



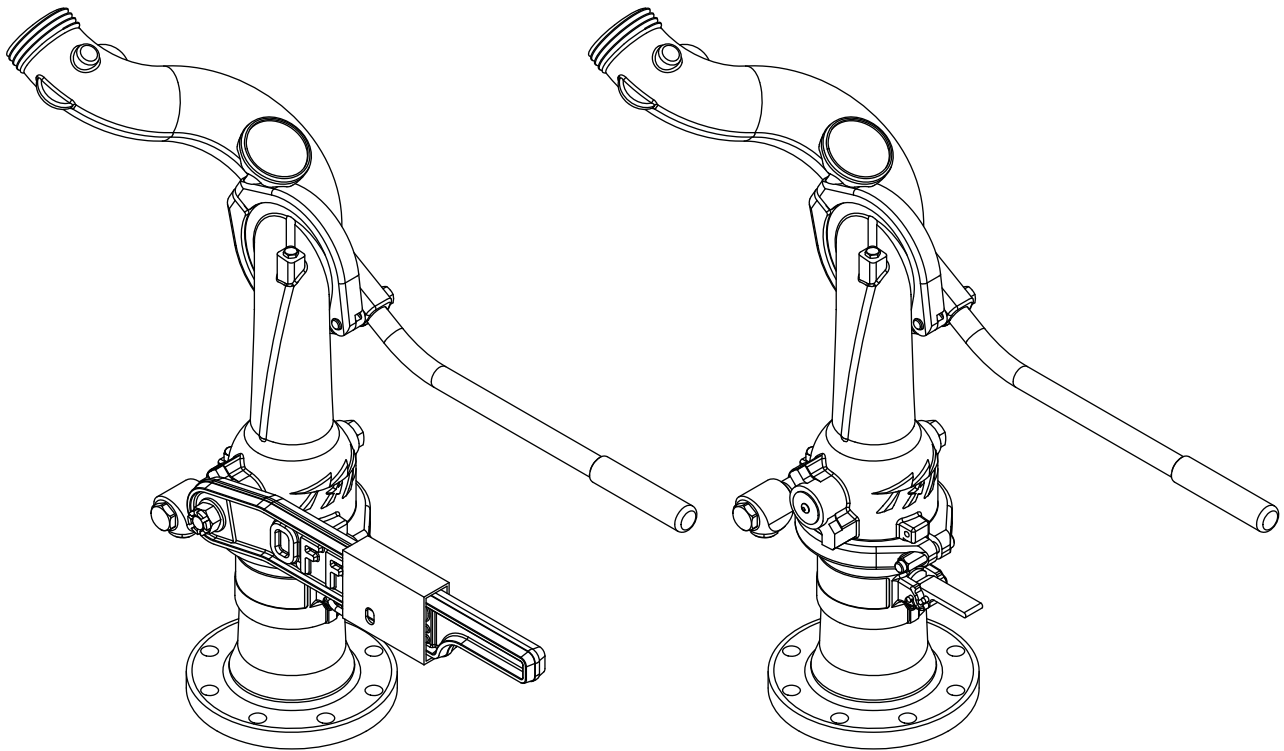
MANUAL: PROTECTOR STATION MONITOR

INSTRUCTIONS FOR SAFE OPERATION AND MAINTENANCE

⚠ WARNING

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

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



Shown with optional valve.

**Maximum flow is
1250 GPM (4800 L/MIN)**

**Maximum inlet pressure is
250 PSI (17 BAR)**

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

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

▲ 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.







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

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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 standard Z535.6-2011, the definitions of the four signal words are as follows:

	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
	NOTICE is used to address practices not related to physical injury.

2.0 SAFETY

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

	DANGER An inadequate supply of nozzle pressure and/or flow will cause an ineffective stream and can result in injury, death, or loss of property. See flow graphs or call 800-348-2686 for assistance.
	WARNING Injury or death may occur by attempting to use a damaged monitor. Before using the monitor inspect it for damage resulting from: <ul style="list-style-type: none">• 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<ul style="list-style-type: none">- Excessive bolt torque- Wrong tightening sequence
	WARNING Injury can result from an inadequately supported monitor. The monitor mount must be capable of supporting 1050 lbs (475 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 This equipment is intended for use by trained personnel for firefighting. Their use for other purposes may involve hazards not addressed by this manual. Seek appropriate guidance and training to reduce risk of injury.
	CAUTION Maximum flow and pressure is 1250 gpm (4800 l/min) and 250 psi (17 bar). Damage or injury may result if the monitor is operated beyond these limits.
	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 To prevent mechanical damage, do not drop or throw equipment.

3.0 GENERAL INFORMATION

The Task Force Tips Protector is a simple and rugged fixed station monitor with many unique features. Its patented waterway gives low friction loss and delivers water to the nozzle with fewer twists and turns than a conventional monitor. The optional built-in on/off valve with position indicator eliminates the need to add a costly valve to the monitor installation. The Protector is capable of flowing up to 1250 gpm (4800 l/min) while maintaining a FULL 360° rotational ability. The lever-action rotational lock is activated in one motion, visually confirmed, and securely holds the monitor's horizontal position. The Protector can be directly bolted to many common pipe flanges. The outlet is available with various 2.5" (65mm) male threads. The simple and basic design requires no grease application or other maintenance. Swiveling elements and seals (including valve seat) can be replaced within a few minutes with common hand tools. All models are equipped with an automatic drain valve to fully evacuate the monitor and optional on/off valve after each use. A threaded pipe port (1/4" NPT) (6mm) is provided for pressure gauge installation. Maximum pressure is 250 psi (17 bar). The Protector is hard anodized ANSI 356-T6 aluminum and is fully powder coat finished inside and out. Swivel clamps, 3" (75mm) valve ball, trunnions, and hardware are 18-8 stainless steel.

3.1 VARIOUS MODELS AND TERMS

The Protector monitor is available in several different models and inlet connections. The two body styles are shown in figures 3.1A and 3.1B below.

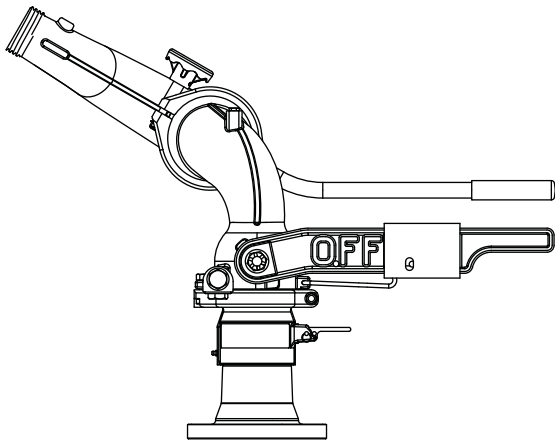


Fig 3.1A
Protector with Shutoff Valve,
Threaded Exit and 4" ANSI 150 inlet

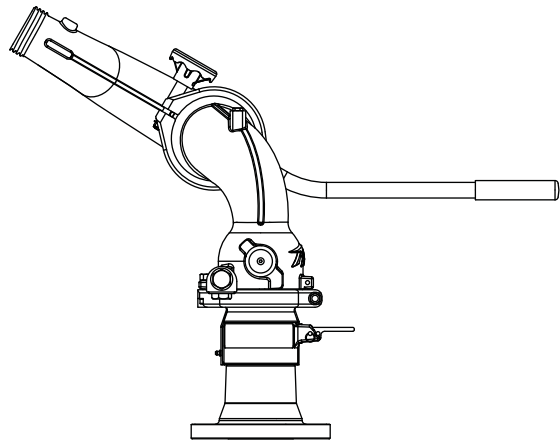


Fig 3.1B
Protector without Valve,
Threaded Exit and 4" ANSI 150 inlet

Figure 3.1C identifies terms that describe the various parts and controls of the monitor.

