SUMNER
A Southwire Company

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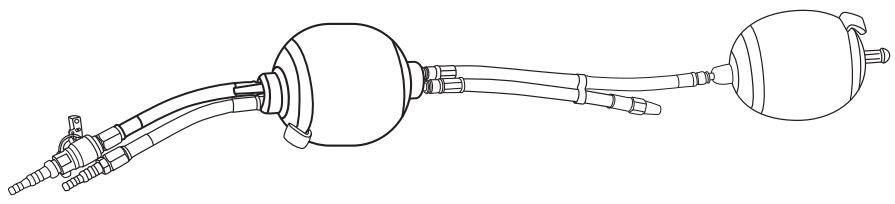
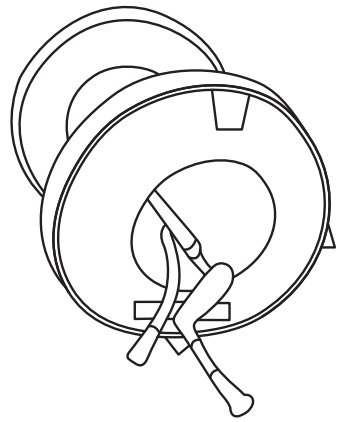
08/19 (PURGE STAR & RING PURGE SYSTEMS)

SUMNER
A Southwire Company

OPERATING INSTRUCTIONS

PURGE STAR & RING PURGE SYSTEMS





READ AND UNDERSTAND ALL THE INSTRUCTIONS AND SAFETY INFORMATION IN THIS MANUAL BEFORE OPERATING OR SERVICING THIS TOOL

TABLE OF CONTENTS

SAFETY FIRST

Safety is essential in the use and maintenance of Sumner Products. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all the safety information provided.

SAFETY ALERT SYMBOLS

These symbols are used to call attention to hazards or unsafe practices related that could result in injury or property damage. The three safety words defined below indicate the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

DANGER - Immediate hazards that if not avoided WILL result in severe injury or death

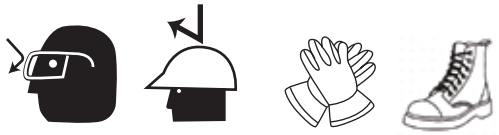
WARNING - Hazards that if not avoided COULD result in severe injury or death

CAUTION - Hazards or unsafe practices that, if not avoided MAY result in severe injury or death

⚠ WARNING

- Read and understand all instructions and safety information in this manual before operating or servicing this tool.

FAILURE TO OBSERVE THESE WARNINGS COULD RESULT IN SEVER INJURY OR DEATH.



⚠ WARNING - Personal Safety Hazards

- Only qualified persons should use the Sumner Purge Systems.
- Wear eye protection, hard hat, cut resistant gloves and safety toe shoes when using this tool.
- Do not use tool while tired or under the influence of drugs, alcohol, or medication.
- Keep body parts and loose clothing away from moving parts.
- Always follow safety procedures as shown in this manual.

FAILURE TO OBSERVE THESE WARNINGS CAN RESULT IN SEVERE INJURY OR DEATH.

⚠ WARNING: Entanglement Hazard

- Do not operate this tool while wearing loose fitting clothing. Retain long hair.

FAILURE TO OBSERVE THESE WARNINGS CAN RESULT IN SEVERE INJURY OR DEATH

⚠ WARNING: Tool Use Hazards

- Use this tool for the manufacturers intended purpose only. Use other than that described in this manual can result in injury or property damage.
- Only qualified personnel should use the Sumner Purge Systems.

FAILURE TO OBSERVE THESE WARNINGS CAN RESULT IN SEVERE INJURY OR DEATH

⚠ CAUTION

- Read and understand all the instructions and safety information in this manual before operating or servicing this tool.

FAILURE TO OBSERVE THESE CAUTIONS CAN RESULT IN INJURY OR PROPERTY DAMAGE

⚠ CAUTION

- Do not use if any parts are damaged as this can cause an unsafe condition and lead to tool malfunction or failure.
- If tool is in disrepair, **DO NOT USE**. Have tool inspected and repaired or replaced prior to use.

