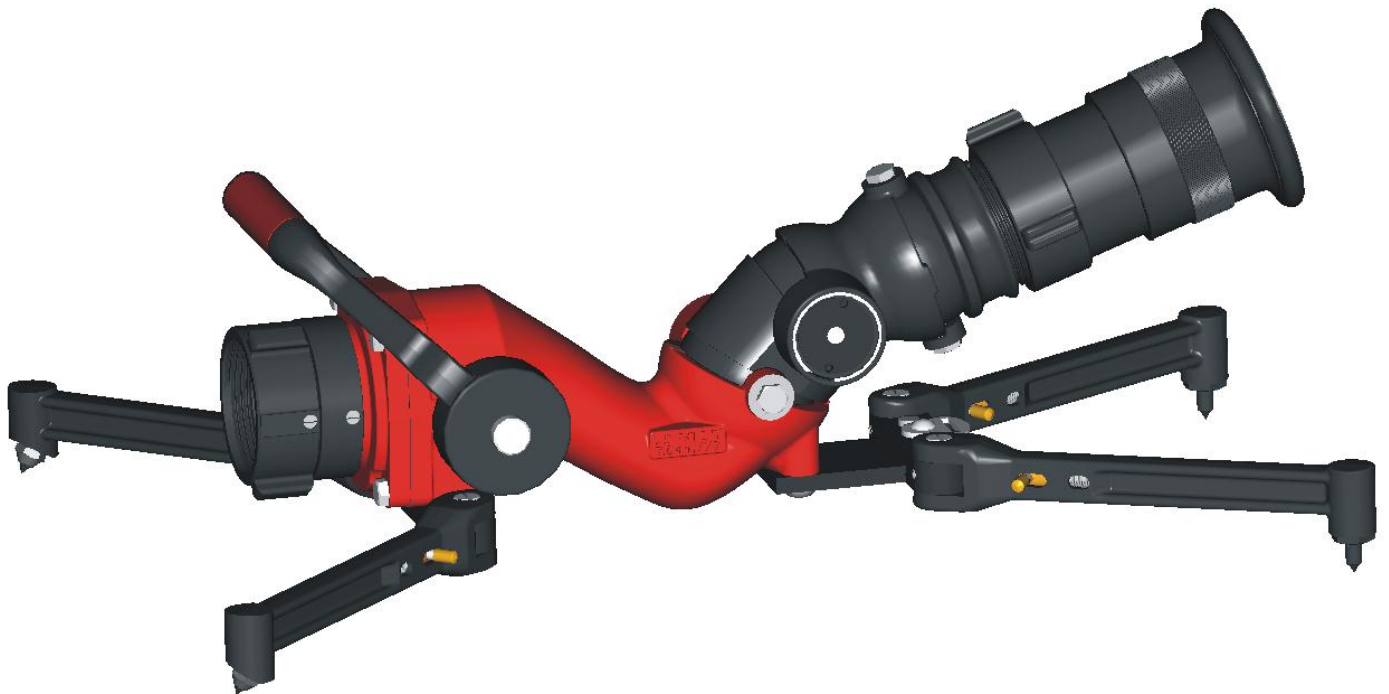




ELKHART BRASS MFG. CO., INC.

1302 WEST BEARDSLEY AVENUE • P.O. BOX 1127 • ELKHART IN 46515 • (574) 295-8330 • FAX (574) 293-9914

Operating, Installation, and Maintenance Instructions



RAM Personal Portable Monitor

Catalog Number: 8296
P/N: 98293000 REV D

RAM Physical Data:

Folded Length = 16.2"

Folded Width = 8.4"

Folded Height = 8.8"

Deployed Length = 25.1"

Deployed Width = 23.4"

Deployed Height = 8.8"

Deployed Footprint = 433 sq. in.

