MANUAL: BOOSTER SECONDARY LDH INLET FOR MONITORS

INSTRUCTIONS FOR INSTALLATION, SAFE OPERATION AND MAINTENANCE

⚠WARNING **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 www.tft.com/serial-number**

This Instruction Manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing and safety procedures associated with the Booster.

This Instruction Manual should be kept available to all operating and maintenance personnel.

RATED OPERATING PRESSURE: 200 psi (14 bar)

SAFE OPERATING RANGE FOR MONITOR OUTLET:

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

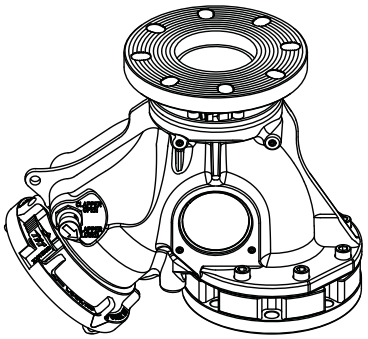
Up to 2000 gpm below 200 psi (8000 l/min @ 14 bar)*

* valid for monitor outlets up to 20” (508mm) tall from the Booster outlet. Read section 4.3 for details.

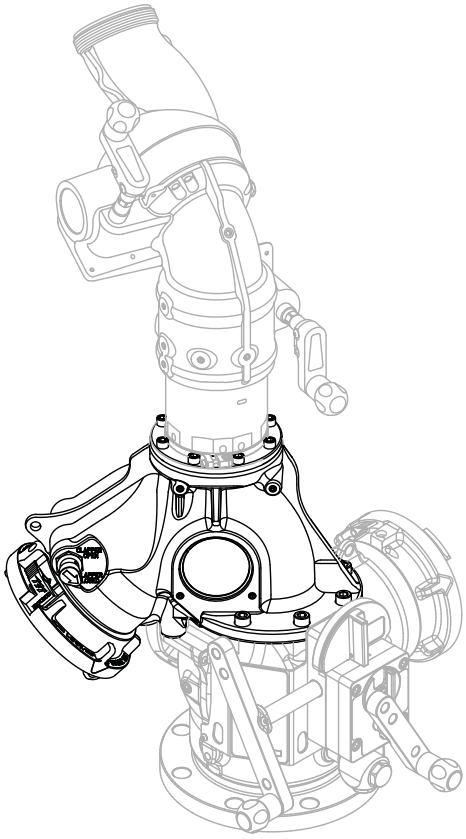
HYDROSTATIC PROOF TEST: 800 psi (55 bar)**

**Do not exceed the rated operating pressure of 200 psi (14 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.

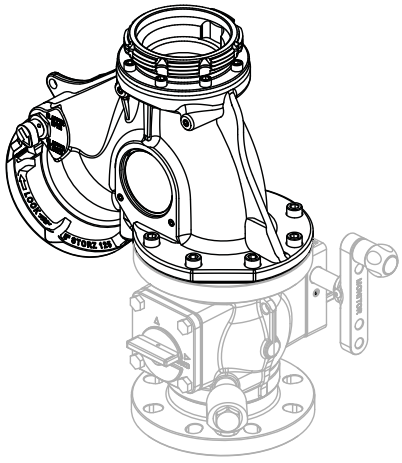
SAMPLE CONFIGURATIONS



Model ZCF1T3
for attachment to Hydrants, Valves and Monitors with 4" ANSI 150 connections



Model ZCH1T1
integrated with
TFT Hydrant Under Monitor and TFT Monsoon Monitor



Model ZCH1TQ
integrated with
TFT Industrial Valve Under Monitor and 4.5" NH Quick Connect for TFT monitor

TASK FORCE TIPS, INC.
MADE IN USA • www.tft.com

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

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⚠ 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 upon 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.

FEMSA

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

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 standard Z535.6-2011, 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

⚠WARNING **Injury or death may occur by attempting to use a damaged Booster. Before using the Booster, inspect it for damage resulting from:**

- **Exposure to temperatures in excess of 160 degrees F**
- **Missing parts, physical abuse, exposure to severe chemicals**
- **Failure to drain standpipe followed by exposure to freezing conditions. See section 5.3 DRAINING RESIDUAL WATER for instructions.**

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

⚠WARNING **Injury or death can result from burst hoses and fittings. Risk can be minimized by the proper care and use of hose and appliances per NFPA 1962.**

⚠WARNING **Kinks in supply hose may reduce water flow and cause injury or death to persons dependent on water flow. Avoid tight bends to minimize risk of hose line kinks.**

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

⚠CAUTION **Maximum operating pressure 200 PSI (14 bar). Exceeding 200 psi (14 bar) may damage the Booster and could cause injury**

⚠CAUTION **Hoses and monitors must be properly connected. Mismatched or damaged connectors may cause leaking or uncoupling under pressure and could cause injury.**

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

⚠CAUTION **Dissimilar metals coupled together can cause galvanic corrosion that can result in the inability to unscrew threads and complete loss of thread engagement over time. Use of flange isolation kits and anti-corrosive lubricant such as Dow Corning 112 Silicone Grease is recommended to prevent galvanic corrosion**

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

3.0 GENERAL INFORMATION

The Booster provides a secondary supply inlet for monitors rated up to 2500 gpm, allowing pressure to be boosted using a pump and/or foam to be introduced. An LDH hose or in-line foam injection device may be connected to the secondary inlet with optional Storz or female hose threads ranging from 3.5” up to 6.0”, as described in section 3.5.4. A swing check valve within the secondary inlet allows connections to be made while the monitor is flowing from the main inlet (standpipe or hydrant). The cast A356-T6 aluminum body and all structural 6061-T6 aluminum components are hard anodized, and the inlet flange and body are powder coated for additional resistance to galvanic corrosion. All models are equipped with an external automatic drain valve. This allows the monitor and Booster to be fully drained after each use when pressure drops below 5 psi, thus minimizing susceptibility to damage from corrosion and freezing water.

The main inlet can be configured either for direct connection to a TFT Hydrant Under Monitor (HUM) or Industrial Valve Under Monitor (IVUM), or adapted to a 4” ANSI 150 bolt pattern, as described in section 3.5.3. Several options are available for monitor connection, as described on in section 3.5.5.

The Booster is designed to allow retrofit of a water-driven oscillator mechanism. This mechanism will allow the monitor nozzle to follow a pre-defined sweep pattern without any electric equipment. Contact factory for retrofit inquiries.

3.1 SPECIFICATIONS

HYDRANT UNDER MONITOR SPECIFICATIONS	
Main Waterway Diameter	3.65" (93 mm)
C3 LDH Port Diameter	3.65" (93 mm)
Safe Operating Range for Side B Monitor Outlet: Maximum flow rates at specified nozzle inlet pressures are based on 1500 lb (680 kg) maximum nozzle reaction force at 20” (508mm) monitor height. Read section 4.3 Monitor Installation and Compatibility.	2500 gpm @ 130 psi (9500 l/min @ 9 bar) 2000 gpm @ 200 psi (8000 l/min @ 14 bar)
Rated Operating Pressure	200 psi (14 bar)
Hydrostatic Proof Test	800 psi (55 bar)*
Temperature Rating **	-25° to 135°F (-32° to 57°C)

* Do not exceed the rated operating pressure of 200 psi (14 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.

** For temperatures below 32°F (0°C), Booster and upstream devices must be drained after use to avoid damage. Read section 5.3 Draining Residual Water.

3.2 CORROSION RESISTANCE

All Booster 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. Upstream equipment such as standpipes and hydrants should be drained while not in use to eliminate a path of conduction. Do not install brass fittings or monitors onto the Booster.

3.3 USE WITH SALT WATER

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

3.4 PARTS IDENTIFICATION AND INTENDED ORIENTATION

Figure 3.4 identifies the typical functional components of the Booster. The Booster is intended to be installed in the orientation shown, with the inlet flange facing towards the earth below. This orientation allows the monitor and Booster to fully drain after use, as described in section 5.3 DRAINING RESIDUAL WATER.

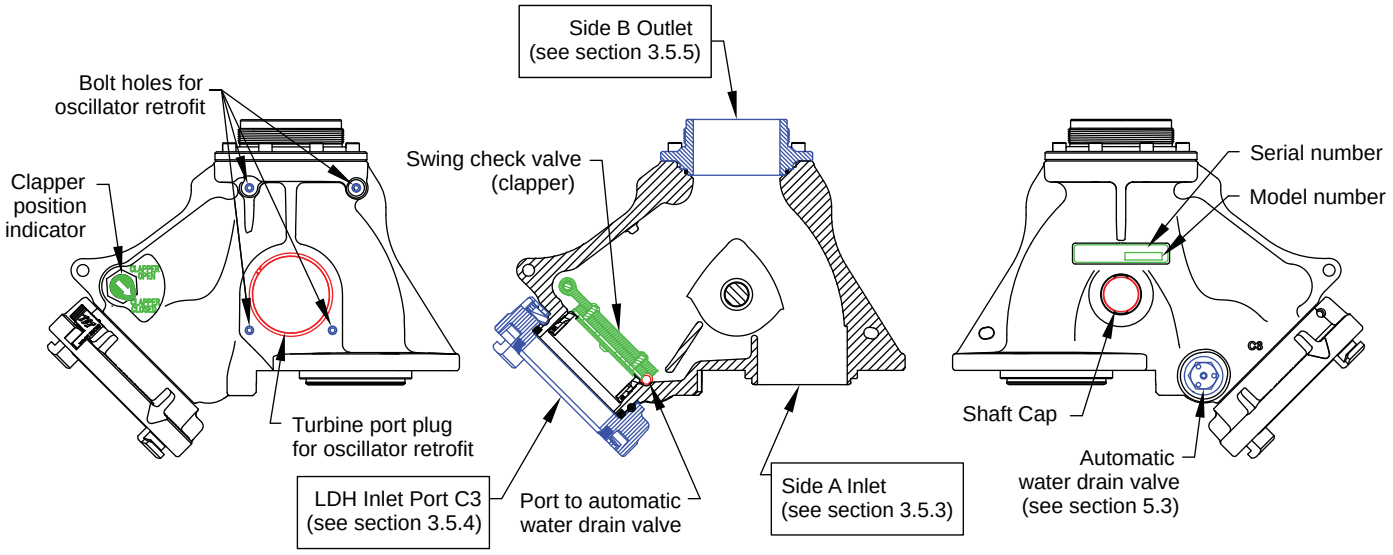


Figure 3.4: Parts Identification and Intended Orientation

3.5 OPTIONS, DIMENSIONS AND WEIGHTS

Several options are available for valve control, monitor mounting, and the two LDH ports. Each option is described in sections 3.5.3 through 3.5.6. The dimensions and approximate weights of the individual options can be added together to calculate the overall size and weight of the Booster with the desired options installed, as shown in figure 3.5.1. 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 sections 3.5.3 through 3.5.7, along with the corresponding weights and dimensions. The model number and unique serial number of each Booster are located on the label above the external automatic drain, as shown in figure 3.4. The serial number also serves as an internet address to provide additional information about the product.

