TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

IVUM and IVUM RC
4” Industrial Valve Under Monitor

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.

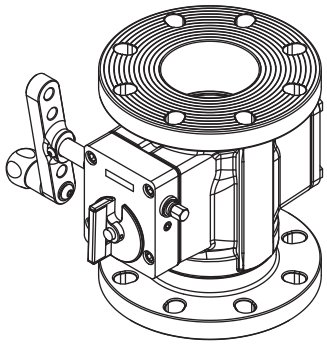
SAFE OPERATING RANGE FOR MONITOR OUTLET:

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)*

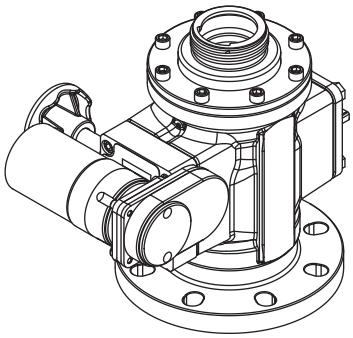
*these maximum flow rates and nozzle inlet pressures are valid for monitor outlets up to 18.6” (472 mm) tall from the IVUM outlet.

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

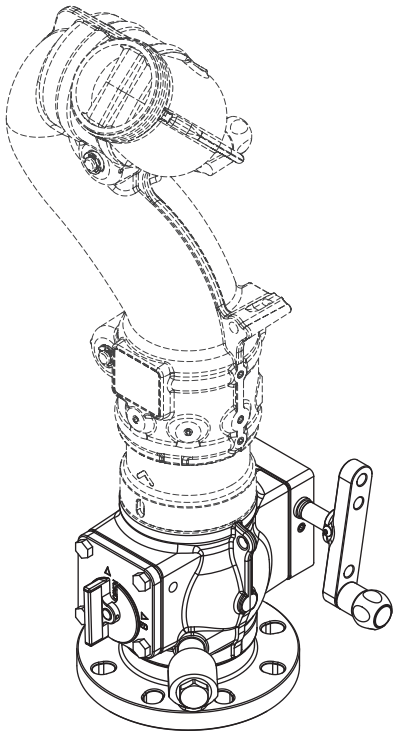
**Do not exceed the rated operating pressure of 300 psi (21 bar). The hydrostatic proof test is performed on a sample valve to ensure it does not visibly rupture, crack or permanently distort at 4 times the rated operating pressure. The purpose of the proof test is to be confident the valve design may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



Model ZAAZ3 or ZASZ3
with 4” ANSI 150 Outlet
(shown from gearbox side)



Model ZAAZT-RC or ZASZT-RC
with 2.5” NH Quick Connect for Tornado
(shown from gearbox side)



Model ZAAZX or ZASZX
for Integrated TFT Monitor
(shown from secondary position indicator side with Y5-D21A-Z)

TASK FORCE TIPS LLC
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LIZ-050 April 10, 2024 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

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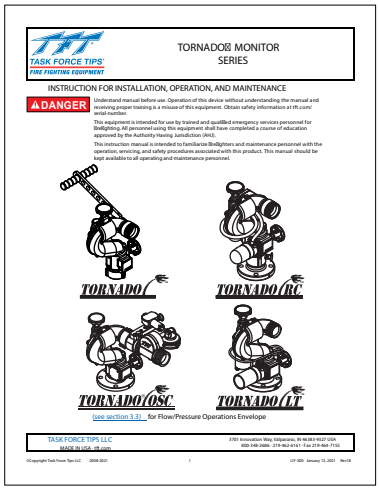
FEMSA

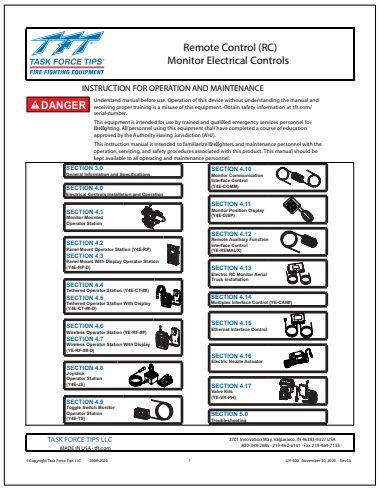
SUPPORTING MATERIALS

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

LIY-250 4.5" Quick Connect Inlets for Elbows and Monitors



LIY-300 Tornado Monitor Series



LIY-500 Remote Control (RC) Monitor Electrical Controls

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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 **This device is not rated as ignition proof, explosion proof, or intrinsically safe. Use only in locations with adequate ventilation and no hazard of flammable vapor buildup.**

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.**

CAUTION **The electric drives are current limited but may still produce enough force to cause injury. To avoid injury from moving equipment:**

- **Be aware that equipment may be remotely operated**
- **Keep hands and fingers away from pinch points**
- **Never operate the manual override while electric controls are in operation**

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

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3.0 GENERAL INFORMATION

The 4” Industrial Valve Under Monitor (IVUM) is a robust, low friction loss valve intended for installation directly beneath monitors on standpipes with 4” ANSI 150 or DN 100 PN16 flange connections. Dual reflective valve position indicators allow 360 degree visual confirmation from a distance in all light conditions. The inlet flange, half ball and valve seat retainer are available in either hard anodized 6061-T6 aluminum or 316 stainless steel.

Several options are available for monitor connection. When paired with a TFT monitor, the monitor flange is omitted to reduce weight, up-front cost and future maintenance expenses.

3.1 SPECIFICATIONS

3.1.1 MECHANICAL

	STANDARD	METRIC
Valve Seat Diameter	3.65”	93 mm
Maximum Operating Pressure	300 psi	21 bar
Maximum Flow at Specified Nozzle Inlet Pressure	2500 gpm @ 130 psi	9500 L/min @ 9 bar
	2000 gpm @ 200 psi	8000 L/min @ 14 bar
	1600 gpm @ 300 psi	6000 L/min @ 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
Worm Drive Gearbox Reduction	7.5 turns open to close (30:1)	
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

3.1.2 ELECTRICAL

Opening/Closing Speed	6 seconds			
Voltage-Auto Sense	12 or 24 Volt DC			
Monitor Current (RC Only)	Nominal		Limit	
	@ 12 VDC	@ 24 VDC	@ 12 VDC	@ 24 VDC
	3 amp	1.5 amp	12 amp	6 amp
Recommended Fuse	20 amp @ 12 Volt		10 amp @ 24 Volt	
Environmental Rating	All components designed to meet minimum rating of NEMA 4 (IP65)			

Table 3.1.2

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3.2 VARIOUS MODELS AND TERMS/INTENDED ORIENTATION

When installed in the orientation shown, the external automatic drain valve will allow the valve and monitor to drain fully after use. An optional internal automatic drain valve allows the standpipe to drain even while the valve is closed. See Section 5.4 on page 17.

