TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

HYDRANT UNDER MONITOR (HUM)

INSTRUCTION FOR INSTALLATION, OPERATION, AND MAINTENANCE

⚠ DANGER

Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at tft.com/serial-number.

This equipment is intended for use by trained and qualified emergency services personnel for firefighting. All personnel using this equipment shall have completed a course of education approved by the Authority Having Jurisdiction (AHJ).

This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing, and safety procedures associated with this product. This manual should be kept available to all operating and maintenance personnel.

SAFE OPERATING RANGE FOR MONITOR OUTLET:

Up to 2500 gpm below 130 psi (9500 L/min @ 9 bar)*

Up to 2000 gpm below 200 psi (8000 L/min @ 14 bar)*

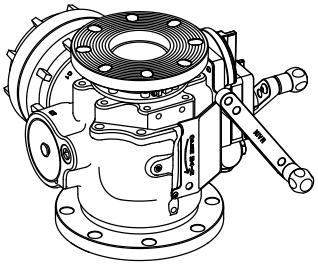
Up to 1600 gpm @ 300 psi maximum (6000 L/min @ 21 bar)*

* valid for monitor outlets up to 20” (508 mm) tall from the HUM outlet.

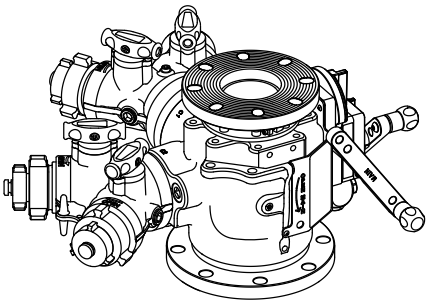
HYDROSTATIC PROOF TEST: 1200 psi (83 bar)**

**Do not exceed the rated operating pressure of 300 psi (21 bar). The hydrostatic proof test is performed on a sample valve to ensure it does not visibly rupture, crack or permanently distort at 4 times the rated operating pressure. The purpose of the proof test is to be confident the valve design may be safely operated at the rated operating pressure.

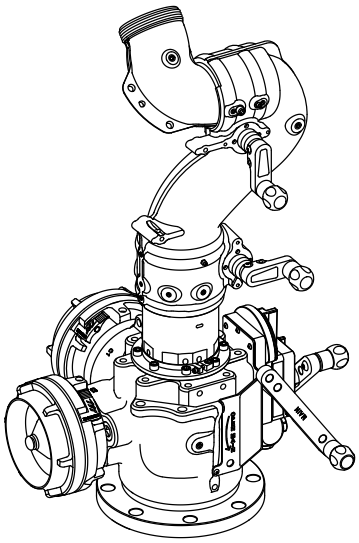
SAMPLE CONFIGURATIONS



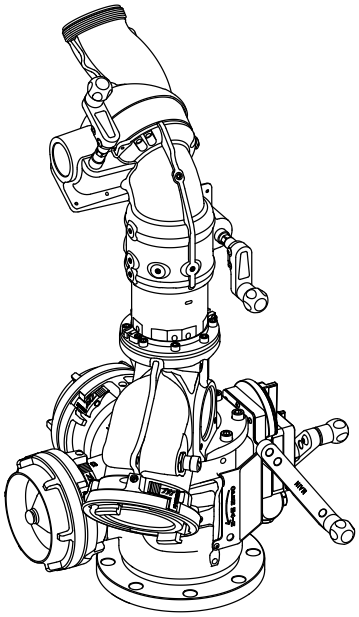
Model ZBAD31X00
with 4" ANSI 150 on side B,
6" Storz on port C1
and blind plug on port C2



Model ZBAD38J8J
with 4" ANSI 150 on side B
and 2.5" gated wyes on
both ports C1 and C2



Model ZBAD11T1T
with integrated TFT Typhoon on side B
and 5" Storz on both ports C1 and C2



Model ZBAD01T1T
with integrated Booster,
TFT Monsoon on side B and
5" Storz on both ports C1 and C2

TASK FORCE TIPS LLC
MADE IN USA · tft.com

3701 Innovation Way, Valparaiso, IN 46383-9327 USA
800-348-2686 · 219-462-6161 · Fax 219-464-7155

LIZ-055 July 14, 2025 Rev05

DANGER

PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

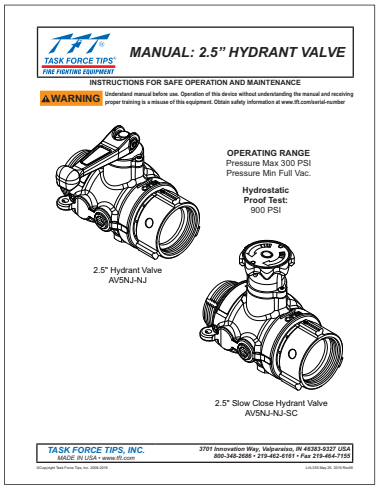
1. **Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.**
2. **IT IS YOUR RESPONSIBILITY to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called on to use.**
3. **IT IS YOUR RESPONSIBILITY to know that you have been properly trained in Firefighting and/or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.**
4. **IT IS YOUR RESPONSIBILITY to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.**
5. **IT IS YOUR RESPONSIBILITY to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.**
6. **Failure to follow these guidelines may result in death, burns or other severe injury.**

Fire and Emergency Manufacturers and Service Association, Inc.
PO Box 147, Lynnfield, MA 01940 • www.FEMSA.org

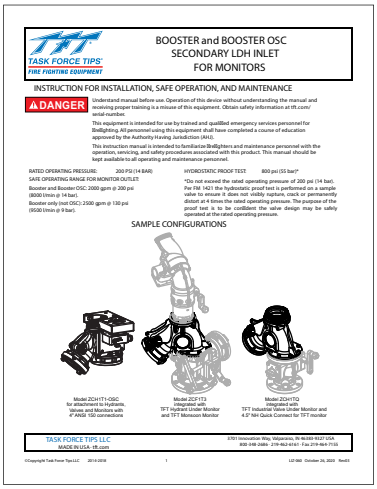
FEMSA

SUPPORTING MATERIALS

The following document contains supporting safety and operating information pertaining to the equipment described in this manual.



LIA-355 2.5" Hydrant Valve Manual



LIZ-060 Booster and Booster OSC Manual

TABLE OF CONTENTS

1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI Z535.6, the definitions of the four signal words are as follows:

DANGER **DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

WARNING **WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

CAUTION **CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.**

NOTICE **NOTICE is used to address practices not related to physical injury.**

2.0 SAFETY

DANGER **An inadequate supply of pressure and/or flow will cause an ineffective stream and can result in injury or death. Choose operating conditions to deliver adequate fire suppression.**

WARNING **This equipment is intended for use by trained personnel for firefighting. Use of this equipment for other purposes may involve hazards not addressed by this manual. Seek appropriate guidance and training to reduce risk of injury.**

WARNING **Equipment may be damaged if frozen while containing significant amounts of water. Such damage may be difficult to detect visually. Subsequent pressurization can lead to injury or death. Any time the equipment is subject to possible damage due to freezing, it must be tested and approved for use by qualified personnel before being considered safe for use.**

WARNING **Sudden changes in valve position can cause pressure spikes (water hammer) and could lead to hose or pipe failure or an out of control monitor. Open and close the valve slowly to avoid water hammer.**

WARNING **Interrupting flow to the device could cause injury or death. Avoid situations that may interrupt flow to the device such as: hose line kinks, traffic running over hose, and automatic doors or devices that can pinch the hose.**

NOTICE **To prevent mechanical damage, do not drop or throw equipment.**

3.0 GENERAL INFORMATION

The Hydrant Under Monitor (HUM) is a robust, low friction loss valve designed to supply a monitor and up to two large diameter hose (LDH) ports. Two concentric slow-close half ball valves allow the monitor to be operated either independently or simultaneously with the LDH ports. The main shutoff valve has a 5.25” waterway, located immediately above the 6” ANSI 150 inlet flange. When the monitor valve above is also open, flow to the monitor from the standpipe is completely unobstructed for the lowest possible friction loss. Each valve control is clearly marked with separate color-coded position indicator flags that are retro-reflective for visibility in all light conditions. The cast A356-T6 aluminum valve body and all structural 6061-T6 aluminum components are hard anodized, and the inlet flange and valve body are powder coated inside and out for additional resistance to galvanic corrosion. Several options are available for monitor connection. For further versatility, the ZC-series Booster or ZD-series Oscillator (both sold separately) can be installed between the HUM and monitor to allow pressure boosting capability or water-driven oscillation of the monitor.

The two LDH ports C1 and C2 can be configured with a Storz coupling, a male threaded nipple, or a gated wye. Connection sizes from 1.5” up to 6.0” are available. All LDH connections are supplied with a pressure cap, and port C2 can also be configured with a blind plug if only one hose connection is needed.

All models are equipped with an external automatic drain valve, as well as an automatic drain valve that is integrated within the monitor valve half ball. These two drain valves fully evacuate the monitor and valve body after each use when pressure in the HUM drops below 5 psi, minimizing susceptibility to damage from corrosion and freezing water. An optional third automatic drain valve that is integrated within the main shutoff half ball allows the standpipe to draw atmospheric air to facilitate draining, even while the half ball is closed.

3.1 SPECIFICATIONS

3.1.1 MECHANICAL

	STANDARD	METRIC
Main Valve Seat Diameter	5.25”	133 mm
Monitor Valve Seat Diameter	3.65”	93 mm
C1 LDH Port Diameter	5.25”	133 mm
C2 LDH Port Diameter	3.50”	89 mm
Maximum Operating Pressure for all ports, closed or flowing	300 psi	21 bar
Hydrostatic Proof Test Pressure (See note on front cover)	1200 psi	83 bar
Operating Temperature Range of Fluid	33° to 120°F	0° to 50°C
Storage Temperature Range*	-25° to 135°F	-32° to 57°C
Materials Used	Aluminum 6000 series hard anodized MIL8625 class 3 type 2, stainless steel 300 series	

* For temperatures below 32° (0°C), valves must be drained after use to avoid damage.

Table 3.1.1

3.2 VARIOUS MODELS AND TERMS/INTENDED ORIENTATION

The HUM is intended to be installed in the orientation shown, with the inlet flange facing towards the earth below. This orientation allows the monitor and HUM to fully drain after use.

EXTERNAL VIEWS FOR PARTS IDENTIFICATION

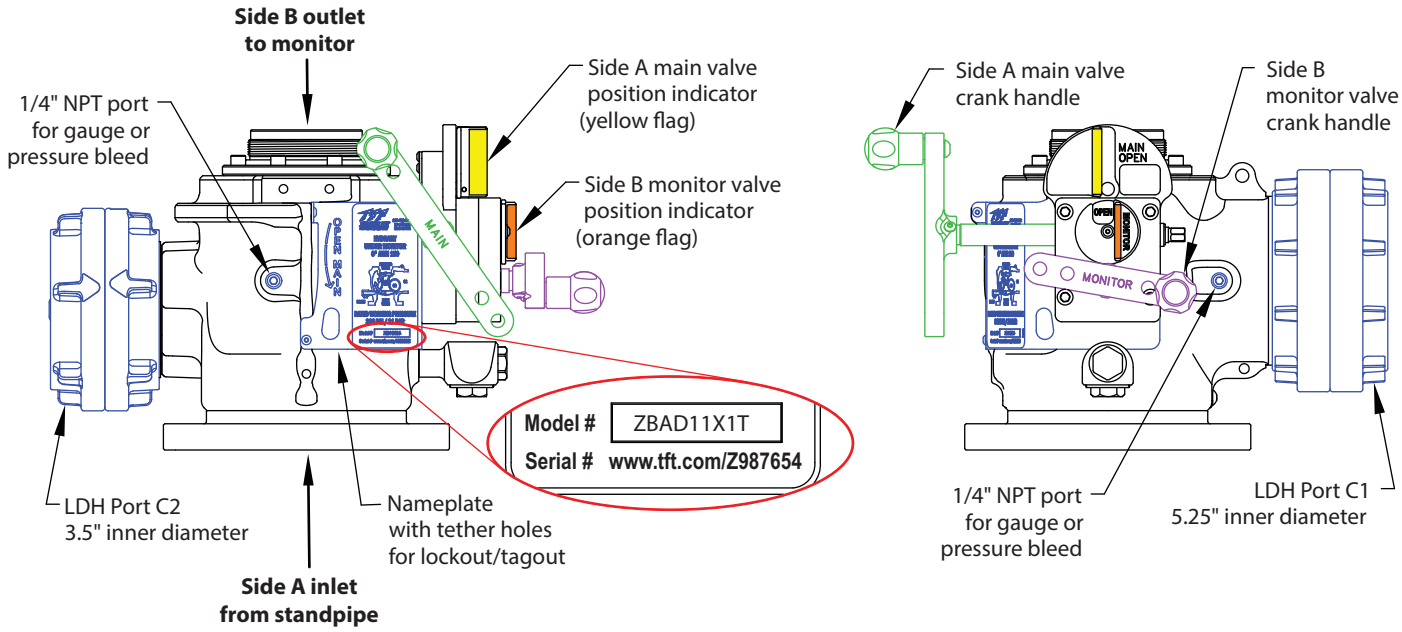
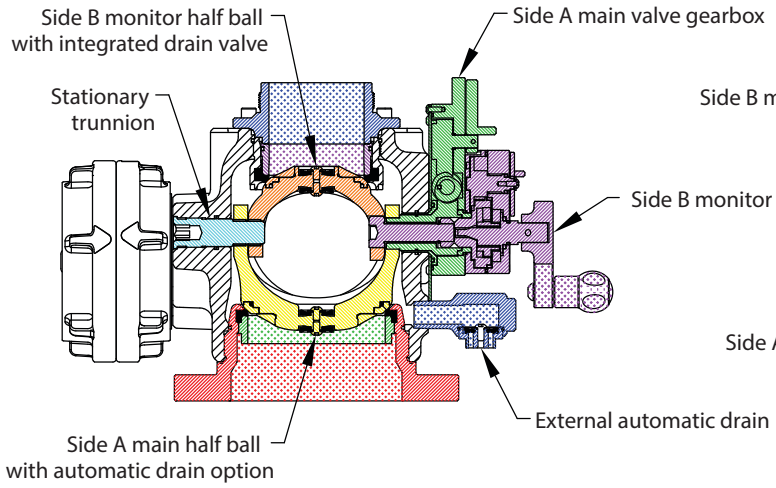