FAILURE TO OBSERVE THESE CAUTIONS CAN RESULT IN INJURY OR PROPERTY DAMAGE

PURPOSE OF THIS MANUAL

This manual is intended to familiarize all personnel with the safe installation and operation of the following Sumner Product: Purge Systems.
Keep this manual available to all personnel. Replacement manuals are available upon request at no charge at www.sumner.com.

Description of Operation

The Sumner Purge Systems provide an air-tight seal and helps achieve a small volume weld chamber. This considerably reduces the amount of purging gas and time needed to reach appropriate atmosphere in the weld proximity which is safe for welding (approximately 0.1 % oxygen content). Use of tandem Purge Systems can create oxidation-free, clean welds and uniform weld profiles.

Before Use

- Carefully read these instructions before using your Purge Sys tems.
- Connect a multi-stage or two-stage regulator and gas flow meter to the gas cylinder to ensure a constant gas flow rate when using your Purge Star or Ring Purge system. All Purge Star and Ring Purge connecting hoses utilize a 1/4” BSP female nut.
- If you have any problems with these instructions or the Purge System itself, please contact Sumner Manufacturing at 281-999-6900 or if outside of North America please call internation ally +1281-999-6900.

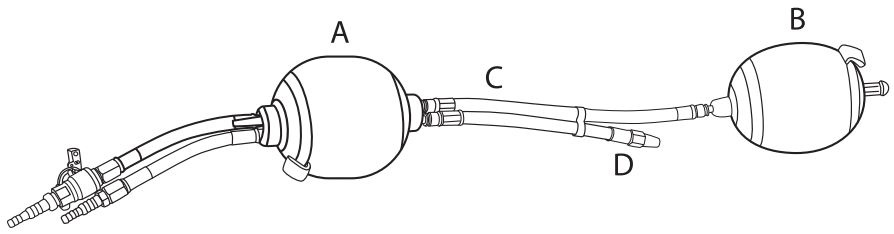
⚠ WARNING

- Welding using a purge dam system requires use of an inert gas such as argon. Argon gas is classified as a simple asphyxiant. On loss of containment argon evaporates very quickly causing supersaturation of the air with serious risk of suffocation when in confined areas.
- Under ambient conditions, argon is a colorless, odorless, tasteless gas. Inhalation in excessive concentrations can result in dizziness, nausea, vomiting, loss of consciousness, and death.

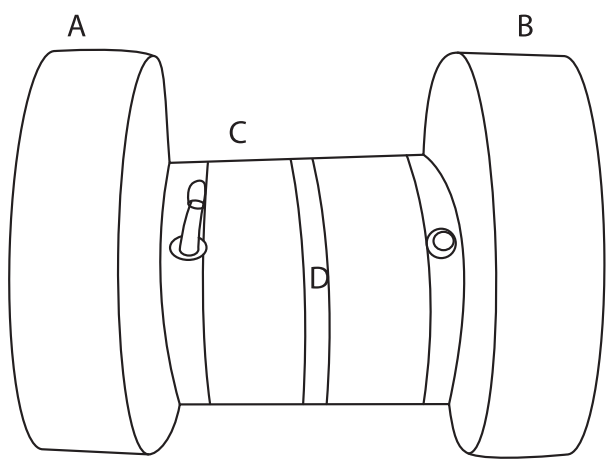
⚠ CAUTION

- Using argon in welding and cutting may create hazardous fumes. Short-term overexposure to fumes may result in dizziness, nausea, dryness or irritation of nose, throat, and eyes, or other similar discomfort.

IDENTIFICATION



Purge Star



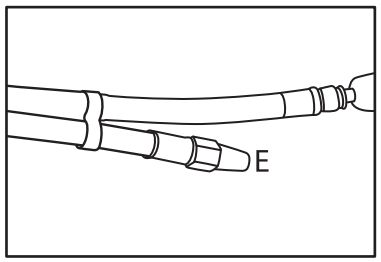
Ring Purge

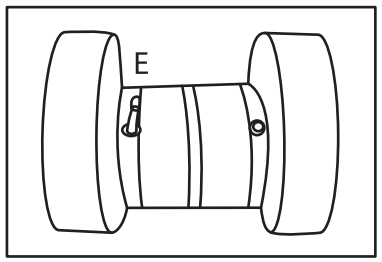
Your Purge Star and Ring Purge systems are re-usable multiple times and consists of 2 inflatable dams (A and B). Purge Star dams are connected by an armored joining hose (C).

