORY SERIAL NUMBER LABEL

INFORMATION PRESENT ON 377 FLOAT CAGE

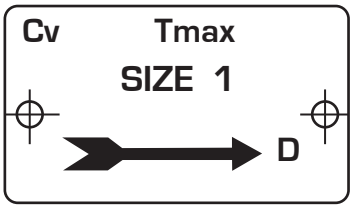
PART NUMBER & SERIAL NUMBER			
Information	**Symbol(s)**	**Location**	**Notes**
Part number	**P/N**	On float box body	* On **Factory Serial Number Label** attached to float box body.
Serial Number	**SERIAL NO.**	On float box body and float box neck	* On **Factory Serial Number Label** attached to float box body. * Sales order number only stamped on float box neck flange.* * Number stamped using approximately 1/8 inch tall characters

INFORMATION PRESENT ON 326L LEVER VALVES

There is information present on each lever valve ranging in importance from the part number and serial number to casting numbers. This information is important for identifying the valve, installing it correctly, and obtaining parts. **Examples of the current factory serial number label used on bronze and stainless steel ½ thru 2 inch 326L Lever Valves and the flow diagram plate used on stainless steel ½ thru 2 inch 326L Lever Valves are shown here.** The accompanying table identifies the information present and where to find it on the lever valve. There may also be other casting numbers and foundry marks present that do not provide useful information. Customer specific tagging may also present. The labels or plates used, and information present, on Warren Controls other product lines or older valves may be different, contact the factory for details.

FACTORY SERIAL NUMBER LABEL

FLOW DIAGRAM PLATE



Flow Diagram Plate
For 326L
Stainless Steel Valves
Size 1/2 thru 1
(Size 1 Shown)

INFORMATION PRESENT ON 326L LEVER VALVES BRONZE OR STAINLESS STEEL 1/2 THRU 2 INCH

PART NUMBER & SERIAL NUMBER			
INFORMATION	**SYMBOL(S)**	**LOCATION**	**NOTES**
Part number	**P/N**	On actuator	• On **Factory Serial Number Label** attached to actuator.
Serial Number	**SERIAL NO.**	On actuator and valve body	• On **Factory Serial Number Label** attached to actuator. • Sales order number only stamped on valve body end connection.* * Number stamped using approximately 1/8 inch tall characters
FLOW DIRECTION			
INFORMATION	**SYMBOL(S)**	**LOCATION**	**NOTES**
Flow direction through valve	→	On valve body	• On **Flow Diagram Plate** attached to mounting boss on valve body between the end connections (S/S valves ½ thru 1 inch). • Arrow cast on valve body between the end connections (2-way S/S 1-1/4 - 2 inch).
Inlet location	**INLET**	On valve body	• Stamped on valve body inlet end connection (2-way bronze valves ½ thru 2 inch & S/S valves 1-1/4 thru 2 inch).
VALVE ATTRIBUTES			
INFORMATION	**SYMBOL(S)**	**LOCATION**	**NOTES**
Maximum temperature rating of valve body	**Tmax**	On valve body	• On **Flow Diagram Plate** attached to mounting boss on valve body between the end connections (S/S valves ½ thru 1 inch).
Trim Cv (Flow coefficient)	**Cv**	On valve body	• On **Flow Diagram Plate** attached to mounting boss on valve body between the end connections (S/S valves ½ thru 1 inch).
Valve Size	**SIZE**	On valve body	• On **Flow Diagram Plate** attached to mounting boss on valve body between the end connections (S/S valves ½ thru 1 inch).
Valve Body Material		On valve body	• If CF8M is cast on the valve the valve body material is 316 stainless steel.

INFORMATION PRESENT ON 322L LEVER VALVES

There is information present on each lever valve ranging in importance from the part number and serial number to the color of the paint and casting numbers. This information is important for identifying the valve, installing it correctly, and obtaining parts. **An example of the current factory serial number label used on 1-1/2 thru 3 inch 322L Lever Valves is shown here.** The accompanying table identifies the information present and where to find it on the lever valve. There may also be other casting numbers and foundry marks present that do not provide useful information. Customer specific tagging may also present. The labels or plates used, and information present, on Warren Controls other product lines or older valves may be different, contact the factory for details.

FACTORY SERIAL NUMBER LABEL

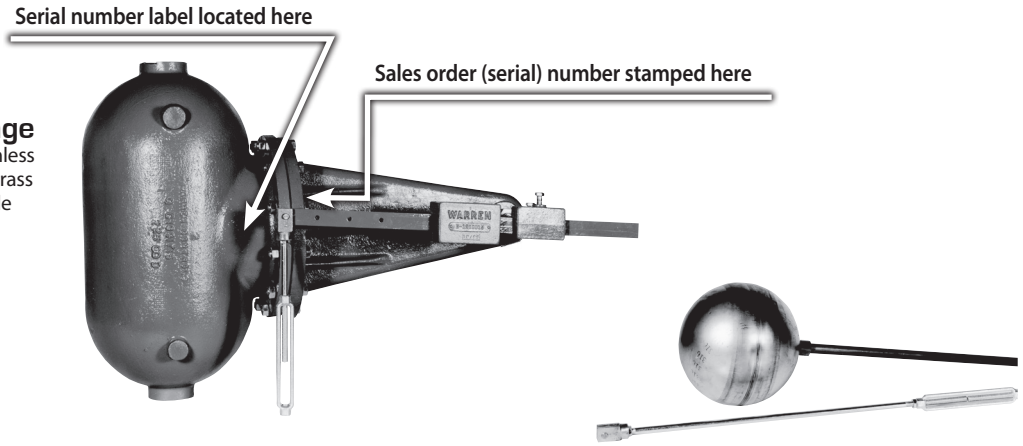
INFORMATION PRESENT ON 322L LEVER VALVES IRON 1-1/2 THRU 3 INCH

PART NUMBER & SERIAL NUMBER			
INFORMATION	**SYMBOL(S)**	**LOCATION**	**NOTES**
Part number	**P/N**	On actuator	• On **Factory Serial Number Label** attached to actuator.
Serial Number	**SERIAL NO.**	On actuator and valve body	• On **Factory Serial Number Label** attached to actuator. • Sales order number only stamped on top of valve body top cover or top of valve body* * Number stamped using approximately 1/8 inch tall characters
FLOW DIRECTION			
INFORMATION	**SYMBOL(S)**	**LOCATION**	**NOTES**
Flow direction through valve	→	On valve body	• Arrow cast on valve body between the end connections.
VALVE ATTRIBUTES			
INFORMATION	**SYMBOL(S)**	**LOCATION**	**NOTES**
Valve Body Material		On valve body	• If the factory applied paint is black the valve body material is iron.

377 FLOAT CAGE SPECIFICATIONS

377	PART NUMBER
Standard 377	0377XXXXX000
377 with sight glass tappings	0377XXXXX002
377 with sight glass assembly	0377XXXXX003
Extra Turnbuckle Sections	
2 Ft Section	B3100033
3 Ft Section	B3100034

377 Float Cage
8" diameter 316 stainless steel float ball with brass float rod, 3' adjustable turnbuckle assembly shown separately



APPLICATION:

The 377 Float Cage opens a 322L or 326L Lever Valve to supply intake water to a tank. When the water reaches the desired level the Float Cage closes the Lever Valve to accurately maintain the liquid at the desired level. Buoyancy of its internal float ball provides the force to actuate the lever valve.

FEATURES:

Cast iron body, 1-1/2" NPT connections, 316 stainless steel float ball, epr o-ring, steel lever and turnbuckle assembly.