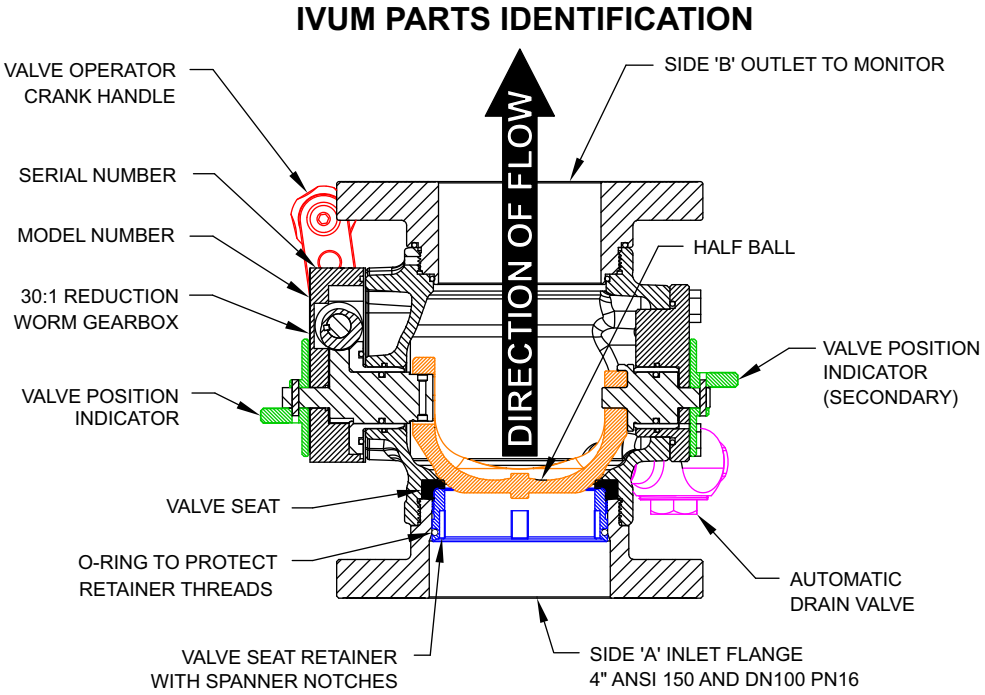

Figure 3.2A

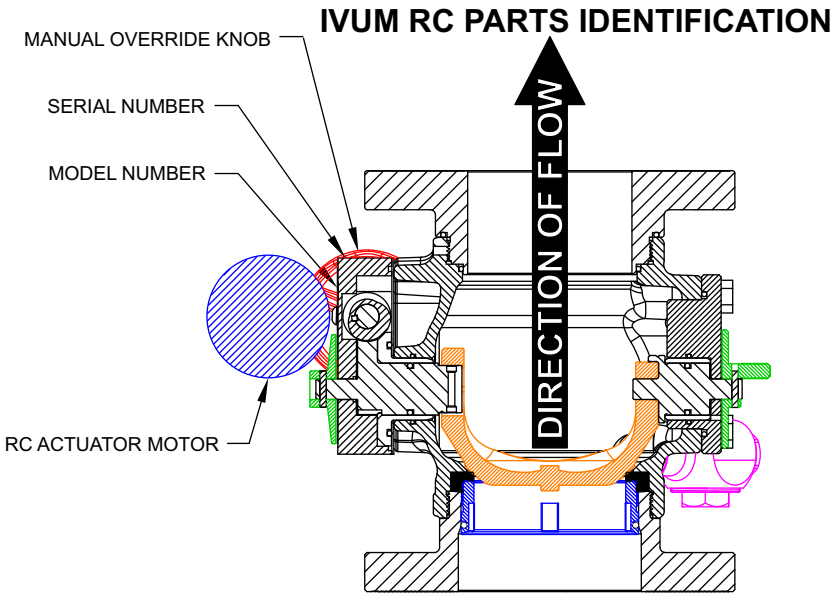

Figure 3.2B

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.

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3.5 IVUM OVERALL DIMENSIONS

The overall height and weight of the IVUM vary according to the side ‘A’ inlet material and choice of side ‘B’ outlet to monitor. The overall height and weight can be calculated by adding the values for the appropriate options shown in section 3.5 through section 3.7.

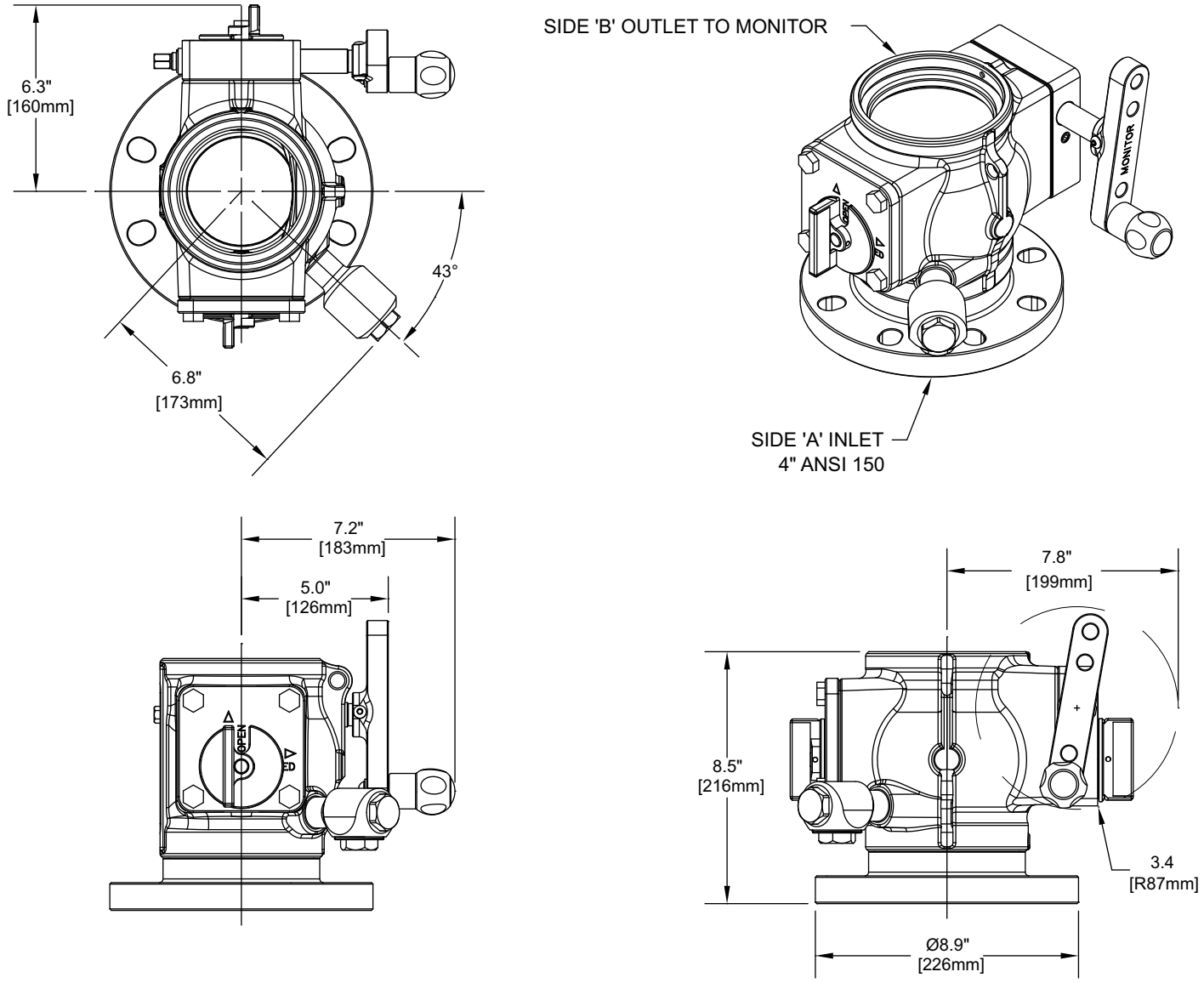

Figure 3.5

IVUM WEIGHT WITHOUT MONITOR OUTLET

MODEL	SIDE A Option for Flange, Seat Retainer, and Half Ball	WEIGHT - lb (kg)
ZAAD*	Hard anodized Aluminum with internal drain in half ball	18.3 (8.3)
ZAAZ*	Hard anodized Aluminum without drain in half ball	18.3 (8.3)
ZASD*	316 Stainless Steel with internal drain in half ball	29.6 (13.4)
ZASZ*	316 Stainless Steel without drain in half ball	29.6 (13.4)

Table 3.5

Third character of model number signifies inlet material (‘A’ for Aluminum, ‘S’ for Stainless Steel).
Fourth character of model number signifies the internal drain option (‘D’ for drain, ‘Z’ for no drain).
All models come standard with an external automatic drain valve.