Monitor Weight = 17.0 lbs

Monitor Weight w/RAN = 21.5 lbs

Vertical Stream Path = 20degrees above horizontal minimum

63 degrees above horizontal maximum

**** patent pending safety system active between 20 and 35 degrees above horizontal*

Horizontal Stream Path = +/- 20 degrees of monitor centerline

RAM Operating Data:

Max Pressure = 150 psi

Max Flow = 500 GPM

Monitor Tie Down = Integral Safety Strap Included

**** For safety purposes and to reduce the risk of injury, all personal monitors require the use of a safety strap / chain to secure the monitor to a fixed / stable base.*

RAM Features:

- Safety System (*patent pending*)
- Counter Balance System (*patent pending*)
- Integral Safety Strap with Pouch
- Locking Valve Control / Carrying Handle
- Hydro-Loc Valve Position Control Mechanism
- 4 Retractable Forged Legs
- Carbide Ground Spikes (spring loaded front spikes)
- Full Vaned Water-Way
- Straight Stream / Fog Nozzle, Smooth Bore Nozzle, Stack Tips, Mini Stream Shaper Accessories
- Truck Mounting Bracket

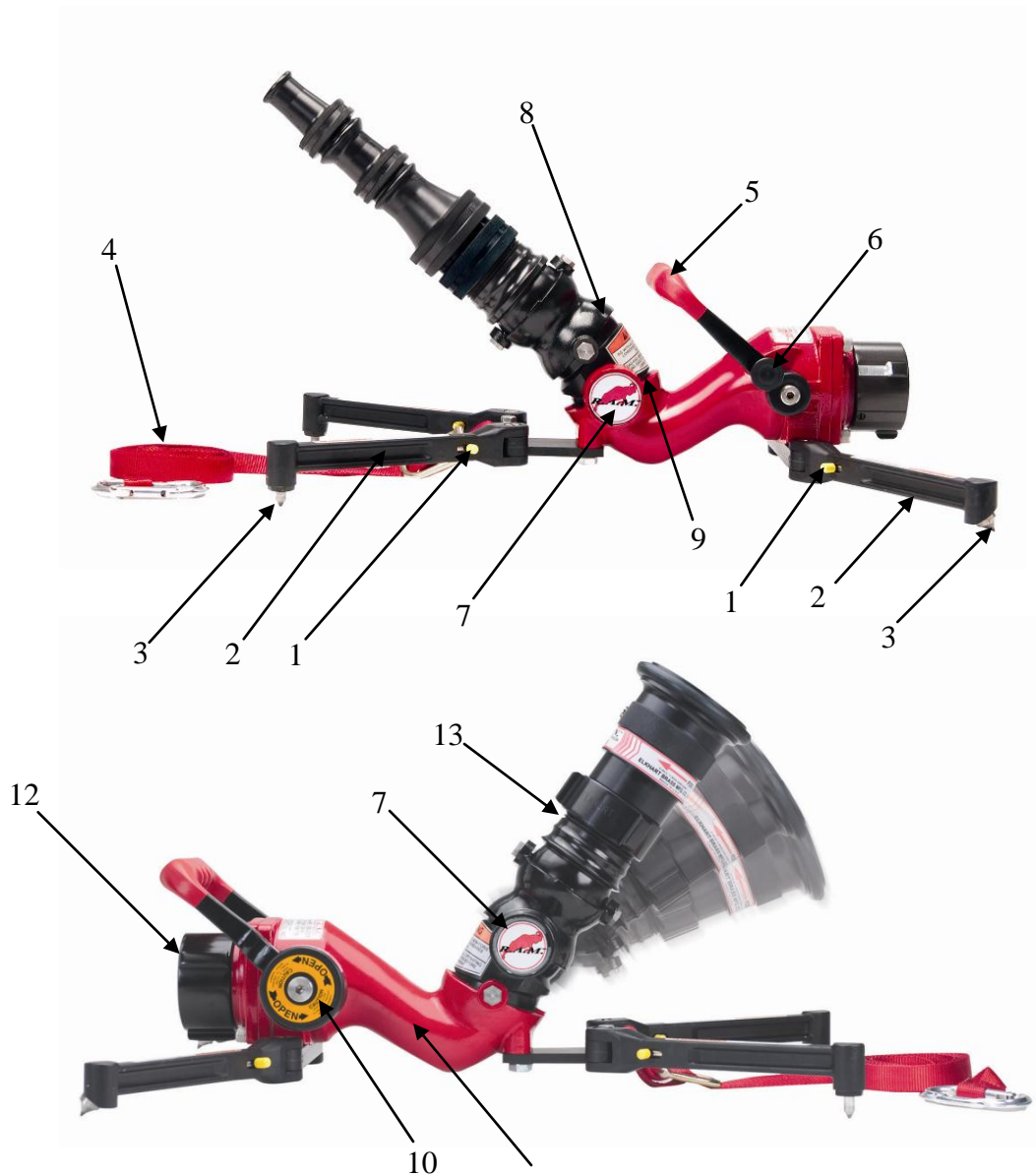
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1. leg pivot and lock pin
2. forged aluminum leg
3. carbide tipped ground spike
4. safety strap
5. carry / valve control handle
6. handle lock pin
7. counter balance mechanism
8. upper waterway pivot point
9. lower waterway pivot point
10. hydro-loc valve position control mechanism
11. fully vaned waterway
12. 2.5" NH free swivel inlet
13. 2.5" NH outlet