Ring Purge Dams are connected with a heat protective sleeve (C). The armored hose and heat protective sleeve both have a centering glow indicator band in its center (D) to assist locating the purge system inside the pipe with the dams equidistant from the weld.

The 2 dams, when inflated, tightly seal inside the pipe and considerably decrease the length of pipe needed for purging. Therefore, the use of a purge dam system cuts down on purging gas and purging time and will save argon costs and time while increasing production rate.

The Ring Purge design reduces the volume further as the sleeve diameter is only 6“ (150 mm) smaller than the inflated dams. This design effectively changes the purge volume between the sleeve and the inner pipe circumference.

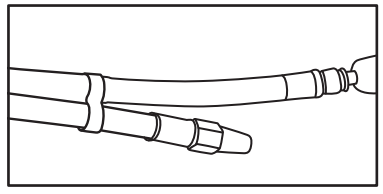


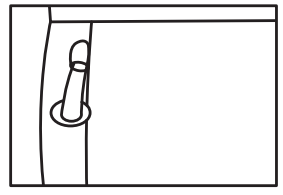


The valve (E) that exhausts argon gas into the purge area is located on the secondary inflatable purge dam, parallel to the Purge Star joining armored hose or Ring Purge heat protective sleeve.

⚠ WARNING

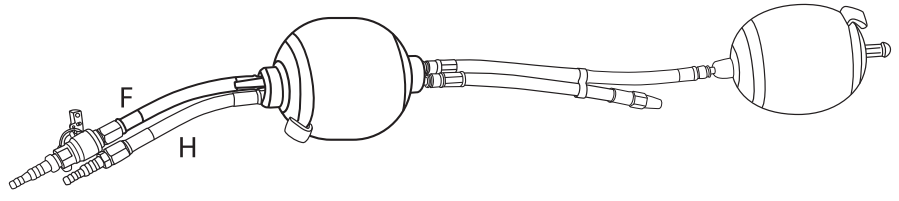
- Purge Star and Ring Purge valves are pre-set and should not be tampered with. If operators have altered the tension of the valve, please refer to the section later in the Operator’s manual for “Adjusting the Valves” for instructions of how to set the valve correctly.





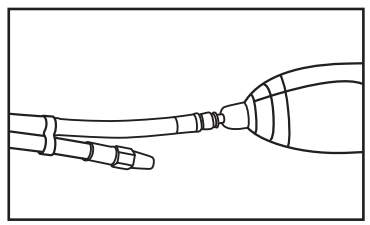
Example of a factory set valve

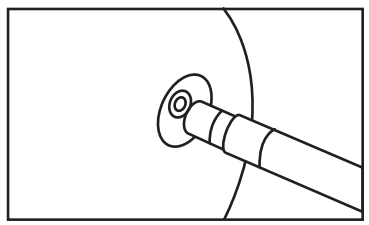
An unsheathed valve could have been altered and might affect the purge system’s performance.



Purge Star with single inflation hose for sizes 2” to 10”.

F depicts the black argon inflation hose.
H depicts the external exhaust hose on the perimeter of the inflatable purge dam end.





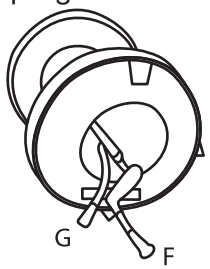
Purge Star Primary End with black inflation hose and black bypass hose for sizes 12” to 16” only.

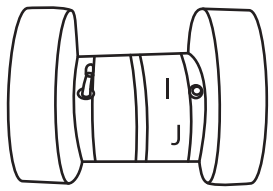
F depicts the black argon inflation hose.
G depicts the black argon bypass hose.
H depicts the external exhaust hose on the perimeter of the inflatable purge dam end.