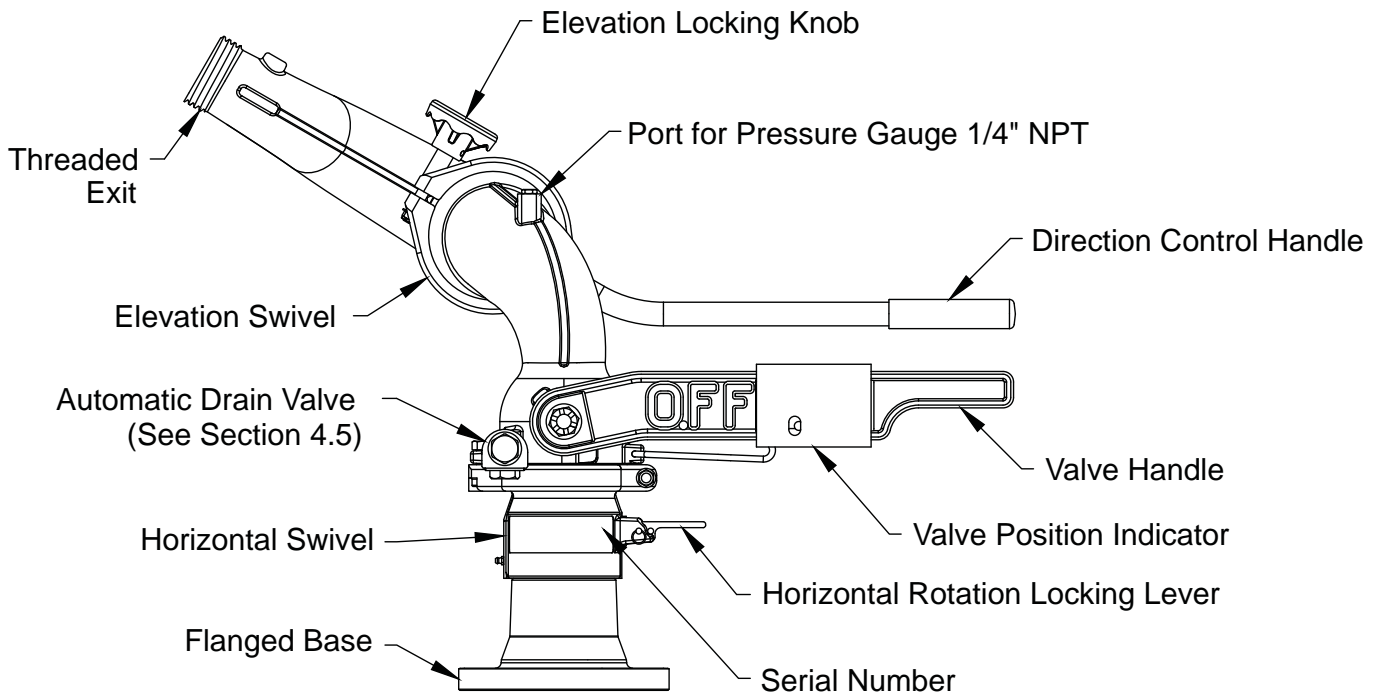
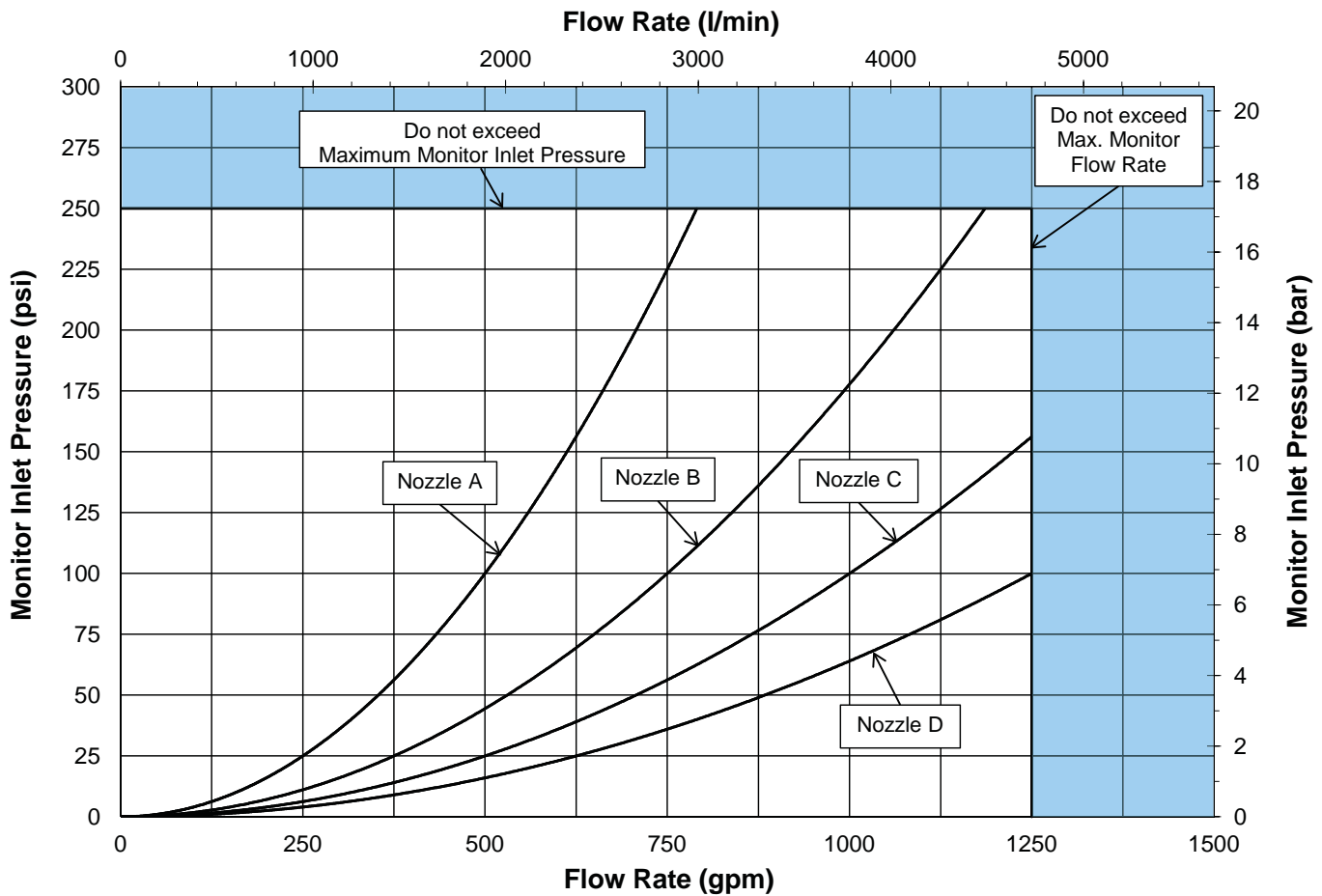


Fig 3.1C
Protector Parts Identification

3.2 MECHANICAL SPECIFICATIONS

	US	METRIC
Maximum weight with optional shutoff valve	35.2 lb	15.7 kg
Maximum weight without valve	27.8 lb	12.5 kg
Min. Flow Area 3" Valve Ball	6.95 square inches	44.8 square cm
Min. Flow Area 2.5" Male Threaded Outlet	4.36 square inches	28.1 square cm
Max Flow	1250 gpm	4800 l/min
Max Operating Pressure	250 psi	17 bar
Materials Used	356-T6 aluminum, 6000-series aluminum, 18-8 stainless steel, UHMW-PE, nylon, acrylonitrile rubber, Dupont Alcryn 2080BK	

Protector Safe Operating Envelope



Nozzle A flows 500 gpm at 100 psi (1900 l/min at 7 bar), K factor = 50
 Nozzle B flows 750 gpm at 100 psi (2800 l/min at 7 bar), K factor = 75
 Nozzle C flows 1000 gpm at 100 psi (3800 l/min at 7 bar), K factor = 100
 Nozzle D flows 1250 gpm at 100 psi (4800 l/min at 7 bar), K factor = 125

Fig. 3.2
 Protector Safe Operating Envelope

3.3 USE WITH SALT WATER

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.