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3.6 IVUM RC OVERALL DIMENSIONS

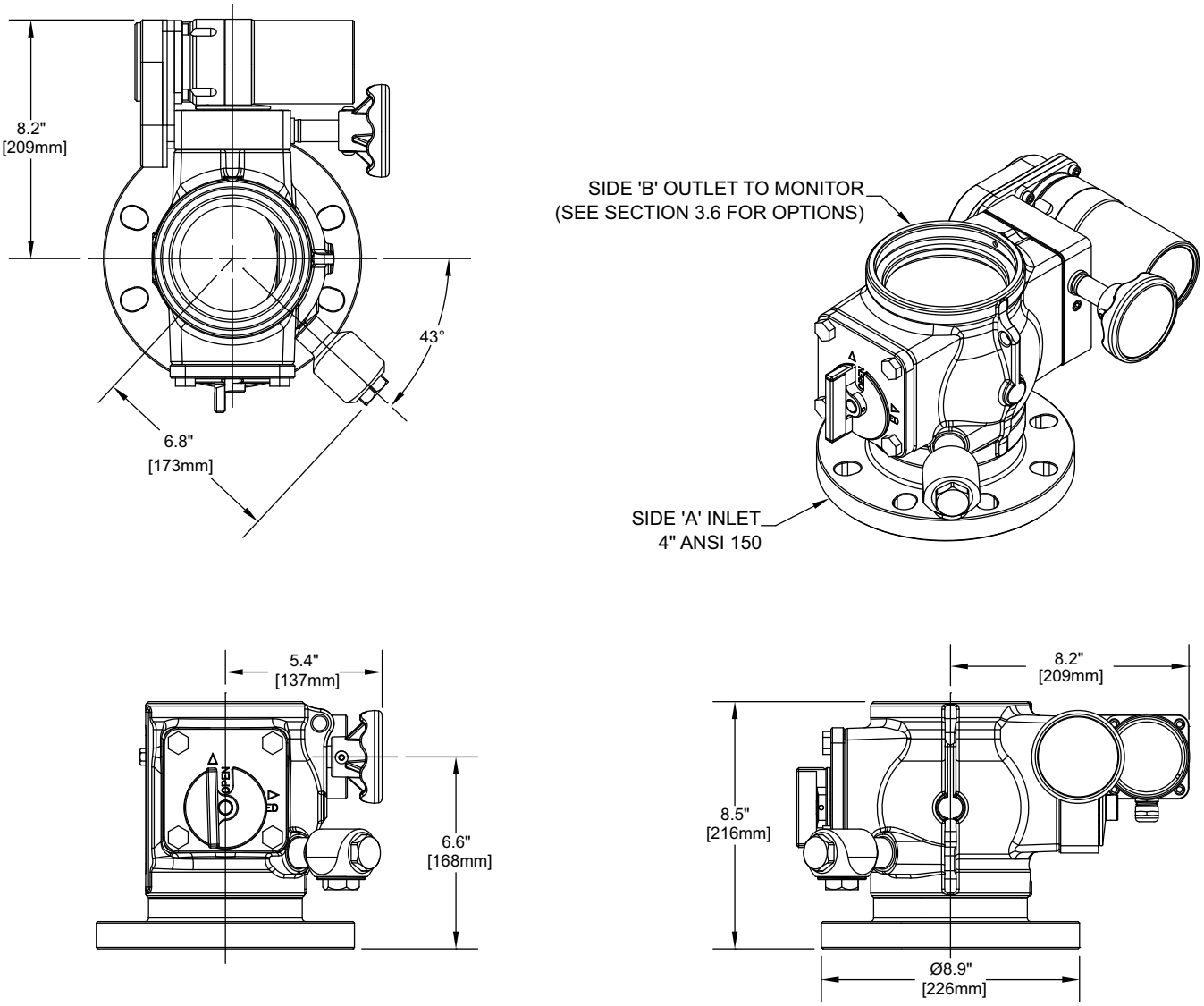

Figure 3.6

IVUM WEIGHT WITHOUT MONITOR OUTLET

MODEL	SIDE A Option for Flange, Seat Retainer, and Half Ball	WEIGHT - lb (kg)
ZAAD*-RC	Hard anodized Aluminum with internal drain in half ball	26.0 (11.8)
ZAAZ*-RC	Hard anodized Aluminum without drain in half ball	26.0 (11.8)
ZASD*-RC	316 Stainless Steel with internal drain in half ball	37.3 (16.9)
ZASZ*-RC	316 Stainless Steel without drain in half ball	37.3 (16.9)

Table 3.6

Third character of model number signifies inlet material ('A' for Aluminum, 'S' for Stainless Steel).
Fourth character of model number signifies the internal drain option ('D' for drain, 'Z' for no drain).
All models come standard with an external automatic drain valve.

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3.7 SIDE B MONITOR OUTLET OPTIONS

DESCRIPTION	OPTION	PART NUMBER	WEIGHT lb	WEIGHT (kg)
CODE-RPM direct connection for TFT monitor, STRAIGHT	1	A1026.4	4.0	1.8
CODE-RPM direct connection for TFT monitor, ANGLED 22.5°	2	A1040.4	5.0	2.3
4" ANSI 150 FLANGE, STRAIGHT	3	A2080	5.4	2.4
4" ANSI 150 FLANGE, ANGLED 22.5°	4	A1039.4	9.7	4.4
3” ANSI 150 FLANGE, STRAIGHT	5	A2082	4.7	2.1
QUICK CONNECT - 4.5”NH (for Monsoon, Typhoon, Hurricane & 90° Elbow)	Q	Y4484.4	4.5	2.0
QUICK CONNECT - 2.5”NHM (for Tornado)	T	Y2432A.4	4.3	1.9
TORNADO INTEGRATED BASE FOR VUM (built-into Tornado monitors Y2-TV1A and Y2-EV1A only)	V	N/A	2.2	1.0
LARGE MONITOR INTEGRATED BASE FOR IVUM (built-in to Monsoon, Typhoon & Hurricane monitor models with ‘X’ inlet option)	X	N/A	0.0	0.0

Table 3.7

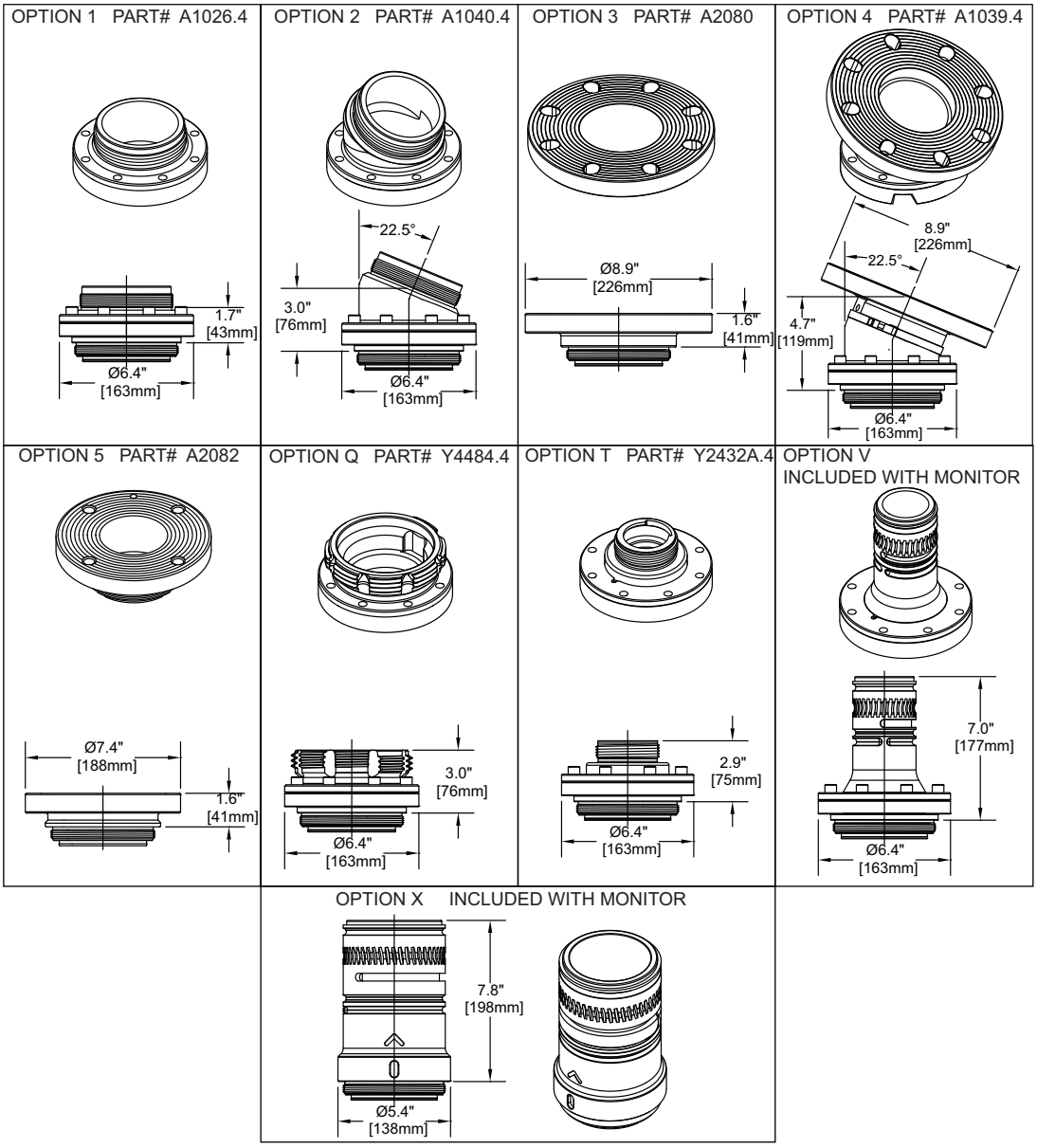

Figure 3.7

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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 FOR PIPE FLANGE MOUNTED MONITORS

⚠WARNING

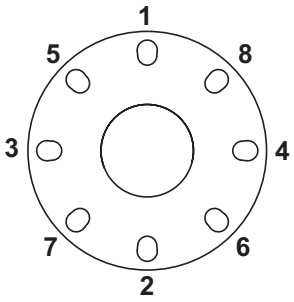
Reaction forces generated are capable of causing injury and property damage if not properly supported. Nozzle reaction can be as high as 1500 lbs (680 kg) (equivalent to 2000 gpm at 200 psi or 1600 gpm at 300 psi). To reduce the risk of injury due to an inadequately supported device:

- **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

This section pertains to bolting the valve to the standpipe, as well as bolting the monitor to the valve for SIDE B options 3, 4, and V. 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.