Character Position	**1**	**2**	**3**	**4**	**5**	**6**
Component	**ZC** (same prefix for all models)		**SIDE A INLET OPTION** (3.65" I.D.)	**LDH INLET PORT C3** (3.65" I.D.)		**SIDE B OPTION** (monitor, 3.65" I.D.)
				STYLE	**SIZE**	

Example model #:	**ZCF1T1**	**Character Sequence**	**Weight (lb**
Booster Body:	Same for all models	prefix ZC same for all models	20.7
Side A Inlet:	4" ANSI 150 Flange	Character "F" in position 3	+ 7.7
Port C3 Style:	Storz	Character "1" in position 4	
Port C3 Size:	5.0"	Character "T" in position 5	+ 3.2
Side B (monitor):	CODE-RPM Direct Connection	Character "1" in position6	+ 1.8
Net Weight:	**33.4 lb (15.15 kg)**		**= 33.4**

Figure 3.5.1: Model Number Sequence and Net Weight Calculation

3.5.2 BOOSTER BODY

The Booster body weighs 20.7 lb (9.37 kg), including the clapper (swing check valve), the turbine port plug, the external automatic drain, and all fasteners that are shared by every Booster model. Dimensions are shown in figure 3.5.2 below. Portions of the Booster body that overlap with installed couplings and adapters are excluded from these dimensions.

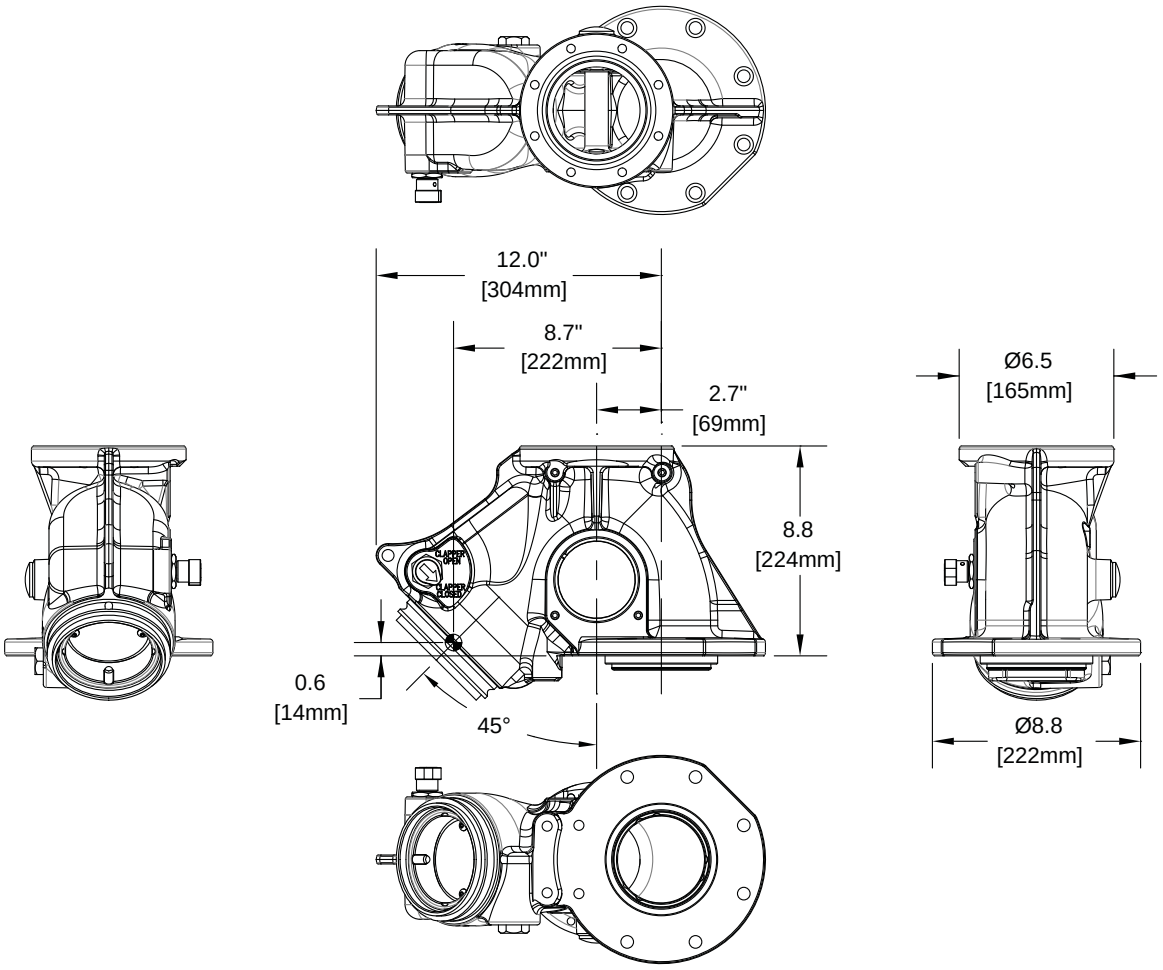


Figure 3.5.2: Booster Body Dimensions

3.5.3 SIDE A INLET OPTIONS (character position 3)

The Side A Inlet with no adapter installed is designed for direct connection to the Task Force Tips Industrial Valve Under Monitor (IVUM) and Hydrant Under Monitor (HUM). These two products provide the valve needed to shut off the supply from the Side A Inlet in order to use an alternate supply of water or foam solution from LDH Inlet Port C3.

The Side A Inlet is also available with a 4” ANSI 150 flange adapter to allow the booster to be mounted directly on a typical standpipe or hydrant. In this case, a separate valve must be present to shut off the Side A Inlet when LDH Port C3 is used.

SIDE A OPTIONS (character position 3)	CHARACTERS	WEIGHT (LB)	WEIGHT (KG)
Direct connection to IVUM or HUM (no adapter installed)	H	NA	NA
4” ANSI 150 flange inlet adapter	F	7.7	3.49

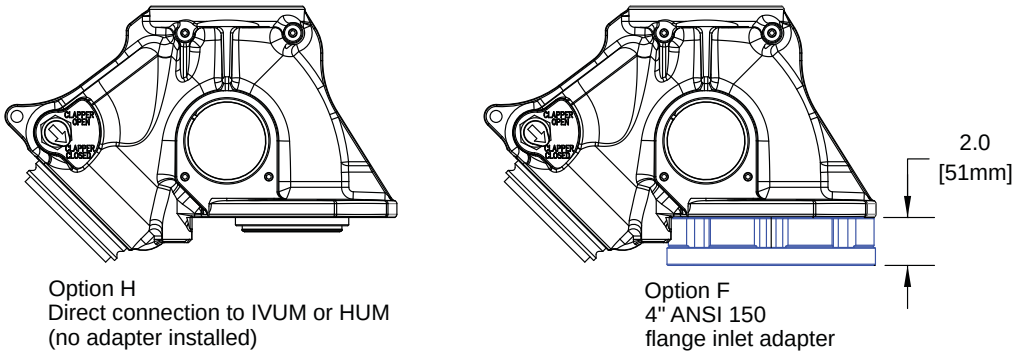


Figure 3.5.3: Side A Inlet options

3.5.4 LARGE DIAMETER HOSE INLET PORT C3 OPTIONS (character positions 4 and 5)

The LDH Inlet Port C3 can be configured with a Storz coupling or female threaded coupling. Hose connection size options range from 3.5” to 6”. A cap is not needed for this port since the clapper closes Port C3 when it is not in use. The dimensions below indicate the distance each option protrudes from the Booster body.