- Lever and turnbuckle assembly are adjustable to ease installation and connection to lever valve.
- Standard turnbuckle is adjustable from 30 to 36 inches in length.
- Extra turnbuckle sections are available for a combined length up to 10 feet.
- Mounting bosses present on body can be provided with 1/2" NPT pipe tappings for optional sight glass assembly.
- Optional sight glass assembly is available complete with brass ball check, shut-off valves, and drain valves.

BODY PRESSURE-TEMPERATURE RATINGS: PRESSURE RATINGS ARE PSIG	
Temperature (°F)	**Iron Body 125 Flg**
+32 to 100°F	175 PSIG
150°F	175 PSIG
175°F	170 PSIG
200°F	165 PSIG
225°F	155 PSIG
250°F	150 PSIG
275°F	145 PSIG
300°F	140 PSIG

PRESSURE — TEMPERATURE RATINGS:

Body 125lb rated cast iron

APPROXIMATE SHIPPING WEIGHT:

190 lb

FOR DIMENSIONS SEE DRAWINGS 03770524101-1

LEVER VALVES SPECIFICATIONS

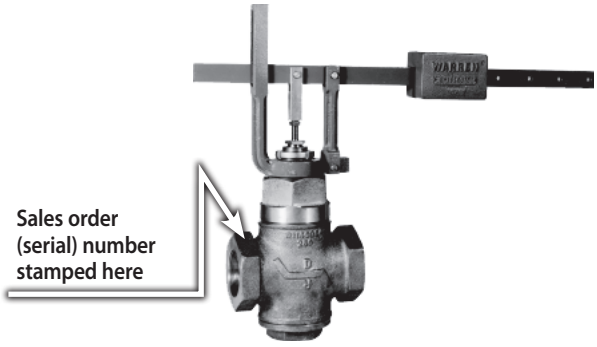
326L	PART NUMBER		
Description	**Size**	**End Connection**	**Part Number**
BRONZE BODY WITH EQ% ST. STL. TRIM	1/2	NPT	VA2604AC-L000
	3/4	NPT	VA2605AC-L000
	1	NPT	VA2606AC-L000
	1-1/4	NPT	VA2607AC-L000
	1-1/2	NPT	VA2608AC-L000
	2	NPT	VA2609AC-L000
ST.STL.BODY WITH EQ% ST. STL. TRIM	1/2	NPT	VA2604EC-L000
	3/4	NPT	VA2605EC-L000
	1	NPT	VA2606EC-L000
	1-1/2	NPT	VA2608EC-L000
	2	NPT	VA2609EC-L000

322L	PART NUMBER		
Description	**Size**	**End Connection**	**Part Number**
DOUBLE SEAT IRON BODY WITH EQ% ST. STL. TRIM	1-1/2	NPT	VA2208BC-L000
	2	NPT	VA2209BC-L000
DOUBLE SEAT IRON BODY WITH EQ% BRONZE TRIM	2-1/2	125 FLG	VA2210CA-L000
	3	125 FLG	VA2211CA-L000
DOUBLE SEAT IRON BODY WITH EQ% ST. STL.TRIM	2-1/2	125 FLG	VA2210CC-L000
	3	125 FLG	VA2211CC-L000

APPLICATION:

A 377 Float Cage opens the 326L Lever Valve to supply intake water to a tank. When the water reaches the desired level the Float Cage closes the Lever Valve to accurately maintain the liquid at the desired level. The 326L combines a balanced, pilot operated, single seated Type 26 globe valve with a rugged lever actuator.

326L LEVER VALVE



2" Bronze 326L

FEATURES:

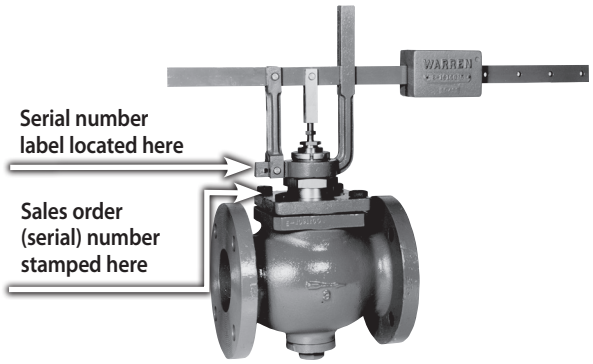
The 326L Lever Valve is available with a bronze or stainless steel body, stainless steel trim, epr o-ring, cast iron lever actuator, and steel lever.
EPDM lip packing is standard.
TFE v-ring packing is optional, must be specified on order.
(EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids.)
(TFE v-ring packing is not suitable for use with fluid temperatures below 60°F.)
Sizes 1/2" through 2" with NPT connections.
Lever actuator is adjustable 360° around top of valve for ease of installation and connection to float cage.
Lever actuator can be reversed from rising lever opens valve to rising lever closes valve.
Cv's to 40
Shut-off pressures to 100 PSI
Nominal leakage rate 0.1% of rated capacity

FOR DIMENSIONS SEE DRAWINGS 0260521101, 00260521102 & 03000521101.

APPLICATION:

A 377 Float Cage opens the 322L Lever Valve to supply intake water to a tank. When the water reaches the desired level the Float Cage closes the Lever Valve to accurately maintain the liquid at the desired level. The 322L combines a double seated Type 22 globe valve with a rugged lever actuator.

322L LEVER VALVE



3" Iron 322L

FEATURES:

The 322L Lever Valve is available with a cast iron body, bronze trim or stainless steel trim, cast iron lever actuator and steel lever.
EPDM lip packing is standard.
TFE v-ring packing is optional, must be specified on order.
(EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids.)
(TFE v-ring packing is not suitable for use with fluid temperatures below 60°F.)
Sizes 1-1/2" and 2" with NPT connections,
2-1/2" and 3" with 125FLG
Lever actuator is adjustable 360° around top of valve for ease of installation and connection to float cage.
Lever actuator can be reversed from rising lever opens valve to rising lever closes valve.
Cv's to 100
Shut-off pressures to 100PSI
Nominal leakage rate 0.5% of rated capacity

FOR DIMENSIONS SEE DRAWINGS 0220521101 & 03000521101.

	WHAT'S AVAILABLE					
	Features	326L			322L	
		Size (IN)			Size (IN)	
		1/2,3/4,1	1-1/4	1-1/2,2	1-1/2,2	2-1/2,3
Trim Material	BRONZE					●
	ST STL	●	●	●	●	●
Body Material & End Connection	BRONZE THREADED (NPT)	●	●	●		
	IRON THREADED (NPT)				●	
	ST STL THREADED (NPT)	●		●		
	IRON 125FLG					●
Packing	EPDM LIP	●	●	●	●	●
	TFE V-RING	○	○	○	○	○

● STANDARD
○ OPTIONAL

PRESSURE-TEMPERATURE:

Temp (F)	Bronze & Iron Thd	Iron 125 Flg	St Steel Thd
+32 to 100F	400 PSIG	175 PSIG	400 PSIG

SHUT-OFFS:

326L/322L	MAXIMUM SHUT-OFF (PSID) USING 377 FLOAT CAGE							
	Valve Size (IN)							
Valve	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
326L	100	100	100	100	100	100	-	-
322L	-	-	-	-	100	100	80	60

APPROXIMATE SHIPPING WEIGHTS:

326L/322L	WEIGHTS (LB)							
	Valve Size (IN)							
Valve	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
326L	24	24	25	32	32	37	-	-
322L	-	-	-	-	33	33	50	60

FLOW COEFFICIENTS Cv:

326L/322L	CV							
	Valve Size (IN)							
Valve	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
326L	6.9	7.7	10	19	25	40	-	-
322L	-	-	-	-	30	42	70	100

FLOW CAPACITIES:

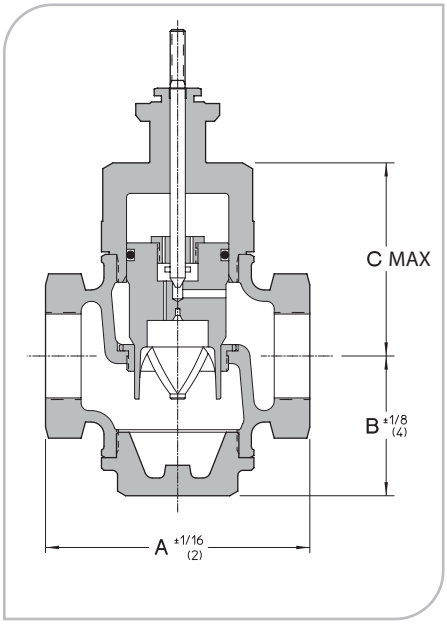
326L	GPM					
	Valve Size (IN)					
DP (PSI)	1/2	3/4	1	1-1/4	1-1/2	2
5	15	17	22	42	56	89
10	22	24	32	60	79	126
15	27	30	39	74	97	155
20	31	34	45	85	112	179
25	35	39	50	95	125	200
30	38	42	55	104	137	219
35	41	46	59	112	148	237
40	44	49	63	120	158	253
45	46	52	67	127	168	268
50	49	54	71	134	177	283

322L	GPM			
	Valve Size (IN)			
DP (PSI)	1-1/2	2	2-1/2	3
5	67	94	157	224
10	95	133	221	316
15	116	163	271	387
20	134	188	313	447
25	150	210	350	500
30	164	230	383	548
35	177	248	414	592
40	190	266	443	632
45	201	282	470	671
50	212	297	495	707

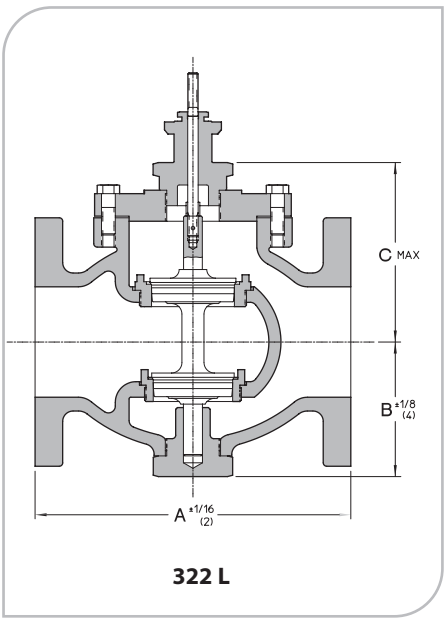
LEVER VALVES SPECIFICATIONS

326L		VALVE SIZE IN (MM)					
Dimension IN (mm)		1/2-1	(15-25)	1-1/4 - 1-1/2	(32-40)	2	(50)
A	Bronze	4-7/8	(124)	5-3/4	(147)	6-1/2	(166)
B	Bronze	2-5/8	(67)	3-1/8	(80)	3-7/16	(88)
C	Bronze	3-13/16	(97)	4-3/16	(107)	4-3/4	(121)
A	St. Steel	5	(127)	6-1/8	(156)	6-1/2	(166)
B	St. Steel	2-13/16	(72)	3-3/8	(86)	3-11/16	(94)
C	St. Steel	3-13/16	(97)	4-3/16	(107)	4-3/4	(121)

322L	VALVE SIZE IN (MM)						
Dimension IN (mm)	1-1/2	(40)	2	(50)	2-1/2	(65)	3	(80)
A	7-3/8	(188)	7-3/8	(188)	7-3/4	(197)	9	(229)
B	3-3/4	(96)	3-3/4	(96)	4	(102)	4-1/4	(108)
C	4-1/2	(115)	4-1/2	(115)	4-7/8	(124)	5-1/16	(129)



326 L



322 L

377 FLOAT CAGE PARTS / OVERHAUL

Damaged or worn parts can decrease performance and shorten the life of the float cage.

A damaged **float ball and/or float rod** can result in poor control and poor shut-off of the attached lever valve.

A damaged or worn **float arm shaft with elbow** can result in poor control and poor shut-off of the attached lever valve, and can also cause damage to the bonnet and o-ring.

A damaged or missing **e-ring** can result in damage to the float rod, float arm shaft, o-ring, and linkage.

A damaged or worn **bonnet** can result in poor control and poor shut-off of the attached lever valve, and can also cause damage to the float shaft and o-ring.

A damaged or worn **o-ring** can result in poor control and poor shut-off of the attached lever valve, and can also cause damage to the bonnet and float shaft.

A damaged or worn **gasket or o-ring** can cause external leakage resulting in damage to surrounding equipment.

A damaged **lever arm or turn buckle assembly** can result in poor control and poor shut-off of the attached lever valve.

Three different parts kits are available. The float ball kit allows for the float ball to be replaced. The soft goods kit allows for the float cage to be opened for inspection and replacement of the gasket, e-ring and o-ring. The replacement neck assembly kit allows for the entire neck assembly including the float rod, float arm shaft, and bonnet, minus the float ball, to be replaced.
Please provide serial number to get the correct kit part number.

326L and 322L Lever Valves with EPDM lip packing or TFE V-Ring packing have self-adjusting packing and require no external adjustment. If the valve has self-adjusting packing and a packing leak is observed replace the packing and if necessary the stem and plug assembly.

326L AND 322L LEVER VALVE PARTS/ OVERHAUL

Damaged or worn parts can decrease performance and shorten valve life.

Damaged or worn packing parts including as applicable the packing, bearings, spring, and other bonnet parts can cause a packing leak resulting in damage to the actuator and surrounding equipment. Damaged or worn packing parts can also cause increased hysteresis resulting in poor control.

Damaged or worn trim parts including as applicable the plug, stem, seat ring(s), piston, pilot retainer, and o-ring can cause increased hysteresis, poor control, excessive internal leakage, and poor shut-off. Damaged or worn trim parts can also cause damage to the packing parts resulting in a packing leak.

Damaged or worn body gaskets can cause external leakage resulting in damage to the actuator, accessories, and surrounding equipment.

Should parts become worn or damaged, parts kits are available. Repack Kits are available to replace the packing. Soft Goods Kits are available to allow the valve to be opened for inspection of its internal parts and replacement of the soft goods and packing. Rebuild/Repack Kits are available to completely rebuild/ overhaul the valve. Parts kits come with complete step-by-step instructions. Each kit has its own part number. **Please provide the valve's serial number to ensure getting the correct kit part number and correct parts.**

377 FLOAT CAGE PARTS KITS [SEE DRAWINGS ON PAGE 17 & 18]

(PROVIDE FLOAT CAGE SERIAL NUMBER TO GET KIT PART NUMBERS)

Three different parts kits are available. The float ball kit allows for the float ball to be replaced. The soft goods kit allows for the float cage to be opened for inspection and replacement of the gasket, e-ring and o-ring. The replacement neck assembly kit allows for the entire neck assembly including the float rod, float arm shaft, and bonnet, minus the float ball, to be replaced.