Section 1 – RAM Product Description

The RAM (Rapid Attack Monitor) is designed to provide the fire-fighter / rescue personnel an efficient and distinct advantage in the application of water or foam at an incident site. This product is a light weight aluminum device designed to a single operator the ability to deliver 500GPM of water as necessary. The monitor is self contained and can be mounted in a pre-connect condition utilizing the truck mounting bracket such that quick deployment can be achieved for effective initial attack.

Leg Pivot and Lock Pin

The forged aluminum legs have integral lock pins that are spring loaded for proper engagement when the legs are fully deployed. This provides a stable / reliable base for the monitor in use.

Forged Aluminum Legs

Forged aluminum legs provide superior strength over cast leg configurations.

Carbide Tipped Ground Spikes

The carbide tipped ground spikes provide secure engagement of the legs across a wide variety of soft and hard surfaces. The front spikes are spring loaded to assist engagement on uneven surfaces. *Severe uneven surfaces where contact of all four legs can not be achieved simultaneously should be avoided.* The rear spikes are angled to provide greater contact in the direction opposing the reaction forces generated by the water flow.

Safety Strap

The monitor is supplied with a length adjustable braided nylon safety strap for use in securing the device to a fixed stable base prior to any use. The metal clip at the end of the safety strap makes attachment of the strap to a pole, tree, guard rail or other such fixture quick and easy. A pouch is provided to keep the strap organized during transport of the monitor.

Carry / Valve Control Handle

The large comfortable handle acts both as a carry handle in the fully closed and locked position and as a valve control handle to open / close the waterway.

Handle Lock Pin

A spring loaded lock pin with a large pull knob is provided to insure the carry / valve control handle remains in the closed position during any time water flow is not desired.

Counter Balance Mechanism

The counter balance mechanism keeps the nozzle position from drifting downward due to the weight of the nozzle / outlet devices. *This mechanism must*

not be altered in any way and repair should only be conducted by Elkhart Brass personnel. The Counter Balance Mechanism is patent pending.

Safety System

The unique flow path generated by the lower and upper waterway pivot points provides two specific advantages. (1) The two pivot points provide a smoother waterway transition through its most extreme bends which improves stream quality. (2) The offset configuration of the two pivot points create a condition where the reaction force of the water acting on the upper pivot point, if sufficient, will cause the nozzle to rotate upward about the lower pivot point. This produces a self correcting increase in nozzle angle to protect against possibly dangerous unmanned use of the monitor at nozzle angles less than 35 degrees above horizontal. The hydraulic effect of the Safety System is active at approximately 350 GPM. The Safety System is patent pending.

Hydro-Loc Valve Position Control

The RAM shut off valve utilizes the Elkhart Brass Hydro-Loc mechanism to hold the valve in a throttled position if desired.

Fully Vaned Waterway

The waterway of the body has a full cast vane to improve water flow and discharge stream quality.