See section 4.2 for SIDE B instructions and torque requirements.



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

4.3 MONITOR INSTALLATION AND COMPATIBILITY

⚠WARNING

Keep monitor discharge height within acceptable limits. Injury can result from the reaction forces when the monitor discharge height is more than 18.6” (472 mm) from the valve outlet. Avoid use of exceptionally tall monitors, accessories between valve and monitor, or telescopic waterways such as the Task Force Tips Extend-A-Gun which exceed the acceptable monitor discharge height.

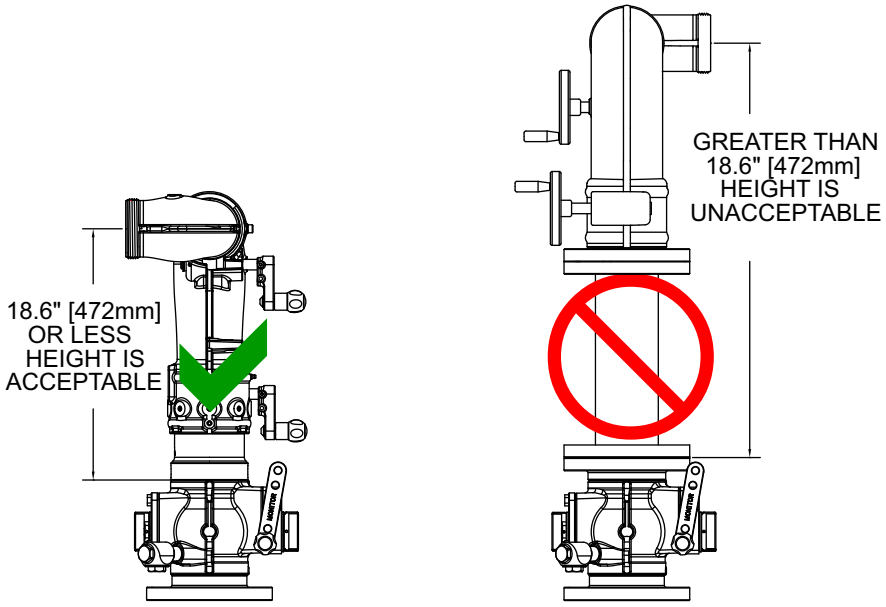


Figure 4.3

4.3.1 FLANGED MONITORS (Side B options 3, 4, and V)

Install monitor on valve using the alternating bolt tightening sequence shown in figure 4.2.

- **For options 3 and 4**, install a ring gasket and tighten 5/8-11 bolts or studs to 76-80 ft-lb (100-110 N·m).
- **For options V**, install an o-ring on barb protruding from bottom of flange and apply silicone grease over O-ring. Align as desired, then draw O-ring into valve body by partially tightening alternate bolts.
- **For option V - Tornado monitor**, torque 3/8-16 x 1.0” long bolts to 180 to 200 in-lb (15-17 ft-lb; 20-23 N·m).

4.3.2 INTEGRATED MONITORS (Side B option X)

1. Apply silicone grease to barb and male threads on monitor base. Slide O-ring over barb, then apply silicone grease over the O-ring.
2. Apply silicone grease to face seal groove near thread, then install O-ring into groove. Apply silicone grease over the O-ring.
3. Install monitor on valve and tighten with spanner wrench until the joint is bottomed out, then loosen until one of the milled pockets in the male thread is lined up with the screw hole in the valve body.
4. Apply Loctite 242 (blue) to 1/4-20 x 1/2” long cup point set screw. Tighten screw into pocket in male thread until screw head is snug against valve body.

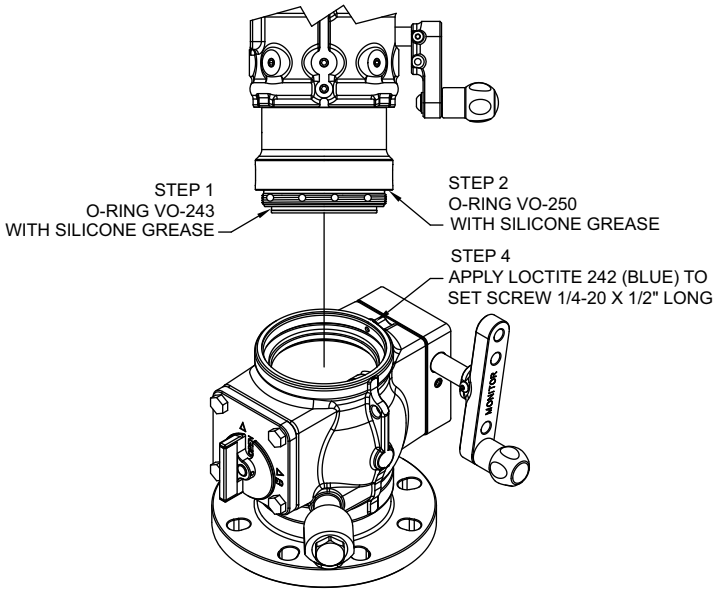


Figure 4.3.2

4.3.3 QUICK CONNECT FOR MONITORS AND ELBOWS (Side B options Q and T)

1. See monitor manuals and quick connect supplement for details (literature numbers LIY-250 and LIY-300).
2. If equipped with locking pin, hold pin out and push coupling up as far as it will go, then release locking pin. This will hold the coupling out of the way while mounting the monitor on the base.
3. Align tongue(s) of female inlet into notches within male threaded outlet. This serves as a rotational lock.
4. 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 coupling if locking pin ends up between detent positions.

NOTICE **To prevent damage, do not use locking pin as a lever to tighten or loosen coupling.**

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4.3.4 CODE-RPM DIRECTION 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.

