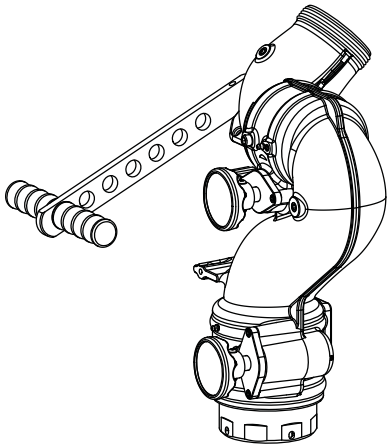
TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

MANUAL: TYPHOON & TYPHOON RC MONITOR

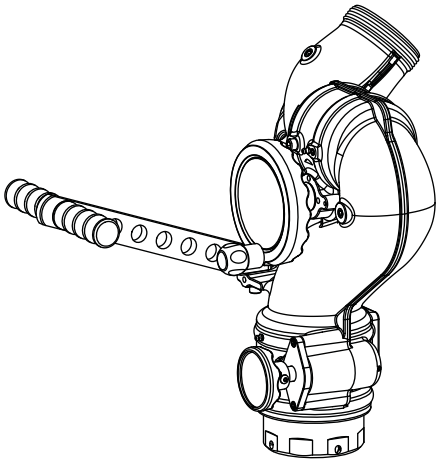
See Remote Control (RC) Monitor Electrical Controls Supplemental Instructions For Use With Typhoon RC Models

INSTRUCTIONS FOR INSTALLATION, SAFE OPERATION AND MAINTENANCE

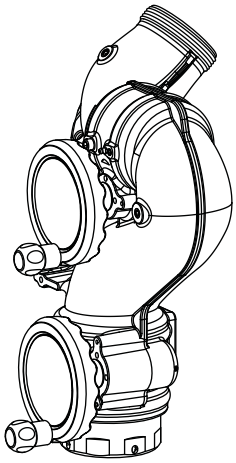
⚠ DANGER **Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at www.tft.com/serial-number**



Typhoon Tiller



Typhoon Tiller
With Handwheel Elevation

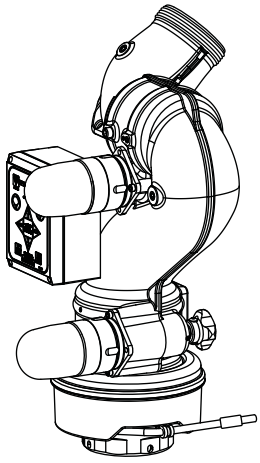


Typhoon
Dual Handwheel

See Section 3.1 for Flow/Pressure Operations Envelope

TYPHOON

TYPHOON RC



Typhoon RC

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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

Table Of Contents

1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI standard Z535.6-2006, 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, may result in minor or moderate injury.**

NOTICE — **NOTICE is used to address practices not related to personal injury.**

2.0 SAFETY

The operation of this monitor can be dangerous. The following must be observed at all times.

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

- **Failure to drain monitor followed by exposure to freezing conditions**
- **Exposure of monitor to temperatures in excess of 160 degrees F**
- **Structural damage caused by over-pressurization**
- **Missing parts, physical abuse, exposure to severe chemicals**
- **Deformed or cracked flanges damaged as a result of improper installation**
  - **Excessive bolt torque**
  - **Wrong tightening sequence**

⚠ WARNING — **Injury can result from an inadequately supported monitor. The monitor mount must be capable of supporting 1100 lbs (500 kg) of nozzle reaction force.**

⚠ WARNING — **The stream exiting a monitor is very powerful and capable of causing injury and property damage. Make sure the monitor is securely attached to the base and pointing in a safe direction before water to the monitor is turned on. Use care in directing the stream.**

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

⚠ WARNING — **Do not connect AC voltage to this remote control device. This RC device is intended for operation from DC power supplies with voltages from 12-24 VDC. Using the wrong power source may cause electrocution or ignition resulting in serious injury or death.**

⚠ CAUTION — **The electric Typhoon RC may be remotely operated. The electric drives are current limited but may still produce enough force to cause injury. Keep hands and fingers away from pinch points on the monitor.**

⚠ CAUTION — **Do not use the manual override knobs while the electric controls are in operation. The electric drives produce enough torque to cause injury.**

⚠ CAUTION — **Operating a monitor beyond it's maximum limits may result in injury. Always stay within the safe operating flow and pressure limits stated on the product.**

⚠ CAUTION — **On many vehicle installations, the monitor is the highest point on the apparatus. Be sure there is sufficient clearance to safely pass under any doors or overhead obstructions. Always check parked position of the monitor before moving.**

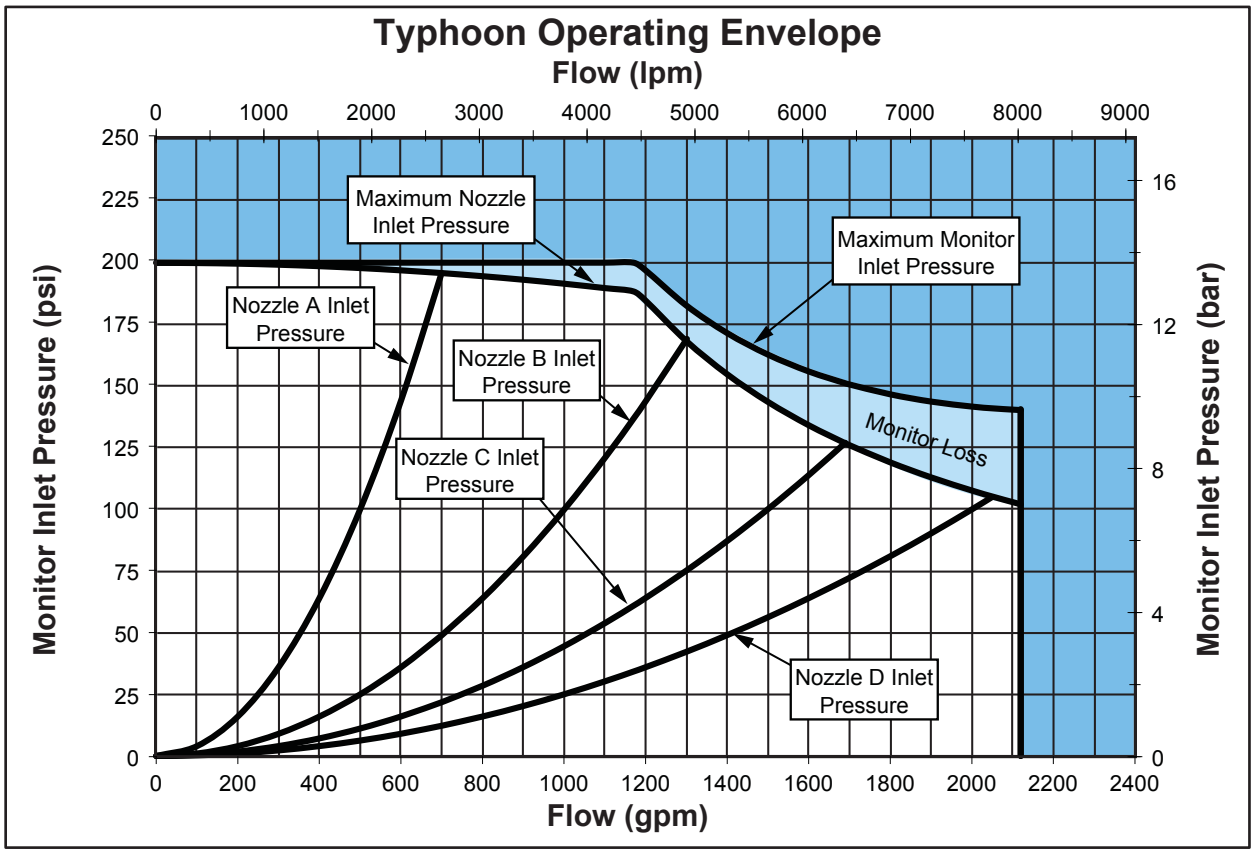
NOTICE — **All replacement parts must be obtained from the manufacturer to assure proper operation of the product, and to maintain approval of the device.**

3.0 GENERAL INFORMATION

The Typhoon monitor is a 4-inch monitor. It is available in various manually operated models as well as an electric remote model. The electric remote model is known as the Typhoon RC.

3.1 MECHANICAL SPECIFICATIONS

	Manual		Electric	
	US	METRIC	US	METRIC
Weight	26 lbs	12 kg	38 lbs	17 kg
Min. Flow Area 4” Inlet	12.6 in^2	81.1 cm^2	12.6 in^2	81.1 cm^2
Min. Flow Area 3” Inlet	7.07 in^2	45.6 cm^2	7.07 in^2	45.6 cm^2
Max Operating Pressure	200 psi	14 bar	200 psi	14 bar
Materials Used	ANSI A356.0-T6 Aluminum, Stainless, Nylon			
Maximum Torque Elevation			70 ft•lbs	95 n•m
Maximum Torque Horizontal			60 ft•lbs	80 n•m
Speed Elevation			12 deg/sec	
Speed Horizontal			12 deg/sec	



Nozzle A flows 500 gpm (1900 l/min), at 100 PSI (6.9 bar), K factor = 50
Nozzle B flows 1000 gpm (3800 l/min), at 100 PSI (6.9 bar), K factor = 100
Nozzle C flows 1500 gpm (5700 l/min), at 100 PSI (6.9 bar), K factor = 150
Nozzle D flows 2000 gpm (7600 l/min), at 100 PSI (6.9 bar), K factor = 200

Fig.3.1
Typhoon Operation Envelope

3.2 PART IDENTIFICATION AND MODELS

The Typhoon Monitor comes in manual and electric remote controlled models. Various manual models are available. Electric remote control models are available in a standard model (suitable for on top of pumpers), Ladder model, and Platform model. Compared to the standard model, the ladder or platform model has horizontal travel stops factory installed at 90° left and right (180° total). The various models of Typhoon monitors are shown in figures 3.2A, 3.2B, 3.2C and 3.2D. The monitor mounted control station on the standard remote controlled model is shown in figure 3.2D.

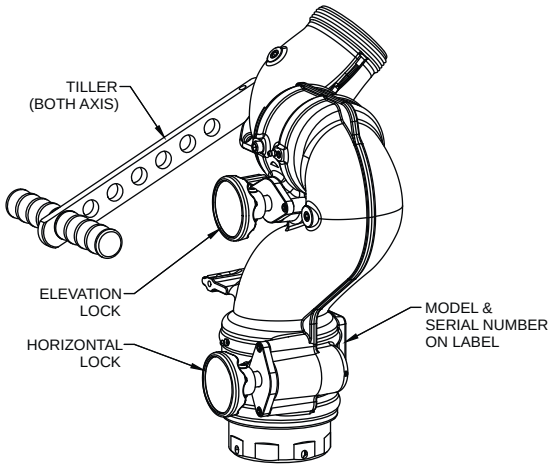


Fig 3.2A
Tiller Typhoon

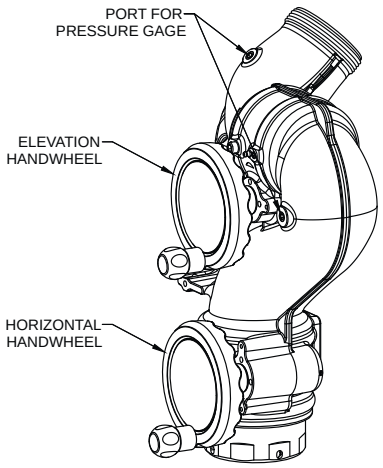


Fig 3.2B
Dual Handwheel Typhoon

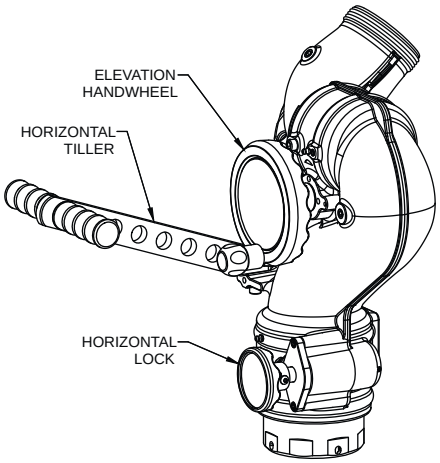


Fig 3.2C
Tiller and Handwheel Typhoon

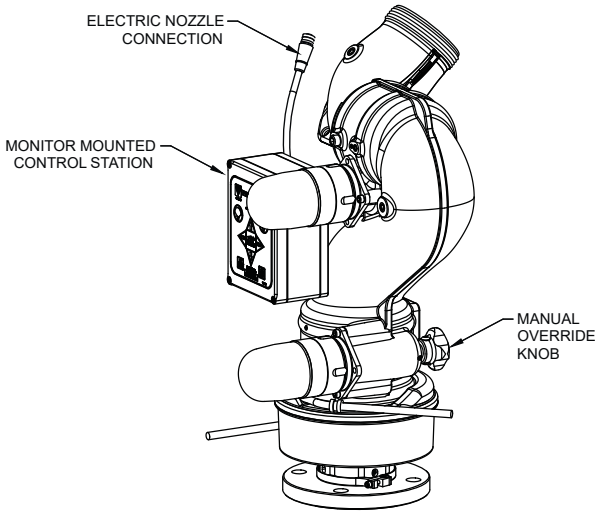


Fig 3.2D
Typhoon RC

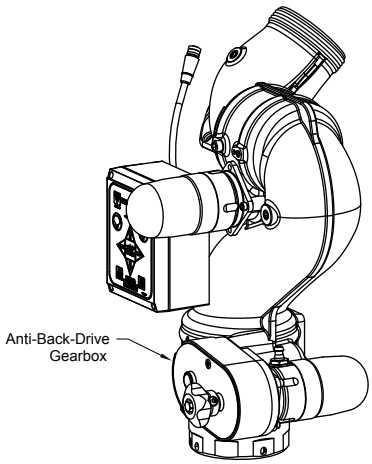


Fig 3.2E
Typhoon RC for Ladders

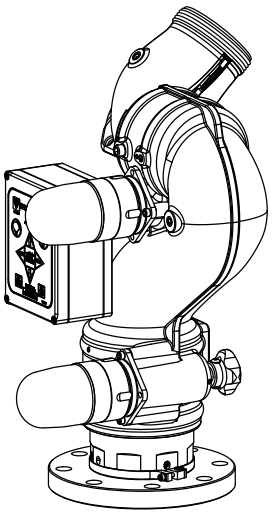


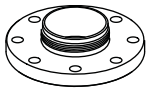
Fig 3.2F
Typhoon RC for Platforms

3.3 INLETS AND OUTLETS

3.3.1 INLET OPTIONS AND ADDITIONAL HEIGHT

Various other inlet and outlet options are available as shown in figure 3.3.