Purge Star with argon bypass hose installed for sizes 12” to 16” only.

Purge Star with argon bypass hose installed for sizes 12” to 16” only.

Exit port (I) for argon to escape from the argon bypass hose (G) to accelerate the rate of purge gas filling the volume created between two sealing purge dams.





Ring Purge with red inflation hose fitted with gas deflation dump valve and black bypass hose for sizes 18” to 80”.

F depicts the red argon inflation hose.
G depicts the black argon bypass hose.

Exit port (I) for argon to escape from the argon bypass hose (G) to accelerate the rate of purge gas filling the volume created between two sealing purge dams.

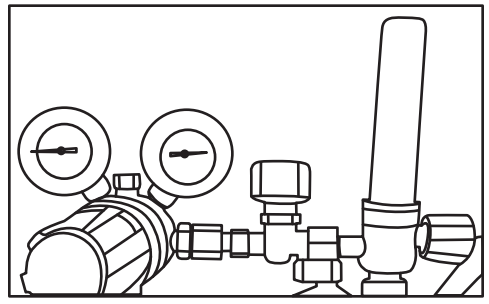
The red inflation hose (F) is connected to the argon source. This hose inflates the dams and then exhausts excess argon gas into the purge volume through the valve.

The Ring Purge vents the exhausting atmosphere and argon through 4 ports (J) located on the connecting sleeve near the primary inflation dam end.

Welders operating a Purge Star range 12” to 16” and Ring Purge range 18” to 80” have an additional central black hose. The black bypass hose (G) can be used to introduce more argon gas into the purge volume e.g. when customers are welding the initial root pass with wider weld gaps. Back-up purge gas through the black hose enters the purge volume through a gas
inlet (I). In this way, additional gas can be introduced without effecting the inflation rate inside the balloon dams and eliminate the risk of bursting the purge dams.

HOW TO USE YOUR PURGE STAR AND RING PURGE SYSTEMS – QUICK GUIDE

1. The valve on your Sumner Purge Star and Ring Purge systems comes pre-set. Do not tamper with it. If you accidentally change the valve setting, please refer to page 5 for instructions on re-setting the valve.



2. Always connect a multi-stage or two-stage regulator, a Y-piece and a gas flow tube between your gas bottle and the purge system.
3. Connect the red fitting or hose of your purge system to an argon hose connected to one side of the Y-piece. The red fitting or hose inflates the purge dams and purges the volume between the dams through the valve.
4. Inflate the dams at a rate no greater than 31.8 scfh (15 lpm).

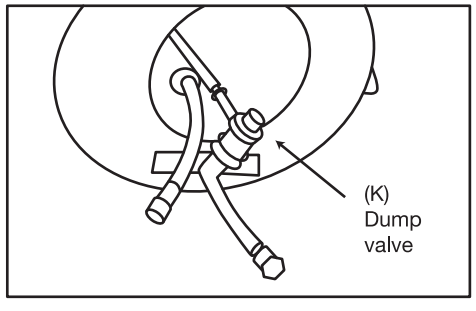
⚠ CAUTION

- Be sure your flowmeter is set at a rate no greater than 31.8 scfh (0.53 scfm or 15 lpm). Using a flow rate that is too high will exceed the argon release valve’s pre-determined setting and could cause the bags to burst

5. As soon as the dams are inflated sufficiently (they should never be rock-hard, but give a good seal to the pipe), reduce the flow rate through the red fitting or hose to 10.6 scfh (0.18 scfm or 5 lpm).

Welders operating a Single Hose Purge Star for pipe sizes 2” - 10” can safely fluctuate the argon rate between 10.8 – 31.8 scfh to provide adequate Argon gas shielding and maintain an oxygen level down to 0.1%.