377 FLOAT BALL KIT - SEE DWG 03770524101					
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	1	FLOAT BALL	3	1	GASKET

377 SOFT GOODS KIT - SEE DWG 03770524101					
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
3	1	GASKET		1	TUBE PERMATEX #2
17	1	E-RING		1	TUBE O-RING LUBE
19	1	O-RING			

377 REPLACEMENT NECK ASSEMBLY KIT SEE DWG 03770524101					
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
3	1	GASKET	18	1	BONNET
8	1	FLOAT BOX NECK	19	1	O-RING
16	1	FLAT ARM SHAFT W/ BRAZED ELBOW	20	1	FLOAT ROD
17	1	E-RING			

26 VALVE PARTS KITS [SEE DRAWINGS ON PAGE 19 & 20]

(PROVIDE VALVE SERIAL NUMBER TO GET KIT PART NUMBERS)

Three different kinds of parts kits are available. The repack kit allows a valve to be repacked. The soft goods kit allows a valve to be opened for inspection of internal parts and replacement of the soft goods and packing. The rebuild/ repack kit allows a valve to be overhauled and repacked

REPACK KIT FOR TYPE 26 BRONZE VALVE WITH EPDM LIP PACKING					
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
2	1	TUBE STEM LUBE	13	1	PACKING RETAINER
12	1	RETAINER BEARING	21	3	LIP PACKING
REPACK KIT INSTRUCTION DOCUMENT P/N 92500037					

REPACK KIT FOR TYPE 26 BRONZE VALVE WITH TEFLON V-RING PACKING					
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
2	1	TUBE STEM KIT	15	1	MALE ADAPTER
12	1	RETAINER BEARING	16	1	PACKING SPRING
13	1	PACKING RETAINER	17	1	O-RING RETAINER
14	1	V-RING PACKING SET	18	1	O-RING
REPACK KIT INSTRUCTION DOCUMENT P/N 92500047					

REPACK KIT FOR 26 ST STL VALVE WITH EPDM LIP PACKING					
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
2	1	TUBE STEM LUBE	13	1	PACKING RETAINER
12	1	RETAINER BEARING	21	3	LIP PACKING
REPACK KIT INSTRUCTION DOCUMENT P/N 92500148					

REPACK KIT FOR TYPE 26 ST STL VALVE WITH TEFLON V-RING PACKING					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
2	1	TUBE STEM LUBE	15	1	MALE ADAPTER
12	1	RETAINER BEARING	16	1	PACKING SPRING
13	1	PACKING RETAINER	17	1	O-RING RETAINER
14	1	V-RING PACKING SET	18	1	O-RING
REPACK KIT INSTRUCTION DOCUMENT P/N 92500028					

SOFT GOODS KIT FOR TYPE 26 BRONZE VALVE WITH EPDM LIP OR TEFLON V-RING PACKING					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
4	1	O-RING	19	1	BONNET BEARING
10	1	TUBE PERMATEX #2		1	REPACK KIT
11	1	TUBE O-RING LUBE			
SOFT GOODS KIT INSTRUCTION DOCUMENT P/N 92500132					
REPACK KIT INSTRUCTION DOCUMENT P/N 92500028					

SOFT GOODS KIT FOR TYPE 26 ST STL VALVE WITH EPDM LIP OR TEFLON V-RING PACKING					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
4	1	O-RING	19	1	BONNET BEARING
10	1	TUBE PST SEALANT		1	REPACK KIT
11	1	TUBE O-RING LUBE			
SOFT GOODS KIT INSTRUCTION DOCUMENT P/N 92500132					

REBUILD/ REPACK KIT - FOR 26 BRONZE VALVE WITH EPDM LIP OR TEFLON V-RING PACKING					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM	10	1	TUBE PERMATEX #2
3	1	PILOT RETAINER	11	1	TUBE O-RING LUBE
4	1	O-RING	19	1	BONNET BEARING
5	1	GROOVE PIN	20	1	BONNET
6	1	PISTON & PLUG		1	REPACK KIT
7	1	SEAT RING			
REBUILD / REPACK KIT INSTRUCTIONS DOCUMENT P/N 92500020					

REBUILD/ REPACK KIT - FOR 26 ST STL VALVE WITH EPDM LIP OR TEFLON V-RING PACKING					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM	10	1	TUBE PST SEALANT
3	1	PILOT RETAINER	11	1	TUBE O-RING LUBE
4	1	O-RING	19	1	BONNET BEARING
5	1	GROOVE PIN	20	1	BONNET
6	1	PISTON & PLUG		1	REPACK KIT
7	1	SEAT RING			
REBUILD / REPACK KIT INSTRUCTIONS DOCUMENT P/N 92500020					

22 VALVE PARTS KITS [SEE DRAWINGS ON PAGE 22]

(PROVIDE VALVE SERIAL NUMBER TO GET KIT PART NUMBERS)

Three different kinds of parts kits are available. The repack kit allows a valve to be repacked. The soft goods kit allows a valve to be opened for inspection of internal parts and replacement of the soft goods and packing. The rebuild/ repack kit allows a valve to be overhauled and repacked.

REPACK KIT -
FOR 22 IRON VALVE WITH EPDM LIP PACKING

ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
2	1	TUBE STEM LUBE	17	1	RETAINER BEARING
16	1	PACKING RETAINER	24	3	LIP PACKING
REPACK KIT INSTRUCTION DOCUMENT P/N 92500037					

REPACK KIT -
FOR 22 IRON VALVE WITH TEFLON V-RING PACKING

ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
2	1	TUBE STEM LUBE	19	1	MALE ADAPTER
16	1	PACKING RETAINER	20	1	PACKING SPRING
17	1	RETAINER BEARING	21	1	O-RING RETAINER
18	1	V-RING PACKING SET	22	1	O-RING
REPACK KIT INSTRUCTION DOCUMENT P/N 92500047					

SOFT GOODS KIT -
FOR TYPE 22 IRON VALVE SIZE 1-1/2 THRU 3 INCH WITH EPDM LIP OR TEFLON V-RING PACKING

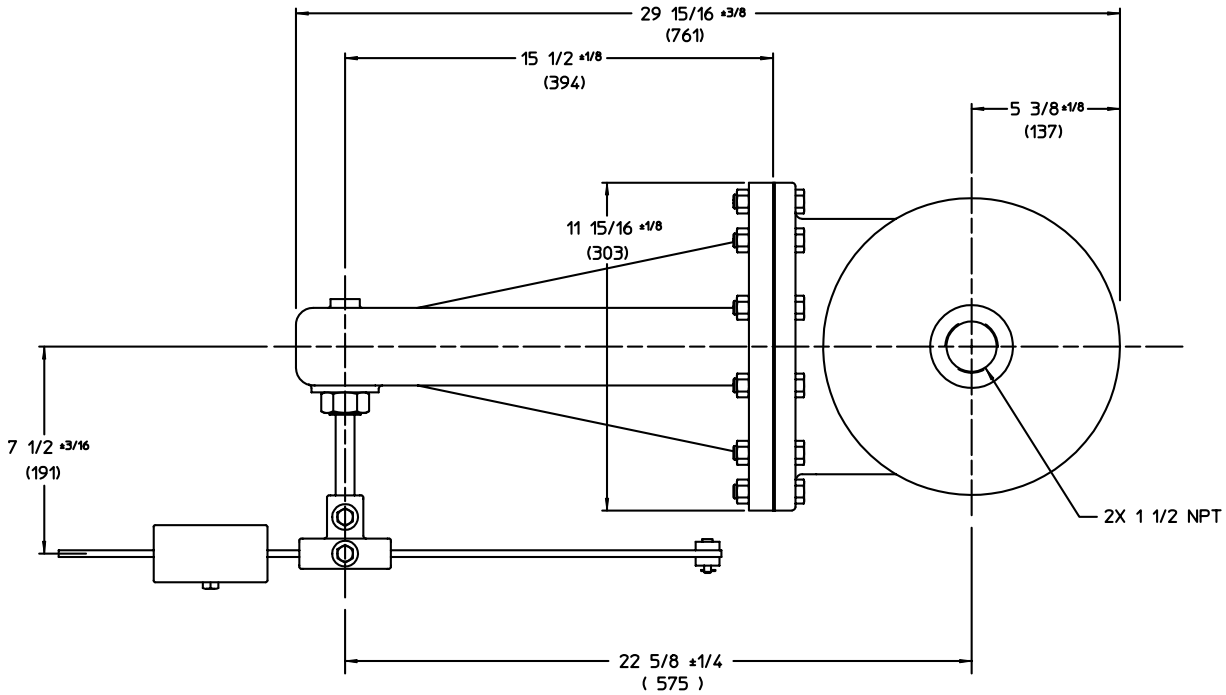
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
7	1	GASKET		1	REPACK KIT
23	1	BONNET BEARING			
SOFT GOODS KIT INSTRUCTION DOCUMENT P/N 92500123					