Inlet / Outlet Configuration

The RAM is manufactured standard with a 2.5" NH thread inlet and a 2.5" NH thread outlet. Special thread configurations can be addressed upon request.

Section 2 – RAM Accessories

RAN Straight Stream / Fog Nozzle

The RAN (Rapid Attack Nozzle) is a purpose built nozzle designed for use with the RAM. RAN is lightweight and utilizes very few components to deliver water in both straight stream and fog pattern. Significant to the stream quality of the RAN is its integral stream shaper. The RAN delivers 500 GPM at 75 psi and 400 GPM at 50 psi. The RAN is manufactured standard with 2.5" NH threaded swivel. Special thread configurations can be addressed upon request.



1-3/8" Discharge Smooth Bore Nozzle

Elkhart Brass offers a 1-3/8" discharge smooth bore nozzle which will provide 500 GPM at 75psi. The nozzle is manufactured standard with 2.5" NH



thread. Special thread configurations can be addressed upon request.

Stack Tips

Elkhart Brass offers stack tips in two combinations.

(1) 1-1/2", 1-1/4", 1" discharges

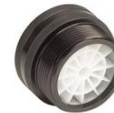
(2) 1-3/8", 1-1/4", 1-1/8" discharges

The stack tips are manufactured standard with NH threads, 2.5" on the stack inlet. Special thread configurations can be addressed upon request.



Mini Stream Shaper

Elkhart Brass offers a mini stream shaper for use with the smooth bore nozzle and stack tips for improved discharge stream quality. The mini stream shaper is manufactured standard with 2.5" NH inlet and outlet. Special thread configurations can be addressed upon request.



Truck Mounting Bracket

Elkhart Brass offers a light weight truck mounting bracket designed to hold the RAM in place during storage and truck transport. The bracket can be mounted in either the horizontal or vertical positions with strap orientation interchangeable between left and right latching.



Section 3 – RAM Operation

The RAM is an easy to use device designed for single fire fighter deployment. However, any device capable of flowing 500 GPM can become very dangerous if not used properly. All personnel who use this device should be thoroughly familiar with its operation. The following outlines proper use of this device.

Deployment of the RAM

The following steps outline proper deployment of the RAM.

- 1) Retrieve the RAM from the mounting bracket or its storage area.
- 2) Carry the RAM to the preferred location for deployment. Make sure to select a surface that is stable and level in proximity of a fixed object (tree, guard rail, post, etc) that can be used to secure the monitor.
- 3) Extend each of the four legs making sure that the lock pin for each leg is securely in place.

- 4) Place the RAM on the ground and position it so that it is in line with the target at which water is to be delivered. Take care to insure that all four carbide tipped ground spikes are securely in contact with the ground.
- 5) Secure the RAM to a fixed object (tree, guard rail, post, etc) using the attached safety strap and take up any slack in the strap.



Important: All personal portable monitors must be secured to a stable fixed base to prevent uncontrolled movement during use – the monitor must be tied down

- 6) If the RAM has not been utilized in a pre-connect condition, securely attach a hose line to the monitor at this point.

Flowing Water with the RAM

The following steps outline the proper procedure for flowing water with the RAM.

- 1) Verify that there are no kinks in the hose line connected to the RAM. Also make sure that there is at least 20 feet of hose feeding into the RAM in direct line of the RAM's flow path for best quality of stream.
- 2) Indicate to the pump operator to charge the line to the proper pressure / flow requirements.



Important: Never exceed 150 psi.



Important: Never exceed 500 GPM



Important: It will be necessary to field test the RAM prior to initial use and create a flow chart for pump operation such that the appropriate pressure / flow conditions will be met at the RAM.

- 3) Pull the lock pin on the valve control handle and slowly open the valve to its full open position.
- 4) Keeping moderate weight on the RAM, move the nozzle to direct the discharge stream of water to the desired target.



Important: Never straddle the hose line feeding the RAM. This can create a dangerous situation for the operator if there is any unwanted movement of the monitor, hose, etc. A knee or the hand opposite the hand being used to direct the stream of water

can be conveniently placed on hose just behind the inlet connection for added monitor support.