Figure 3.2A

CROSS-SECTION VIEW THROUGH HALF BALL TRUNNIONS WITH BOTH VALVES CLOSED



CROSS-SECTION VIEW THROUGH LDH PORT C1 WITH BOTH VALVES OPEN

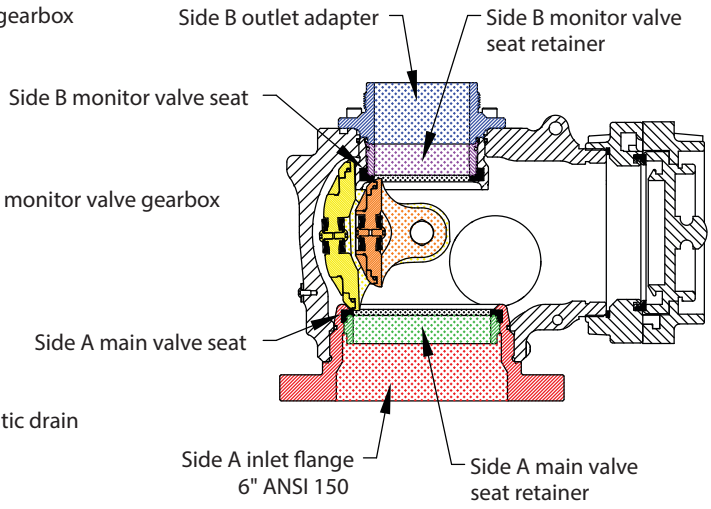


Figure 3.2B

3.3 CORROSION

All valve bodies are hard anodized aluminum which is powder coated inside and out to help prevent corrosion. Galvanic corrosion due to dissimilar metals can be minimized by using flange isolation kits and an anti-corrosive lubricant such as Dow Corning 112 Silicone Grease. Where practical, the standpipe should be drained while not in use to eliminate a path of conduction. Do not install brass fittings, discharge fittings, or monitors onto this valve. The effects of corrosion can also be minimized by good maintenance practice.

3.4 USE WITH SALT WATER

Use with salt water is permissible provided the equipment is thoroughly cleaned with fresh water after each use. The service life of the equipment may be shortened due to the effects of corrosion, and is not covered under warranty.

3.5 OVERALL DIMENSIONS

Several options are available for valve control, monitor mounting, and the two LDH ports. Each option is described in this manual. The dimensions and approximate weights of the individual options can be added together to calculate the overall size and weight of the HUM with the desired options installed. All weights include supplied caps and adapters.

3.5.1 MODEL NUMBERS AND SERIAL NUMBERS

Model numbers can be specified by combining 9 characters in the sequence shown below. The unique characters for each component option are presented in section 3.5.3 through section 3.5.7, along with the corresponding weights and dimensions.

The model number and unique serial number of each HUM are located at the bottom of the nameplate, as shown in Figure 3.2A. The serial number also serves as an internet address to provide additional information about the product.

MODEL NUMBER SEQUENCE

Character Position	1	2	3	4	5	6	7	8	9
Component	**ZB** (same prefix for all models)		**A RESERVED** (same for all models)	**DRAIN OPTION**	**SIDE B** (monitor)	**LDH PORT C1** (5.25” I.D.)		**LDH PORT C2** (3.5” I.D.)	
						SIZE	**STYLE**	**SIZE**	**STYLE**

Example Model #	**ZBAD31X8J**	**Character Sequence**	**Weight (lb)**
Main Valve Body:	Same for all models	prefix ZBA (same for all models)	57.5
Drain Option:	Main Half Ball w/Automatic Drain	Character “D” in position 4	+ 0.0
Side B (monitor):	4” ANSI 150/DN 100 PN16 Flange	Character “3” in position 5	+ 6.5
Port C1 Style:	Storz	Character “1” in position 6	--
Port C1 Size:	6.0” (150 mm)	Character “X” in position 7	+ 10.9
Port C2 Style:	2.5” Gated Wye	Character “8” in position 8	--
Port C2 Size:	2.5”	Character “J” in position 9	+ 11.4
Net Weight:	**85.4 lb (38.7 kg)**		**= 85.4**

Table 3.5.1

3.5.2 MAIN VALVE BODY

The main valve body is shared by all HUM models. It weighs 57.5 lb (26.1 kg), including the inlet flange, both half balls, the external drain valve, and all fasteners that are shared by every HUM model. The optional drain in the main valve half ball does not affect the weight of the valve.

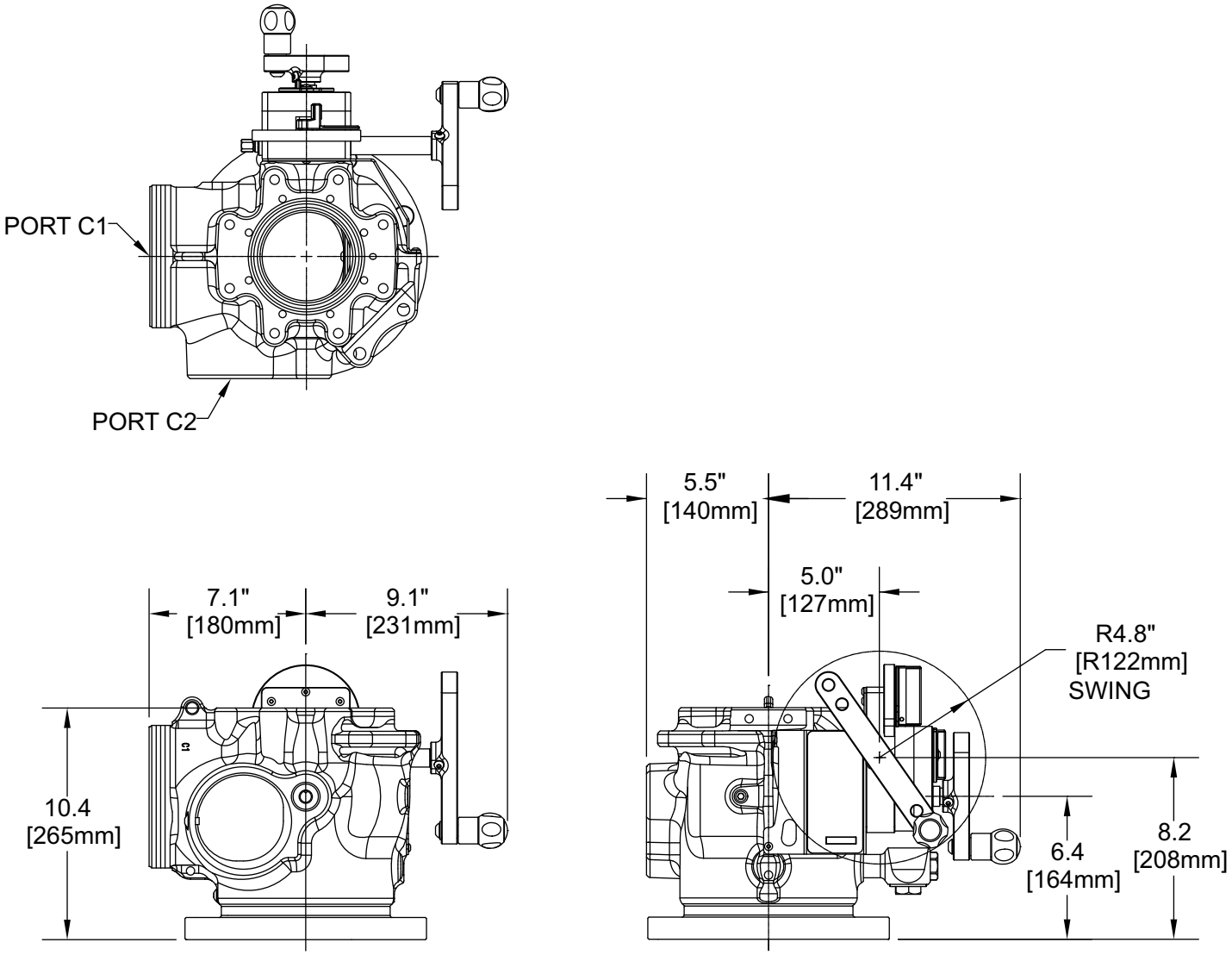


Figure 3.5.2

3.5.3 INTERNAL DRAIN OPTION (character position 4)

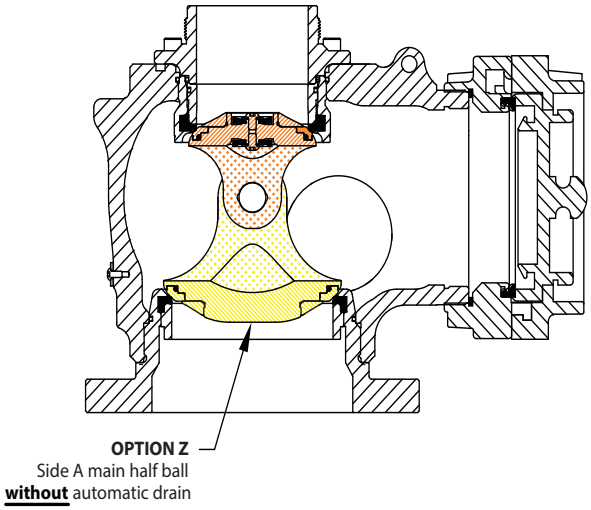
All HUM models are equipped with an external automatic drain valve attached to a port directly above the valve seat, as well as a drain valve integrated within the monitor-control half ball (Side B). These drain valves allow the monitor and valve body to drain fully after the half ball is closed, minimizing susceptibility to damage from corrosion and freezing water. See Section 5.3 on page 21 for further details.

The side A main half ball valve used for monitor shutoff can be specified either with (option D) or without (option Z) an integrated automatic drain valve. This drain allows the standpipe to draw atmospheric air to facilitate draining, even while the main half ball is closed. It is beneficial in applications where the standpipe will typically be drained following use, especially where freezing conditions are a concern.

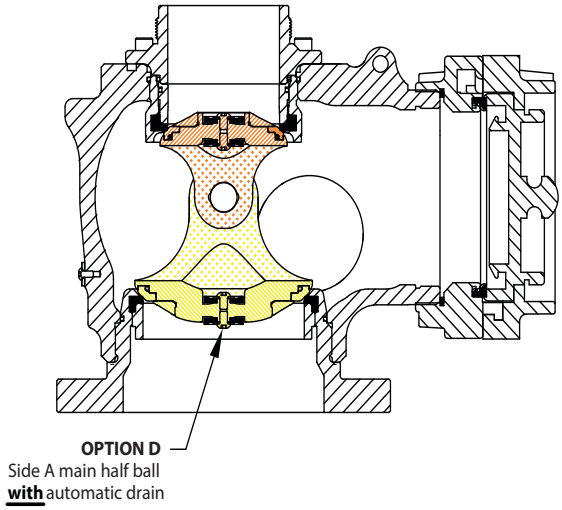
This drain valve is able to seal the full rated pressure from either side of the half ball, and does not affect the weight of the assembly.

INTERNAL DRAIN OPTION (character position 4)	CHARACTER	PART NUMBER	WEIGHT
MAIN HALF BALL with AUTOMATIC DRAIN	D	A1089P.3	included in main valve body weight
MAIN HALF BALL without AUTOMATIC DRAIN	Z	A1088P.1	

Table 3.5.3



WET Standpipe Systems



DRY Standpipe Systems

Table 3.5.3

3.5.4 OPTIONS FOR SIDE B OUTLET TO MONITOR (character position 5)

The side B outlet is intended to be connected directly to the inlet of a deluge monitor. The industry standard 4” ANSI 150 and DN 100 PN16 bolt patterns are available combined into a single flange (options 3 and 4). The other options allow unique capabilities when combined with Task Force Tips monitors, such as direct connection for reduced height and cost (options 1 and 2), a secure quick connection (options Q and T), pressure boosting capability (sold separately for use with option 0), or water-driven oscillation of the monitor (also sold separately for use with option 0). The dimensions below indicate the distance each option protrudes from the main valve body. Portions of the graphics that overlap with the main valve body are excluded from these dimensions.