3.3.1.1 FLANGES

									Manual & Electric		Tiller	
	INLET OPTION #	PART NUMBER	MONITOR INLET ADAPTER	MONITOR INLET BASE	ADDITIONAL HEIGHT*		QUICK CONNECT OPTION # **	PART NUMBER	ADDITIONAL HEIGHT*		ADDITIONAL HEIGHT*	
					in	mm			in	mm	in	mm
	1	Y4410A	3" ANSI 150 FLANGE	TFT CODE-RLF	0.75	20						
	2	Y4415A	4" ANSI 150 FLANGE	TFT CODE-RPF	0.94	23	R	Y4482	3.83	96	6.58	166
	3	Y4417A	6" ANSI 150 FLANGE	TFT CODE-RPF	1.00	25						
	4	Y4423A	DN80, PN16 FLANGE	TFT CODE-RLF	0.87	22						
	5	Y4425A	DN100, PN16 FLANGE	TFT CODE-RPF	0.87	22						

3.3.1.2 NPT FEMALE

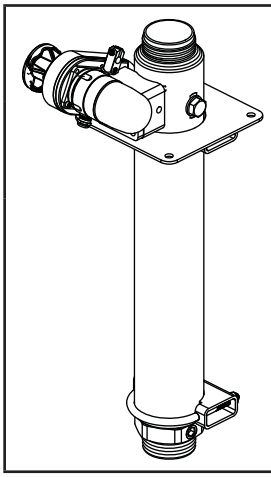
									Manual & Electric		Tiller	
	INLET OPTION #	PART NUMBER	MONITOR INLET ADAPTER	MONITOR INLET BASE	ADDITIONAL HEIGHT*		QUICK CONNECT OPTION # **	PART NUMBER	ADDITIONAL HEIGHT*		ADDITIONAL HEIGHT*	
					in	mm			in	mm	in	mm
	6	Y4440NL	3" NPT FEMALE	TFT CODE-RLF	2.00	51						
	7	Y4450NP	4" NPT FEMALE	TFT CODE-RPF	1.75	45	S	Y4483	3.63	92	6.38	162

3.3.1.3 BSP MALE

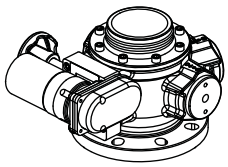
									Manual & Electric		Tiller	
	INLET OPTION #	PART NUMBER	MONITOR INLET ADAPTER	MONITOR INLET BASE	ADDITIONAL HEIGHT*		QUICK CONNECT OPTION # **	PART NUMBER	ADDITIONAL HEIGHT*		ADDITIONAL HEIGHT*	
					in	mm			in	mm	in	mm
	8	Y4420A	3" BSP MALE THREAD	TFT CODE-RLF	2.30	58						
	9	Y4430A	4" BSP MALE THREAD	TFT CODE-RPF	2.30	58						

* SEE SECTION 3.4 OVERALL DIMENSIONS FOR NOMINAL MONITOR DIMENSIONS
** FOR QUICK CONNECT OPTIONS REFERENCE LIY-250

3.3.1.4 MATING PRODUCTS



					Manual & Electric				Tiller	
INLET OPTION #	PART NUMBER	MONITOR INLET ADAPTER	MONITOR INLET BASE	ADDITIONAL HEIGHT*		QUICK CONNECT OPTION # **	PART NUMBER	ADDITIONAL HEIGHT*		ADDITIONAL HEIGHT*	
				in	mm			in	mm	in	mm
L	see LIX-512	FOR EXTEND-A-GUN 3"	TFT CODE-RLF	0.00	0	T	Y4487	3.83	96	6.58	166
	see LIX-530	FOR EXTEND-A-GUN RC3	TFT CODE-RLF								
P	see LIX-530	FOR EXTEND-A-GUN RC4	TFT CODE-RPF	0.00	0	U	Y4486	3.63	92	6.38	162



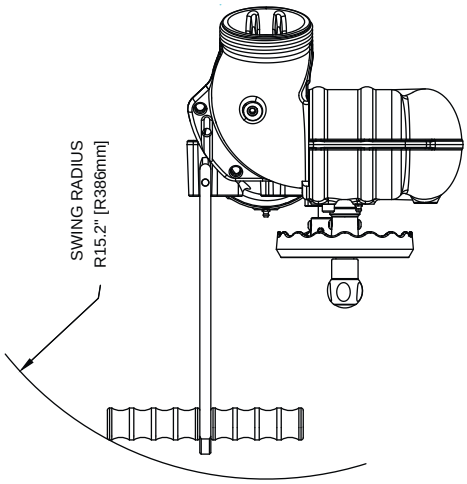
					Manual & Electric				Tiller	
INLET OPTION #	PART NUMBER	MONITOR INLET ADAPTER	MONITOR INLET BASE	ADDITIONAL HEIGHT*		QUICK CONNECT OPTION # **	PART NUMBER	ADDITIONAL HEIGHT*		ADDITIONAL HEIGHT*	
				in	mm			in	mm	in	mm
P	see LIA-285	FOR AK SERIES VUM	TFT CODE-RPF	0.00	0	Q	N/A	0.63	16	3.38	86
	see LIZ-055	FOR ZB SERIES HUM	TFT CODE-RPF								
X	see LIZ-050	ELECTRIC FOR ZA SERIES 4" IVUM	TFT CODE-RRM	-0.59	-15						
	see LIZ-050	HANDWEEL FOR ZA SERIES 4" IVUM	TFT CODE-RRM	1.41	36						
	see LIZ-050	TILLER FOR ZA SERIES 4" IVUM	TFT CODE-RRM	-0.19	-5						

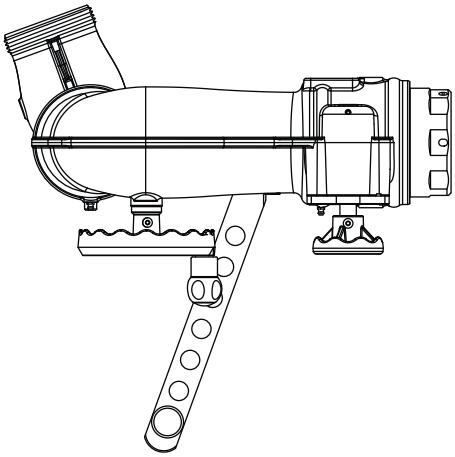
* SEE SECTION 3.4 OVERALL DIMENSIONS FOR NOMINAL MONITOR DIMENSIONS
** FOR QUICK CONNECT OPTIONS REFERENCE LIY-250

3.3.2 OUTLET OPTIONS

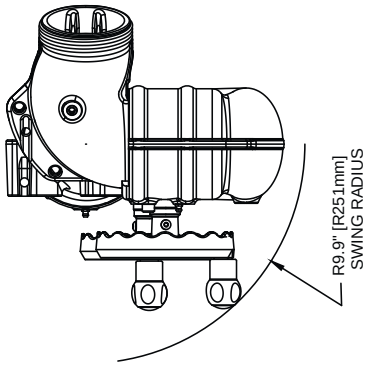
OUTLET OPTIONS		
OPTION #	THREAD	ADAPTER
1	3.5" NH MALE	N/A
2	3.5" BSP MALE	Y4330ABN
3	3.5" NPSH MALE	Y4330AIN
4	4.0" BSP MALE	Y4334ABP
5	2.5" NH MALE	Y3325ANJ
6	2.5" BSP MALE	Y3325ABJ