- 5) If it becomes necessary to move the monitor to a new location. Slowly close the valve control handle and verify that the lock pin is latched. The monitor can now be repositioned while the hose line is charged.
- 6) If the RAM is repositioned, verify that the criteria outlined in the “Deployment of the RAM section” have been satisfied.
- 7) When use of the RAM is complete. Slowly close the valve control handle and verify that the lock pin is latched.
- 8) Indicate to the pump operator to close the water feed to the hose line that is attached to the RAM. Any residual hose line pressure can be released by slowly opening and re-closing the valve control handle.

Storage of the RAM

The following steps outline the proper procedure for returning the RAM to storage.

- 1) Remove the safety strap from the fixed object it had been secured to and place the strap back into the attached pouch.
- 2) Fold the legs of the RAM by pulling outward on the lock pin cross lever to disengage it. The front legs are folded towards the back first and the rear legs are then folded forward.
- 3) If the RAM is not to be stored in a pre-connect condition, disconnect the hose line from the monitor inlet.
- 4) Return the RAM to its mounting bracket or storage area and secure for transportation.

Section 4 – Maintenance of the RAM

The following section outlines the necessary maintenance procedures for the RAM. Adherence to these recommendations will keep the RAM operational and reduce the possibility of field difficulty or failure.

Maintenance After Each Use

Verify that the carbide tipped ground spike on each of the four legs is sharp and undamaged. If any tip has a flat larger than 1/16”, replace the carbide tip. If any of the tips show signs of damage, replace the carbide tip ground spike before the next use.

Verify that the lock pin mechanism for each leg is in good condition. Examine the lock pin end and the leg bracket slot that the lock pin connects for damage. If any damage is noticed, replace that specific leg assembly / bracket as needed. Examine the spring to insure it is operating properly. If any springs are not

operating properly, replace that specific leg assembly. If necessary a light weight water repelling lubricant can be applied to the lock pin / spring mechanism in the legs.

Inspect the safety strap for visible damage. The strap should be inspected for fraying and the D-Clip and Length Adjustment Ring should be inspected for physical damage. If any of the components are damaged they need to be replaced before the next use.

Verify that the lock pin on the valve control handle is operating properly. If any damage or operational issue is detected, repair as necessary. If needed, a light weight water repelling lubricant can be applied to the valve control lock pin / spring mechanism.

Operate the valve control handle from full closed to full open in order to insure the shut off ball is working properly and lubricated. The shut off ball can be observed from the inlet of the RAM.

Visually inspect the RAM for any noticeable damage. Repair as needed.



Important: If there is a question regarding any necessary repair or damage issue, contact Elkhart Brass for assistance.

Maintenance Recommended Every Six Months

The valve ball should be inspected for physical damage and lubricated with a light grease.