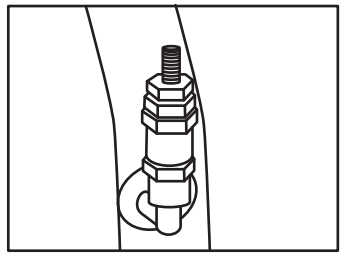
6. Especially during the root pass, you may have to add additional gas flow through the black bypass hose. This will guarantee maintenance of the 0.1% O2 purge environment without any risk of bursting the dams.
7. Connect the black hose on any Purge Star with a bypass hose or Ring Purge system to the second end of the Y-piece.
1.8 scfm; 5 and 50 lpm) depending on the width of the gap between your pipes.8. Adjusting the bypass hose - Add additional gas to the purge with a gas flow between 10.8 and 108.0 scfh (0.18 scfm and 1.8 scfm; 5 and 50 lpm) depending on the width of the gap between your pipes.
9. Once the root pass has been completed, the gas flow into the purge can be adapted by changing the flow through the black bypass hose. This may be necessary as a too high low rate can cause pressure that may blow out the root pass.
10. Once welding has been completed, the inflated purge system should stay in place and purging should continue until the pipe's weld has cooled down to avoid any risk of oxidation of the hot metal.
11. Once the weld has cooled down, disconnect the hoses of the Purge Star or Ring Purge system from the gas source and wait for a few minutes for it to deflate before removing it from the pipe.



When operating the Ring Purge system once you completely turn off the argon gas inflating the dams the dump valve releases the gas pressure inflating the dams to rapidly deflate the Ring Purge and break its seal against the internal pipe circumference.

IMPORTANT

- The valve of your bypass Purge Star and Ring Purge system has been pre-set in our workshops. Please do not tamper with it! If you accidentally change the valve setting, please follow the instructions below to re-set the valve appropriately.
- When the purge dam system is connected to a gas supply (please use multi-stage or 2 stage regulator), the purge gas will initially inflate the 2 dams (A and B). Once the dams are fully inflated, the valve (D) will open and release the purging gas into the purge volume around the weld.
- If the valve is closed, the dams of your purge dam system will over-inflate and burst since no gas can be exhausted into the purge volume.
- If the valve is fully open, the dams will not sufficiently inflate and no air-tight seal within the pipe can be achieved.
- Use a flow rate of 10.6 scfh (0.18 scfm or 5 lpm) for initial valve adjustment.

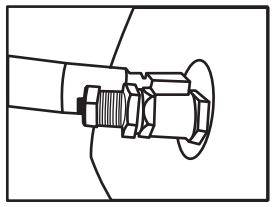


If the valve is in the above position it is possible to over-inflate purge dams.

1. The valve is fully closed.

Using the purge dam system with the valve in this position will ultimately cause over-inflation and the product might burst.

Purge systems are designed for one pipe size (including all schedules of the pipe diameter) only. Over-inflation will destroy the covers of the dams.

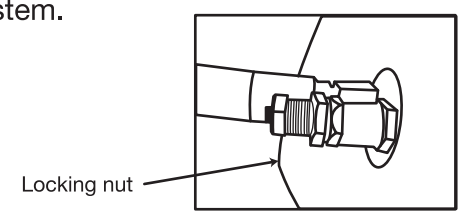


If the valve is in the above position it is possible the dams will not seal against the pipe.purge dams.

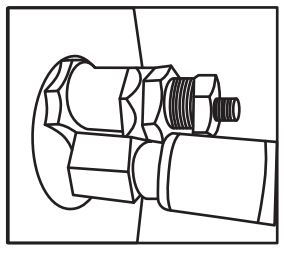
2. The Valve is fully open.

Using the purge dam system in this position will not allow inflation of the dams since all gas is exhausted into the purge volume. No seal within the pipe can be achieved using this valve position.

This will also happen if the valve was detached from the purge dam system.



Adjust the valve with the locking nut loose.



Correct setting once locking nut is secure and locked down.

3. Adjust the valve by turning the threaded stem and securing the position with the free-spinning nut.

On first inflation outside the pipe start with the valve fully open (see 2).

Connect the purge system to a regulated gas supply at 10.8 scfh (0.18 scfm or 5 lpm). All the gas will be exhausted through the valve. The dams will not inflate.

Slowly start closing the valve until the dams start to inflate. Carefully check the inflation of the dam ends by pressing them with your hand.

IMPORTANT

The dam ends should be inflated to be wrinkle free for a tight seal. They must not be rock hard since this might damage the product.