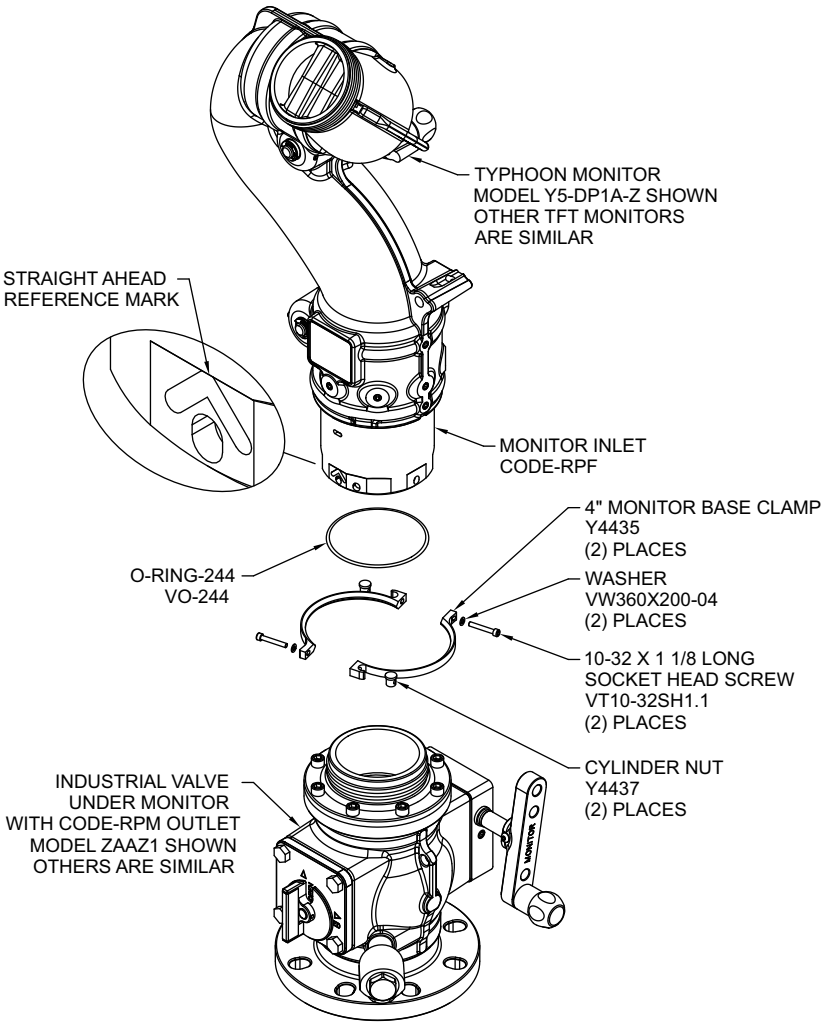

Figure 4.3.4

4.4 ELECTRONIC INSTALLATION AND WIRING

Red (+) and black (-) wires of the Valve Interface Box must be connected to a 12 or 24 VDC protected circuit from the power distribution center. To control the valve from a TFT RC monitor operator station, the valve's Blue and White communication wires must be connected to the monitor's blue and white wires as described in section 2.0 of LIY-500 RC MONITOR ELECTRICAL CONTROLS SUPPLEMENT. Figure 4.4 shows the IVUM RC typical interface box connections.

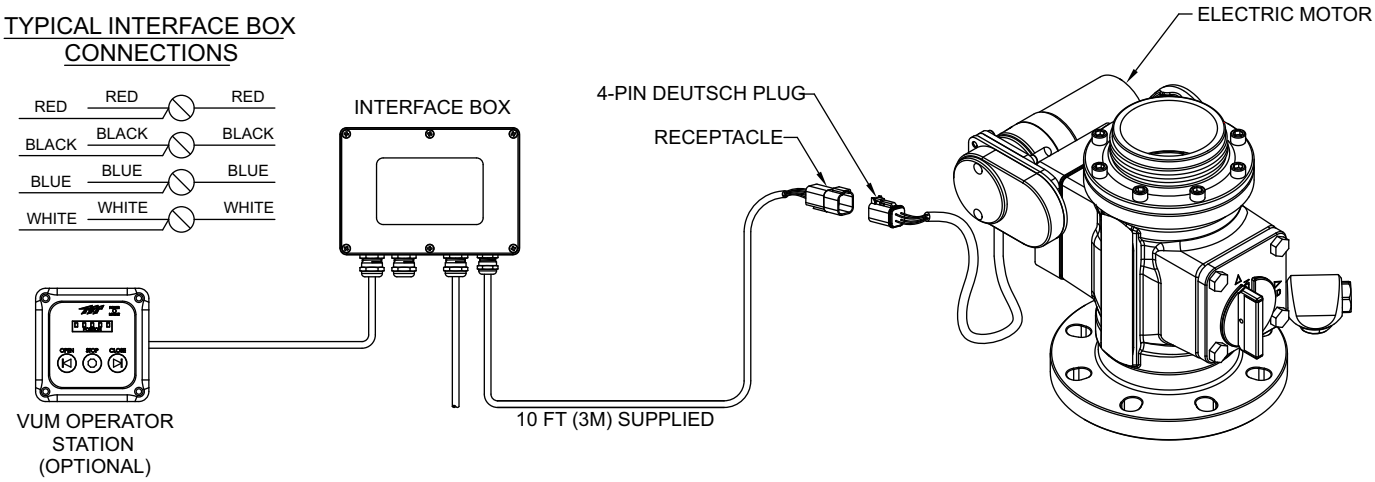

Figure 4.4

	12 VDC Nominal System	24 VDC Nominal System
Minimum voltage at Interface Box	10 volts	18 volts
Valve motor current draw	10 amps	5 amps
Voltage drop at factory supplied cable	1/4 volt	1/3 volt

Table 4.4

NOTICE

To avoid excessive voltage drop at the valve motor, do not lengthen factory supplied receptacle cable. Power cable selection is critical. Voltage supplied to the valve motor should not fall below 10 Volts when the valve is in operation.

NOTICE

In applications where the only valve control will be from a TFT operator station and no feedback relays are required, it is acceptable to install the RC VUM without the valve interface box. The 4-conductor cable with receptacle can be removed from the interface box. The installer must make appropriate connections to a protected circuit and the monitor communication wires, as described above, in a protected enclosure.

NOTICE

Cable is gel filled to prevent moisture wicking into the enclosure. Gel is non-hazardous and should be wiped from conductors with a rag.

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4.4.1 INTERFACE ENCLOSURE MOUNTING

Select an enclosure location. The enclosure is designed to be surface mounted and the size is 4 3/4 x 6 3/4 (120 mm x 170 mm). Height of enclosure is 2 1/4" (57 mm). A full size template is provided below.

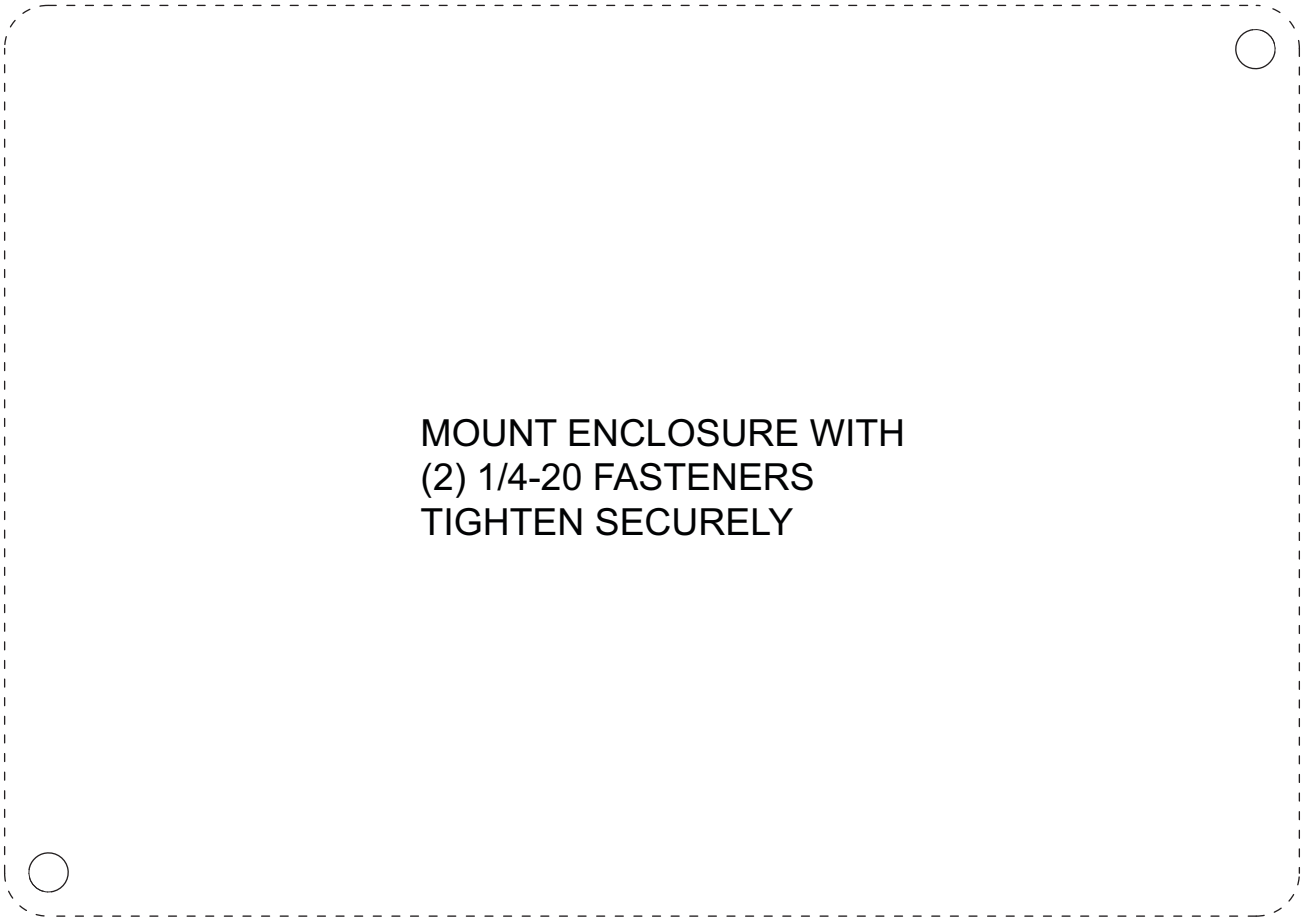

Figure 4.4.1

4.4.2 TESTING THE ELECTRICAL INSTALLATION

VERIFY PROPER VOLTAGE

The TFT Ball Intake Valve RC has built in circuit protection to guard against a circumstance where the unit's movement is blocked before reaching its full travel limits. Without this circuitry the motor would stall, overheat, and could be permanently damaged.