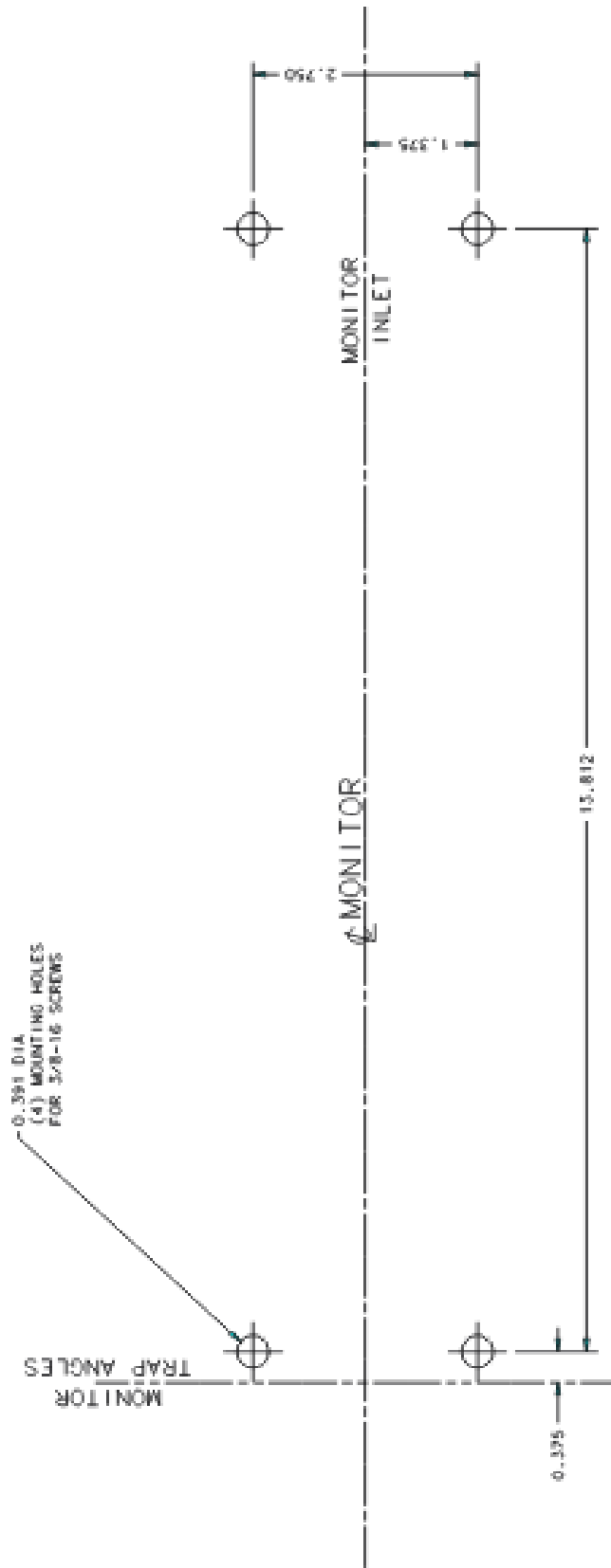
The RAM internal passage ways should be inspected for possible damage caused by foreign objects that have carried by the water through the monitor. If damage affecting the integrity of the monitor is noticed, contact Elkhart Brass for assistance.

SECTION 5 – Mounting Bracket Detail Drawing and Installation Template

The mounting bracket is designed to accommodate mounting locations that are close to physical obstructions on one or the other side of the bracket such as a truck wall or other surface mounted device on a



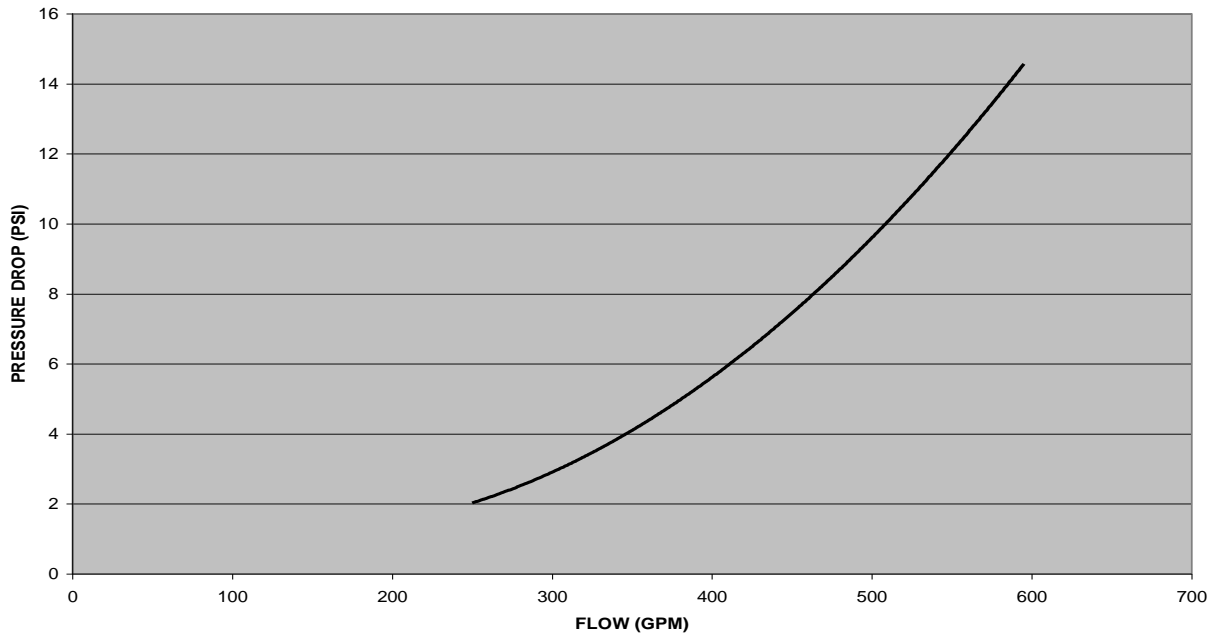
truck. The attachment strap and clip ring can be removed and reversed to place the hook mechanism on the opposite side if a physical interference exists.