PORT C3 OPTIONS (char. positions 4 & 5)	CHARACTERS	SUBASSEMBLY #	WEIGHT (LB)	WEIGHT (KG)
4.0" Storz	1P	ZCC3-1P	3.3	1.50
5.0" Storz	1T	ZCC3-1T	3.2	1.44
6.0" Storz	1X	ZCC3-1X	8.7	3.96
3.5" NH female thread	4N	ZCC3-4N	3.1	1.42
4.0" NH female thread	4P	ZCC3-4P	2.2	1.00
4.5" NH female thread	4R	ZCC3-4R	3.6	1.61
5.0" NH female thread	4T	ZCC3-4T	3.1	1.40
6.0" NH female thread	4X	ZCC3-4X	4.0	1.81

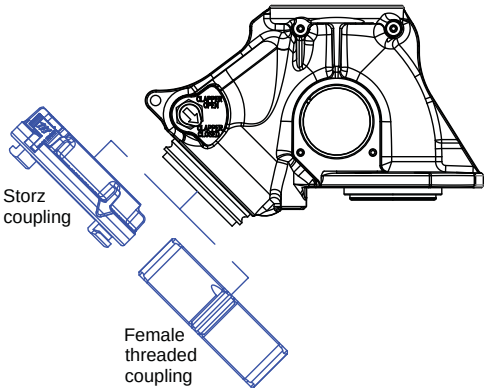
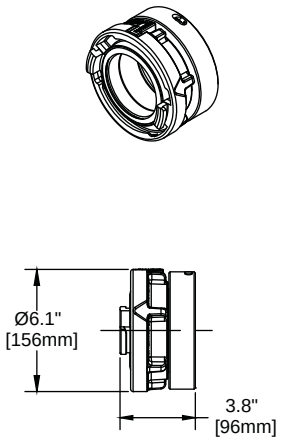
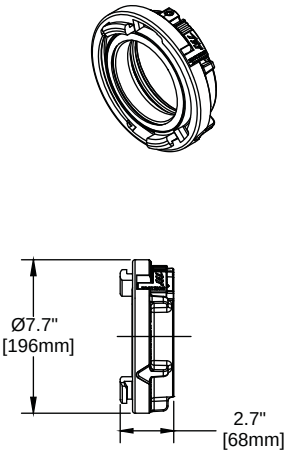


Figure 3.5.4: LDH Inlet Port C3 Options

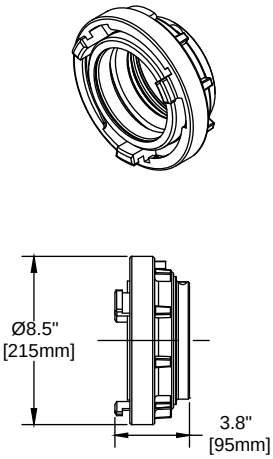
OPTION 1P PART # ZCC3-1P
4.0" Storz



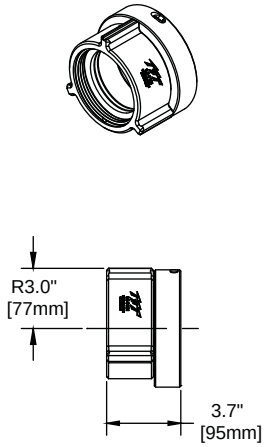
OPTION 1T PART # ZCC3-1T
5.0" Storz



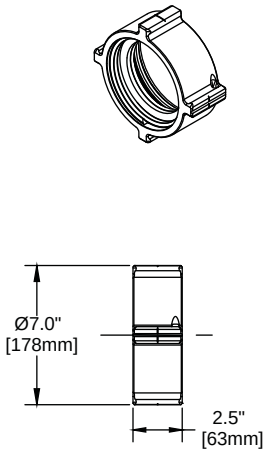
OPTION 1X PART # ZCC3-1X
6.0" Storz



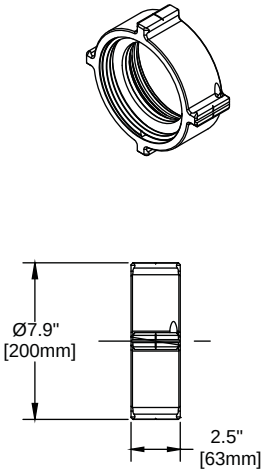
OPTION 7N PART # ZCC3-7N
3.5"NH female thread



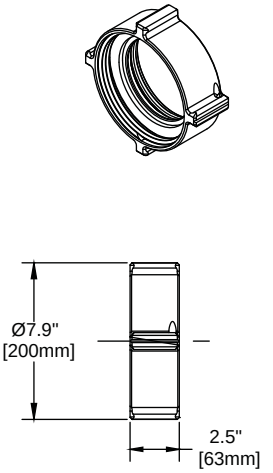
OPTION 7P PART # ZCC3-7P
4.0"NH female thread



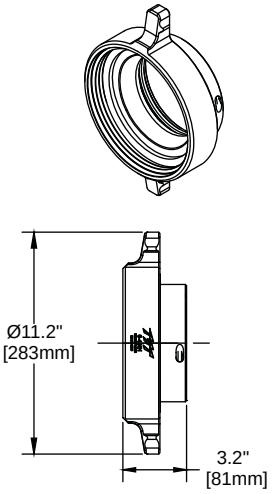
OPTION 7R PART # ZCC3-7R
4.5"NH female thread



OPTION 7T PART # ZCC3-7T
5.0"NH female thread



OPTION 7X PART # ZCC3-7X
6.0"NH female thread



3.5.5 OPTIONS FOR SIDE B OUTLET TO MONITOR (character position 6)

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) or a secure quick connection (options Q and T). 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.

SIDE B OPTIONS (character position 6)	CHARACTER	PART NUMBER	WEIGHT (LB)	WEIGHT (KG)
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	3.40
QUICK CONNECT - 4.5”NHM (for Monsoon, Typhoon, Hurricane & 90° Elbow)	Q	Y4484	2.3	1.04
QUICK CONNECT - 2.5"NHM (for Tornado)	T	Y2432A.1	2.1	0.95

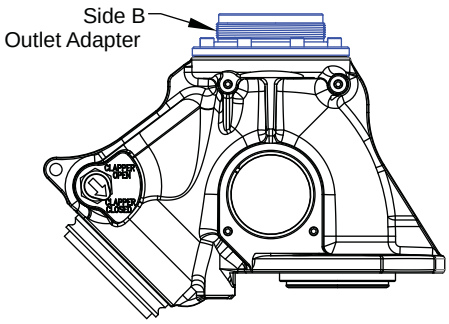
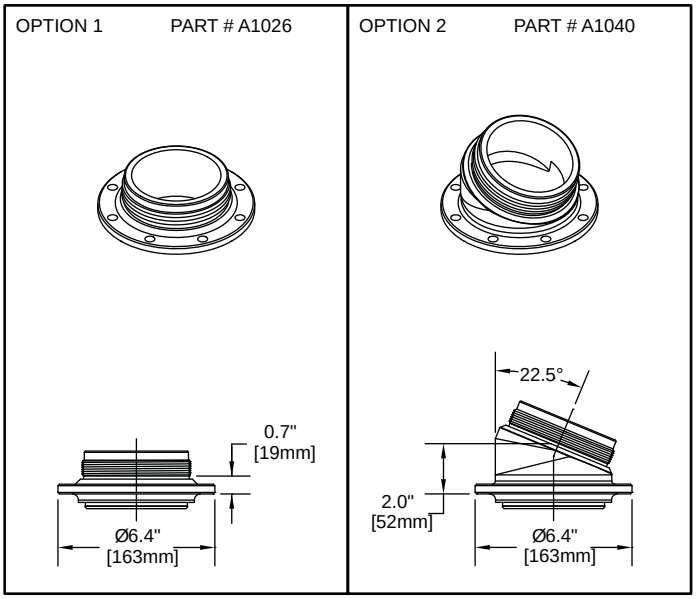
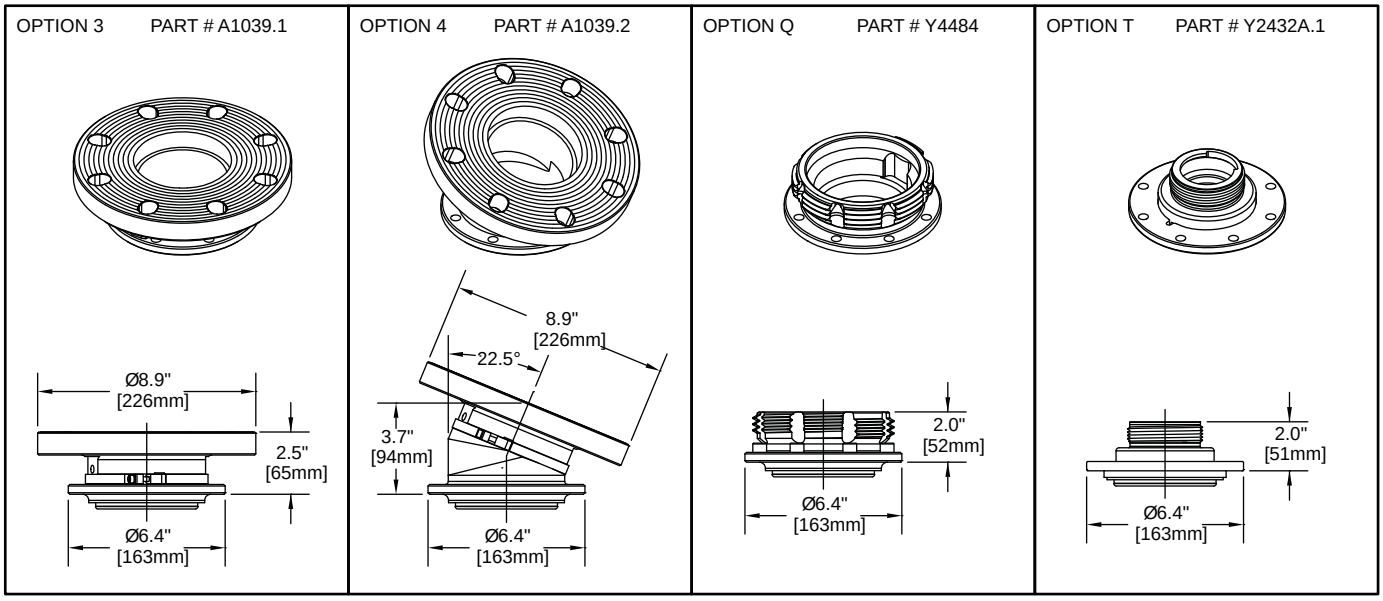


Figure 3.5.5: LDH Inlet Port C3 Options





4.0 INSTALLATION
4.1 STRUCTURAL REQUIREMENTS

⚠WARNING **Injury can result from an inadequately supported monitor. The structure to which the Booster is mounted must be capable of withstanding the internal pressure of the monitor as well as shear and bending forces due to nozzle reaction. Nozzle reaction can be as high as 1500 lb (680 kg) (equivalent to 2000 gpm at 200 psi). Flanges and pipe made from plastic are inadequate for valve mounting and must not be used. The Booster is not intended for portable use.**

4.2 CONNECTION TO WATER SUPPLY

4.2.1 INSTALLATION ON HYDRANT UNDER MONITOR OR INDUSTRIAL VALVE UNDER MONITOR (side A option H)

Refer to figure 4.2.1.