3.4 INLET FLANGE OPTIONS

Four different flange options are available. Monitor height varies depending on whether the flange inner diameter is 4" (100 mm) or 3" (80 mm), as shown in figure 3.4 below. Monitor height is measured from the bottom of the inlet flange to the centerline of the elevation swivel.

Inlet Flange option	3" ANSI 125/150 (also DN80 PN20)	DN80 P16	4" ANSI 150 (also DN100 PN20)	DN100 PN16
Monitor height (inlet to elevation swivel)	16.2 in (41.1 cm)	16.2 in (41.1 cm)	19.1 in (48.5 cm)	19.1 in (48.5 cm)
Height at +30° elevation	24.7 in (62.7 cm)	24.7 in (62.7 cm)	27.6 in (70.1 cm)	27.6 in (70.1 cm)
Max. height at +80° elevation	31.0 in (78.7 cm)	31.0 in (78.7 cm)	33.9 in (86.1 cm)	33.9 in (86.1 cm)

Fig 3.4
Monitor height with each inlet flange option

3.5 OUTLET OPTIONS

Three options are available for the 2.5 inch male threaded outlet:

- National Hose Thread (NH, also referred to as National Standard Thread)
- National Pipe Straight Hose (NPSH, also referred to as Iron Pipe Thread)
- British Standard Pipe Thread (BSP)

3.6 OVERALL DIMENSIONS

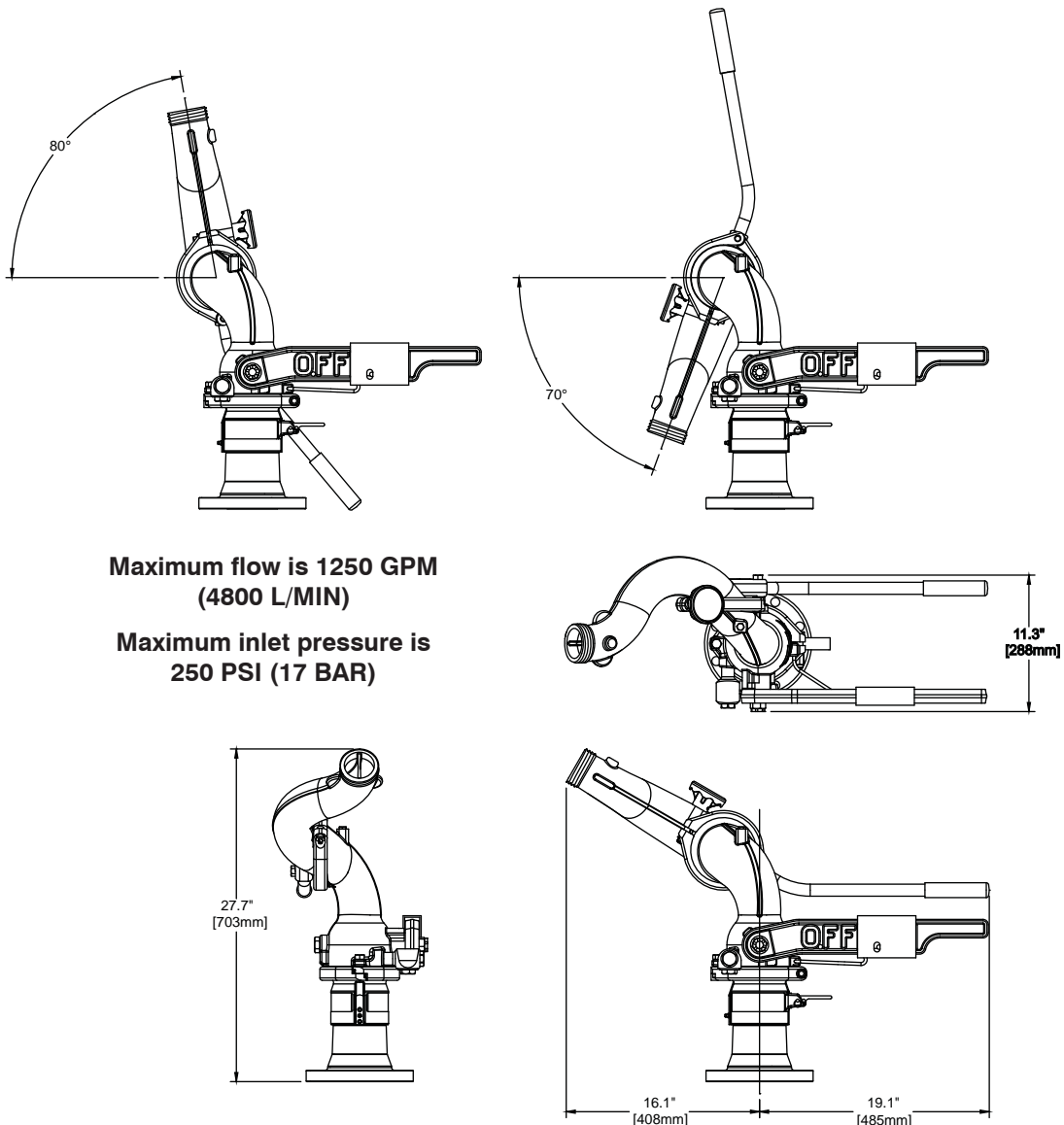


Fig 3.6
Overall Dimensions

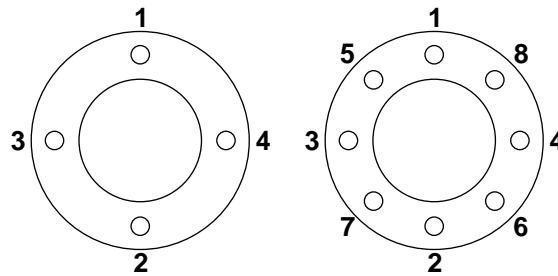
4.0 INSTALLATION

The Protector station monitor is installed to a riser pipe by a bolted flange joint. Verify that no interference exists between the Protector and surrounding hardware that would limit its usefulness. If a valve is to be mounted under the Protector, verify that no interference exists with the valve handle. If a butterfly valve is to be mounted under the Protector, verify that no interference exists between the butterfly and the flanged base of the Protector when the valve is in its open position.

4.1 STRUCTURAL REQUIREMENTS

The structure that the Protector station 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 1050 lbs (480 kg) (1250 gpm at 250 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 4.1A. Tighten sequentially each bolt or stud three times with 30%, then 60%, and finally 100% of the specified torque in figure 4.1B.



Tighten Sequentially Each Bolt Three Times.

Fig 4.1A
Flange Bolt Tightening Sequence

FLANGE TYPE	OUTSIDE DIAMETER		THICKNESS		BOLT HOLE CIRCLE		# OF BOLTS	SIZE OF BOLTS		TORQUE ON BOLTS	
	in	mm	in	mm	in	mm		in	mm	ft-lb	N-m
3" ANSI 125/150-DN80 PN20	7.5	190	0.75	20	6.0	152.5	4	5/8	16	76-80	100-110
4" ANSI 150-DN100 PN20	9.0	230	0.94	23	7.5	190	8	5/8	16	76-80	100-110
DN80, PN16 FLANGE	7.9	200	0.87	22	6.3	160	8	5/8	16	76-80	100-110
DN100, PN16 FLANGE	8.7	220	0.87	22	7.1	180	8	5/8	16	76-80	100-110

Fig 4.1B
Flange Specifications

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 1050 lbs (480 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 NOZZLE INSTALLATION

The nozzle is simply screwed onto the monitor's exit threads until it bottoms out and compresses the rubber gasket.

CAUTION

The nozzle threads must match the threads of the Protector 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.

4.3 PRESSURE GAGE

There is a 1/4" NPT female threaded hole adjacent to the elevation swivel, as shown in Figure 4.3. The hole is 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.