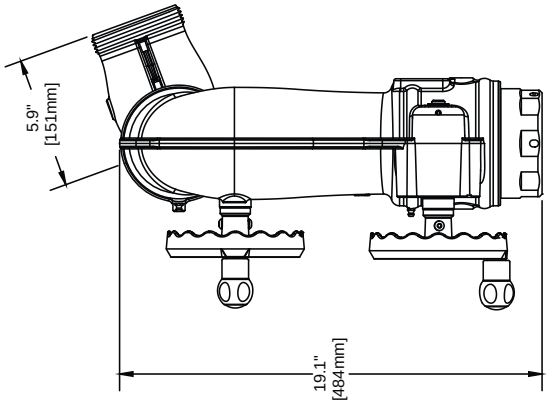
3.4 OVERALL DIMENSIONS



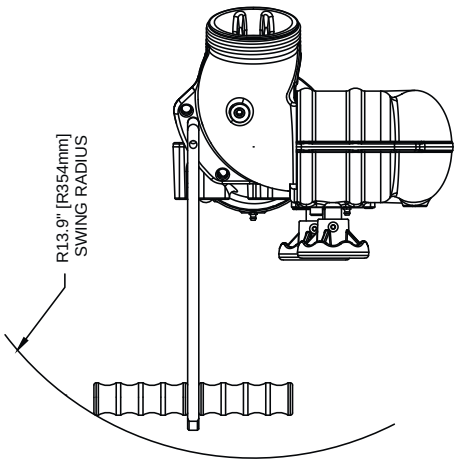


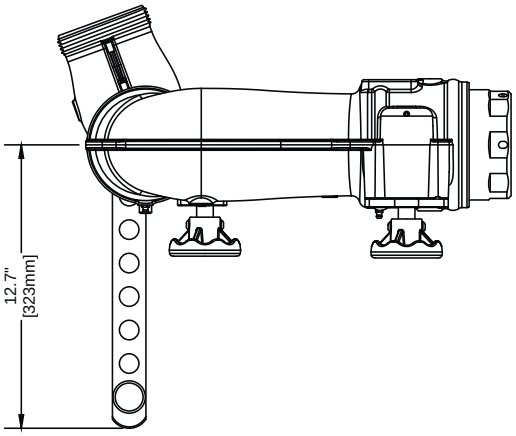
Manual Tiller Bar Typhoon
Figure 3.4C





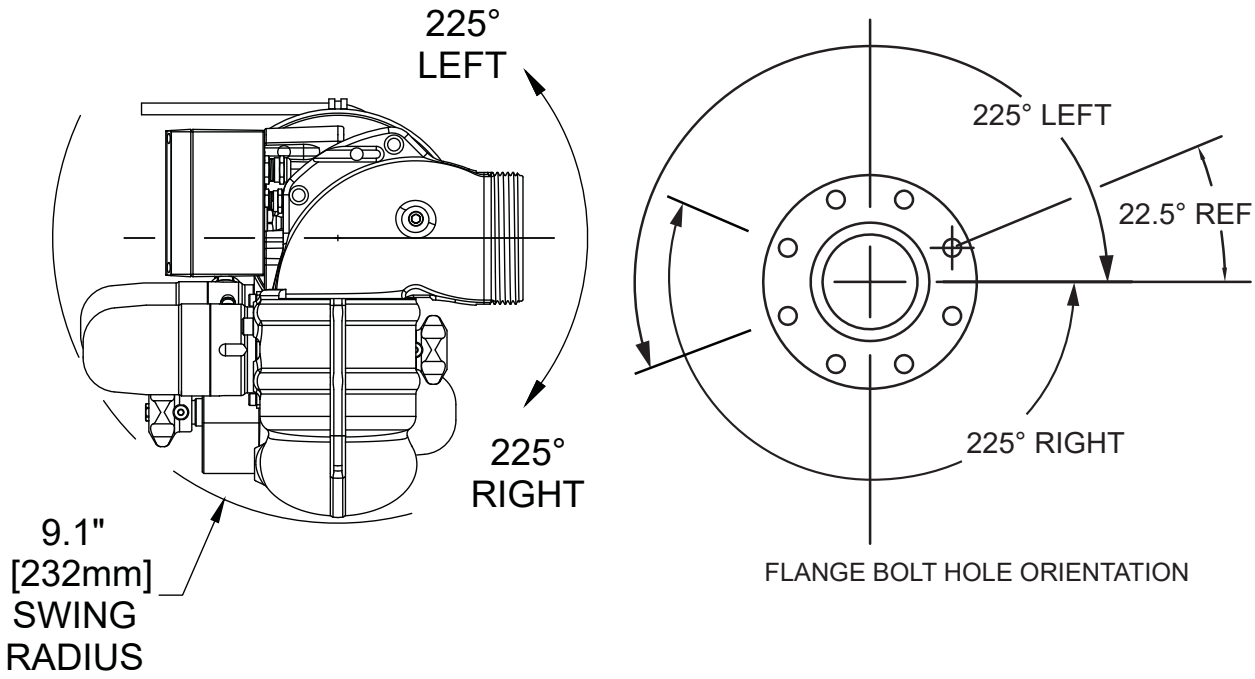
Dual Handwheel Typhoon
Figure 3.4B

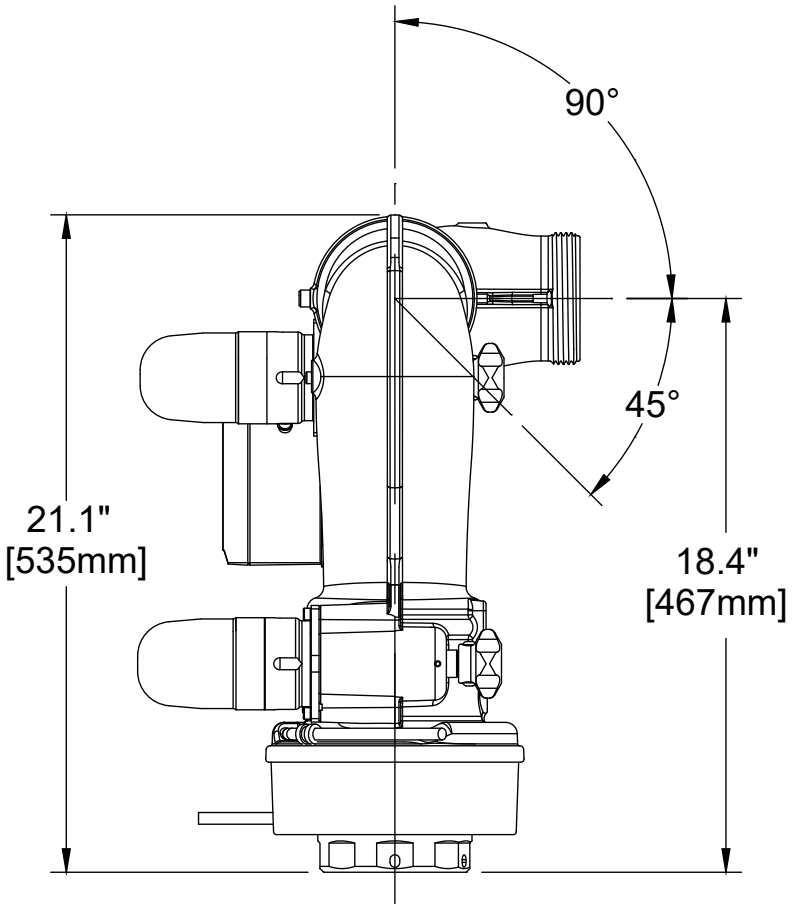




Tiller Typhoon
Figure 3.4A

3.4 OVERALL DIMENSIONS

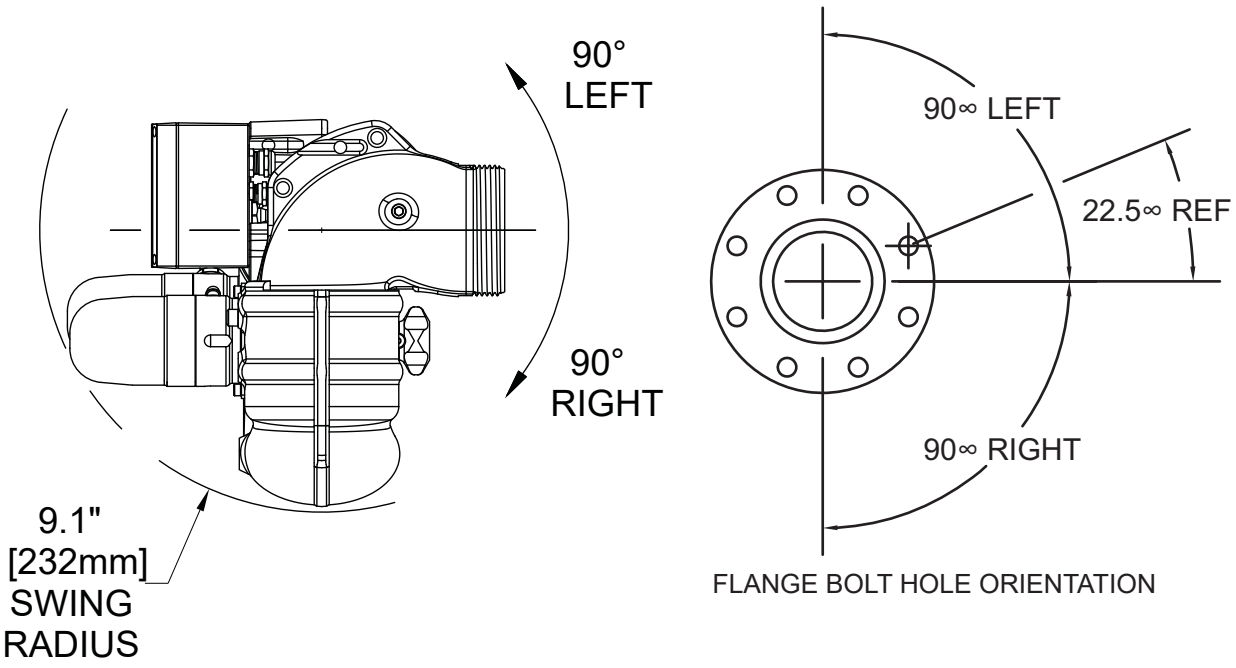


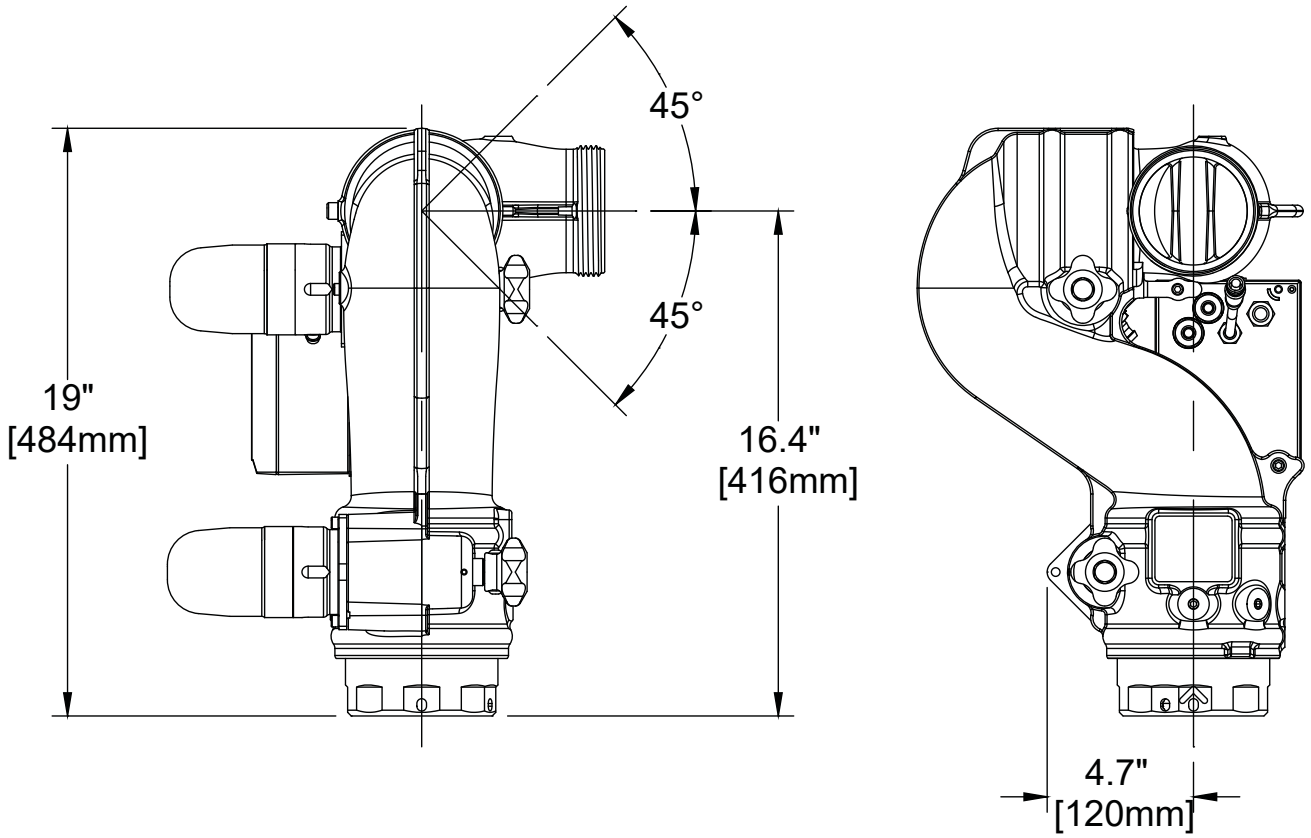


Typhoon RC

Figure 3.4D

3.4 OVERALL DIMENSIONS

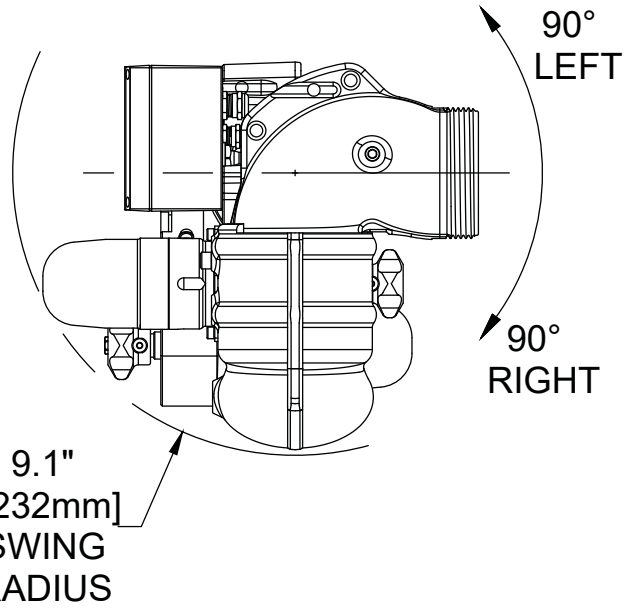


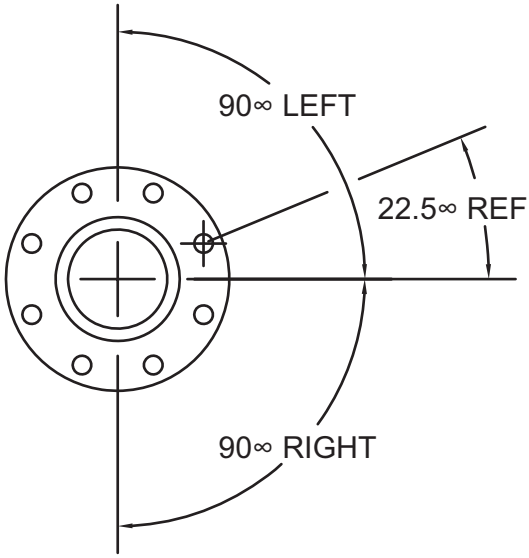


Typhoon RC for Platform

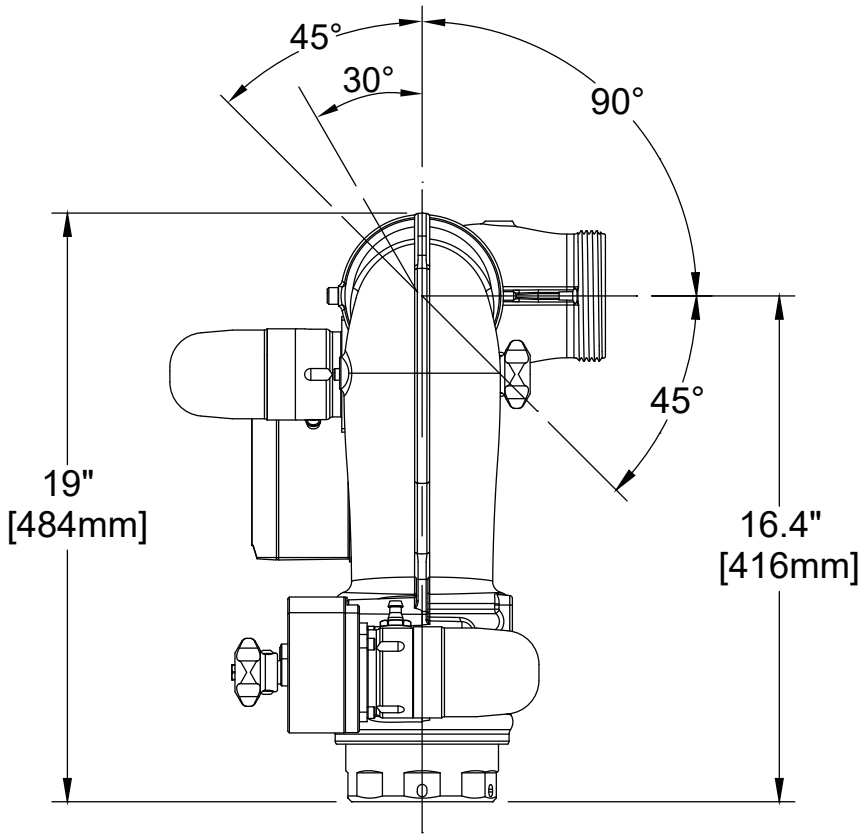
Figure 3.4E

3.4 OVERALL DIMENSIONS

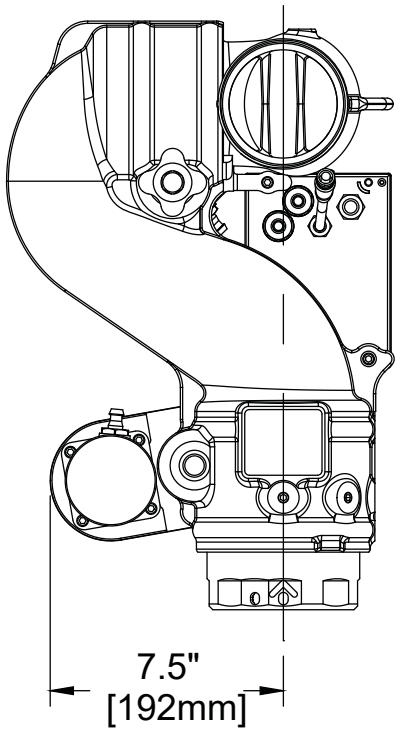




FLANGE BOLT HOLE ORIENTATION



Shown with anti back-drive mechanism.
Can be ordered without
anti back-drive mechanism



Typhoon RC for Ladder

Figure 3.4F

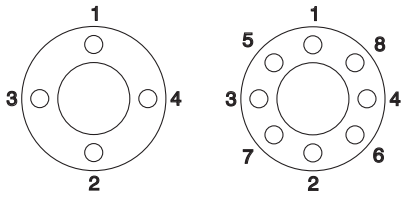
4.0 INSTALLATION

See Remote Control (RC) Monitor Electrical Controls Supplemental Instructions LIY-500.

4.1 STRUCTURAL REQUIREMENTS FOR MONITOR MOUNTING

The structure that the Typhoon Monitor is mounted to must withstand the internal pressure of the monitor as well as shear and bending forces due to nozzle reaction. Nozzle reaction can be as high as 1100 lbs (500 kg) (2100 gpm at 100 psi).

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. Tighten flange bolts in an alternating sequence as shown in figure 4A. Tighten to 76-80 ft-lb (100-110 Newton-Meters).



Tighten sequentially each bolt three times.

Fig 4.1 Flange Bolt Tightening Sequence

FLANGE TYPE	OPT#	OUTSIDE DIAMETER		THICKNESS		BOLT HOLE CIRCLE		# OF BOLTS	SIZE OF BOLTS		TORQUE ON BOLTS	
		in	mm	in	mm	in	mm		in	mm	ft-lbs	N-m
3" ANSI 125/150 - DN80 PN20	1	7.5	190	0.75	20	6.0	152.5	4	5/8	16	76-80	100-110
4" ANSI 150 - DN100 PN20	2/R	9.0	230	0.94	23	7.5	190	8	5/8	16	76-80	100-110
6" ANSI 150 FLANGE	3	10.9	277	1.0	25.4	9.5	241.3	8	3/4	19	76-80	100-110
DN80, PN16 FLANGE	4	7.9	200	0.87	22	6.3	160	8	5/8	16	76-80	100-110
DN100, PN16 FLANGE	5	8.7	220	0.87	22	7.1	180	8	5/8	16	76-80	100-111

⚠WARNING **Injury can result from an inadequately supported monitor. The monitor mount must be capable of supporting the nozzle reaction force which can be as high as 1100 lbs (500 kg). Flanges and pipe made from plastic are inadequate for monitor mounting and must not be used. This monitor is not recommended for portable use.**

4.2 INLET MOUNTING AND TRAVEL RANGES

4.2.1 INLET FITTING OR EXTEND-A-GUN INSTALLATION

The Typhoon Monitor is available with various inlet fittings as shown in fig 3.3. When the inlet fittings are used see figure 4.2.1A for the addition to overall height. The Typhoon Monitor also connects directly to TFT's Extend-A-Gun RC3 or RC4. The fittings and Extend-A-Gun RC are attached to the monitor by means of a threaded joint with an o-ring seal.

TWO PIECE CLAMP ROTATIONAL LOCK INSTALLATION INSTRUCTIONS (without tapped holes):

1) Assemble Clamps and place loosely on Extend-A-Gun.
   A) Apply VSA-125 blue Loctite to threads on Cylinder Nut.
   B) Loosely install Screws, Washers and Cylinder Nuts on Clamp.
   C) Grooves on heads of Cylinder Nuts indicate alignment of threaded holes.
   D) Place Clamp assembly over male threads of Extend-A-Gun outlet.
   E) Heads of Cylinder Nuts must be on top side of Clamps.
2) Screw monitor onto Extend-A-Gun RC until threaded joint bottoms out.

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

A) DO NOT USE PIPE SEALANT OR LOCTITE ON THE INLET BASE THREADS.

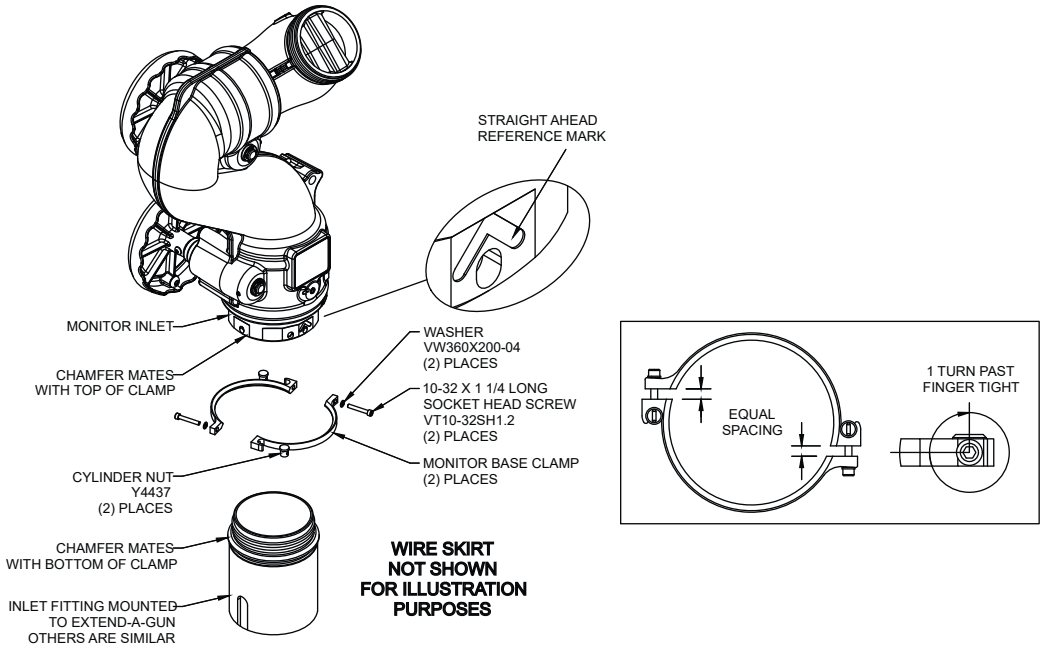
NOTICE **These threads are sealed with an O-ring. The use of thread locking compounds will make removal difficult.**

3) Unscrew monitor until the "Straight Ahead Reference Mark" is facing the desired direction.
   A) 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) Rotate the Clamps to the desired orientation.
   A) Ensure that Clamp assembly does not interfere with RC monitor Power/Com Cable.
5) Tighten each Screw gradually until both are finger tight with approximately equal spacing between opposite ends of Clamps.
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 Clamps.**



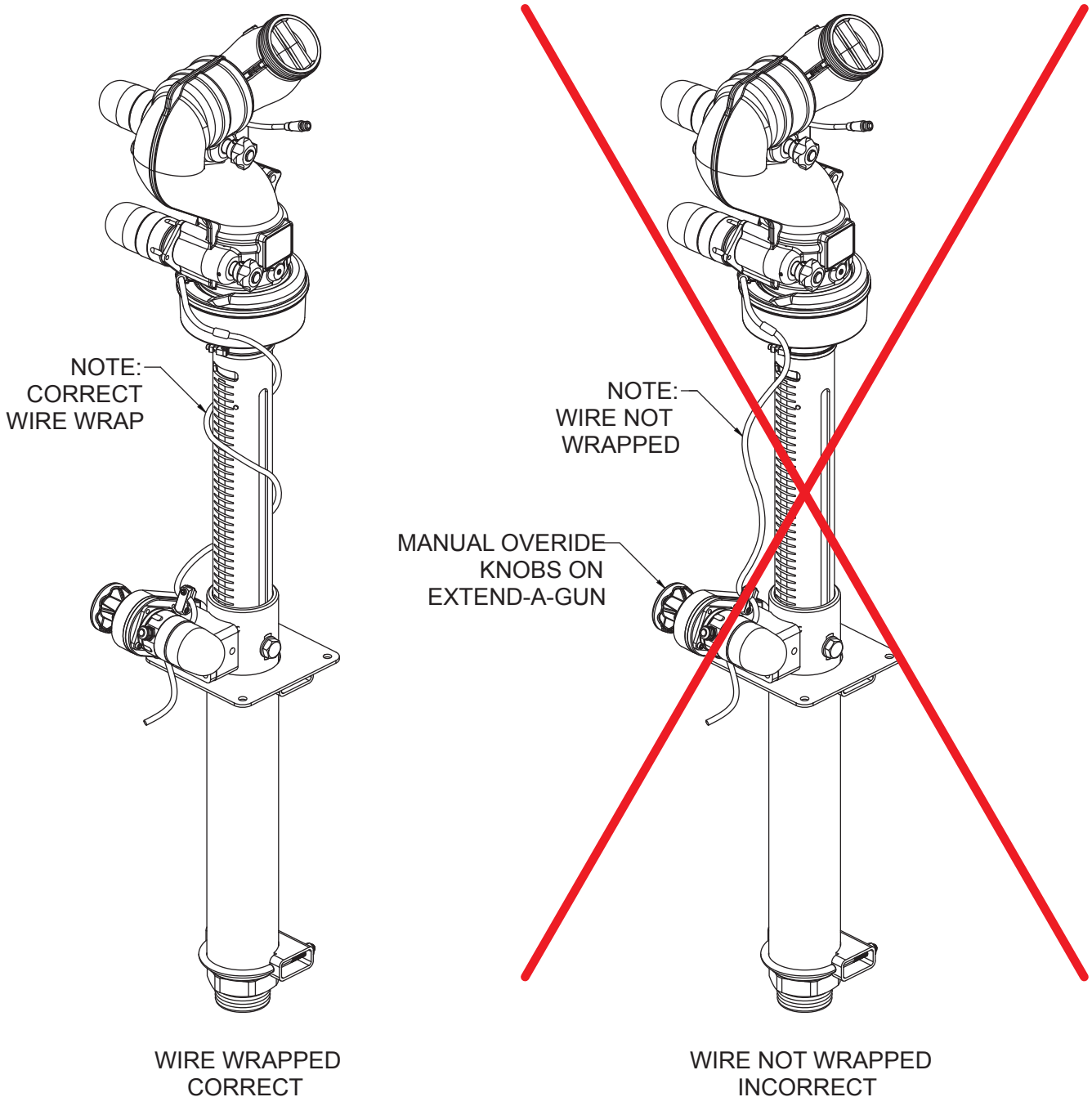


Fig 4.2.1C Possible Extend-A-Gun RC Mounting Orientations

The Extend-A-Gun manual override knob may be mounted in any of four possible orientations (90 degrees apart) relative to the Straight Ahead Reference Mark on the monitor.