1. Install the supplied o-ring onto the barb that protrudes from the bottom flange of the Booster. Apply silicone grease over the o-ring.
2. Align the Booster with the HUM or IVUM as shown.
3. For the IVUM only, the IVUM Flange Adapter must be oriented such that the non-threaded counter-bored holes are aligned with screw locations 3 and 5, and the threaded holes are aligned with the other six screw locations. Orientation of the Booster to the IVUM is flexible; however it is critical to choose an orientation such that the LDH Inlet Port C3 on the Booster will not interfere with the crank handle on the IVUM.
4. Apply Loctite 242 (blue) thread-locking adhesive to (8) supplied ½-13 x 1.5" screws, then hand tighten into the locations shown until the screw heads are bottomed out. Screw numbers 3 and 5 are inserted up thru the HUM or IVUM, then into the Booster. The other six screws are inserted through the Side A Inlet flange of the Booster.
5. Tighten the (8) screws to 40 to 45 ft-lb (54-61 N-m) torque in the alternating sequence shown on figure 4.2.1. Tighten at graduated intervals of 30%, then 60%, and finally 100% of the specified torque.
6. To install the monitor, see section 4.3.

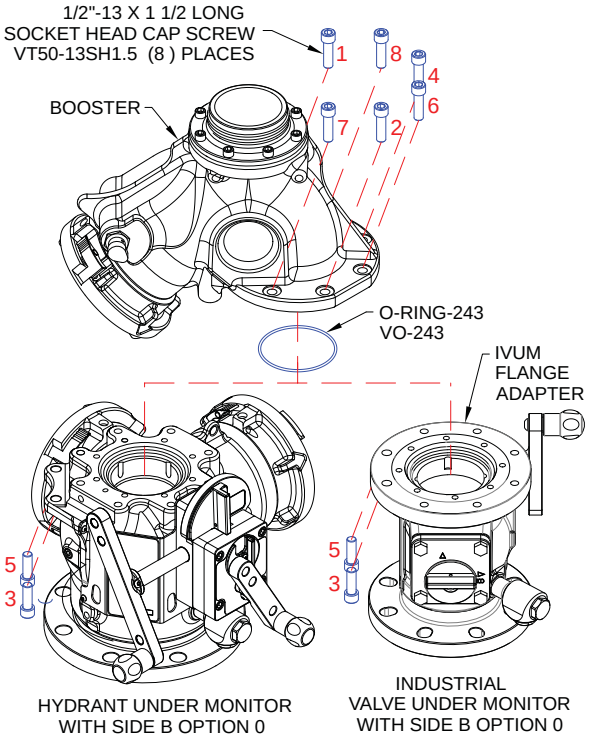


Figure 4.2.1: Installation on HUM or IVUM

4.2.2 INSTALLATION USING 4" ANSI 150 FLANGE INLET ADAPTER (Side A option F)

When Side A option F is specified, the 4" ANSI 150 Flange Inlet Adapter is pre-installed on side A of the Booster. Eight 5/8-11 x 3"bolts, thick washers, and nuts are supplied. One of the nuts and an o-ring seal are pre-installed between the Inlet Adapter and Booster body. To install the Booster on a 4" ANSI 150 flange, refer to figure 4.2.2 and the instructions below.

1. Install a ring gasket between the Booster and the mating flange.
2. Slide (7) 5/8-11 nuts into the notches on the outside of the Flange Adapter. Washers are not necessary under these nuts . The close fit achieved by the notches and hole diameters results in sufficient load bearing area without washers.
3. Slide thick washers over 5/8-11 x 3" bolts. Slide (8) bolts through flanges and tighten into nuts until snug against mating flange. To prevent damage, verify that no bolt ends are close to contacting the Booster body. If they are close, then stack additional thick washers under the bolt heads or substitute studs with nuts. Stainless steel hardware is recommended.
4. Tighten (8) bolts or studs to 76-80 ft-lb (100-110 Newton-Meters) torque in the alternating sequence shown in figure 4.2.2. Tighten at graduated intervals of 30%, then 60%, and finally 100% of the specified torque.
5. To install the monitor, see section 4.3.

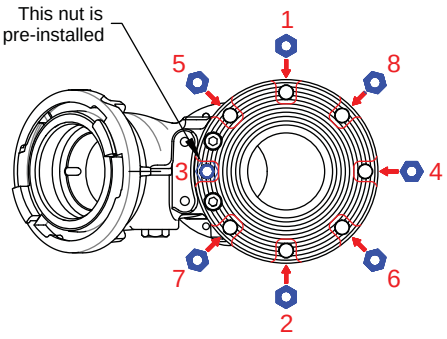


Figure 4.2.2: Installation using 4" ANSI 150 Inlet Adapter

NOTICE

If flange isolation washers are desired for the 4” ANSI 150 flange joint, it is recommended to install them under the bolt heads or nuts on the mating flange (standpipe or hydrant), rather than within the notches on the Booster Inlet Adapter. It is not necessary to install isolation washers on both flanges. The purpose of these washers is to break the electrical connection between two flanges made from dissimilar metals, which can be achieved with isolating washers on one flange only.

4.3 MONITOR INSTALLATION AND COMPATIBILITY

A series of TFT Industrial Monitors has been created specifically for use with the Booster, Hydrant Under Monitor, 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 verified to be compatible with the Booster. All TFT Industrial Monitors feature American Red powder coating and monitor base heights chosen to work well with the Booster, HUM and IVUM. In addition, all Industrial Monsoons and Typhoons include aluminum crank handles on each worm-drive control.

⚠WARNING

Exceeding safe operating range could cause pressure vessels to rupture and result in injury.

- **Do not install shutoff valves downstream of Booster.**
- **When valve upstream of Booster is closed (no flow), do not exceed pressure rating of valve and other upstream devices.**
- **While flowing, do not exceed the lowest operating pressure and flow ratings of any devices assembled together. Safe operating range of Booster is defined in Section 3.1.**
- **Do not install monitor extension pipes between Booster and monitor such as Task Force Tips Extend-A-Gun, Akron 3406 and Elkhart Extender.**
- **Do not exceed 20” (508 mm) monitor height measured from bottom edge of monitor inlet (flange or female thread) to centerline of monitor outlet. Examples of acceptable and forbidden monitors are illustrated in Figure 4.3 Acceptable Monitor Height.**

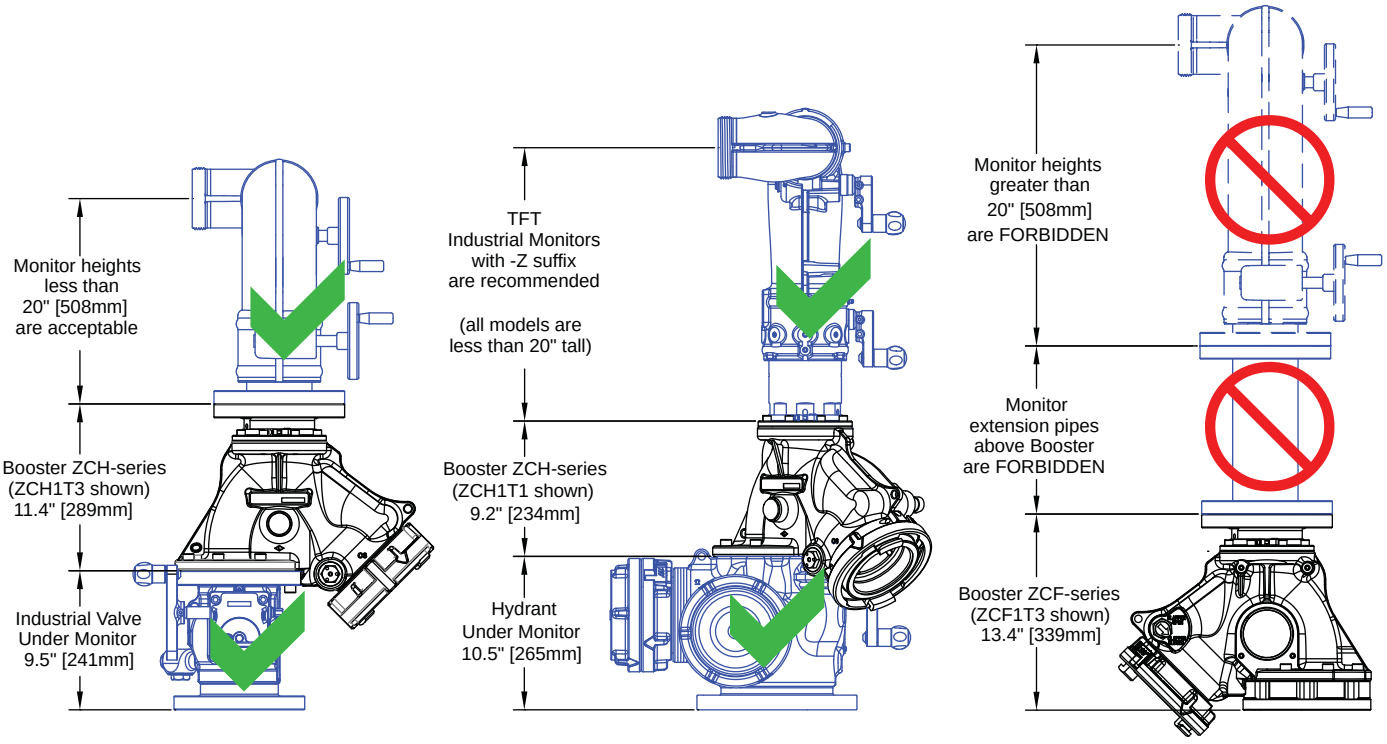


Figure 4.3: Acceptable Monitor Height

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

Refer to figure 4.3.1.