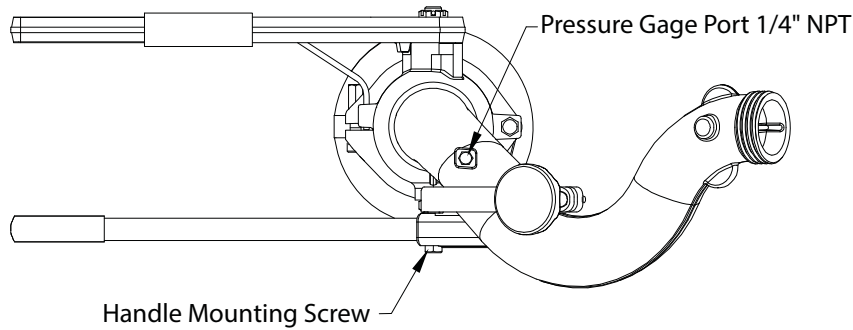


Fig 4.3
Pressure Gage Port and Handle Mounting Screw

4.4 HANDLE INSTALLATION

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. Handle mounting screw location is shown in Figure 4.3.

4.5 DRAINING RESIDUAL WATER

NOTICE

All monitors, valves and standpipes exposed to freezing conditions must be drained immediately following use to prevent damage. To drain a standpipe, a drainage port must be opened underground below the frost depth to keep water out of the standpipe until the next use.

All Protector station monitors are equipped with an automatic drain valve attached to a port located just above the valve seat and/or lower seal. The automatic drain valve ensures the monitor is completely drained following use, which minimizes susceptibility to damage from corrosion and freezing water. The drain valve seal membrane is designed to close automatically when pressure exceeds 5 psi. When pressure drops below 5 psi, the seal membrane will open to allow drainage. If the automatic drain valve is omitted or disabled, then the monitor must be manually drained after use to prevent damage.

5.0 OPERATION

5.1 VALVE OPERATION

For models equipped with a built-in valve, the flow is OFF when the valve handle is horizontal and ON when the handle is vertical. Parts are manufactured so that the valve cannot be assembled out of phase. A position indicator shows the valves position as "OFF" or "ON". The position that the valve is normally left in will depend upon your particular location's standard operating procedure. Operate the valve slowly to reduce water hammer.

5.2 HORIZONTAL ROTATION CONTROL

The Protector can rotate from side to side on its swivel base. Lift the rotation lock lever and rotate the monitor right or left using the directional control handle (see figure 5.2). To lock the monitor in position, depress the rotation lock lever. A small spring holds the rotation lock lever in the unlocked position when it is disengaged. When the monitor is not in use, the rotation lock lever should be kept in the locked position.

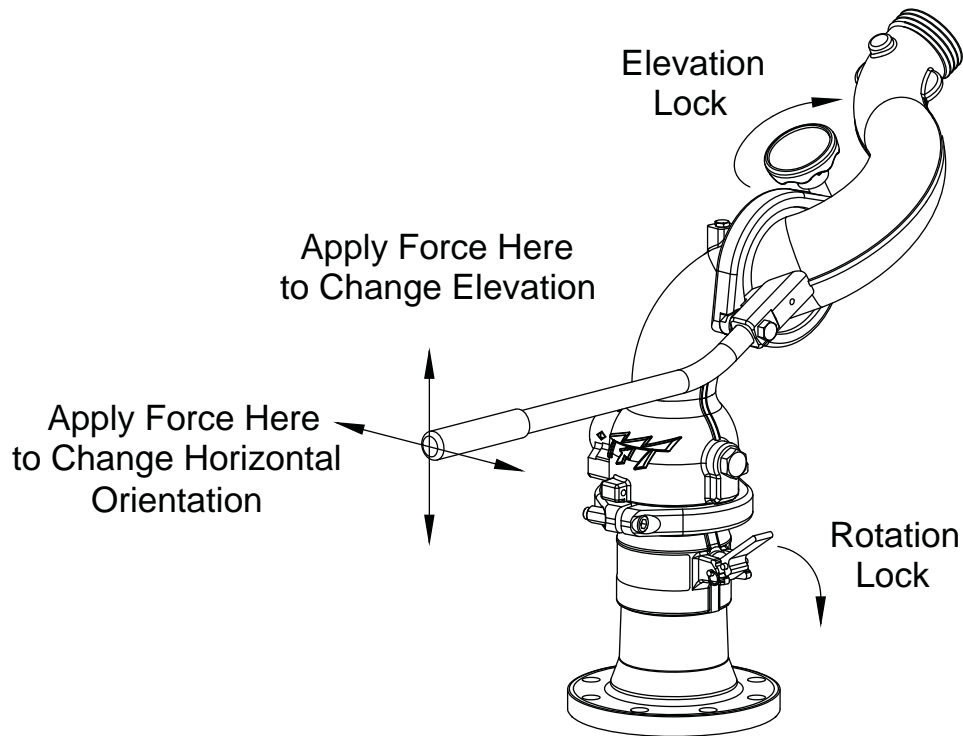


Fig 5.2
Rotation & Elevation Control

5.3 ELEVATION CONTROL

The up and down direction (elevation) of the stream is changed by pushing or pulling vertically on the direction control handle (see figure 5.2). Twisting the elevation locking knob clockwise will increase the drag on the upper swivel joint to “lock” the monitor at a particular elevation. Select discharge devices that do not exceed the 70 ft-lb locking capability of the elevation lock.

For a typical fog nozzle, the maximum allowable weight works out to be about 40 lbs (18.1 kg).

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.

6.0 FLOW CHARACTERISTICS

6.1 AUTOMATIC 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 1250 gpm (4800 LPM) and 250 psi (17 bar).

6.2 STACKED TIPS FLOW AND REACH

NOZZLE DIAMETER (inches)	INLET 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)	INLET 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 6.2A
Stacked Tip Flow Table