INTERNAL DRAIN OPTION (character position 5)	CHARACTER	PART NUMBER	WEIGHT (lb)	WEIGHT (kg)
NO SIDE B ADAPTER INSTALLED (not shown) for use with ZC-series Booster or ZD-series Oscillator	0	N/A	N/A	N/A
CODE-RPM DIRECT CONNECTION - STRAIGHT	1	A1026	1.8	0.82
CODE-RPM DIRECT CONNECTION - ANGLED 22.5°	2	A1040	2.8	1.27
4" ANSI 150/DN 100 PN16 FLANGE - STRAIGHT	3	A1039.1	6.5	2.95
4" ANSI 150/DN 100 PN16 FLANGE - ANGLED 22.5°	4	A1039.2	7.5	3.4
QUICK CONNECT - 4.5"NHM for Monsoon, Typhoon, Hurricane, and 90° Elbow	Q	Y4484	2.3	1.04
QUICK CONNECT - 2.5”NHM for Tornado	T	Y2432A.1	2.1	0.95

Table 3.5.4

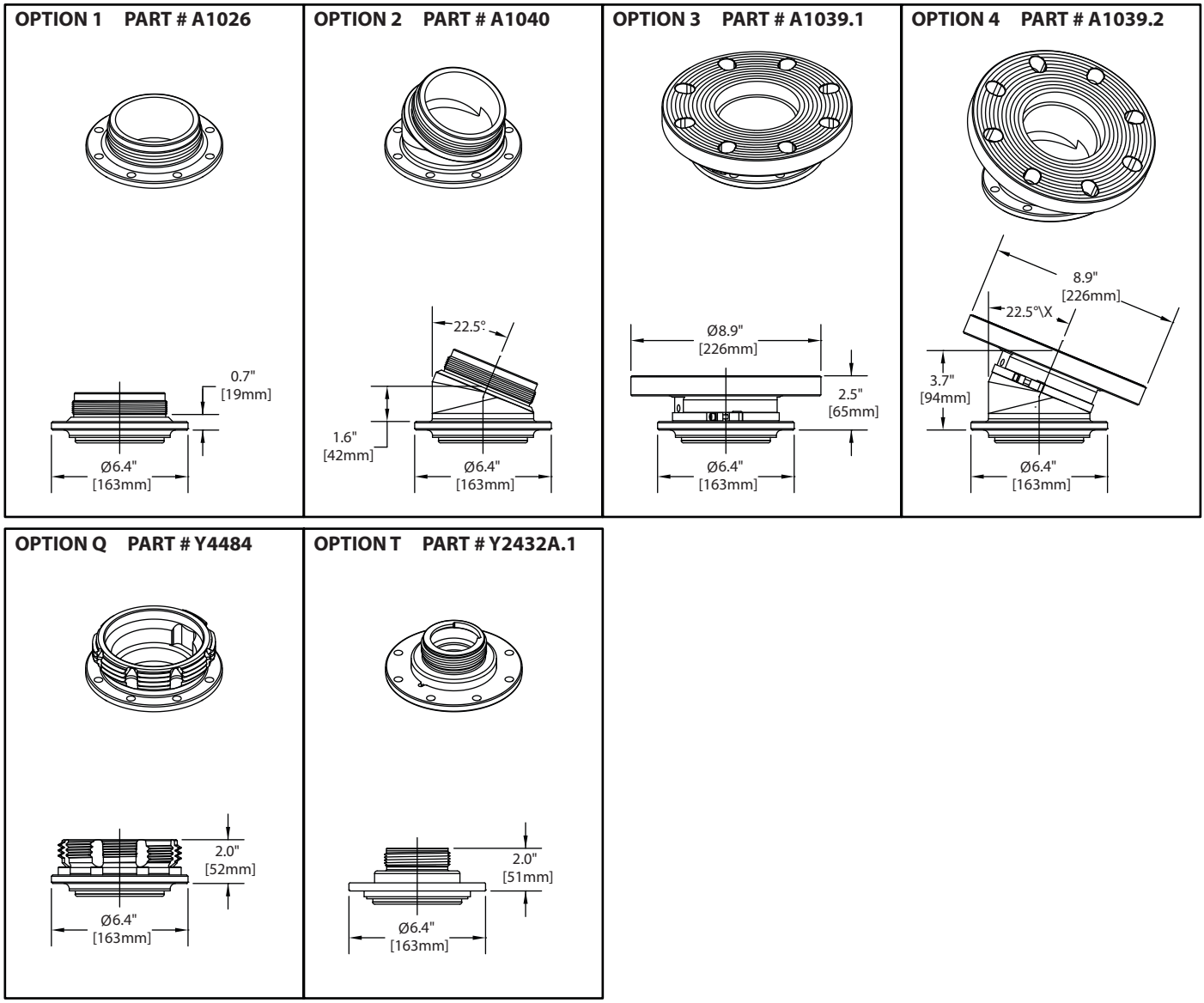


Figure 3.5.4

3.5.5 LDH PORT OPTIONS

The two LDH ports C1 and C2 can each be configured with a Storz coupling, a male threaded spout, or a gated wye. Hose connection size options range from 1.5” to 6” for the larger Port C1 and from 1.5” to 5” for the smaller Port C2. Each LDH connection is supplied with a pressure cap. If only one hose connection is needed, port C2 can be configured with a blind plug. When specifying port options, the 1st character is the connection type and the 2nd character is the connection size.

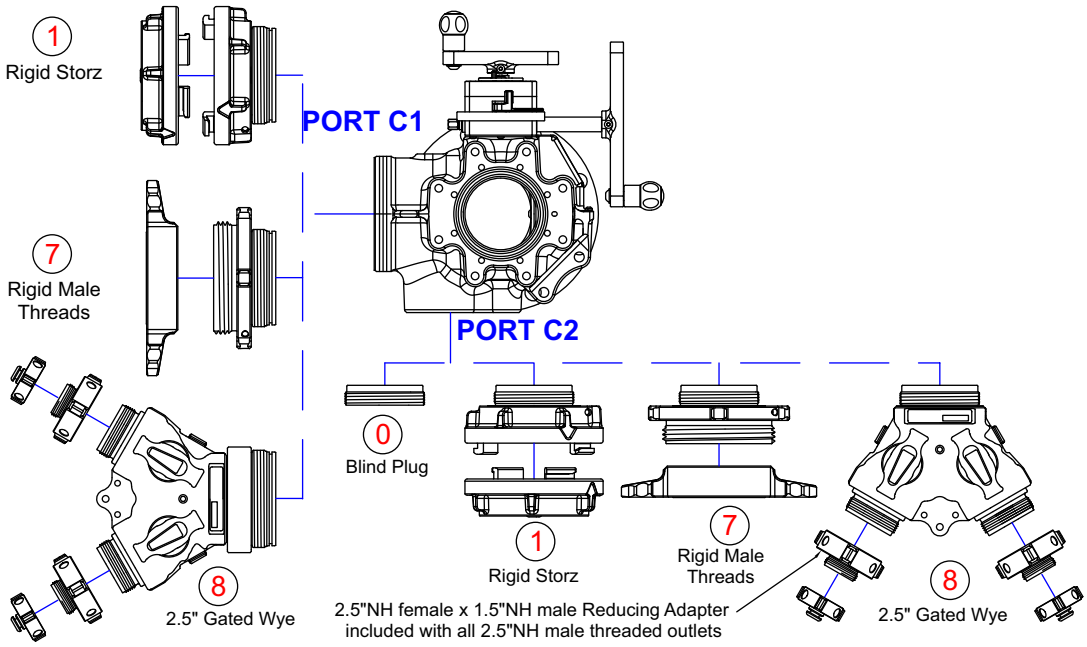


Figure 3.5.5

PORT C1 OPTIONS (character positions 6 and 7)	CHARACTERS	SUBASSEMBLY	WEIGHT (lb)	WEIGHT (kg)
4.0" Storz for port C1 only (includes pressure cap)	1P	ZBC1-1P	6.5	2.94
5.0" Storz for port C1 only (includes pressure cap)	1T	ZBC1-1T	7.3	3.30
6.0" Storz for port C1 only (includes pressure cap)	1X	ZBC1-1X	10.0	4.53
2.5" NH male thread for port C1 only (includes 2.5” NH female x 1.5” NH male reducer and 1.5” cap)	7J	ZBC1-7J	4.3	1.95
3.0" NH male thread for port C1 only (includes cap)	7L	ZBC1-7L	6.9	3.14
3.5" NH male thread for port C1 only (includes cap)	7N	ZBC1-7N	6.5	2.95
4.0" NH male thread for port C1 only (includes cap)	7P	ZBC1-7P	5.5	2.51
4.5" NH male thread for port C1 only (includes cap)	7R	ZBC1-7R	6.6	2.98
5.0" NH male thread for port C1 only (includes cap)	7T	ZBC1-7T	6.6	3.00
6.0" NH male thread for port C1 only (includes cap)	7X	ZBC1-7X	7.9	3.57
2.5” NH male gated wye for port C1 only (includes 2.5” NH female x 1.5” NH male reducer and 1.5” cap)	8J	ZBC1-8J	13.2	5.99
PORT C2 OPTIONS (character positions 8 and 9)	**CHARACTERS**	**SUBASSEMBLY**	**WEIGHT (lb)**	**WEIGHT (kg)**
Blind Plug for port C2 only	00	ZBC2-00	1.0	0.44
4.0" Storz for port C2 only (includes pressure cap)	1P	ZBC2-1P	4.6	2.11
5.0" Storz for port C2 only (includes pressure cap)	1T	ZBC2-1T	7.3	3.30
2.5" NH male thread for port C2 only (includes 2.5” NH female x 1.5” NH male reducer and 1.5” cap)	7J	ZBC2-7J	2.5	1.12
3.0" NH male thread for port C2 only (includes cap)	7L	ZBC2-7L	5.1	2.31
3.5" NH male thread for port C2 only (includes cap)	7N	ZBC2-7N	4.7	2.12
4.0" NH male thread for port C2 only (includes cap)	7P	ZBC2-7P	5.5	2.50
4.5" NH male thread for port C2 only (includes cap)	7R	ZBC2-7R	6.6	2.97
5.0" NH male thread for port C2 only (includes cap)	7T	ZBC2-7T	6.6	2.99
2.5” NH male gated wye for port C2 only (includes 2.5” NH female x 1.5” NH male reducer and 1.5” cap)	8J	ZBC2-8J	11.4	5.18

Table 3.5.5

3.5.6 LDH PORT C1 DIMENSIONS (character positions 6 and 7)

The dimensions below indicate the distance each option protrudes from the main valve body. Portions of the graphics that overlap with the main valve body are excluded from these dimensions. For options that include removable caps and reducing adapters, dimensions are shown for the overall assembled condition as well as each component individually.

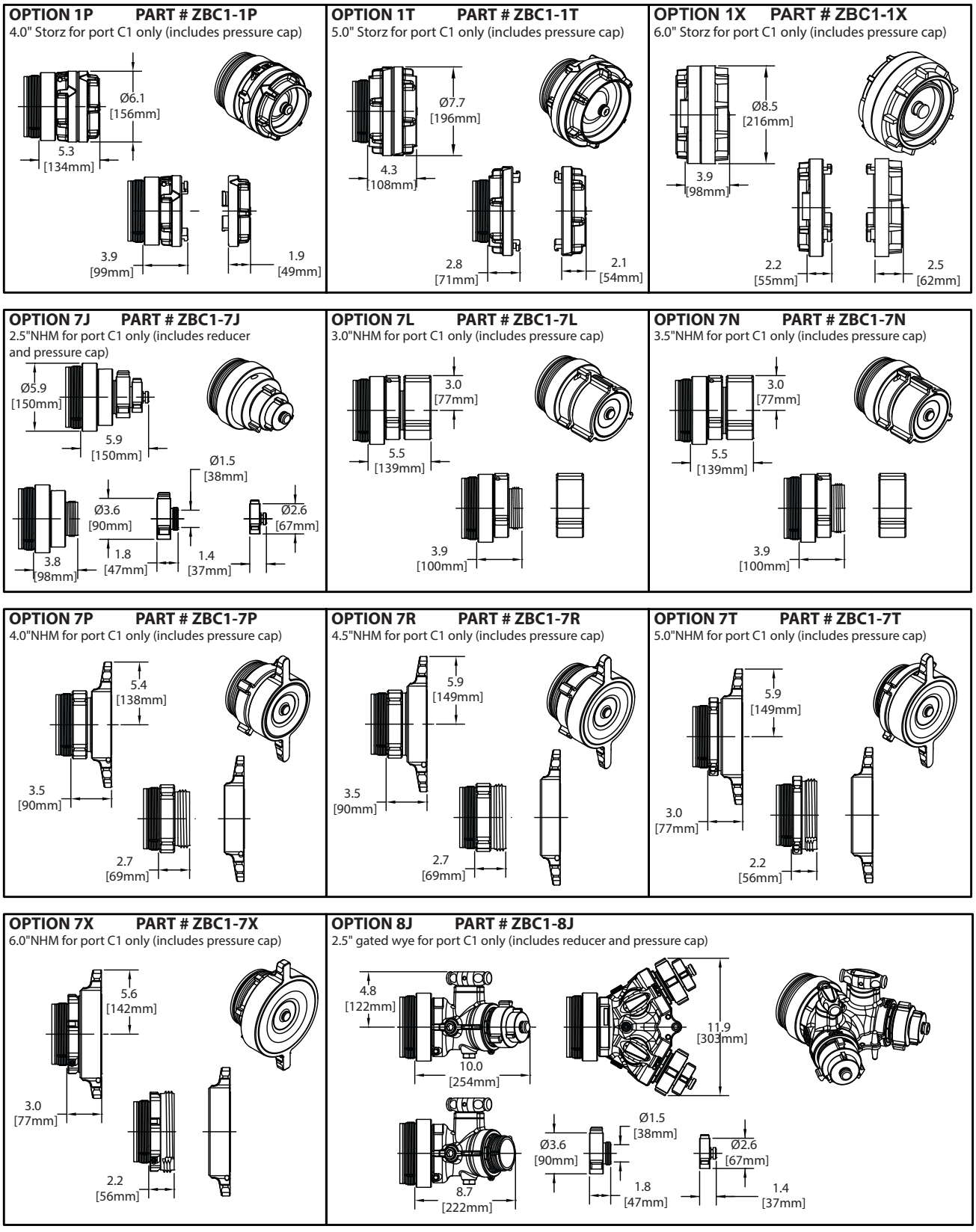


Figure 3.5.6

3.5.7 LDH PORT C2 DIMENSIONS (character positions 8 and 9)

The dimensions below indicate the distance each option protrudes from the main valve body. Portions of the graphics that overlap with the main valve body are excluded from these dimensions. For options that include removable caps and reducing adapters, dimensions are shown for the overall assembled condition as well as each component individually.