1. Assemble Monitor Base Clamp loosely per instructions from monitor manual. Place clamps over HUM outlet, in an orientation that allows access to tighten the Clamp screws.
2. Screw monitor onto HUM until threaded joint bottoms out. 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.

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.

3. Unscrew monitor until the “Straight Ahead Reference Mark” is facing the desired direction. Monitor may be unscrewed up to one full turn from the bottomed out position.

NOTICE

Monitor will leak if unthreaded more than one full rotation from bottomed-out condition.

4. Ensure that Clamp assembly does not interfere with RC monitor Power/Com Cable (if applicable). Reposition Clamp if needed.
5. Tighten each Screw gradually until both are finger tight with approximately equal spacing between opposite ends of Clamp.
6. 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.

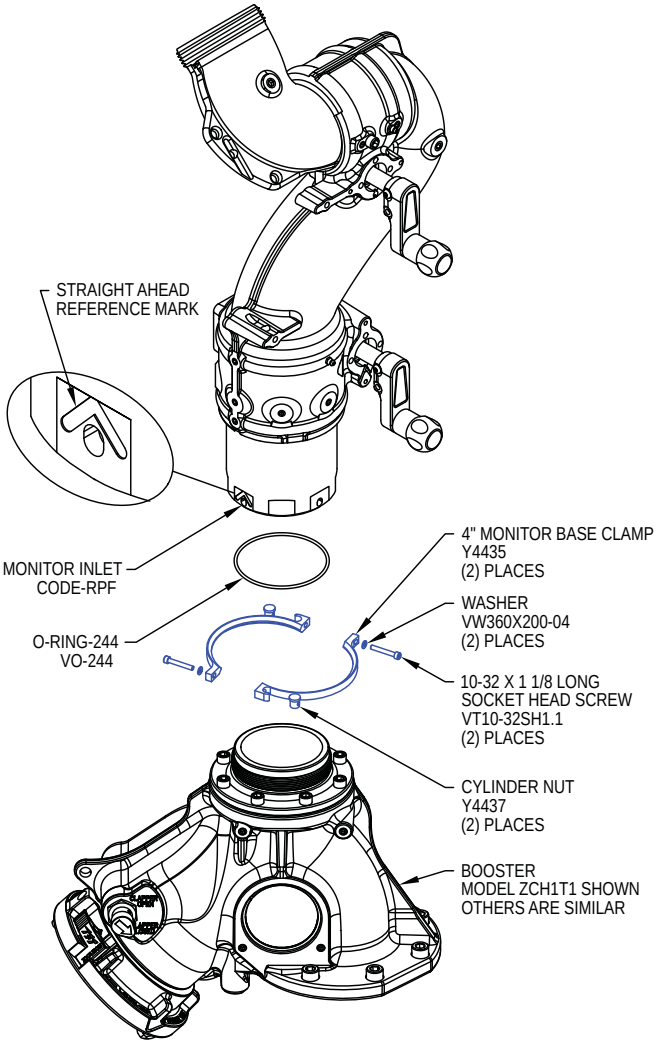


Figure 4.3.1: CODE-RPM Direct Connection

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

Refer to figure 4.3.2.

1. Install a ring gasket between the monitor and Booster.
2. Hand tighten all nuts until snug against the flanges,
3. For 4” ANSI 150 flanges with 5/8-11 bolts or studs, tighten to 76-80 ft-lb (100-110 Newton-Meters) torque in the alternating sequence shown in figure 4.3.2. Tighten at graduated intervals of 30%, then 60%, and finally 100% of the specified torque.

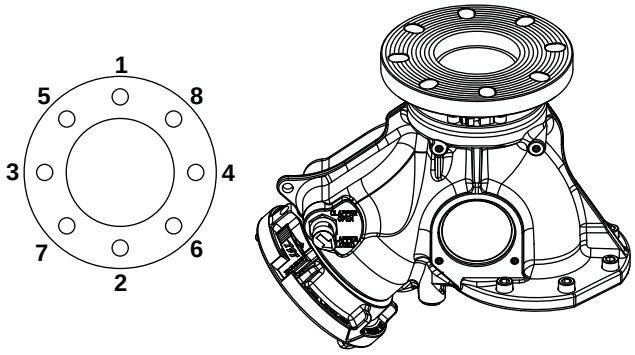


Figure 4.3.2: 4” ANSI 150 Monitor Installation

4.3.3 MONITOR/ELBOW INSTALLATION USING QUICK CONNECT COUPLING (Side B options Q and T)

Refer to figure 4.3.4. Boosters with Side B options Q and T are supplied with the male threaded side of the quick connect installed. A Booster 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 the Booster. 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. To prevent damage, do not use locking pin as a lever to tighten or loosen coupling

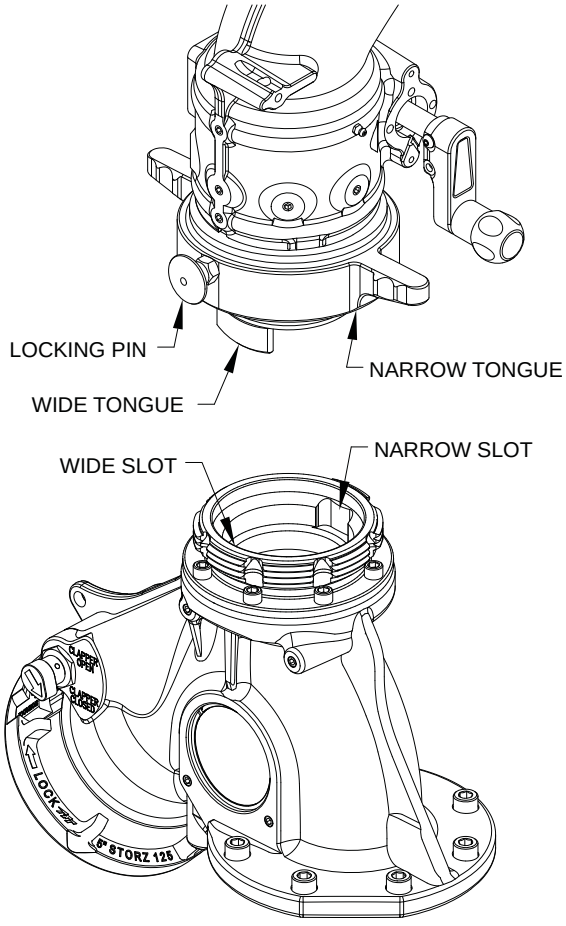


Figure 4.3.3: Quick Connect Installation

5.0 USE

5.1 OPERATION AND CLAPPER POSITION INDICATOR

The Booster has no user controls since it functions automatically when water is supplied from either the Side A Inlet or LDH Inlet Port C3.

Flow through LDH Inlet Port C3 can be immediately verified by observing the clapper position indicator that is rigidly connected to the swing-check valve. Gravity holds the check valve closed unless water pressure is supplied to LDH Inlet Port C3

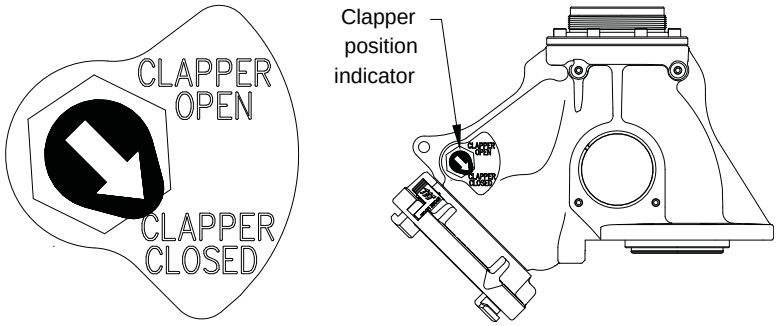


Figure 5.1: Clapper Position Indicator

5.2 TYPICAL USE SCENARIOS

The Booster allows a monitor to receive water from either a standpipe or hydrant below using the Side A Inlet, or from another source that is connected to the LDH Inlet Port C3. Port C3 allows a pump to be connected in line with the source to boost the pressure available to the monitor. Port C3 also allows an inline eductor or other foam injection system to be attached to supply foam solution to the monitor. See section 8.0 PRESSURE LOSS to estimate the performance of each inlet used independently.

NOTICE

To avoid backflow into the water supply, the Side A Inlet and LDH Inlet Port C3 must not be used simultaneously. A valve must be installed upstream of the Side A Inlet to isolate it from the water supply when LDH inlet Port C3 is used. The TFT Hydrant Under Monitor or Industrial Valve Under Monitor models are suitable valves for this purpose. In addition, the Hydrant Under Monitor offers two LDH outlets that can be used to supply a pump or foam eductor. See documents LIZ-055 and LIZ-050 for additional information regarding the TFT Hydrant Under Monitor and Industrial Valve Under Monitor.

5.2.1 SUPPLY MONITOR FROM SIDE A INLET

Refer to figure 5.2.1. Blue shading indicates water delivered to the monitor from the Side A Inlet. When a water supply is introduced from a standpipe or hydrant below the Booster, the swing-check valve (clapper) within the Booster will remain closed to keep Port C3 sealed. Clapper position can be verified visually by viewing the position indicator shown in figure 5.1. The water supply will flow through the Booster to the monitor with minimal pressure loss as described in section 8.0.