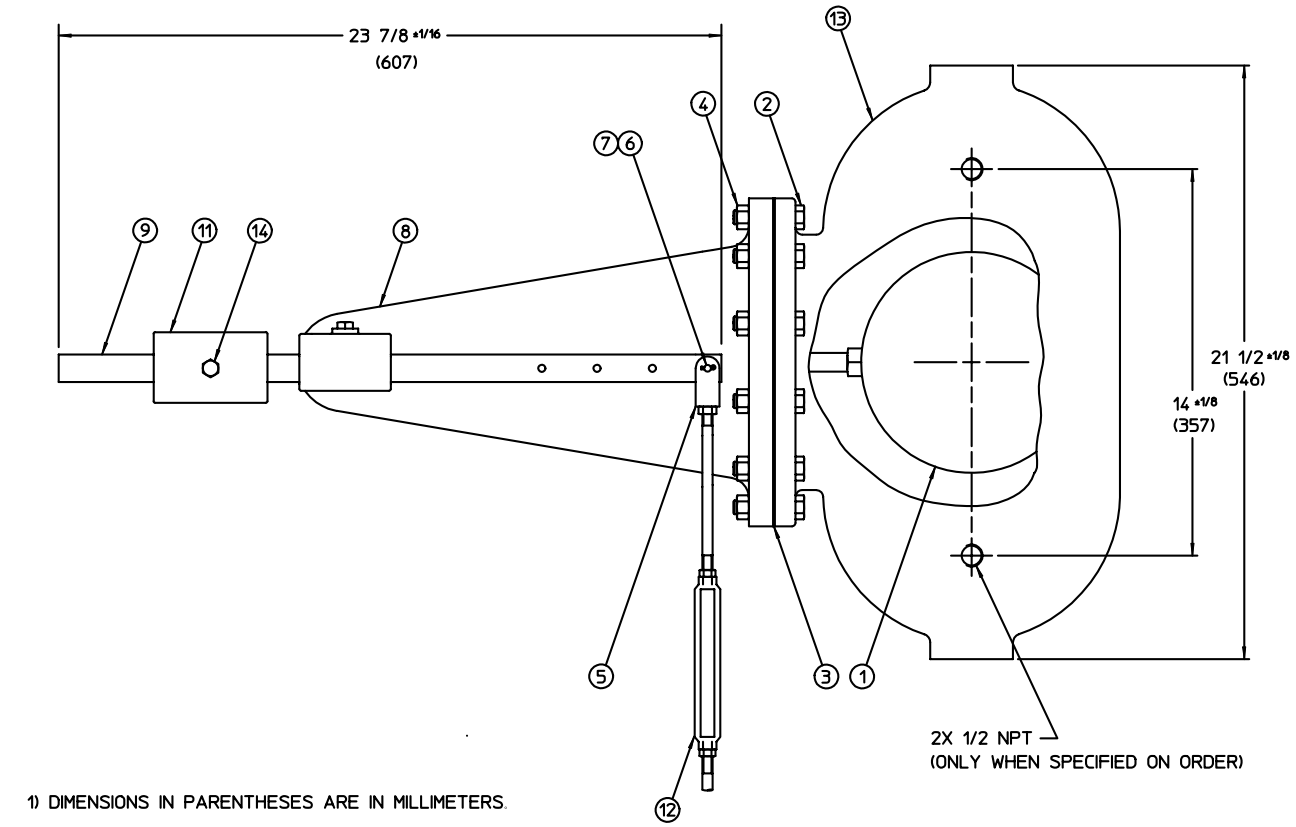
REBUILD / REPACK KIT -
FOR TYPE 22 IRON VALVE SIZE 1-1/2 THRU 3 INCH WITH EPDM LIP OR TEFLON V-RING PACKING

ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	1	VALVE STEM	10	1	PLUG
3	1	TRAVEL STOP	13	1	TUBE PERMATEX #2 (Valve size 1-1/2, 2 & 2-1/2 inch)
5	1	INTEGRAL BONNET (Valve size 3 inch)	15	1	SCREWED IN BONNET (Valve size 1-1/2, 2 & 2-1/2 inch)
6	1	GROOVE PIN	23	1	BONNET BEARING
7	1	GASKET		1	REPACK KIT
SEAT RINGS ARE MACHINED IN VALVE AND ARE **NOT** AVAILABLE SEPARATELY					
REBUILD / REPACK KIT INSTRUCTION DOCUMENT P/N 92500156					

DRAWING 03770524101-1

Type 377 Float Cage





1) DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS.

NOTES:

DRAWING 03770524101-2

Type 377 Float Cage

BILL OF MATERIAL					
NO.	DESCRIPTION	MATERIAL	NO.	DESCRIPTION	MATERIAL
1	FLOAT BALL	ST STL	11	WEIGHT	CAST IRON
2	CAPSCREW	STL PLTD	12	TURNBUCKLE	STL PLTD
3	GASKET	NONASBESTOS	13	FLOAT BOX BODY	CAST IRON
4	NUT	STL PLTD	14	CAPSCREW	STL PLTD
5	CLEVIS	ST STL	15	ROCKER ARM	CAST IRON
6	COTTER PIN	BRASS	16	FLOAT ARM SHAFT WITH BRAZED ELBOW	ST STL/BRONZE
7	CLEVIS PIN	BRASS	17	E RING	STL PLTD
8	FLOAT BOX NECK	CAST IRON	18	BONNET	BRASS
9	LEVER ARM	STEEL	19	O-RING	EPR
10	CAPSCREW	STL PLTD	20	FLOAT ROD	BRASS