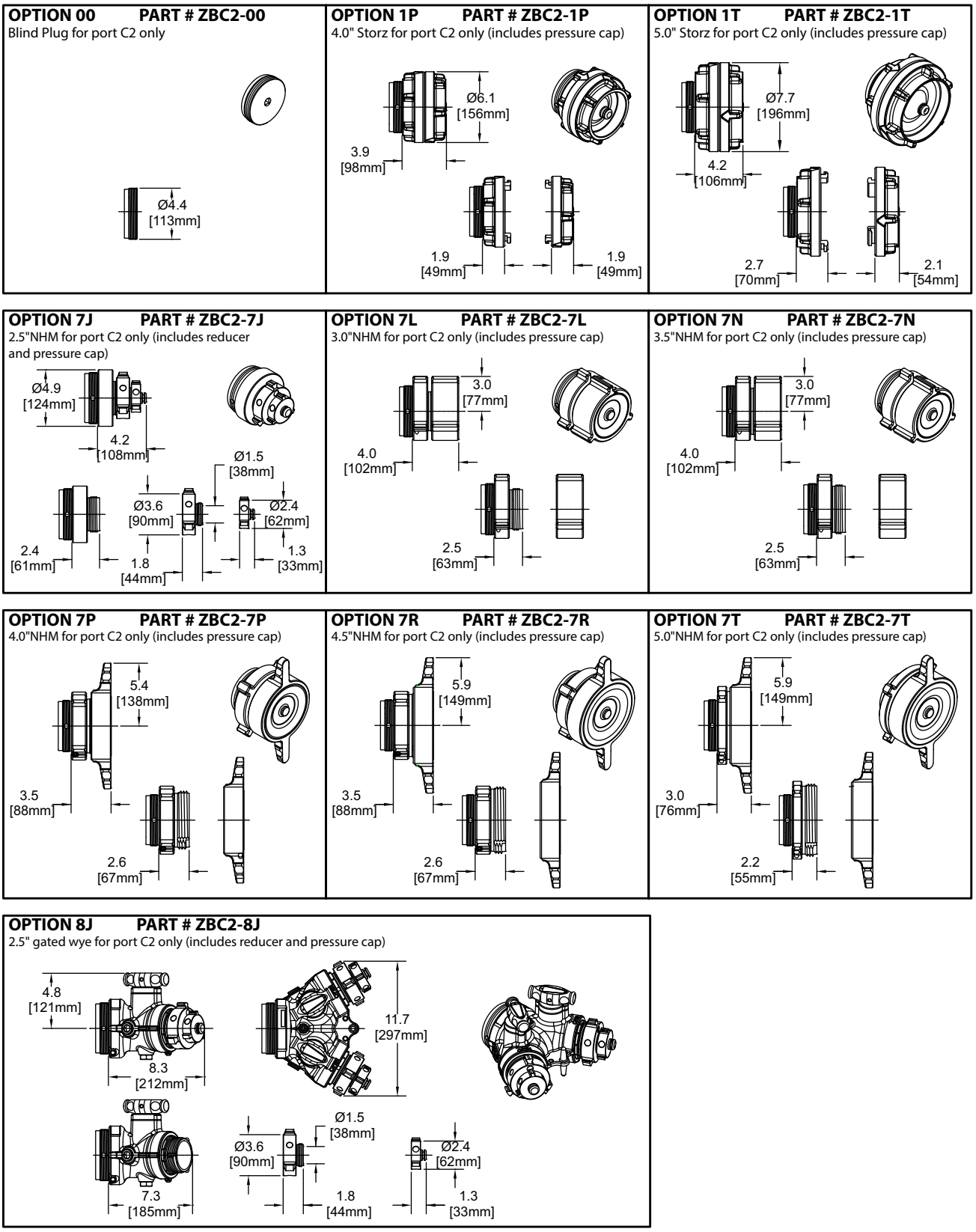


Figure 3.5.7

4.0 INSTALLATION

⚠CAUTION

Mismatched or damaged waterway connections may cause equipment to leak or uncouple under pressure. Failure could result in injury. Equipment must be mated to matched connections.

⚠CAUTION

Dissimilar metals coupled together can cause galvanic corrosion that can result in the inability to uncouple the connection, or complete loss of engagement over time. Failure could cause injury. Per NFPA 1962, if dissimilar metals are left coupled together, an anti-corrosive lubricant should be applied to the connection and the coupling should be disconnected and inspected at least quarterly.

4.1 STRUCTURAL REQUIREMENTS

⚠WARNING

Reaction forces generated are capable of causing injury and property damage if not properly supported. Nozzle reaction can be as high as 1500 lbs (680 kg) (equivalent to 2000 gpm at 200 psi or 1600 gpm at 300 psi). To reduce the risk of injury due to an inadequately supported device:

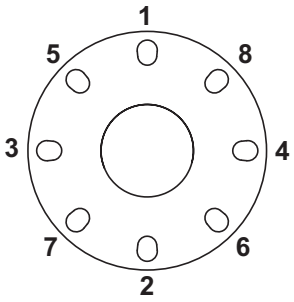
- **Equipment should be securely installed by qualified individuals.**
- **Mounting objects must be capable of withstanding the internal pressure of the monitor as well as shear and bending forces due to nozzle reaction.**
- **The monitor must be securely mounted to rigid support members.**
- **Do not use flanges or pipe made from plastic for monitor mounting.**
- **Torque all fasteners to specified values.**
- **Verify that mobile equipment is constructed and setup for stable and safe operation under the influence of tipping and sliding hazards.**

4.2 FLANGE INSTALLATION

For flanged connections, the use of flat flanges without raised faces is recommended. Use a ring gasket as defined in ASME 16.21 or ISO 7483. Hand tighten all nuts until snug against the flanges, then tighten in the alternating sequence shown in Figure 4.2. Tighten sequentially each bolt or stud three times with 30%, then 60%, and finally 100% of the specified torque.

For the Side A inlet with a 6” ANSI 150 flange and 3/4-10 bolts or studs, tighten to 134-141 ft-lb (182-191 N·m).

For 4” ANSI 150 flanges with 5/8-11 bolts or studs, tighten to 76-80 ft-lb (100-110 N·m).



Tighten Sequentially Each Bolt Three Times to the specified torque.
Figure 4.2

4.3 MONITOR INSTALLATION AND COMPATIBILITY

A series of TFT Industrial Monitors has been created specifically for use with the HUM, Booster and Industrial Valve Under Monitor. These monitors are specified by adding the –Z suffix to the desired model of TFT Monsoon, Typhoon or Hurricane (e.g. Y5-DP1A-Z). Models with –Z suffix are the only monitors verifi ed to be compatible with the HUM. All TFT Industrial Monitors feature American Red powder coating and monitor base heights chosen to work well with the HUM and IVUM. In addition, all Industrial Monsoon and Typhoon monitors include aluminum crank handles on each worm-drive control.

⚠WARNING

Within the specified operating range, the Hydrant Under Monitor is designed to withstand nozzle reaction forces from monitors measuring up to 20” (508 mm) from the bottom edge of the monitor inlet (flange or female thread) to the center line of the monitor outlet. Injury can result from the reaction forces of monitor outlets located more than 20” (508 mm) from the inlet. The monitor height limit shown below applies whether or not a ZC-series Booster or ZD-series Oscillator is installed between the HUM and the Monitor.

⚠WARNING

Using Hydrant Under Monitor with monitor extension pipes such as the Task Force Tips Extend-A-Gun, Akron 3406 and Elkhart Extender can result in injury and equipment damage due to the reaction forces from this combination of products. This exclusion does not apply to the ZC-series Booster and ZD-series Oscillator, which were specifically designed for safe use with the HUM.

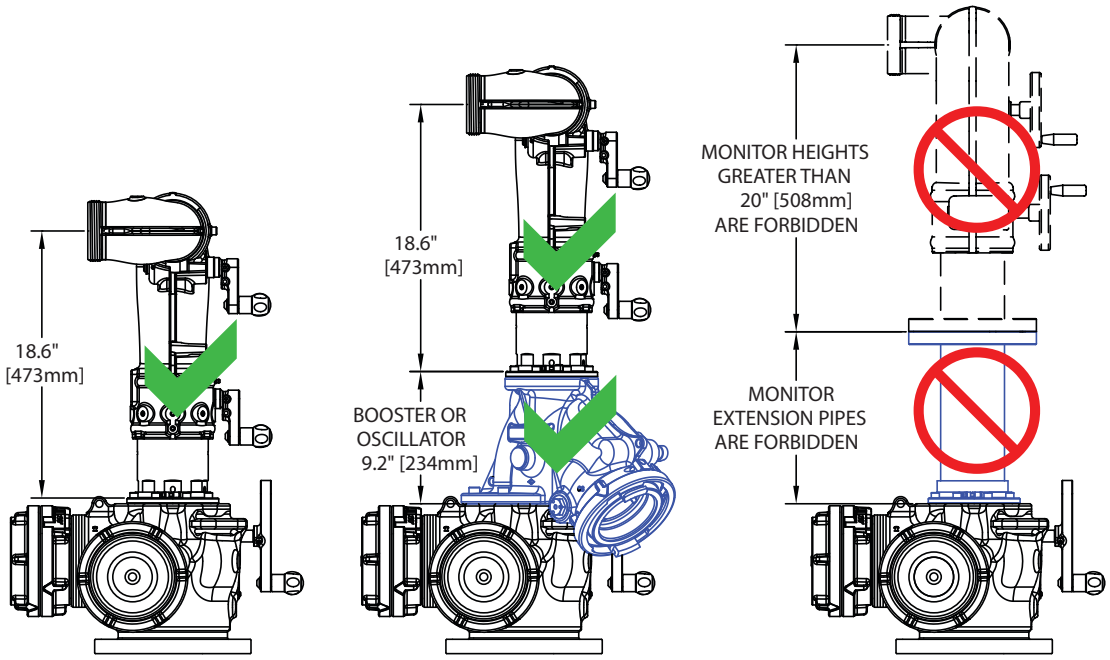


Figure 4.3

4.3.1 MONITOR INSTALLATION USING CODE RPM DIRECT CONNECTION (Side B options 1 and 2)

1. Apply blue Loctite® to the threads on both Cylinder Nuts.
2. Align the grooves in the heads of the Cylinder Nuts with the top sides of the Clamps.
3. Slide the Screws through the Washers and Clamps and loosely thread into the Cylinder Nuts.
4. Place the Clamps over the male threads of the HUM outlet. Cylinder Nuts heads MUST be on the top side of the Clamps.
5. Screw the monitor onto the HUM until the threaded joint bottoms out.

NOTICE

Make sure the Clamp is not tight enough to prevent the monitor Base from bottoming out. The monitor will leak if it does not bottom out in this step.

NOTICE

Do not use pipe dope or Loctite on the monitor base threads. These threads are sealed with the O-ring shown, which is installed in the monitor at the factory. The use of thread locking compounds will make removal difficult.

6. Unscrew monitor until the “Straight Ahead Reference Mark” is facing the desired direction.

NOTICE

Monitor may be unscrewed up to one full turn from the bottomed out position. Monitor will leak if unthreaded more than one full rotation from bottomed-out condition.

7. Ensure that Clamp assembly does not interfere with RC monitor Power/Com Cable (if applicable). Reposition Clamp if needed.
8. Tighten each Screw gradually until both are finger tight with approximately equal spacing between opposite ends of the Clamp.
9. Carefully tighten each Screw one additional turn using a 5/32 hex wrench by alternating to the opposite Screw in half turn increments.

NOTICE

Over tightening the Screws will damage Screws and Clamp.

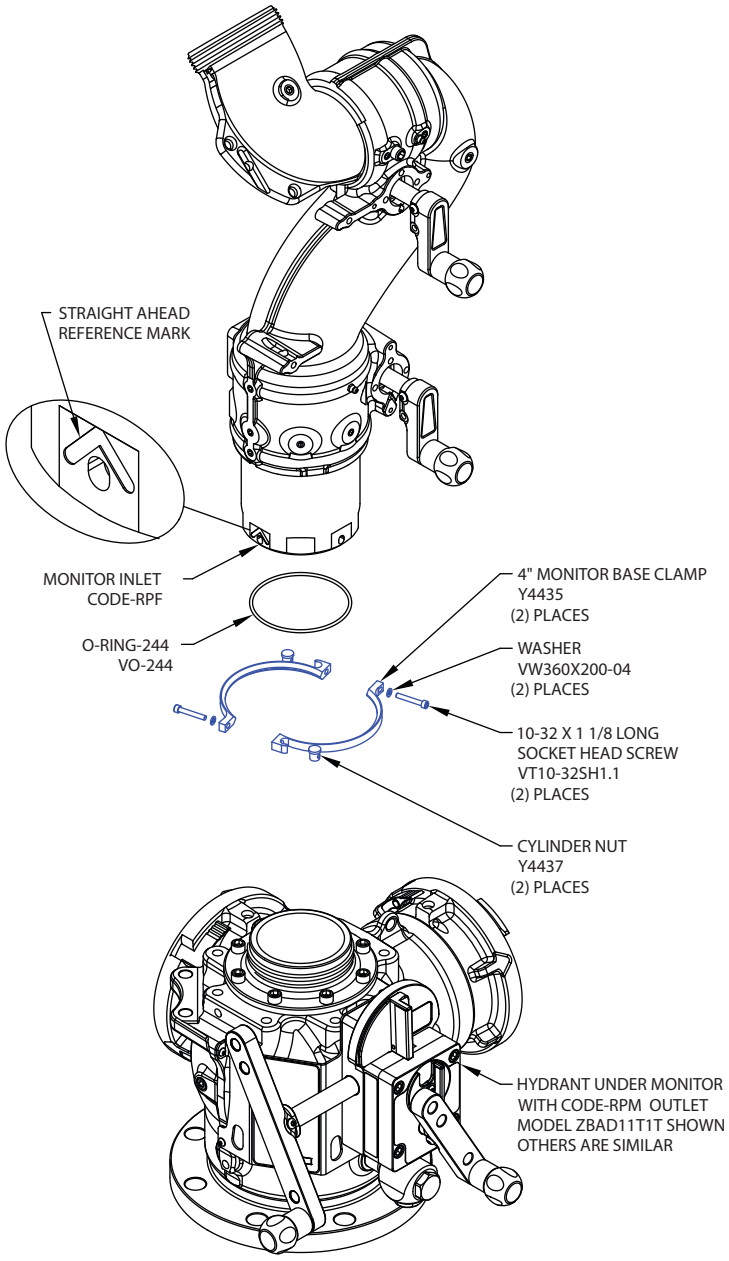


Figure 4.3.1

4.3.2 MONITOR INSTALLATION USING 4” ANSI 150 FLANGE (Side B options 3 and 4)

1. Install a ring gasket between the monitor and HUM.
2. Hand tighten all nuts until snug against the flanges, then tighten in an alternating sequence as shown.
3. For 4” ANSI 150 flanges with 5/8-11 bolts or studs, tighten to 76-80 ft-lb (100-110 N·m).
   A. Tighten sequentially each bolt or stud three times with 30%, then 60%, and finally 100% of the specified torque.