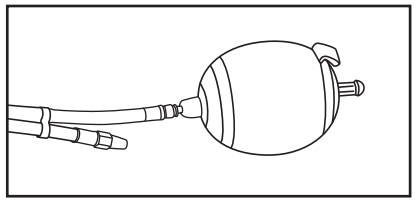
4. If the dam ends become too hard (over-inflation) slightly open the valve to allow gas to be exhausted.

If the dam ends do not inflate enough slightly close the valve. Find a position where the dams will seal but not over-inflate.

Always use the Purge Star and Ring Purge system with a multi- or two-stage regulator since gas pressure can fluctuate according to the filling level of the gas bottle which might affect your purge and damage the device.

Once the valves have been adjusted, the tandem purge system is ready to use inside a pipe.

HOW TO USE YOUR PURGE STAR AND RING PURGE SYSTEM



1. Insert Purge Star or Ring Purge system into the pipe.

If the Purge Star or Ring Purge system is to be positioned too far inside the pipe to reach without difficulty:

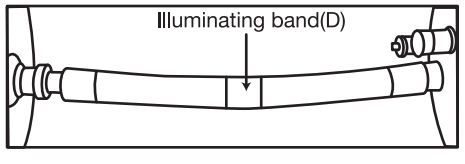
- Attach pull wires or ropes to the pull eyelets (L) to ensure easy removal after use.
- Connect an additional exhaust hose to enable monitoring of the exhaust gas.
- Position the purge dam system within the pipe using the pull wire or ropes attached to the pull eyelets.

2. Connect the Purge Star or Ring Purge System to the gas supply

Connect the gas supply to the red gas inlet hose via a Y-piece. If additional gas is needed connect secondary gas supply to black bypass hose.

3. Position the Purge Star or Ring Purge system under the weld gap

Ideally the purge system should be positioned so the dams are an equal distance away from the weld. An illuminating band (D) is taped to the connecting hose to assist welders in centering the Purge Dams and to ensure each purge dam is equal distance from the weld.



IMPORTANT

- **The flame-resistant dams will resist the heat produced during welding if positioned correctly. However, if the dams are too close to the weld or directly below, this can reduce the longevity of the product or even cause damage.**

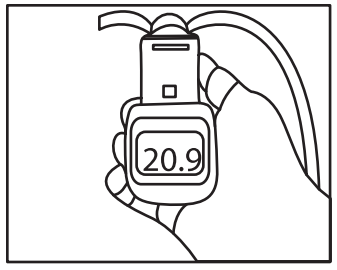
4. Start the gas supply

The dams will now inflate and seal inside the pipe around the weld. Once the dams are inflated the valve will release purge gas into the weld chamber. The weld chamber will purge quickly, however, gas flow can be increased by feeding additional purge gas through the supplementary inlet while the weld gap is open.

Use a flow rate between 10.8 and 31.8 scfh (0.18 and 0.53 scfm or 5 and 15 lpm) for inflation. A higher flow rate may cause over-inflation and damage the product voiding the product warranty.

IMPORTANT

- **Sumner Manufacturing recommends the use of an Argo-Naught Weld Gas Analyzer to closely and accurately monitor the oxygen level in the weld chamber.**



779281 Sumner Argo-Naught Weld Gas Analyzer
Once the required oxygen level (typically 0.1 %) has been achieved, welding can begin.

5. Welding the root pass

Sumner recommends reducing the flow rate through the red inflation hose to 10.8 scfh (0.18 scfm or 5 lpm) for the duration of the weld. Gas flow rate can be adapted more easily through additional gas supply through the black bypass hose which will eliminate the risk of bursting the purge dams.

Especially if larger weld gaps are used through which argon gas can freely escape, contamination may occur if the purge gas flow rate is not high enough to prevent oxygen penetration through the gap. To prevent oxygen penetration additional back-up gas can be introduced into the weld proximity by connecting a secondary gas supply to the especially designed black bypass hose on the bypass Purge Star and Ring Purge systems. Working with a second gas supply will allow the welder to compensate for any gas loss through the weld gap while not exposing the dams to over-inflation which might occur if the flow rate of the primary gas supply is too high.