NOTE: Typhoon monitor, for use with Extend-A-Gun RC, comes with the wire installed in a nylon tube. The nylon tubing gives the wire additional stiffness so it better follows as the Extend-A-Gun RC extends or retracts.

4.2.2 HORIZONTAL ROTATION TRAVEL STOPS

The range of horizontal rotation travel for the manual Typhoon monitor is continuous 360 degrees. The motorized version is limited to 450 degrees total horizontal rotation travel or 225 degrees from either side of a straight ahead position. Horizontal rotation travel stop bolts may be installed in the monitor to limit travel as shown in figures 4.2.2A and 4.2.2B. Note that left and right are relative to the "Straight Ahead Reference Mark" (the Straight Ahead Reference Mark is shown in figures 4.2.1B and 4.2.2A) and refer to the nozzle's discharge direction as seen from an operator's position behind the nozzle. Figures 4.2.2A and 4.2.2B show the range of travel for the various stop bolt locations and give installation notes.

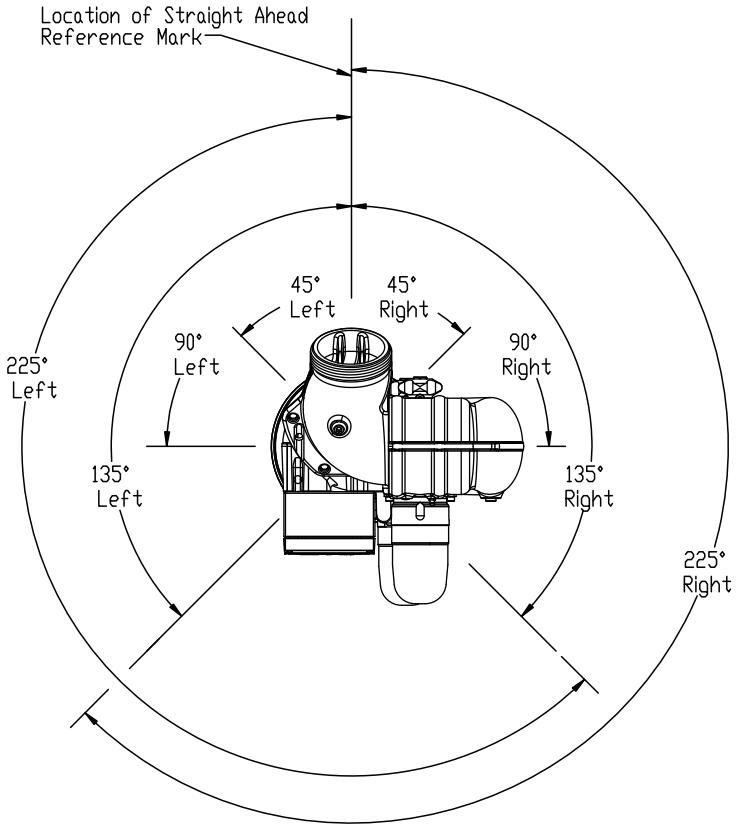


Fig 4.2.2A
Horizontal Rotation Travel Limits

Electric model with no stop bolts installed has 225° left and right horizontal rotation travel limits.

Manual model with no stop bolts installed has continuous 360° horizontal rotation travel.

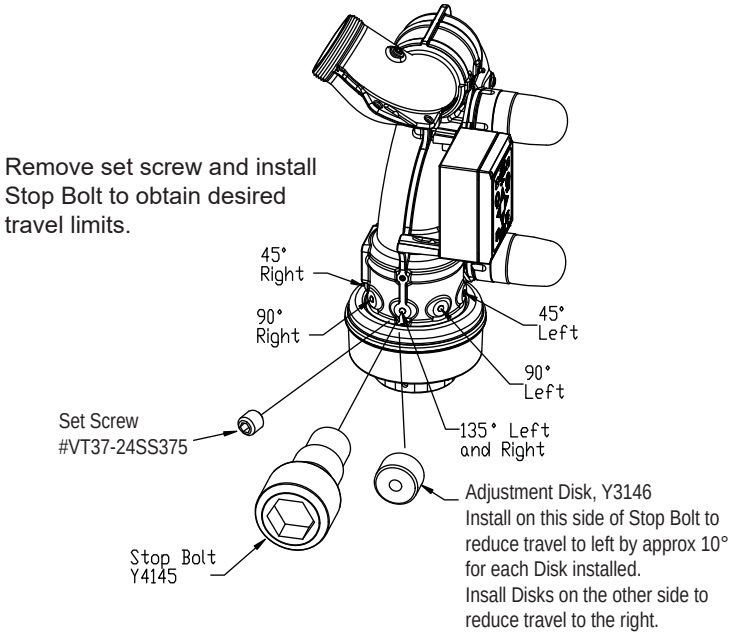


Fig 4.2.2B
Horizontal Rotation Travel Stop Locations

4.2.3 ELEVATION TRAVEL STOPS

The range of elevation travel for the Typhoon Monitor is 45 degrees past vertical to 45 degrees below horizontal. The elevation range may be limited by installing the supplied stop bolts and adjustment disks at the locations shown is figures 4.2.3A and 4.2.3B. Consult factory for other ranges. The figures include installation notes.

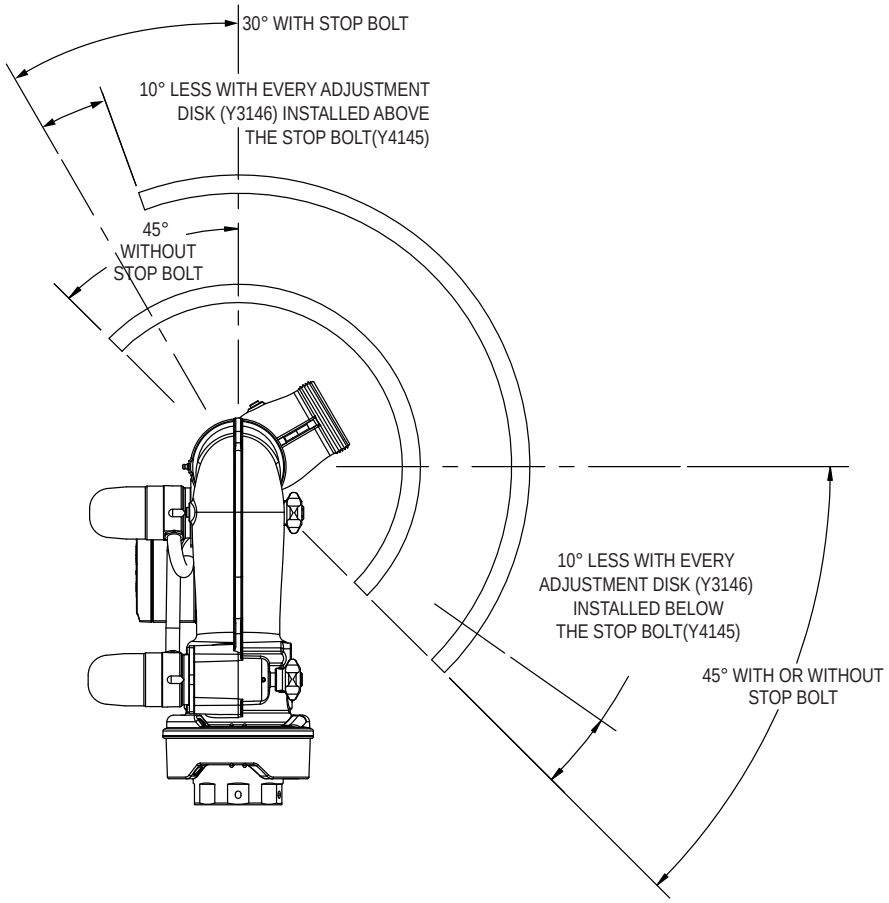


Fig 4.2.3A
Elevation Travel Limits

Remove set screw and install Stop Bolt to obtain desired travel limits.

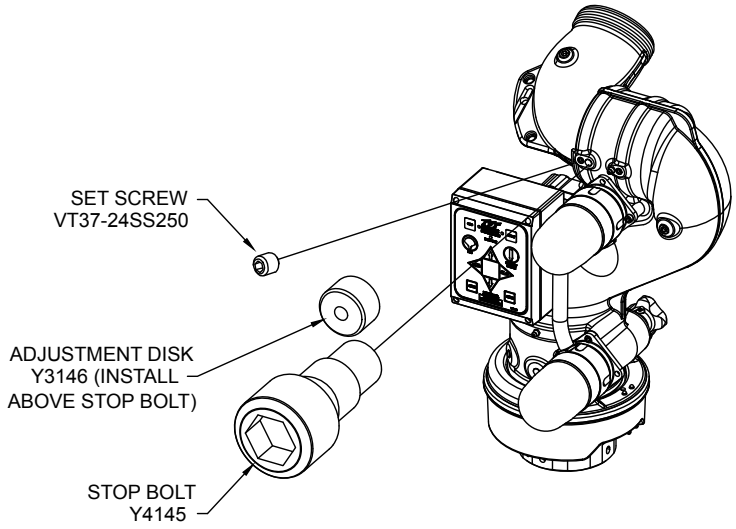


Fig 4.2.3B
Elevation Travel Stop Locations

4.3 NOZZLE INSTALLATION

The nozzle is simply screwed onto the monitor's exit threads. If the nozzle is installed on a Typhoon RC (with electric motors) assure that the nozzle's actuator does not make contact with the horizontal drive motor housing when the monitor is in it's lowest elevation position.

⚠CAUTION **The nozzle threads must match the threads of the Typhoon monitor in both size and type. Mismatched or damaged threads may cause the nozzle to leak or uncouple under pressure and could cause injury.**

⚠CAUTION **Do not connect aluminum to brass or brass to aluminum. Dissimilar metals coupled together can cause galvanic corrosion that will freeze the threaded joint or cause complete loss of thread engagement. If dissimilar metals must be coupled together, the effects of corrosion can be greatly delayed by various coatings on the metal such as powder paint, hard anodizing, or silicone grease.**

NOTICE **For nozzles with electric pattern control, a cable with a female, waterproof connector is provided at the outlet of the Typhoon RC which attaches directly to TFT's electric Masterstream 1250, 1500 or 2000 nozzle. The cable used is a dual-key, micro type plug assembly. Any other nozzle should have the corresponding male electrical connector installed. Do not cut off the female connector on the monitor. This connector is molded onto the cable and must remain in place to maintain the water tightness of the electrical system.**

4.4 PRESSURE GAGE PORT

There is a ¼" NPT female threaded hole on the back of the monitor and the exit elbow. The holes are plugged from the factory. If a pressure gage is desired, unscrew the plug and install the gage using pipe sealant. Make sure the gage does not interfere with operation.

4.5 HANDLE INSTALLATION INSTRUCTIONS

The tiller handle is shipped loose from the monitor and must be installed to complete the installation process. When installing the tiller handle, be sure to coat the threads of the mounting screw with the Loctite supplied in the hardware packet.

4.6 DRAIN

There is no drain on the Typhoon Monitor itself. A drain valve should be installed on the monitor's inlet piping.

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

⚠CAUTION **Structural damage from corrosion can result from failure to drain appliance between uses. Always drain appliance.**

4.7 LADDER MONITOR INSTALLATION

Due to the unique mounting orientations found on ladder trucks, an anti-back-drive mechanism gearbox is included on ladder models to prevent unintended monitor/nozzle movement due to vibration. The gearbox allows the motor and manual override wheel to turn the monitor in both directions, while preventing the monitor from back-driving the motor and manual override wheel.

NOTICE **The anti-back-drive gearbox adds to the size of the monitor (see Figure 3.4F), so additional clearance may be needed to prevent interference with the cab in some installations. The anti-back-drive gearbox is removable. Contact factory for instructions.**

There is also an electronic method to help prevent unintended monitor/nozzle movement due to vibration. This method is provided for installations where adequate clearance for the anti-back-drive gearbox is not available. The electronic method can only be used if the monitor is always powered while the truck is in operation. See LIY-500 Section 4.13.3 for wiring and programming information.

5.0 OPERATION

5.1 HORIZONTAL ROTATION CONTROL

A handwheel controls the monitor's horizontal rotation direction. Clockwise rotation of the handwheel moves the nozzle to the left and counter-clockwise rotation to the right. Approximately 14 turns of the handwheel will give a 90 degree change in horizontal rotation direction.

5.2 ELEVATION CONTROL

A handwheel controls the monitor's elevation direction. Clockwise rotation of the handwheel lowers the elevation and counter-clockwise raises it. About 18 turns of the handwheel will give the complete 135 degree elevation travel range of the monitor.

5.3 TILLER BAR MODEL

On the Tiller Bar model the horizontal rotation is changed by pushing or pulling horizontally on the Tiller Handle. Twisting the Rotation Locking Knob clockwise will increase the drag on the lower swivel joint to “lock” the monitor in a particular direction. See figure 5.3 for the Tiller Bar model controls.

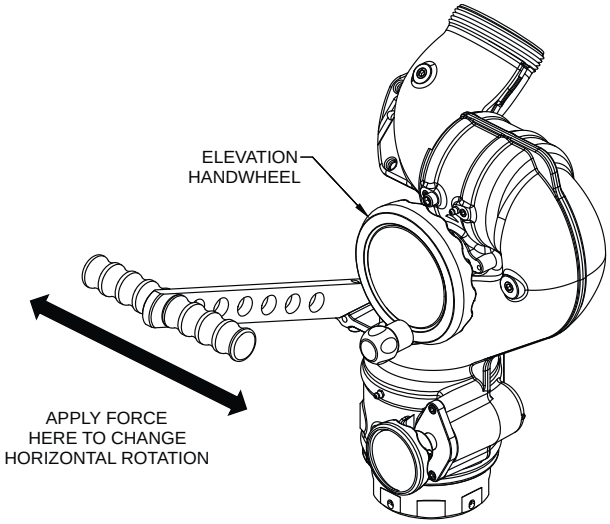


Figure 5.3
Tiller Bar Model Controls

⚠CAUTION **Injury can result from the monitor changing direction due to an off center nozzle reaction. An off center nozzle reaction may be caused by debris in the nozzle causing an asymmetrical stream. Always keep the rotation lock tight when not rotating the monitor. Always keep one hand on the tiller handle when loosening the locking knob. Where continuous 360 degree rotation of the monitor is not needed it is recommended that the Horizontal Rotation Stop Bolts (see section 4.2.2 for Stop Bolt locations) be installed to reduce any chance of the monitor spinning due to an off center nozzle reaction caused by debris trapped in the nozzle.**

5.4 RECOMMENDED PARK POSITION

For truck mounted applications it is recommended that the monitor be parked in a position such that the monitor’s nozzle rests against a bracket or support surface. If a support surface is not available, run the elevation against one of its travel stops to take some of the backlash out of the gear drive. This will minimize bouncing of the nozzle when the apparatus is traveling. Always be sure the monitor is properly parked before moving the truck and know the overall height to avoid damage from overhead obstructions such as doors or bridges.

See LIY-500 for information on programming PARK position.

5.5 OVERRIDE KNOBS

In the event of electrical system failure on the monitor or fire truck the Typhoon Monitor is factory supplied with knobs so the monitor may be manually operated. To make the Typhoon RC more compact the manual override knobs may be removed. The drive shafts have a hex so an 11/16” wrench or socket may be used for manual override. The wrenching hexes are shown in figure 5.5.