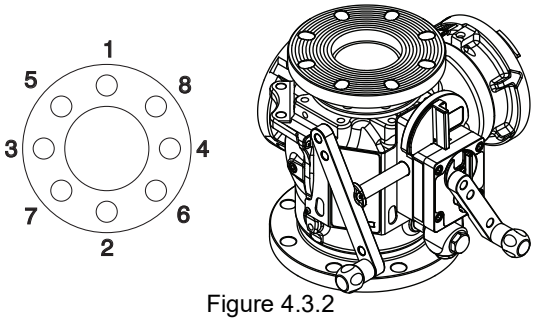


Figure 4.3.2

4.3.3 ZC-SERIES BOOSTER OR ZD-SERIES OSCILLATOR INSTALLATION (Side B option 0)

1. Install the O-ring onto the barb that protrudes from the bottom flange of the Booster or Oscillator. Apply silicone grease over the O-ring.
2. Align the Booster or Oscillator with the HUM as shown. Apply Loctite 242 (blue) thread locker to (8) ½ 13 x 1.5" screws, then insert and tighten the screws until the heads are bottomed out.
   A. Bolt numbers 3 and 5 are inserted up thru the HUM, then into the Booster or Oscillator.
   B. The other six bolts are inserted through the top of the Booster or Oscillator.
3. Continue tightening screws according to the alternating sequence indicated by bolt numbers 1 through 8 until the O-ring is compressed into the HUM and the flange faces contact each other.
   A. Tighten alternating screws to 33 - 37 ft-lb (45 - 50 N·m) sequentially three times at 30%, then 60%, and finally 100% of the specified torque.
4. The Side 'B' monitor connection options for the Booster and Oscillator use the same components as the Hydrant Under Monitor. Install monitor using the appropriate instructions from section 4.3 of this manual.

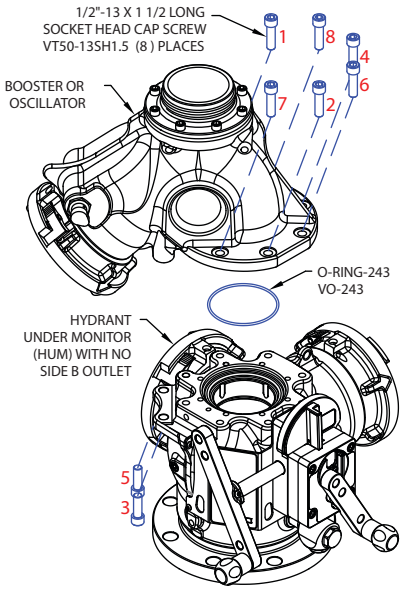


Figure 4.3.3

4.3.4 MONITOR/ELBOW INSTALLATION USING QUICK CONNECT COUPLING (Side B options Q & T)

HUMs with Side B options Q and T are supplied with the male threaded side of the quick connect installed.

An HUM with side B option Q is shown with a 4.5"NH quick connect monitor.

Side B option T for the 2.5"NH quick connect is similar, but only has one tongue and slot rather than two. The female coupling of the appropriate monitor or elbow can be installed using these instructions.

For additional details, refer to documents LIY-250 for 4.5"NH quick connect and LIY-300 for Tornado with 2.5"NH inlet.

1. **For female couplings with locking pins**, hold pin out and push coupling up as far as it will go, then release the pin. This will hold the coupling out of the way while mounting the monitor on theHUM. **For elbows or other devices that do not include a locking pin on the female coupling**, omit this step.
2. Align tongue(s) of female inlet into notches within male threaded outlet. This feature is a rotational lock to prevent loosening of the coupling when the device is swiveled. Slide tongue(s) into slots(s) until the threads make contact.
3. Rotate coupling clockwise until threads engage on male threaded outlet, then release locking pin (if so equipped). Continue to rotate coupling until tight. Locking pin will ratchet across detents, but it is not necessary to over-tighten the coupling if locking pin ends up between detent positions.

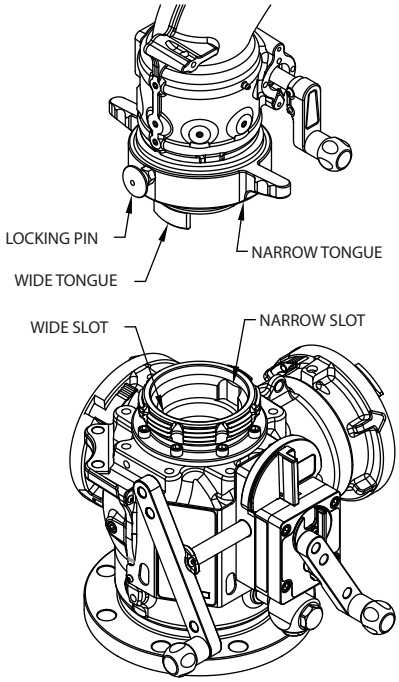


Figure 4.3.4

NOTICE **Do not use locking pin as a lever to tighten or loosen coupling.**

5.0 USE

5.1 VALVE OPERATION AND VALVE POSITION INDICATORS

The main shutoff valve and the monitor valve are operated using two separate crank handles marked MAIN and MONITOR.

Each valve has its own valve position indicator that is color-coded and retro-reflective for visibility in low-light conditions.

The yellow position indicator corresponds to the side A main valve. The orange position indicator corresponds to the side B monitor valve. When each valve is open, the position indicator is parallel to the direction of flow through the valve seats.

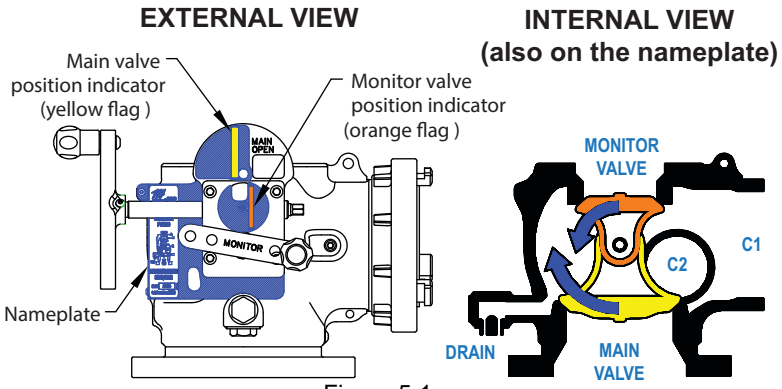


Figure 5.1

5.1.1 MAIN SHUTOFF VALVE OPERATION

To open the main valve, turn the larger crank handle marked MAIN counter-clockwise until the yellow position indicator flag is vertical and the MAIN OPEN label is fully exposed.

To close the main valve, turn the larger crank handle marked MAIN clockwise until the yellow position indicator flag is horizontal and the MAIN CLOSED label is fully exposed.

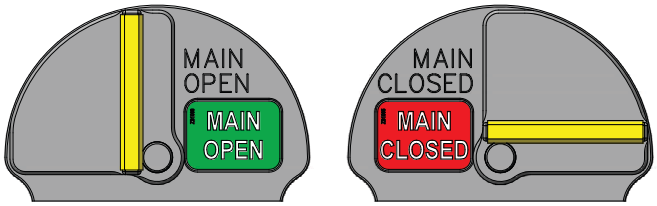


Figure 5.1.1

5.1.2 MONITOR VALVE OPERATION

To open the monitor valve, turn the smaller crank handle marked MONITOR clockwise until the orange position indicator flag is vertical and the word OPEN is fully exposed.

To close the monitor valve, turn the smaller crank handle marked MONITOR counter-clockwise until the orange position indicator flag is horizontal and the word CLOSED is fully exposed.

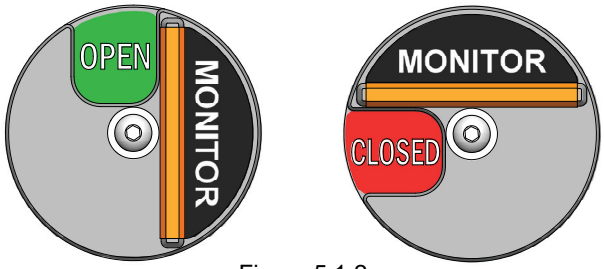


Figure 5.1.2

5.1.3 LOCKOUT/TAGOUT

When it is necessary to prevent operation of the HUM or monitor, the HUM crank handles may be tethered. All suitable tether points are shown in red, and the valve crank handles are shown in blue. It is also acceptable to tether the two crank handles to each other. Polymer ties or aircraft cable (wire rope) may be used in all locations. The nameplate also allows 1/8” and smaller trade size chain to be used by inserting the lock shackle through both the chain and the crank handle.

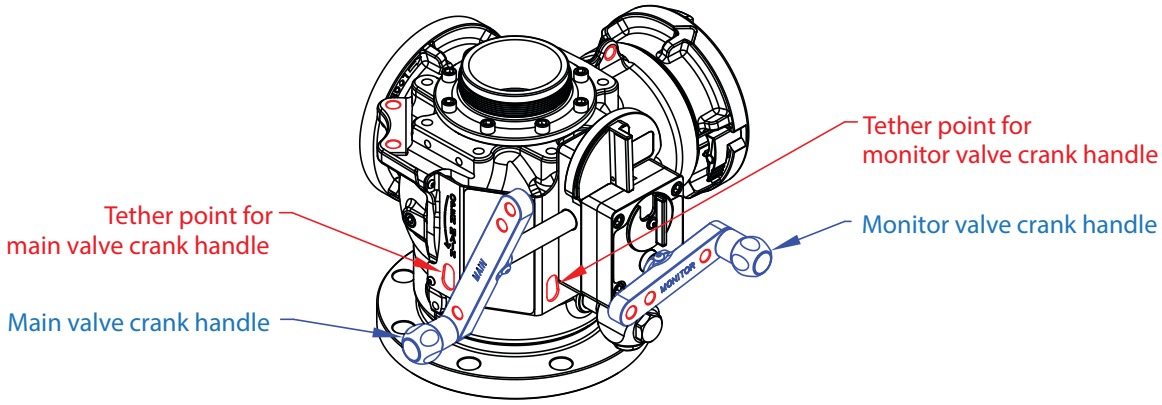


Figure 5.1.3

5.2 TYPICAL USE SCENARIOS

The monitor and LDH hose ports can be used either independently or simultaneously. The scenarios below explain the valve operation for each intended use. In each graphic below, blue shading indicates water delivered from the side A inlet. See Section 6.0 on page 22 to estimate the performance of each outlet used independently or simultaneously.

NOTICE

Downstream connections can highly influence the flow rate through each outlet of the HUM. When a pump is attached downstream of any of the HUM outlets, care must be taken to avoid starving flow to any outlets that are not connected to the same pump. Independent testing is recommended to ensure the entire system meets performance requirements.

5.2.1 TOTAL SHUTOFF (Side A main valve closed)

When the Side A main valve is closed, no water will be discharged from the HUM.

Keeping pressure caps on ports C1 and C2 at all times when hose connections are not being utilized prevents the interior of the valve from foreign debris. The automatic water drain valves described in section 5.3 will allow the valve body to drain completely even while the pressure caps are installed.

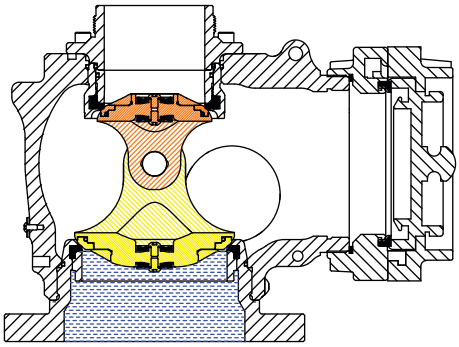


Figure 5.2.1

5.2.2 USE LDH PORTS ONLY (Side A main valve open; Side B monitor valve closed)

⚠CAUTION

Prior to removing LDH caps or hoses, a downstream valve on the HUM must be opened briefly to vent any pressure stored within the HUM. Injury or damage can occur from the uncontrolled release of stored pressure. The side B monitor valve may be used for this purpose, or a ¼" NPT bleed valve may be attached to one of the two ports shown in figure 3.2.

When the Side A main valve is opened, water pressure is introduced immediately to the valve body. Any hose connections needed should be properly connected through the entire system prior to opening the Side A main valve. Any unused LDH ports must have the included pressure cap or a separate valve installed prior to opening the Side A Valve. A monitor installed on Side B will not flow unless the Side B monitor valve is opened.