⚠WARNING **Inadequate voltage cause the valve to become damaged to the point of inability to properly open or close, resulting in inadequate water supply. Injury or death can occur. To reduce the risk of improper voltage:**

- **Check wiring for proper gauge for the installed length, and for proper termination.**
- **Never lengthen factory supplied receptacle cable.**
- **Ensure that the power source supplying the BIV RC and the grounding are adequate (other electrical loads on a shared circuit with the BIV RC may cause a low-voltage situation).**
- **ALWAYS test for proper voltage after installation.**

VOLTAGE TEST

When mechanical installation and electrical connections are complete, perform the following test to verify voltage supply is adequate and the current limiting feature is functioning.

10. Apply power to Valve Control.
11. Press OPEN or CLOSE button and hold until valve reaches stop position. Continue to hold button down.
12. Once movement is stopped, manually turn override knob in opposite direction while continuing to hold button down. (The override knob will only turn in one direction.
    A. If knob can be turned, then voltage supply is adequate.
    B. If knob can't be turned and motor continues to operate, the current limit was not reached because the voltage supply or wiring is not adequate.

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SET TRAVEL STOPS

Once proper voltage is verified, perform the following to set the full travel limits:

1. Apply power to Valve Control.
2. Press CLOSE button and continue to hold until valve is fully closed. Motor must stop by current limit method.
   A. If motor continues to operate, see proper voltage test above.
3. Press OPEN button and continue to hold until valve is fully open. Motor must stop by current limit method.
   A. If motor continues to operate see proper voltage test above.
4. OPEN/CLOSE input relays will now track valve movement.

4.5 INPUTS SIGNAL CONFIGURATION

The Valve Interface box is shipped from the factory configured to accept +12/24 volt DC input signals, but can be field changed to accept ground input signals. To change configuration:

1. Remove the lid from the box.
2. Locate DIP switches on the A5830 board.
3. Slide DIP switch #4 to the OFF position to select GROUND inputs, or slide to the ON position to select VOLTAGE input.
4. Replace the lid.
   A. Verify rubber seal is clean and undamaged.
   B. Verify that no wires are caught between lid and box.

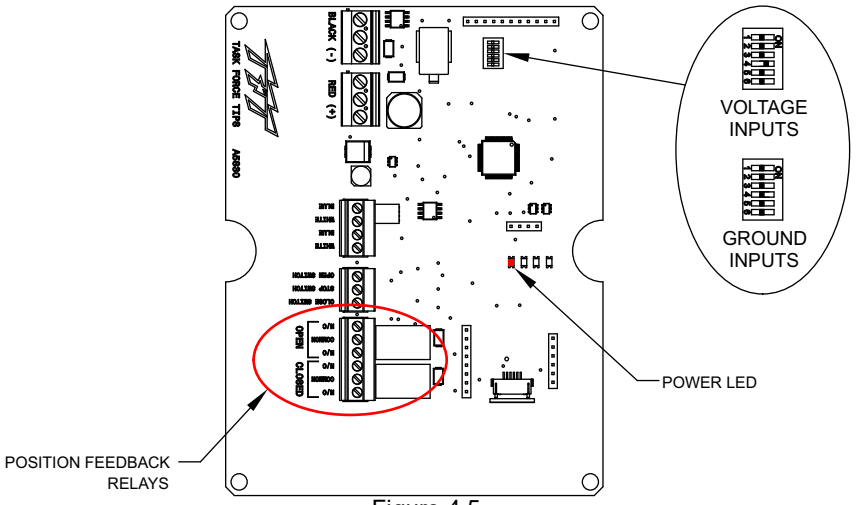

Figure 4.5

4.6 VALVE POSITION FEEDBACK RELAYS

The Valve Interface Box provides position feedback for the user to indicate which position the valve is in. The position relays are energized when the valve is in the corresponding position. The contact rating of the relay is 1 amp @ 30 VDC for resistive loads and 0.2 amps @ 30 VDC for inductive loads.

The position relays have one dry Form-C contact (common, normally open, normally closed) that can be used. Figure 4.5 shows the terminal blocks available for user wiring.

4.7 AUX BUTTON OPERATION

The IVUM RC can be operated from any TFT RC Monitor operator station equipped with AUX 1/AUX 2 buttons. The IVUM RC is factory configured to operate from the AUX 2 button, but can be changed to operate from the AUX 1 button. To change AUX button operation:

1. Turn off power.
2. Remove the retaining ring and cap from the back of the motor.
3. Slide DIP switch #1 to the desired position.
4. Replace the cap and retaining ring.
5. Apply Power.

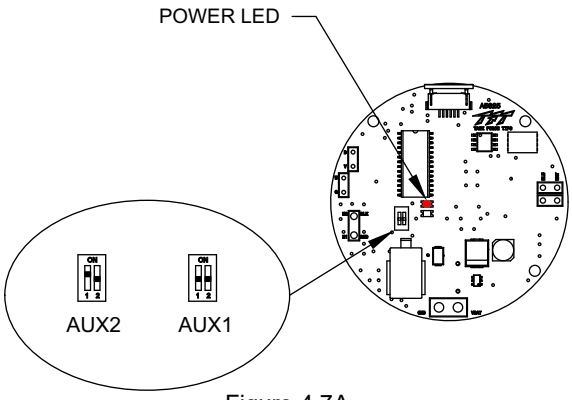

Figure 4.7A

Each IVUM RC is shipped with several button overlays with adhesive that can be attached to any RC monitor operator station with an AUX button. If additional overlays are needed, contact the factory.

To apply the overlay:

1. Clean operator station surface to remove any oils or residues.
2. Carefully peel off the desired overlay and place on top of AUX button, just inside blue border of button.

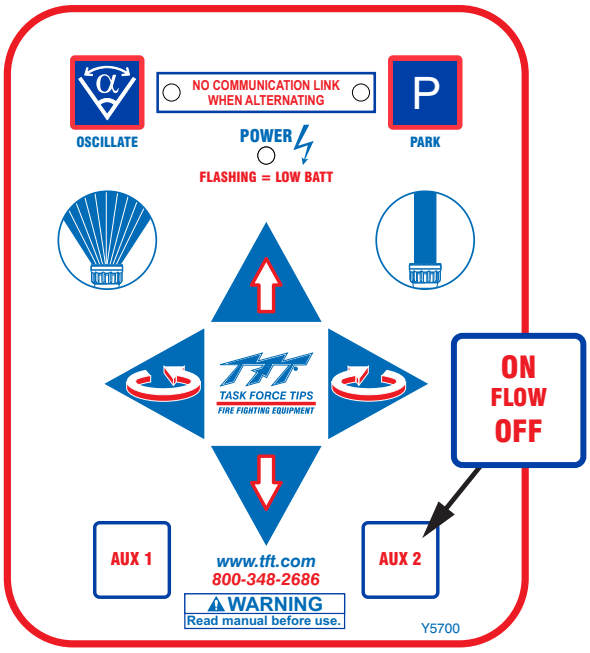

Figure 4.7B

5.0 USE

5.1 VALVE OPERATION AND POSITION INDICATORS

To open the valve, turn the crank handle counter-clockwise until the pointer on the gearbox indicates “OPEN”.

To close the valve, turn the crank handle clockwise until the pointer indicates “CLOSED”.

A secondary position indicator is included on the opposite side of the valve to allow 360° verification of valve position. When the valve is open, reflective flags on each indicator are parallel to the direction of flow through the valve.