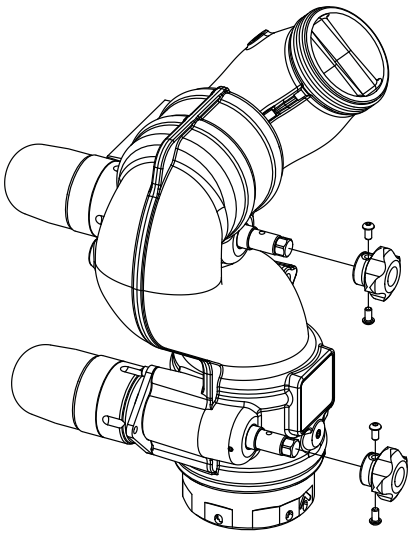
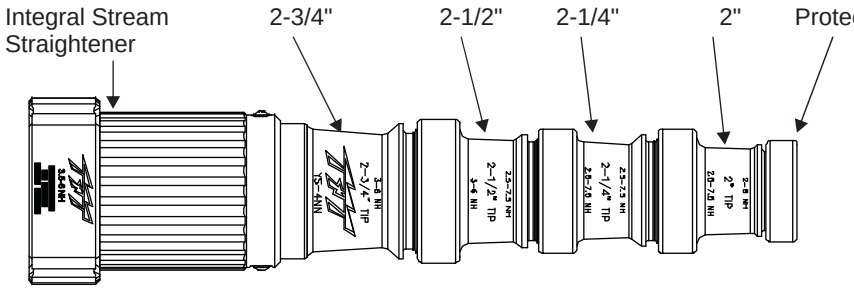


Fig 5.5
Wrenching Hexes on Drive Shaft

6.0 FLOWS AND PRESSURES

6.1 STACKED TIPS FLOW AND REACH



Remove cap and install smaller tips if desired. Such as Model #MST-4NJ (1-3/8", 1-1/2", 1-3/4", 2")

Fig 6.1A
Stacked Tip Model YST-4NN

Nozzle Diameter (inches)	NOZZLE INLET PRESSURE							
	50 PSI		60 PSI		80 PSI		100 PSI	
	FLOW (GPM)	REACTION (LBS)	FLOW (GPM)	REACTION (LBS)	FLOW (GPM)	REACTION (LBS)	FLOW (GPM)	REACTION (LBS)
2.0	840	310	920	380	1060	500	1190	630
2.25	1080	400	1170	480	1350	640	1500	790
2.5	1310	490	1440	590	1660	980	1860	980
2.75	1590	590	1740	710	2010	950	—	—

14.5 psi = 1 bar
1 gpm = 3.785 l/min

FLOW EXCEEDS RATING OF TYPHOON MONITOR

Nozzle Diameter (mm)	NOZZLE INLET PRESSURE							
	3.5 BAR		4.1 BAR		5.5 BAR		7 BAR	
	FLOW (l/min)	REACTION (KG)	FLOW (l/min)	REACTION (KG)	FLOW (l/min)	REACTION (KG)	FLOW (l/min)	REACTION (KG)
50	3180	140	3480	170	4010	230	4500	290
57	4010	180	4430	220	5110	290	5680	360
64	4960	220	5450	270	6480	360	7040	450
70	6020	270	6590	320	7610	430	—	—

14.5 psi = 1 bar
1 gpm = 3.785 l/min

FLOW EXCEEDS RATING OF TYPHOON MONITOR

Fig. 6.1B
Stacked Tips Flow Table

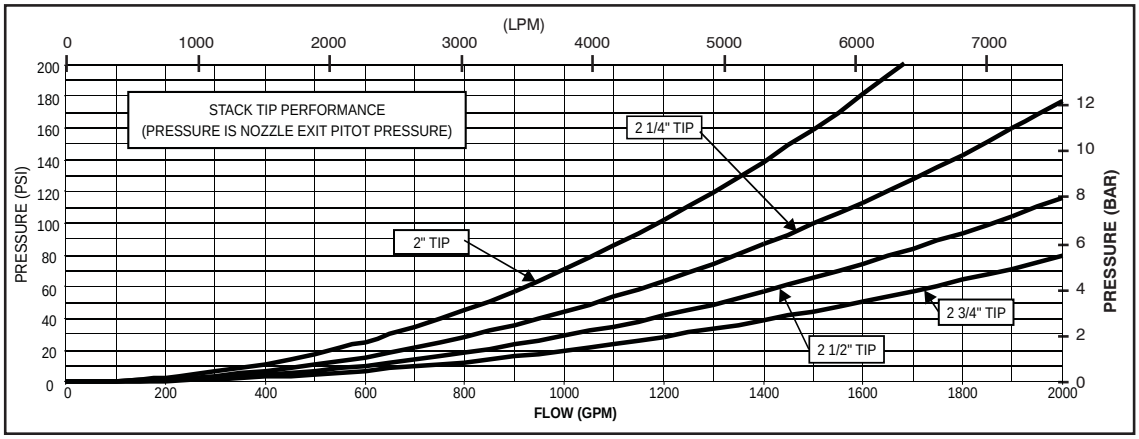
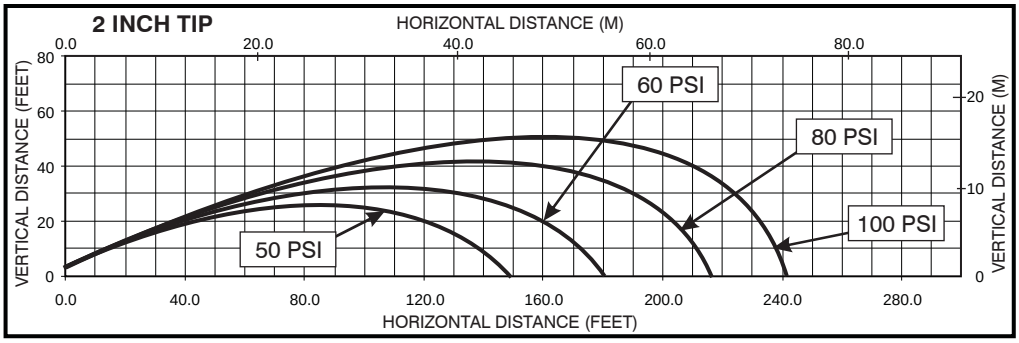
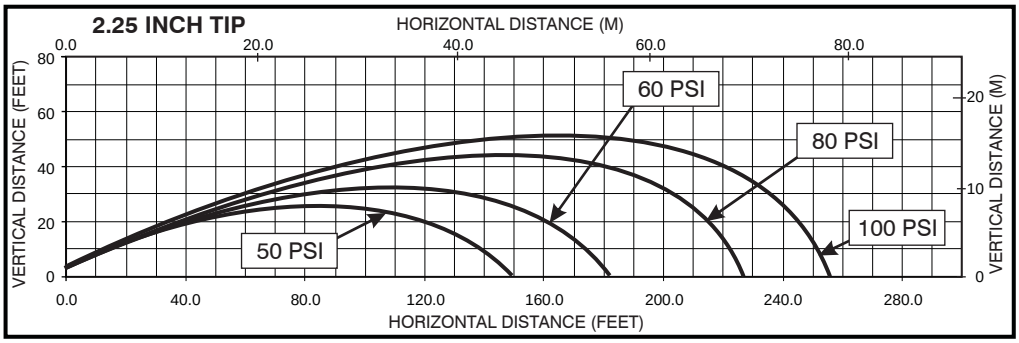
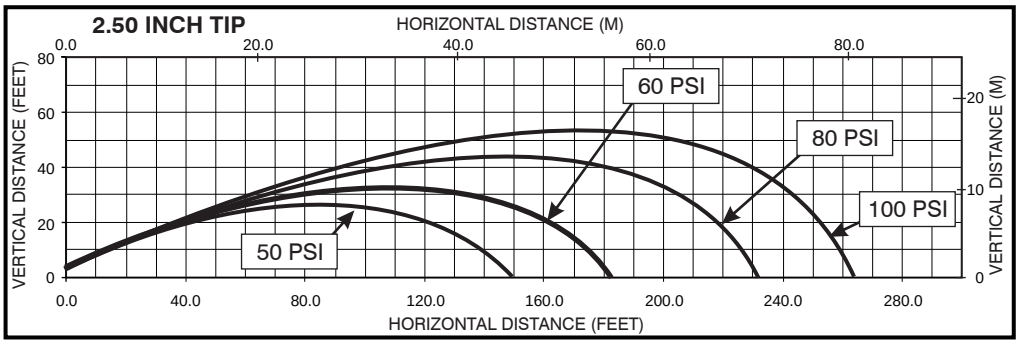


Fig 6.1C
Stacked Tip Flow Graph







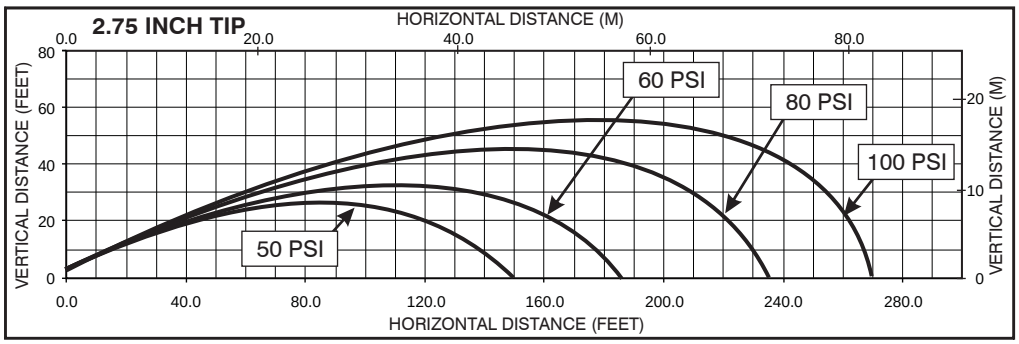


Fig 6.1D
Stacked Tip Stream Trajectory Graphs

This graph is approximate only. Critical applications should be tested in actual conditions to verify adequate reach.

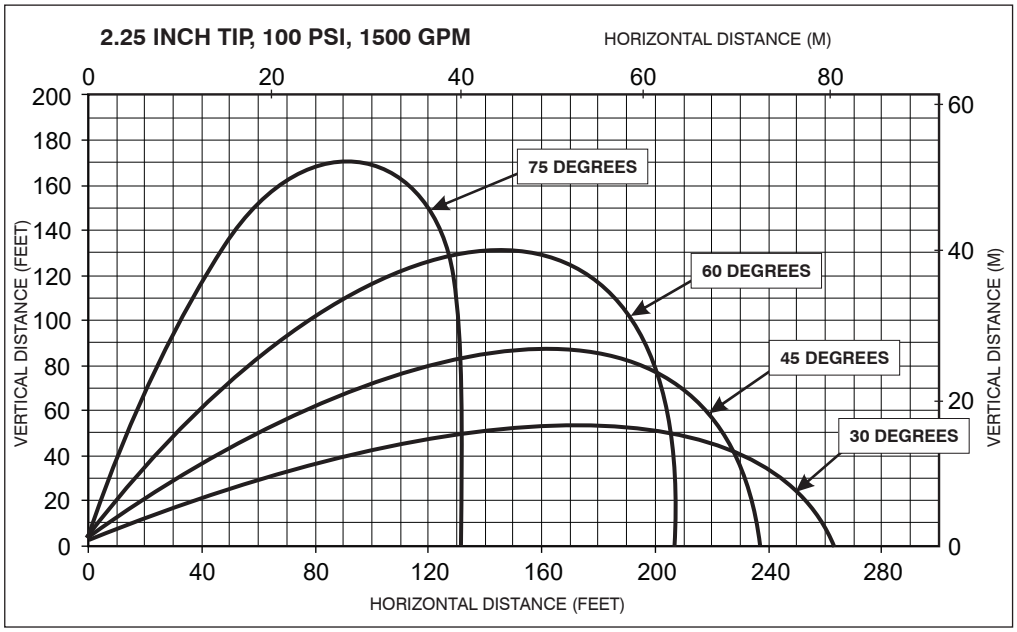


Fig 6.1E
Effects of Elevator Trajectory

This graph shows approximately how a moderate wind can affect stream reach. 1 ft = 0.3048 m

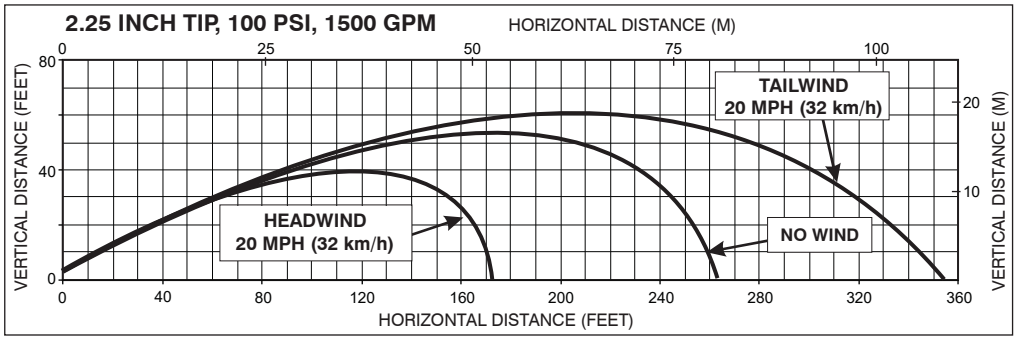
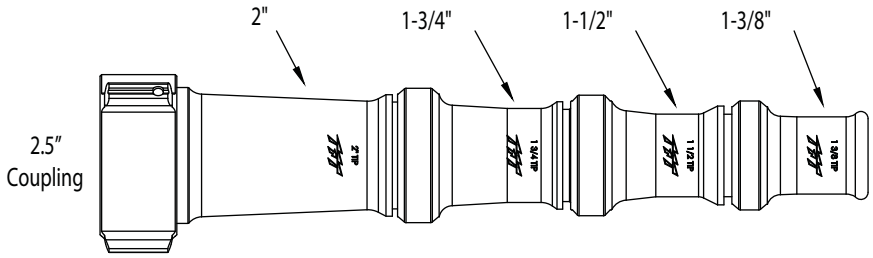


Fig 6.1F
Effects of Wind on Reach

6.1.1 MST-4NJ FLOW AND REACH



NOZZLE DIAMETER (inches)	NOZZLE PRESSURE (PSI)							
	40		60		80		100	
	FLOW (GPM)	REACTION (LBS)	FLOW (GPM)	REACTION (LBS)	FLOW (GPM)	REACTION (LBS)	FLOW (GPM)	REACTION (LBS)
1.375	360	120	440	180	500	240	560	300
1.50	420	140	520	210	600	280	670	350
1.75	580	190	700	290	810	380	910	480
2.00	750	250	920	380	1000	500	1190	630

NOZZLE DIAMETER (MM)	NOZZLE PRESSURE (BAR)							
	2.8		4.1		5.5		7	
	FLOW (l/min)	REACTION (KG)	FLOW (l/min)	REACTION (KG)	FLOW (l/min)	REACTION (KG)	FLOW (l/min)	REACTION (KG)
35	1360	50	1670	80	1890	110	2120	140
38	1590	60	1970	100	2270	130	2540	160
45	2200	90	2650	130	3070	170	3440	220
50	2840	110	3480	170	4010	230	4500	290