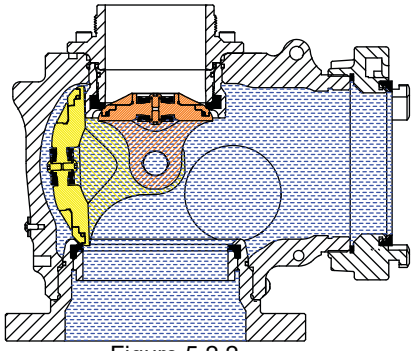


Figure 5.2.2

5.2.3 USE MONITOR ONLY (both valves open; caps installed on LDH ports)

When both the Side A and Side B valves are opened, water pressure is supplied to the monitor and the LDH ports. In order to use the monitor only, the included pressure caps or separate valves must be installed on the LDH ports C1 and C2 prior to opening the Side A valve.

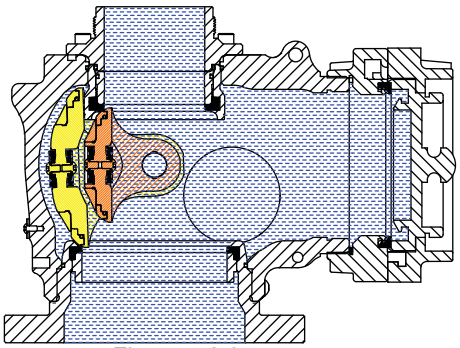


Figure 5.2.3

NOTICE

In this scenario, pressure will be stored in the HUM if the side B monitor valve is closed before the side A main valve is closed. A downstream valve on the HUM must be opened briefly to vent any pressure and allow the automatic drain valve function to begin. The side B monitor valve may be used for this purpose, or a ¼" NPT bleed valve may be attached to one of the two ports shown in figure 3.2. When the external drain valve begins to flow continuously, the downstream bleed valve may be closed completely. Drainage will continue until the Hydrant Under Monitor is empty.

5.2.4 USE MONITOR AND LDH PORTS SIMULTANEOUSLY (both valves open; LDH cap(s) removed)

⚠CAUTION **Prior to removing LDH caps or hoses, a downstream valve on the HUM must be opened briefly to vent any pressure stored within the HUM. Injury or damage can occur from the uncontrolled release of stored pressure. The side B monitor valve may be used for this purpose, or a ¼" NPT bleed valve may be attached to one of the two ports shown in figure 3.2.**

When both the Side A and Side B valves are opened, water pressure is supplied to the monitor and the LDH ports. Any hose connections that will be needed must be connected prior to opening the Side A main valve. Any unused LDH ports must have the included pressure cap or a separate valve installed prior to opening the Side A Valve. If the LDH port(s) are used to feed a pump, the monitor nozzle pressure must be monitored to ensure the desired nozzle flow rate is maintained.

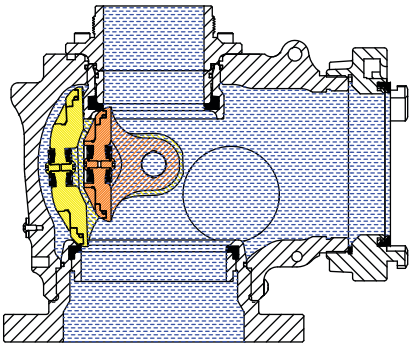


Figure 5.2.4

5.2.5 USE WITH ZC-SERIES BOOSTER OR ZD-SERIES OSCILLATOR

When a Booster or Oscillator is installed on the HUM, the monitor and LDH ports may be used exactly as described in section 5.2.1 through section 3.5.4. In these cases, the swing-check valve (clapper) within the Booster or Oscillator will remain closed to keep port C3 sealed.

To boost the discharge pressure or introduce foam solution to the monitor, see section 3.5.6.

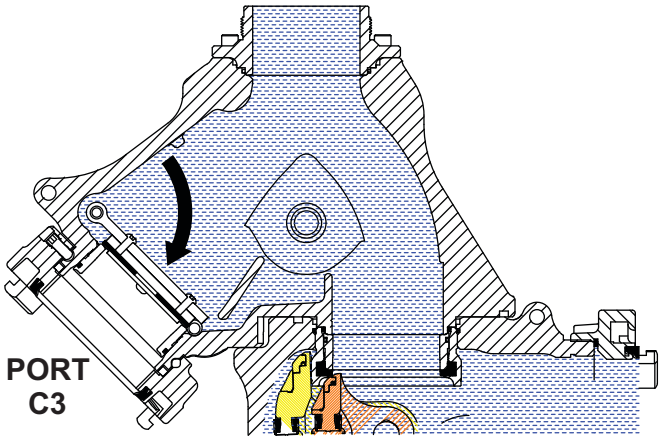


Figure 5.2.5

5.2.6 BOOST OR FOAM SOLUTION USING ZC-SERIES BOOSTER OR ZD-SERIES OSCILLATOR

Blue shading indicates water delivered from the side A inlet. Purple shading indicates water that has been supplemented by a pump and/or foam eductor.

To boost the discharge pressure or introduce foam solution to the monitor, follow the steps below. See LIZ-060 for further details on use of the ZC-Series Booster.

NOTICE **Keep the Side B monitor valve closed at all times to prevent backflow into the standpipe.**

1. With the Side A main valve closed, connect a hose from port C1 of the HUM to the inlet of a pump or foam eductor.
2. Connect hose from the outlet of the pump or eductor to port C3 of the Booster or Oscillator.
3. Open this Side A main valve and any other valves in-line with the pump or eductor. The swing-check valve in the Booster or Oscillator will swing open and the monitor will begin to flow. The pump may now be throttled to achieve the desired nozzle performance.
4. When operation is completed, close Side A main valve and vent the pressure. The HUM drain valves will fully drain the Booster and HUM without allowing any to backflow into the standpipe.

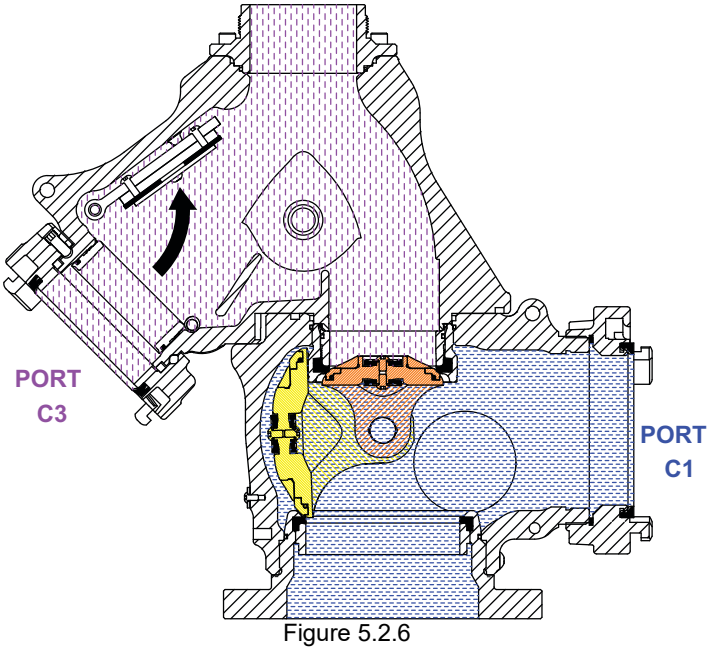


Figure 5.2.6

5.3 DRAINING RESIDUAL WATER

NOTICE

All monitors, valves and standpipes exposed to freezing conditions must be drained immediately following use to prevent damage. To drain a standpipe:

1. **A drainage port must be opened underground below the frost depth to keep water out of the standpipe until the next use.**
2. **Both the main and monitor valves in the HUM must be vented to prevent vacuum from suspending the water in the standpipe.**

Venting can be performed by either opening both valves manually, or through proper use of automatic water drain valves.

Some usage scenarios will result in pressure being stored within the Hydrant Under Monitor, which will prevent the drain valves from opening automatically.

When the side A main shutoff valve is closed following use, the user must verify that a stream of water has exited the external drain valve continuously for several seconds.

If no water has exited the external drain valve, a downstream valve on the HUM must be opened briefly to vent any pressure and allow the automatic drain function to begin.

The side B monitor valve may be used for this purpose, or a ¼" NPT bleed valve may be attached to one of the two ports shown in figure 3.2.

When the external drain valve begins to flow continuously, the downstream bleed valve may be closed completely. Drainage will continue until the Hydrant Under Monitor is empty.

Automatic water drain valves allow the monitor and HUM body to drain fully after the half balls are closed, which minimizes susceptibility to damage from corrosion and freezing water. The drain valve seal membranes are designed to close automatically when pressure exceeds 5 psi. When pressure drops below 5 psi, the seal membranes will open to allow drainage.

Proper function must be verified prior to fireground use. When the automatic drain valves are omitted or disabled, the half balls must be manually opened for venting and drainage. The two standard and one optional drain valve locations are described in the following sections.

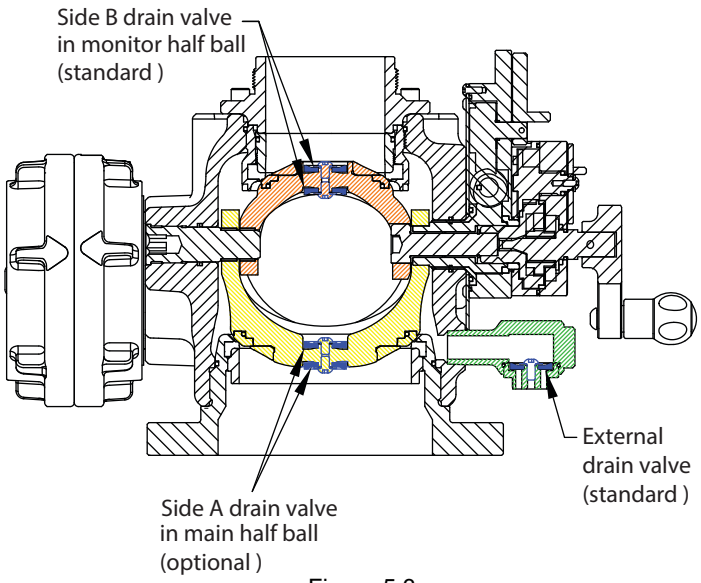


Figure 5.3

5.3.1 EXTERNAL DRAIN VALVE (STANDARD)

All HUM models are equipped with an external automatic drain valve attached to a port located directly above the valve seat, just below the gearbox. The external drain valve ensures the HUM valve body is completely drained following use. This drain valve uses a single seal membrane, since pressure will always be applied from the inside of the valve.

5.3.2 SIDE B DRAIN VALVE IN MAIN HALF BALL (STANDARD)

All HUM models are equipped with an automatic drain valve integrated within the monitor half ball (Side B). The Side B drain valve allows the monitor and HUM to drain fully after the monitor half ball is closed. This drain valve includes one seal membrane on each side of the half ball (two total), in order to seal pressure either from the side A inlet, or from a ZC-series Booster or ZD-series Oscillator installed on Side B.

5.3.3 SIDE A DRAIN VALVE IN MAIN HALF BALL (OPTIONAL)

An automatic drain valve located within the main half ball (Side A) allows the standpipe to draw atmospheric air to facilitate draining, even while the main half ball is closed. It is beneficial in applications where the standpipe will typically be drained following use, especially where freezing conditions are a concern. This drain valve includes one sealing membrane on each side of the half ball (two total), in order to seal pressure either from the Side A inlet, or from supply hoses attached to any of the LDH ports on the HUM, Booster, or Oscillator. This prevents backflow into the standpipe when the pressure within the HUM exceeds the pressure within the standpipe.

6.0 PRESSURE LOSS

The flow coefficients in Table 6.1 and curves in Figure 6.2 represent all models of the Hydrant Under Monitor for several possible usage scenarios. This data is estimated from the Side A inlet flange to the designated outlet of the HUM only and does not include pressure losses of any downstream equipment such as monitors, nozzles and hoses. The Cv flow coefficients in Table 6.1 apply for water use only, and are calculated according to the formula:

$$C_v = \frac{Q}{\sqrt{\Delta P}}$$

Where:

C_v = flow coefficient

Q = flow rate in gpm

ΔP = pressure loss in psi across valve

To calculate pressure loss for a given flow rate through each port, this formula can be rearranged as:

$$\Delta P = \frac{Q^2}{C_v^2}$$

NOTICE

Downstream connections can highly influence the flow rate through each outlet of the HUM. When a pump is attached downstream of any of the HUM outlets, care must be taken to avoid starving flow to any outlets that are not connected to the same pump.

The data in table 6.1 and figure 6.2 assume that all ports are either discharging to the atmosphere with no downstream pumps, or that all ports are attached to the same downstream pump. This data is not valid if separate pumps are connected to each outlet, or if some outlets have pumps connected while others do not.

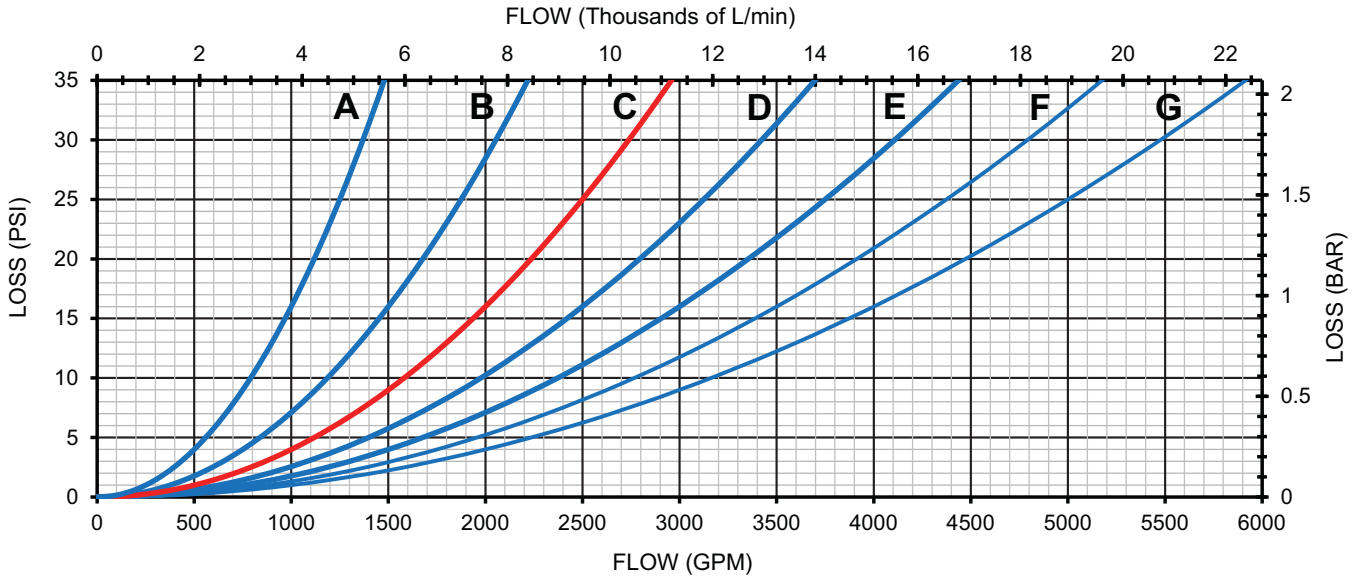
Independent testing is recommended to ensure the entire system meets performance requirements.