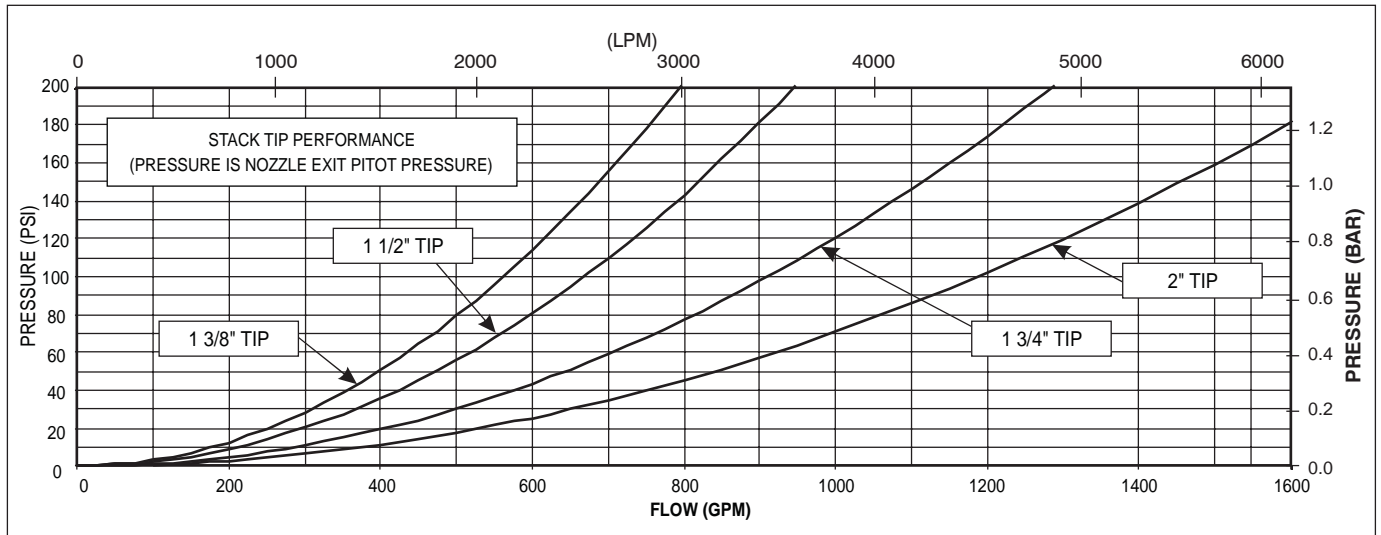


Fig 6.2B
Stacked Tip Flow Graph

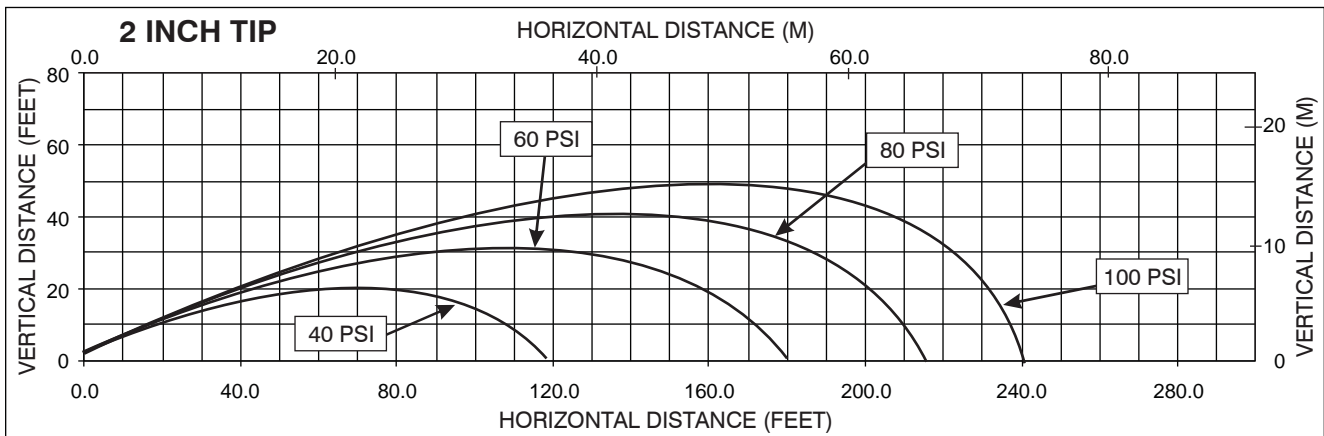
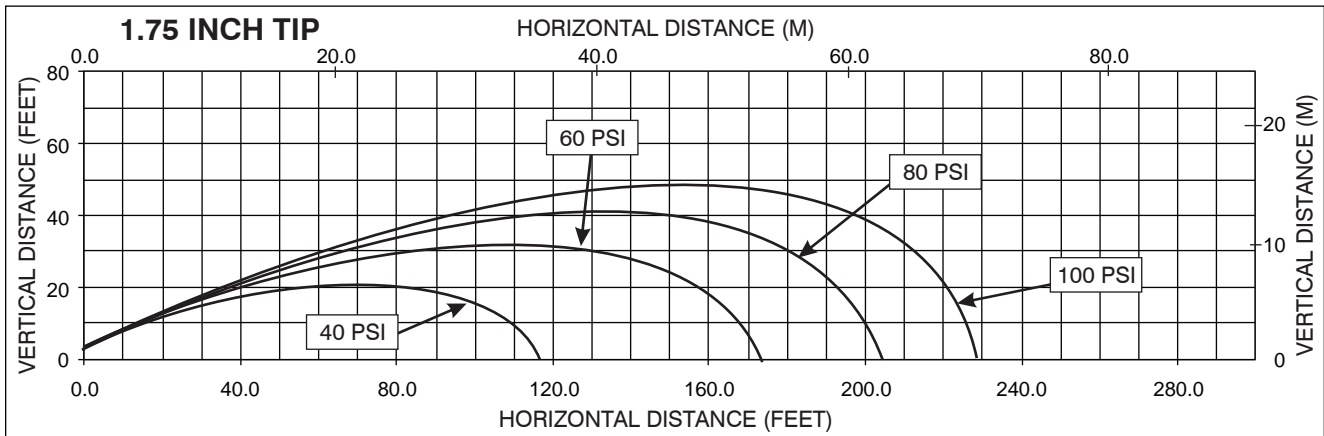
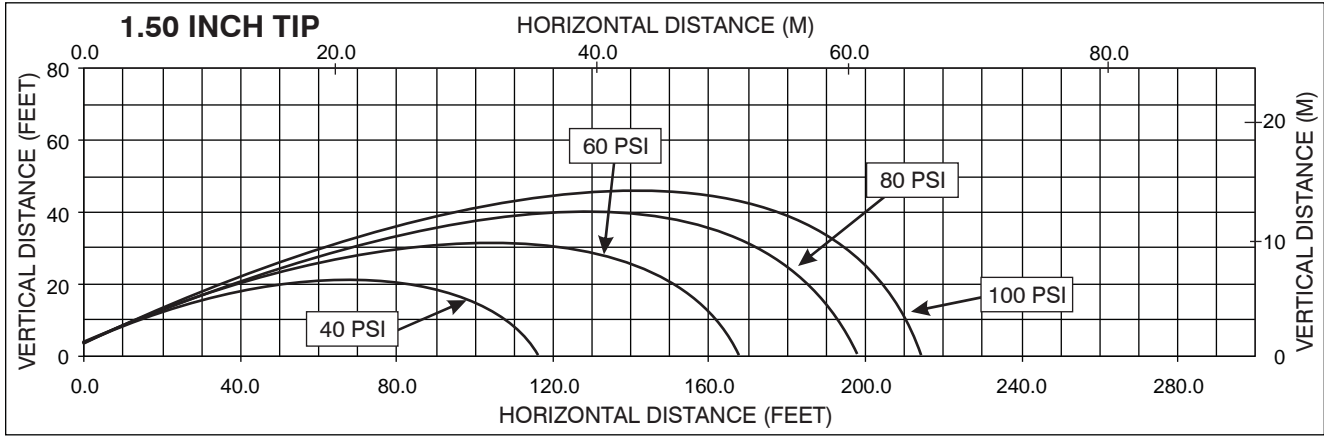
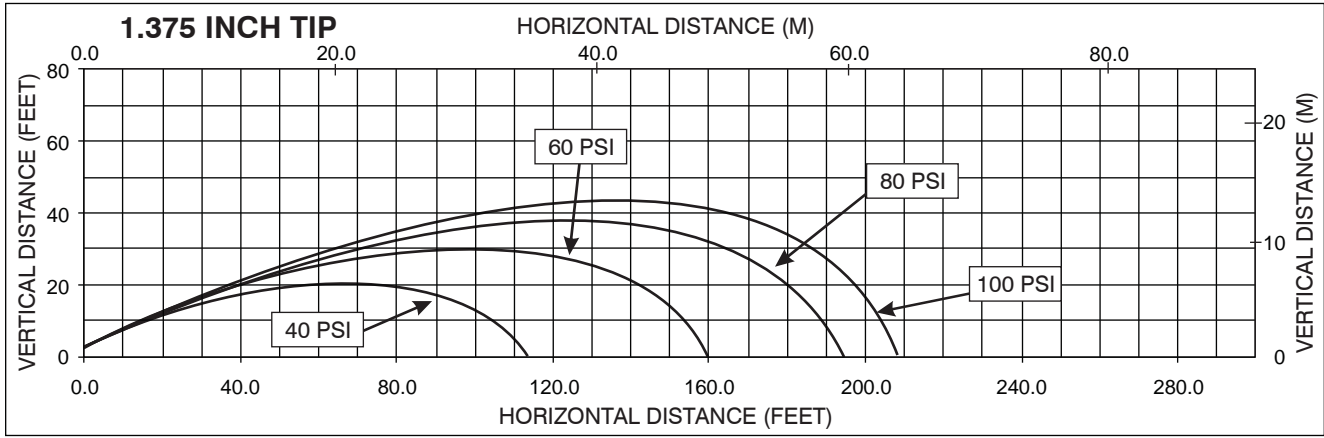