Fig. 6.1.1A
Stacked Tips Flow Table

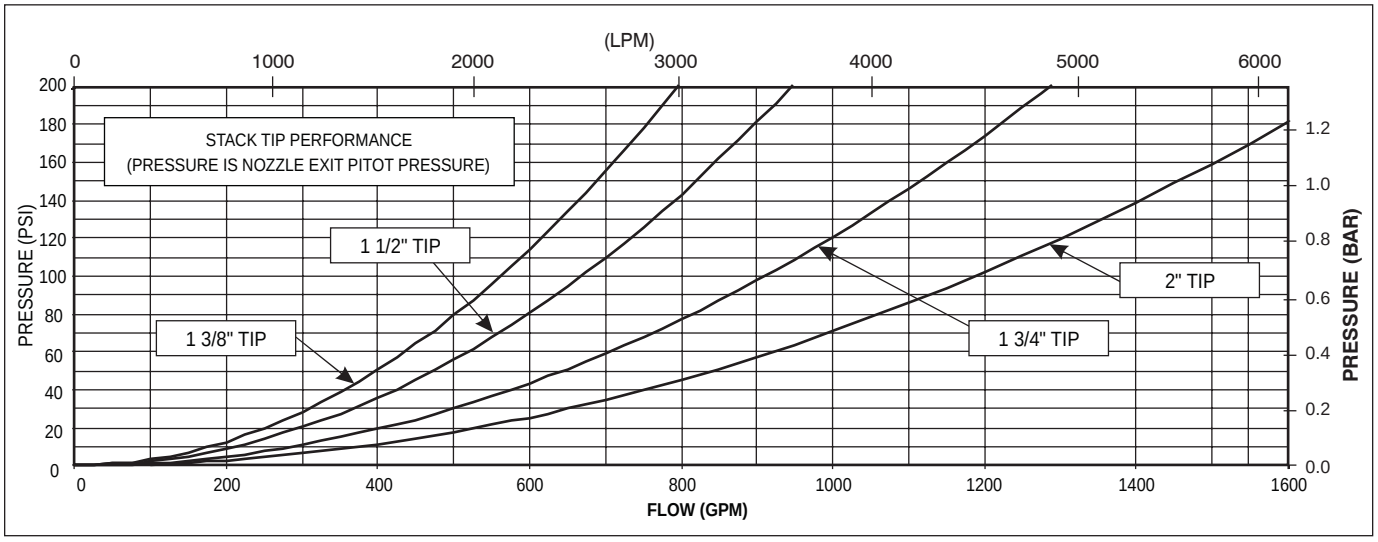
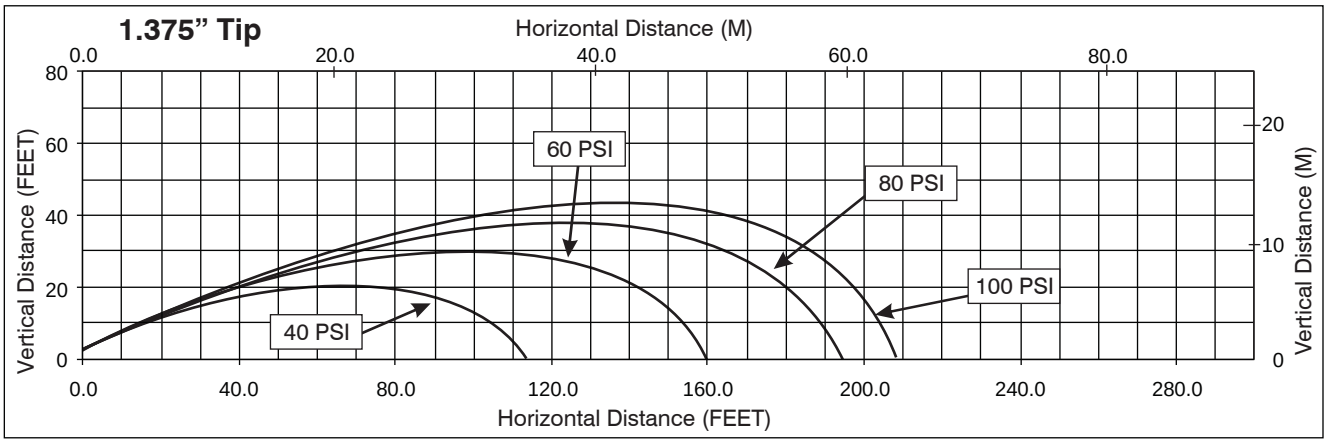
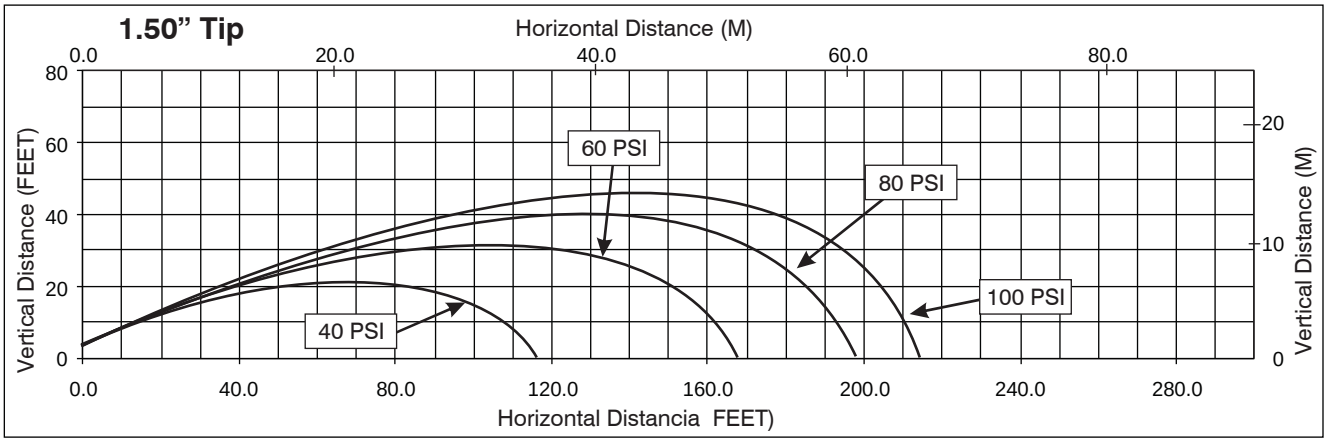
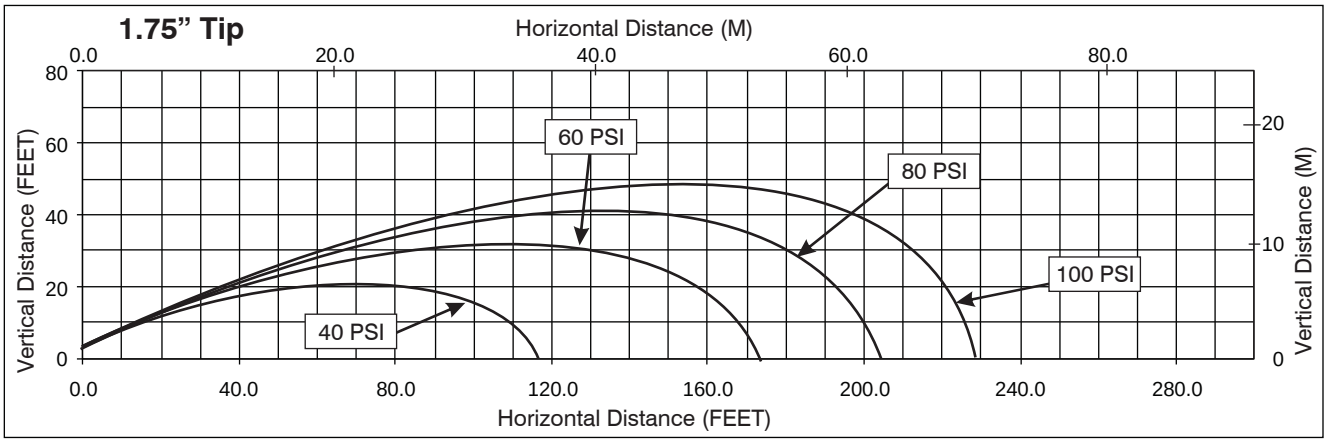


Fig 6.1.1B
Stacked Tips Flow Graph







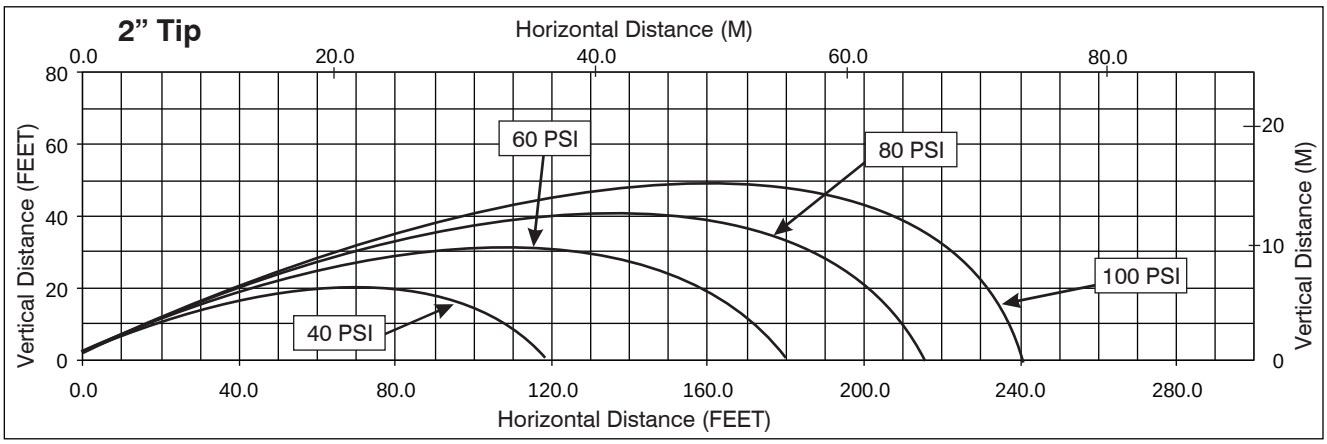
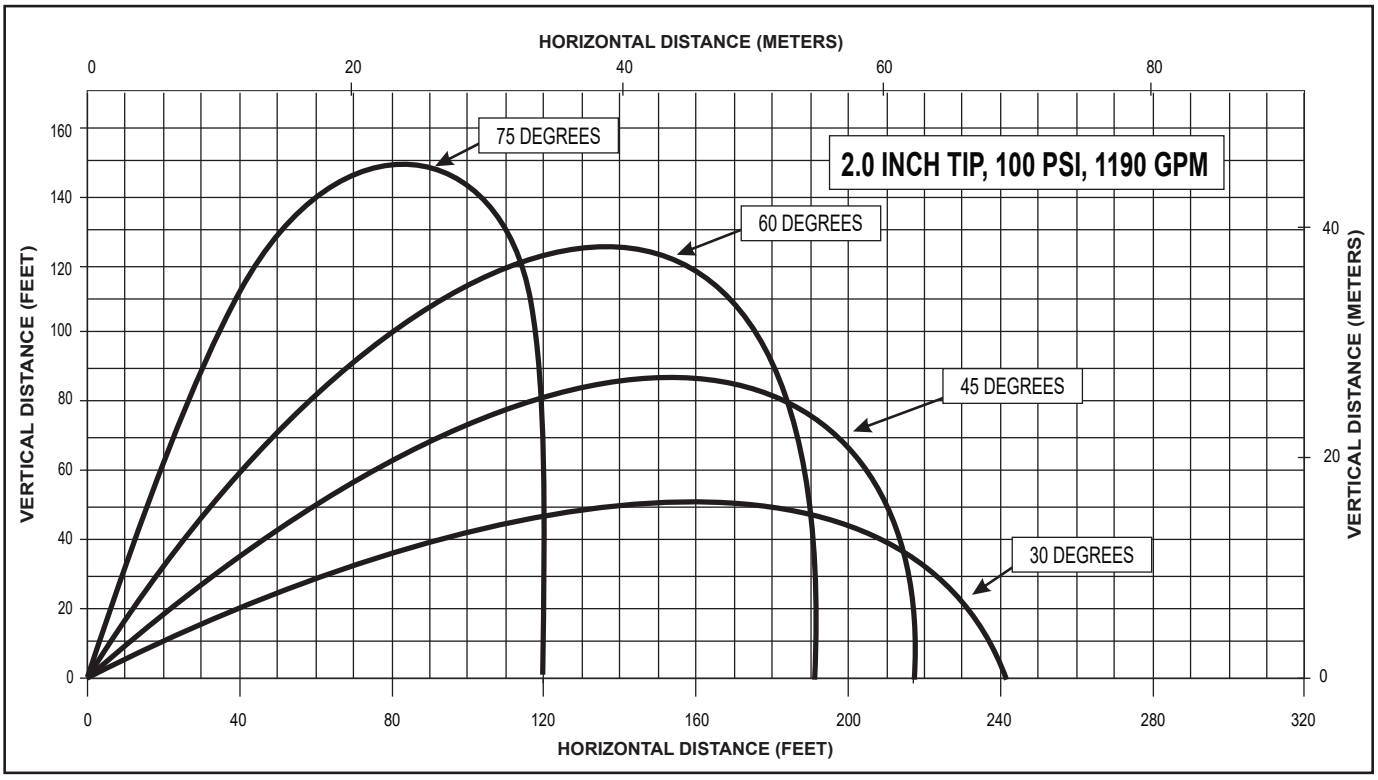


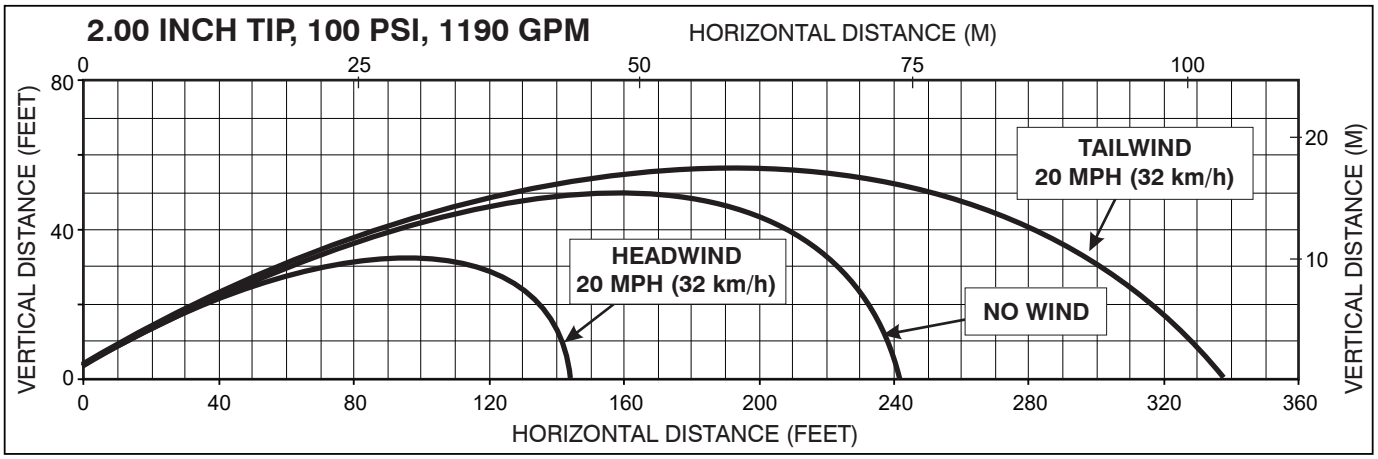
Fig 6.1.1C
Stacked Tips Stream Trajectory Graphs



This graph is approximate only.

Critical applications should be tested in actual conditions to verify adequate reach.

Fig 6.1.1D
Effects of Elevation on Trajectory



This graph shows approximately how a moderate wind can affect stream reach. 1 ft = 0.3048 m

Fig 6.1.1E
Effects of Wind on Reach

6.2 AUTOMATIC MASTERSTREAM NOZZLES

Automatic nozzles maintain a constant pressure by adjusting their orifice to match the available flow. Consult the nozzle manufacturer for maximum flow and pressure range. In all cases, do not exceed the maximum rating of the Typhoon Operating Envelope. TFT's Masterstream 1500 nozzle has a 300-1500 gpm flow range. Masterstream 1500 Nozzle operating instructions (Item Number LIM-030) is available on TFT's website: www.tft.com

6.3 TYPHOON MONITOR FRICTION LOSS

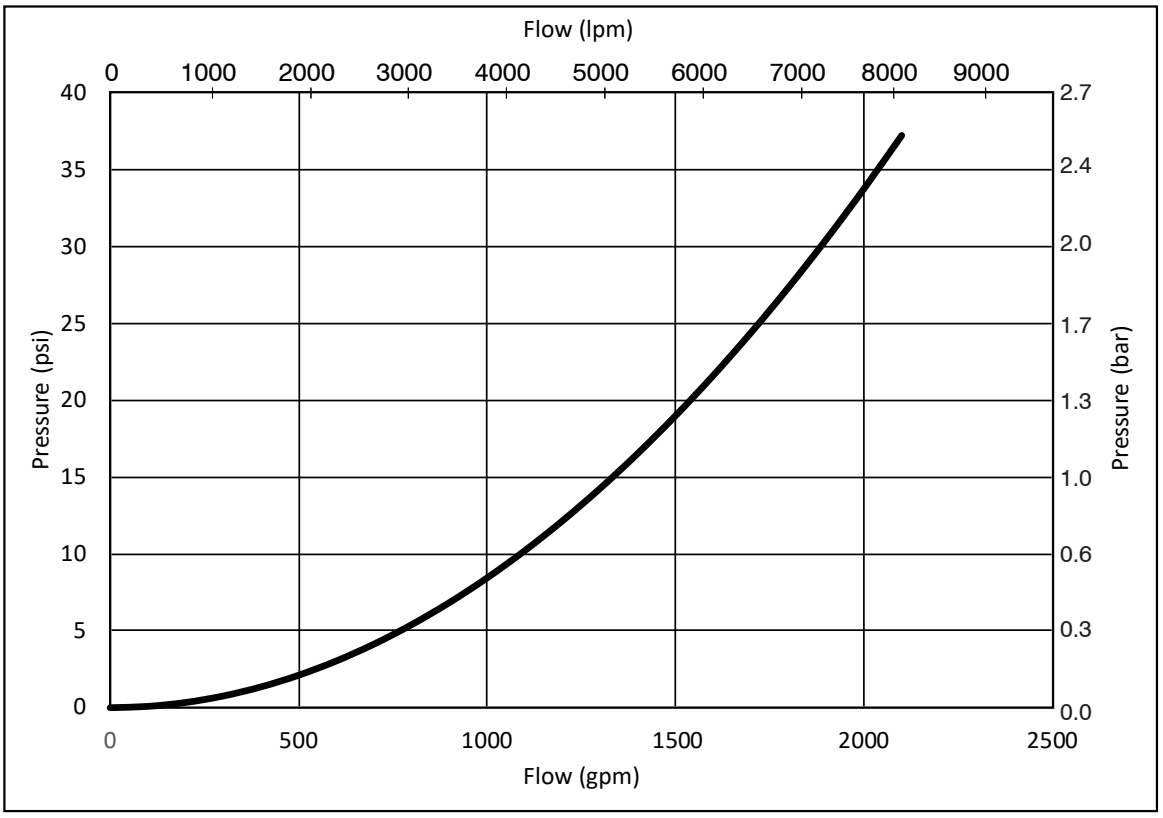
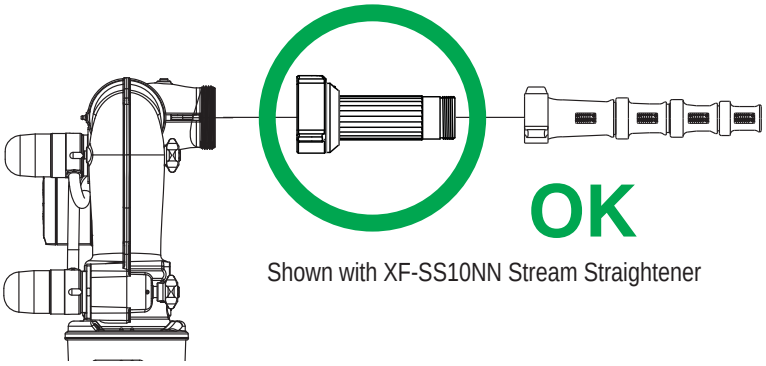


Fig 6.3
Typhoon Monitor Friction Loss

6.4 STREAM STRAIGHTENERS

6.4.1 STREAM STRAIGHTENERS WITH STACKED TIPS

Turbulence though the Typhoon Monitor is very low but stream quality and reach can be improved with the use of the integral stream straightener on the TFT stacked tip nozzle. See figure 6.4.1 for the stacked tip's integral stream straightener friction loss.