6.1 ESTIMATED FLOW COEFFICIENTS FOR VARIOUS SCENARIOS

SCENARIO	Flow versus pressure loss curves for approximate ranges A through G are shown on the graph below.						
	A	B	C	D	E	F	G
	Cv= 250	Cv= 375	Cv= 500	Cv= 625	Cv= 750	Cv= 875	Cv= 1000
Side B Monitor			Side B Cv=550				
C1 with 6" Storz							Port C1 Cv=1010
C1 w/ 5" Storz or 4.5" to 6" male threads					Port C1 Cv=750		
C1 w/ 4" Storz or 3.5" to 4" male threads			Port C1 Cv=460				
C1 w/ 2.5" male threads or gated wye (loss per port)	Port C1 Cv=240						
C2 w/ any 3.5" to 5" connection			Port C2 Cv=490				
C2 w/ 2.5" male threads or gated wye (loss per port)	Port C2 Cv=260						
C1 w/ 6" Storz & C2 w/ any 3.5" to 5" connection		C2 Cv=335				Port C1 Cv=890	
C1 & C2 w/ 5" Storz on both ports		Port C2 Cv=355			Port C1 Cv=700		
C1 & C2 w/ 2.5"male threads or gated wyes	C1/C2 Cv=220						
Side B Monitor & C1 w/ 6" Storz			Side B Cv=550			Port C1 Cv=890	
Side B Monitor & C1 w/ 5" Storz or 4.5" to 6" male			Side B Cv=550	Port C1 Cv=660			
Side B Monitor & C1 w/ 2.5" gated wye	Port C2 Cv=220		Side B Cv=550				
Side B Monitor & C2 w/ 5" Storz		Port C2 Cv=380	Side B Cv=525				
Side B Monitor & C2 w/ 2.5" gated wye	Port C2 Cv=220		Side B Cv=525				
Side B Monitor, C1 w/ 6" Storz & C2 w/ 5" Storz	Port C2 Cv=250		Side B Cv=480		Port C1 Cv=740		
Side B, C1 & C2 w/ 2.5" gated wyes on both ports	C1/C2 Cv=200		Side B Cv=550				

Table 6.1

6.2 FLOW RATE VS. PRESSURE LOSS CURVES



For Side B monitor (curve C), do not exceed the following flow rates at specified nozzle inlet pressures:

2500 gpm below 130 psi (9500 l/min @ 9 bar)
2000 gpm below 200 psi (8000 l/min @ 14 bar)
1600 gpm below 300 psi (6000 l/min @ 14 bar

Figure 6.2

7.0 WARRANTY

Go to tft.com for all warranty information.

8.0 MAINTENANCE

TFT products are designed and manufactured to be damage resistant and require minimal maintenance. However, as the primary firefighting tool upon which your life depends, it should be treated accordingly. The unit should be kept clean and free of dirt by rinsing with water after each use. Any inoperable or damaged parts should be repaired or replaced before placing the unit in service. To help prevent mechanical damage, do not drop or throw equipment.

In applications where appliances are left continuously connected to the apparatus or other devices or are used where water is trapped inside the appliance, the appliance must be flushed with fresh water following each use and inspected for damage.

This appliance should be disconnected, cleaned and visually inspected inside and out at least quarterly, or as water quality and use may require. Moving parts such as handles, valve ball and couplings should be checked for smooth and free operation. Seals shall be greased as needed with Silicone based grease such as Molykote 112. Any scrapes that expose bare aluminum should be cleaned and touched up with enamel paint such as Rust-Oleum. Replace any missing or damaged parts before returning to service.

Any equipment taken out of service due to failure should be returned to the factory for repair or replacement. If you have any questions regarding the testing or maintenance of your valve, please call Task Force Tips at 800-348-2686.

8.1 SERVICE TESTING

In accordance with NFPA 1962, equipment must be tested a minimum of annually. Units failing any part of this test must be removed from service, repaired and retested upon completion of the repair.

8.2 REPAIR

Factory service is available. Factory serviced equipment is repaired by experienced technicians, wet tested to original specifications, and promptly returned. Call TFT service department at 1-800-348-2686 to troubleshoot and, if needed, directions for return. A return for service form can also be obtained at tft.com/Support/Returning-an-Item-for-Service.

Repair parts and service procedures are available for those wishing to perform their own repairs. Task Force Tips assumes no liability for damage to equipment or injury to personnel that is a result of user service. Contact the factory or visit the web site at tft.com for parts lists, exploded views, test procedures and troubleshooting guides.

Performance tests shall be conducted on the equipment after a repair, or anytime a problem is reported to verify operation in accordance with TFT test procedures. Consult factory for the procedure that corresponds to the model and serial number of the equipment. Any equipment which fails the related test criteria should be removed from service immediately. Troubleshooting guides are available with each test procedure or equipment can be returned to the factory for service and testing.

⚠WARNING **It is the responsibility of service technicians to ensure the use of appropriate protective clothing and equipment. The chosen protective clothing and equipment must provide protection from potential hazards users may encounter while servicing equipment. Requirements for protective clothing and equipment are determined by the Authority Having Jurisdiction (AHJ).**

⚠CAUTION **Any alterations to the product or its markings could diminish safety and constitutes a misuse of this product.**

NOTICE **All replacement parts must be obtained from the manufacturer to assure proper performance and operation of the device.**

8.3 MAIN VALVE CRANKSHAFT OVERRIDE AND REPLACEMENT

The crankshaft includes an intentional shear joint to protect the gear train from overload, costly repairs, and loss of service. The magnitude of torque required to shear the crankshaft is several times greater than the torque typically needed to operate the valve at maximum operating pressure. If the crankshaft breaks during use, this is an indication that either there is something obstructing the half ball internally. or the crank shaft has been abused (e.g. used as a step for climbing).

The crankshaft can be safely overridden, removed and replaced without removing the gearboxes from the HUM as described in the following sections.

8.3.1 EMERGENCY CRANKSHAFT OVERRIDE

In an emergency, the opposite side of the crankshaft can be turned using a 1/2” wrench or hex socket. This allows the valve to be open or closed until the crankshaft is replaced. To prevent loss of the 1/8” square key on the crankshaft, do not allow the crankshaft to slide out of gearbox until a replacement crankshaft is on hand. It is important not to rely on the emergency override as a long-term method of operation.

8.3.2 DIAGNOSING MAIN VALVE CRANKSHAFT FAILURE

To determine the cause of a crankshaft to failure, complete the following steps:

1. Close the upstream water supply and relieve pressure leading up to the main valve.
2. Open the monitor valve to relieve all internal pressure from the HUM.
3. Remove cap(s) from port C1 to observe whether there is any internal debris obstructing movement of the half ball.
4. Locate 1/2” hex where crankshaft protrudes from gearbox.
5. Gently turn crank shaft away from travel stop using a ½” hex wrench. To prevent further damage, do not strike the wrench with a hammering action and do not exceed 50 ft-lb (68 N·m) of torque.
6. **If crankshaft will not rotate**, the half ball is likely obstructed. The HUM must be disconnected at the flanged joint for inspection and possible repair.
   A. Ensure upstream water supply has been shut off.
   B. Disconnect any hoses or devices on C1 & C2 ports.
   C. Loosen the flange bolts in the pattern described in section 4.2.
   D. Clear any obstructions and evaluate whether repair is needed before returning to service.
7. **If crankshaft is able to rotate**, cycle the valve several times from open to closed to determine whether the crankshaft binds at any place between the travel stops. If crankshaft binds, consult Task Force Tips Service Department to determine the appropriate repairs.
8. **If crankshaft rotates freely after clearing any obstructions**, a replacement crank shaft may be ordered from Task Force Tips and replaced as described below.

8.3.3 MAIN VALVE CRANKSHAFT REPLACEMENT

A broken crankshaft can be replaced at any time by completing the following steps, regardless of whether or not the upstream water supply is pressurized. Referring to item numbers shown in the exploded view available at TFT.com/serial-number, follow the steps below:

1. Remove external retaining ring adjacent to ½" hex on crankshaft. Do not over-expand the retaining ring.
2. Using a punch or Phillips head screwdriver at least 6" in length, gently push on dimple in ½" hex end of crankshaft. Continue to push crankshaft through until it protrudes from opposite side of gearbox.
3. Grab broken end of crankshaft and pull out of gearbox. As crankshaft is withdrawn, grasp small key on shaft so it does not get lost.
   A. If 1/8" square x 1" long key is not visible in shaft, it has likely fallen into gearbox bore and must be removed before installing new crankshaft. If square key is visible in gearbox bore, slide it out of bore. Needle-nose pliers may be helpful depending on position of key in bore.
4. Verify polymer bushings are still seated in bores on each side of gearbox. If not, locate and reinstall bushings.
5. Look through gearbox bore and note approximate orientation of square keyway in worm. Verify round notch in thrust washer is aligned with square keyway in worm.
6. Prepare new crankshaft by applying small dab of grease to keyway and seating 1/8" square x 1" long key into keyway. Grease will keep key in place during assembly.
7. Slide shaft into gearbox with key orientation the same as keyway in worm.
8. Rotate shaft slightly in alternating directions until key finds keyway, then push shaft in until it stops. Retaining ring groove and ½" hex should be protruding through opposite side of gearbox.
   A. If hex is not visible, it may be necessary to slide polymer bushing back into gearbox bore.
9. Install retaining ring onto shaft. Do not over-expand the retaining ring.

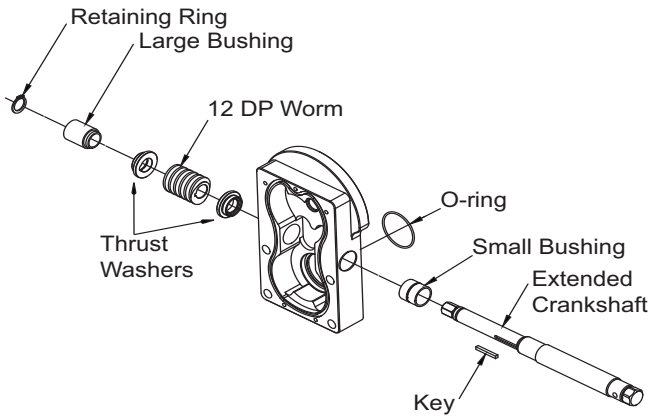


Figure 8.3.3

8.4 MONITOR VALVE GEARBOX DIAGNOSIS AND REPLACEMENT

The monitor valve gearbox includes an intentional shear joint on the output shaft that is designed to fail before any of the other components in the HUM are significantly damaged. This feature is intended to minimize costly repairs and loss of service. The magnitude of torque required to shear the output is much greater than the torque typically needed to operate the valve at maximum operating pressure. If the output shaft breaks during use, this is an indication that either there is something obstructing the half ball internally or the gearbox has been abused. The monitor valve gearbox must be repaired and/or replaced to resume proper operation of the HUM. Spare gearboxes may be purchased ahead of time to allow immediate repairs in the field.

NOTICE

For maximum safety it is recommended to shutoff the water supply and relieve pressure within the HUM prior to any maintenance procedures. However, in compliance with regulatory standards, the monitor valve gearbox can be safely removed and replaced whether or not the HUM contains internal pressure up to the rated working pressure of 300 psi (21 bar).

8.4.1 MONITOR VALVE GEARBOX DISASSEMBLY AND DIAGNOSIS

1. Close the upstream water supply and relieve pressure leading up to the monitor valve.
2. After relieving all internal pressure, remove cap(s) from port C1 to observe whether there is any internal debris obstructing movement of the half ball.
3. Remove the four socket head cap screws from the monitor valve gearbox, then pull the gearbox away from the HUM. Save these screws for reassembly.
4. Remove O-ring (see Figure 8.3.3) from main gearbox. Save the O-ring for reassembly. DO NOT REMOVE the four socket head screws from the main valve gearbox.
5. **If the serrated spline socket of the output shaft is still attached to the gearbox**, then the output shaft has not sheared. Consult Task Force Tips Service Department for further troubleshooting.
6. **If the output shaft has sheared**, an edge of bare aluminum will be visible on the output shaft where the spline socket was formerly located. A broken remnant of the output shaft will be visible in the trunnion bore of the main valve gearbox, around the inner trunnion. This broken remnant will appear as a ring with a tapered outer edge and an edge of bare aluminum exposed where the shear occurred. Remove the broken remnant of the output shaft using pliers. The entire monitor gearbox must be sent to Task Force Tips to determine whether it is repairable or requires a complete replacement.