PARTS DETAIL

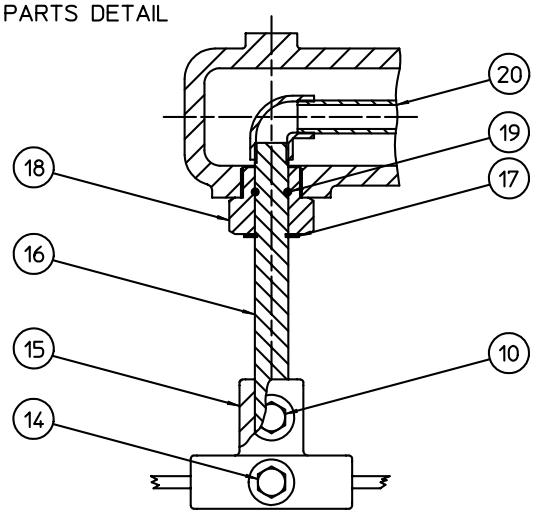
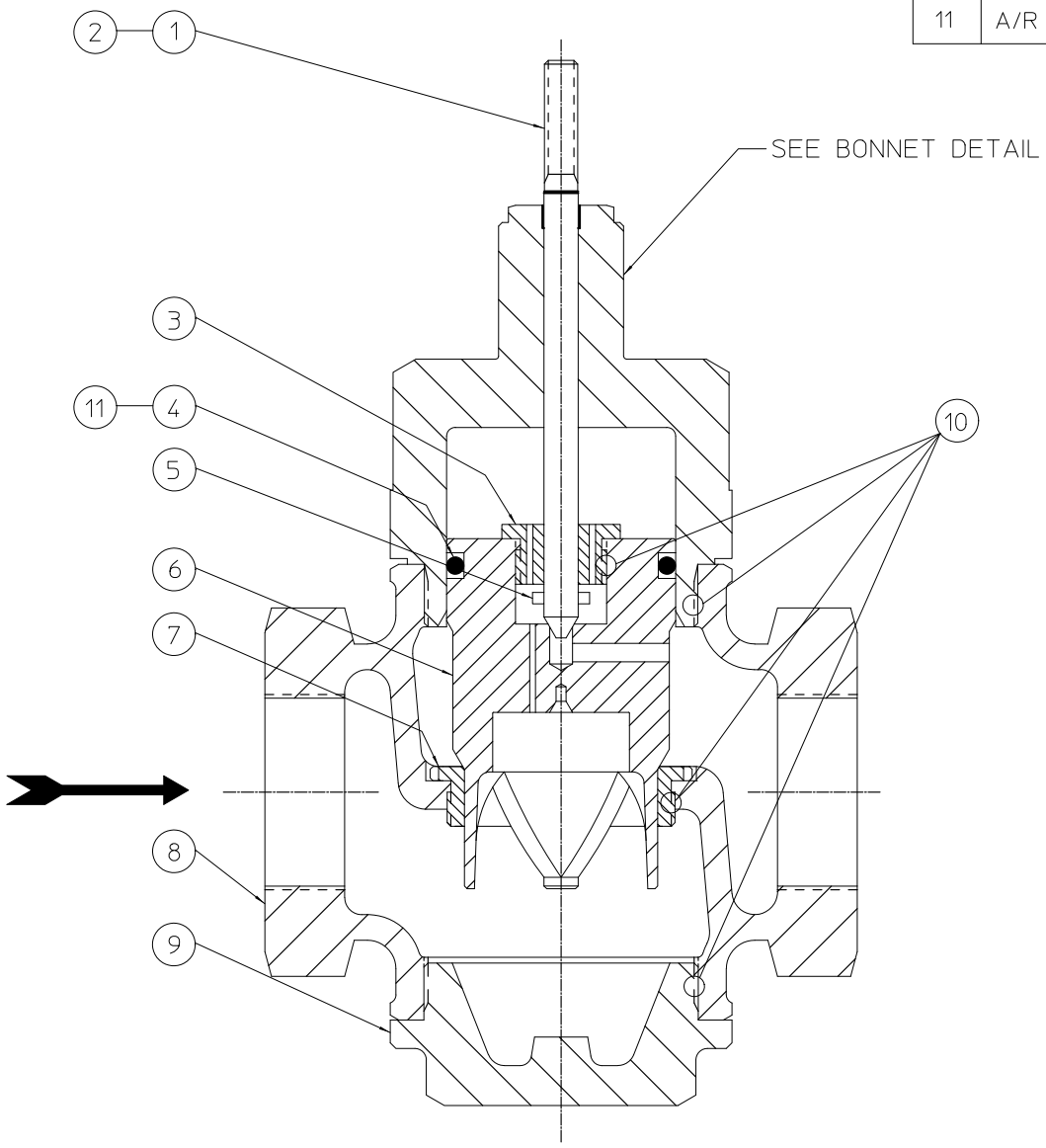


FIGURE 1

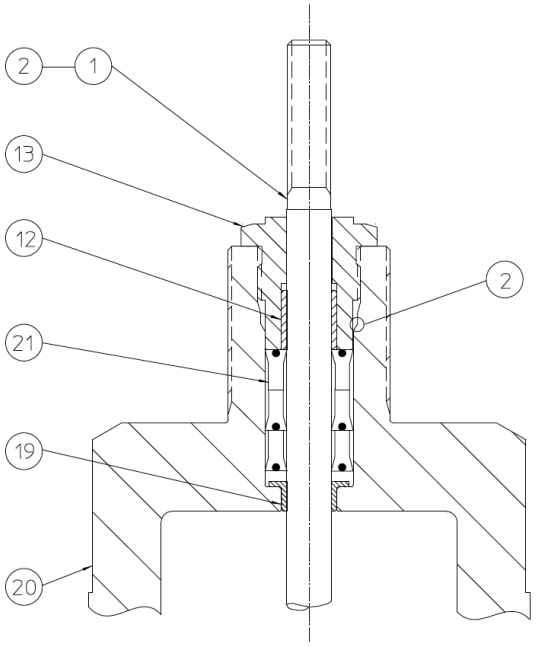
TYPE 26 & 26S

ITEM	QTY	DESCRIPTION
1	1	VALVE STEM
2	A/R	STEM LUBE
3	1	PILOT RETAINER
4	1	O-RING
5	1	GROOVE PIN
6	1	PISTON & PLUG
7	1	SEAT RING
8	1	VALVE BODY
9	1	BOTTOM PLUG
10	A/R	GASKET SEALANT
11	A/R	O-RING LUBE