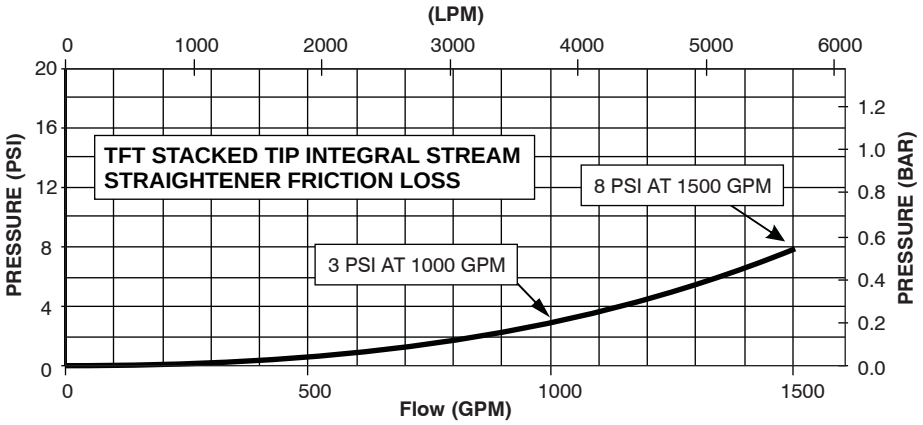
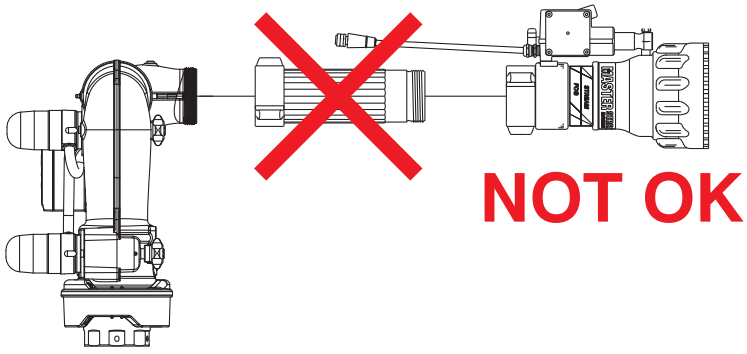


Fig 6.4.1
TFT Stack Tip Integral Stream Straightener Friction Loss

6.4.2 STREAM STRAIGHTENERS WITH FOG NOZZLES

NOTICE

When using a fog nozzle it is recommended that no stream straightener be used since the fog nozzle's flow path generally serves as a stream straightener. Use of a stream straightener with a fog nozzle will increase the stresses on the monitor's gear train and may lead to premature wear.



7.0 FM APPROVAL (FACTORY MUTUAL)

FM approved monitors are identified with the symbol FM APPROVED on their labels.

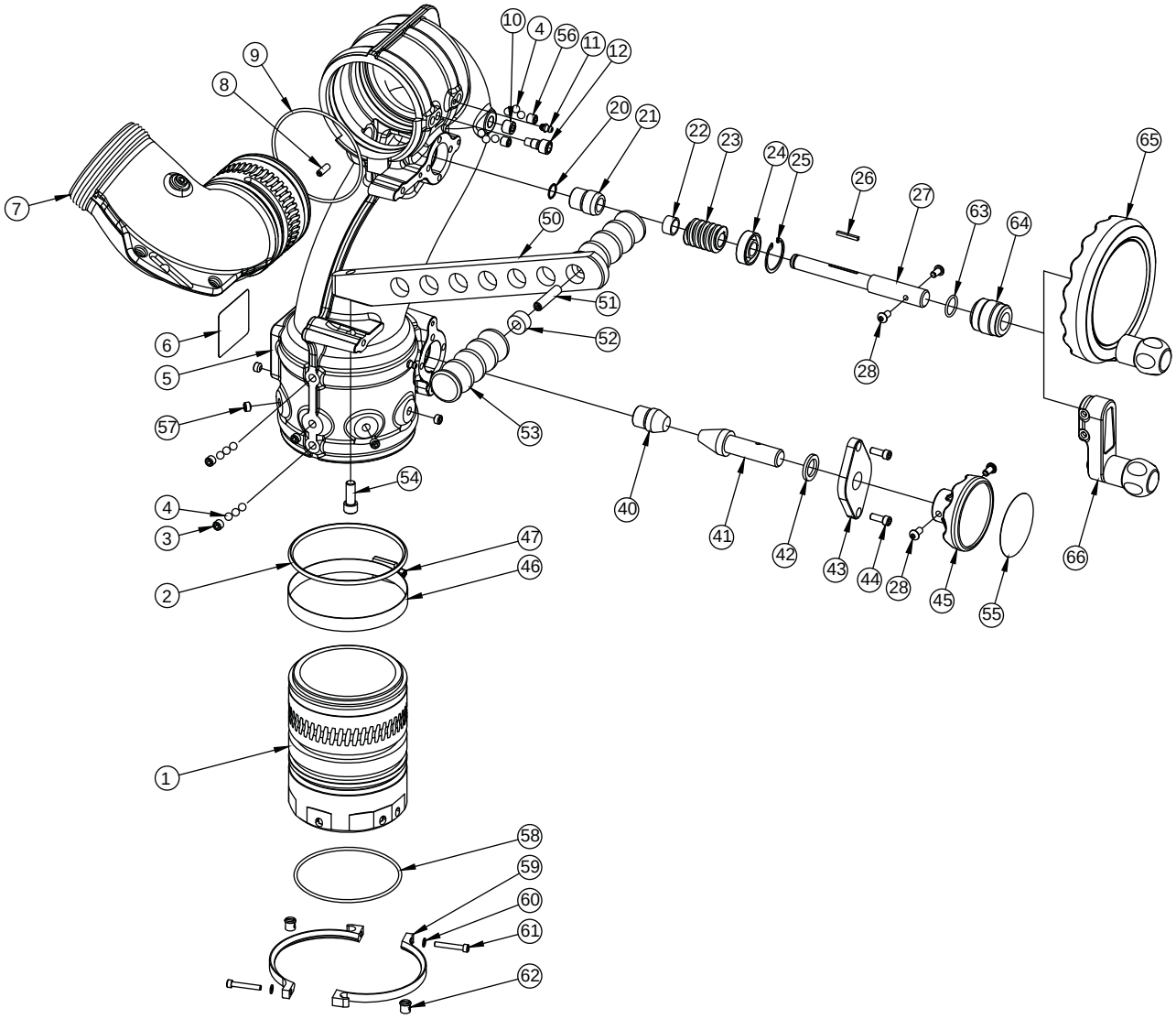
All Manual models with FM Approval have been tested to FM Approval Class 1421 - Monitor Assembly.

RC monitors are not FM approved.

FM Approved monitors are not FM Approved for use with foam.

8.0 TYPHOON DRAWINGS & PARTS LIST

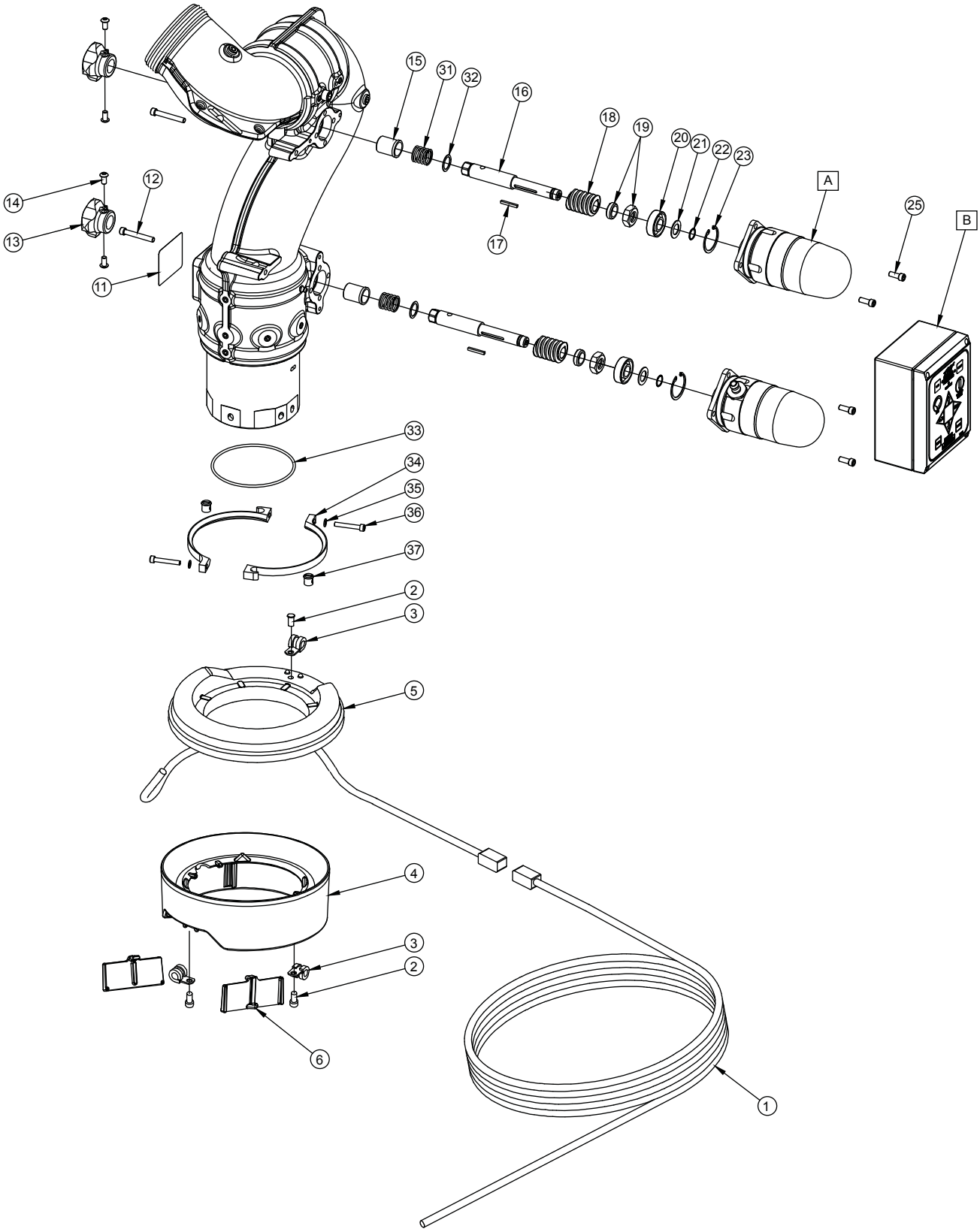
8.1 MANUAL TYPHOON DRAWING



#	DESCRIPTION	QTY	PART #
1	BASE SHORT CODE-RPF 4"	1	Y4401A
	BASE CODE-RLF 3"		Y4405A
	BASE QUICK CONNECT 4.5"NHF SUBASSY		Y4960
	TILLER BASE QUICK CONNECT 4.5"NHF SUBASSY		Y4961
2	O-RING-350	1	VO-350
3	3/8-24 X 5/16 SOCKET SET SCREW	2	VT37-24SS312
4	5/16" TORLON BALL	184	VB.312TO
5	LOWER SECTION RC	1	Y3110A
6	NAME LABEL	1	Y3124
7	ELBOW 3 1/2"	1	Y3310A
8	1/4-28 X 3/4 SOCKET SET SCREW	2	VT25-28SS750
9	O-RING-243	1	VO-243
10	1/4"NPT PLUG	2	VFSP2M-SS

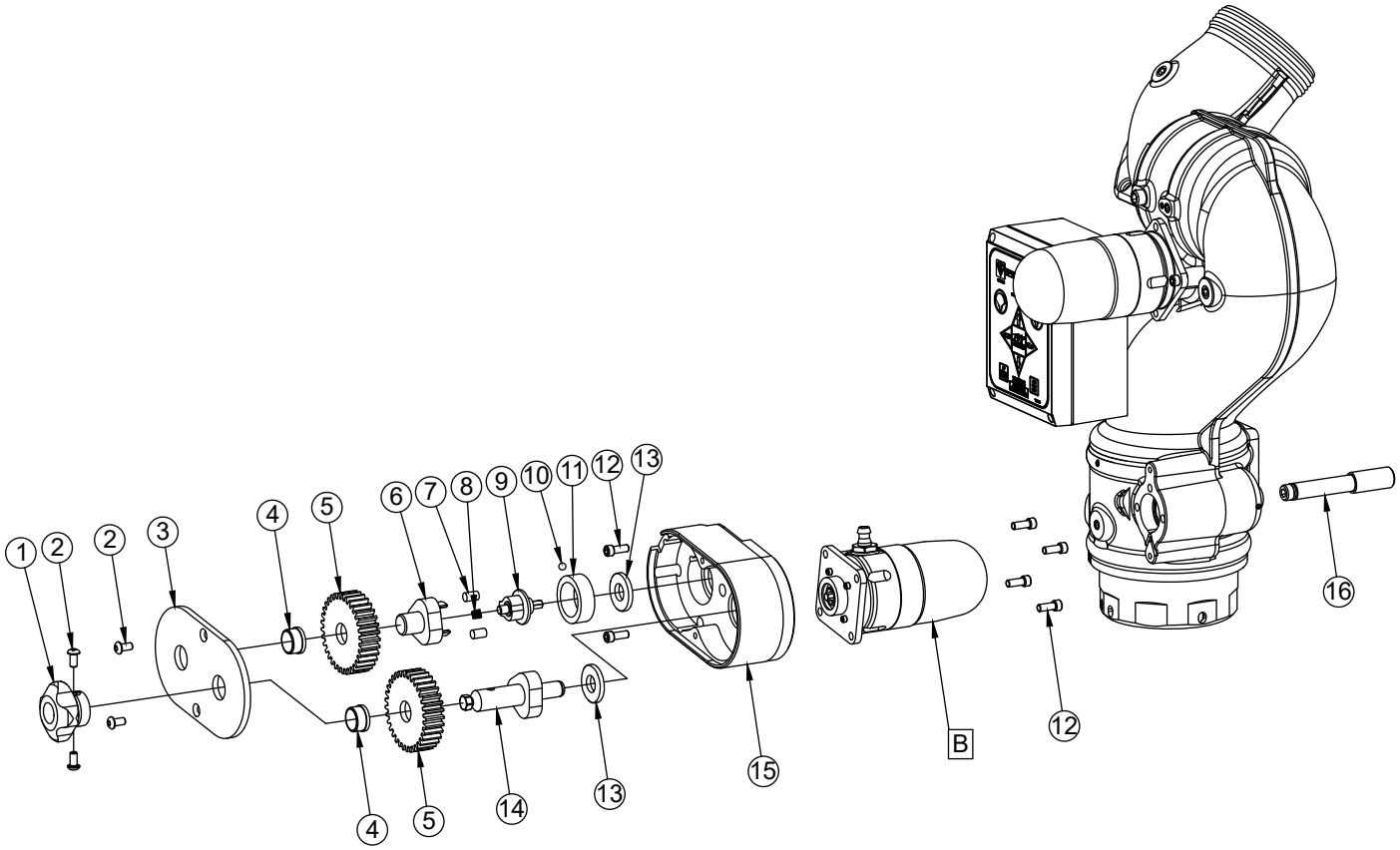
#	DESCRIPTION	QTY	PART #
11	GREASE FITTING	2	VT25-28ZERK
12	STOP BOLT	1	Y4145
20	SMALLEY RING	1	VR4365
21	BUSHING	1	Y3162
22	SPACER	1	Y4150
23	12 DP WORM	1	X220
24	BEARING	1	VM4252
25	SNAP RING	1	VR4220
26	KEY	1	X225
27	DRIVE SHAFT	1	Y3160
28	1/4-20 X 1/2 BUTTON HEAD SCREW	4	VT25-20BH500
29	HANDWHEEL	1	X281
30	HANDWHEEL LABEL	1	A1306
31	3/8-16 X 1-1/2 BUTTON HEAD SCREW	1	VT37-16BH1.5
32	CRANK BUSHING	1	A1513
33	WASHER	1	VW812X406-65
34	KNOB	1	A1512
40	COVER	1	Y4192
41	LOCKING BOLT	1	Y3193
42	THIN WASHER	1	A1530
43	RETAINER	1	Y3194
44	1/4-28 X 5/8 SOCKET HEAD SCREW	2	VT25-28SH625
45	LOCKING KNOB	1	Z245
46	BAND CLAMP	1	Y3191
47	CLAMP SHIELD	1	Y3190
50	TILLER HANDLE	1	Y2316
51	3/8-16 X 1 3/4 SOCKET SET SCREW	1	VT37-16SS1.7
52	HANDLE BUSHING	1	Y2317
53	PEG	2	X362
54	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
55	OVERRIDE KNOB LABEL	1	Y4176
56	3/8-24 X 3/8 SOCKET SET SCREW	2	VT37-24SS375
57	3/8-24 X 1/4 SOCKET SET SCREW	5	VT37-24SS250
58	O-RING-244 RPF-INLET	1	VO-244
	O-RING-236 RLF-INLET		VO-236
59	4" MONITOR BASE CLAMP	2	Y4435
	3" MONITOR BASE CLAMP		Y4436
60	WASHER	2	VW360X200-04
61	10-24 X 1 1/4 SOCKET HEAD SCREW	2	VT10-24SH1.2
62	CYLINDER NUT	2	Y4437
63	O-RING-116	1	VO-116
64	BUSHING	1	Y3163
65	HANDWHEEL SUBASSEMBLY	1	A3910
66	CRANK WITH KNOB SUBASSEMBLY		A1629