8.4.2 MONITOR VALVE GEARBOX REPALACEMENT

1. Install O-ring (see Figure 8.3.3) around the bushing that protrudes from the main valve gearbox.
2. Align the notch on the outer diameter of the monitor valve gearbox output shaft with the groove on the exposed face of the inner trunnion. Slide the output shaft over the inner trunnion, wiggling as needed to get the serrated spline teeth to engage. When completed, the monitor valve gearbox should be flush against the main valve gearbox.
3. Rotate the monitor valve crank handle until the two gearboxes are aligned. If the valve is not pressurized, the entire monitor valve gearbox may be twisted to align the two gearboxes.
4. Apply blue Loctite to threads of four socket head cap screws removed in section Step 3. Insert them into the holes in the monitor valve gearbox and tighten until snug.
5. Gently cycle the monitor valve to the fully open position, then the fully closed position. **If this test is successful**, the HUM is ready for use. **If abnormal resistance is encountered during operation**, stop immediately and consult Task Force Tips Service Department for further troubleshooting.

8.5 VALVE SEAT REPLACEMENT

Each valve seat may be replaced in the field if it becomes a source of leakage due to harsh environmental conditions, or excessive age. Procedures for the main and monitor valve seats are described below. For the valve seats in the 2.5” gated wye option, see LIA-355.

⚠CAUTION **Safety goggles are recommended to avoid eye injury while servicing the valve seats. A high velocity jet of water may exit the valve seat at any time while pressure is contained.**

8.5.1 REMOVAL OF MONITOR, BOOSTER, AND OSCILLATOR

Monitor removal is necessary for replacement of the Side B monitor valve seat, and will also make the HUM easier to maneuver for replacement of the Side A main valve seat. To remove the Monitor, Booster, or Oscillator:

1. Close upstream water supply and relieve pressure leading up to valve.
2. Remove the monitor and Side B Outlet Adapter from HUM. This procedure varies depending on the connection type.
   A. For models with a ZC-series Booster or ZD-series Oscillator installed, remove eight Socket Head Cap Screws from Booster or Oscillator. Remove Booster or Oscillator and O-ring (see Figure 4.3.3).
   B. For models with a 4”ANSI 150 / DN100 PN16 flange installed on side B, loosen two screws using a 5/32” male hex wrench until two-piece clamp can move freely. Then, unscrew the flange from assembly (see Figure 4.3.1).
   C. For all models without a Booster or Oscillator, remove eight Socket Head Cap Screws from Side B Outlet Adapter using a 5/16” male hex wrench. Remove Side B Outlet and O-ring.

8.5.2 SIDE A MAIN VALVE SEAT REPLACEMENT

This procedure requires special tool TFAZ020 which may be purchased from Task Force Tips. Undamaged tools may be returned after use for a credit. This tool is used with a ½" drive breaker-bar or T-handle wrench and a short extension. To replace the Side A Main Valve Seat:

1. Close upstream water supply and relieve pressure leading up to HUM. Remove monitor, booster, or oscillator if desired.
2. The HUM inlet flange must be disconnected to replace the side A valve seat.
   A. Ensure upstream water supply has been shut off.
   B. Disconnect any hoses or devices on C1 & C2 ports.
   C. Loosen and remove the (8) bolts or studs through the side A flange, then remove the HUM from the standpipe.
3. Using special tool TFAZ020, remove Valve Seat Retainer from Flange.
4. Using pliers, pull old Valve Seat out of groove in Flange.
5. Using soap and water, clean all surfaces of Half Ball, Flange and Valve Seat Retainer that contact the Valve Seat. Also clean all debris from threads of Valve Seat Retainer and Flange. Verify all sealing surfaces are smooth and intact. If significant damage is visible, consult Task Force Tips Service Department.
6. Apply light coat of silicone-based grease such as Dow Corning 112 to all sealing surfaces and threads of Half Ball, Flange, and Valve Seat Retainer. Open valve so Half Ball is out of the way.
7. Install new Valve Seat into groove in Flange with wider side facing the Half Ball. Slide a pick laterally between female thread and Valve Seat to verify entire circumference of Valve Seat is seated in groove.
8. Install Valve Seat Retainer into Flange until it is snug against the Valve Seat. When the Retainer stops moving and a significant increase in effort is needed to move it further, stop tightening.
9. Reinstall valve according to instructions in section 4.0. Close the side A main valve, open the side B monitor valve, then restore the water supply to the HUM.
10. Rotate the side A main valve crank handle approximately 1 full turn counter-clockwise to bleed air out of the standpipe.
11. When the water level raises above the side A main valve seat, close the side A main valve.
12. Wait for the majority of water in the HUM body to exit through the external drain valve. If leakage is observed past the Valve Seat, try tightening the Valve Seat Retainer slightly more. **If leaking does not stop**, consult Task Force Tips Service Department.
13. Reinstall Monitor, Booster, or Oscillator according to instructions in section 4.0.

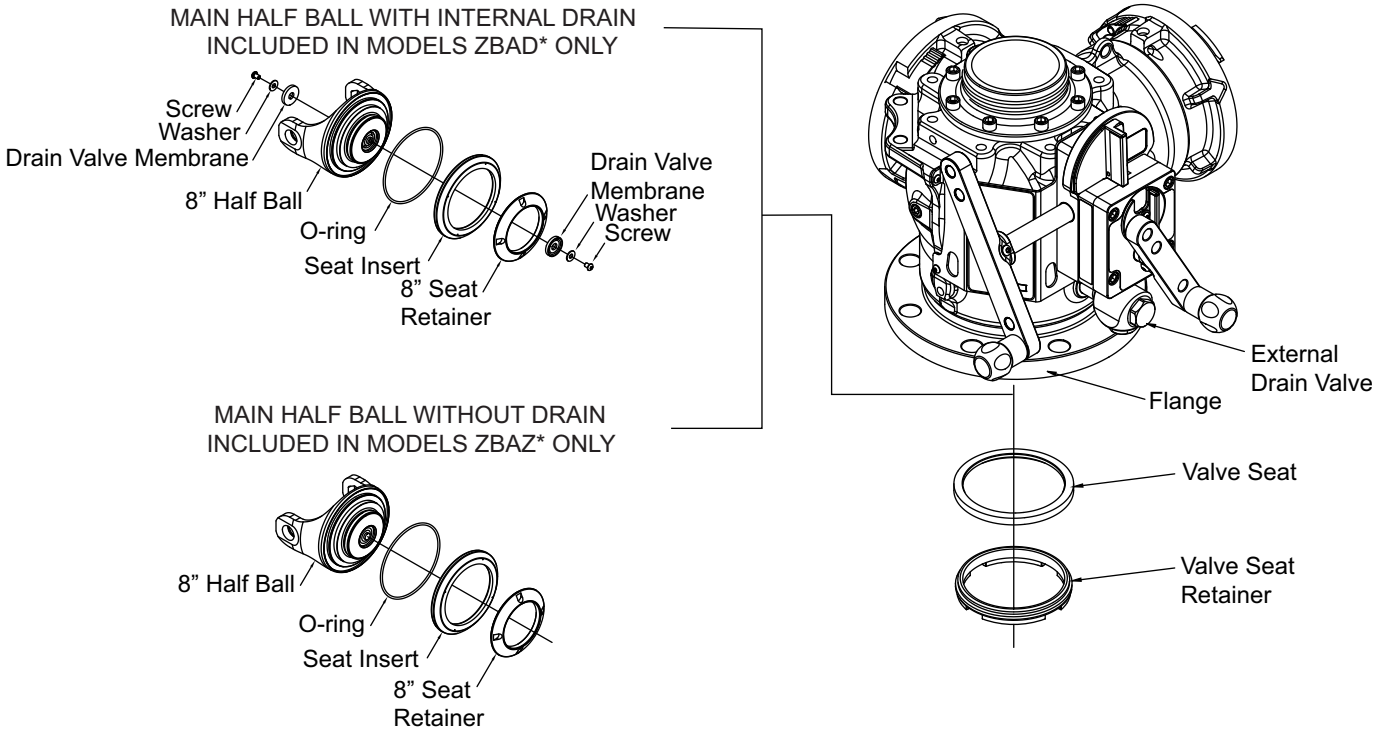


Figure 8.5.2

8.5.3 SIDE B MONITOR VALVE SEAT REPLACEMENT

This procedure requires special tool TFAZ019 which may be purchased from Task Force Tips. Undamaged tools may be returned after use for a credit. This tool is used with a ½" drive breaker-bar or T-handle wrench and a short extension. To replace the Side A Main Valve Seat:

1. Close upstream water supply and relieve pressure leading up to HUM. Remove Monitor, Oscillator, or Booster.
2. Using special tool TFAZ019, remove Inner Valve Seat Retainer.
3. Using pliers, pull old Valve Seat out of groove in Outer Valve Seat Retainer.
4. Using soap and water, clean all surfaces of Half Ball, Outer Retainer and Inner Retainer that contact the Valve Seat. Also clean all debris from threads of the Outer and Inner Retainers. Verify all sealing surfaces are smooth and intact. If significant damage is visible, consult Task Force Tips Service Department.
5. Apply light coat of silicone based grease such as Dow Corning 112 to all sealing surfaces and threads of Half Ball, the Outer Retainer and Inner Retainer. Open valve so Half Ball is out of the way.
6. Install new Valve Seat into groove in the Outer Retainer with wider side facing the Half Ball. Slide a pick laterally between female thread and valve seat to verify entire circumference of Valve Seat is seated in groove.
7. Install Valve Seat Retainer into Flange until it is snug against the Valve Seat. When the Retainer stops moving and a significant increase in effort is needed to move it further, stop tightening.
8. Start with both valves in the closed position. Rotate the side A main valve crank handle approximately 1 full turn counterclockwise and the side B monitor valve crank handle approximately 2 full turns clockwise to bleed air out of the standpipe and HUM.
9. When water level raises above the side B valve seat, close the side B monitor valve. Verify that the side B valve seat does not leak. It will be helpful to soak up excess water with a sponge or absorbent cloth, for a clear view of any leaks. If leakage is observed, try tightening the valve seat retainer slightly more. **If leaking does not stop**, consult Task Force Tips Service Department.
10. Reinstall Monitor, Booster, or Oscillator according to instructions in section 4.0.

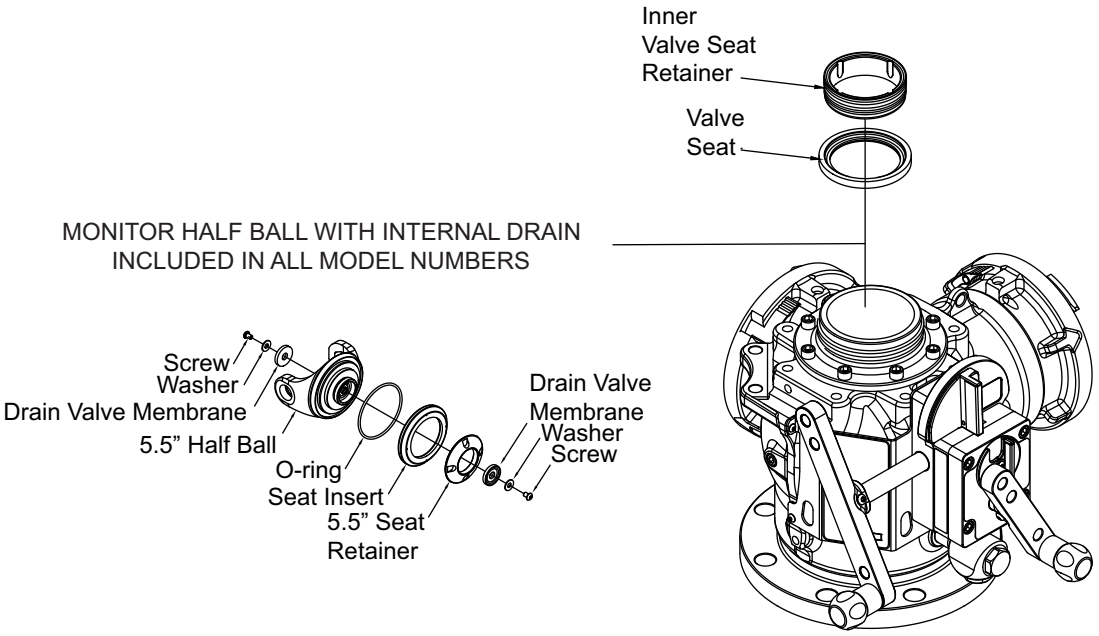


Figure 8.5.3

9.0 EXPLODED VIEW AND PARTS LISTS

Exploded views and part lists are available at tft.com/serial-number.

10.0 OPERATION AND INSPECTION CHECKLIST

BEFORE EACH USE, equipment must be inspected to this checklist:

1. All valves open and close fully and smoothly.
2. Waterway is clear of obstructions.
3. There is no damage to any thread or other connection.
4. All locks and hold-down devices work properly.
5. The pressure setting on the relief valve (if so equipped) is set correctly.
6. Gaskets are in good condition.
7. There is no obvious damage such as missing, broken or loose parts.
8. There is no damage to the appliance (e.g. dents, cracks, corrosion, or other defects that could impair operation).
9. All swiveling elements rotate freely.
10. There is no corrosion on any surface.
11. There are no missing, worn out or broken lugs on couplings.
12. Hose is securely attached.

BEFORE BEING PLACED BACK IN SERVICE, equipment must be inspected to this list:

1. All valves open and close smoothly and fully.
2. The waterway is clear of obstructions.
3. There is no damage to any thread or other type connection.
4. The pressure setting on the relief valve (if so equipped) is set correctly.
5. All locks and hold-down devices work properly.
6. Internal gaskets are in good condition
7. There is no damage to the appliance (e.g., dents, cracks, corrosion, or other defects that could impair operation).
8. All swiveling connections rotate freely.
9. There are no missing parts or components.
10. The marking for maximum operating pressure is visible.
11. There are no missing, broken, or worn lugs on couplings.

⚠WARNING **Equipment failing any part of the checklist is unsafe for use and must have the problem corrected before use or being placed back into service. Operating equipment that has failed the checklist is a misuse of this equipment.**