To boost the discharge pressure or introduce foam solution to the monitor, see section 5.2.2.

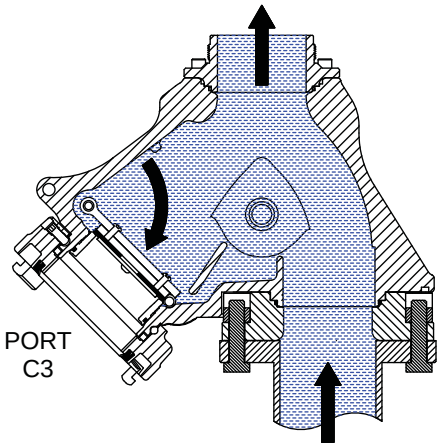


Figure 5.2.1: Supply monitor from Side A Inlet

5.2.2 SUPPLY MONITOR FROM LDH INLET PORT C3 (Boost the pressure or introduce foam solution)

Refer to figures 5.2.2a and 5.2.2b. Blue shading indicates water delivered from the standpipe or hydrant below, and purple shading indicates water that has been supplemented by a pump and/or foam injection device. To boost the discharge pressure or introduce foam solution to the monitor, follow the steps below.

NOTICE

To avoid backflow into the water supply, a valve must be closed upstream of the Side A Inlet. The TFT HUM and IVUM are suitable valves for this purpose.

When the water supply is from an HUM installed below the Booster, see LIZ-055 section 5.2.6 for complete instructions. For water supplies from other sources, follow the instructions below.

1. Close valve installed upstream of the Booster Side A Inlet.
2. Connect a hose from the water supply to LDH Inlet Port C3 of the Booster. Pumps and/or foam injection devices should be connected in this hose line.
3. After all connections have been made, introduce the water supply. When water reaches the Booster, the swing- check valve (clapper) will swing open and the monitor will begin to flow. Clapper position can be verified visually by viewing the position indicator shown in figure 5.1.
4. The pump may now be throttled to achieve the desired nozzle performance. The pressure ratings of the Booster and the monitor must not be exceeded. See section 8.0 to estimate pressure loss through the Booster.
5. When operation is completed, shut the water supply and disconnect all hoses. The Side A Inlet of the Booster must be drained through the upstream device to which it is mounted. See section 5.3 DRAINING RESIDUAL WATER.

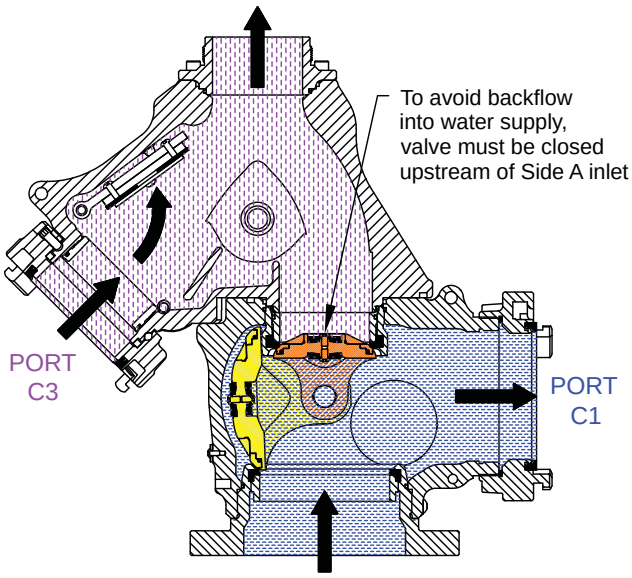


Figure 5.2.2a: Booster mounted to HUM
Pressure boost or foam injection from Port C1into Port C3

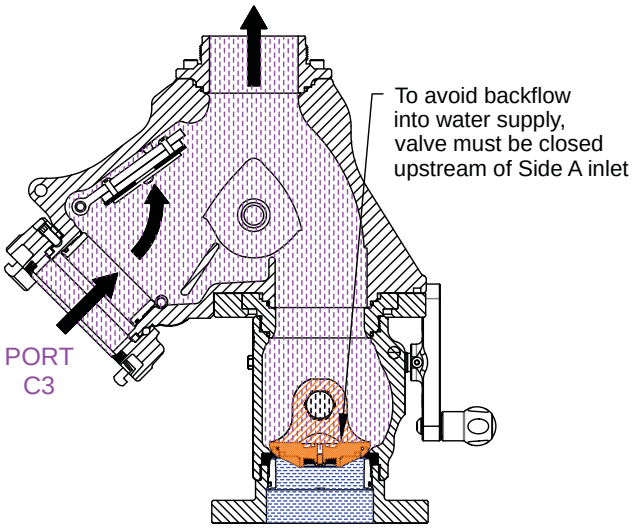


Figure 5.2.2b: Booster mounted on IVUM or other valve
Pressure boost or foam injection from other source into Port C3

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, a drainage port must be opened underground below the frost depth to keep water out of the standpipe until the next use.

Refer to figure 5.3. The automatic water drain valve allows the monitor and Booster body to drain after the upstream water supply is shut off, even with the swing-check valve closed. This minimizes susceptibility to damage from corrosion and freezing water. The drain valve seal membrane is designed to close automatically when pressure exceeds 5 psi. When pressure drops below 5 psi, the seal membrane will open to allow drainage. Proper function must be verified prior to fireground use.

To fully drain the Side A Inlet of the Booster, the upstream device to which it is mounted must also be drained. The TFT Hydrant Under Monitor and Industrial Valve Under Monitor include additional automatic drain valves that serve this purpose.

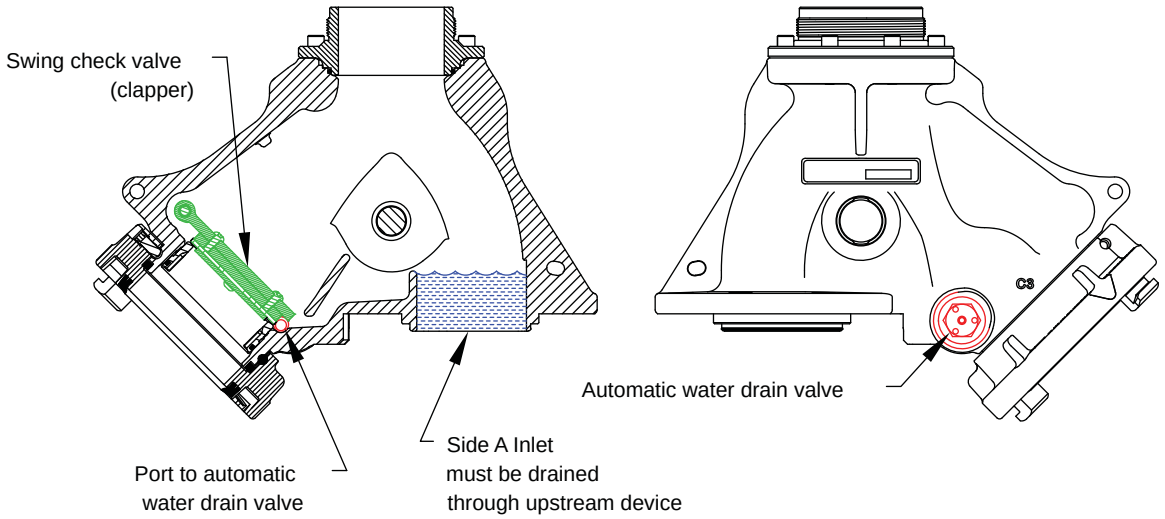


Figure 5.3: Draining Residual Water

6.0 MAINTENANCE AND REPAIRS

The Booster requires no routine maintenance. 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 the valve to service.

The Booster should be inspected annually and after each use. In particular, check that:

- There are no leaks while flowing.
- All water is drained from both inlets to the Booster following use.

7.0 PRESSURE LOSS

The flow coefficients below and curves in figure 8.0 represent all models of the Booster. All data is estimated from the designated inlet to the side B outlet of the Booster only and does not include pressure losses of any upstream or downstream equipment such as hoses, monitors and nozzles. The Cv flow coefficients below apply for water use only, and are calculated according to the formula:

$$C_v = \frac{Q}{\sqrt{\Delta P}}$$ Where Cv = flow coefficient, Q = flow rate in gpm, and ΔP = pressure loss in psi

To calculate pressure loss for a given flow rate through each port, this formula can be rearranged as $$\Delta P = \frac{Q^2}{C_v^{\,2}}$$

Flow from Side A Inlet for ZCH models integrated directly with a TFT HUM or IVUM, Cv = 565.

Flow from Side A Inlet for ZCF models with a 4” ANSI 150 flange adapter, Cv = 510.

Flow from the LDH Inlet Port C3 (all models), Cv = 430.