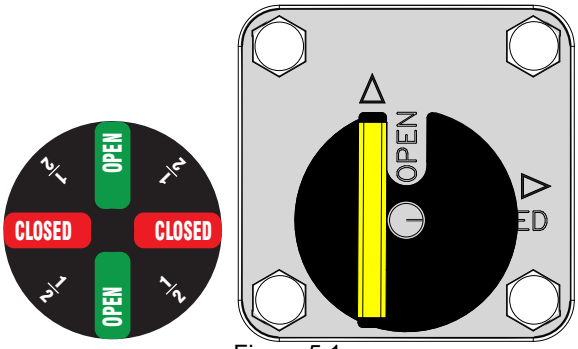

Figure 5.1

5.2 IVUM RC MANUAL OVERRIDE

The IVUM RC is motor driven but also has an override handwheel for operating the valve manually. The override handwheel may also be used in the event of power failure. If electrical power is supplied to the control panel, the LED valve position display will track the valve’s position as the knob is moved. If the knob is moved while there is no power to the electric controls, the LED valve position display will be in error when the electric power is reconnected. The LED valve position indicator will self correct the first time the valve is cycled under electric control.

If more compactness is desired, the override knob may be removed. The drive shaft has a hex so a wrench or socket may be used for manual override. If the manual override knob is removed, assure that the correct size wrench or socket is available in the event of power failure.

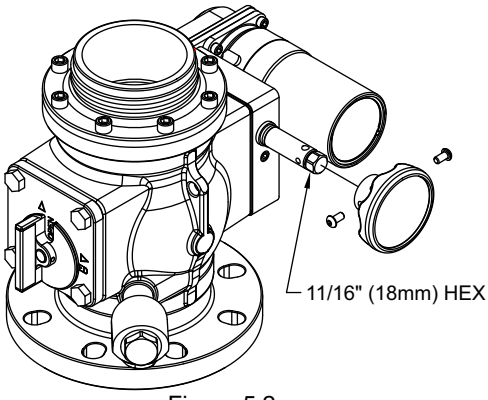

Figure 5.2

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5.3 ELECTRIC REMOTE CONTROL OPERATION

Power LED:
- LED will be solid green when power is present.
- Flashing green LED indicates low voltage.

Changing Modes (Unit is shipped from factory in the Automatic Mode):
- Activate CLOSE and STOP inputs together for 3 seconds to change to Automatic Mode.
- Activate OPEN and STOP inputs together for 3 seconds to change to Manual Mode.

Manual Mode – not connected to TFT RC monitor:
- Activating OPEN input will cause valve to open.
- Deactivating OPEN input will cause valve to stop.
- Activating CLOSE input will cause valve to close.
- Deactivating CLOSE input will cause valve to stop.
- STOP input is not applicable in Manual Mode.

Manual Mode – when connected to TFT RC monitor:
- Activating AUX2 signal or OPEN input will cause valve to open.
- Deactivating AUX2 signal or OPEN input will automatically cause valve to close.

Automatic Mode – not connected to TFT RC monitor:
- Activating OPEN input (momentarily) will cause valve to travel to full open position.
- Activating CLOSE input (momentarily) will cause valve to travel to full close position.
- Activating STOP input while valve is moving will stop valve.

Automatic Mode – when connected to TFT RC monitor:
- Activating AUX2 signal will cause full travel. If valve was open, it will move closed and vice-versa.
- Activating AUX2 signal while valve is moving will cause valve to stop momentarily, then reverse direction to full travel.
- Activating OPEN input will cause valve to travel to full open position.
- Activating CLOSE input will cause valve to travel to full close position.
- Activating STOP input while valve is moving will stop valve.

5.3.1 LOCKOUT/TAGOUT

Tether points have been provided on the valve body and both sides of the crank handle to prevent operation of the valve. To minimize the ability to rotate the shaft, tether the nearest end of the crank handle to the valve body with minimal slack.

5.4 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.**

5.4.1 EXTERNAL DRAIN VALVE (STANDARD)

All Industrial VUMs are equipped with an external automatic drain valve attached to a port directly above the valve seat. The drain valve allows the monitor and valve body to drain fully after the half ball is closed, minimizing susceptibility to damage from corrosion and freezing water.

The drain valve is designed to close automatically when pressure exceeds 5 psi. When pressure drops below 5 psi, the drain valve will open.

If the external drain valve becomes damaged to the extent that it leaks excessively, it may be temporarily replaced with a 3/4” NPT plug during monitor operation. Loosen the plug to drain the monitor following use, and replace it with a functional drain valve assembly as soon as possible. The external drain valve is assembled within a two piece housing which threads into the valve body using ¾” NPT threads.

5.4.2 INTERNAL DRAIN VALVE (OPTIONAL)

An optional internal automatic drain valve located within the half ball allows the standpipe to draw atmospheric air to facilitate draining, even while the 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.

If the internal drain valve is not included, the half ball must be manually opened and the standpipe drained below the freeze line to protect the equipment from freezing conditions.

The internal drain valve is fastened directly to the outside of the half ball.

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5.4.3 USE ON TELESCOPING WATERWAYS (AERIAL APPARATUS)

Specifying the internal automatic drain valve is highly recommended to assist draining and retracting of telescoping waterways. The internal automatic drain valve is only functional after pressure has been relived from the waterway and will not serve as a pressure relief valve under any circumstances.

After pressure has been relieved, the internal drain valve allows water and atmospheric air to back flow through the monitor and IVUM to drain the waterway, even if the IVUM remains closed. Then, the internal drain valve allows air to vent out to the atmosphere as the waterway is retracted.

If the internal drain valve is not included, then the IVUM must be opened prior to draining and retracting the waterway. Otherwise, damage to the waterway may occur if no other atmospheric vent orifice is present.

6.0 PRESSURE LOSS

The flow coefficient and graph below apply to all models of the 4” Industrial Valve Under Monitor. Data shown is for valve only and does not include monitor or nozzle pressure losses.

The Cv flow coefficient is calculated according to the formula:

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

Where:

C_v = flow coefficient (IVUM is 815)
Q = flow rate in gpm
ΔP = pressure loss in psi across valve (water only)