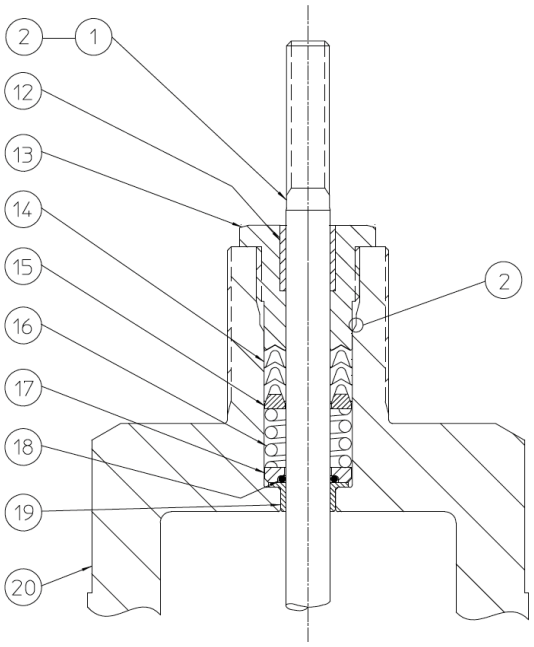


TYPE 26 AND 26S

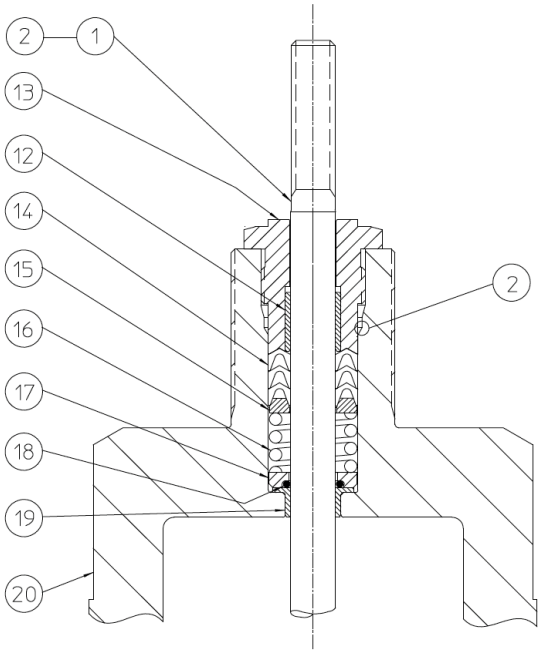
TYPE 26 & 26S



BONNET DETAIL
TYPE 26 BRONZE AND
TYPE 26S STAINLESS STEEL
EPDM LIP NLP PACKING



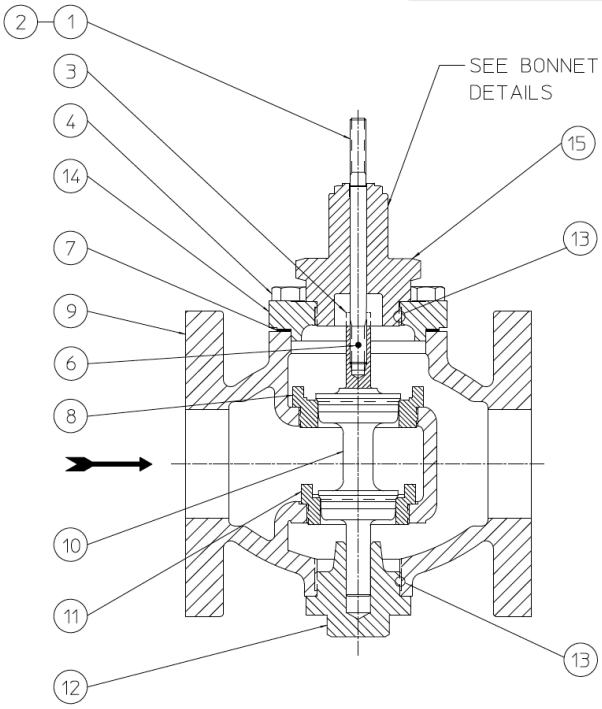
BONNET DETAIL
TYPE 26S STAINLESS STEEL
TFE V-RING NVP PACKING



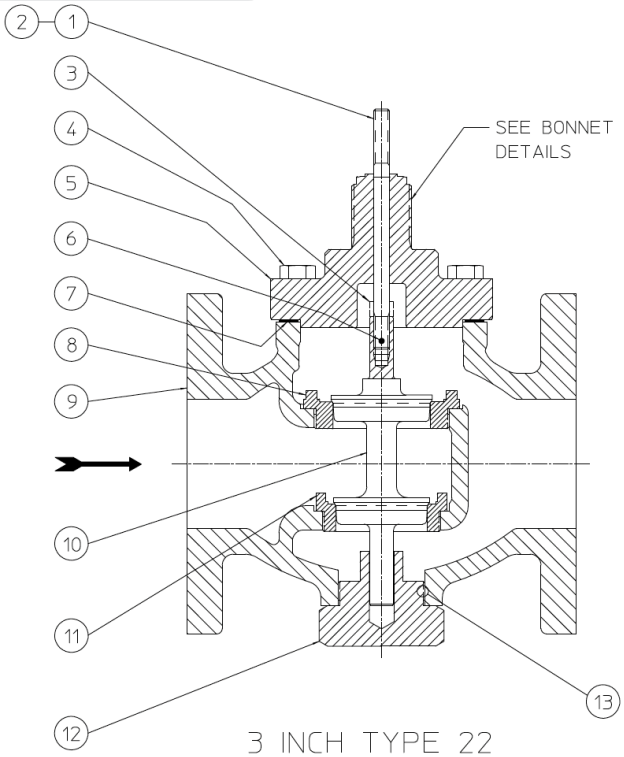
BONNET DETAIL
TYPE 26 BRONZE
TFE V-RING GLFVP PACKING

ITEM	QTY	DESCRIPTION
1	1	VALVE STEM
2	A/R	STEM LUBE
12	1	RETAINER BEARING
13	1	PACKING RETAINER
14	1	V-RING PACKING SET
15	1	MALE ADAPTER
16	1	PACKING SPRING
17	1	O-RING RETAINER
18	1	O-RING -012
19	1	BONNET BEARING
20	1	BONNET
21	3	NLP PACKING

TYPE 22

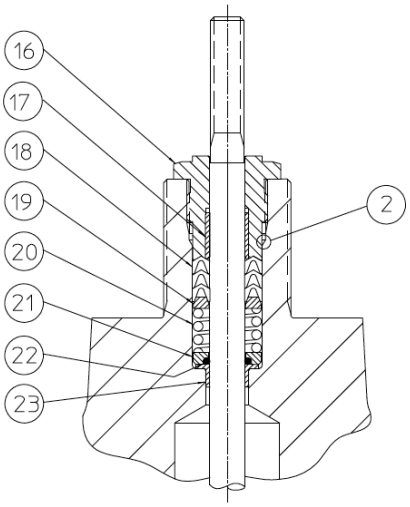


1 1/2, 2 & 2 1/2 INCH TYPE 22

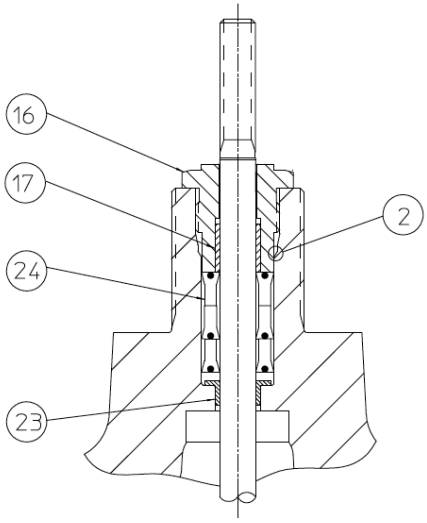


3 INCH TYPE 22

ITEM	QTY	DESCRIPTION
1	1	VALVE STEM
2	A/R	STEM LUBE
3	1	TRAVEL STOP
4	4	HEX HEAD CAPSCREW - INTEGRAL BONNET & TOP COVER
5	1	INTEGRAL BONNET
6	1	GROOVE PIN
7	1	GASKET
8	1	UPPER SEAT RING - SEE NOTE 1
9	1	VALVE BODY - SEE NOTE 1
10	1	PLUG
11	1	LOWER SEAT RING - SEE NOTE 1
12	1	BOTTOM GUIDE PLUG
13	A/R	PERMATEX #2
14	1	TOP COVER
15	1	SCREWED IN BONNET
16	1	PACKING RETAINER
17	1	RETAINER BEARING
18	1	V-RING PACKING SET
19	1	MALE ADAPTER
20	1	PACKING SPRING
21	1	O-RING RETAINER
22	1	O-RING
23	1	BONNET BEARING
24	3	LIP PACKING

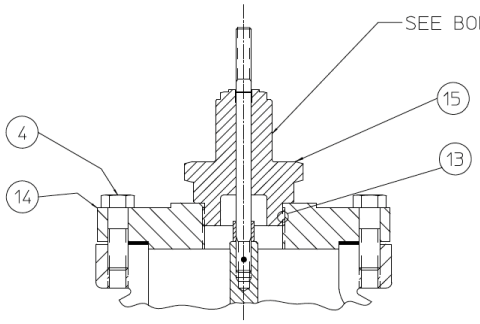


BONNET DETAIL
TYPE 22
TFE V-RING GLFVP PACKING



BONNET DETAIL
TYPE 22
EPDM LIP NLP PACKING

NOTES:
1) THE VALVE BODY AND SEAT RINGS (ITEMS 8, 9 & 11) ARE ONLY AVAILABLE AS AN INSEPARABLE ASSEMBLY.