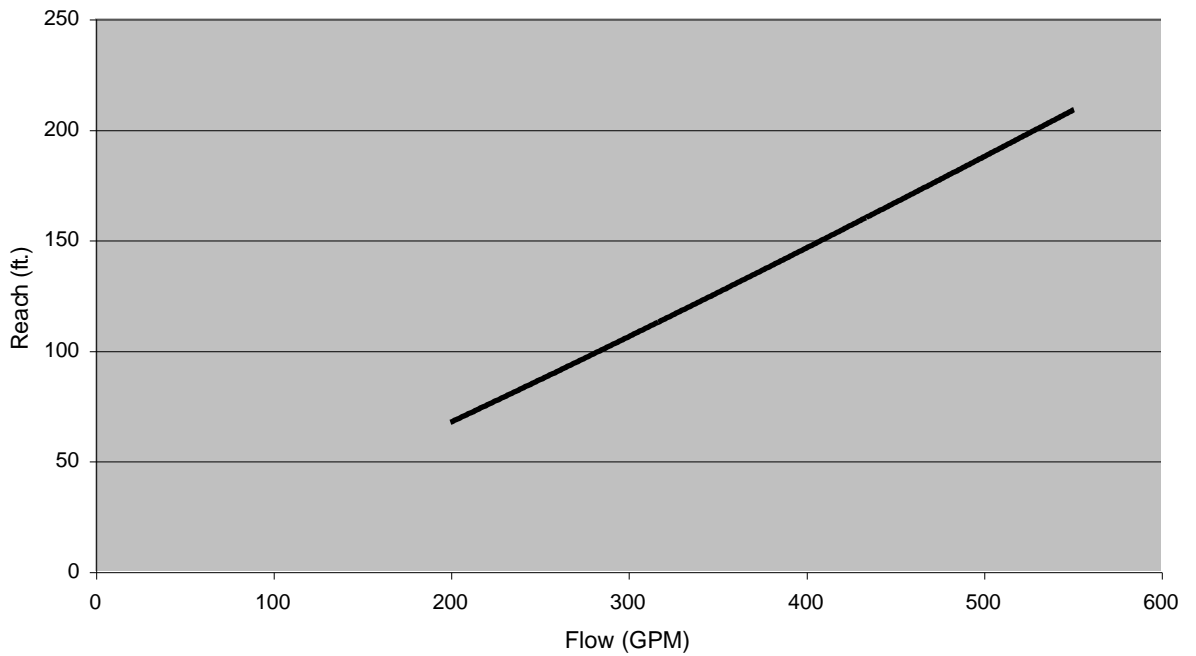
82 96MB RAM MOUNTING BRACKET
MOUNTING HOLE PATTERN TEMPLATE

SECTION 6 – Friction Loss and Effective Reach Charts

RAM PRESSURE DROP



RAM REACH CHART
With RAN Nozzle





ELKHART BRASS MFG. CO., INC.

P.O. Box 1127 · 1302 West Beardsley Ave.

Elkhart, Indiana 46515

E-mail: info@elkhartbrass.com

Website: www.elkhartbrass.com

(800) 346-0250