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

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

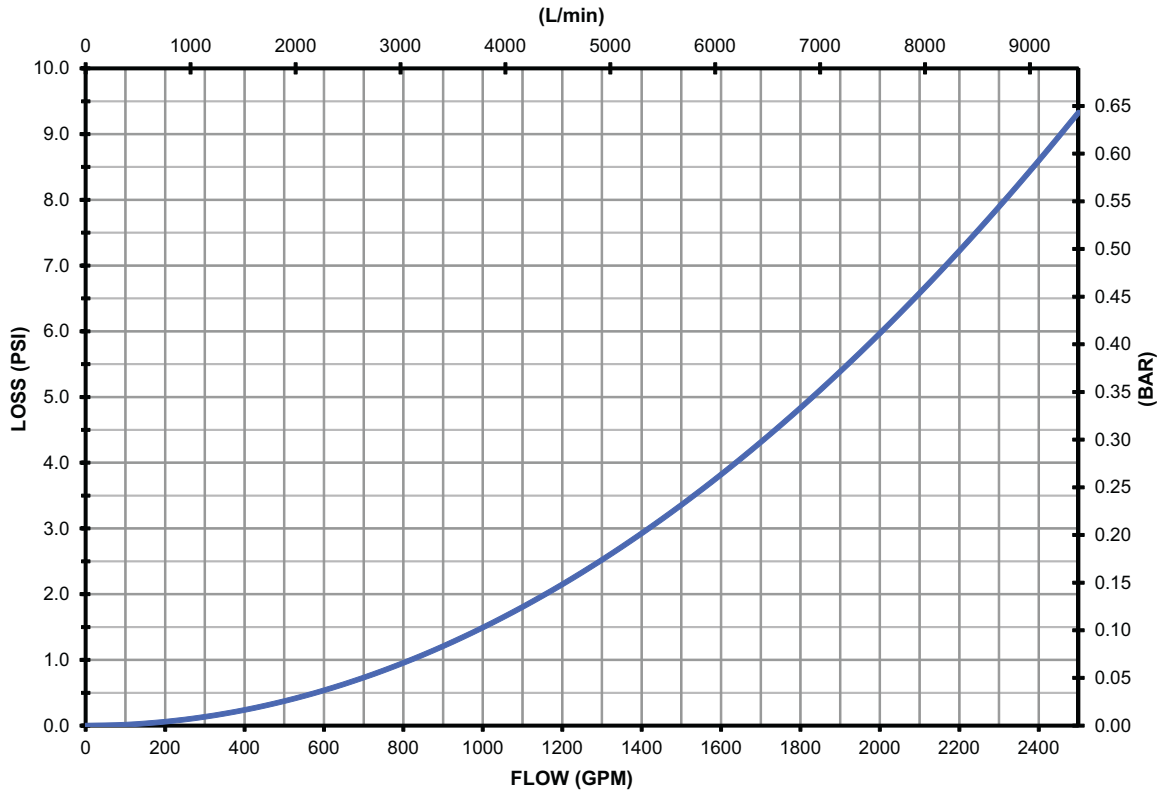

Figure 6.0

7.0 WARRANTY

Task Force Tips LLC, 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA (“TFT”) warrants to the original purchaser of its products (“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 for mechanical components, and the two (2) year period from the date of purchase for electrical components. 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 USA, 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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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 TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
Leaks	Debris or damage in seal area	Clean out debris and/or replace damaged parts
Binding, Erratic Operation	Low voltage (see below)	See Below
Power LED on but no operation	Low voltage due to: • wire gauge too small • wire length too long • poor connection • inadequate apparatus electrical system	Check connections and wiring See Section 4.4 on page 13.
LED D6 on motor board blinks rapidly when button is pressed	Bad motor encoder	Replace motor subassembly
No power LED	Polarity reversed or poor connection	Check wiring and correct polarity
Valve operates from the valve control but not from RC monitor operator stations	Incorrect communication wiring	Check Blue and White communication wiring

Table 8.2

8.3 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.**

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8.4 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).

8.4.1 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.

8.4.2 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 valve.
2. Locate 1/2” hex where crankshaft protrudes from opposite side of gearbox. For IVUM RC models, it will be necessary to remove the chain cover using a 3/16” Allen wrench, then remove the chain and sprockets.
3. 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.
4. **If crankshaft will not rotate**, the half ball is likely obstructed. Only after relieving pressure on flanged joint, unbolt valve. Clear any obstructions and evaluate whether repair is needed before returning to service.
5. **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.
6. **If crankshaft rotates freely after clearing any obstructions**, a replacement crank shaft may be ordered from Task Force Tips and replaced as described below.

8.4.3 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. To replace a broken crankshaft, follow the steps below:

1. Remove external retaining ring (item 118) 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 (item 131). 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 (item 119) on shaft so it does not get lost.
   C. 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 (item 117 and 120) 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 (item 115). Verify round notch in thrust washer (item 116) 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 (item 118) onto shaft. Do not over-expand the retaining ring.

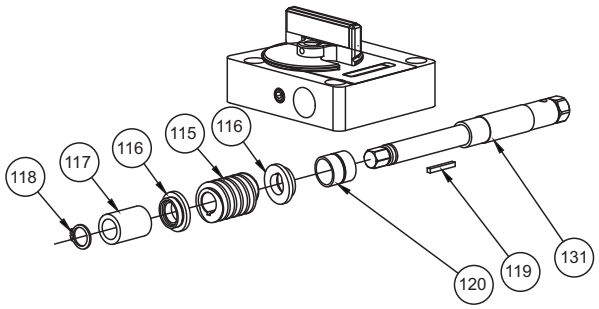

Figure 8.4.3

8.4.4 SIDE B MONITOR VALVE SEAT REPLACEMENT

The valve seat may be replaced in the field if it becomes a source of leakage due to harsh environmental conditions or excessive age. A ½" drive spanner wrench for the valve seat retainer may be purchased from Task Force Tips.

To replace the valve seat:

1. Close upstream water supply and relieve pressure leading up to valve.
2. After relieving pressure on the inlet flanged joint, unbolt inlet flange of valve.
3. Using 1/2" drive spanner wrench, remove Valve Seat Retainer.
4. Remove the O-ring from the Valve Seat Retainer.
5. Using pliers, pull old Valve Seat out of groove in the Valve Body.
6. Using soap and water, clean sealing surfaces of half ball, valve body, flange and valve seat retainer. 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.
7. Apply light coat of silicone based grease such as Dow Corning 112 to all sealing surfaces and threads of half ball, valve body, and valve seat retainer. Open valve so half ball is out of the way.
8. Install new Valve Seat into groove in the valve body 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.
9. Install new O-ring over valve seat retainer. Apply grease over O-ring.
10. Install valve seat retainer into flange until it is snug against the valve seat.
11. Reinstall valve on flange according to instructions in section 4.0. If valve leaks through valve seat, try tightening the valve seat retainer slightly more.

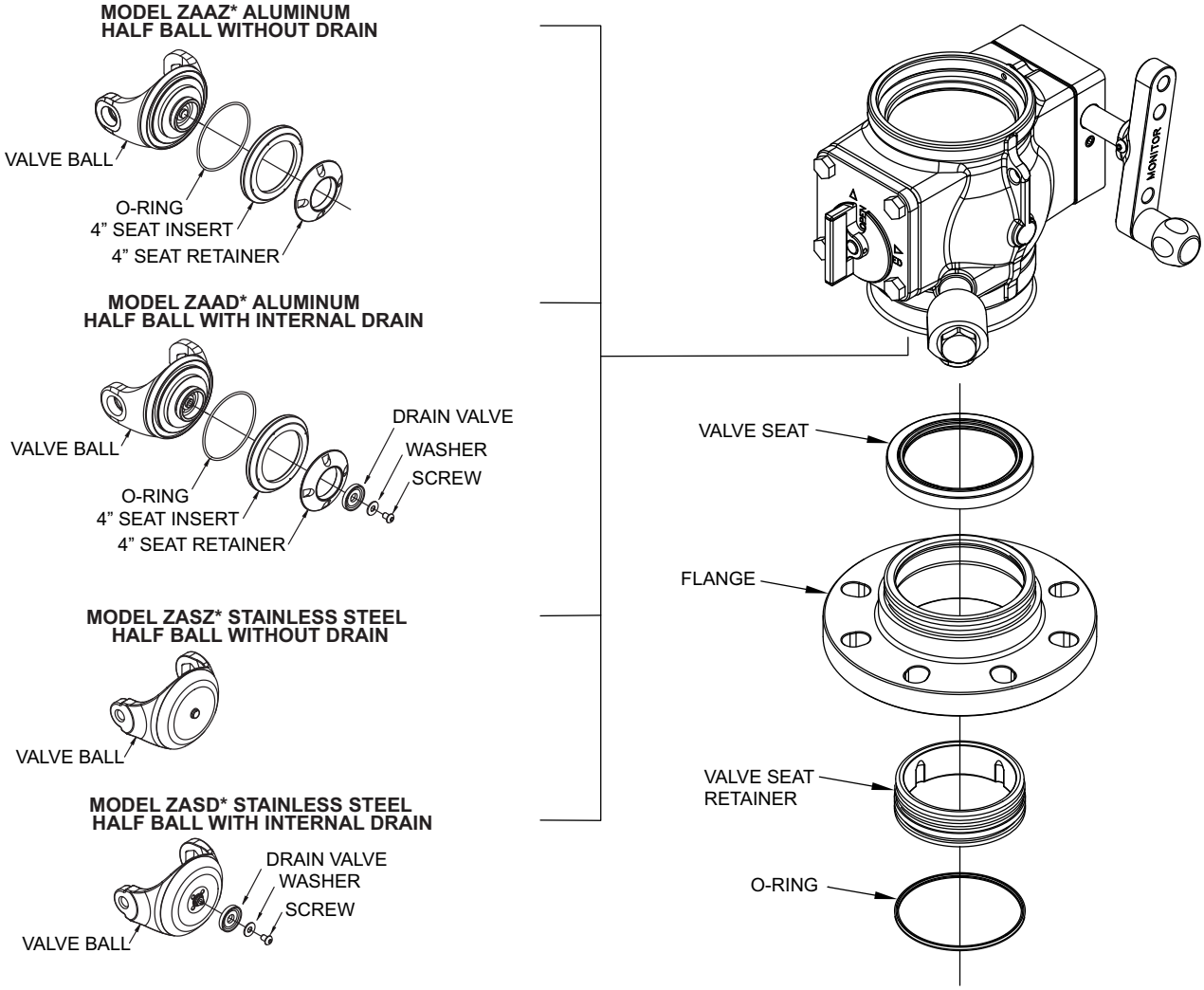

Figure 8.4.4

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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.**

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