Fig 6.2C
Stacked Tips Stream Trajectory Graphs

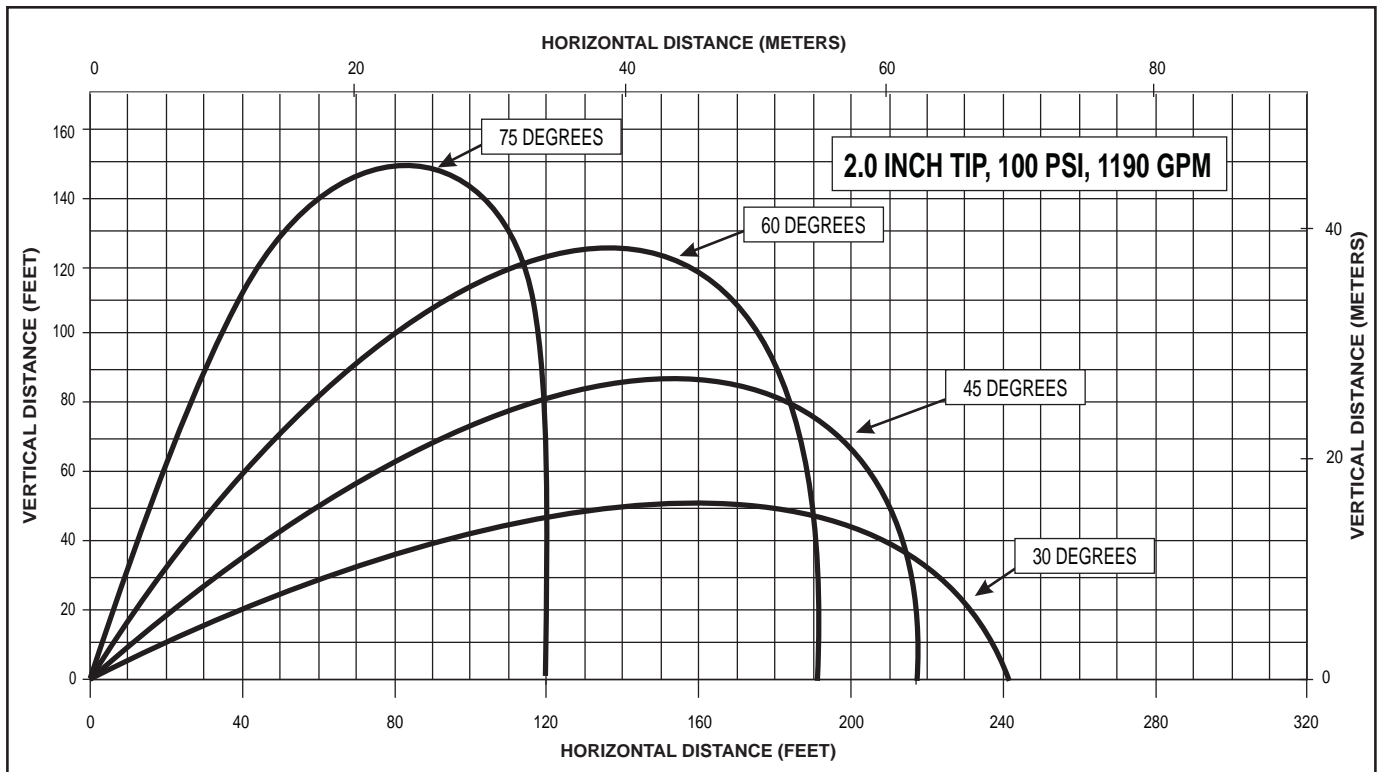


Fig 6.2D
Effects of Elevation on Trajectory

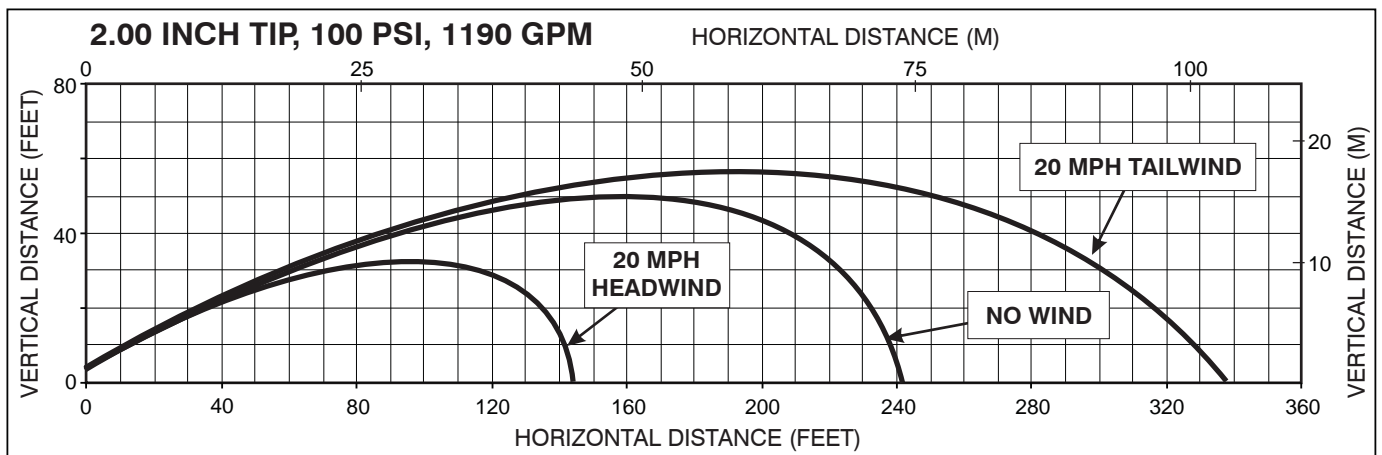
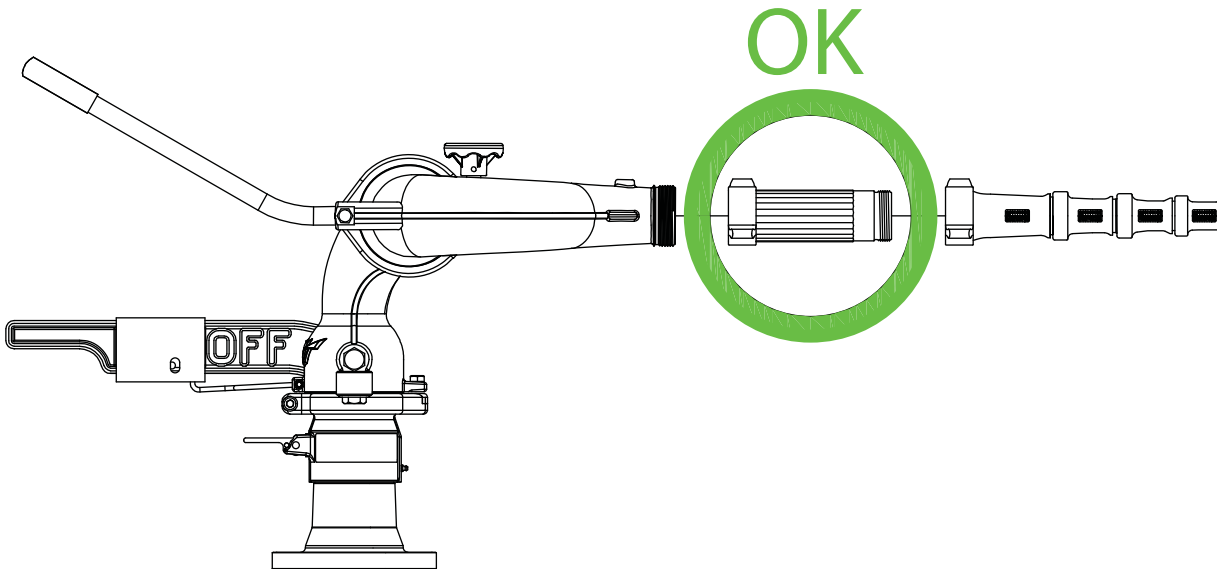