SCREWED IN BONNET
CONSTRUCTION

DRAWING 03000521101

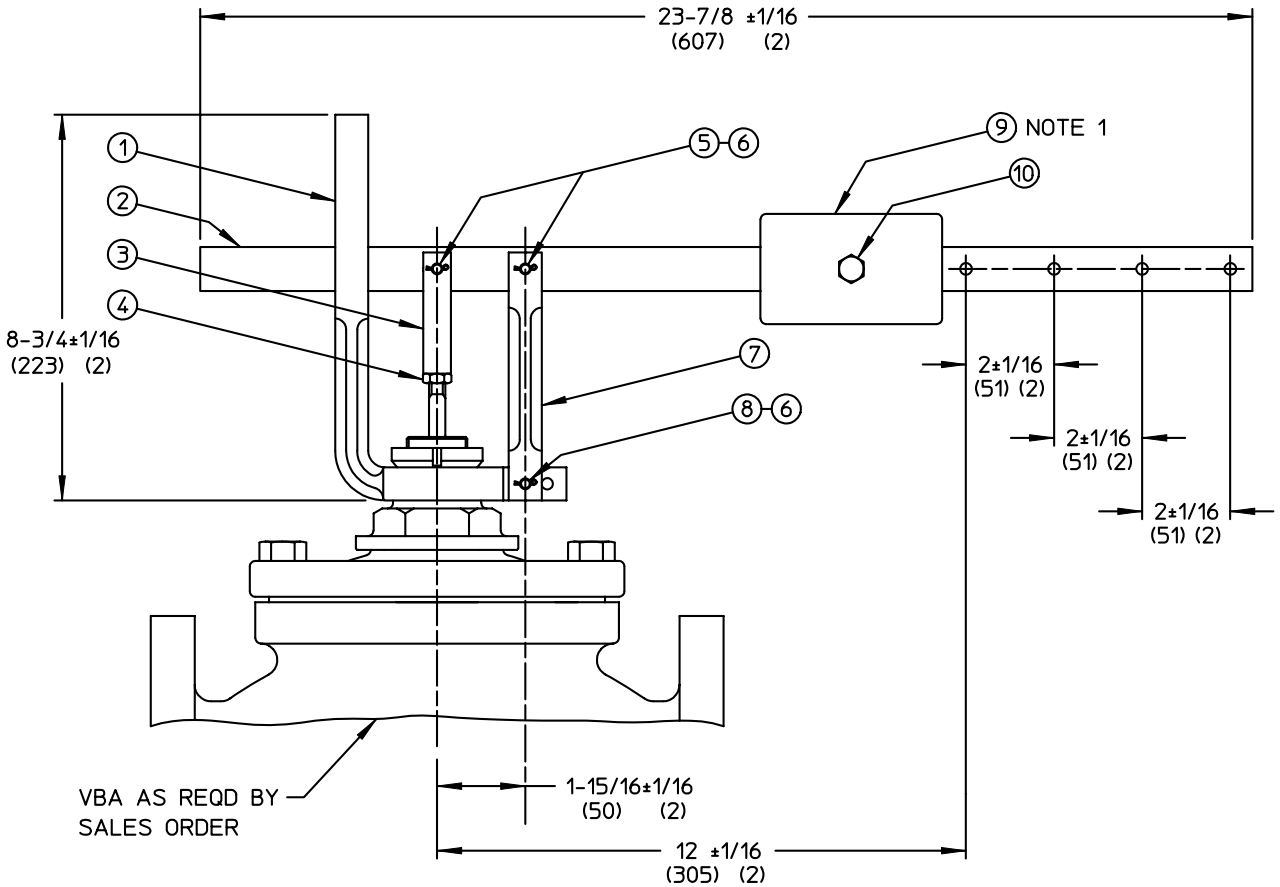
Lever Actuator

NOTES:

1) LOCATION OF WEIGHT ⑨ ON LEVER ARM ② TO BE DETERMINED BY CUSTOMER

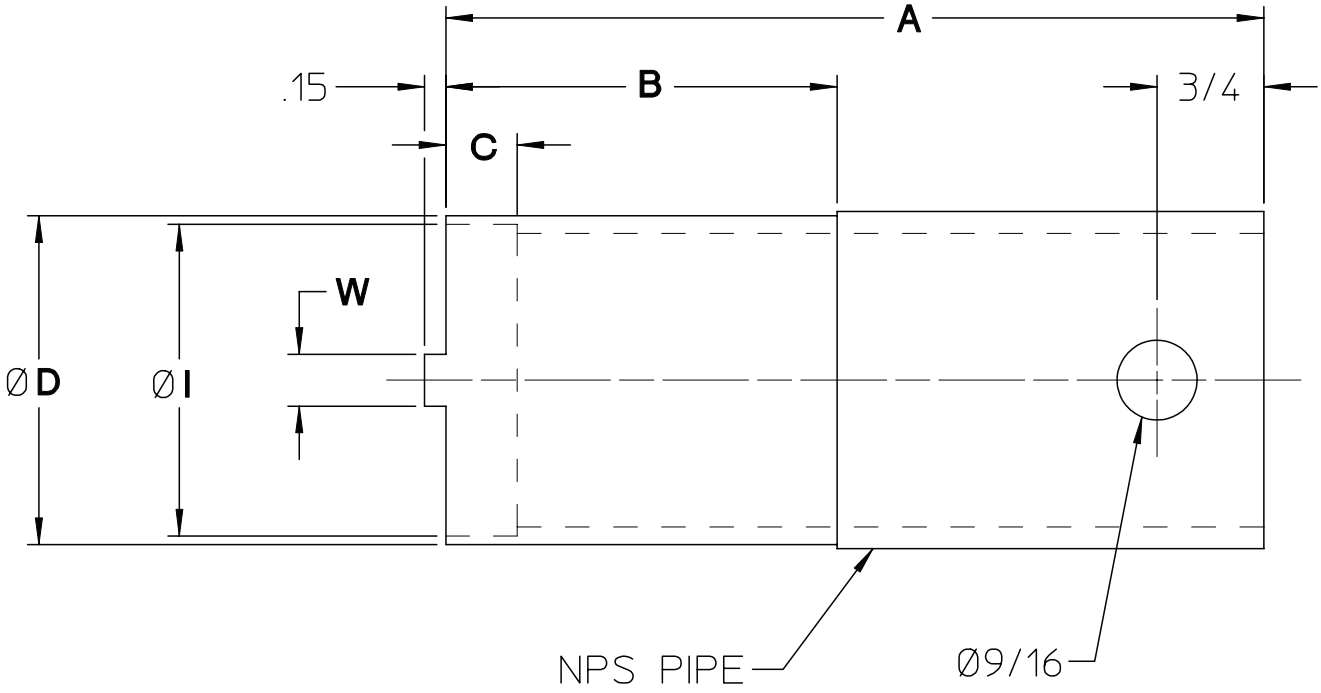
2) DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS

ITEM	PART NOMENCLATURE
1	LEVER BRACKET
2	LEVER ARM
3	CLEVIS
4	HEX JAMNUT
5	CLEVIS PIN
6	COTTER PIN
7	PIVOT ARM
8	CLEVIS PIN
9	WEIGHT
10	HEX CAPSCREW



SEAT WRENCH

SEAT WRENCH FOR SLOTTED SEAT RINGS
0.5 TO 2.0 INCH TYPES 20, 70, 30 AND 26



SIZE	NPS	SCH	A	B	C	D	I	W
0.50-1.00	1 1/2	80	5 1/4	2 1/4	1/2	1.900	1.595	0.295
1.25-1.50	2	40	5 3/4	2 3/4	1/2	2.375	2.285	0.365
2.00	2 1/2	40	6	3	1/2	2.875	2.725	0.365

WARREN CONTROLS INC.

A VETERAN OWNED, PRIVATELY HELD, SMALL BUSINESS

377_326L_322L_IOM_RevD_1023

WARREN CONTROLS

2600 EMRICK BLVD • BETHLEHEM, PA 18020 • USA •800-922-0085 • WWW.WARRENCONTROLS.COM

DEPENDABLE, RUGGED, PRECISION CONTROL VALVES AND ACCESSORIES