8.2 TYPHOON RC DRAWING



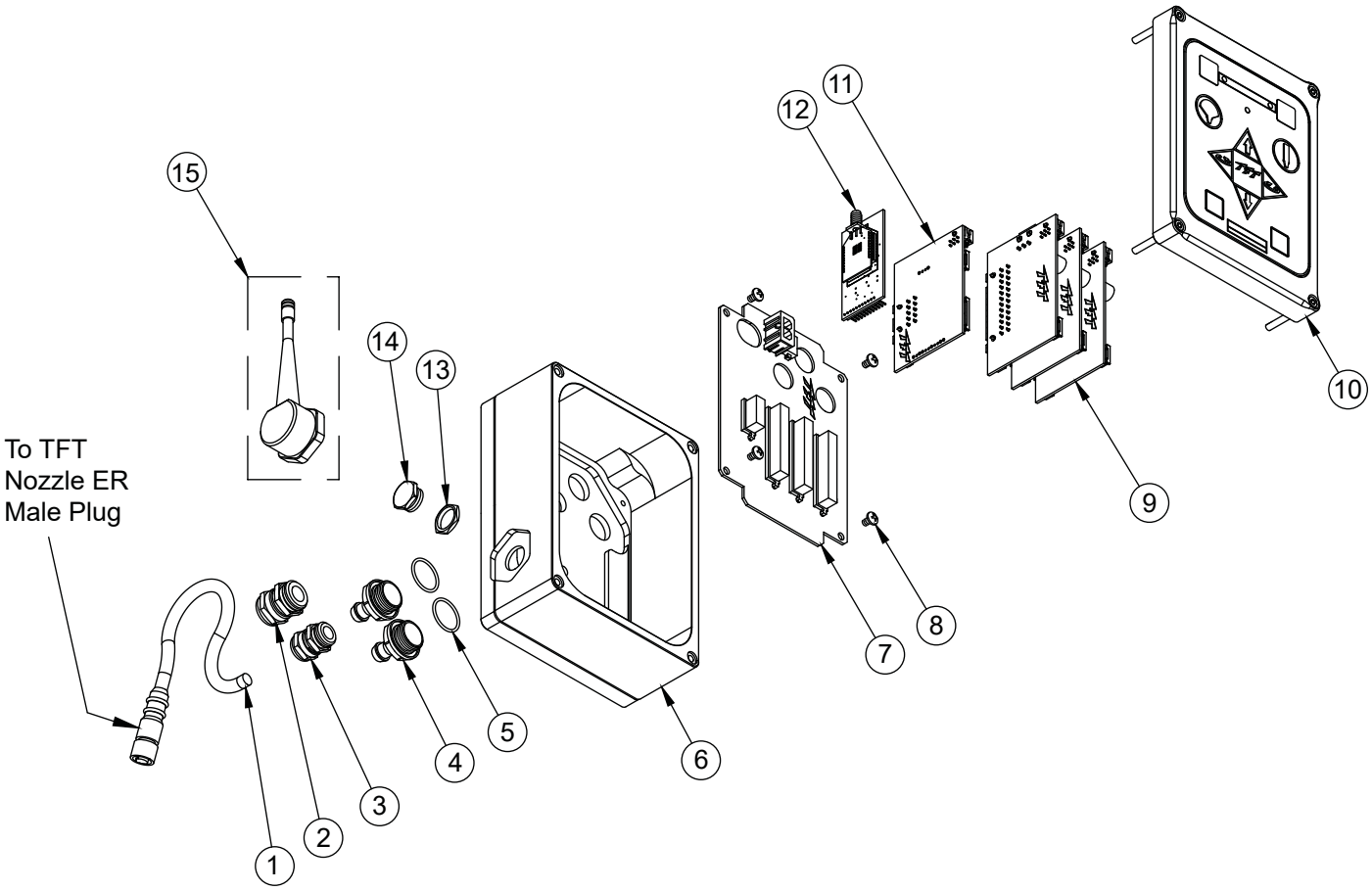
#	DESCRIPTION	QTY	PART #
1	CABLE - POWER & COMM.	30'	Y5200
2	1/4-20 X 1/2 BUTTON HEAD SCREW	3	VT25-20BH500
3	CLAMP	3	Y4655
4	LOWER WIRE SKIRT	1	Y4660
5	UPPER WIRE SKIRT	1	Y4650
6	WIRE SKIRT RETAINER	2	Y4661
11	NAME LABEL	1	Y3122
12	1/4-28 X 1-3/4 SOCKET HEAD SCREW	2	VT25-28SH1.7
13	OVERRIDE KNOB	2	Y3165
14	1/4-20 X 1/2 BUTTON HEAD SCREW	4	VT25-20BH500
15	HEADED BUSHING	2	Y4141
16	DRIVE SHAFT	2	Y4163
17	KEY	2	X225
18	12 DP WORM	2	X220
19	MALE THREADED BUSHING	2	Y2175
	FEMALE THREADED BUSHING	2	Y2176
20	BEARING	2	VM4252
21	WASHER	2	VW97X595-048
22	SMALLEY RING	2	VR4365
23	SNAP RING	2	VR4220
B	MOTOR ENCLOSURE SUBASSEMBLY	2	SEE SECTION 10.5
25	1/4-28 X 5/8 SOCKET HEAD SCREW	4	VT25-28SH625
A	CONTROL BOX SUBASSEMBLY	1	SEE SECTION 10.4
31	SHAFT SPRING	2	Y4159
32	WASHER	2	VW1.0X759-04
33	VO-RING-244 RPF-INLET	1	VO-244
	VO-RING-236 RLF-INLET		VO-236
34	4" MONITOR BASE CLAMP	2	Y4435
	3" MONITOR BASE CLAMP		Y4436
35	WASHER	2	VW360X200-04
36	10-24 X 1 1/4 SOCKET HEAD SCREW	2	VT10-24SH1.2
37	CYLINDER NUT	2	Y4437

8.3 LADDER TYPHOON RC DRAWING



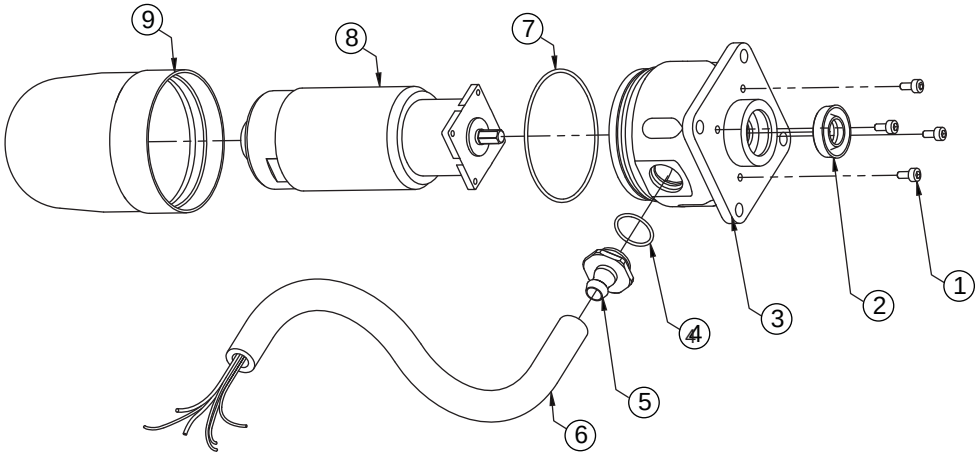
#	DESCRIPTION	QTY	PART #
1	OVERRIDE KNOB	1	Y3165
2	1/4-20 X 1/2 BUTTON HEAD SCREW	4	VT25-20BH500
3	GEARBOX COVER	1	Y4262
4	SHORT HEADED BUSHING	2	XGE634
5	GEAR	2	Y4261
6	DRIVING SHAFT	1	Y4265
7	DOWEL PIN	2	VP312X.50
8	ANTI-BACK-DRIVE SPRING	1	Y4266
9	DRIVEN SHAFT	1	Y4263
10	1/4" SS BALL	1	V2125
11	FLOATING RING	1	AY352
12	1/4-28 X 5/8 SOCKET HEAD SCREW	6	VT25-28SH625
13	BUSHING	2	XGE637
14	DRIVE SHAFT	1	Y4264
15	GEARBOX	1	Y4260
16	DRIVE SHAFT	1	Y4267
B	MOTOR ENCLOSURE SUBASSEMBLY	1	SEE SECTION 10.5

8.4 CONTROL BOX SUBASSEMBLY



INDEX	DESCRIPTION	QTY	PART #
1	CABLE - 6 POLE FEMALE PLUG	21" or 28" TOTAL LENGTH USED	Y5475
	FOR TYPHOON RC NOZZLE CONNECTION	16" or 23" EXPOSED CABLE (NOT INCLUDING PLUG)	
2	PG11 STRAIN RELIEF	1	Y5205A
3	PG9 STRAIN RELIEF	1	Y5245A
4	CONDUIT FITTING	2	Y5213
5	O-RING-018	2	VO-018
6	ENCLOSURE BOX	1	Y5116B
7	MAIN BOARD	1	Y5105
8	M4-0.7 X 6MM PHILLIPS HEAD SCREW	4	VTM4-0.7PH6
9	MOTOR CONTROL BOARD	3	Y5100
10	MONITOR CONTROL BOX SHELL - SUBASSEMBLY	1	Y5801-LID
11	COMMUNICATION BOARD	1	Y5110-B
*12	RADIO + ADAPTER XBEE TO XSTREAM 900 MHZ RADIO	1	Y5891
	RADIO + ADAPTER XBEE TO XSTREAM 2.4 GHZ RADIO		Y5893
13	PG9 LOCKNUT	1	Y5246
14	PG9 HEX PLUG	1	Y5248
*15	900/920 MHZ ANTENNA W/FITTING & CONN. SUBASSY.	1	Y5897
	2.4 GHZ ANTENNA ADAPTER W/CONN. SUBASSY.		Y5898
* - OPTIONAL			

8.5 MOTOR ENCLOSURE SUBASSEMBLY



#	DESCRIPTION	QTY	PART #
1	6-32 x 5/16 LONG SHCS WITH HEAD SEAL	4	VT06S32SH312
2	CUP SEAL 1.0625 x .5625 x 1/4	1	Y4620
3	MOTOR SOCKET, ANGLED FITTING	1	Y4617
4	O-RING-018, 3/4 ID 1/16 CS	1	VO-018
5	CONDUIT FITTING	1	Y5213
6	HOSE - 3/8" ID PUSH-LOK	1	Y5250
7	O-RING-038, 2-5/5 ID 1/16 CS	1	VO-038
8	GEAR MOTOR WITH ENCODER	1	Y4611-KIT
9	ENCLOSURE	1	Y4616

9.0 WARRANTY

Task Force Tips LLC, 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA (“TFT”) warrants to the original purchaser of its nozzles and other equipment (“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 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, it 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 or countries 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 THE DOCUMENT.

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

10.0 MAINTENANCE

The Typhoon Monitor requires little maintenance. 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. Equipment can be returned to the factory for service and/or testing.

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

10.1 LUBRICATION

The Typhoon monitor generally should not require greasing. In the event that the operation becomes stiff grease may be applied to the horizontal rotation and elevation worm gears. The grease is applied by removing the plugs at the grease ports and replacing with grease fittings that have ¼-28 male threads. See figure 10.1 for grease port locations. Use medium viscosity automotive chassis grease. Apply only enough grease to restore normal operation. If normal operation is not restored by greasing than inspect for other causes of stiff operation.

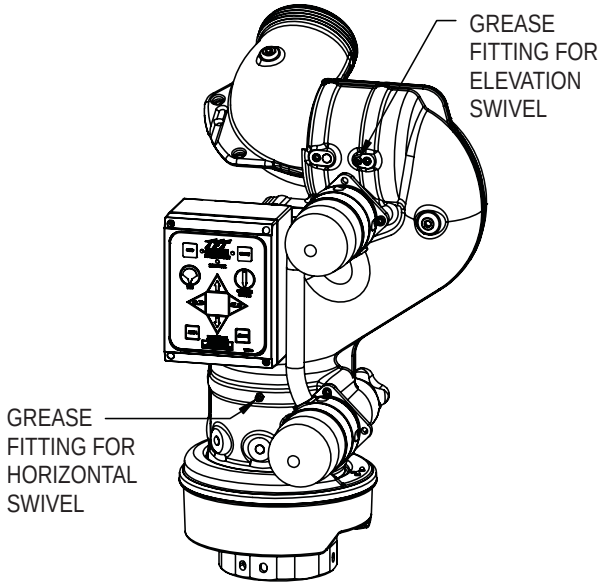


Fig 10.1
Location of Grease Port for Horizontal Rotation Worm Gear and Elevator Joint

10.2 TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
Leaks	Debris or damage in seal area	Clean out debris or replace damaged parts
Elevation Binding	Debris or damage to elevation drive parts	Clean out debris or replace damaged parts
	Lack of lubricant	Grease, see section 10.1
Horizontal Rotation Binding	Debris or damage to horizontal drive parts	Clean out debris or replace damaged parts
	Lack of lubricant	Grease, see section 10.1

10.3 REPAIR

Factory service is available with repair time seldom exceeding one day in our facility. Factory serviced appliances are repaired by experienced technicians to original specifications, fully tested and promptly returned.

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.

For additional information on care, maintenance and testing, refer to: NFPA 1962: Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances, 2013 Edition

11.0 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.

12.0 INSPECTION CHECKLIST

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

- All valves (if so equipped) open and close fully and smoothly
- Waterway is clear of obstructions
- There is no damage to any thread or other connection
- All locks and hold-down devices work properly
- The pressure setting on the relief valve (if so equipped) is set correctly
- Gaskets are in good repair
- There is no obvious damage such as missing, broken or loose parts
- There is no damage to the appliance that could impair safe operation (e.g. dents, cracks, corrosion, or other defects)
- All swiveling elements rotate freely
- Nozzle is securely attached

BEFORE BEING PLACED BACK IN SERVICE, appliances 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 of the relief valve, if any, is set correctly
5. All locks and hold-down devices work properly
6. Internal gaskets are in accordance with NFPA 1962 (2013) Section 7.2
7. There is no damage to the appliance that could impair safe operation (e.g. dents, cracks, corrosion, or other defects)
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

NFPA 1962: Standard for the care, use, inspection, service testing, and replacement of fire hose, couplings, nozzles and fire hose appliances. (2013 ed., Section 6.2.1). Quincy, MA: National Fire Protection Agency.

⚠WARNING **Any monitor failing any part of the inspection checklist is unsafe and must have the problem corrected before use. Operating a monitor that fails any of the above inspections is a misuse of this equipment.**

TASK FORCE TIPS LLC
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