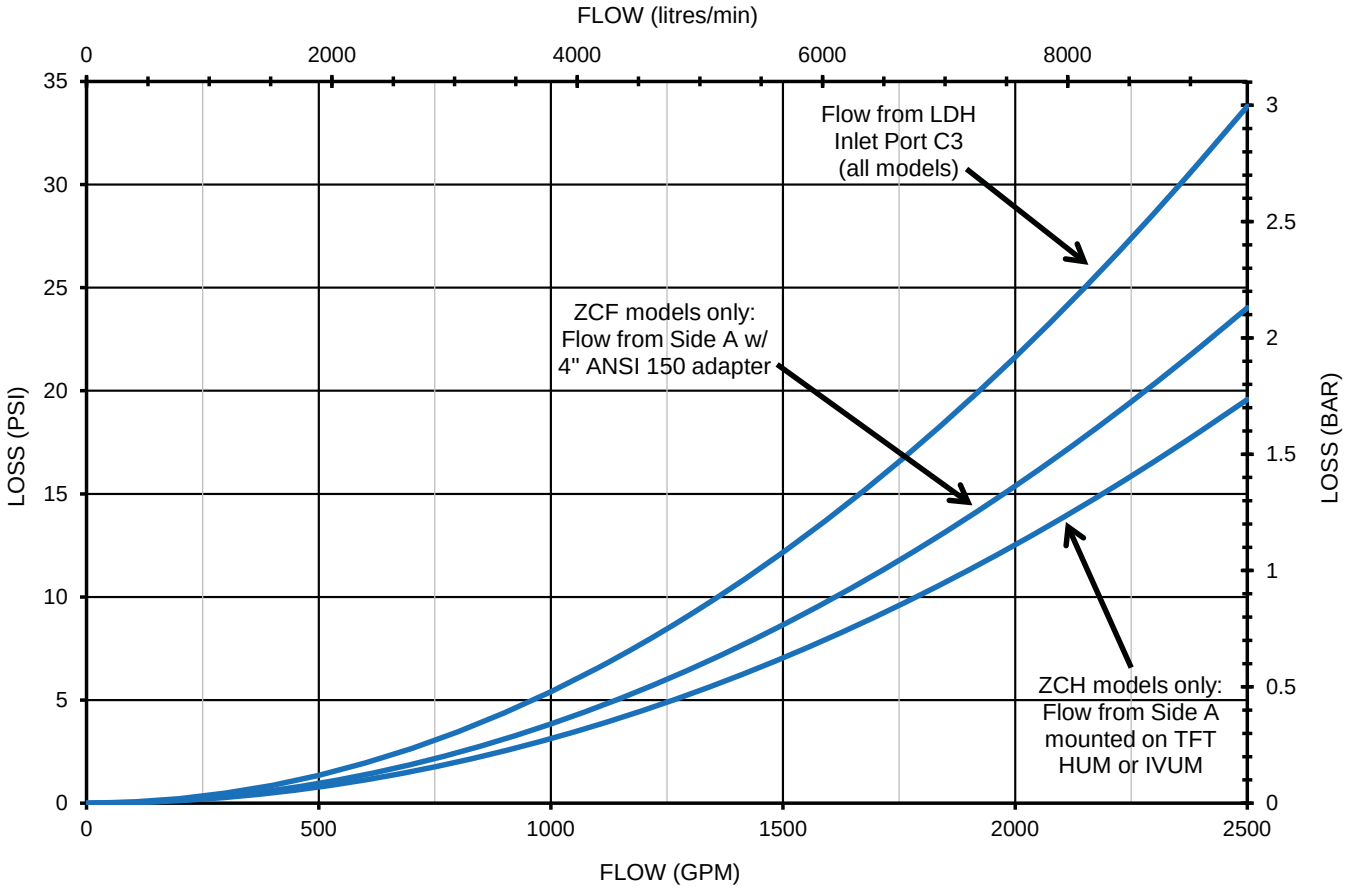
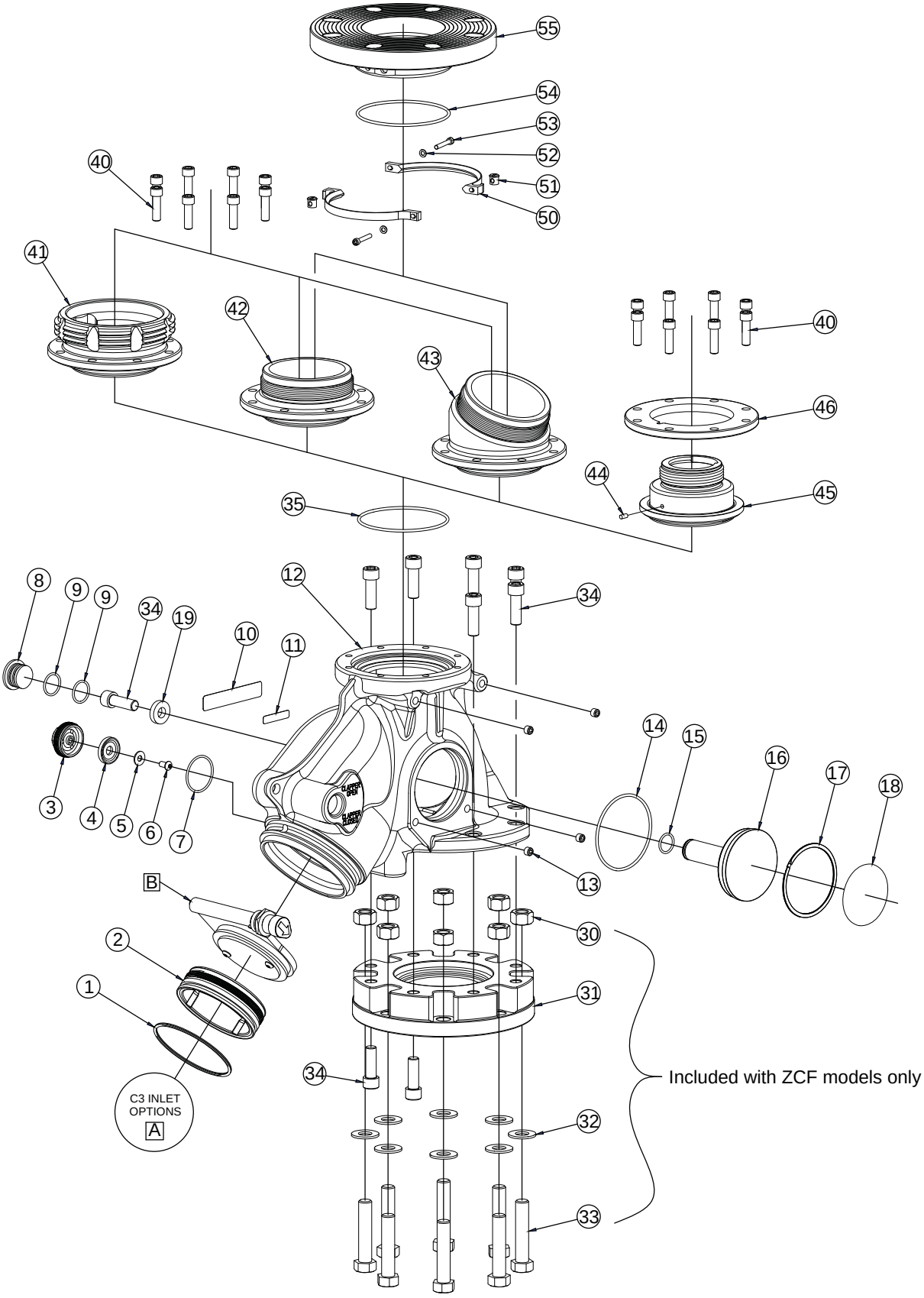


Figure 7.0: Flow rate versus pressure loss curves

8.0 EXPLODED VIEWS AND PARTS LISTS

8.1 OVERALL ASSEMBLY

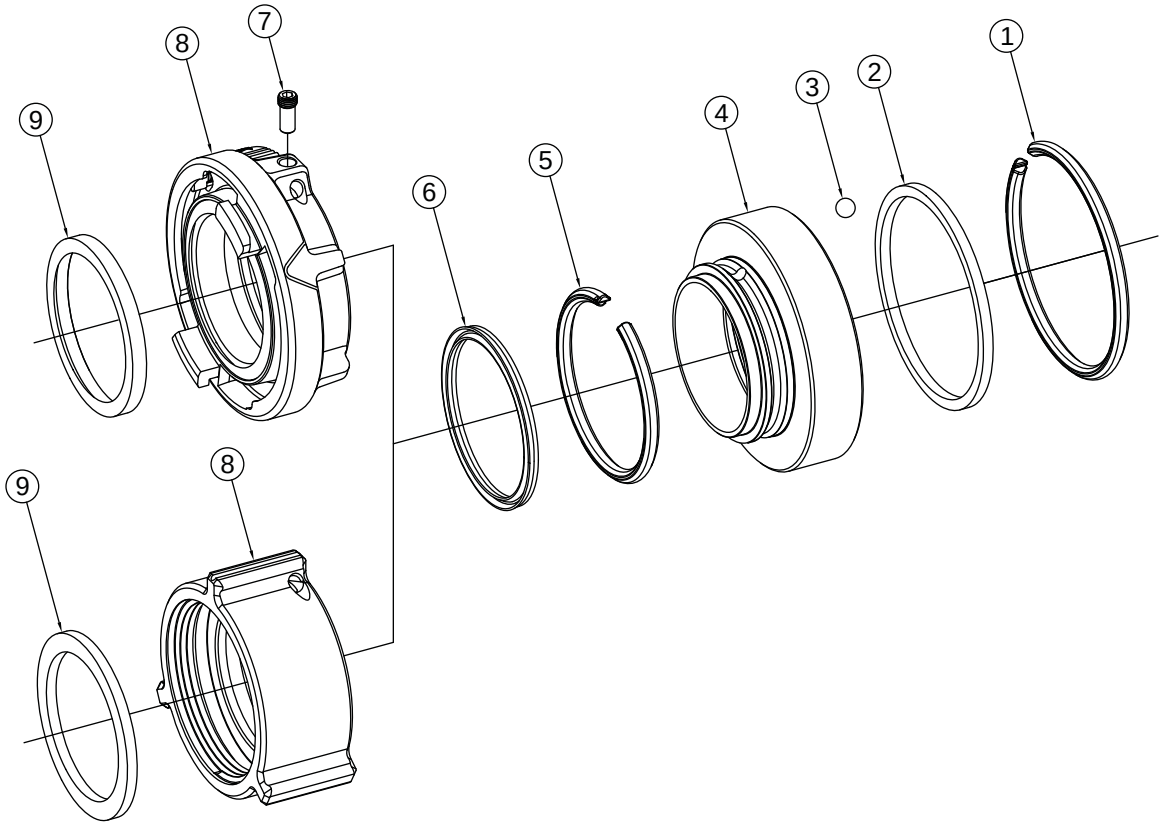
Subassemblies and optional components marked [A] and [B] are shown exploded on following pages