Fig 6.2E
Effects of Wind on Reach

6.3 STREAM STRAIGHTENERS

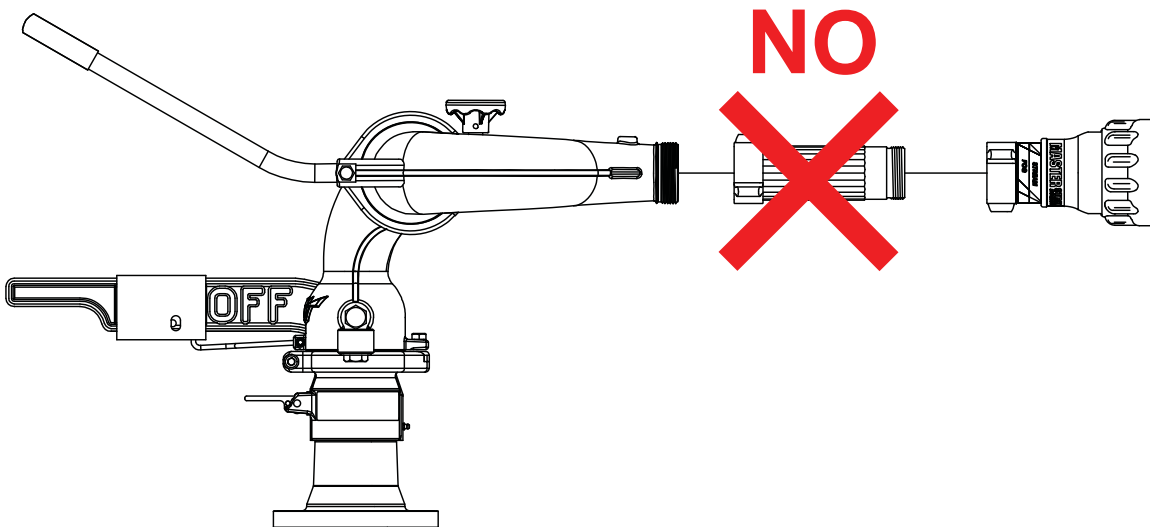
6.3.1 STREAM STRAIGHTENERS WITH STACKED TIPS

Turbulence through the Protector station 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.



6.3.2 STREAM STRAIGHTENERS WITH FOG NOZZLES

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 elevation locking clamp due to the greater cantilevered weight. Select discharge devices that do not exceed the 70 ft-lb locking capability of the elevation lock.



6.4 MONITOR FRICTION LOSS

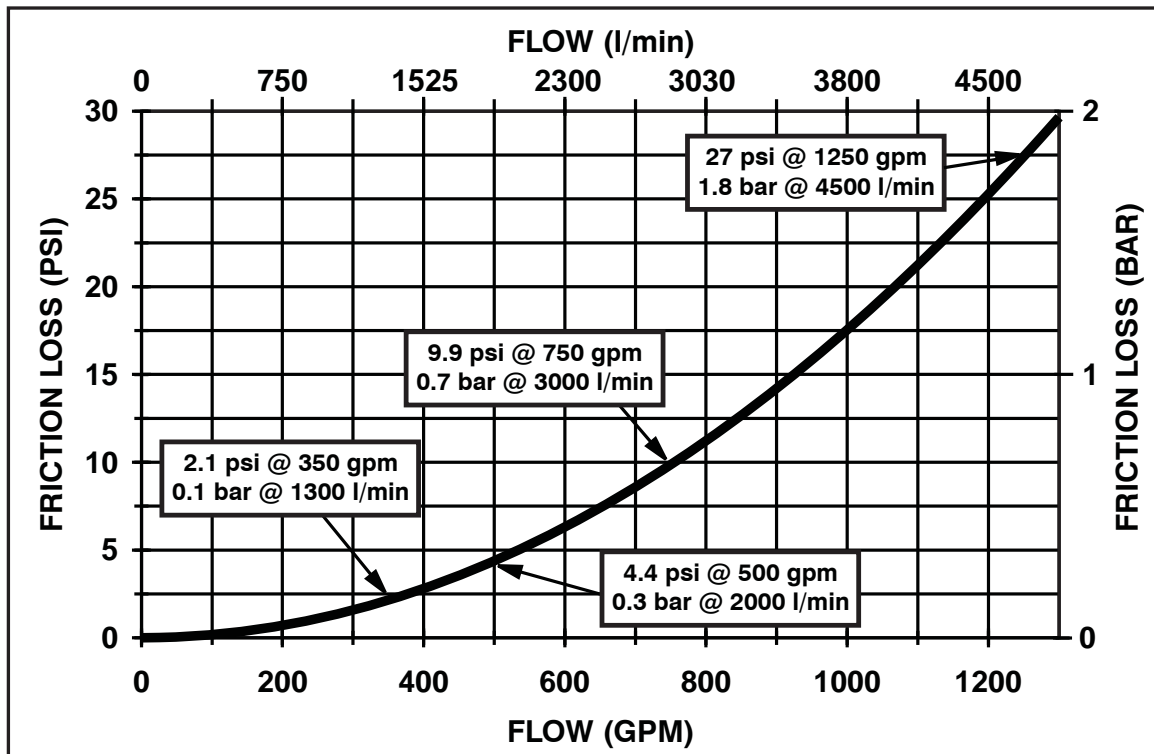
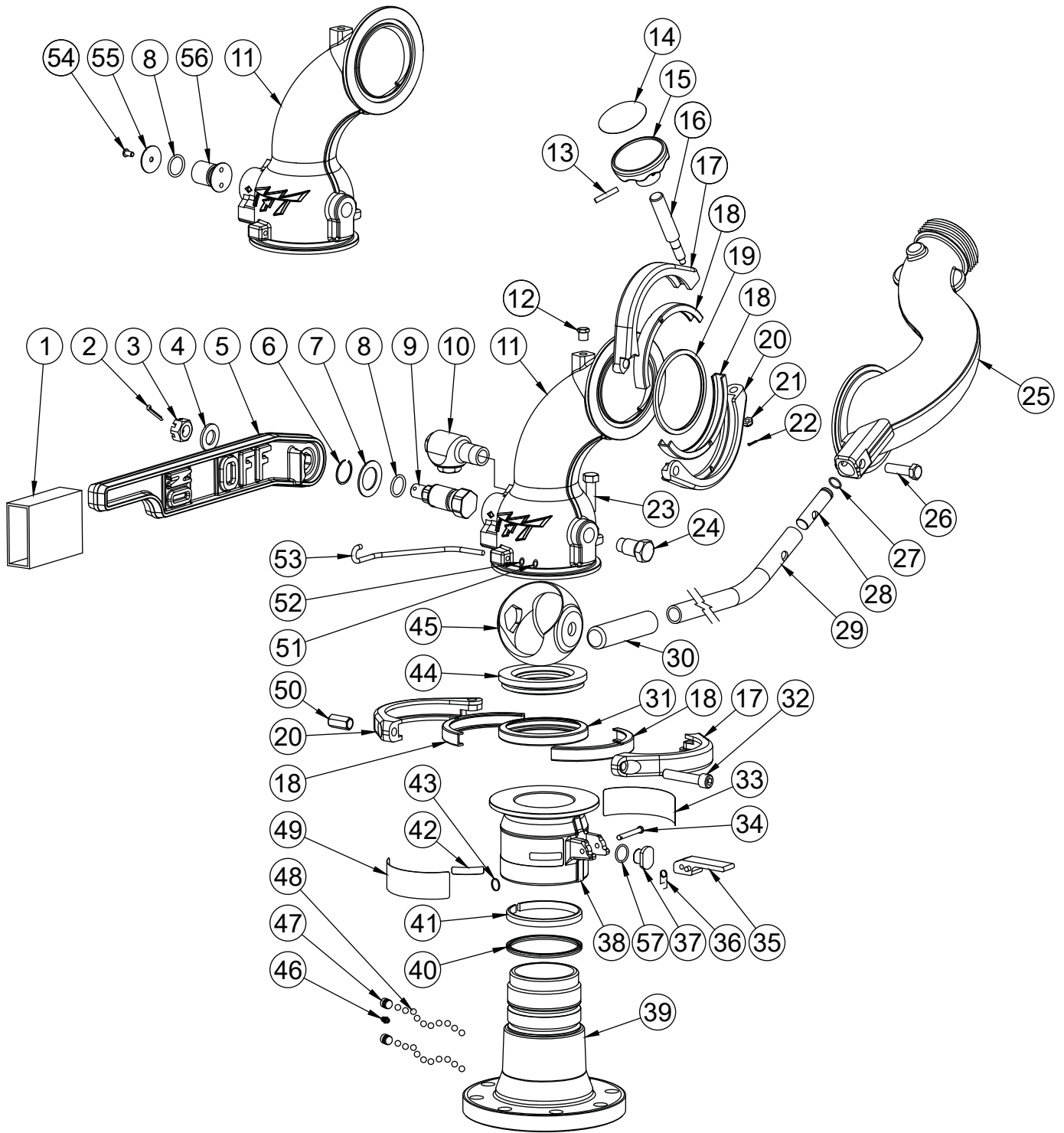