6. Welding hot passes

Once the weld gap is closed, loss of purge gas should be minimal due to the tight seal of the inflatable system in the pipe. A flow rate

between 10.8 and 21.2 scfh (0.18 scfm and 0.35 scfm; 5 and 10 lpm) is recommended during welding of the hot passes as this is enough to maintain an oxygen-free environment and will avoid that the root pass is “blown out” by too high flow rates.

7. Remove Purge Star or Ring Purge System from pipe

After completion of the weld the purge dam system should remain inflated with argon gas in the pipe until the weld has cooled down enough to avoid oxidation.

Turn off the gas supply, disconnect gas inflation line from the purge dam system by loosening the hose fitting at the Y-piece to allow the product to deflate inside the pipe.

Once deflated, the purge dam system can easily be pulled out of the pipe using pull wires or ropes attached to eyelets.

SETUP AND OPERATION

⚠ WARNING

• Stainless steel fabricators using a purge system are encouraged to clean pipes prior to installing purge dams and welding. Any dirt or dust present in the pipes when purging the weld can oxidize the weld root as well as generate heat, creating discolored lines that run parallel to the internal weld.
• If the pipes are not cleaned prior to welding or if any tacks are ground out when welding two pipe lengths together, the internal pipe surface is likely to contain dust or liquids from a machining process or storage. The purge system, when sealed against the pipe and pulled through the pipe, can be contaminated with these materials.
• Depending on the amount of dirt, some dusts can be cleaned with a soft brush. If the Purge System is covered with oils, owners might use detergents and stiffer brushes and rinse the product with clean water. Excessive cleaning with detergents will reduce the additives in the flame-retardant material reducing the effectiveness to withstand grinding parks.
• Using the purge dams equidistant from the weld maximizes the usage life of both purge dams. Locating the reflective band below the weld ensures the purge system is centrally located. When welding a flange or a fitting to the pipe end, one end of the purge system may be located closer to the weld. Using flange pins to locate a second flange to a welded flange or clamping a short length of pipe to an elbow or T piece will increase the length of available pipe to seal a purge dam inside and ensure the reflective band can be located below the weld.

INSPECTION

Flow Rate Conversion Table

Recommended range for inflating Purge Star is between 5.0 and 15.0 LPM (10.6 and 31.8 SCFH).

Flow rates may be increased when utilizing black bypass hose for Purge Stars 12`` to 16`` or Ring Purge products.

LPM	SCFH	SCFM
20.0	42.4	0.71
19.0	40.3	0.67
18.0	38.1	0.64
17.0	36.0	0.60
16.0	33.9	0.56
15.0	31.8	0.53
14.0	29.7	0.49
13.0	27.5	0.46
12.0	25.4	0.42
11.0	23.3	0.39
10.0	21.2	0.35
9.0	19.1	0.32
8.0	16.9	0.28
7.0	14.8	0.25
6.0	12.7	0.21
5.0	10.6	0.18

LPM = Liters per minute
SCFH = Standard cubic feet per hour
SCRM = Standard cubic feet per minute

INSPECTION

1. Inspect the flame-retardant material for any cuts, tears or premature wear, replace if damaged.
2. Inspect the sleeve for any cuts, tears or signs of premature wear, replace if damaged.
3. Inspect inlet hoses for any cuts, tears or premature wear, replace if damaged.
4. For parts, contact Sumner Manufacturing at 1.281.999.6900

WARRANTY ON SUMNER EQUIPMENT

What Does This Warranty Cover?

Limited Lifetime Warranty on Sumner Equipment

Under Sumner's Equipment Limited Lifetime Warranty, Sumner Manufacturing Co., LLC warrants that all Sumner Equipment will be free from manufacturer defects for a Limited Lifetime except for moving parts deemed consumables from the date of the original end user's purchase. Products deemed as consumable products, components and parts such as steel cables, rollers, bearings, wheels, lift mast sections components are excluded from this Limited Lifetime Warranty and are subject to One -Year Limited Warranty terms. Sumner electrical components are excluded from this Limited Lifetime Warranty and are subject to One -Year Limited Warranty terms. Under this Limited Lifetime Warranty, the following are also excluded, and Sumner will have no liability for any of the following: normal wear and tear resulting from product use and damage arising out of misuse, abuse, modification, and improper product maintenance. This warranty also does not cover Sumner's Equipment products that have been modified by any party other than Sumner or its authorized third-party designee. This Limited Lifetime Warranty is not transferrable to or enforceable by any person other than the product's original end user.