8.1 OVERALL ASSEMBLY

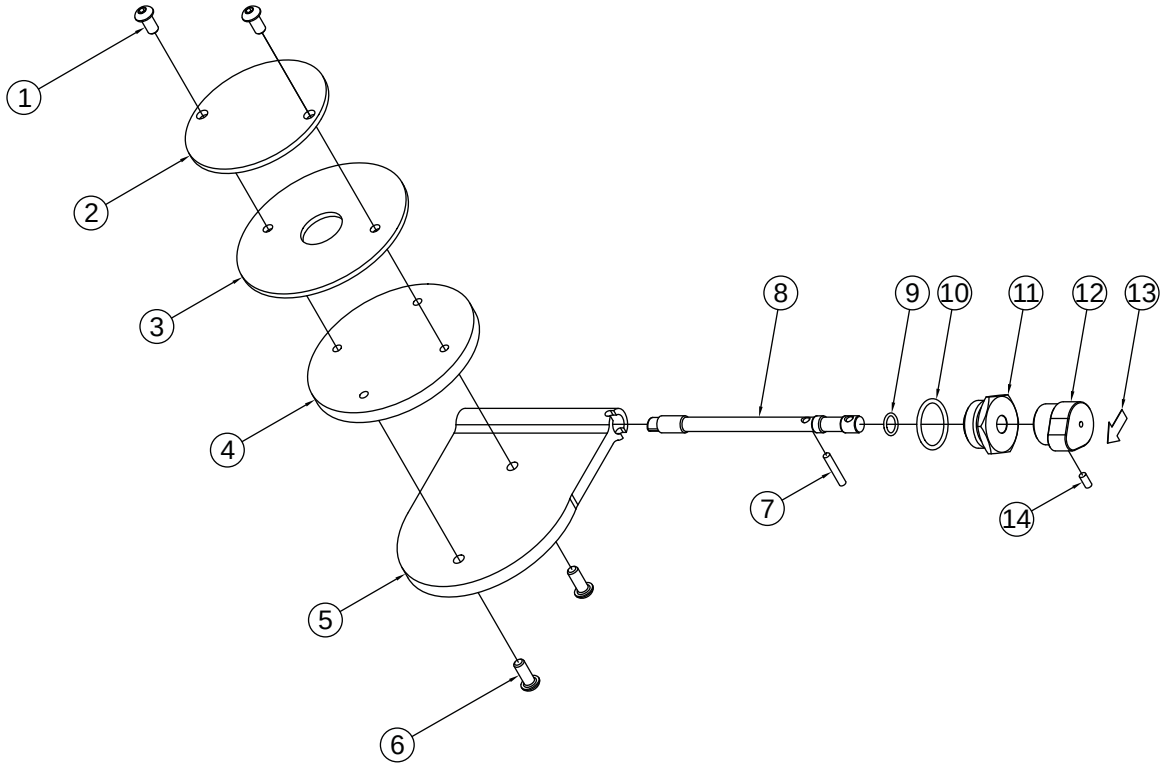
INDEX	DESCRIPTION	QTY	PART #
1	QUAD-RING-242	1	VOQ-4242
2	INNER SEAT RETAINER ALUMINUM	1	A2071
3	DRAIN HOUSING	1	X375
4	DRAIN VALVE	1	X382
5	FLAT WASHER 1/4"	1	VW687X281-50
6	1/4-20 X 1/2 BUTTON HEAD SCREW	1	VT25-20BH500
7	O-RING-130	1	VO-130
8	SHAFT CAP	1	XX037
9	O-RING-119	2	VO-119
10	SERIAL NUMBER LABEL	1	ZB1105
11	MODEL NUMBER LABEL	1	A1303
12	BOOSTER BODY	1	ZB1100
13	3/8-16 X 5/16 SOCKET SET SCREW	4	VT37-16SS312
14	O-RING-238	1	VO-238
15	O-RING-117	1	VO-117
16	TURBINE PORT PLUG	1	ZB1140
17	SMALLEY RING WH-350-S02	1	VR4360
18	NAME LABEL: BOOSTER - FM APPROVED	1	ZB1106-FM
30	5/8"-11 NUT	8	VT62-11NT
31	FLANGE ADAPTER 4"ANSI 150	1	ZB1120
	FLANGE ADAPTER 3"ANSI 150		ZB1122
32	WASHER 1 3/8"OD X 21/32"I.D X 14/.11"THK	8	VW1.3X65-110
33	5/8"-11 X 3" HEX HEAD SCREW	8	VT62-11HX3.0
34	1/2-13 X2 1.5 SOCKET HEAD SCREW	8	VT50-13SH1.5
35	O-RING-243	2	VO-243
40	3/8-16 X 1.25 SOCKET HEAD SCREW	8	VT37-16SH1.2
41	QUICK CONNECT - VUM X 4.5"NHM	1	Y4484
42	OUTLET VUM CODE-RPM	1	A1026
43	OUTLET VUM 22.5 DEGREE CODE-RPM	1	A1040
44	3/16 X 3/8 HDP SPIROL PIN	1	VP188X.38HDP
45	QUICK CONNECT - VUM X 2.5"NHM	1	Y2432A
46	FLANGE VUM FOR SMALL MONITORS	1	Y2433
50	4" MONITOR BASE CLAMP	2	Y4435
51	CYLINDER NUT	2	Y4437
52	WASHER .360 OD X .200 ID X .040 THICK	2	VW360X200-04
53	10-32 X 1-1/4 SOCKET HEAD SCREW	2	VT10-32SH1.2
54	O-RING-244	1	VO-244
55	FLANGE CODE-RPF X 4"ANSI 150	1	A1039
A	C3 INLET OPTIONS	1	SEE SECTION 6.2
B	CLAPPER	1	SEE SECTION 6.3

8.2 LDH INLET PORT C3 OPTIONS [A]



#	DESCRIPTION	PARTS USED PER CONNECTION TYPE							
		4.0" STORZ	5.0" STORZ	6.0" STORZ	3.5" NH FEMALE	4" NH FEMALE	4.5" NH FEMALE	5" NH FEMALE	6" NH FEMALE
1	PLASTIC STRIP	A1291	A1291	A1291	A1291	A1291	A1291	A1291	A1291
2	CUP SEAL	A1596	A1596	A1596	A1596	A1296	A1296	A1296	A1596
3	LOCKOUT BALL	VB.437	--	VB.437	VB.437	--	--	--	VB.437
4	MATE	A4730	--	--	A4730	--	--	--	A4745
5	PLASTIC STRIP	A1292	--	--	A1292	--	--	--	A1290
6	CUP SEAL	A1597	--	--	A1297	--	--	--	--
7	LOCKOUT SCREW	A1294	A1294	--	--	--	--	--	--
8	COUPLING	A4124	A4125	A4126	A4655N	A4660N	A4665N	A4670N	A1266NX
9	GASKET	A4215	A4220	A4225	V3196	V3198	V3210	V3220	V3240

8.3 CLAPPER SUBASSEMBLY [B]



INDEX	DESCRIPTION	QTY	PART #
1	1/4-20 X 1/2 BUTTON HEAD SCREW	2	VT25-20BH500
2	WASHER	1	A2033
3	OUTER CLAPPER SEAL	1	A2032
4	SPACER PLATE	1	A2036
5	CLAPPER	1	A2034
6	1/4-20 X 7/8 BUTTON HEAD SCREW	2	VT25-20BH625
7	5/32 X 7/8 HDP SPIROL PIN	2	V1900
8	PIVOT PIN	1	A2035
9	O-RING-012	1	VO-012
10	O-RING-119	1	VO-119
11	PIVOT CAP	1	G191
12	LOCATOR	1	A5774
13	ARROW LABEL	1	UL220
14	10-32 X 1/4 SOCKET SET SCREW CUP POINT	1	VT10-32SS250

9.0 FM APPROVAL (FACTORY MUTUAL)

FM Approved Booster models are identified with the symbol FM APPROVED on their labels and are listed for use with FM Approved monitor assemblies under FM Approval Class 1421 - Monitor Assembly. These models have also been verified to meet the applicable performance requirements of FM Approvals Class 1210 - Approval Standard for Swing Check Valves.

10.0 ANSWERS TO YOUR QUESTIONS

We appreciate the opportunity of serving you and making your job easier. If you have any problems or questions, our toll-free "Hydraulics Hotline", 800-348-2686, is normally available to you 24 hours a day, 7 days a week.

11.0 WARRANTY

Task Force Tips, Inc., 3701 Innovation Way, Valparaiso, Indiana 46383-9327 ("TFT") warrants to the original purchaser of its Booster ("equipment"), and to anyone to whom it is transferred, that the equipment shall be free from defects in material and workmanship during the five (5) year period from the date of purchase.

TFT's obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by TFT's examination to be in a defective condition attributable to TFT. To qualify for this limited warranty, the claimant must return the equipment to TFT, at 3701 Innovation Way, Valparaiso, Indiana 46383-9327, within a reasonable time after discovery of the defect. TFT will examine the equipment. If TFT determines that there is a defect attributable to it, TFT will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, TFT will assume the expenses of repair.

If any defect attributable to TFT under this limited warranty cannot be reasonably cured by repair or replacement, TFT may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If TFT makes this election, claimant shall return the equipment to TFT free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from TFT any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by TFT. It is agreed and understood that the price stated for the equipment is in part consideration for limiting TFT's liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

TFT shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

THIS IS A LIMITED EXPRESS WARRANTY ONLY. TFT EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY TFT BEYOND THAT STATED IN THIS DOCUMENT.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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