Fig 6.4
Protector Station Monitor Friction Loss

7.0 DRAWING & PART LIST



PROTECTOR PARTS LIST

INDEX	DESCRIPTION	QTY	PART #
1	SLIDE	1	Z285
2	5/32 X 1-1/2 COTTER PIN	1	VP156X1.5
3	3/4-10 SLOT FIN HEX NUT	1	VT75-10SF
4	FLAT SS WASHER	1	VW1.5X81-134
5	VALVE HANDLE	1	Z280
6	SMALLEY RING	1	V4235
7	BELLEVILLE SPRING	1	VM4900
8	O-RING-214	1	VO-214
9	TRUNNION	1	Z265
10	AUTOMATIC DRAIN VALVE	1	A-DRAIN-KIT
11	BELL ALUMINUM	1	Z210A
12	1/4"NPT HEX HEAD PLUG	1	VFHP2M
13	1/4 X 1-3/8 HDP SPIROL	1	VP250X1.375H
14	OVERRIDE KNOB LABEL	1	Y4176
15	KNOB	1	Z245
16	LOCKING BOLT	1	Z240
17	CLAMP THREADED	2	Z221
18	SWIVEL INSERT	4	Z225
19	UPPER SWIVEL SEAL	1	Z230
20	CLAMP	2	Z220
21	5/16-18 ALL METAL FLEX-LOCK NUT	1	VT31-18SLNT
22	1/16 X 1/2 COTTER PIN	1	VP063X.50
23	1/2-13 X 1-3/4 HEX BOLT FULLY THREADED	1	VT50-13HX1.7
24	TRUNNION	1	Z260
25	EXIT ALUM. 2.5"BSP	1	Z310ABJ
	EXIT ALUM. 2.5"NPSH		Z310AIJ
	EXIT ALUM. 2.5"NH		Z310ANJ
26	1/2-13 X 2-3/4 HEX BOLT FULLY THREADED	1	VT50-13HX2.7
27	O-RING-016	1	VO-016
28	ELEVATION HANDLE NUT	1	Z316
29	ELEVATION HANDLE	1	Z315
30	HANDLE GRIP	1	Z317
31	LOWER SEAL	1	Z275
32	1/2-13 X 2.5 SOCKET HEAD SCREW	1	VT50-13SH2.5

INDEX	DESCRIPTION	QTY	PART #
33	NAME LABEL: PROTECTOR STATION MONITOR	1	ZL101
34	CLEVIS PIN 1/4 X 2	1	X180
35	ROTATIONAL LOCK LEVER ALUM.	1	X160
36	ROTATION LOCK LEVER SPRING	1	X152
37	ROTATION LOCK INSERT	1	X170
38	INDUSTRIAL BELL WITH RIM	1	Z425
39	3"ANSI FLANGE ALUM.	1	X410-3ASA
	FLANGE ALUM. 4"ANSI/XF		X414-4ASA
	FLANGE ALUM. DN80 PN16/XF		X423
	FLANGE ALUM. DN100 PN16/XF		X424
40	CUP SEAL	1	X125
41	WEAR STRIP	1	X120
42	MODEL NUMBER LABEL	1	A1303
43	SS CLEVIS PIN RETAINER	1	X137
44	REAR VALVE SEAT	1	Z270
45	VALVE BALL	1	Z250
46	GREASE FITTING	1	VT25-28ZERK
47	3/8-24 X 3/8 SOCKET SET SCREW	2	VT37-24SS375
48	5/16" SS BALL	76	VB.312
49	S/N LABEL: PROTECTOR/	1	ZL102
50	1/2-13 X 1-1/4 COUPLING NUT	1	VT50-13CPLNT
51	EXTERNAL SELF-LOCKING RING	1	VR4290
52	WASHER	1	VW500x265-63
53	SLIDE LINK	1	Z286
54	1/4-28 X 1/2 BUTTON HEAD SCREW	1	VT25-28BH500
55	2.5" CLAPPER WASHER	1	X752
56	PLUG	1	Z261
57	O-RING-117	1	VO-117
NOTE: SPECIFY COLOR WHEN ORDERING AMERICAN RED OR RAL 3000			

8.0 WARRANTY

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

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

9.0 MAINTENANCE

The Protector station monitor requires no routine maintenance. All seals slide on plastic surfaces and require no periodic greasing. The swiveling joints use plastic sliding elements that also do not require grease. The Protector should be inspected annually and after each use.



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

9.1 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

9.2 LOWER SEAL AND VALVE SEAT

If the lower joint leaks externally or the valve does not fully shut off, then the lower seal and/or valve seat may need to be replaced.

To replace these parts:

- Turn off water.
- Remove coupling nut from lower clamp using 5/8" wrench or socket.
- Remove socket head cap screw from lower clamp using 3/8" male hex wrench.
- Separate the joint by pivoting the clamp piece off of the flanged section.
- Pull out the valve seat and lower seal.
- Clean away dirt on flanges and clamps.
- Inspect seal and sealing surfaces of valve seat and flange.
- Replace damaged parts as needed.
- Apply grease to surface of seal.
- Snap black seal into groove on white valve seat.
- Insert assembly into monitor, white end first.
- Reassemble joint.
- Torque socket head cap screw to 50 ft-lbs prior to installing coupling nut.
- Torque coupling nut to 50 ft-lbs while preventing socket head cap screw from rotating.

9.3 UPPER SWIVEL SEAL AND SWIVEL INSERTS

If the upper swivel leaks or requires excessive force to swivel, then the upper swivel seal and/or plastic swivel inserts may need to be replaced. To replace these parts:

- Turn off water.
- Remove the cotter pin and then the nut on the locking knob with a 1/2 inch (13mm) socket.
- Remove the locking knob.
- Separate the joint by pivoting the clamp piece off of the flanged section.
- Pry out the swivel inserts and inspect for damage.
- Clean away dirt on flanges and clamps.
- Inspect the seal and sealing surface of the flange.
- Replace damaged parts as needed.
- Apply grease to surface of seal.
- Reassemble joint.

10.0 ANSWERS TO YOUR QUESTIONS

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

11.0 INSPECTION CHECKLIST

Monitor must be inspected for proper operation and function according to this checklist before each use. Before flowing water check:

- 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 operation (e.g. dents, cracks or other defects).
- All swiveling elements rotate freely
- Nozzle is securely attached



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.