Three-Year Limited Warranty on Pallet Jacks and Hydraulic Tools

Under Sumner's 3-Year Limited Warranty, Sumner Manufacturing Co., LLC warrants that all Sumner Pallet Jacks and Hydraulic Tools will be free from manufacturer defects for a period of three (3) years from the date of the original end user's purchase. Under this Three-Year Limited Warranty for Pallet Jacks and Hydraulic Tools, the following are excluded and Sumner Manufacturing Co., LLC will have no liability for any of the following: normal wear and tear resulting from product use and damage arising out of misuse, abuse, modification, and improper product maintenance. This warranty also does not cover Pallet Jacks and Hydraulic Tools that have been modified by any party other than Sumner Manufacturing Co., LLC or its authorized third-party designee. This 3-Year Limited Warranty is not transferrable to or enforceable by any person other than the product's original end user.

One-Year Limited Warranty on All Products

Under Sumner's 1-Year Limited Warranty, Sumner Manufacturing Co., LLC warrants that all products will be free from manufacturer defects for a period of one-year from the date of the original end user's purchase. Under this 1-Year Limited Warranty, Sumner Manufacturing Co., LLC will have no liability for any of the following: normal wear and tear resulting from product use and damage arising out of misuse, abuse, modification, and improper product maintenance. This warranty also does not cover Sumner Equipment that has been modified by any party other than Sumner Manufacturing Co., LLC or its authorized third-party designee. This 1-Year Limited Warranty is not transferable to or enforceable by any person other than the product's original end user.

Exclusion of Incidental, Consequential, Indirect, Special and Punitive Damages

SUMNER MANUFACTURING CO. LLC MAKES NO WARRANTY THAT SUMNER MANUFACTURING CO. LLC PRODUCTS WILL BE MERCHANTABLE OR FIT FOR ANY PARTICULAR PURPOSE. SUMNER MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, OTHER THAN THE RELEVANT WARRANTY SPECIFICALLY SET FORTH IN THIS WARRANTY SECTION. SOUTHWIRE WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES FOR ANY BREACH OF THIS LIMITED LIFETIME WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Warranty Claim Information/How Do You Get Service?

For all warranty, customer service, and product return authorizations and inquiries, please contact Sumner at:

Sumner Manufacturing Co., LLC
7514 Alabonson Road
Houston, Texas 77088
Phone Number: 1.281.999.6900

Sumner – Canada
75 Saltman Drive, Unit 5
Cambridge, Ontario N3H 4R7
Phone Number: 1.519.651.5300

Sumner – U.K.
Unit 3 Kepton Road
Keytec 7 Business Park
Pershore Worcestershire
WR10 2TA, UK
Phone Number: +44 (0) 1386 556278

Sumner – Netherlands
Handelsweg 26
3881LS Putten
The Netherlands
Phone Number: +31 (0) 85 489 028

1. All warranty claims must be approved by Sumner's Warranty Department prior to return of product. If Sumner determines that a product is defective, Sumner will, at its option, repair or replace defective products or defective product components, free of charge.
2. Upon approval, Sumner will issue a Product Return Authorization Form which will include instructions on how and where to return the product. **The product serial number and the original date of delivery must be set forth on the Product Return Authorization Form.**
3. Sumner will cover standard freight charges (Courier Ground rate) incurred in connection with products that Sumner ultimately determines to be defective.
4. All defective components and defective products that Sumner replaces under these Warranties will become Sumner's property and will be retained by Sumner.

Repair Your Product When it is Out of Warranty

Southwire is happy to provide information about where a purchaser can send a product for repair at consumers' own expense, please contact 1.855.SW.tools or visit www.southwiretools.com/tools/home.do for more information about servicing for Southwire Products.